STANDARD COMPONENTS FOR PRESS DIE
2007-2008 CONTENTS①

New : New products added in this Catalog 2007-2008
Add. : Products with additional specifications
Price Cut : Reduced price products.
Delivery Shortened : Delivery Shortened products.

Time for delivery
1 • 1 Day　8 • 8 Days　T • Express T　A • Express A
3 • 3 Days　10 • 10 Days　B • Express B
5 • 5 Days　12 • 12 Days　C • Express C

Refer to the page concerned to determine if "Express service" is available.

About Reduced Prices
Items applicable to reduced prices vary depending on the type and size of products. Please refer to the catalog pages concerned.

HOW TO USE Catalog
- GUIDE TO MARKS ——— (P.34)
- HOW TO USE Catalog ——— (P.35)
- DELIVERY ——— (P.37)
- EXPRESS SERVICE SYSTEM ——— (P.38)
- GUIDE OF ALTERATIONS ——— (P.39)
- ENVIRONMENTAL ACTIVITIES AND RoHS DIRECTIVES (P.40)
- HOW TO USE Web Order System (P.41)

PUNCHES

Name / Catalog No.	SHOULDER PUNCHES	SHOULDER PUNCHES —Dicoat® type—	SHOULDER PUNCHES —TiCN coating type—	SHOULDER PUNCHES —WPC® type— —HW coating type—	SHOULDER PUNCHES —Lapping type—	JECTOR PUNCHES	JECTOR PUNCHES —Dicoat® type—
Delivery	③Ⓣⓐ	③ⓐ	③	③ⓐ ③	③Ⓣⓐ	③Ⓣⓐ	③ⓐ
Page 33～44	53	55	57	59 59	61	63	65

JECTOR PUNCHES —TiCN coating type—	JECTOR PUNCHES —WPC® type— —HW coating type—	JECTOR PUNCHES —Lapping type—	JECTOR PUNCHES —L Specified, dim. B fixed type—	JECTOR PUNCHES —L Specified, dim. B fixed type, WPC® type—	JECTOR PUNCHES —Large diameter pin—	JECTOR PUNCHES —Large diameter pin—	SHOULDER PUNCHES —Quill—	SHOULDER PUNCHES —Quill, Lapping type, TiCN coating type—	SHOULDER PUNCHES —Short type—
③	③ⓐ ③	③Ⓣⓐ	③Ⓣⓐ	③ⓐ	③Ⓣⓐ	③Ⓣⓐ	③Ⓣⓐ	③Ⓣⓐ·③	③ⓐ
67	69 69	71	73	73	75	75	77	77	79

SHOULDER PUNCHES —Short, TiCN coating type—	DOUBLE STEPPED SHOULDER PUNCHES	DOUBLE STEPPED SHOULDER PUNCHES —Quill—	SHOULDER PUNCHES —Normal type, TiCN coating type—	SHOULDER PUNCHES —WPC® type— —HW coating type—	JECTOR PUNCHES —Normal type, TiCN coating type—	JECTOR PUNCHES —WPC® type— —HW coating type—	PUNCHES WITH DOWEL	PUNCHES WITH DOWEL —Dicoat® type—	PUNCHES WITH DOWEL —TiCN coating type—
③	③ⓐ·③	③ⓐ	③ⓐ·③	③ⓐ ③	③ⓐ·③	③ⓐ ③	③Ⓣⓐ	③ⓐ	③
79	81	83	85	87 87	89	91 91	93	95	97

PUNCHES WITH DOWEL —WPC® type— —HW coating type—	JECTOR PUNCHES WITH DOWEL	JECTOR PUNCHES WITH DOWEL —Dicoat® type—	JECTOR PUNCHES WITH DOWEL —TiCN coating type—	JECTOR PUNCHES WITH DOWEL —WPC® type— —HW coating type—	PUNCHES FOR HEAVY LOAD	PUNCHES FOR HEAVY LOAD —Dicoat® type—	PUNCHES FOR HEAVY LOAD —TiCN coating type—	PUNCHES FOR HEAVY LOAD —WPC® type— —HW coating type—	PUNCHES FOR HEAVY LOAD —Lapping type—
③ⓐ ③	③Ⓣⓐ	③ⓐ	③	③ⓐ ③	③Ⓣⓐ	③ⓐ	③	③ⓐ ③	③Ⓣⓐ
99 99	101	103	105	107 107	109	111	113	115 115	117

JECTOR PUNCHES FOR HEAVY LOAD	JECTOR PUNCHES FOR HEAVY LOAD —Dicoat® type—	JECTOR PUNCHES FOR HEAVY LOAD —TiCN coating type—	JECTOR PUNCHES FOR HEAVY LOAD —WPC® type— —HW coating type—	JECTOR PUNCHES FOR HEAVY LOAD —Lapping type—	JECTOR PUNCHES FOR HEAVY LOAD —L Specified, dim. B fixed type—	JECTOR PUNCHES FOR HEAVY LOAD —L Specified, dim. B fixed type, TiCN coating type—	JECTOR PUNCHES FOR HEAVY LOAD —L Specified, dim. B fixed type, WPC® type—	JECTOR PUNCHES FOR HEAVY LOAD —L Specified, dim. B fixed type, HW coating type—	TAPERED HEAD PUNCHES
③Ⓣⓐ	③ⓐ	③	③ⓐ ③	③Ⓣⓐ	③Ⓣⓐ	③	③ⓐ	③	③ⓐ
119	121	123	125 125	127	129	131	133	133	135

TAPERED HEAD PUNCHES —TiCN coating type—	TAPERED HEAD PUNCHES —HW coating type—	TAPERED HEAD JECTOR PUNCHES	TAPERED HEAD JECTOR PUNCHES —WPC® type—	TAPERED HEAD JECTOR PUNCHES —TiCN coating type—	TAPERED HEAD JECTOR PUNCHES —HW coating type—	PUNCHES FOR HEAVY LOAD WITH DOWEL	PUNCHES FOR HEAVY LOAD WITH DOWEL —TiCN coating type—	PUNCHES FOR HEAVY LOAD WITH DOWEL —WPC® type— —HW coating type—	JECTOR PUNCHES FOR HEAVY LOAD WITH DOWEL —Finished for retainers—
③	③	③ⓐ	③	③	③	③Ⓣⓐ	③	③ⓐ ③	③Ⓣⓐ
135	135	137	137	137	137	139	141	143 143	145

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Ⓐ Express A Ⓑ Express B Ⓒ Express C

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JECTOR PUNCHES FOR HEAVY LOAD WITH DOWEL —TiCN coating type—	JECTOR PUNCHES FOR HEAVY LOAD WITH DOWEL —WPC® type—	—HW coating type—	DOUBLE STEPPED SHOULDER PUNCHES FOR HEAVY LOAD	TAPPED PUNCHES	TAPPED PUNCHES —Dicoat® type—	TAPPED PUNCHES —TiCN coating type—	TAPPED PUNCHES —WPC® type—	—HW coating type—	TAPPED JECTOR PUNCHES	TAPPED JECTOR PUNCHES —WPC® type—	DOUBLE STEPPED TAPPED PUNCHES
③	③Ⓐ	③	③Ⓐ·⑤Ⓑ	③ⓉⒶ	③Ⓐ	③	③Ⓐ	③	③ⓉⒶ	③Ⓐ	③Ⓐ·③
147	149	149	151	153	155	155	157	157	159	159	161

TAPPED PUNCHES —Normal type, TiCN coating type—	PUNCHES WITH KEY GROOVE	PUNCHES WITH KEY GROOVE —TiCN coating type—	PUNCHES WITH KEY GROOVE —WPC® type—	—HW coating type—	JECTOR PUNCHES WITH KEY GROOVE	PUNCHES WITH KEY GROOVE —WPC® type—	PRESS-FIT HEADED PUNCHES —Normal type, TiCN coating type—	STRAIGHT PUNCHES	STRAIGHT PUNCHES —Lapping type—	STRAIGHT PUNCHES —TiCN coating type—
③Ⓐ·③	③Ⓐ	③	③Ⓐ	③	③Ⓐ	③Ⓐ	③	③ⓉⒶ	③ⓉⒶ	③	
163	165	167	169	169	171	171	173	175	175	176	

JECTOR STRAIGHT PUNCHES	JECTOR STRAIGHT PUNCHES —Lapping type—	TAPPED STRAIGHT PUNCHES	TAPPED STRAIGHT PUNCHES —Lapping type—	STRAIGHT PUNCHES FOR HEAVY LOAD	STRAIGHT PUNCHES FOR HEAVY LOAD —Lapping type—	BLANKING PUNCHES	MINI PUNCHES	MINI STRAIGHT PUNCHES	PUNCH BLANKS
③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③ⓉⒶ	③ⓉⒶ	⑤	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ		
177	177	178	178	179	180	181	183	184	185		

PUNCH BLANKS —With dowel—	JECTOR PUNCH BLANKS	JECTOR PUNCH BLANKS —With dowel—	PUNCH BLANKS FOR HEAVY LOAD	TAPPED PUNCH BLANKS	PUNCH BLANKS FOR HEAVY LOAD —With dowel—	JECTOR PUNCH BLANKS WITH DOWEL FOR HEAVY LOAD	TAPPED JECTOR PUNCH BLANKS	JECTOR PUNCH BLANKS FOR HEAVY LOAD —With dowel—	JECTOR PIN SETS SJ AJ VJ FJ LJ
③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ
185	186	186	187	187	187	188	188	188	189 190 192

PUSHING PINS JP JPW JPWH	PUNCH HOLDERS BBPH BBPHC	KBPH KBPHC	SPACERS FOR PUNCH PWA	SHIMS FOR PUNCH PWB	SPACERS FOR A PUNCH WITH A TAP PWC	KEYS	KEYS	KEYS KE KED KES KEG
③Ⓐ	③Ⓐ	③Ⓐ	③	③	③	①	③Ⓐ	①·③Ⓐ
192	193	193	194	194	194	195	195	196

PILOT PUNCHES

Name	PILOT PUNCHES	PILOT PUNCHES —Lapping type—	PILOT PUNCHES —TiCN coating type—	PILOT PUNCHES —Dicoat® type—	PILOT PUNCHES WITH DOWEL	PILOT PUNCHES —Standard type—	—Free type— —Dicoat® type—	PILOT PUNCHES PRESS-FIT TYPE	PILOT PUNCHES Tapped	PILOT PUNCHES WITH KEY GROOVE
Catalog No.										
Delivery	③ⓉⒶ	③ⓉⒶ	③	③Ⓐ	③ⓉⒶ·③	③Ⓐ	③	③	③ⓉⒶ·③	③Ⓐ·③
Page	201	203	205	207	209	211	211	212	213	215

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T Express T
A Express A B Express B C Express C
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Add. Tip acute-angle type

Add. Tip acute-angle type

Add. Tip acute-angle type

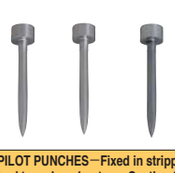
Add. Tip acute-angle type TiCN coating type

Add. Tip acute-angle type TiCN coating type

STRAIGHT PILOT PUNCHES	STRAIGHT PILOT PUNCHES —Lapping type—	STRAIGHT PILOT PUNCHES —TiCN coating type—	STRAIGHT PILOT PUNCHES Tapped	STRAIGHT PILOT PUNCHES WITH KEY GROOVE	PILOT PUNCHES —Fixed in stripper plate—
③Ⓐ	③Ⓐ	③	③Ⓐ·③	③Ⓐ·③	③ⓉⒶ
217	219	221	223	225	227

PILOT PUNCHES —Fixed in stripper plate— —Lapping type—	PILOT PUNCHES —Fixed in stripper plate— —TiCN coating type—	SHAPED PILOT PUNCHES —Fixed in stripper plate—	PILOT PUNCHES —Fixed in stripper plate— —Standard type—	PILOT PUNCHES —Fixed in stripper plate— —Straight type— —Lapping type, Coating type—	
③ⓉⒶ	③	③Ⓐ	③ⓉⒶ	③ⓉⒶ	③
227	229	231	233	233	233

Add.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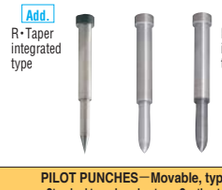

Add. R·Taper integrated type

Add. R·Taper integrated type

PILOT PUNCHES —Fixed in stripper plate— —Standard type, Lapping type, Coating type—			STRAIGHT PILOT PUNCHES —Fixed in stripper plate— —Standard type, Lapping type, Coating type—			PILOT PUNCHES —Movable, type— —Standard type, Lapping type, Coating type—			PILOT PUNCHES —Movable, type— —Standard type, Lapping type, Coating type—		
③Ⓐ	③Ⓐ	③	③Ⓐ	③Ⓐ	③	③ⓉⒶ	③ⓉⒶ	③	③ⓉⒶ	③ⓉⒶ	③
235	235	235	236	236	236	237	237	238	239	239	240

PILOT PUNCHES —Fixed tip diameter type—	PILOT EJECTOR BUSHINGS MEG
③ⓉⒶ	③ⓉⒶ
241	242

PUNCH GUIDE BUSHINGS

Add. Shank dia. tolerance $D^{+0.005}_{0}$

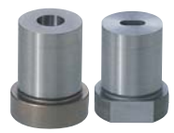
Add. Shank dia. tolerance $D^{+0.005}_{0}$

Name / Catalog No.	PUNCH GUIDE BUSHINGS Headed type	PUNCH GUIDE BUSHINGS Straight type	—Long type— Headed type	—Long type— Straight type
Delivery	③ⓉⒶ		③ⓉⒶ	
Page	245		247	

—Super Long type— Headed type	—Super Long type— Straight type	—Two stepped guide type— Headed type	—Two stepped guide type— Straight type	—Block type— Bolt fixing type	—Block type— Flange type
③		③		③Ⓐ	
249		250		251	

BUTTON DIES

Add.



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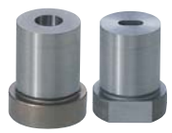

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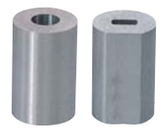


Add.

Name / Catalog No.	BUTTON DIES —Headed type—(Regular)	BUTTON DIES —Headed type—(Economy)	BUTTON DIES —Straight type—(Regular)	BUTTON DIES —Straight type—(Economy)
Delivery	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ
Page	257	259	261	263

Add.

Price Cut

Add.

Price Cut

Add.

Price Cut

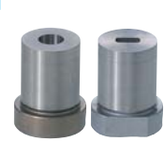
Add.

Price Cut

SCRAP RETENTION BUTTON DIES —Headed type—(Regular)	SCRAP RETENTION BUTTON DIES —Headed type—(Economy)	SCRAP RETENTION BUTTON DIES —Straight type—(Regular)	SCRAP RETENTION BUTTON DIES —Straight type—(Economy)
③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ
265	267	269	271

BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP —Headed type—	BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP —Straight type—
③	③
273	273

Add.



ANGULAR BUTTON DIES —Headed type—	ANGULAR BUTTON DIES —Straight type—
③Ⓐ	③Ⓐ
275	277

Add.

SCRAP RETENTION ANGULAR BUTTON DIES —Headed type—
③Ⓐ
279

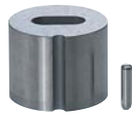
Price Cut

SCRAP RETENTION ANGULAR BUTTON DIES —Straight type—	LONG POINT BUTTON DIES —Headed type—	LONG POINT BUTTON DIES —Straight type—	FREE LENGTH BUTTON DIES —Headed type—	FREE LENGTH BUTTON DIES —Straight type—	SCRAP RETENTION FREE LENGTH BUTTON DIES —Headed type—	SCRAP RETENTION FREE LENGTH BUTTON DIES —Straight type—
③Ⓐ	③ⓉⒶ		⑤		⑤	
281	283		285		287	

Price Cut

Price Cut

FREE SIZE BUTTON DIES —Headed type—	FREE SIZE BUTTON DIES —Straight type—	SCRAP RETENTION FREE SIZE BUTTON DIES —Headed type—	SCRAP RETENTION FREE SIZE BUTTON DIES —Straight type—	BUTTON DIES —Dowel slot type—	SCRAP RETENTION BUTTON DIES —Dowel slot type—
⑤		⑤		③ⓉⒶ	③Ⓐ
289		291		293	294



TILTING BUTTON DIES —Dowel slot type—	UNHARDENED BUTTON DIES —Dowel slot type—	SCRAP VACUUM UNIT	SHOOTING UNIT
③ⓉⒶ	⑤Ⓑ	③Ⓐ	③Ⓐ
295	296	297	298

SCRAP REMOVER
①
299·300

Add.

BUTTON DIE BLANKS —Headed type— —Straight type—
③ⓉⒶ
301

Add.

ANGULAR BUTTON DIE BLANKS —Headed type— —Straight type—
③ⓉⒶ
302

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SPACERS —For angular button die—	SPACERS —For back relief hole of straight button die—	COLLARS FOR BUTTON DIES
③Ⓐ	①	③
303	303	304

BLOCK PUNCHES

Name	BLOCK PUNCHES	BLOCK PUNCHES —Tapped—	JECTOR BLOCK PUNCHES —Tapped—	BLOCK PUNCHES —With key groove—	JECTOR BLOCK PUNCHES —With key groove—
Catalog No.					
Delivery	③Ⓣ Ⓐ·③	③Ⓐ·③	③Ⓐ·⑧	③Ⓐ·③	③Ⓐ·⑧
Page	311	313	315	317	319

BLOCK PUNCHES —Single flanged—	JECTOR BLOCK PUNCHES —Single flanged—	BLOCK PUNCHES —Double flanged—	JECTOR BLOCK PUNCHES —Double flanged—	BLOCK PUNCHES—Flange thickness 10mm— —Single flanged—	BLOCK PUNCHES—Flange thickness 10mm— —Double flanged—
③Ⓐ·③·⑧	③Ⓐ·⑧	③Ⓐ·③·⑧	③Ⓐ·⑧	③Ⓐ·③	③Ⓐ·③
321	323	325	327	329	331

BLOCK PUNCHES —Flange fixing type—	BLOCK PUNCHES —Standard type—	BLOCK PUNCHES—Free size type— —Tapped—	—With key groove—	—Single flanged—	—Double flanged—
③Ⓐ·③	⑧	⑧	⑧	⑧	⑧
333	335	335	335	335	335

BLOCK PUNCHES —WPC® type— —Standard—	—Tapped—	—With key groove—	—Single flanged—	—Double flanged—	BLOCK PUNCHES—TiCN coating type— —Standard type—	—Tapped—	—With key groove—
⑤	⑤	⑤	⑤·⑧	⑤·⑧	⑤	⑤	⑤
339	339	339	339	339	343	343	343

BLOCK PUNCHES—TiCN coating type— —Single flanged—	—Double flanged—	BLOCK PUNCHES —HW coating type— —Standard—	—Tapped—	—With key groove—	—Single flanged—	—Double flanged—
⑤·⑧	⑤·⑧	⑤	⑤	⑤	⑤ ⑩	⑤ ⑩
343	343	347	347	347	347	347

JECTOR BLOCK PUNCHES —WPC® type— —Tapped—	—With key groove—	—Single flanged—	—Double flanged—	JECTOR BLOCK PUNCHES —TiCN coating type— —Tapped—	—With key groove—	—Single flanged—	—Double flanged—
⑤·⑧	⑤·⑧	⑤·⑧	⑤·⑧	⑧	⑧	⑧	⑧
351	351	351	351	355	355	355	355

JECTOR BLOCK PUNCHES —HW coating type— —Tapped—	—With key groove—	—Single flanged—	—Double flanged—	BLOCK PUNCHES—Flange thicness 10mm,TiCN coating type— —Single flanged—	—Double flanged—	JECTOR BLOCK PUNCHES FOR HEAVY LOAD -WPC® type— —Single flanged / Double flanged thickness 10mm type—
⑩	⑩	⑩	⑩	⑤	⑤	⑤ ⑤
359	359	359	359	363	363	365 365

BLOCK PUNCHES FOR HEAVY LOAD —HW coating type— —Single flanged / Double flanged thickness 10mm type—		BLOCK PUNCHES —Free size · TiCN coating type— —Standard—	—Tapped—	—With key groove—	—Single flanged—	—Double flanged—
⑤	⑤	⑧	⑧	⑧	⑧	⑧
365	365	369	369	369	369	369

STRAIGHT PUNCHES —Straight—	—Tapped—	—With key groove—	—Single flanged—	—Double flanged—	JECTOR STRAIGHT PUNCHES —Tapped—	—With key groove—	—Single flanged—	—Double flanged—
③Ⓐ·③	③Ⓐ·③	③Ⓐ·③	⑤Ⓑ·⑤·⑧	⑤Ⓑ·⑤·⑧	③Ⓐ·⑧	③Ⓐ·⑧	⑤Ⓑ·⑧	⑤Ⓑ·⑧
373	373	373	373	373	377	377	377	377

STRAIGHT PUNCHES—TiCN coating type— —Straight—	—Tapped—	—With key groove—	JECTOR STRAIGHT PUNCHES—TiCN coating type— —Tapped—	—With key groove—	SHORT STRAIGHT PUNCHES —Tapped—	—Single flanged—	—Double flanged—
⑤	⑤	⑤	⑧	⑧	③	③	③
381	381	381	383	383	385	385	385

BLOCK PUNCH BLANKS	JECTOR BLOCK PUNCH BLANKS
③Ⓐ	③Ⓐ
387	389

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Time for delivery
① 1 Day ③ 3 Days ⑤ 5 Days ⑧ 8 Days ⑩ 10 Days ⑫ 12 Days
T Express T
Ⓐ Express A Ⓑ Express B Ⓒ Express C

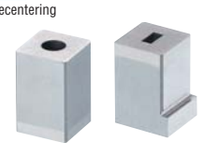
Refer to the page concerned to determine if "Express service" is available.

About Reduced Prices
Items applicable to reduced prices vary depending on the type and size of products. Please refer to the catalog pages concerned.

BLOCK PUNCH BLANKS—Short type—	FLANGE HOLDERS HFW	KEYS PSK□ PSKBH	—Long type— PSKW
③Ⓐ	③Ⓐ	①	③Ⓐ
391	393	394	394

BLOCK DIES

Add. Point decentering type



Add. Point decentering type

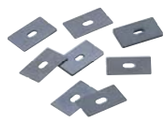
Name / Catalog No.	BLOCK DIES —Straight type— —Single flanged type—	BLOCK DIES—Small type— —Straight type— —Single flanged type—	SCRAP RETENTION BLOCK DIES —Straight type— —Single flanged type—
Delivery	③Ⓐ	③Ⓐ	③Ⓐ
Page	397	399	401

Add. Point decentering type

Add. Point decentering type

Add. Point decentering type

Add. Point decentering type



BLOCK DIES —Configurable type—	SCRAP RETENTION BLOCK DIES —Configurable type—	BLOCK DIES —Bolt fixing type—	SCRAP RETENTION BLOCK DIES —Bolt fixing type—	BLOCK DIE BLANKS —Straight type— —Single flanged type—	BLOCK DIE BLANKS —Bolt fixing type—	SPACERS FOR BLOCK DIE
③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ
403	405	407	409	411	412	413

PRECISION PUNCHES & DIES

Name / Catalog No.	PRECISION SHOULDER PUNCHES —Standard type—	—Lapping type—	PRECISION SHOULDER PUNCHES WITH AIR HOLE —Standard type—	—Lapping type—	PRECISION CARBIDE SHOULDER PUNCHES —Standard type—	—Lapping type—	PRECISION CARBIDE SHOULDER PUNCHES WITH AIR HOLE —Standard type—	—Lapping type—	PRECISION CARBIDE SHOULDER QUILL PUNCHES —Standard type—	—Lapping type—	PRECISION PUNCHES WITH KEY GROOVE —Standard type—	—Lapping type—	PRECISION PUNCHES WITH KEY GROOVE AND AIR HOLE —Standard type—	—Lapping type—	PRECISION CARBIDE PUNCHES WITH KEY GROOVE —Standard type—	—Lapping type—	PRECISION CARBIDE PUNCHES WITH KEY GROOVE AND AIR HOLE —Standard type—	—Lapping type—
Delivery	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤
Page	419	419	420	420	421	421	422	422	423	423	425	425	426	426	427	427	428	428

PRECISION ROUND PUNCHES —Standard type—	—Lapping type—	PRECISION CARBIDE ROUND PUNCHES —Standard type—	—Lapping type—	PRECISION CARBIDE BLOCK PUNCHES	PRECISION CARBIDE BLOCK PUNCHES WITH AIR HOLE	PRECISION CARBIDE STRAIGHT PUNCHES	PRECISION CARBIDE STRAIGHT PUNCHES WITH AIR HOLE	PRECISION CARBIDE PILOT PUNCHES —Standard type—	—Lapping type—	PRECISION CARBIDE PILOT PUNCHES—Fixed in stripper plate— —Standard type—	—Lapping type—	PRECISION CARBIDE PILOT PUNCHES—Fixed in stripper plate— —Standard type—	—Lapping type—
⑤	⑤	⑤	⑤	⑩	⑩	⑩	⑩	⑤	⑤	⑤	⑤	⑤	⑤
429	429	430	430	431	433	435	437	441	441	442	442	442	442

Add.

PRECISION ANGULAR BUTTON DIES —Fully tapered type—	PRECISION CARBIDE ANGULAR BUTTON DIES	PRECISION SCRAP RETENTION CARBIDE ANGULAR BUTTON DIES	PRECISION CARBIDE ANGULAR BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP
⑤	⑤	⑤	⑤
443	444	445	446

CARBIDE PUNCHES

Add. Blade length X type

Add. Blade length X type

Add. Blade length X type

Name / Catalog No.	CARBIDE SHOULDER PUNCHES —Standard type—	—Lapping type—	CARBIDE SHOULDER PUNCHES —TiCN coating type—	CARBIDE SHOULDER PUNCHES WITH AIR HOLE —Standard type—	—Lapping type—
Delivery	③Ⓐ·⑤Ⓑ	③Ⓐ·⑤Ⓑ	⑧Ⓒ	③Ⓐ·⑤Ⓑ	③Ⓐ·⑤Ⓑ
Page	449	449	451	453	453

Add. Blade length X type

New

Add.

New

Add.

CARBIDE SHOULDER PUNCHES WITH AIR HOLE —TiCN coating type—	CARBIDE JECTOR PUNCHES —Standard type—	—Lapping type—	—TiCN coating type—	CARBIDE SHOULDER QUILL PUNCHES —Standard type—	—Lapping type—	—TiCN coating type—	CARBIDE PUNCHES —Mirror type—	CARBIDE SHOULDER PUNCHES—Short type— —Standard type—	—Lapping type—	—TiCN coating type—	CARBIDE DOUBLE STEPPED TYPE PUNCHES —Standard type—	—TiCN coating type—	CARBIDE KEY FLAT SHANK SHOULDER PUNCHES —Standard type—	—TiCN coating type—	CARBIDE KEY FLAT SHANK SHOULDER PUNCHES WITH AIR HOLE —Standard type—	—TiCN coating type—
⑧Ⓒ	③Ⓐ·⑤Ⓑ	③Ⓐ·⑤Ⓑ	⑧Ⓒ	③·⑤·⑤Ⓑ	③·⑤·⑤Ⓑ	⑧Ⓒ	③·⑤	③	③	⑧	③·⑤·⑤Ⓑ	⑧Ⓒ	③Ⓐ·⑤Ⓑ	⑧Ⓒ	③Ⓐ·⑤Ⓑ	⑧Ⓒ
455	459	459	459	461	461	461	463	465	465	465	467	467	469	469	471	471

STANDARD COMPONENTS FOR PRESS DIE
2007-2008 CONTENTS⑥

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⑧ 8 Days ⑩ 10 Days ⑫ 12 Days
Ⓣ Express T
Ⓐ Express A Ⓑ Express B Ⓒ Express C

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TAPPED CARBIDE PUNCHES			CARBIDE PUNCHES WITH KEY GROOVE		CARBIDE PUNCHES WITH KEY GROOVE	CARBIDE PUNCHES WITH KEY GROOVE		
—Standard type—	—Lapping type—	—TiCN coating type—	—Standard type—	—Lapping type—	—TiCN coating type—	—Standard type—	—Lapping type—	—Negative D tolerance— —TiCN coating type—
③Ⓐ·⑤Ⓑ	③Ⓐ·⑤Ⓑ	⑧Ⓒ	③Ⓐ·⑤Ⓑ	③Ⓐ·⑤Ⓑ	⑧Ⓒ	③Ⓐ	③Ⓐ	⑧Ⓒ
473	473	473	475	475	477	479	479	479

CARBIDE DOUBLE STEPPED TYPE PUNCHES WITH KEY GROOVE		CARBIDE PUNCHES WITH KEY GROOVE AND AIR HOLE		CARBIDE PUNCHES WITH KEY GROOVE AND AIR HOLE
—Standard type—	—TiCN coating type—	—Standard type—	—Lapping type—	—TiCN coating type—
③·⑤·⑤Ⓑ	⑧Ⓒ	③Ⓐ·⑤Ⓑ	③Ⓐ·⑤Ⓑ	⑧Ⓒ
481	481	483	483	485

CARBIDE PUNCHES WITH KEY GROOVE AND AIR HOLE—Negative D tolerance—			CARBIDE ROUND PUNCHES			CARBIDE ROUND PUNCHES—Negative D tolerance—			CARBIDE ROUND PUNCHES		
—Standard type—	—Lapping type—	—TiCN coating type—	—Standard type—	—With air hole type—	—TiCN coating type—	—Standard type—	—With air hole type—	—TiCN coating type—	—Standard type—	—Lapping type—	—TiCN coating type—
③Ⓐ	③Ⓐ	⑧Ⓒ	③	③	⑧Ⓒ	③	③	⑧Ⓒ	③Ⓐ	③Ⓐ	⑧Ⓒ
487	487	487	489	489	489	489	489	489	490	490	490

CARBIDE PILOT PUNCHES

Name / Catalog No.	CARBIDE PILOT PUNCHES			CARBIDE PILOT PUNCHES WITH KEY GROOVE	
	—Standard type—	—Lapping type—	—TiCN coating type—	—Standard type—	—Negative D tolerance—
Delivery	③	③	⑧Ⓒ	③	③
Page	493	493	495	497	499

CARBIDE STRAIGHT PILOT PUNCHES			CARBIDE STRAIGHT PILOT PUNCHES WITH KEY GROOVE	CARBIDE PILOT PUNCHES—Fixed in stripper plate—		
—Standard type—	—Lapping type—	—TiCN coating type—	—Standard type—	—Standard type—	—Lapping type—	—TiCN coating type—
③	③	⑧Ⓒ	③	③	③	⑧Ⓒ
501	501	501	502	503	503	504

CARBIDE STRAIGHT PILOT PUNCHES—Fixed in stripper plate—			CARBIDE PILOT PUNCHES—Tip R·Tapered integrated type·Flange negative tolerance—		
—Standard type—	—Lapping type—	—TiCN coating type—	—Standard type—	—Lapping type—	—TiCN coating type—
③	③	⑧Ⓒ	③	③	⑧Ⓒ
505	505	506	507	507	507

CARBIDE STRAIGHT PILOT PUNCHES—Tip R·Tapered integrated type·Flange negative tolerance—			CARBIDE PILOT PUNCHES—Detachable type—		
—Standard type—	—Lapping type—	—TiCN coating type—	—Standard type—	—Lapping type—	—TiCN coating type—
③	③	⑧Ⓒ	③	③	⑧Ⓒ
508	508	508	509	509	509

CARBIDE BUTTON DIES

Name / Catalog No.	CARBIDE BUTTON DIES	SCRAP RETENTION CARBIDE BUTTON DIES	CARBIDE BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP
Delivery	③·⑤Ⓑ	③·⑤Ⓑ	③
Page	513	515	517

CARBIDE ANGULAR BUTTON DIES	SCRAP RETENTION CARBIDE ANGULAR BUTTON DIES	CARBIDE ANGULAR BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP
③·⑤Ⓑ·⑧	③·⑤Ⓑ	③
519	521	523

CARBIDE BUTTON DIE BLANKS	SPACER FOR BUTTON DIE —For angular button die—	SPACER FOR BUTTON DIE —For straight button die drain hole—
③Ⓐ	③Ⓐ	①
525	526	526

CARBIDE BLOCK PUNCHES

Name / Catalog No.	CARBIDE BLOCK PUNCHES ZP□BL ZP□ML ZP□KL ZP□FL ZP□WL	CARBIDE BLOCK PUNCHES WITH AIR HOLE ZJ□BL ZJ□KL ZJ□FL ZJ□WL	CARBIDE BLOCK PUNCHES—Configurable type— FZP□BL FZP□ML FZP□KL FZP□FL FZP□WL
Delivery	⑤	⑩	⑩
Page	529	531	535

CARBIDE STRAIGHT PUNCHES ZPC□ ZMC□ ZKC□ ZFC□ ZWC□	CARBIDE STRAIGHT PUNCHES WITH AIR HOLE ZJC□ ZJKC□ ZJFC□ ZJWC□	CARBIDE BLOCK PUNCH BLANKS ZPDB ZPDM ZPDK ZPDF ZPDW	CARBIDE BLOCK PUNCH BLANKS ZPB B-ZPB ZPM ZPK B-ZPK ZPF ZPW
⑤	⑩	⑤Ⓑ	⑤Ⓑ
539	541	547	549

STANDARD COMPONENTS FOR PRESS DIE
2007-2008 CONTENTS⑦

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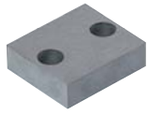
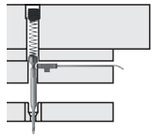
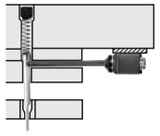
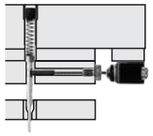
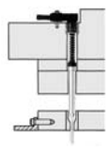
CARBIDE BLOCK DIES



CARBIDE BLOCK PUNCH BLANKS WITH AIR HOLE ZJB ZJK ZJF ZJW	CARBIDE BLOCKS Z	Name / Catalog No.	CARBIDE BLOCK DIES —Straight type, Single flanged type—	SCRAP RETENTION CARBIDE BLOCK DIES	BLOCK DIES —Free size type—	SCRAP RETENTION CARBIDE BLOCK DIES (FREE SIZE TYPE)	CARBIDE BLOCK DIE BLANKS WBLDB WBLDBF	CARBIDE BLOCK DIE BLANKS ZD ZDA ZD□B ZD□C
⑩	①	Delivery	⑧Ⓒ	⑧Ⓒ	⑧Ⓒ	⑧Ⓒ	⑤Ⓑ	⑤Ⓑ·⑩
551	553	Page	557	559	561	562	563	564・565

RELATED COMPONENTS OF MISFEED SENSOR

Name / Catalog No.	RESISTANCE MISFEED SENSOR UNITS MFSF	RESISTANCE MISFEED SENSOR UNITS MFL SMA□	MICROSWITCH MISFEED SENSOR UNIT FOR GROOVE —Groove feed type—	—Hole feed type—	PHOTO MICRO MISFEED SENSOR UNITS MFG MGA□	BRACKETS FOR SENSOR SNB SNB-D	BRACKETS FOR SENSOR SNBA SNBA-D	SENSOR UNITS—Contact type— OKJS
Delivery	③Ⓐ	① ③ⓉⒶ	① ③ⓉⒶ	① ③ⓉⒶ	① ③ⓉⒶ	①	①	①
Page	568	569	571	573	575	577	577	578

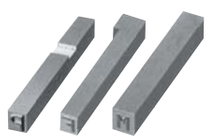
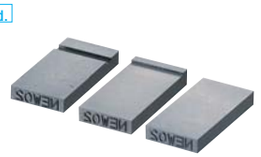
PUNCHES & DIES FOR FORMING

Name / Catalog No.	BURRING PUNCHES SPM T—SPM SJM	BURRING PUNCHES SPMB□ L—SPMB□	BURRING PUNCHES —Half-made tip R type—	BURRING PUNCHES —Half-made tip tapered type—	BURRING DIE UNITS BDU	SCRAPLESS BURRING PUNCHES	EMBOSSING PUNCHES —SR・Stepped SR・Stepped taper type—	KNOCKOUT PIN SETS FOR EMBOSSING PUNCH BMPS BMP	CHAMFERING PUNCHES	DRAWING PUNCHES —Standard・Lapping type—
Delivery	①	③Ⓐ	③Ⓐ·③	③Ⓐ·③	③Ⓐ·③	③Ⓐ·③	③Ⓐ	① ①	③Ⓐ	③Ⓐ
Page	581	582	583	585	587	589	591	592	593・595	599

DRAWING BUTTON DIES

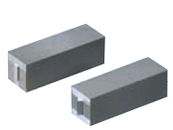
ENGRAVING PUNCHES

DRAWING PUNCHES —Dicoat®・TiCN coating type—	JECTOR DRAWING PUNCHES —Standard・Lapping type—	JECTOR DRAWING PUNCHES —Dicoat®・TiCN coating type—	DRAWING BUTTON DIES —Steel—	KNOCKOUT PINS KOP	DRAWING BUTTON DIES —Carbide—	DRAWING BUTTON DIES	ENGRAVING PUNCHES —R・L type— —Free type—	ENGRAVING PUNCHES FOR TILTING TCPTS□M TCPTL□M	SHIMS TCIM TCIMT DCIM・DCIMT
③	③Ⓐ	③	⑤	③Ⓐ	⑧	③Ⓐ	③ⓉⒶ ⑤Ⓑ	③ ③	③ⓉⒶ
601	603	605	607	608	609	611	613	614	614 616

ENGRAVING BLOCK PUNCHES

ENGRAVING PUNCHES KMCP KMCPW KMCPWF	DIE CHECK BUTTONS DCBA DCBAW	ENGRAVING BLOCK PUNCHES HCP HCF HCM	ENGRAVING BLOCK PUNCHES HCP□M HCF□M HCM□M	ENGRAVING BLOCK PUNCHES OCP□M	ENGRAVING BLOCK PUNCHES BCP□M	PRECISION ENGRAVING BLOCK PUNCHES VCF VCM	STAMP HOLDERS HCFPH HCFS	BENDING PUNCHES & DIES —Selectable type—
③Ⓐ ③Ⓐ ⑤Ⓑ	③ⓉⒶ ③Ⓐ	③Ⓐ ③ ③	⑤Ⓑ ⑤Ⓑ ⑤Ⓑ	⑤Ⓑ	⑤Ⓑ	⑤Ⓑ ⑤Ⓑ	③Ⓐ	⑤
615	616	617	618	619	619	620	621	623



BENDING PUNCHES & DIES —Selectable type—	BENDING PUNCHES & DIES —Configurable type—	BENDING DIES —Bolt fixing type—	PUNCHES FOR RIB RA□P RB□P	CAMBER ADJUSTMENT BLOCK PUNCHES CSMT CSMV	CAMBER ADJUSTMENT UNITS CSAU	COMMON SCRAP CUTTERS SCL・SCT	SPRING CASE SET SPRC
⑤	⑧	③Ⓐ	③	⑤ ⑤	⑧	⑤	①
625	627	629	630	631	632	633	634

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SPECIAL SHAPED PUNCHES & DIES

Add. WPC® type TiCN coating type Tip shape oval

Add. Tip shape oval

Add. Tip shape oval

Name / Catalog No.	SPECIAL SHAPED PUNCHES	SPECIAL SHAPED PUNCH GUIDE BUSHINGS/BUTTON DIES	SPECIAL SHAPED BLOCK DIES
Delivery	⑤Ⓑ.⑧Ⓒ.⑫	③Ⓐ	③Ⓐ
Page	639～648	649	651

RETAINERS

New

New

New

Name / Catalog No.	DURABLE END RETAINER SETS FOR NC PROCESS HDP—A□ HDP—F□	DURABLE END RETAINER SETS —For NC process・heavy load punch—	DURABLE SQUARE RETAINER SETS HSR—□□ HSA—□□
Delivery	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ
Page	660	661	662

Price Cut Up to 5%

Price Cut Up to 5%

Name / Catalog No.	END RETAINER SETS FOR NC PROCESS—25mm thickness type— —Single bolt type—	END RETAINER SETS FOR MANUAL PROCESS—25mm thickness type— —Single bolt type—	END RETAINER SETS FOR NC PROCESS DP—A□ DP—F□	END RETAINER SETS FOR MANUAL PROCESS CP—A□ CP—F□
Delivery	③Ⓐ	③Ⓐ	③ⓉⒶ ③ⓉⒶ	③ⓉⒶ ③ⓉⒶ
Page	663	664	665	666

Price Cut Up to 5%

Name / Catalog No.	END RETAINER SETS FOR NC PROCESS —Use for heavy load punch—	END RETAINER SETS FOR MANUAL PROCESS —Use for heavy load punch—	END RETAINER SETS FOR NC PROCESS—25mm thickness type— —Triangle type—	END RETAINER SETS FOR NC PROCESS—32mm thickness type— —Triangle type—
Delivery	③ⓉⒶ	③ⓉⒶ	③Ⓐ	③Ⓐ
Page	667	668	669	670

Name / Catalog No.	SQUARE RETAINER SETS SR—□□ SA—□□	RETAINER BACKING PLATES BPC	SELECT RETAINER SETS —Compact·air type—	SELECT RETAINER SETS —Standard·air type—	SELECT RETAINER SETS —Standard·manual type—	SELECT RETAINER SETS —Punch for heavy load·air type—	SPECIAL RETAINER SETS —Plate size selection type—	SPECIAL RETAINER SETS —Plate size free type—
Delivery	③ⓉⒶ ③ⓉⒶ	③ⓉⒶ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	⑤Ⓐ Ⓑ	⑤Ⓑ Ⓑ
Page	671	672	675	676	677	678	679	681

BALL-LOCK PUNCHES & DIES·RETAINERS

Name / Catalog No.	BUSHING FOR ADJUSTING PUNCH HOLE PCWB	URETHANE STRIPPER UNITS PQSP USPP USQP	URETHANE STRIPPERS FOR ANTI-DROPPING UNITS US	PROTECTION RINGS FOR URETHANE STRIPPER USR	URETHANE STRIPPERS TUS	URETHANE STRIPPERS USN	BALL-LOCK PUNCHES—Economy type— —Light load type—	BALL-LOCK PUNCHES—Economy type— —Heavy load type—	BALL-LOCK JECTOR PUNCHES—Economy type— —Light load type—	BALL-LOCK JECTOR PUNCHES—Economy type— —Heavy load type—	BALL-LOCK PUNCHES—With groove for spanner— —Light load type—	BALL-LOCK PUNCHES—With groove for spanner— —Heavy load type—
Delivery	①	①	①	①	①	①	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③Ⓐ	③Ⓐ
Page	683	684	685	685	687	688	691	692	693	694	695	696

Name / Catalog No.	BALL-LOCK JECTOR PUNCHES—With groove for spanner— —Light load type—	BALL-LOCK JECTOR PUNCHES—With groove for spanner— —Heavy load type—	BALL-LOCK PUNCH BLANKS—Economy type— —Light load type—	BALL-LOCK PUNCH BLANKS—Economy type— —Heavy load type—	BALL-LOCK PUNCH BLANKS—With groove for spanner— —Light load type—	BALL-LOCK PUNCH BLANKS—With groove for spanner— —Heavy load type—	BALL-LOCK BUTTON DIES ELD□ LD□	BALL-LOCK RETAINERS—Compact type— —Light load type—	BALL-LOCK RETAINERS—Compact type— —Heavy load type—	BALL-LOCK RETAINERS—Triangle type— —Light load type—	BALL-LOCK RETAINERS—Triangle type— —Heavy load type—	BALL-LOCK RETAINERS —Light load·Triangle compact type-
Delivery	③Ⓐ	③Ⓐ	③ⓉⒶ	③ⓉⒶ	③Ⓐ	③Ⓐ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③Ⓐ	③Ⓐ	③Ⓐ
Page	697	698	699	699	700	700	701	703	704	705	706	707

COMPONENTS

Add.

Name / Catalog No.	BALL-LOCK RETAINERS —Light load single bolt type—	SPECIAL RETAINER SETS —For ball-lock punch—	DOWEL PINS MS	DOWEL PINS—High precision type— MSV	DOWEL PINS WITH TAPPING—Precision type— MSTP	DOWEL PINS WITH TAPPING—p6— —m6— MST MSTM	TAPER DOWEL PINS MTT	DOWEL PINS—h7— MSSH	DOWEL PINS—h7— MSTH
Delivery	③Ⓐ	⑫	①	①	①	①	①	①	①
Page	708	711	715	715	715	715 716	716	716	716

STANDARD COMPONENTS FOR PRESS DIE
2007-2008 CONTENTS ⑨

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Time for delivery
① 1 Day ③ 3 Days ⑤ 5 Days ⑧ 8 Days ⑩ 10 Days ⑫ 12 Days Ⓣ Express T Ⓐ Express A Ⓑ Express B Ⓒ Express C
Refer to the page concerned to determine if "Express service" is available.

About Reduced Prices
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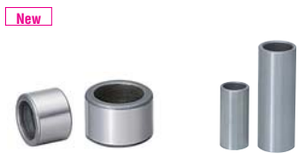
DOWEL PINS ECONOMY PACK 100PACK-MSTH 200PACK-MSTH ⑤ 717
SPRING PLUGS FOR DOWEL PINS SWA ① 717 SWAL
STEPPED DOWEL PINS MSFW ① 718 MSFWM
DOWEL PIN EXTRACTOR KNHN ③Ⓐ 718 KNHN-B KNHN-M



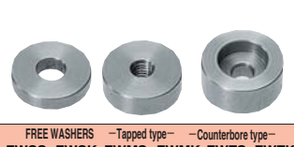
New
DOWEL RINGS DAS ① DASP 719
DOWEL PIN BUSHINGS KNLB ① KNLBB ③ⓉⒶ 720

CAP SCREWS CB ① 721
SPRING WASHERS CBW ① 722
CAP SCREWS LB ① SCB ① 723
FLAT HEAD CAP SCREWS FB ① FBJ ① 724

LOW HEAD CAP SCREWS / EXTRA LOW HEAD CAP SCREW CBS ① CBSST ① CBSS ① 725

Add.
LOOSENING PREVENTION WASHERS NLDP ① NLDP-B 726

WASHERS / SPACERS MSRB ① SW K W T R J LRB ① SRW SBW WSS ① 727 728 728



Delivery Shortened
FREE WASHERS FWSS ③Ⓐ FWSK ③Ⓐ 729
–Tapped type– FWMS ③Ⓐ FWMK ③Ⓐ 729
–Counterbore type– FWZS ③Ⓐ FWZK ③Ⓐ 729

New
LOOSENING PREVENTION SCREW PLUGS LMSW ① 730
SCREW PLUGS MSW ① MSWA ① MSWZ ① 731

SCREW PLUGS–Short type– MSWS ① MSWAS ① MSWZS ① 731
SCREW PLUGS–Hole type– MSWH ① MSWZH ① 732
–Hole/Short type– MSWSH ① MSWZSH ① 732

STRIPPER BOLTS MSB ① SMSB ① 735

PRECISION STRIPPER BOLTS–Male screw type– MSBL ⑤Ⓑ 736

STROKE EXTENSION RETAINERS FOR STRIPPER BOLT MSBE ③Ⓐ 736

STRIPPER BOLTS–Female screw type– SBT ① SBTN SBTC SBTCN SBTL ③ⓉⒶ SBTLN SBTK SBTKN 737

STRIPPER BOLTS–Bushing type– SBTH SBRH SBJH ③ⓉⒶ SB 739

STRIPPER BOLTS–Bushing type– SBWH ③ⓉⒶ 740

PRESSURE PINS FOR STRIPPER HSPP ③Ⓐ HSPPH 741

PRESSURE PINS FOR STRIPPER PWP ③ⓉⒶ 741

PRESSURE PINS FOR STRIPPER SBKP ③Ⓐ SBKS ③ⓉⒶ 742
HANG COLLARS FOR STRIPPER SBKT ③Ⓐ SBK ③ⓉⒶ 742

ADJUST PINS PIN PIN-N ③Ⓐ PINH PINH-N 743

PRESSURE PINS PRPS ③ PRP 744

Add.
STROKE END BLOCKS SBV ③ⓉⒶ SBVH ③Ⓐ 745

–Tapped type– SBVM ③ⓉⒶ 746

STROKE END BLOCKS SBS ③ⓉⒶ SBN ③ⓉⒶ SEC ③ⓉⒶ 747

–Quenching material type– SBVK ③ⓉⒶ 748

CHAINS FOR END BLOCK RSC ③ⓉⒶ 748

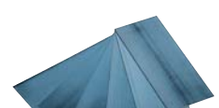
New
AIR JET COOLERS FOR DIE PAJC ① 749

COUPRINGS FOR FLUORORESIN TUBE MCPT ① 750

FLUORORESIN TUBE PUTF · PUTFL ③ⓉⒶ 750

TUBES FOR AIR PIPING M–UB ③ⓉⒶ 750

ADJUSTMENT HOSES HOSAJ ③ⓉⒶ 750



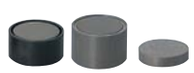
LAYERED PLATES FOR SPACER LHP ③Ⓐ LHP-H LHP-SET 751

SHIM TAPES FGSM ① FGSMW ① FGSML ① 752

PRECISION UTILITY PLATES UTPB ⑤Ⓑ UTPL ⑤ 753

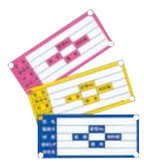
SPARE PUNCH BOXES PBX100Y ① PBX150Y ① 754

MAGNETS MG MGN ① HX 755



MAGNETS HXH HXU ① HXMB 755

MAGNETS MLG ③Ⓐ 756
MAGNET–Press-fit type– MGATA ③Ⓐ MGATB ③Ⓐ 756



NAME PLATES KNP ① 757

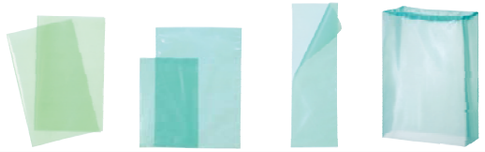
NAME STICKERS KNS ① 757

Delivery Shortened
ADHESIVE CEMENT LOC638 ① LOC242 ① 758

Delivery Shortened
ADHESIVE CEMENT–Stick type– LOC268 ① LOC248 ① 758

CLEANER METACL ① 758

MOLD CHECKS–Shinmyotan– N-RED ① SP-RED ① 758



VOLATILE CORROSION INHIBITOR FILMS RSHT□ RBAG□ ③⑤ PBAG□ PBOX□ 759

GUIDE LIFTERS

Add.
Name GUIDE LIFTER SETS GLS GLP ① GLS□ GL□ ③ⓉⒶ
Catalog No. SPACERS LRB ①
Delivery GUIDE LIFTERS–Removable type– GLR ③ⓉⒶ
Page –Heavy load type– AGL ③ⓉⒶ 767
GUIDE LIFTERS–With spring hole type– GLSZ ③ 768
765 766 767 767 768

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LIFTER PINS—Spring guide hole type—	LIFTER PINS—Spring guide hole type/Pilot drain hole type—	BLOCK GUIDE LIFTERS—Detachable · guide width free type—	BLOCK GUIDE LIFTERS—Detachable type—	BLOCK GUIDE LIFTERS—Key type—
LPAH	LHAH	GLBF	GLB	GLBK
③Ⓐ	③Ⓐ	③	③Ⓐ	③Ⓐ
768	768	769	770	770

GUIDE LIFTERS—With air hole type—	LIFTER PINS WITH AIR HOLE	BLOCK LIFTER SETS	BLOCK LIFTERS—Detachable type—	LIFTER PIN SETS		LIFTER PINS—Resin type—
GLJS	LJS	BLS	BLR	LPS LP	LPH LPSH	JLP
③	①	③Ⓐ	③Ⓐ	①	③ⓉⒶ	③ⓉⒶ
771	771	772	772	773		774

LIFTER PIN SETS—With pilot hole—	LIFTER PINS—Precision type—	PRECISION BLOCK LIFTERS—Dimension designation · Key type—		BLOCK LIFTERS—Key type—		
LHSH LHH	LHHV	BL□S—□	BL□X—□	BLL—□	BLH—□	BLLF—□
③ⓉⒶ	③Ⓐ	⑤Ⓑ	⑤Ⓑ	⑤Ⓑ	⑤Ⓑ	⑤Ⓑ
775	776	777	777	779	779	779

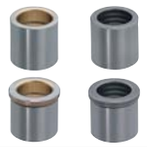
SPRING PLUNGERS	WRENCHES FOR SPRING PLUNGER		SPRING PLUNGERS—SUS type—	SPRING PLUNGERS—For slanted surface—
PJ□ · NPJ□	PJG	BPJG	PJ□W · PJ□K	PJHZ
①	①	①	①	①
781	781	785	782	782

SPRING PLUNGERS	WRENCHES FOR HEX—HEAD PIN	SPRING PLUNGERS WITH FLANGE		BALL PLUNGERS WITH FLANGE		BALL BUTTONS	BALL PLUNGERS
PJLS PJFW PJLR PJHR	PJRW	FPJL	FPJH	FBPJS	FBPJ	BBT	BP□ · BS□ · NB□J · NBPW · NBS□
①	①	①	①	①	①	①	①
783	783	784		784		784	785

KNOCKOUT PINS	PUSHING PINS	STOCK GUIDE UNITS—Standard type—		STOCK GUIDE UNITS		STOCK GUIDE PLATES / SPACER BLOCKS FOR STOCK GUIDE		FITTING GUIDE SETS
KOP	JP JPW JPWH	ZGUA	ZGUB	SUK-A	SUK-B	SBM SBA	SSB	FGK
③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	①
786	786	787		789		791		792

STRIPPER GUIDE PINS & BUSHINGS

Name	STRIPPER GUIDE PINS—Headed type—		STRIPPER GUIDE PINS—Straight type—		STRIPPER GUIDE PINS—Demountable type—		
Catalog No.	SGPH	SGOH	SGPN	SGON	SGPR	SGOR	SGPW
Delivery	①	①	①	①	①	③Ⓐ	①
Page	797	797	798	798	799	799	800



STRONG TYPE STRIPPER GUIDE PINS	FIXED-TYPE STOPPERS FOR BALL BEARING GUIDE	CLAMPS FOR STRIPPER GUIDE PIN	STRIPPER GUIDE BUSHINGS—Steel—					—Copper alloy—	—Steel—
SGPWS	SGPWH	SSTK	FCLP	SGBD	SGBA	SGBH	SGBL SGBT	SGSF SGBF	SGBZ SGHZ
③	③	③Ⓐ	③Ⓐ	①				①	①
801	801	802	802・824	803				804	804

—Copper alloy—	—Sintered alloy—	STRIPPER GUIDE BUSHINGS	STRIPPER GUIDE BUSHINGS	BALL CAGE	SPRINGS
SGCZ SGFZ	SGBM SGHM	SGBB SGBBL SGBBF	SGBBW SGBBS SGBBH	MBSH MBJH	BSWP
①	①	①	①	①	③ⓉⒶ
805	805	806	807	808	808

STRIPPER GUIDE PINS—3 μm range—	—Demountable—	STRIPPER GUIDE BUSHINGS—3 μm range, Steel—		—Copper alloy—		—Sintered alloy—	PRECISION CARBIDE STRIPPER GUIDE PINS
TGPH TGPN	TGPR	TGBL TGBT	TGBZ TGHZ	TGSF TGBF	TGCZ TGFZ	TGBM TGHM	WVGPH WVGPN WVGPS
①	③Ⓐ	③Ⓐ	①	③Ⓐ	①	③Ⓐ	⑤Ⓑ
810	810	811		811	812	812	814

PRECISION STRIPPER GUIDE PINS	—Demountable—	PRECISION STRIPPER GUIDE BUSHINGS—Steel—	—Copper alloy—		—Sintered alloy—
VGPH VGPN VGPS	VGPR	VGBL VGBH VGBZ VGHZ	VSGSF VSGBF	VSGCZ VSGFZ	VGBM VGHM
③ⓉⒶ	③Ⓐ	③ⓉⒶ	③Ⓐ	③Ⓐ	③Ⓐ
815	816	817	817	818	818

NEEDLE ROLLER STRIPPER GUIDE PIN SETS	—Single roller type—	ROLLER CAGE	STOPPERS FOR ROLLER CAGE	SPRINGS
RSGPW	RSGPS	RBJ	RSTKH	RSWP
⑧	⑧	③ⓉⒶ	③Ⓐ	③ⓉⒶ
821	822	823	823	823

STANDARD COMPONENTS FOR PRESS DIE
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Ⓣ Express T　Ⓐ Express A　Ⓑ Express B　Ⓒ Express C
Refer to the page concerned to determine if "Express service" is available.

About Reduced Prices

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GUIDE POSTS & BUSHINGS FOR DIE SET

Name	NEEDLE ROLLER BEARING GUIDE POST SETS	ROLLER CAGES	STOPPERS	STOPPERS	SPRINGS	ANTI-RISE RINGS FOR CAGE	BALL BEARING GUIDE POST SETS —High-rigidity, Demountable post type—			BALL BEARING GUIDE POST SETS —Demountable post type—		
Catalog No.	RGBL RGSL RGKL	RBJ	RSTM	RSTK	RSWP	RWR	RBSH QBSH	RMSH QMSH	RKSH QKSH	RB QB	RM QM	RK QK
Delivery	⑤Ⓑ ⑧	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	①	①	①	①	①	①
Page	831	833	833	833	834	834	835	835	835	835	835	835

Name	BALL BEARING GUIDE POST SETS —High-rigidity, Press fit type—			BALL BEARING GUIDE POST SETS —Press fit post—			PLAIN GUIDE POST SETS				GUIDE POSTS	
Catalog No.	PBSH GBSH	PMSH GMSH	PKSH GKSH	PB GB	PM GM	PK GK	RD RF	RZ RFZ	PD PF	PZ PFZ	MRP BRPM BRPK	MSP BSPM BSPK
Delivery	①	①	①	①	①	①	①	①	①	①	①	①
Page	837	837	837	837	837	837	839	839	841	841	843	843

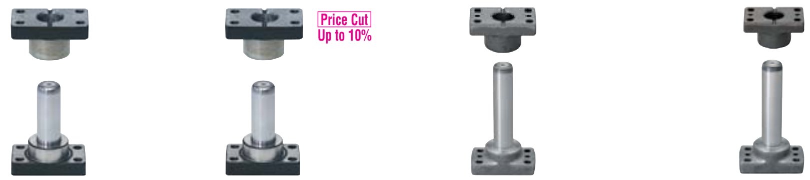
Name	GUIDE POSTS—Length specified type—		BALL BEARING GUIDE BUSHINGS	—Length specified type—	BALL BEARING GUIDE BUSHINGS—Demountable type—	BALL BEARING GUIDE BUSHINGS	SPRINGS	BALL CAGES	STOPPERS	STOPPERS	SPRINGS	
Catalog No.	MRP BRPM BRPK	MSP BSPM BSPK	MBB LBB	LBB	RBB	LBBS	SWPB	MBSH MBJH MBS MBJ	STM	STK	SWP	SWPL
Delivery	③ⓉⒶ ⑧	③ⓉⒶ ⑧	①	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	①	①	①	①	③ⓉⒶ
Page	845	845	847	847	848	849	849	850	851	851	851	

Delivery Shortened　Delivery Shortened

Name	ANTI-RISE RINGS FOR CAGE	PLAIN GUIDE BUSHINGS	SHANKS FOR DIE SET	CAP SCREWS	ADHESIVE CEMENT
Catalog No.	RWB	MDB LDB LFB LDBZ LFBZ	MSK MSKS MSKTP	CB	LOC638
Delivery	①	①	①	①	①
Page	852	853	855	855	856

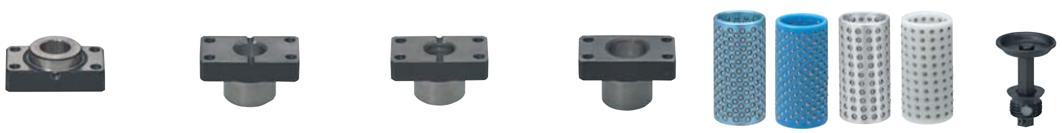
HOLDER GUIDE POST SETS

Price Cut Up to 10%



Name	PLAIN GUIDE POST SETS	OIL-FREE GUIDE POST SETS	INTEGRATED TYPE PLAIN GUIDE POST SETS—Oil type—	INTEGRATED TYPE PLAIN GUIDE POST SETS—Oil・free type—
Catalog No.	MY MYP	MYZ MYZP	N—MYP	N—MYZP
Delivery	①③ⓉⒶ	①③ⓉⒶ	①	①
Page	861	861	863	863

Name	BALL GUIDE POST SET—Movable stopper—		BALL GUIDE POST SETS	—Fixed stopper—	INTEGRATED TYPE PLAIN GUIDE POSTS	BUSHINGS FOR INTEGRATED TYPE PLAIN GUIDE POST SET	GUIDE POST SETS WITH OIL GROOVE	GUIDE POSTS
Catalog No.	MYA MYAP	MYJ MYJP	MYAK MYKP	MYJK MJKP	N—MGP	N—MGBP N—MGBZP	MGOH MGOHP MGO	MGP
Delivery	①	①③ⓉⒶ	①③ⓉⒶ	③ⓉⒶ	③Ⓐ	③Ⓐ	③ⓉⒶ	①③ⓉⒶ
Page	865	865	867	867	869	870	871	873



Name	GUIDE HOLDERS	PLAIN GUIDE BUSHINGS	OIL-FREE GUIDE BUSHINGS	BALL GUIDE BUSHINGS	BALL CAGES	STOPPERS	WASHERS FOR PREVENTING FALL OF DOWEL PIN	SPRINGS	OIL-FREE GUIDE POST SETS	OIL-FREE GUIDE BUSHINGS	SPACERS FOR GUIDE POST SET	
Catalog No.	MGH MGHP	MGB MGBP	MGBZ MGBZP	MAB MABP	MBSH MBJH MBS MBJ	STMY	MW	SWMY	GPZE GPZ	GBZE GBZ	MGBPS MABPS	MGHPS
Delivery	①③ⓉⒶ	①③ⓉⒶ	①③ⓉⒶ	①	①③Ⓐ	①	①	③ⓉⒶ	①③ⓉⒶ	①③ⓉⒶ	①	①
Page	874	874	874	875	875	876	876	876	877	878	879	879

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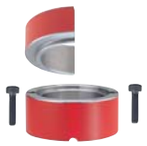
SPACERS FOR GUIDE POST SET
MGSPS MGLPS
① 881



STROKE END BLOCKS
CEB CSB EBS EBW
③ⓉⒶ 883

STROKE END BLOCKS—Flat type—
CEB□ CSB□ EBYS EBAS
③ⓉⒶ 885

CHAIN SETS FOR END BLOCK
RSC
③ⓉⒶ 886

GUIDING COMPONENTS FOR AUTOMOBILE DIE

Name: GUIDE POSTS
Catalog No. GPM
Delivery ③Ⓐ
Page 893

OIL-FREE GUIDE BUSHINGS
GBF GBW
③Ⓐ 893

OIL-FREE GUIDE BUSHINGS WITH FLANGE
HGBF
③Ⓐ 893

GUIDE POSTS
GPOB
③ 894

Price Cut

STOPPERS FOR GUIDE POST
GPSB
③ 894

STROKE END BLOCKS
GEB DSEB
③ⓉⒶ 895

LOCKING BLOCKS FOR GUIDE BUSHING
KEB
③ⓉⒶ 896

BALL GUIDE POST SETS
PKHL PKHLU PKH PKH—U
③ⓉⒶ 898 ③ⓉⒶ 898

DISTANCE GUIDE RINGS
HKD
③ⓉⒶ 900

OIL-FREE HEEL GUIDE PLATES
OGG OGP OGPZ
③ ③ ③ 901

HEEL GUIDE PLATES WITH OIL GROOVE
OG OGZ
③ ③ 902

OIL-FREE HEEL GUIDE PLATES
GWZ GWAZ GWBZ
③ ③ ③ 903

HEEL GUIDE PLATES WITH OIL GROOVE
GW GWA GWB
③ ③ ③ 904

KEEPER
KEPN
③Ⓐ 905

—With oil groove—
KEPNZ
⑤ 905

PAD GUIDE BLOCK
PGWN
⑤ 906

COMPONENTS FOR AUTOMOBILE DIE

Name: SPOOL RETAINERS
Catalog No. CSR
Delivery ①
Page 909

COLLARS FOR SPOOL RETAINER
CSRE
③Ⓐ 910

SPOOL RETAINER URETHANE WASHERS
CSRUR
① 910

SPOOL RETAINERS—Thick type—
CSRH CSRT
③ⓉⒶ 911

SPOOL RETAINERS—Large shoulder type—
CSRTA CSRTB
③ 911

Delivery Shortened

SPOOL RETAINERS—Counterbore type—
CSRZ
① 912

Delivery Shortened

BLANK HOLDER STOPPER BOLTS
CBH
① 912

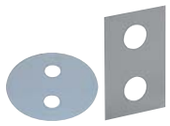
RETAINER PIN SETS
CSPST CSPWT CSPS CSPW P-CSPS P-CSPW CSPSP CSPWP
① 913

STOPPERS FOR RETAINER PIN
SPP CSPT CST-N
① 914

ROUND DISTANCE PLATES
DTPM DTPME DTPY DTPYE
③ⓉⒶ 915

Add.

SQUARE DISTANCE PLATES
DTPK DTPB
③ⓉⒶ 915



SHIMS FOR DISTANCE PLATES
DTPMS DTPKS
③Ⓐ 916

STROKE END BLOCKS
DEB
③ⓉⒶ 917

LOCATING KEYS
LK
① 918

BACK UP KEYS
BUKE
③Ⓐ 918

WASHERS FOR DIE FASTENING
KWN
① 919

WASHERS FOR ELLIPTIC HOLES
WSS
① 919

SCRAP BREAKER
CPSBR
① 919

AIR VENT
WUR5 WAV5
① 920 ① 920

ANGLE STAYS
UAS
① 920

CUSHION PINS
RCUP MCUP HCUP LCUP
③Ⓐ 921 ③ⓉⒶ 921 ③ⓉⒶ 922 ③ⓉⒶ 922

LIFTER CUSHION PINS
DTCA DTCB
③Ⓐ 923

BUSHINGS FOR LIFTER CUSHION PINS
TGF TGW
③Ⓐ 923

PLATE LIFTER PINS
LCP
③ⓉⒶ 924

LIFTER PLATE STOPPERS
BSE BST
① ③Ⓐ 924

SPARE PUNCH BOXES
PBX100Y PBX150Y
① ① 925

Add.

MAINTENANCE SCREWS
MM□ MM□B
① ① 926

HINGE PINS
CLKGH
③ⓉⒶ 927

KEYS FOR HINGE PIN
HK
① 927

PINS FOR TENSION SPRINGS
SSPO WSPO
① 927

TENSION SPRINGS
AW□
① 928

TENSION SPRINGS
AWK
① 928

RINGS FOR TENSION SPRINGS
BSR
① 928

STANDARD COMPONENTS FOR PRESS DIE
2007-2008 CONTENTS ⑬

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T Express T
A Express A B Express B C Express C
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About Reduced Prices
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LOCATING COMPONENTS FOR AUTOMOBILE DIE

Name / Catalog No.	PANEL INPUT DETECTORS —Liner type— PLGL PLGR	PANEL INPUT DETECTORS PACO□—□ PACO□N—□	ROUGH GUIDES RG—R RG RG—L	NEST GUIDES NGUA NGUBR NGUBL
Delivery	③	③ T A	③ A	③ A
Page	931	933	934	935

Name / Catalog No.	—Economy type— ENSTA ENSTC ENSTD	NEST GUIDES (Mouting plate length spec. type) NGNX ENSX	NEST GUIDES (Guide long) —Guide profile spec. type— NGW NGWK NGWS	NEST GUIDES BLANKS—Long type— NBBCL
Delivery	③ A	⑤ B	⑤ B	③ A
Page	939	940	941	943

Name / Catalog No.	LOCATING PILOT PIN SKSTH SFSTH	LOCATING PILOT PIN PST PSTM	LOCATING PILOT PIN RFPP	PILOT PUNCHES—Free type— RTP T-RTP RTPE T-RTPE	LOCATION PINS FOR ARRANGEMENTS DIKPA DIKPB IKPDA IKPDB IKPDC IKPE
Delivery	③ A	③ T A	⑤ B	③ A	③
Page	947	948	948	949	950

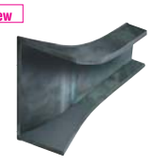
Name / Catalog No.	LOCATION PINS TLPA TLPB TLPC	LOCATION PINS LPU LPL DLPA	MAGNET LIFTER PINS MLP	PRE-HOLDING PUSH PIN SETS—Normal type— PAPZ PAPZU	—Economy type— PAEZS PAEZU	—Long stroke type— PAP□ PAPG□
Delivery	①	①	③ A	⑤ B ⑤ B	⑤ B ⑤ B	③ A ③ A
Page	951	951	952	953	955	956

Name / Catalog No.	PRE-HOLDING PUSH PIN SETS PALZS PALZU PALZP	PRE-HOLDING PUSH PIN SETS—Air type— PAEAS PAEAU	PUSHING PIN SETS PSPH PSH	PUSH-OUT PIN POP HPOP	PUSH-OUT PINS DHPA	PUSH-OUT PINS COVERS DHPF100
Delivery	⑤ B	⑤ B	③ A	③ A	⑤	⑤
Page	957	958	959	960	960	960

Name / Catalog No.	SPRING PLUNGERS PJ□	SPRING PLUNGERS PJLR PJHR	WRENCHES FOR HEX—HEAD PIN PJRW	SPRING PLUNGERS FOR SLANTED SURFACE PJHZ	MAGNETS MG	MGN	HX	HXH	HXU	HXMB
Delivery	①	①	①	①			①			
Page	961	962	962	962			963			

Name / Catalog No.	MAGNETS MLG	MAGNET—Press-fit type— MGATA	MGATB	SQUARE SKID BRACKETS STB STB-N	STBY STBY-N	ROUND SKID BRACKETS MRTB MRTB-N	MRTBY MRTBY-N	SKID BRACKETS SCTB	SCTBY
Delivery	③ A	③ A	③ A	③ A	③ A	③ A	③ A	③ A	③ A
Page	964	964	964	965		965		966	

COMPONENTS FOR TRANSFER DIE



Name / Catalog No.	COILED MATERIAL GUIDES CILG	STOCK GUIDES MCG MCGN MCGE	STOCK GUIDE SETS GDRT□ GDRT□W GDRT□T	STOCK GUIDE SETS EGDR EGDRW EGDRT
Delivery	⑤	③ T A	① ③ A ①	① ③ A ①
Page	969	970	971	972

Name / Catalog No.	STOCK GUIDE SETS GDRA	STOCK LIFTERS SRL	ROLLER STOCK LIFTER UNITS ZORW□□	SHEET LIFTERS SLCES	SHEET LIFTERS SLC	SHEET LIFTERS SLCE
Delivery	①	①	①	③ A	③ A	③ A
Page	972	973	973	974	974	974

Name / Catalog No.	LIFTER UNITS LTH CLTH	AIR CYLINDER LTHCT LTHCS	PADS FOR LIFTING UP VCH VCHT	QUICK FITTING JOINTS FOR AIR PIPING M-PC	M-POC	QUICK FITTING JOINTS FOR AIR PIPING M-PL	M-POL
Delivery	⑧ ⑧	③	③	①	①	①	①
Page	975	977	978	979	979	979	979

STANDARD COMPONENTS FOR PRESS DIE
2007-2008 CONTENTS⑭

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⑧ 8 Days ⑩ 10 Days ⑫ 12 Days
Ⓣ Express T
Ⓐ Express A Ⓑ Express B Ⓒ Express C

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About Reduced Prices
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TUBES FOR AIR PIPING M-UB ③ⓉⒶ 980

DEDICATED TUBE CUTTERS M-TCN ① 980

BRAKETS FOR AIR PIPING DAHK-A DAHK-B DAHK-C DAHK-D DAHK-E ① 981

TERMINALS FOR PIPING TAHK-A TAHK-B TAHK-C TAHK-D ① 981

AIR MANIFOLDS DMFDA DMFDB ① 982

New

SENSOR UNITS FOR MISGRIPPING —Light type— MGUG□ MGUC□ MGUE□ MGUL□ ① 983

—High rigidity type— MGUA□ MGUB□ ① 984

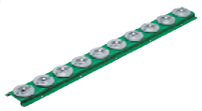
Delivery Shortened

JUNCTION BOXES JBX160 JBX100 ① 985

HOOKS FOR TRANSPORTING DEVICE DVJ ① 986

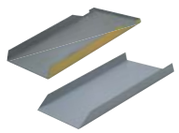
CURL CORD HOOKS DKLH ① 986

ROLLER CARRIER CORO ③Ⓐ 987


BALL CARRIER GORO ③Ⓐ 987

BALL CARRIER GORON ③Ⓐ 987

EMBOSSED SHOOTING PLATES EBSP ③ 988


SCRAP SHOOTER SRST□ ⑧ 989

CHAINS FOR SCRAP SHOOTER SRT ③ⓉⒶ SRTN ③ⓉⒶ 990

GENERAL PURPOSE CHAINS CN ③ⓉⒶ 990

CHAIN JOINTS JT ① 990

OIL-FREE SLIDE PLATES

Name Catalog No. OIL-FREE SLIDE PLATES —Casting 20mm, 2 bolts type— Delivery ① Page 993

OIL-FREE SLIDE PLATES —Casting 20mm. 4 bolts type— ① 993

OIL-FREE SLIDE PLATES —Copper alloy 20mm, 2 bolts type— ① 994

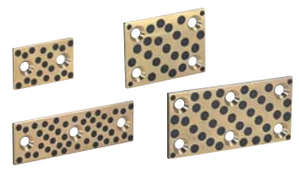
OIL-FREE SLIDE PLATES —Copper alloy 20mm, 4 bolts type— ① 994

OIL-FREE SLIDE PLATES —Copper alloy 10mm, 2 bolts type— ① 995

OIL-FREE SLIDE PLATES —Copper alloy 10mm, 4 bolts type— ① 995

SHIMS FOR OIL-FREE SLIDE PLATES SMP ① 996

COMPACT OIL-FREE SLIDE PLATES —Copper alloy 10mm type — ① 997


OIL-FREE THIN-WALL SLIDE PLATES —Copper alloy 5mm type— ① 998

COMPONENTS OF CAMS

Name Catalog No. OIL-FREE FLYING CAM UNIT — V type— MFV48—□ MFV65—□ MFV68—□ MFV80—□ Delivery ⑤ ⑤ ⑤ ⑤ Page 1003～1036

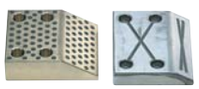
OIL-FREE UNDER CAM UNIT MUC50—□ ⑤ 1037～1040

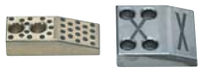
CAM SLIDE PLATES CSLA ① 1041

CAM SIDE PLATES CSLP ① 1041

CAM UPPER PLATES CUPF CUPW ① 1042

CAM SIDE BLOCKS CSBL ① 1042


CAM STROKE PLATES—30° type— CS30W CS30F ① 1043


—15° type— CS15W CS15F ① 1044

CAM BOTTOM GUIDE PLATE CBG ① 1045

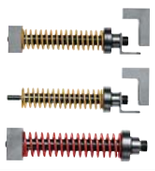
CAM BOTTOM SLIDE PLATE CBP ① 1045

CAM COMPULSORY RETURNING FOLLOWER CKF ① 1046

CAM COMPULSORY RETURNING BLOCK CKB ① 1046

CAM STOPPER CCS ① 1047

SILENCER URETHANES CCUC ① CCUR ① 1048


RETURNING UNITS FOR CAM SLIDER CUKI CUKS CUKA ③ 1049

SPRING GUIDE UNITS CUK ③ 1051

WASHERS CUP CUR ① 1052

COMPACT CAMS KPAR KPFR ③Ⓐ 1053

PUNCHES FOR COMPACT CAM UN□□ ③Ⓐ 1054

COIL SPRINGS

Name Catalog No. WIRE SPRINGS WY·WR·WF·WL·WT·WM·WH·WB Delivery ① Page 1058～1065

—Internal diameter standard type— NWL · NWM · WP ① 1066

Add.

COIL SPRINGS SWY ① 1067

SWU ① 1068

Add.

SWR ① 1069

SWS ① 1071

STANDARD COMPONENTS FOR PRESS DIE
2007-2008 CONTENTS ⑮

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Ⓣ Express T Ⓐ Express A Ⓑ Express B Ⓒ Express C

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About Reduced Prices
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COIL SPRINGS
SWC ① 1073
SWF ① 1075
SWL ① 1077
SWM ① 1079
SWH ① 1081
SWB ① 1083
SWG ① 1085
SWZ ① 1087
SWV ① 1089
SWX ① 1090

COIL SPRINGS —Stainless type— SWUF・SWUL・SWUM・SWUH ③ 1091
SPRING GUIDE UNITS CUK ③ 1095
WASHERS FOR COIL SPRING SSWA・SSWB・SSWC ① 1097
FLANGE FOR SPRING UNITS WUNT ③Ⓐ 1098
SPRING GUIDE PINS SGA ① 1099
SPRING GUIDE RETAINERS SGC ① 1100

GAS SPRINGS

Name
Catalog No.
Delivery
Page
—Compact heavy duty type— GSX ① 1105
—Plates for GSX— AM ① 1106
—Compact type— GSM ① 1107
—Plates for GSM— HM ① 1108
FM ① 1108
—Short type— GSC ① 1109
—Plates for GSC— BM ① 1109
—Heavy load mini type— MGSC ① 1110
—Mini type— MGSA ①, H ①, F ① 1111
—Threaded type— MGSB ① 1112

—ISO/CNOMO standard type— GSE ③ 1113
—Plates for GSE— SF ③ 1114
KF ③ 1114
—Slow return type— GSSR ① 1115

URETHANE SPRINGS

Name
Catalog No.
Delivery
Page
URETHANES FOR HEAVY LOAD EX ①③ⓉⒶ 1121
SQUARE URETHANES FOR HEAVY LOAD QX ① 1122
URETHANE STOCK BLOCKS EST・ESBT・ESU・ESUB・S・SU ① 1122
URETHANES FOR HEAVY LOAD A ① 1123
URETHANE STOCK BLOCKS E ①③ⓉⒶ, EL ③ⓉⒶ 1124
URETHANES FOR HEAVY LOAD LA・C ①, AX・CX ③ⓉⒶ 1125

URETHANES WITH COUNTERBORE AZ AZX ① ③ⓉⒶ 1126
URETHANE SHEETS UT UTH ① ③Ⓐ 1127
URETHANE DIE PADS UD UDH ① ③Ⓐ 1128
ECONOMY URETHANES AE・LAE・CE・AEX・CEX ③ⓉⒶ 1131·1132
HIGH DEFLECTION TYPE URETHANE FOAM (POROUS) PA PLA ① ① 1133

URETHANES —Low repulsion type— AN・LAN・CNN ANX・CNX ① ③ⓉⒶ 1134
—With counterbore, Low repulsion type— AZN AZNX ① ③ⓉⒶ 1135
URETHANE SHEETS —Low repulsion type— UTN ① 1136
URETHANE DIE PADS —Low repulsion type— UDN ① 1136

COMPONENTS FOR LIFTING・DIE STORING

Name
Catalog No.
Delivery
Page
LIFTING BARS HLFB ① 1142
LIFTING EYE BOLTS CHI ① 1143
CAST-IN LIFTING BUSHES CSN ① 1143
HOOKS—Bolt type— CHN ① 1144

—Large head bolt type— CHNL ① 1144
HOOKS—Plate type— CHP ① 1145
—Large head plate type— CHPL ① 1146
HOOKS—Insert type— CHU ① 1147
HOOKS CHF ① 1148

—Large head bolt type— CHFL ① 1148
LIFTING T-SHAPED BOLTS TB ① 1148
FIXING PLATES DKP DKPL ③ⓉⒶ 1149
HOLDING PIPES DYP□ ③ⓉⒶ 1149
BUSHES FOR RETAINING KPB ③Ⓐ 1150

URETHANE STOCK BLOCK SETS PHBT PHBTN PHUB PHUBN ① 1151 1152
STROKE END PIPES PH PHN ① 1153
URETHANE STOCK BLOCKS EST ESBT ESU ESUB ① 1154
ABSORBERS DUSA ① 1154
PADS DURP ① 1154

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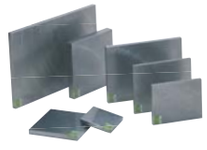
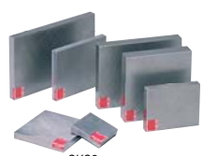
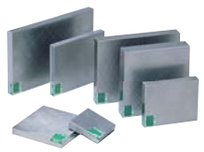
FINISHED PLATES FINISHED BLOCKS

SKD11


DC53


SKS3

SKS93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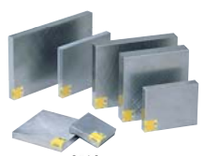
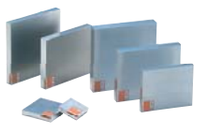
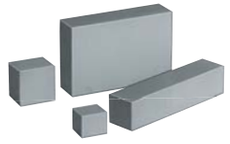
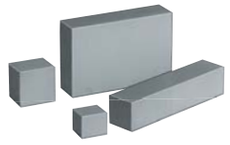

S50C

SS400

Name / Catalog No.	FINISHED PLATES SKD・S-SKD・E-SKD	FINISHED PLATES DC・S-DC・E-DC	FINISHED PLATES SKS・S-SKS・E-SKS	FINISHED PLATES SK・S-SK・E-SK	FINISHED PLATES HPM・S-HPM・E-HPM	FINISHED PLATES SC・S-SC・E-SC	FINISHED PLATES SS・S-SS・E-SS
Delivery	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ
Page	1159	1161	1163	1165	1167	1169	1171


A7075P-T651

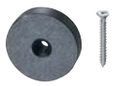

SKH51 SKD11 DC53


SKS3 SKS93 S50C

JIGS & FIXTURES SERIES FOR INSPECTION

FINISHED PLATES ALP	FINISHED BLOCKS FB-SKH	FB-SKD	FB-DC	FB-SKS	FB-SK	FB-SC	HARDENED PLATES HPSH	HPHE	CARBIDE BLOCK MATERIALS Z	Name / Catalog No.	PRECISION CARBIDE LIMIT GAUGES VGSA	VGWA	PRECISION CARBIDE LIMIT GAUGES VGSB	VGWB
③Ⓐ	③Ⓐ						①	①	①	Delivery	⑤	⑤	⑧Ⓒ	⑧Ⓒ
1173	1175	1175	1175	1175	1175	1175	1181		1182	Page	1189	1189	1190	1190

LIMIT GAUGES SGSA	SGWA	PRECISION CARBIDE LIMIT GAUGES VGOA	PRECISION CARBIDE LIMIT GAUGES VGOB	PLUG GAUGES FOR CHECKING FIXTURE BGQ・BGQH・BGQT・BGQTH	BGQEH・BGOEH	BGO・BGOH	PLUG GAUGES FOR CHECKING FIXTURE BGU・BGUH	BGOPH	BGUPH	LOCATING PINS FOR CHECKING FIXTURE BGTDSH・BGTA・BGTAH・BGTD・BGTDH	TAPER LOCATING PINS FOR CHECKING FIXTURE BGMA	BGMD	BUSHINGS FOR CHECKING FIXTURE JBA JBAM JBH JBHM
③Ⓐ	③Ⓐ	⑤	⑧Ⓒ	③	⑤	③	③	③	③	③	③	③	①
1191	1191	1192	1192	1193	1194	1195	1195	1196	1196	1197	1198	1198	1199



BUSHINGS FOR CHECKING FIXTURE KJBS KJBST	BUSHINGS FOR CHECKING FIXTURE KJBSK KJBSTK	BUSHINGS FOR CHECKING FIXTURE KJBSC KJBSTC	MARKING-OFF PINS FOR CHECKING FIXTURE BGK BGKS	LOCATING BARS FOR TAPPING POSITION BGM	SHIM PLATES FOR CHECKING FIXTURE—Round type— KGSPM	SHIM PLATES FOR CHECKING FIXTURE—Square type— KGSP	SHIM PLATES FOR CHECKING FIXTURE—Square type with hole— KGZ
③	③	③	③	③	①	①	①
1199	1200	1200	1201	1201	1202	1202	1202

PRODUCTS DATA

- HOW TO MOUNT PUNCHES & DIES
- CHARACTERISTICS OF PUNCHING TOOLS
- SHAPES & DIMENSIONS OF PUNCHES & DIES
- CALCULATION OF PUNCH STRENGTH
- DURABILITY OF PUNCHES FOR PUNCHING
- DICOAT® PUNCHES
- QUALITY IMPROVEMENT COATING PUNCHES
- COATING PUNCHES—TiCN—
- WPC® PUNCHES・HW coating
- PUNCHES FOR HEAVY LOAD
- CONDITIONS UNDER WHICH FRACTURE, BREAKAGE AND ABNORMAL WEAR ARE APT TO OCCUR
- CEMENTED CARBIDE TOOL MATERIALS FOR WEAR RESISTANCE
- SELECTION OF BUTTON DIES
- SCRAP RETENTION BUTTON DIES
- BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP AND SCRAP VACUUM UNIT
- PRECAUTIONS ON ASSEMBLING STRIPPER GUIDE

Product data	TECHNICAL DATA
Page 1203～1234	Page 1235～1266

TECHNICAL DATA

- SI (International system of units)
- QUENCHING, SURFACE TREATMENT AND HARDNESS TESTS
- CONVERSION TABLE OF HARDNESS
- SURFACE ROUGHNESS
- TECHNICAL DRAWINGS
- SURFACE ROUGHNESS BY DIFFERENT PROCESSING METHODS
- INDICATIONS OF GEOMETRICAL TOLERANCE ON DRAWINGS
- BASIS OF SELECTION FOR FITS
- SYSTEM OF LIMITS AND FITS
- TOLERANCES OF COMMONLY USED HOLE FITS
- TOLERANCES OF COMMONLY USED SHAFT FITS
- GENERAL DIMENSIONAL TOLERANCES FOR PARTS FORMED BY PRESS WORKING FROM SHEET METAL AND SHEAR FROM METAL PLATES
- GENERAL DIMENSIONAL TOLERANCE
- SOCKET HEAD CAP SCREWS
- TABLE OF HOLE SIZE BEFORE THREADING
- SUITABLE AXIAL FORCE AND TIGHTENING TORQUE OF BOLTS
- STRENGTH OF BOLTS, SCREW PLUGS AND DOWEL PINS
- CALCULATION OF CUBIC VOLUME
- CALCULATIONS OF AREA, CENTER OF GRAVITY AND SECTIONAL SECONDARY MOMENT
- CONPERSION CHART OF TRIGONOMETRICAL FUNCTION
- COMPARISON OF MATERIALS BETWEEN JIS AND FOREIGN STANDARDS (1)
- COMPARISON OF MATERIALS BETWEEN JIS AND FOREIGN STANDARDS (2)
- COMPARISON OF DIE STEEL BY MANUFACTURERS
- HARDNESS OF MATERIAL AND CORRESPONDING TOOLS

BUSINESS INFORMATION

- COMPETITIVENESS OF MISUMI
- WORLD NETWORK
- GENERAL ORDERING INFORMATION
- CHANGING AND CANCELING ORDERS/RETURNING GOODS
- REQUEST FOR MISUMI CATALOGS
- CATALOG REQUEST FORM
- COMMUNICATION CARD
- ENTRY CARD
- MISUMI CORPORATION —HISTORY—

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INDEX

- CATALOG NO. INDEX
- PRODUCTS NAME INDEX
- DISCONTINUED PRODUCTS LIST
- RULES OF USE OF THE CATALOG

Page 1283

HOW TO USE CATALOG

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●How to use Catalog ····· 35
●Delivery ····· 37
●Express Delivery Services ····· 38
●Guide of Alterations ····· 39
●Environmental Activities and RoHS Directives ····· 40

HOW TO USE CATALOG
—GUIDE TO MARKS—

Mark	Meaning	Notes・Description examples
PRESS NEW	New products	Newly released products in this edition.
PRESS NEW Printed in Red	New products	Products printed in red are new products that are sold from this edition.
PRESS ADD.SPEC. Printed in Red	Add. Spec.	Products with additional specifications.
M	Material	M SKH51
H	Hardness	H 58～60HRC
S	Surface Treatment	S Black Oxide
A	Accessories	A MS6—25
T	Tolerance	T $^{+0.005}_{0}$
!	Notes :	P/2≦KC＜H/2
⊗	Not Applicable	Indicates that specific sizes or items are not applicable for alteration. ⊗ D3 to 8 (D3 to 8: Not applicable) Also used to indicate specifications that cannot be ordered.
→ P.	Refer to Catalog page	P.234
••• ⇨	Conditions and their results. A ···B means	L $^{+0.02}_{0}$ (L＞200 ···L $^{+0.05}_{0}$) This example signifies that the standard tolerance of length L [0 to + 0.02] changes to [0 to +0.05] when L is over 200.
①②③	Unit No.	Number applied to each part of the product that includes two parts or more.

Mark	Meaning	Notes・Description examples
RoHS	RoHS Compliance Products	Product compliance with 6 RoHS Directive Substances describes to P.40. Printed on the upper right of the photograp
	Example of order code	Order Catalog No. MS 6 — L — 50
	Delivery	Delivery 3 Days
1 Day	Indicates the number of business days required before shipment from MISUMI's distribution center in Japan.	Delivery time is 1 business day.
3 Days		Delivery time is 3 business days.
5 Days		Delivery time is 5 business days.
8 Days		Delivery time is 8 business days.
10 Days		Delivery time is 10 business days.
12 Days		Delivery time is 12 business days.
Express T / Express A / Express B / Express C	Express Services	Express Delivery Services are available.
¥	Price (Yen)	Price
¥	Unit Price	¥U/Price
ex	Example	Example
	Alteration	Alteration can be ordered without drawings.

All items are symbolised by respective marks and signs so that this Catalog can be widely used in the world.

HOW TO USE Catalog

Product name

Catalog No.

Material, etc.

Photograph

Drawing

Specification table

●Obtain the order code of a product by selecting, from left to right, a catalog number and dimensions printed in blue.

●Dimensions that are not required for your order are shaded in blue in each table.

How to order

●Ordering example

Usage example

●Usage example or how to use the parts in simple illustration.

PUNCHES WITH DOWEL —FINISHED FOR RETAINERS—

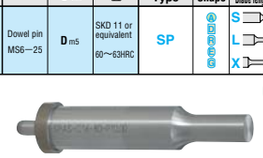
Punch & Retainer Set Available

Detail P.657

Type	A	Shank dia. D T	M H	Catalog No. Type	Shape	Blade length B	With dowel
With dowel	Dowel pin MS6−25	D m5	SKD 11 or equivalent 60~63HRC	SP	A B C D E G	S L X	−C

RoHS

Select tip shape from shape A~G shown below.



Blade length (B) X>L>S

Shape A: P≧W; R=0 : Applicable; K=$\sqrt{P^2+W^2}$

Shape D: P≧W; ⌖0.02 A

Shape R: P≧W; 0.15≦R< W/2; K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E: P>W

Shape G: P>W; R≦0.2

Catalog No. Type	D	L	0.01mm increments A P min.	A P max.	B R E G P-Kmax.	B R E G P-Wmin.	R	B	H
S SPAS−C	10	(40) 50 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50		13	13	13
SPDS−C	13	(40) 50 60 70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	3.00				16
SPRS−C	16	(40) 50 60 70 80 90 100 110 120 130 140 150	10.00～15.99	15.97	4.00			19	19
SPES−C	20	(40) 50 60 70 80 90 100 110 120 130 140 150	13.00～19.99	19.97	5.00				23
SPGS−C	25	(40) 50 60 70 80 90 100 110 120 130 140 150	18.00～24.99	24.97	6.00				28
	32	(40) (50) 60 70 80 90 100 110 120 130 140 150	20.00～31.99	31.97	7.00				35
	38	(40) (50) 60 70 80 90 100 110 120 130 140 150	28.00～37.99	37.97	8.00				41
	45	(40) (50) 60 70 80 90 100 110 120 130 140 150	35.00～44.99	44.97	9.00				48
L SPAL−C	10	50 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50		0.15≦R< W/2 (R Only)	19	13
SPDL−C	13	50 60 70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	3.00				16
SPRL−C	16	60 70 80 90 100 110 120 130 140 150	10.00～15.99	15.97	4.00				19
SPEL−C	20	60 70 80 90 100 110 120 130 140 150	13.00～19.99	19.97	5.00			25	23
SPGL−C	25	60 70 80 90 100 110 120 130 140 150	18.00～24.99	24.97	6.00				28
	32	60 70 80 90 100 110 120 130 140 150	20.00～31.99	31.97	7.00				35
	38	60 70 80 90 100 110 120 130 140 150	28.00～37.99	37.97	8.00				41
	45	60 70 80 90 100 110 120 130 140 150	35.00～44.99	44.97	9.00				48
X SPAX−C	10	70 80 90 100 110 120 130 140 150	6.00～ 9.99	9.97	5.00			30	13
	13	70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	5.00				16
SPDX−C	16	80 90 100 110 120 130 140 150	10.00～15.99						19
SPRX−C	20	80 90 100 110 120 130 140 150	13.00～19.99						23
SPEX−C	25	80 90 100 110 120 130 140 150	18.00～24.99						28
SPGX−C	32	80 90 100 110 120 130 140 150	20.00～31.99						35
	38	80 90 100 110 120 130 140 150	28.00～37.99						41
	45	80 90 100 110 120 130 140 150	35.00～44.99						48

P L (40), D10～25→B=8, When L (40) and D(10～25), the blade length is fixed to 8 mm. L (40), D32～45→B=6, When L (40) and D(32～45), the blade length is fixed to 6 mm.

P L (50)→B=13, When L(50), the blade length is fixed to 13mm.

P A: P>D−0.03→ ℓ =0, When P>D−0.03 round punch, D$^{-0.01}_{-0.03}$ (press-in lead) is not available.

P B E G: P・K>D−0.05→ ℓ =0, When P・K>D−0.05 shaped punch, D$^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order: Catalog No. − L − P − W − R(B only)

Example: SPAS−C 25 − 100 − P18.05

■Punch with dowel is ;
Mainly used for dies of body of automobile with retainer which hold punch. Different from indirect positioning by retainer's dowel hole, it allows direct positioning by the dowel hole coaxially machined to punch, and improves the die precision. It is effective when used for die machining by NC process. It can also be used for dies of exterior panels of electrical appliances by setting with retainer or for attaching to punch plate of progressive die.

Shear angle alteration P.182	1F	2F	3F	4F	5F	6F	7F

The volume discount rate is also applicable to alteration cost. P.39

Delivery

● ϕD 10～32 A	3 Days	Express T 1,000/1Pc. / Express A 500/1Pc.	P.38
● ϕD 10～32 D R E G	3 Days	Express T 1,600/1Pc. / Express A 800/1Pc.	P.38
● ϕD 38-45 A D R E G	3 Days	Express A 1,500/1Pc.	P.38

P A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

P A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

P A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration

Catalog No. − L(LC) − P(PC) − W(WC) − R − (BC・HC・TC…etc.)
SPAS−C 25 − LC95 − P18.05 − BC30

Alterations	Code	A	D R E G	¥/1Code
Tip	PC WC	Changes dimension P. PC≧ P min./2, 0.01mm increments (Combination with PKC−0.001mm increments) P(PC) 8max: 1.500～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	Changes dimension P・W. PC≧ P・W min./2, WC≧ P・W min./2, 0.01mm increments. ⊗Blade length X:Not applicable. P(PC)・W(WC) 8max: 1.25～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	200
	BC	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments. Full L (LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments. Full L (LC) requires BC+30mm or more.	200
	SC	Finishes blade with lapping. Dimension P tolerance and the specification unit remain the same. ⊗B shape is not applicable with a corner radius of 0.		1,200 (only A 800)
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1, 0.1mm increments. PRC≦(P−0.2)/2. ⊗PCC・GC:Not applicable	——	400
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1, 0.1mm increments. PCC≦(P−0.2)/2. ⊗PRC・GC:Not applicable	——	200
	GC	20°≦GC<90°, 1° increments. Blade length B≧ℓ+2, ℓ=P/2×tan(90°−GC°). When used with SC, tip and edge are rounded. ⊗LKC・LKZ・PRC・PCC :Not applicable	——	400
	PKC	Changes tolerance on P. P$^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P : 0.001mm incr.)	Changes tolerance on P(W). P・W±0.01 ⇨ $^{+0.01}_{0}$	400
Full length	LC	Changes full length. 25+B(BC)≦LC<L, 0.1mm increments. When LC−B(or BC) is 25mm or less, B(or BC) is LC−25mm. (Combination with LKC・LKZ−0.01mm increments)	Changes full length. 30+B(BC)≦LC<L, 0.1mm increments. When LC−B(BC) is 30mm or less, B(BC) is LC−30mm.	200
	LKC	Changes full length tolerance.	L$^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	400
	LKZ	Changes full length tolerance.	L$^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗D>25:Not available	600
Head	KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
	WKC	Adds double key flats in parallel.	Adds double key flats in parallel. To change angle, add KC.	200 (only A 400)

Alterations	Code	A	D R E G	¥/1Code
Head	KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments. ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments. ⊗KC・WKC:Not applicable	400 (only A 600)
	NKC	——	No key flat. ⊗Punch & retainer set not available.	0
	HC	Changes head diameter. D≦HC<H, 0.1mm increments. ⊗Punch & retainer set not applicable.		200
	TC	Changes head thickness 2≦TC<5, 0.1mm increments. P L is shortened by (5−TC). When LC is combined, L=LC. ⊗Punch & retainer set not available.		200
	TCC	Adds Chamfering to head. Strengthen the punch head. P.1223. 0.1mm increments. 0.5≦TCC≦(H−D)/2. ⊗SRC:Not applicable		200
	SRC	Modifies head to fit to select retainers (SLS). For details, refer to P.673. D10～32 : Applicable. ⊗Punch & retainer set not available.		100
Shank	UC	Modifies shank to fit to urethane stripper (USN). Code / U / L / Applicable USN: UC40 / 37 / L≧80 / USN40; UC50 / 47 / L≧90 / USN50. P K-max.=D−1.1. For details, see P.674. Applicable to L≧80, L≧90. D10～32 : Applicable		400
	TPC	Replaces dowel pin. Attached MS6−25 to MSTP6−25 (tapped type). ⊗D38・45:Not applicable		100
	NDC	No press-in lead, ℓ ≧3⇨ ℓ =0. ⊗Punch & retainer set not available.		0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

P To be quoted on price & lead time above Max. Q'ty.

■MSKD 11 or equivalent

D	A SPAS−C SPAL−C	A SPAX−C	D R E G SP□S−C SP□L−C	D R E G SP□X−C
10	720	890	1,490	1,680
13	800	970	1,810	2,000
16	910	1,080	2,230	
20	1,100	1,270	2,730	
25	1,550	1,720	3,150	—
32	3,020	3,190	5,460	
38	4,230	4,400	6,820	
45	5,180	5,350	8,060	

Alteration

●Select alterations with the codes.
P.39

Index

Price

●Prices are set and shown based on quantity 1.

●Volume discount rates are available for most products.

＜Calculation Example＞
Punches with dowel hole
SPAS−C25−100−P18.05
Unit price for 10 pieces
1,550×0.95=1,472yen
(less than 1 yen is discarded)

※Volume discount rate is also available for alteration cost. P.39

How to find the product

To find the Product Shape, Catalog No., Production Time, and the detail page,

- Use the picture index. ····· P.1
- Use the Catalog No. Index to find the product by its catalog number. ····· P.1285
- Use the Product Name Index to find the products by its product name. ····· P.1309

Page

Delivery

●The number of days required before shipping (counted from the next business day following your order date). P.37

1 Day / 3 Days / 5 Days / 8 Days / 10 Days / 12 Days

●Indication of "Express service" P.38

Express T / Express A / Express B / Express C

About the JIS notation

RoHS

MSW / MSWS (Short type)

MSW SCM435(M2.5～10) S45C(M12～45)
MSWS S45C
H 34～43HRC
S Fe3O4(Black oxide) (JIS B 0207/Grade 2)

MSWA (Break through type) / MSWAS (Break through, short type)

M S45C
H 34～43HRC
S Fe3O4(Black oxide) (JIS B 0207/Grade 2)

MSWZ (Washer type) / MSWZS (Washer, short type)

M S45C
H 33～38HRC
S Fe3O4(Black oxide) (JIS B 0207/Grade 2)

●In the case that JIS standards are indicated on certain location of the product page, please note that this is only for product reference and is not an indication that the product is conforming to the JIS standards

CAD Data

●CAD data (DXF data or IGES data) is prepared.
(Some products are excluded.)
Download it from the MISUMI HP via Internet.
http://www.mol.ne.jp/
http://www.misumi.co.jp

DELIVERY

Time of delivery

Time of delivery depends on products

●Please refer to Delivery on each page.

Time described in this catalog is days for production

Delivery time symbols

Time of delivery is 1st working day … Delivery **1** Day

Time of delivery is 3rd working day … Delivery **3** Days

Time of delivery is 5th working day … Delivery **5** Days

Time of delivery is 8th working day … Delivery **8** Days

Time of delivery is 10th working day … Delivery **10** Days

Time of delivery is 12th working day … Delivery **12** Days

Delivery time varies depending on the order quantity and product, even if it is not indicated. Please contact your local MISUMI office before ordering.

■Volume discount rate

Quantity	1～4	5～12	13～19	20～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

●Delivery dates indicated in the catalog mean the shipping dates from MISUMI distribution center in Japan.
●Actual date of delivery depends on the countries or regions, please contact our subsidiaries or agents.
●Time of delivery stipulated in catalog might delay in case of stock shortage and/or required quantity.

■Example (Delivery 5 Days)

The calendar below shows 5th day delivery for goods ordered on Thursday the 3rd. Sunday is off day, so the 5th working day and shipping day from MISUMI distribution center would be Wednesday the 9th. Depending on the region, goods should clear customs and be flown out the following day or two at the latest.

SUN	MON	TUE	WED	THU	FRI	SAT
		1	2	3 Your order	4 1st working day	5 2nd working day
Off 6	7 3rd working day	8 4th working day	Shipping date: 9 5th working day	Customs clearance /Flight 10	11 Flight	12

EXPRESS DELIVERY SERVICES

EXPRESS SHIPMENT SERVICES

This is our quick delivery system for custom parts in an emergency.

●This system can be used only for products with the symbols indicated below.
In some cases "Express service" will not be available. Please refer to each production page for details.

Express T | Express A | Express B | Express C

Special express service "Express T"

●"Express T" is the special express service which allows the products to be shipped on the day of order.
●Please note that "Express T" may not be available according to the quantity.

Time for application of the express service system

Express service system	Express T	Express A	Express B	Express C
Order cut-off time	Please contact to MISUMI subsidiary in your country.			
Delivery time	On the same day	1 Day	3 Days	5 Days

●Delivery date of the express service "Express T" will be changed according to the order receipt time in Japan.
The order receipt time depends on difference in time. Please contact our subsidiaries or agents.
●Delivery date is the working days from the order reception.
●Reception time will differ according to the conditions of customs clearance and transport.
If you use this system, we recommend you to confirm delivery time with our subsidiary or MISUMI Japan.
●You cannot use this system for products with special notations about delivery because of specification or alterations.

Express shipment fees (Prices have been revised so that the price will be uniform for 3 or more pieces with the same size.)

①The charges on the pages are the unit prices of one piece.

②If you order 3 or more pieces of the same size "Express service", the express unit price is as shown below.

Express list price×0.9×3 Quantity
=Express unit price
(Prices less than one Yen are rounded off.)

(ex.) If 10 pieces of a product with the same size and with a express list price of 500Yen are purchased, the express unit price is 500Yen×0.9×3÷10=135Yen.

●This volume discount rate is not available for "Express T".

•Example of product unit price calculation when express service is used.

CX • Ⓐ Express A 500/1Pc.
• ⓑⓒⓓⓔ Express A 800/1Pc.

Shoulder punch SPAL10—60—P8.50
①1Unit price for 1 piece with "Express A"
(Product unit price ￥470)＋("Express A"unit price ￥500)＝￥970
②Unit price for 10 pieces with "Express A"
(Product unit price ￥446)＋("Express A"unit price ￥135)＝￥581

Quick find table of express fee in Yen

Order quantity \ Express list price	2,000	1,500	1,000	800	500	300	200
Q'ty：1	2,000	1,500	1,000	800	500	300	200
2	2,000	1,500	1,000	800	500	300	200
3	1,800	1,350	900	720	450	270	180
4	1,350	1,012	675	540	337	202	135
5	1,080	810	540	432	270	162	108
6	900	675	450	360	225	135	90
7	771	578	385	308	192	115	77
8	675	506	337	270	168	101	67
9	600	450	300	240	150	90	60
10	540	405	270	216	135	81	54
11	490	368	245	196	122	73	49
12	450	337	225	180	112	67	45
13	415	311	207	166	103	62	41
14	385	289	192	154	96	57	38
15	360	270	180	144	90	54	36
16	337	253	168	135	84	50	33
17	317	238	158	127	79	47	31
18	300	225	150	120	75	45	30
19	284	213	142	113	71	42	28
20	270	202	135	108	67	40	27

Alterations

Alterations can be ordered without drawings

●Our Alteration Service enables you to select additional features and tolerances. You can easily order the alteration by just adding the desired alteration code to the end of the part number. You don't need to fax a complicated drawing.

Volume discount rate on the alteration cost

The volume discount rate is applicable to alteration cost.

■Example of volume discount rate on the alteration cost

In the case where ten SPDS10-70-P5.00-W3.00-PKC-KC45 are purchased

Main body SPDS10 1.320 × 0.95 = 1,254
Alteration PKC 400 × 0.95 = 380
Alteration KC 200 × 0.95 = 190
→ 1,824/1Pc. × 10 = 18,240 yen (Fractions are discarded)

The volume discount rate does not apply to the charge-free/repaying alterations.

Example of alterations (Shoulder punches)

Alteration | Catalog No. – L(LC・LCT・LMT) – P(PC) – W(WC) – R – (BC・HC・・etc)
SPDS 10 – LC72 – PC2.80 – WC2.80 – BC8 – KC45

3 Days

If the delivery date is changed according to the alteration, there is an indication.

Alterations	Code	Ⓐ	DREG	¥/1Code
Tip	PC WC	Changes dimension P. PC≧Pmin./2, 0.01mm increments (Combination with PKC→0.001mm increments) P(PC) / Bmax: 0.500～0.799 / 10; 0.800～0.999 / 13; 1.000～1.999 / 20; 2.000～3.999 / 35; 4.000～4.999 / 45; 5.000～5.999 / 50; 6.000～ / 60	Changes dimension P・W. PC/WC≧(P・Wmin./2)≧0.80, 0.01mm increments ⊗Blade length X:Not applicable. P(PC)・W(WC) / Bmax: 0.80～1.49 / 8; 1.50～1.99 / 13; 2.00～3.49 / 19; 3.50～4.99 / 25; 5.00～ / 30	200
	BC	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments Ⓨ Full length L(LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments Ⓨ Full length L(LC) requires BC+30mm or more.	200
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1, 0.1mm increments Ⓨ PRC≦(P−0.2)/2 ⊗PCC・GC:Not applicable	———	400
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1, 0.1mm increments Ⓨ PCC≦(P−0.2)/2 ⊗PRC・GC:Not applicable	———	200
	GC	Changes to pointed tip. 20°≦GC<90°, 1°increments Blade length B≧f+2, f=P/2×tan(90°−GC°) ⊗P<1.0:Not applicable ⊗LKC・LKZ・LCT・LMT・PRC・PCC:Not applicable	———	400
	PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓨ (P：0.001mm incr.)	Changes tolerance on P(W). $P・W\pm0.01^{+0.01}_{0}$	400
Full length	LC	Changes full length. 25+B(BC)≦LC<L, 0.1mm increments Ⓨ When LC−B(or BC) is 25mm or less, B(or BC) is LC−25mm. (Combination with LKC・LKZ→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L, 0.1mm increments Ⓨ When LC−B(BC) is 30mm or less, B(BC) is LC−30mm.	200
	LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKC $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		300
	LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKM $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		300
	LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
	LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		600

Alterations	Code	Ⓐ	DREG	¥/1Code
Head	KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
	WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)
	KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
	NKC	———	No flats ⊗Punch & retainer set not available.	0
	HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not available.		200
	TC	Changes head thickness 2≦TC<5, 0.1mm increments (Combination with TKC・TKM・LCT・LMT→0.01mm increments) Ⓨ L is shortened by (5−TC). When used with LC, LCT, LMT, L remains the same as specified. ⊗Punch & retainer set not available.		200
	TKC	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		200
	TKM	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		200
	TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓨ H≦5：TCC 0.5 ⊗SRC:Not applicable		200
	RC	Reduces head thickness by −0.04～0 from retainer surface. ⊗Cannot be applied to the $D^{+0.005}_{0}$ type.		200
	SRC	Modifies head to fit to select retainers (SLS). Ⓨ For the details, refer to P.673 Ⓨ Applicable to D10～25 ⊗Not applicable to $D^{+0.005}_{0}$ type. ⊗Punch & retainer set not available.		300
Shank	SKC	Adds key flat on shank. Ⓐ DREG ・D3～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC・WKC・KFC:Not applicable ⊗Punch & retainer set not available.		600
	UC	Modifies shank to fit to urethane stripper (USN). Ⓨ For details, refer to P.674. Ⓨ Applicable to D10～25		400
	NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.		0

■Environmental Activities

MISUMI has formulated Green Procurement Guidelines to observe the legal restrictions and other requirements concerning environmental chemicals and to help build up a recycling society, and we are advancing green procurement activities. By preparing Green Procurement Guidelines and continuously striving to improve our environmental preservation and environmental chemicals management activities, we seek to eliminate environmental chemicals from our products.

Please confirm Green Procurement Guidelines on our Web site.

http://www.misumi.co.jp/about/environment/green/index.html

■MISUMI Specified Chemical Substances Summary Table

Classification		No.	Substance	Subject Items and Applications	Threshold Value	
Prohibited Substances	6 RoHS Directive Substances	1	Tributyl Tin Oxide (TBTO)	Coatings, pigments	—	
		2	Tributyl Tins (TBTs), Triphenyl Tins (TPTs)	Stabilizers, antioxidants, age resisters	—	
		3	Polychlorinated Biphenyls (PCBs)	Insulating oil, lubricating oil, fire retardants	—	
		4	Polychloronapthalenes (Cl=3 or more)	Lubricating oil, coatings, resin stabilizers, fire retardants	—	
		5	Short Chain Chlorinated Paraffins	Fire retardants, plasticizers	—	
		6	Asbestos	Electric insulation, bulking agents, gaskets	—	
		7	Azo Dies and Pigments that Generate Specific Amines	Pigments and colorants for electric wire coatings *Limited to sections in continuous contact with the human body	—	
		8	Ozone-Depleting Substances	Cooling Medium	—	
		9	Radioactive Substances	Packing, packaging materials	—	
		10	Cadmium and Cadmium Compounds	Cadmium contained in alloys with zinc content (brass, zinc die cast, lead-free solder, etc.), plating, plastic, rubber, coating, etc.	Less than 75 ppm*1	For packaging materials, less than 100 ppm combined of cadmium, lead, mercury, and hexavalent chromium
		11	Lead and Lead Compounds	Lead contained in all types of alloys, solder, and all items other than those which are exempted	Less than 1,000 ppm	
			Exemptions: Lead contained in steel materials		0.35wt% (3,500 ppm) or less	
			Exemptions: Lead contained in aluminum alloys		0.4wt% (4,000 ppm) or less	
			Exemptions: Lead contained in copper alloys		4wt% (40,000 ppm) or less	
			Exemptions: Solder with a lead content of at least 85%		—	
		12	Mercury and Mercury Compounds	Mercury contained in all items aside from small fluorescent light bulbs and straight-tube fluorescent light bulbs	less than 1,000 ppm	
		13	Hexavalent Chromium Compounds	All hexavalent chromium in chromate treatment, plating, coating, etc. Chromium metal and chrome in metal alloys are exempted.	less than 1,000 ppm	
		14	Polybrominated Biphenyls (PBBs)	All PBBs including those in fire retardants	less than 1,000 ppm	
		15	Polybrominated Diphenyl Ethers (PBDEs)	All PBDEs including those in fire retardants	less than 1,000 ppm	
Controlled Substances		16	Antimony and Antimony Compounds	Pigments, coatings, lead-free solder, etc.	less than 1,000 ppm	
		17	Arsenic and Arsenic Compounds	Pigments, coatings, dyes, fire retardant	less than 1,000 ppm	
		18	Beryllium and Beryllium Compounds	Ceramics, alloys, catalysts, and solder	less than 1,000 ppm	
		19	Bismuth and Bismuth Compounds	Glass, lead-free solder, easy-cutting aluminum materials	less than 1,000 ppm	
		20	Nickel and Nickel Compounds	Plating, coatings, pigments (alloys are exempted)	less than 1,000 ppm	
		21	Selenium and Selenium Compounds	Pigments, coatings	less than 1,000 ppm	
		22	Other Bromined Flame Retardants (other than PBBs and PBDEs)	Fire retardants	less than 1,000 ppm	
		23	Phthalates	Plasticizers, dyes, coatings, adhesives	less than 1,000 ppm	
		24	Polyvinyl Chloride (PVC)	Resins, cord sheathing, plasticizers	less than 1,000 ppm	

*1 Less than 100 ppm under the RoHS Directive

1. The prohibited substances and controlled substances are the 24 JIG* substances.

*JIG (Joint Industry Guide)：Guidelines jointly deliberated and issued by the Japan Green Procurement Survey Standardization Initiative (JGPSSI), the European Information, Communications and Consumer Electronics Industry Technology Association (EICTA), and the US Electronic Industries Alliance (EIA) for the standardization of chemical substances surveys.

2. The threshold values are not for intentional additives, but rather stipulate the maximum permitted concentrations allowed for the impurities which are contained in homogeneous materials that cannot be mechanically separated.

ネットで設計・注文、こんなに便利

ミスミECサービスとは？

ミスミカタログ掲載商品の**見積や発注がインターネットでできるWebOrderSystem**をはじめ、インターネットだけに掲載している**技術講座やCADデータ、設計支援ソフトウェアの無料ダウンロード**など、お客様の商品選定やご購入に役立つサービスをご提供しています。日々のお仕事にぜひお役立てください。

商品情報はこちら
カタログ別商品情報・技術情報はこちらからご覧いただけます。

ECサービスからのお知らせ
新サービスやメンテナンス、営業日などをお知らせします。

パスワードを忘れたときは
パスワードを忘れてしまった際は、こちらからお問合せください。ログインIDを忘れてしまった際は、ECサービスヘルプデスクへお問合せください。

おすすめ情報
お得な商品やキャンペーンなどおすすめ情報を随時更新しています。

ログインIDのご登録はこちら
ログインIDをお持ちでない方は、こちらよりご登録ください。
ご登録は無料です。

今すぐアクセス!!　➲➲➲　http://ec.misumi.jp/

ミスミECサービスのご登録方法

ご登録までのステップ

ステップ1　EC サービスメンバー登録する

ログイン ID、パスワード他を登録してください。
ご登録メールアドレス宛に完了メールが送信されます。

ご利用いただけるサービス
コンテンツダウンロード
・CAD データ
・設計支援ソフト

**EC サービス
メンバー登録はこちらから**

ステップ2　WOS 利用の申込みをする

ログインをして WOS 利用申込ボタンをクリック。
お客様コード（6桁の数字）をご入力して利用の承認依頼をします。
※お客様コードをお持ちでない、又は[illegible]マーケティングセンターへご連絡ください

**WOS 利用申込みは
こちらから**

ステップ3　WOS 利用が承認される

申請内容の確認後、お申込みが承認されます。

※承認が完了後、メールにてご連絡致します
※同じお客様コードで既にご利用者様がいる場合は、
原則代表ユーザー（親ユーザー）に承認していただきます
※申請内容によっては承認できない場合がございますので、
予めご了承ください

ご利用いただけるサービス
見積・発注サービス
・WebOrderSystem
・FA プレート板金自由加工
・CSS プラスワン
・Web ハーネス設計
・ボックス見積サービス

お問合せはECサービスヘルプデスクまで
TEL：03-3647-7427／FAX：03-3647-7121
［受付時間］9:00～12:00、13:00～18:00（日曜、年末年始を除く）
※ご注文内容やお取引に関するお問合せはマーケティングセンターへご連絡ください

WOSの便利な機能について
次ページで詳しく解説

Not Applicable

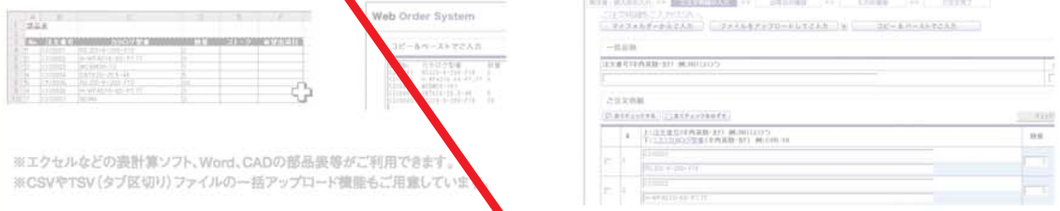
ミスミ・カタログ掲載品をネットで注文できる
Web Order System (wos)

WOS、ここが便利！ その1

社内で作成している部品表を有効利用できないかしら？

エクセル画面をそのままはりつけるだけ！コピー&ペースト機能が簡単・便利です。

エクセルで作成された部品表の一部をコピーして・・・ → WOSにそのままペースト → 注文入力がらくらく完了！



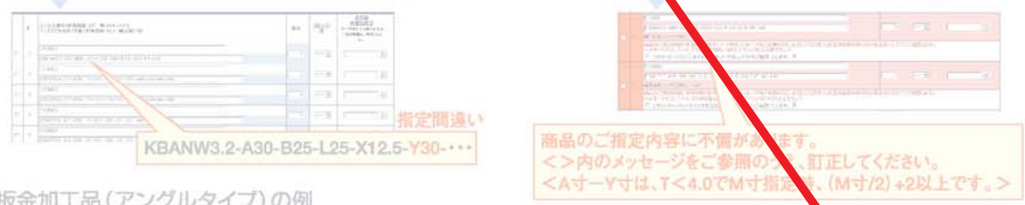
※エクセルなどの表計算ソフト、Word、CADの部品表等がご利用できます。
※CSVやTSV（タブ区切り）ファイルの一括アップロード機能もご用意してい

WOS、ここが便利！ その2

注文したら「規格外です」の回答。事前にカタログ型番の間違いがわかればいいんだけど・・・

WOSなら、ご注文確定前に手軽に型番のチェックができます！

WOSにカタログ型番を入力すると・・・ → ○○ぐさまエラー内容をお知らせ



板金加工品（アングルタイプ）の例
KBANW3.2-A30-B25-L25-X12.5-Y23-F12.5-G18-M5-NA6

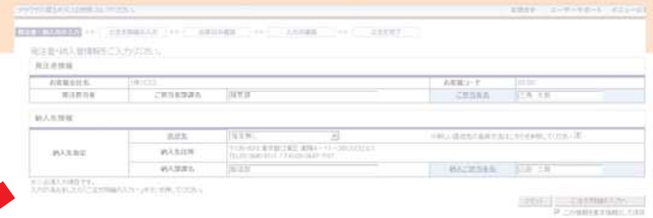
※お見積機能でも同様に型番チェックができます。

そのほかいろいろ、WOS充実機能！

WOSでのご注文方法

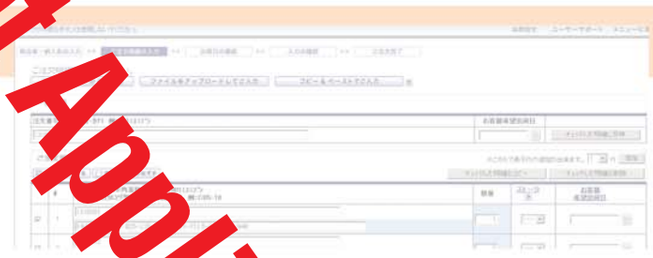
➲➲➲ http://ec.misumi.jp/

1. 発注者・納入先を入力する



●納入先を指定します。直送先を登録いただくと、リストから選択できます。
※直送先の利用には、事前に登録が必要です。登録依頼は「アカウント…メニュー」より行うことができます。
●納入先にご入力いただいた内容が…書に反映されます。

2. ご注文を入力する



●ご注文データ（CSVファイル）を一括アップロードできます。
●エクセルで作成した表をコピーしてそのまま注文画面にはりつけることができます。
●マイフォルダーに登録済みの商品は、入力画面にコピーすることができます。

3. 出荷日を確認する

●注文確定前に価格や出荷日を確認することができます。
●配送をまとめることができ、受入れ業務の効率化を図れます。
●休日配送をご依頼いただけます（休前日出荷分のみ）。

4. ご注文を完了する

●注文書の控えを印刷できます。
●注文確認メールを送信いたします。
●発送が完了いたしますと、ご連絡のメールを送信いたします。
●注文の処理状況は実績照会にて確認できます。

Not Applicable

PUNCHES

PUNCHES

Delivery Shortened

Name / Catalog No.	SHOULDER PUNCHES	SHOULDER PUNCHES —Dicoat ® type—	SHOULDER PUNCHES —TiCN coating type—	SHOULDER PUNCHES —WPC ® type—	SHOULDER PUNCHES —HW coating type—
Delivery	③Ⓣ Ⓐ	③Ⓐ	③	③Ⓐ	③
Page	53	55	57	59	59

Add.

Add.

Add.

Add.

Delivery Shortened

SHOULDER PUNCHES —Lapping type—	JECTOR PUNCHES	JECTOR PUNCHES —Dicoat ® type—	JECTOR PUNCHES —TiCN coating type—	JECTOR PUNCHES —WPC ® type—	JECTOR PUNCHES —HW coating type—
③Ⓣ Ⓐ	③Ⓣ Ⓐ	③Ⓐ	③	③Ⓐ	③
61	63	65	67	69	69

Add.

New

New

New

JECTOR PUNCHES —Lapping type—	JECTOR PUNCHES —L Specified, dim. B fixed type—	JECTOR PUNCHES —L Specified, dim. B fixed type, WPC ® type—	JECTOR PUNCHES —Large diameter pin—	JECTOR PUNCHES —Large diameter pin—
③Ⓣ Ⓐ	③Ⓣ Ⓐ	③Ⓐ	③Ⓣ Ⓐ	③Ⓣ Ⓐ
71	73	73	75	75

Add.

Add.

SHOULDER PUNCHES —Quill—	SHOULDER PUNCHES —Quill, Lapping type, TiCN coating type—	SHOULDER PUNCHES —Short type—	SHOULDER PUNCHES —Short, TiCN coating type—	SHOULDER PUNCHES —Double stepped type—
③Ⓣ Ⓐ	③Ⓣ Ⓐ·③	③Ⓐ	③	③Ⓐ·③
77	77	79	79	81

New

Add.

New

SHOULDER PUNCHES —Quill, Double stepped type—	D-CUT SHOULDER PUNCHES —Standard type, TiCN coating type—	D-CUT SHOULDER PUNCHES —WPC ® type—	D-CUT SHOULDER PUNCHES —HW coating—	D-CUT JECTOR PUNCHES —Standard type, TiCN coating type—	D-CUT JECTOR PUNCHES —WPC ® type—	D-CUT JECTOR PUNCHES —HW coating type—
③Ⓐ	③Ⓐ·③	③Ⓐ	③	③Ⓐ·③	③Ⓐ	③
83	85	87	87	89	91	91

New

New

Add.

PUNCHES WITH DOWEL	PUNCHES WITH DOWEL —Dicoat ® type—	PUNCHES WITH DOWEL —TiCN coating—	PUNCHES WITH DOWEL —WPC ® type— —HW coating—	JECTOR PUNCHES WITH DOWEL
③Ⓣ Ⓐ	③Ⓐ	③	③Ⓐ ③	③Ⓣ Ⓐ
93	95	97	99 99	101

Add.

New

New

Add.

JECTOR PUNCHES WITH DOWEL —Dicoat ® type—	JECTOR PUNCHES WITH DOWEL —TiCN coating—	JECTOR PUNCHES WITH DOWEL —WPC ® type—	—HW coating—	PUNCHES FOR HEAVY LOAD	PUNCHES FOR HEAVY LOAD —Dicoat ® type—
③Ⓐ	③	③Ⓐ	③	③Ⓣ Ⓐ	③Ⓐ
103	105	107	107	109	111

Add.

Add.

Delivery Shortened

Add.

Add.

PUNCHES FOR HEAVY LOAD —TiCN coating type—	PUNCHES FOR HEAVY LOAD —WPC ® type— —HW coating type—	PUNCHES FOR HEAVY LOAD —Lapping type—	JECTOR PUNCHES FOR HEAVY LOAD	JECTOR PUNCHES FOR HEAVY LOAD —Dicoat ® type—
③	③Ⓐ ③	③Ⓣ Ⓐ	③Ⓣ Ⓐ	③Ⓐ
113	115 115	117	119	121

Add.

Add.

Delivery Shortened

Add.

New

New

JECTOR PUNCHES FOR HEAVY LOAD —TiCN coating type—	JECTOR PUNCHES FOR HEAVY LOAD —WPC ® type— —HW coating type—	JECTOR PUNCHES FOR HEAVY LOAD —Lapping type—	JECTOR PUNCHES FOR HEAVY LOAD —L Specified, dim. B fixed type—	JECTOR PUNCHES FOR HEAVY LOAD —L Specified, dim. B fixed type, TiCN coating—
③	③Ⓐ ③	③Ⓣ Ⓐ	③Ⓣ Ⓐ	③
123	125 125	127	129	131

New

New

New

JECTOR PUNCHES FOR HEAVY LOAD —L Specified, dim. B fixed type, WPC ®—	JECTOR PUNCHES FOR HEAVY LOAD —L Specified, dim. B fixed type, HW coating—	TAPERED HEAD PUNCHES	TAPERED HEAD PUNCHES —TiCN coating—	TAPERED HEAD PUNCHES —HW coating—
③Ⓐ	③	③Ⓐ	③	③
133	133	135	135	135

New

New

New

New

Add.

TAPERED HEAD JECTOR PUNCHES	TAPERED HEAD JECTOR PUNCHES —WPC ® type—	TAPERED HEAD JECTOR PUNCHES —TiCN coating—	TAPERED HEAD JECTOR PUNCHES —HW coating—	PUNCHES WITH DOWEL FOR HEAVY LOAD —Finished for retainers—
③Ⓐ	③	③	③	③Ⓣ Ⓐ
137	137	137	137	139

Add.

Add.

Delivery Shortened

Add.

Add.

Add.

Delivery Shortened

PUNCHES WITH DOWEL FOR HEAVY LOAD —Finished for retainers,TiCN coating type—	PUNCHES WITH DOWEL FOR HEAVY LOAD —WPC ® type— —HW coating type—	JECTOR PUNCHES WITH DOWEL FOR HEAVY LOAD —Finished for retainers—	JECTOR PUNCHES WITH DOWEL FOR HEAVY LOAD —Finished for retainers,TiCN coating type—	JECTOR PUNCHES WITH DOWEL FOR HEAVY LOAD —WPC ® type— —HW coating type—
③	③Ⓐ ③	③Ⓣ Ⓐ	③	③Ⓐ ③
141	143 143	145	147	149 149

PUNCHES

DOUBLE STEPPED SHOULDER PUNCHES FOR HEAVY LOAD
③Ⓐ·⑤Ⓑ
151

TAPPED PUNCHES
③ⓉⒶ
153

TAPPED PUNCHES
—Dicoat® type—
③Ⓐ
155

TAPPED PUNCHES
—TiCN coating type—
③
155

New

TAPPED PUNCHES
—WPC® type— —HW coating—
③Ⓐ ③
157 157

TAPPED JECTOR PUNCHES
③ⓉⒶ
159

New

TAPPED JECTOR PUNCHES
—WPC® type—
③Ⓐ
159

DOUBLE STEPPED TAPPED PUNCHES
③Ⓐ·③
161

D-CUT AND TAPPED PUNCHES
—Normal type, TiCN coating type—
③Ⓐ·③
163

PUNCHES WITH KEY GROOVE
③Ⓐ
165

PUNCHES WITH KEY GROOVE
—TiCN coating—
③
167

New

PUNCHES WITH KEY GROOVE
—WPC® type— —HW coating—
③Ⓐ ③
169 169

TAPPED JECTOR PUNCHES WITH KEY GROOVE
③Ⓐ
171

New

TAPPED JECTOR PUNCHES WITH KEY GROOVE
—WPC® type—
③Ⓐ
171

PRESS-FIT HEADED PUNCHES
—Standard type, TiCN coating type—
③
173

STRAIGHT PUNCHES
③ⓉⒶ
175

STRAIGHT PUNCHES
—Lapping type—
③ⓉⒶ
175

STRAIGHT PUNCHES
—TiCN coating type—
③
176

JECTOR STRAIGHT PUNCHES
③Ⓐ
177

JECTOR STRAIGHT PUNCHES
—Lapping type—
③Ⓐ
177

TAPPED STRAIGHT PUNCHES
③Ⓐ
178

TAPPED STRAIGHT PUNCHES
—Lapping type—
③Ⓐ
178

New

STRAIGHT PUNCHES FOR HEAVY LOAD
③ⓉⒶ
179

New

STRAIGHT PUNCHES FOR HEAVY LOAD
—Lapping type—
③ⓉⒶ
180

BLANKING PUNCHES
⑤
181

MINI PUNCHES
③ⓉⒶ
183

MINI STRAIGHT PUNCHES
③ⓉⒶ
184

PUNCH BLANKS
③ⓉⒶ
185

PUNCH BLANKS
—With dowel—
③ⓉⒶ
185

Add.

JECTOR PUNCH BLANKS
③ⓉⒶ
186

JECTOR PUNCH BLANKS
—With dowel—
③ⓉⒶ
186

PUNCH BLANKS FOR HEAVY LOAD
③ⓉⒶ
187

TAPPED PUNCH BLANKS
③ⓉⒶ
187

PUNCH BLANKS FOR HEAVY LOAD
—With dowel—
③ⓉⒶ
187

JECTOR PUNCH BLANKS
FOR HEAVY LOAD
③ⓉⒶ
188

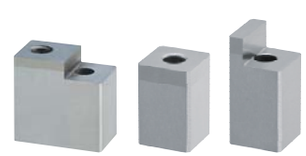
TAPPED JECTOR
PUNCH BLANKS
③ⓉⒶ
188

JECTOR PUNCH BLANKS FOR HEAVY LOAD
—With dowel—
③ⓉⒶ
188

Add.

JECTOR PIN SETS
SJ AJ LJ
③ⓉⒶ
189 192

PUSHING PINS
JP JPW JPWH
③Ⓐ
192



PUNCH HOLDERS
BBPH BBPHC KBPH KBPHC
③Ⓐ ③Ⓐ
193 193

SPACERS FOR PUNCH
PWA
③
194

SHIMS FOR PUNCH
PWB
③
194

SPACERS FOR A PUNCH WITH A TAP
PWC
③
194

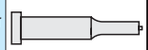
KEYS
①
195

KEYS
—Long type—
③Ⓐ
195

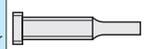
KEYS
KE KED KES KEG
①·③Ⓐ
196

PUNCHES
—GUIDE I—

Printed in Red：New product/Added spec.

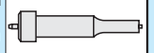
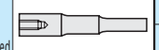
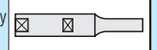
Shank type		M	Shank diameter tolerance	Standard type		Dicoat® type		TiCN Coating type		WPC® type (Upper) HW coating type (Lower)		Lapping type	
Shoulder		SKD 11 or equivalent	D_{m5}	SP□□	P.53	T—SP□□	P.55			W—SP□□	P.59	L—SP□□	P.61
			$D^{+0.005}_{0}$	A—SP□□		AT—SP□□				AW—SP□□		AL—SP□□	
		SKH51	D_{m5}	SH□□				H—SH□□	P.57	W—SH□□ HW—SH□□		L—SH□□	
			$D^{+0.005}_{0}$	A—SH□□				AH—SH□□		AW—SH□□ AHW—SH□□		AL—SH□□	
		Powdered high-speed steel	D_{m5}	PH□□		T—PH□□	P.55	H—PH□□		W—PH□□ HW—PH□□		L—PH□□	
			$D^{+0.005}_{0}$	A—PH□□		AT—PH□□		AH—PH□□		AW—PH□□ AHW—PH□□		AL—PH□□	
Shoulder jector		SKD 11 or equivalent (D4~6 SKH51)	D_{m5}	SJ□□	P.63	T—SJ□□	P.65			W—SJ□□	P.69	L—SJ□□	P.71
			$D^{+0.005}_{0}$	A—SJ□□		AT—SJ□□				AW—SJ□□		AL—SJ□□	
		Powdered high-speed steel	D_{m5}	PJ□□		T—PJ□□		H—PJ□□	P.67	W—PJ□□ HW—PJ□□		L—PJ□□	
			$D^{+0.005}_{0}$	A—PJ□□		AT—PJ□□		AH—PJ□□		AW—PJ□□ AHW—PJ□□		AL—PJ□□	
Shoulder jector (Spring reinforced type)		SKD 11 or equivalent	D_{m5}	SJV□□	P.63	T—SJV□□	P.65			W—SJV□□	P.69	L—SJV□□	P.71
			$D^{+0.005}_{0}$	A—SJV□□		AT—SJV□□				AW—SJV□□		AL—SJV□□	
		Powdered high-speed steel	D_{m5}	PJV□□		T—PJV□□		H—PJV□□	P.67	W—PJV□□ HW—PJV□□		L—PJV□□	
			$D^{+0.005}_{0}$	A—PJV□□		AT—PJV□□		AH—PJV□□		AW—PJV□□ AHW—PJV□□		AL—PJV□□	
Shoulder jector (B dim. fixed)		SKD 11 or equivalent	D_{m5}	LFSJ□□	P.73					W—LFSJ□□	P.73	Alteration SC	P.74
			$D^{+0.005}_{0}$	A—LFSJ□□						AW—LFSJ□□			
Shoulder jector (Large dia. pin)		SKD 11 or equivalent	D_{m5}	SJF□□	P.75							L—SJF□□	P.75
Shoulder quill		SKH51	D_{m5}	SH□□	P.77			H—SH□□	P.77			L—SH□□	P.77
			$D^{+0.005}_{0}$	A—SH□□				AH—SH□□				AL—SH□□	
		Powdered high-speed steel	D_{m5}	PH□□				H—PH□□				L—PH□□	
			$D^{+0.005}_{0}$	A—PH□□				AH—PH□□				AL—PH□□	
Shoulder quill (Head thickness 5mm)		SKH51	D_{m5}	SHLT□□	P.77			H—SHLT□□	P.77			L—SHLT□□	P.77
			$D^{+0.005}_{0}$	A—SHLT□□				AH—SHLT□□				AL—SHLT□□	
		Powdered high-speed steel	D_{m5}	PHLT□□				H—PHLT□□				L—PHLT□□	
			$D^{+0.005}_{0}$	A—PHLT□□				AH—PHLT□□				AL—PHLT□□	
Shoulder short		SKD 11 or equivalent	D_{m5}	SS□□	P.79				P.79				
			$D^{+0.005}_{0}$	A—SS□□									
		SKH51	D_{m5}	SSH□□				H—SSH□□					
			$D^{+0.005}_{0}$	A—SSH□□				AH—SSH□□					
		Powdered high-speed steel	D_{m5}	SSP□□				H—SSP□□					
			$D^{+0.005}_{0}$	A—SSP□□				AH—SSP□□					
Shoulder Double Stepped		SKD 11 or equivalent	D_{m5}	SPTW□	P.81							Alteration SC	P.82
			$D^{+0.005}_{0}$	A—SPTW□									
		SKH51	D_{m5}	SHTW□									
			$D^{+0.005}_{0}$	A—SHTW□									
		Powdered high-speed steel	D_{m5}	PHTW□									
			$D^{+0.005}_{0}$	A—PHTW□									

Printed in Red：New product/Added spec.

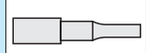
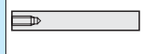
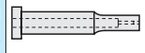
Shank type		M	Shank diameter tolerance	Standard type		Dicoat® type		TiCN Coating type		WPC® type (Upper) HW coating type (Lower)		Lapping type	
Shoulder Small dia. Double Stepped		SKH51	D_{m5}	SHTWA	P.83								
			$D^{+0.005}_{0}$	A—SHTWA									
		Powdered high-speed steel	D_{m5}	PHTWA									
			$D^{+0.005}_{0}$	A—PHTWA									
D-cut shoulder		SKD 11 or equivalent	$D^{+0.005}_{0}$	G—SP□□	P.85					GW—SP□□	P.87		
		SKH51		G—SH□□				GH—SH□□	P.85	GW—SH□□ GHW—SH□□			
		Powdered high-speed steel		G—PH□□				GH—PH□□		GW—PH□□ GHW—PH□□			
D-cut Jector		SKD 11 or equivalent (D4~6 SKH51)	$D^{+0.005}_{0}$	G—SJ□□	P.89					GW—SJ□□	P.91		
		Powdered high-speed steel	$D^{+0.005}_{0}$	G—PJ□□				GH—PJ□□	P.89	GW—PJ□□ GHW—PJ□□			
D-cut Jector (Spring reinforced type)		SKD 11 or equivalent	$D^{+0.005}_{0}$	G—SJV□□	P.89					GW—SJV□□	P.91		
		Powdered high-speed steel	$D^{+0.005}_{0}$	G—PJV□□				GH—PJV□□	P.89	GW—PJV□□ GHW—PJV□□			
With dowel		SKD 11 or equivalent	D_{m5}	SP□□—C	P.93	T—SP□□—C	P.95	H—SP□□—C	P.97	W—SP□□—C HW—SP□□—C	P.99	Alteration SC	P.94
Jector with dowel		SKD 11 or equivalent	D_{m5}	SJ□□—C	P.101	T—SJ□□—C	P.103	H—SJ□□—C	P.105	W—SJ□□—C HW—SJ□□—C	P.107	Alteration SC	P.102
Jector with dowel (Reinforced spring)		SKD 11 or equivalent	D_{m5}	SJV□□—C	P.101	T—SJV□□—C	P.103	H—SJV□□—C	P.105	W—SJV□□—C HW—SJV□□—C	P.107	Alteration SC	P.102
For heavy load		SKH51	D_{m5}	AP□□	P.109			H—AP□□	P.113	W—AP□□ HW—AP□□	P.115	L—AP□□	P.117
			$D^{+0.005}_{0}$	A—AP□□				AH—AP□□		AW—AP□□ AHW—AP□□		AL—AP□□	
		Powdered high-speed steel	D_{m5}	APH□□		T—APH□□	P.111	H—APH□□		W—APH□□ HW—APH□□		L—APH□□	
			$D^{+0.005}_{0}$	A—APH□□		AT—APH□□		AH—APH□□		AW—APH□□ AHW—APH□□		AL—APH□□	
Jector for heavy load		Powdered high-speed steel	D_{m5}	APJ□□	P.119	T—APJ□□	P.121	H—APJ□□	P.123	W—APJ□□ HW—APJ□□	P.125	L—APJ□□	P.127
			$D^{+0.005}_{0}$	A—APJ□□		AT—APJ□□		AH—APJ□□		AW—APJ□□ AHW—APJ□□		AL—APJ□□	
Jector for heavy load (B fixed dim.)		Powdered high-speed steel	D_{m5}	LFAPJ□□	P.129			H—LFAPJ□□	P.131	W—LFAPJ□□ HW—LFAPJ□□	P.133		
			$D^{+0.005}_{0}$	A—LFAPJ□□				AH—LFAPJ□□		AW—LFAPJ□□ AHW—LFAPJ□□			
Taperd head		SKH51	D_{m5}	TSSHA□	P.135			H—TSSHA□	P.135	HW—TSSHA□	P.135	Alteration SC	P.136
		Powdered high-speed steel		TSPHA□				H—TSPHA□		HW—TSPHA□			
Taperd head jector		SKH51	D_{m5}	TSSJA□	P.137			H—TSSJA□	P.137	W—TSSJA□ HW—TSSJA□	P.137	Alteration SC	P.138
		Powdered high-speed steel		TSPJA□				H—TSPJA□		W—TSPJA□ HW—TSPJA□			

PUNCHES —GUIDE II—

Printed in Red：New product/Added spec.

Shank type		M	Shank diameter tolerance	Standard type		Dicoat® type		TiCN Coating type		WPC® type (Upper) HW coating type (Lower)		Lapping type	
For heavy load with dowel		SKH51	D_{m5}	AP□□−C	P.139			H−AP□□−C	P.141	W−AP□□−C HW−AP□□−C	P.143	Alteration SC	P.140
		Powdered high-speed steel		APH□□−C				H−APH□□−C		W−APH□□−C HW−APH□□−C			
Jector for heavy load with dowel		SKH51	D_{m5}	AHJ□□−C	P.145			H−AHJ□□−C	P.147	W−AHJ□□−C HW−AHJ□□−C	P.149	Alteration SC	P.146
Double stepped shoulder for heavy load		SKH51	D_{m5}	APTW□	P.151							Alteration SC	P.152
			$D^{+0.005}_{0}$	A−APTW□									
		Powdered high-speed steel	D_{m5}	APHTW□									
			$D^{+0.005}_{0}$	A−APHTW□									
Tapped		SKD 11 or equivalent	D_{m5}	MP□□ MPL□□	P.153	T−MP□□	P.155			W−MP□□	P.157	Alteration SC	P.154
			$D^{+0.005}_{0}$	A−MP□□		AT−MP□□				AW−MP□□			
		Powdered high-speed steel	D_{m5}	MPH□□		T−MPH□□		H−MPH□□	P.155	W−MPH□□ HW−MPH□□			
			$D^{+0.005}_{0}$	A−MPH□□		AT−MPH□□		AH−MPH□□		AW−MPH□□ AHW−MPH□□			
Tapped jector		SKD 11 or equivalent	D_{m5}	MJ□□	P.159					W−MJ□□	P.159	Alteration SC	P.160
			$D^{+0.005}_{0}$	A−MJ□□						AW−MJ□□			
Doubule stepped and Tapped		SKD 11 or equivalent	D_{m5}	MPTW□	P.161							Alteration SC	P.162
			$D^{+0.005}_{0}$	A−MPTW□									
		Powdered high-speed steel	D_{m5}	MPHTW□									
			$D^{+0.005}_{0}$	A−MPHTW□									
D-cut and tapped		SKD 11 or equivalent	$D^{+0.005}_{0}$	G−MP□□	P.163								
		Powdered high-speed steel		G−MPH□□				GH−MPH□□	P.163				
With key groove		SKD 11 or equivalent	D_{m5}	SK□□	P.165					W−SK□□	P.169	Alteration SC	P.166
			$D^{+0.005}_{0}$	A−SK□□						AW−SK□□			
		SKH51	D_{m5}	SHK□□				H−SHK□□	P.167	W−SHK□□ HW−SHK□□			
			$D^{+0.005}_{0}$	A−SHK□□				AH−SHK□□		AW−SHK□□ AHW−SHK□□			
		Powdered high-speed steel	D_{m5}	PK□□				H−PK□□		W−PK□□ HW−PK□□			
			$D^{+0.005}_{0}$	A−PK□□				AH−PK□□		AW−PK□□ AHW−PK□□			
Tapped jector with key groove		SKD 11 or equivalent	D_{m5}	SKJ□□	P.171					W−SKJ□□	P.171	Alteration SC	P.172
			$D^{+0.005}_{0}$	A−SKJ□□						AW−SKJ□□			

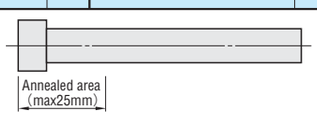
Printed in Red：New product/Added spec.

Shank type		M	Shank diameter tolerance	Standard type		Dicoat® type		TiCN Coating type		WPC® type (Upper) HW coating type (Lower)		Lapping type	
Press-fit headed		Powdered high-speed steel	$D^{+0.005}_{0}$	PHTAL	P.173			H−PHTAL	P.173			Alteration SC	P.174
Straight		SKD 11 or equivalent	–	SPC	P.175							L−SPC	P.175
		SKH51	–	SHC				H−SHC	P.176			L−SHC	
		Powdered high-speed steel	–	PHC				H−PHC				L−PHC	
Straight jector		SKD 11 or equivalent (No.5・SKH51)	–	SJC	P.177							L−SJC	P.177
Tapped straight		SKD 11 or equivalent	–	MSPC	P.178							L−MSPC	P.178
For heavy load with straight		SKH51	–	AHC	P.179							L−AHC	P.180
		Powdered high-speed steel	–	APHC								L−APHC	
Blanking Punches		SKD 11 or equivalent	D_{m5}	SPCPD	P.181								
Mini		SKH51	–	SHCL	P.183								
Mini straight		SKH51	–	SH	P.184								

■Guide of jector punches

Category	Standard type This is the most widely used scrap removal punch.		L dimension designation type The blade length B remains constant even when the total length L changes.		Spring reinforced type The spring constant is twice that of the standard type. The spring load is large, so even greater scrap removal effectiveness can be expected.		Large diameter pin This type has a thicker jector pin than that of the standard type. The pin has excellent strength and stiffness.	
Shoulder	Jector punches Dicoat® TiCN coating WPC®, HW coating Lapping type	P.63 P.65 P.67 P.69 P.71	L dimension designation type L dimension designation type WPC®, HW coating	P.73 P.73	Spring reinforced type Spring reinforced type Dicoat® Spring reinforced type TiCN coating Spring reinforced type WPC®, HW coating Spring reinforced type Lapping type	P.63 P.65 P.67 P.69 P.71	Large diameter pin	P.75
D-cut	Jector punches WPC®, HW coating	P.89 P.91	—		Spring reinforced type Standard, TiCN coating Spring reinforced type WPC®, HW coating	P.89 P.91	—	
With dowel	Jector punches Dicoat® TiCN coating WPC®, HW coating	P.101 P.103 P.105 P.107	—		Spring reinforced type Spring reinforced type Dicoat® Spring reinforced type TiCN coating Spring reinforced type WPC®, HW coating	P.101 P.103 P.105 P.107	—	
For heavy load	Jector punches Dicoat® TiCN coating WPC®, HW coating	P.119 P.121 P.123 P.125	L dimension designation type TiCN coating WPC®, HW coating	P.129 P.131 P.133	—		—	
Tapered head	—		Jector punches TiCN coating WPC®, HW coating	P.137 P.137 P.137	—		—	
For heavy load with dowel	Jector punches TiCN coating WPC®, HW coating	P.145 P.147 P.149	—		—		—	
Tapped	Jector punches	P.159	—		—		—	
With key groove	Jector punches	P.171	—		—		—	
Straight	Jector punches	P.177	—		—		—	

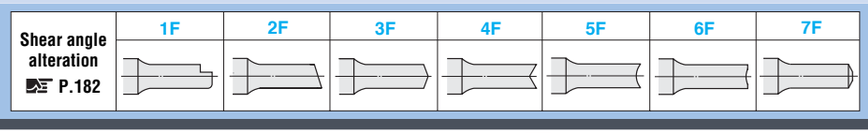
■The flange of punches and punch blanks made of powder high-speed tool steel is annealed; it is softer than other portions.（50～55HRC）
However, the following types have not been annealed.
- Stopper flange type
- Short type
- Shank diameter（dimension D）1.6, 2.0, 2.5



SHOULDER PUNCHES

Detail P.657

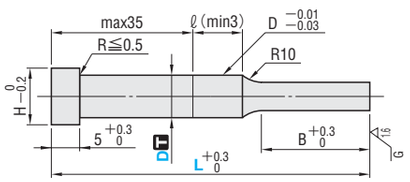
Shear angle alteration P.182



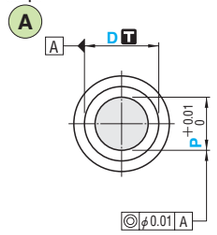
The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length
RoHS Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	D_{m5}	SKD 11 or equivalent 60～63HRC	SP	A	S
		SKH51 61～64HRC	SH	D	
		Powdered high-speed steel 64～67HRC	PH	R	L
	$D^{+0.005}_{0}$	SKD 11 or equivalent 60～63HRC	A–SP	E	X
		SKH51 61～64HRC	A–SH	G	Blade Length (B) X>L>S
		Powdered high-speed steel 64～67HRC	A–PH		

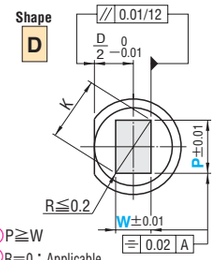
Select tip shape from Shape A～G shown below.



Shape A

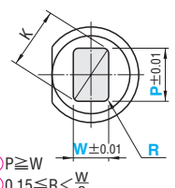


Shape D



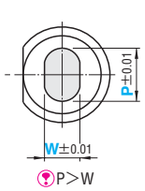
P≧W
R=0 : Applicable
K=√(P²+W²)

Shape R



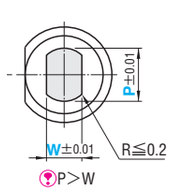
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P·K max.	0.01mm increments DREG P·W min.	0.01mm increments R R	B	H
(Dm5) SP SH PH	A D R E G	S	3	40 50 60 70 80 90 100	1.00～ 2.99	P.77			8	5
			4	40 50 60 70 80 90 100	1.00～ 3.99	3.97	1.00			7
			5	40 50 60 70 80 90 100	2.00～ 4.99	4.97	1.20			8
			6	40 50 60 70 80 90 100	2.00～ 5.99	5.97	1.50			9
			8	(40) 50 60 70 80 90 100	3.00～ 7.99	7.97	2.00		13	11
			10	(40) 50 60 70 80 90 100	3.00～ 9.99	9.97	2.50			13
			13	(40) 50 60 70 80 90 100	6.00～12.99	12.97	3.00			16
			16	(40) 50 60 70 80 90 100	10.00～15.99	15.97	4.00		19	19
			20	(40) 50 60 70 80 90 100	13.00～19.99	19.97	5.00			23
			25	(40) 50 60 70 80 90 100	18.00～24.99	24.97	6.00			28
(D $^{+0.005}_{0}$) A–SP A–SH A–PH		L	3	50 60 70 80 90 100	1.00～ 2.99	P.77		0.15≦R< W/2 (Ⓡonly)	13	5
			4	50 60 70 80 90 100	1.00～ 3.99	3.97	2.00			7
			5	50 60 70 80 90 100	2.00～ 4.99	4.97	2.00			8
			6	50 60 70 80 90 100	2.00～ 5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00～ 7.99	7.97	2.50		19	11
			10	50 60 70 80 90 100	3.00～ 9.99	9.97	2.50			13
			13	50 60 70 80 90 100	6.00～12.99	12.97	3.00			16
			16	60 70 80 90 100	10.00～15.99	15.97	4.00		25	19
			20	60 70 80 90 100	13.00～19.99	19.97	5.00			23
			25	60 70 80 90 100	18.00～24.99	24.97	6.00			28
		X	3	50 60 70 80 90 100	1.20～ 2.99	–			19	5
			4	50 60 70 80 90 100	1.20～ 3.99	3.97	2.00			7
			5	60 70 80 90 100	2.00～ 4.99	4.97	3.50		25	8
			6	60 70 80 90 100	2.00～ 5.99	5.97	3.50			9
			8	60 70 80 90 100	3.00～ 7.99	7.97	5.00		30	11
			10	60 70 80 90 100	3.00～ 9.99	9.97	5.00			13
			13	60 70 80 90 100	6.00～12.99	12.97	5.00			16
			16	70 80 90 100	10.00～15.99				40	19
			20	70 80 90 100	13.00～19.99	–				23
			25	70 80 90 100	18.00～24.99					28

Ⓐ : P>D−0.03→ ℓ =0, When P>D−0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
DREG : P・K>D−0.05→ ℓ = 0, When P・K>D−0.05 shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
L(40)→B=8, When L(40), the blade length is fixed to 8mm.

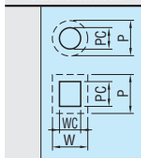
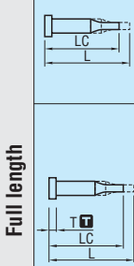
Order Catalog No. — L — P — W — R(Ⓡonly)
A–PHDL 13 — 80 — P10.50 — W7.34

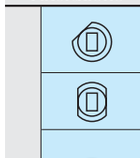
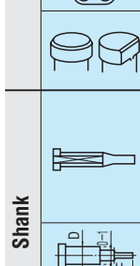
For smaller diameter than listed : Shoulder punches—Quill— P.77
For shorter dimension L : Shoulder punches—Short— P.79

Delivery

- Ⓐ : 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38
  A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
- DREG : 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. P.38
  A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration Catalog No. – L(LC·LCT·LMT) – P(PC) – W(WC) – R – (BC·HC··etc.)
SPDS 10 – LC72 – PC2.80 – WC2.80 – BC8– KC45

Alterations	Code	Ⓐ	DREG	¥/1Code
Tip 	PC WC	Changes dimension P. PC≧ Pmin./2, 0.01mm increments (Combination with PKC→0.001mm increments) P(PC) Bmax: 0.500～0.799 10; 0.800～0.999 13; 1.000～1.999 20; 2.000～3.999 35; 4.000～4.999 45; 5.000～5.999 50; 6.000～ 60	Changes dimension P・W. PC/WC ≧ P・Wmin./2 ≧0.80, 0.01mm increments ⊗Blade length X:Not applicable. P(PC)・W(WC) Bmax: 0.80～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	200
	BC	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments ?Full length L(LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments ?Full length L(LC) requires BC+30mm or more.	200
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1, 0.1mm increments ?PRC≦(P−0.2)/2 ⊗PCC・GC:Not applicable	——	400
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1, 0.1mm increments ?PCC≦(P−0.2)/2 ⊗PRC・GC:Not applicable	——	200
	GC	Changes to pointed tip. 20°≦GC<90°, 1°increments, Blade length B≧f+2, f=P/2×tan(90°−GC°) ⊗P<1.0:Not applicable ⊗LKC・LKZ・LCT・LMT・PRC・PCC:Not applicable	——	400
	PKC	Changes tolerance on P. P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P : 0.001mm incr.)	Changes tolerance on P(W). P・W±0.01 ⇨ $^{+0.01}_{0}$	400
Full length 	LC	Changes full length. 25+B(BC)≦LC<L, 0.1mm increments ?When LC−B(or BC) is 25mm or less, B(or BC) is LC−25mm. (Combination with LKC・LKZ→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L, 0.1mm increments ?When LC−B(BC) is 30mm or less, B(BC) is LC−30mm.	200
	LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (?) are the same as LC. TKC T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	Changes full length tolerance.	300
	LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (?) are the same as LC. TKM T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	Changes full length tolerance.	
	LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
	LKZ	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		600

Alterations	Code	Ⓐ	DREG	¥/1Code
Head 	KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
	WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)
	KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
	NKC	——	No flats ⊗Punch & retainer set not available.	0
	HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not available.		200
	TC	Changes head thickness 2≦TC<5, 0.1mm increments (Combination with TKC・TKM・LCT・LMT→0.01mm increments) ?L is shortened by (5−TC). When used with LC, LCT, LMT, L remains the same as specified. ⊗Punch & retainer set not available.		200
	TKC	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		200
	TKM	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		200
	TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 ?H≦5 : TCC 0.5 ⊗SRC:Not applicable		200
	RC	Reduces head thickness by −0.04～0 from retainer surface. ⊗Cannot be applied to the D $^{+0.005}_{0}$ type.		200
	SRC	Modifies head to fit to select retainers (SLS). ?For the details, refer to P.673 ?Applicable to D10～25 ⊗Not applicable to D $^{+0.005}_{0}$ type. ⊗Punch & retainer set not available.		300
Shank 	SKC	Adds key flat on shank. Ⓐ DREG ・D3～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC・WKC・KFC:Not applicable ⊗Punch & retainer set not available.		600
	UC	Modifies shank to fit to urethane stripper (USN). ?For details, refer to P.674. ?Applicable to D10～25		400
	NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.		0

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

?To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 100 yen required.
Example : A—SPAS6, the price is 290 (SPAS6 unit price) +100 = 390 yen (product unit)

MSKD 11 or equivalent

D	Ⓐ SPAS SPAL	Ⓐ SPAX	DREG SP□S SP□L	DREG SP□X
3	250	340	—	—
4	260	340	910	1,100
5	280	360	1,000	1,190
6	290	390	1,070	1,260
8	350	490	1,160	1,350
10	470	590	1,320	1,510
13	560	710	1,630	1,820
16	670	840	2,080	
20	840	1,010	2,590	—
25	1,290	1,460	3,020	

MSKH51

D	Ⓐ SHAS SHAL	Ⓐ SHAX	DREG SH□S SH□L	DREG SH□X
3	320	380	—	—
4	340	400	1,030	1,220
5	340	420	1,120	1,310
6	360	440	1,200	1,390
8	470	560	1,370	1,560
10	590	680	1,490	1,680
13	760	870	1,810	2,000
16	920	1,030	2,290	
20	1,150	1,290	2,850	—
25	1,770	1,890	3,320	

MPowdered high-speed steel

D	Ⓐ PHAS PHAL	Ⓐ PHAX	DREG PH□S PH□L	DREG PH□X
3	490	580	—	—
4	520	610	1,270	1,460
5	550	650	1,380	1,570
6	640	740	1,550	1,740
8	960	1,090	1,910	2,100
10	1,240	1,400	2,150	2,340
13	1,950	2,130	3,100	3,290
16	2,360	2,490	3,790	
20	2,990	3,170	4,790	—
25	3,740	3,890	5,730	

SHOULDER PUNCHES
—DICOAT® TYPE—

PRODUCTS DATA P.1215

DICOAT®PUNCHES

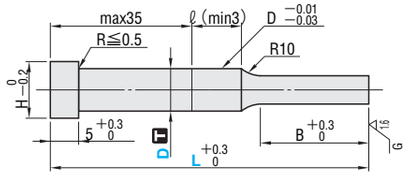
Punch & Retainer Set Available Detail P.657

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M / H	Catalog No. Type	Shape	B Blade length
—Dicoat® type— RoHS	D_{m5} (D3~25)	SKD 11 or equivalent 60~63HRC Surface 3000HV	T—SP	A	S
		Powdered high-speed steel 62~64HRC Surface 3000HV	T—PH	D	L
	$D^{+0.005}_{0}$ (D3~13)	SKD 11 or equivalent 60~63HRC Surface 3000HV	AT—SP	R	X
		Powdered high-speed steel 62~64HRC Surface 3000HV	AT—PH	E	
				G	

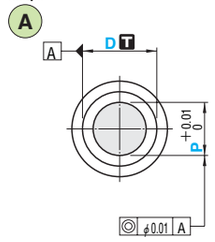
Shank Dia.Tolerance D T $m5$ · $^{+0.005}_{0}$ Selectable

Select tip shape from Shape A~G shown below.

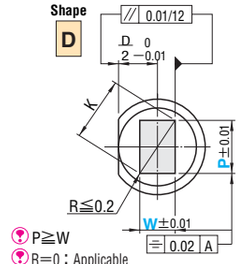


Blade Length (B) X>L>S

Shape A

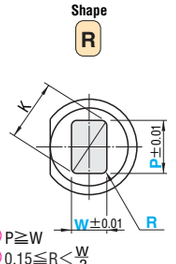


Shape D

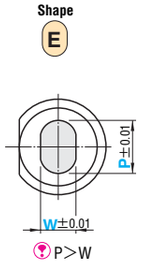


Ⓟ P≧W
Ⓟ R=0 : Applicable
Ⓟ $K=\sqrt{P^2+W^2}$

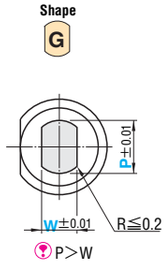
Shape R



Shape E



Shape G



Ⓟ P≧W
Ⓟ 0.15≦R< W/2
Ⓟ $K=\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Ⓟ P>W

Ⓟ P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ R E G P·Kmax.	Ⓓ R E G P·Wmin.	Ⓡ R	B	H
(Dm5) T—SP T—PH	A D R E G	S	3	40 50 60 70 80	1.00~ 2.99	—	—	0.15≦R< W/2 (Ⓡ only)	8	5
			4	40 50 60 70 80	1.00~ 3.99	3.97	1.00			7
			5	40 50 60 70 80	2.00~ 4.99	4.97	1.20			8
			6	40 50 60 70 80	2.00~ 5.99	5.97	1.50			9
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	2.00		13	11
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	2.50			13
			13	(40) 50 60 70 80 90 100	6.00~ 12.99	12.97	3.00			16
			16	(40) 50 60 70 80 90 100	10.00~ 15.99	15.97	4.00		19	19
			20	(40) 50 60 70 80 90 100	13.00~ 19.99	19.97	5.00			23
			25	(40) 50 60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
($D^{+0.005}_{0}$) (D3~13) AT—SP AT—PH	A D R E G	L	3	50 60 70 80	1.00~ 2.99	—	—		13	5
			4	50 60 70 80	1.00~ 3.99	3.97	2.00			7
			5	50 60 70 80	2.00~ 4.99	4.97	2.00			8
			6	50 60 70 80	2.00~ 5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	2.50		19	11
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	2.50			13
			13	50 60 70 80 90 100	6.00~ 12.99	12.97	3.00			16
			16	60 70 80 90 100	10.00~ 15.99	15.97	4.00		25	19
			20	60 70 80 90 100	13.00~ 19.99	19.97	5.00			23
			25	60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
	A	X	3	50 60 70 80	2.00~ 2.99	—		—	19	5
			4	50 60 70 80	2.00~ 3.99					7
			5	60 70 80	2.00~ 4.99				25	8
			6	60 70 80	2.00~ 5.99					9
			8	60 70 80 90 100	3.00~ 7.99				30	11
			10	60 70 80 90 100	3.00~ 9.99					13
			13	60 70 80 90 100	6.00~ 12.99					16
			16	70 80 90 100	10.00~ 15.99				40	19
			20	70 80 90 100	13.00~ 19.99					23
			25	70 80 90 100	18.00~ 24.99					28

Ⓟ Ⓐ : P>D−0.03→ ℓ =0, When P>D−0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓟ Ⓓ Ⓡ Ⓔ Ⓖ : P・K>D−0.05→ ℓ = 0, When P・K>D−0.05 shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓟ L(40)→B=8, When L(40), the blade length is fixed to 8mm.

Order

Catalog No.	L	P	W	R(Ⓡ only)
T—SPEL 16	70	P12.00	W6.00	

Delivery

3	Days	Express A	800/1Pc.

Express A is not available for D $^{+0.005}_{0}$ type. P.38

Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration

Catalog No.	L(LC·LCT·LMT)	P(PC)	W(WC)	R	(BC·HC·TC···etc.)
T—SPEL 16	LC65	P12.00	W6.00		KC90

Alterations		Code	Ⓐ	Ⓓ R E G	¥/1Code
Tip		PC WC	Changes dimension P. PC≧ Pmin/2 ≧1.00 0.01mm increments P(PC) | Bmax 1.00~1.99 | 20 2.00~3.99 | 35 4.00~5.99 | 40 6.00~ | 45	Changes dimension P・W. PC・WC/2 ≧ P・Wmin/2 ≧1.00 0.01mm increments P(PC)・W(WC) | Bmax 1.00~1.49 | 8 1.50~1.99 | 13 2.00~3.49 | 19 3.50~4.99 | 25 5.00~ | 30	200
		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓟ Full length L(LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓟ Full length L(LC) requires BC+30mm or more.	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−0.2)/2	——	400
Full length		LC	Changes full length. 25+B(BC)≦LC<L 0.1mm increments Ⓟ When LC−B(or BC) is 25mm or less, B(or BC) is LC−25mm. (Combination with LKC→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L 0.1mm increments Ⓟ When LC−B(BC) is 30mm or less, B(BC) is LC−30mm.	200
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓟ) are the same as LC. TKC $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓟ) are the same as LC. TKM $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		300
		LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)

Alterations		Code	Ⓐ	Ⓓ R E G	¥/1Code
Head		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC : Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC : Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
		HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not available.		200
		TC	Changes head thickness 2≦TC<5 0.1mm incr. (Comb. with TKC・TKM・LCT・LMT →0.01mm incr.) Ⓟ L is shortened by (5−TC). When used with LC, LCT, LMT, L remains the same as specified. ⊗Punch & retainer set not available.		200
		TKC	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		200
		TKM	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓟ H≦5 : TCC 0.5 ⊗SRC : Not applicable		200
		RC	Reduces head thickness by −0.04~0 from retainer surface. ⊗D $^{+0.005}_{0}$ type : Not applicable		200
		SRC	Modifies head to fit to select retainers (SLS). Ⓟ For details, refer to P.673 Ⓟ D10~25 : Applicable ⊗Not applicable D $^{+0.005}_{0}$ type. ⊗Punch & retainer set not available.		300
Shank		SKC	Adds key flat on shank. Ⓐ: D/2 −0.5 $^{0}_{-0.01}$ ・D3~6 P≦D−1.2 (Machining width 0.5) ・D8~ P≦D−2.2 (Machining width 1) Ⓓ R E G: W≦D−1.2 / W≦D−2.2 ⊗KC・WKC・KFC : Not applicable ⊗Punch & retainer set not available.		600
		UC	Modifies shank to fit to urethane stripper (USN). Ⓟ For details, refer to P.772. Ⓟ Applicable to D10~25		400
		NDC	No press-in lead ℓ ≧3 ⇨ ℓ =0 ⊗Punch & retainer set not available.		0

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of D $^{+0.005}_{0}$, additional 340 yen required.
Example : AT—SPAS13, the price is 2,660 (T—SPAS13 unit price) +340 = 3,000 yen (product unit)

M SKD11 or equivalent

D	Ⓐ T—SPAS T—SPAL	Ⓐ T—SPAX	Ⓓ T—SPDS T—SPDL	Ⓡ T—SPRS T—SPRL	Ⓔ T—SPES T—SPEL	Ⓖ T—SPGS T—SPGL
3	1,620	1,820	—	—	—	—
4	1,660	1,860	2,940	3,890	3,190	2,720
5	1,700	1,900	2,990	3,980	3,280	2,750
6	1,890	2,090	3,090	4,170	3,370	2,820
8	2,100	2,300	3,230	4,440	3,560	2,990
10	2,380	2,580	3,470	4,520	3,850	3,190
13	2,660	2,860	4,060	5,050	4,440	3,720
16	3,030	3,230	4,860	5,890	5,300	4,530
20	3,510	3,710	5,700	6,820	6,170	5,400
25	4,090	4,290	6,660	7,580	6,760	6,270

M Powdered high-speed steel

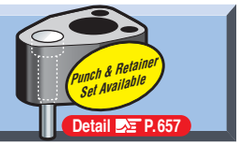
D	Ⓐ T—PHAS T—PHAL	Ⓐ T—PHAX	Ⓓ T—PHDS T—PHDL	Ⓡ T—PHRS T—PHRL	Ⓔ T—PHES T—PHEL	Ⓖ T—PHGS T—PHGL
3	1,930	2,130	—	—	—	—
4	2,000	2,200	3,480	4,730	3,800	3,180
5	2,050	2,250	3,610	4,850	3,840	3,250
6	2,380	2,580	3,810	5,120	4,040	3,390
8	2,930	3,130	4,230	5,750	4,530	3,880
10	3,340	3,540	4,550	5,890	4,810	4,180
13	3,870	4,070	5,880	7,160	6,270	5,460
16	5,040	5,200	6,790	8,880	6,980	6,440
20	6,070	6,270	8,150	10,290	8,290	7,760
25	6,950	7,140	9,630	11,610	9,840	9,230

SHOULDER PUNCHES
—TiCN COATING TYPE—

Quality Improved

PRODUCTS DATA P.1220

COATING PUNCHES—TiCN COATING—
QUALITY IMPROVED P.1217



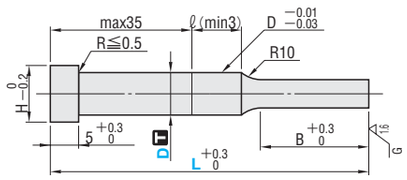
Detail P.657

The volume discount rate is also applicable to alteration cost. P.39

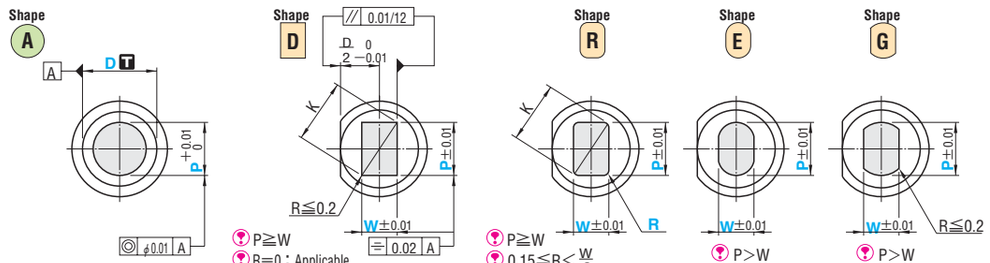
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length
—TiCN coating type— RoHS	D_{m5}	SKH51 61～64HRC Surface 3000HV	H—SH	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S
		Powdered high-speed steel 64～67HRC Surface 3000HV	H—PH		L
	$D^{+0.005}_{0}$	SKH51 61～64HRC Surface 3000HV	AH—SH		X
		Powdered high-speed steel 64～67HRC Surface 3000HV	AH—PH		Blade Length (B) X>L>S

Shank Dia.Tolerance D T $m5$· $^{+0.005}_{0}$ Selectable

Select tip shape from Shape A～G shown below.



The tip surface is ground before coating.



Ⓨ P≧W
Ⓨ R=0：Applicable
Ⓨ $K=\sqrt{P^2+W^2}$

Ⓨ P≧W
Ⓨ $0.15 \leqq R < \frac{W}{2}$
Ⓨ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Ⓨ P>W

Ⓨ P>W

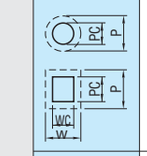
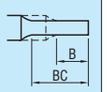
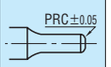
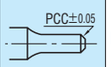
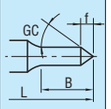
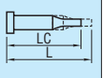
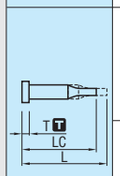
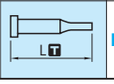
Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	ⒹⓇⒺⒼ P·Kmax.	ⒹⓇⒺⒼ P·Wmin.	Ⓡ R	B	H
(D_{m5}) H—SH H—PH	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	3	40 50 60 70 80 90 100	1.00～ 2.99	—	—	$0.15 \leqq R < \frac{W}{2}$ Ⓡ only	8	5
			4	40 50 60 70 80 90 100	1.00～ 3.99	3.97	1.00			7
			5	40 50 60 70 80 90 100	2.00～ 4.99	4.97	1.20			8
			6	40 50 60 70 80 90 100	2.00～ 5.99	5.97	1.50			9
			8	(40) 50 60 70 80 90 100	3.00～ 7.99	7.97	2.00		13	11
			10	(40) 50 60 70 80 90 100	3.00～ 9.99	9.97	2.50			13
			13	(40) 50 60 70 80 90 100	6.00～12.99	12.97	3.00			16
			16	(40) 50 60 70 80 90 100	10.00～15.99	15.97	4.00		19	19
			20	(40) 50 60 70 80 90 100	13.00～19.99	19.97	5.00			23
			25	(40) 50 60 70 80 90 100	18.00～24.99	24.97	6.00			28
($D^{+0.005}_{0}$) AH—SH AH—PH		L	3	50 60 70 80 90 100	1.00～ 2.99	—	—		13	5
			4	50 60 70 80 90 100	1.00～ 3.99	3.97	2.00			7
			5	50 60 70 80 90 100	2.00～ 4.99	4.97	2.00			8
			6	50 60 70 80 90 100	2.00～ 5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00～ 7.99	7.97	2.50		19	11
			10	50 60 70 80 90 100	3.00～ 9.99	9.97	2.50			13
			13	50 60 70 80 90 100	6.00～12.99	12.97	3.00			16
			16	60 70 80 90 100	10.00～15.99	15.97	4.00		25	19
			20	60 70 80 90 100	13.00～19.99	19.97	5.00			23
			25	60 70 80 90 100	18.00～24.99	24.97	6.00			28
		X	3	50 60 70 80 90 100	1.20～ 2.99	—			19	5
			4	50 60 70 80 90 100	1.20～ 3.99	3.97	2.00			7
			5	60 70 80 90 100	2.00～ 4.99	4.97	3.50		25	8
			6	60 70 80 90 100	2.00～ 5.99	5.97	3.50			9
			8	60 70 80 90 100	3.00～ 7.99	7.97	5.00		30	11
			10	60 70 80 90 100	3.00～ 9.99	9.97	5.00			13
			13	60 70 80 90 100	6.00～12.99	12.97	5.00			16
			16	70 80 90 100	10.00～15.99	—			40	19
			20	70 80 90 100	13.00～19.99					23
			25	70 80 90 100	18.00～24.99					28

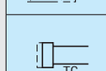
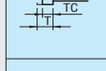
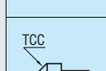
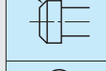
Ⓨ Ⓐ：P>D−0.03→ℓ=0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓨ ⒹⓇⒺⒼ：P・K>D−0.05→ℓ=0, When P・K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓨ L(40)→B=8, When L(40), the blade length is fixed to 8mm.

Order Catalog No. — L — P — W — R(Ⓡ only)
AH—SHEL16 — 70 — P12.00 — W6.00

Delivery 3 Days

Alteration Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC…etc.)
H—SHAL 10 — LC72 — PC2.80 — BC8

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Tip		PC WC	Changes dimension P. PC≧ Pmin. 2 ≧1.00 0.01mm increments (Combination with PKC →0.001mm increments.) P(PC) / Bmax: 1.000～1.999 20; 2.000～3.999 35; 4.000～4.999 45; 5.000～5.999 50; 6.000～ 60	Changes dimension P・W. PC WC ≧ P・Wmin. 2 ≧1.00 0.01mm increments Ⓧ Blade length X:Not applicable P(PC)・W(WC) / Bmax: 1.00～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	200
		BC	Changes blade length B. 2≦BC≦Bmax≦L/2 0.1mm increments Ⓨ Full length L(LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax≦L/2 0.1mm increments Ⓨ Full length L(LC) requires BC+30mm or more.	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 Ⓧ PCC・GC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 Ⓧ PRC・GC:Not applicable	——	200
		GC	Changes to pointed tip. 20°≦GC<90° 1°increments Blade length B≧f+2 f=P/2×tan(90°−GC°) Ⓨ When used with SC, tip and edge are rounded. Ⓧ P<1.0:Not applicable Ⓧ LKC・LCT・LMT・PRC・PCC:Not applicable	——	400
		PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓨ (P:0.001mm incr.) Ⓧ D>13:Not applicable	Changes tolerance on P(W). P・W±0.01 ⇨ $^{+0.01}_{0}$ Ⓧ D>13:Not applicable	600
Full length		LC	Changes full length. 25+B(BC)≦LC<L 0.1mm increments Ⓨ When LC−B(or BC) is 25mm or less, B(or BC) is LC−25mm. (Combination with LKC→0.001mm increments)	Changes full length. 30+B(BC)≦LC<L 0.1mm increments Ⓨ When LC−B(BC) is 30mm or less, B(BC) is LC−30mm.	200
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKC $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKM $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		
		LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Head		KC	Adds single key flat at head.	90° 0° 180° 270° Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC Applicable	200 (only Ⓐ 400)
		KFC	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments Ⓧ KC・WKC:Not applicable	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments Ⓧ KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. Ⓧ Punch & retainer set not available.	0
		HC	Changes head diameter. D≦HC<H 0.1mm increments Ⓧ Punch & retainer set not available.		200
		TC	Changes head thickness 2≦TC<5 0.1mm incr. (Comb. with TKC・TKM・LCT・LMT→0.01mm incr.) Ⓨ L is shortened by (5−TC). When used with LC, LCT, LMT, L remains the same as specified. Ⓧ Punch & retainer set not available.		200
		TKC	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		200
		TKM	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓨ H≦5：TCC 0.5 Ⓧ SRC:Not applicable		200
		RC	Reduces head thickness by −0.04～0 from retainer surface. Ⓧ $D^{+0.005}_{0}$ type：Not applicable		200
		SRC	Modifies head to fit to select retainers (SLS). Ⓨ For details, refer to P.673. Ⓨ D10～25：Available Ⓧ Not applicable $D^{+0.005}_{0}$ type. Ⓧ Punch & retainer set not available.		300
Shank		SKC	Adds key flat on shank. Ⓐ ⒹⓇⒺⒼ ・D3～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) Ⓧ KC・WKC・KFC：Not applicable Ⓧ Punch & retainer set not available.		600
		UC	Modifies shank to fit to urethane stripper (USN). Ⓨ For details, refer to P.674. Ⓨ D10～25：Applicable		400
		NDC	No press-in lead ℓ≧3⇨ℓ=0 Ⓧ Punch & retainer set not available.		0

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 100 yen required.
Example：AH—SHAS5, the price is 1,520 (H—SHAS5 unit price) +100 = 1,620 yen (product unit)

M SKH51 Ⓨ To be quoted on price & lead time above Max. Q'ty.

D	Ⓐ H—SHAS H—SHAL	Ⓐ H—SHAX	ⒹⓇⒺⒼ H—SH□S H—SH□L	ⒹⓇⒺⒼ H—SH□X
3	1,420	1,480	—	—
4	1,470	1,530	2,220	2,410
5	1,520	1,600	2,340	2,530
6	1,660	1,740	2,510	2,700
8	1,910	2,000	2,820	3,010
10	2,170	2,260	3,070	3,260
13	2,490	2,600	3,540	3,730
16	2,820	2,930	4,190	—
20	3,240	3,380	4,940	
25	3,950	4,070	5,500	

M Powdered high-speed steel

D	Ⓐ H—PHAS H—PHAL	Ⓐ H—PHAX	ⒹⓇⒺⒼ H—PH□S H—PH□L	ⒹⓇⒺⒼ H—PH□X
3	1,720	1,810	—	—
4	1,780	1,870	2,600	2,790
5	1,870	1,970	2,770	2,960
6	2,090	2,190	3,080	3,270
8	2,570	2,700	3,600	3,790
10	3,010	3,170	4,010	4,200
13	3,880	4,060	5,130	5,320
16	4,480	4,610	5,990	—
20	5,330	5,510	7,200	
25	6,170	6,320	8,200	

SHOULDER PUNCHES
—WPC®TYPE / HW COATING TYPE—

Quality Improved

PRODUCTS DATA P.1221

WPC®PUNCHES
COATING PUNCHES—HW—
QUALITY IMPROVED P.1217

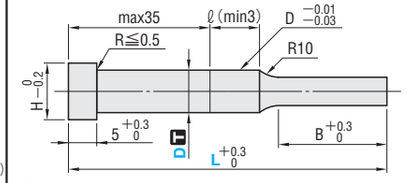
Punch & Retainer Set Available
Detail P.657

DELIVERY SHORTENED

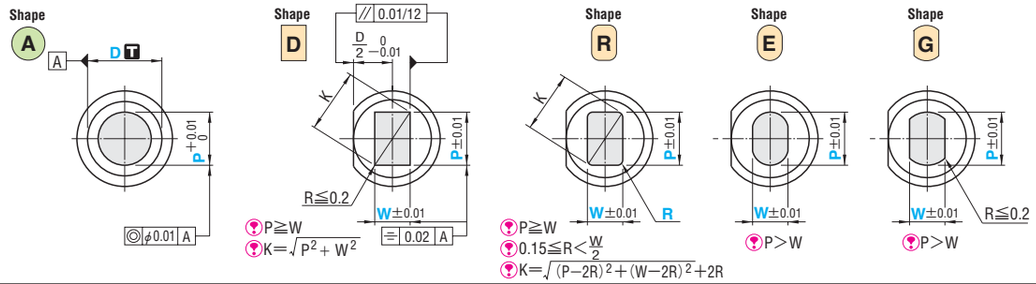
The volume discount rate is also applicable to alteration cost. P.39

Type	M / H	Catalog No. Type: Shank dia. T D_{m5}	Type: Shank dia. T $D^{+0.005}_{0}$	Shape	B Blade length
—WPC®type— RoHS	SKD 11 or equivalent 60～63HRC Surface100～1100HV	W—SP	AW—SP	A	S
	SKH51 61～64HRC Surface100～1100HV	W—SH	AW—SH	D	L
—HW coating type—	Powdered high-speed steel 64～67HRC Surface100～1100HV	W—PH	AW—PH	R	
	SKH51 61～64HRC Surface3000HV	HW—SH	AHW—SH	E	X
Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	Powdered high-speed steel 64～67HRC Surface3000HV	HW—PH	AHW—PH	G	Blade Length (B) X>L>S

Select tip shape from Shape A～G shown below.



The tip is very slightly rounded.



Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	R	B	H
(D_{m5}) —WPC®type— W—SP W—SH W—PH —HW coating type— HW—SH HW—PH	A D R E G	S	3	40 50 60 70 80 90 100	1.00～ 2.99	—	—	R only: 0.15≦R<W/2	8	5
			4	40 50 60 70 80 90 100	1.00～ 3.99	3.97	1.00			7
			5	40 50 60 70 80 90 100	2.00～ 4.99	4.97	1.20			8
			6	40 50 60 70 80 90 100	2.00～ 5.99	5.97	1.50			9
			8	(40) 50 60 70 80 90 100	3.00～ 7.99	7.97	2.00		13	11
			10	(40) 50 60 70 80 90 100	3.00～ 9.99	9.97	2.50			13
			13	(40) 50 60 70 80 90 100	6.00～12.99	12.97	3.00			16
			16	(40) 50 60 70 80 90 100	10.00～15.99	15.97	4.00		19	19
			20	(40) 50 60 70 80 90 100	13.00～19.99	19.97	5.00			23
			25	(40) 50 60 70 80 90 100	18.00～24.99	24.97	6.00			28
($D^{+0.005}_{0}$) —WPC®type— AW—SP AW—SH AW—PH —HW coating type— AHW—SH AHW—PH		L	3	50 60 70 80 90 100	1.00～ 2.99	—	—		13	5
			4	50 60 70 80 90 100	1.00～ 3.99	3.97	2.00			7
			5	50 60 70 80 90 100	2.00～ 4.99	4.97	2.00			8
			6	50 60 70 80 90 100	2.00～ 5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00～ 7.99	7.97	2.50		19	11
			10	50 60 70 80 90 100	3.00～ 9.99	9.97	2.50			13
			13	50 60 70 80 90 100	6.00～12.99	12.97	3.00			16
			16	60 70 80 90 100	10.00～15.99	15.97	4.00		25	19
			20	60 70 80 90 100	13.00～19.99	19.97	5.00			23
			25	60 70 80 90 100	18.00～24.99	24.97	6.00			28
		X	3	50 60 70 80 90 100	1.20～ 2.99	—	—		19	5
			4	50 60 70 80 90 100	1.20～ 3.99	3.97	2.00			7
			5	60 70 80 90 100	2.00～ 4.99	4.97	3.50		25	8
			6	60 70 80 90 100	2.00～ 5.99	5.97	3.50			9
			8	60 70 80 90 100	3.00～ 7.99	7.97	5.00		30	11
			10	60 70 80 90 100	3.00～ 9.99	9.97	5.00			13
			13	60 70 80 90 100	6.00～12.99	12.97	5.00			16
			16	70 80 90 100	10.00～15.99	—			40	19
			20	70 80 90 100	13.00～19.99					23
			25	70 80 90 100	18.00～24.99					28

Ⓐ: P>D−0.03→ℓ=0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
DREG: P・K>D−0.05→ℓ=0, When P・K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
L(40)→B=8, When L(40), the blade length is fixed to 8mm.

Order

Catalog No. — L — P — W — R(Ronly)
AW—PHDL 13 — 80 — P10.50 — W7.34

Delivery

■WPC®type (W— · AW—)

- Ⓐ: 3 Days | Express A | 500/1Pc. P.38
  A flat charge of 1,350 yen for 3 pieces or more of the same size.
- DREG: 3 Days | Express A | 800/1Pc. P.38
  A flat charge of 2,160 yen for 3 pieces or more of the same size.

■HW coating type (HW— · AHW—): 3 Days

Alteration

Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC···etc.)
W—SPDS 10 — LC72 — PC2.80 — WC2.80 — BC8— KC45

Alterations	Code	Ⓐ	DREG	¥/1Code
Tip	PC WC	Changes dimension P. PC≧$P_{min.}/2$ 0.01mm increments (Combination with PKC→0.001mm increments.) P(PC): 0.500～0.799 Bmax 10; 0.800～0.999 13; 1.000～1.999 20; 2.000～3.999 35; 4.000～4.999 45; 5.000～5.999 50; 6.000～ 60	Changes dimension P・W. PC/WC≧P・Wmin./2≧0.80 0.01mm increments ⊗Blade length X:Not applicable P(PC)・W(WC): 0.80～1.49 Bmax 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	200
	BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments ⓡFull length L(LC) requires BC+25mm or more. ⊗When PC<1.00, HW coating type : Not applicable	Changes blade length B. 2≦BC≦Bmax 0.1mm increments ⓡFull length L(LC) requires BC+30mm or more.	200
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments ⓡPRC≦(P−0.2)/2 ⊗PCC:Not applicable	——	400
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments ⓡPCC≦(P−0.2)/2 ⊗PRC:Not applicable ⊗HW coating type:Not applicable	——	200
	PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⓡ(P : 0.001mm incr.) ⊗HW coating type:Not applicable	Changes tolerance on P(W). P・W±0.01⇨$^{+0.01}_{0}$	400
Full length	LC	Changes full length. 25+B(BC)≦LC<L 0.1mm increments ⓡWhen LC−B(or BC) is 25mm or less, B(or BC) is LC−25mm. (Combination with LKC→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L 0.1mm increments ⓡWhen LC−B(BC) is 30mm or less, B(BC) is LC−30mm.	200
	LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (ⓡ) are the same as LC. TKC: $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC: $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	Changes full length tolerance.	300
	LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (ⓡ) are the same as LC. TKM: $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC: $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	Changes full length tolerance.	300

Alterations	Code	Ⓐ	DREG	¥/1Code
Full length	LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
Head	KC	Adds single key flat at head.	Changes the position of key flat. 0°～180°～270° 1° incr.	200
	WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)
	KFC	0°～90°～180°～270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	0°～90°～180°～270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
	NKC	——	No key flats ⊗Punch & retainer set not available.	0
	HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not available.		200
	TC	Changes head thickness 2≦TC<5 0.1mm increments (Combination with TKC・TKM・LCT・LMT→0.01mm increments) ⓡL is shortened by (5−TC). When used with LC, LCT, LMT, L remains the same as specified. ⊗Punch & retainer set not available.		200
	TKC	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		200
	TKM	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		200
	TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 ⓡH≦5 : TCC 0.5 ⊗SRC:Not applicable		200
	RC	Reduces head thickness by −0.04～0 from retainer surface. ⊗Not applicable $D^{+0.005}_{0}$ type.		200
	SRC	Modifies head to fit to select retainers (SLS). ⓡFor the details, refer to P.673 ⓡApplicable to D10～25 ⊗Not applicable $D^{+0.005}_{0}$ type. ⊗Punch & retainer set not available.		300
Shank	UC	Modifies shank to fit to urethane stripper (USN). ⓡFor details, refer to P.674. ⓡApplicable to D10～25		400
	NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.		0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

ⓡTo be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 100 yen required.
Example : AW—SHAS10, the price is 1,620 (W—SHAS10 unit price) +100 = 1,720 yen (product unit)

■W SKD11 or equivalent

D	Ⓐ W—SPAS W—SPAL	Ⓐ W—SPAX	DREG W—SP□S W—SP□L	DREG W—SP□X
3	1,280	1,370	—	—
4	1,290	1,370	1,940	2,130
5	1,310	1,390	2,030	2,220
6	1,320	1,420	2,100	2,290
8	1,380	1,520	2,190	2,380
10	1,500	1,620	2,350	2,540
13	1,590	1,740	2,660	2,850
16	1,700	1,870	3,110	—
20	1,870	2,040	3,620	
25	2,320	2,490	4,050	

■W SKH51

D	Ⓐ W—SHAS W—SHAL	Ⓐ W—SHAX	DREG W—SH□S W—SH□L	DREG W—SH□X
3	1,350	1,410	—	—
4	1,370	1,430	2,060	2,250
5	1,370	1,450	2,150	2,340
6	1,390	1,470	2,230	2,420
8	1,500	1,590	2,400	2,590
10	1,620	1,710	2,520	2,710
13	1,790	1,900	2,840	3,030
16	1,950	2,060	3,320	—
20	2,180	2,320	3,880	
25	2,800	2,920	4,350	

■W Powdered high-speed steel

D	Ⓐ W—PHAS W—PHAL	Ⓐ W—PHAX	DREG W—PH□S W—PH□L	DREG W—PH□X
3	1,520	1,610	—	—
4	1,550	1,640	2,300	2,490
5	1,580	1,680	2,410	2,600
6	1,670	1,770	2,580	2,770
8	1,990	2,120	2,940	3,130
10	2,270	2,430	3,180	3,370
13	2,980	3,160	4,130	4,320
16	3,390	3,520	4,820	—
20	4,020	4,200	5,820	
25	4,770	4,920	6,760	

D	Ⓐ HW—SHAS HW—SHAL	Ⓐ HW—SHAX	DREG HW—SH□S HW—SH□L	DREG HW—SH□X
3	1,660	1,730	—	—
4	1,720	1,770	2,810	2,990
5	1,760	1,850	2,930	3,110
6	1,910	1,980	3,090	3,290
8	2,190	2,280	3,400	3,590
10	2,460	2,550	3,650	3,830
13	2,880	2,980	4,210	4,410
16	3,200	3,310	4,960	—
20	3,820	3,960	5,920	
25	4,530	4,650	6,660	

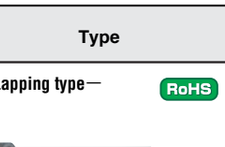
D	Ⓐ HW—PHAS HW—PHAL	Ⓐ HW—PHAX	DREG HW—PH□S HW—PH□L	DREG HW—PH□X
3	1,950	2,030	—	—
4	2,010	2,100	3,350	3,450
5	2,100	2,190	3,520	3,610
6	2,320	2,420	3,800	3,880
8	2,850	2,970	4,300	4,360
10	3,280	3,430	4,650	4,700
13	4,230	4,410	5,920	5,950
16	4,840	4,950	6,720	—
20	5,880	6,040	8,120	
25	6,710	6,860	9,310	

SHOULDER PUNCHES
—LAPPING TYPE—

Detail P.657

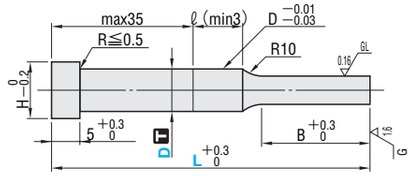
The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M / H	Catalog No. Type	Shape	B Blade length
—Lapping type— RoHS	D_{m5}	SKD 11 or equivalent 60～63HRC	L—SP	A D R E G	S
		SKH51 61～64HRC	L—SH		L
		Powdered high-speed steel 64～67HRC	L—PH		X
	$D^{+0.005}_{0}$	SKD 11 or equivalent 60～63HRC	AL—SP		
		SKH51 61～64HRC	AL—SH		
		Powdered high-speed steel 64～67HRC	AL—PH		

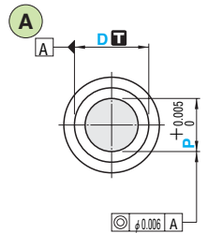


Shank Dia.Tolerance D T $m5$ · $^{+0.005}_{0}$ Selectable

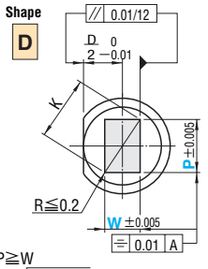
Select tip shape from Shape A～G shown below.



Shape A

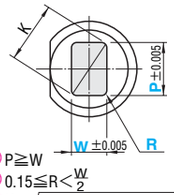


Shape D



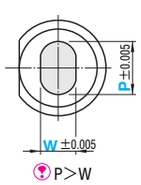
Ⓡ P≧W
Ⓡ $K=\sqrt{P^2+W^2}$

Shape R



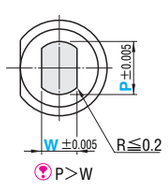
Ⓡ P≧W
Ⓡ $0.15 \leqq R < \frac{W}{2}$
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



Ⓡ P>W

Shape G



Ⓡ P>W

Catalog No. Type	Shape	B Blade length	D	L	0.001mm increments Ⓐ min. P max.	0.001mm increments DREG P·Kmax.	0.001mm increments DREG P·Wmin.	0.01mm R R	B	H
(D_{m5}) L—SP L—SH L—PH	A D R E G	S	3	40 50 60 70 80 90 100	1.000～ 2.990	(P.77)		0.15≦R< W/2 (Ⓡ only)	8	5
			4	40 50 60 70 80 90 100	1.000～ 3.990	3.970	1.000			7
			5	40 50 60 70 80 90 100	2.000～ 4.990	4.970	1.200			8
			6	40 50 60 70 80 90 100	2.000～ 5.990	5.970	1.500			9
			8	(40) 50 60 70 80 90 100	3.000～ 7.990	7.970	2.000		13	11
			10	(40) 50 60 70 80 90 100	3.000～ 9.990	9.970	2.500			13
			13	(40) 50 60 70 80 90 100	6.000～12.990	12.970	3.000			16
			16	(40) 50 60 70 80 90 100	10.000～15.990	15.970	4.000		19	19
			20	(40) 50 60 70 80 90 100	13.000～19.990	19.970	5.000			23
			25	(40) 50 60 70 80 90 100	18.000～24.990	24.970	6.000			28
($D^{+0.005}_{0}$) AL—SP AL—SH AL—PH		L	3	50 60 70 80 90 100	1.000～ 2.990	(P.77)			13	5
			4	50 60 70 80 90 100	1.000～ 3.990	3.970	2.000			7
			5	50 60 70 80 90 100	2.000～ 4.990	4.970	2.000			8
			6	50 60 70 80 90 100	2.000～ 5.990	5.970	2.000			9
			8	50 60 70 80 90 100	3.000～ 7.990	7.970	2.500		19	11
			10	50 60 70 80 90 100	3.000～ 9.990	9.970	2.500			13
			13	50 60 70 80 90 100	6.000～12.990	12.970	3.000			16
			16	60 70 80 90 100	10.000～15.990	15.970	4.000		25	19
			20	60 70 80 90 100	13.000～19.990	19.970	5.000			23
			25	60 70 80 90 100	18.000～24.990	24.970	6.000			28
		X	3	50 60 70 80 90 100	1.200～ 2.990	—			19	5
			4	50 60 70 80 90 100	1.200～ 3.990	3.970	2.000			7
			5	60 70 80 90 100	2.000～ 4.990	4.970	3.500		25	8
			6	60 70 80 90 100	2.000～ 5.990	5.970	3.500			9
			8	60 70 80 90 100	3.000～ 7.990	7.970	5.000		30	11
			10	60 70 80 90 100	3.000～ 9.990	9.970	5.000			13
			13	60 70 80 90 100	6.000～12.990	12.970	5.000			16
			16	70 80 90 100	10.000～15.990	—			40	19
			20	70 80 90 100	13.000～19.990					23
			25	70 80 90 100	18.000～24.990					28

Ⓡ Ⓐ : P>D−0.03→ ℓ =0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓡ DREG : P・K>D−0.05→ ℓ = 0, When P・K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓡ L(40)→B=8, When L(40), the blade length is fixed to 8mm.

Order

Catalog No.	L	P	W	R(Ⓡ only)
L—SHAS 10	70	P9.500		
AL—PHDL 13	80	P10.500	W7.340	

Delivery

● Ⓐ: 3 Days

Express	T	1,000/1Pc.
Express	A	500/1Pc.

P.38

Ⓡ A flat charge of 1,350 yen for 3 pieces or more of the same size. (excluding Express T)

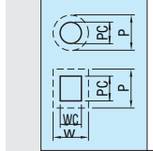
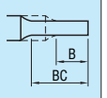
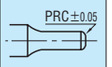
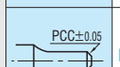
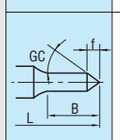
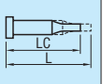
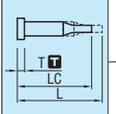
● DREG: 3 Days

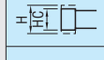
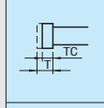
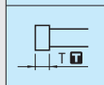
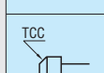
Express	A	800/1Pc.

P.38

Ⓡ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC···etc.)
AL—SPAS 10 — LC72 — PC2.800 — BC8

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧ Pmin / 2. 0.001mm increments. P(PC) / Bmax: 0.500～0.799 10; 0.800～0.999 13; 1.000～1.999 20; 2.000～3.999 35; 4.000～4.999 45; 5.000～5.999 50; 6.000～ 60	Changes dimension P・W. PC/WC ≧ P・Wmin / 2 ≧0.800. ⊗Blade length X:Not applicable. 0.001mm increments. P(PC)・W(WC) / Bmax: 0.800～1.499 8; 1.500～1.999 13; 2.000～3.499 19; 3.500～4.999 25; 5.000～ 30	200
		BC	Changes blade length B. 2≦BC≦Bmax. 0.1mm increments. Ⓡ Full length L (LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax. 0.1mm increments. Ⓡ Full length L (LC) requires BC+30mm or more.	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1. 0.1mm increments. Ⓡ PRC≦(P−0.2)/2. ⊗PCC・GC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1. 0.1mm increments. Ⓡ PCC≦(P−0.2)/2. ⊗PRC・GC:Not applicable	——	200
		GC	Changes to pointed tip. 20°≦GC<90°. 1° increments. Full length B≧f+2. f=P/2×tan(90°−GC°). Ⓡ Tip and edge are rounded. ⊗P<1.0:Not applicable. ⊗LKC・LKZ・LCT・LMT・PRC・PCC:Not applicable	——	400
Full length		LC	Changes full length. 25+B(BC)≦LC<L. 0.1mm increments. Ⓡ When LC—B (or BC) is 25mm or less, B (or BC) is LC—25mm. (Combination with LKC・LKZ→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L. 0.1mm increments. Ⓡ When LC—B (or BC) is 30mm or less, B (or BC) is LC—30mm.	200
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓡ) are the same as LC. TKC $T^{+0.3}_{0} \Rightarrow ^{+0.02}_{0}$ + LC $L^{+0.3}_{0} \Rightarrow ^{+0.1}_{0}$		300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓡ) are the same as LC. TKM $T^{+0.3}_{0} \Rightarrow ^{0}_{-0.02}$ + LC $L^{+0.3}_{0} \Rightarrow ^{+0.1}_{0}$		

Alterations		Code	Ⓐ	DREG	¥/1Code
Full length		LKC	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow ^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow ^{+0.01}_{0}$		600
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments. ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments. ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
		HC	Changes head diameter. D≦HC<H 0.1mm increments. ⊗Punch & retainer set not available.		200
		TC	Changes head thickness 2≦TC<5. 0.1mm increments(Combination with TKC・TKM・LCT・LMT →0.01mm incr.) Ⓡ L is shortened by (5—TC). When used with LC, LCT, LMT, L remains the same as specified. ⊗Punch & retainer set not available.		200
		TKC TKM	Changes head thickness tolerance. TKC $T^{+0.3}_{0} \Rightarrow ^{+0.02}_{0}$ TKM $T^{+0.3}_{0} \Rightarrow ^{0}_{-0.02}$		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments. 0.5≦TCC≦(H−D)/2. Ⓡ H≦5 : TCC 0.5		200
		RC	Reduces head thickness by −0.04～0 from retainer surface. ⊗Not applicable $D^{+0.005}_{0}$ type.		200
Shank		SKC	Adds key flat on shank. Ⓐ DREG. ・D3～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC・WKC・KFC:Not applicable ⊗Punch & retainer set not available.		600
		NDC	No press-in lead	ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.	0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓡ To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 100 yen required.
Example : AL—PHAS4, the price is 1,660 (L—PHAS4 unit price) +100 = 1,760 yen (product unit)

■M SKD11 or equivalent

D	Ⓐ L—SPAS L—SPAL	Ⓐ L—SPAX	DREG L—SP□S L—SP□L	DREG L—SP□X
3	1,270	1,360	—	—
4	1,280	1,360	2,340	2,530
5	1,300	1,380	2,420	2,610
6	1,310	1,410	2,470	2,660
8	1,370	1,510	2,570	2,760
10	1,490	1,610	2,680	2,870
13	1,580	1,730	3,000	3,190
16	1,690	1,860	3,440	—
20	1,860	2,030	3,950	
25	2,310	2,480	4,380	

■M SKH51

D	Ⓐ L—SHAS L—SHAL	Ⓐ L—SHAX	DREG L—SH□S L—SH□L	DREG L—SH□X
3	1,340	1,400	—	—
4	1,360	1,420	2,450	2,640
5	1,360	1,440	2,520	2,710
6	1,380	1,460	2,570	2,760
8	1,490	1,580	2,740	2,930
10	1,610	1,700	2,850	3,040
13	1,780	1,890	3,170	3,360
16	1,940	2,050	3,650	—
20	2,170	2,310	4,210	
25	2,790	2,910	4,680	

■M Powdered high-speed steel

D	Ⓐ L—PHAS L—PHAL	Ⓐ L—PHAX	DREG L—PH□S L—PH□L	DREG L—PH□X
3	1,630	1,720	—	—
4	1,660	1,750	2,870	3,060
5	1,690	1,790	2,980	3,170
6	1,780	1,880	3,150	3,340
8	2,100	2,230	3,510	3,700
10	2,380	2,540	3,750	3,940
13	3,090	3,270	4,700	4,890
16	3,500	3,630	5,390	—
20	4,130	4,310	6,380	
25	4,880	5,030	7,290	

PRESS ADD.SPEC. Printed in Red

JECTOR PUNCHES

Detail P.657

RELATED PRODUCTS P.73

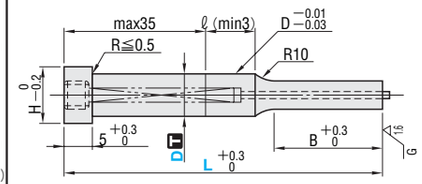
■JECTOR PUNCHES
—L SPECIFIED, DIM. B FIXED TYPE—
Jector punch which keeps Dimension B length even if L changes.

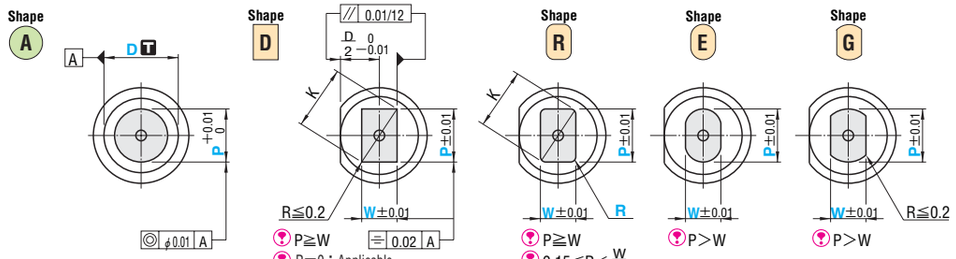
• Refer to Jector punch blank for the details of jector hole. P.186
• Refer to Jector pin set for the details of Jector pin. P.189

How to calculate the projection length of a jector pin(reference) P.191

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length
RoHS Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable	D_{m5}	D4～6 SKH51 61～64HRC	SJ	A	S
		D8～25 SKD11 or equivalent 60～63HRC	SJV		
		Powdered high-speed steel 64～67HRC	PJ PJV	D	
	$D^{+0.005}_{0}$	D4～6 SKH51 61～64HRC	A—SJ	R	L
		D8～25 SKD11 or equivalent 60～63HRC	A—SJV	E	X
		Powdered high-speed steel 64～67HRC	A—PJ A—PJV	G	Blade Length (B) X>L>S

Select tip shape from Shape A～G shown below.





Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	R	B	H
(D_{m5}) SJ PJ Spring reinforced type SJV PJV	A D R E G	S	(4)	40 50 60 70 80	1.00～ 3.99	3.97	1.00	0.15≦R<W/2 (Ⓡ only)	8	7
			(5)	40 50 60 70 80	2.00～ 4.99	4.97	2.00			8
			(6)	40 50 60 70 80	2.00～ 5.99	5.97	2.00			9
			8	(40) 50 60 70 80 90 100	3.00～ 7.99	7.97	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00～ 9.99	9.97	3.00			13
			13	(40) 50 60 70 80 90 100	6.00～ 12.99	12.97	6.00			16
			16	(40) (50) 60 70 80 90 100	10.00～ 15.99	15.97	6.00		19	19
			20	(40) (50) 60 70 80 90 100	13.00～ 19.99	19.97	6.00			23
			25	(40) (50) 60 70 80 90 100	18.00～ 24.99	24.97	6.00			28
($D^{+0.005}_{0}$) A—SJ A—PJ Spring reinforced type A—SJV A—PJV		L	(4)	50 60 70 80	1.00～ 3.99	3.97	2.00		13	7
			(5)	50 60 70 80	2.00～ 4.99	4.97	2.00			8
			(6)	50 60 70 80	2.00～ 5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00～ 7.99	7.97	3.00		19	11
			10	50 60 70 80 90 100	3.00～ 9.99	9.97	3.00			13
			13	50 60 70 80 90 100	6.00～ 12.99	12.97	6.00			16
			16	60 70 80 90 100	10.00～ 15.99	15.97	6.00		25	19
			20	60 70 80 90 100	13.00～ 19.99	19.97	6.00			23
			25	60 70 80 90 100	18.00～ 24.99	24.97	6.00			28
(D_{m5}) SJ Spring reinforced type SJV ($D^{+0.005}_{0}$) A—SJ Spring reinforced type A—SJV		X	(5)	60 70 80	2.00～ 4.99	4.97	3.50		25	8
			(6)	60 70 80	2.00～ 5.99	5.97	3.50			9
			8	70 80 90 100	3.00～ 7.99	7.97	5.00		30	11
			10	70 80 90 100	3.00～ 9.99	9.97	6.00			13
			13	70 80 90 100	6.00～ 12.99	12.97	6.00			16
			16	80 90 100	10.00～ 15.99	—		—	40	19
			20	80 90 100	13.00～ 19.99					23
			25	80 90 100	18.00～ 24.99					28

The spring constant of SJV, PJV, A-SJV and A-PJV is as twice as that of SJ, PJ, A-SJ and A-PJ.
L(40)→B = 6, When L(40), the blade length is fixed to 6mm.
L(50)→B = 13, When L(50), the blade length is fixed to 13mm.
Ⓐ : P>D−0.03→ ℓ =0, When P>D−0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
DREG : P・K>D−0.05→ ℓ = 0, When P・K>D−0.05 shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
D(4), (5), (6)are applicable for SJ, PJ, A-SJ and A-PJ only.

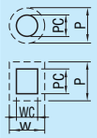
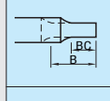
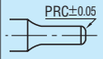
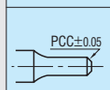
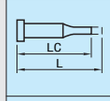
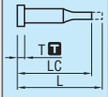
Order — Catalog No. — L — P — W — R (Ⓡ only)
SJDS 6 — 60 — P3.00 — W2.80
A—SJEL 10 — 70 — P8.50 — W4.25

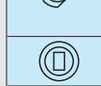
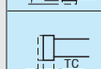
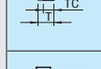
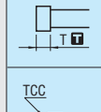
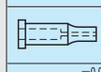
Delivery
• Ⓐ 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38
Ⓨ A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
• DREG 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. P.38
Ⓨ A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

■Benefit of Reinforced spring
It is twice the spring constant of standard type Jector punch. Due to the spring's larger load, more effective scrap removal can be expected.

The volume discount rate is also applicable to alteration cost. P.39

Alteration — Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC···etc·)
SJDS 6 — LC58 — P3.00 — W2.80 — HC8— KC45

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧PCmin 0.01mm increments (Combination with PKC→0.001mm increments) D / PCmin: 4 0.900; 5 1.800; 6 1.800; 8 2.500; 10 2.800; 13 5.000; 16 8.000; 20 9.000; 25 9.000	Changes dimension P・W. PC・WC≧PC・WCmin 0.01mm increments ⊗D4：Not available. ⊗Blade length X:Not applicable D / PC・WCmin: 5 1.80; 6 1.80; 8 2.50; 10 2.80; 13 5.00; 16 5.00; 20 5.00; 25 5.00	200
		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments For SJAX, A—SJAX with dimension D of 5.6: PC 1.80～1.99 / Bmax 20		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.186. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.186. ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓨ (P：0.001mm incr.)	Changes tolerance on P(W). P・W±0.01⇨$^{+0.01}_{0}$	400
Full length		LC	Changes full length. LC<L 0.1mm increments Ⓨ B is shortened by (L—LC). (Combination with LKC・LKZ→0.01mm increments) Ⓨ The projection length of the jector pin is 2mm.		200
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKC T $^{+0.3}_{0}$⇨$^{+0.02}_{0}$ + LC L $^{+0.3}_{0}$⇨$^{+0.1}_{0}$ Changes full length tolerance.		300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKM T $^{+0.3}_{0}$⇨$^{0}_{-0.02}$ + LC L $^{+0.3}_{0}$⇨$^{+0.1}_{0}$ Changes full length tolerance.		
		LKC	Changes full length tolerance. L $^{+0.3}_{0}$⇨$^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. L $^{+0.3}_{0}$⇨$^{+0.01}_{0}$		600

Alterations		Code	Ⓐ	DREG	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
		HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not available.		200
		TC	Changes head thickness 3.5≦TC<5 0.1mm incr. (Comb. with TKC・TKM・LCT・LMT→0.01mm incr.) Ⓨ L is shortened by (5—TC). When used with LC, LCT, LMT, L remains the same as specified. ⊗Punch & retainer set not available.		200
		TKC	Changes head thickness tolerance. T $^{+0.3}_{0}$⇨$^{+0.02}_{0}$		200
		TKM	Changes head thickness tolerance. T $^{+0.3}_{0}$⇨$^{0}_{-0.02}$		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓨ H≦5：TCC 0.5 ⊗SRC:Not applicable		200
		RC	Reduces head thickness by −0.04～0 from retainer surface. ⊗Not appicable $D^{+0.005}_{0}$ type.		200
		SRC	Modifies head to fit to select retainers (SLS). Ⓨ For details,refer to P.673. Ⓨ D10～25：Applicable ⊗Not applicable to the $D^{+0.005}_{0}$ type. ⊗Punch & retainer set not available.		300
Shank		SKC	Adds key flat on shank Ⓐ DREG ・D4～6 P≦D−1.2 W≦D−1.2 ・D8～ P≦D−2.2 W≦D−2.2 (Machining with 0.5) (Machining with 1) ⊗KC・WKC・KFC：Not applicable ⊗Punch & retainer set not available.		600
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		−100
		NC	Removes the jector pin. ⊗AC：Not applicable		−200
		NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.		0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example：A—SJAL16, the price is 1,610 (SJAL16 unit price) +200 = 1,810 yen (product unit)

■MSKH51・SKD11 or equivalent

D	Ⓐ SJAS SJAL SJVAS SJVAL	Ⓐ SJAX SJVAX	DREG SJ□S SJ□L SJV□S SJV□L	DREG SJ□X SJV□X
4	1,160	—	1,950	—
5	1,100	1,660	1,910	2,300
6	1,100	1,730	1,910	2,300
8	1,180	1,870	1,910	2,400
10	1,270	1,950	2,100	2,640
13	1,380	2,160	2,390	3,030
16	1,610	2,430	2,900	—
20	1,810	2,780	3,400	
25	2,080	3,130	3,960	

■MPowdered high-speed steel

D	Ⓐ PJAS PJAL PJVAS PJVAL	DREG PJ□S PJ□L PJV□S PJV□L
4	1,940	2,800
5	1,830	2,780
6	1,830	2,840
8	2,260	3,330
10	2,650	3,680
13	3,520	4,810
16	4,300	5,900
20	5,290	7,270
25	6,620	8,760

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JECTOR PUNCHES —DICOAT® TYPE—

Punch & Retainer Set Available Detail P.657

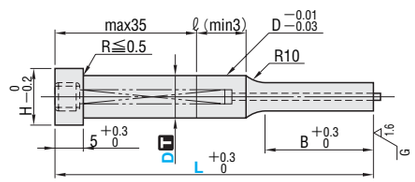
PRODUCTS DATA P.1215

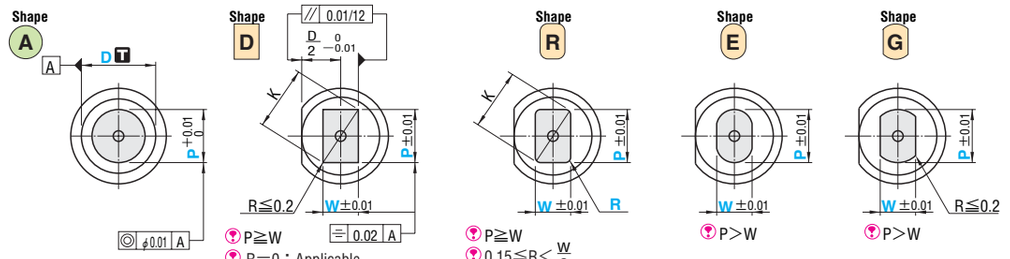
DICOAT®PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

How to calculate the projection length of a jector pin(reference) P.191

- Refer to Jector punch blank for the details of jector hole. P.186
- Refer to Jector pin set for the details of Jector pin. P.189

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A~G shown below.
—DICOAT®type— RoHS Shank Dia.Tolerance D T m5・$^{+0.005}_{0}$ Selectable	D_{m5} (D4~25)	SKD11 or equivalent 60~63HRC Surface 3000HV	T—SJ T—SJV	A D R E G	S L	
		Powdered high-speed steel 62~64HRC Surface 3000HV	T—PJ T—PJV			
	$D^{+0.005}_{0}$ (D4~13)	SKD11 or equivalent 60~63HRC Surface 3000HV	AT—SJ AT—SJV		Blade Length (B) L>S	
		Powdered high-speed steel 62~64HRC Surface 3000HV	AT—PJ AT—PJV			



- P≧W
- R=0：Applicable
- $K=\sqrt{P^2+W^2}$
- P≧W
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
- P>W
- P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P	Ⓐ max.	DREG P·Kmax.	DREG P·Wmin.	Ⓡ R	B	H
(D_{m5}) T—SJ T—PJ Spring reinforced type T—SJV T—PJV	A D R E G	S	(4)	40 50 60 70 80	1.00	3.99	3.97	1.00	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	8	7
			(5)	40 50 60 70 80	2.00	4.99	4.97	2.00			8
			(6)	40 50 60 70 80	2.00	5.99	5.97	2.00			9
			8	(40) 50 60 70 80 90 100	3.00	7.99	7.97	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00	9.99	9.97	3.00			13
			13	(40) 50 60 70 80 90 100	6.00	12.99	12.97	6.00			16
			16	(40) (50) 60 70 80 90 100	10.00	15.99	15.97	6.00		19	19
			20	(40) (50) 60 70 80 90 100	13.00	19.99	19.97	6.00			23
			25	(40) (50) 60 70 80 90 100	18.00	24.99	24.97	6.00			28
($D^{+0.005}_{0}$) (D4~13) AT—SJ AT—PJ Spring reinforced type AT—SJV AT—PJV		L	(4)	50 60 70 80	1.00	3.99	3.97	2.00		13	7
			(5)	50 60 70 80	2.00	4.99	4.97	2.00			8
			(6)	50 60 70 80	2.00	5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00	7.99	7.97	3.00		19	11
			10	50 60 70 80 90 100	3.00	9.99	9.97	3.00			13
			13	50 60 70 80 90 100	6.00	12.99	12.97	6.00			16
			16	60 70 80 90 100	10.00	15.99	15.97	6.00		25	19
			20	60 70 80 90 100	13.00	19.99	19.97	6.00			23
			25	60 70 80 90 100	18.00	24.99	24.97	6.00			28

- The spring constant of T-SJV, T-PJV, AT-SJV and AT-PJV is as twice as that of T-SJ, T-PJ, AT-SJ and AT-PJ.
- Ⓐ：P>D−0.03→ℓ=0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
- DREG：P・K>D−0.05→ℓ=0, When P・K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
- L(40)→B=6, When L(40), the blade length is fixed to 6mm.
- L(50)→B=13, When L(50), the blade length is fixed to 13mm.
- D(4), (5), (6) are applicable for T-SJ, T-PJ, AT-SJ and AT-PJ only.

Order

Catalog No.	L	P	W	R (Ⓡ only)
T—SJES 6	50	P5.48	W3.20	

Delivery 3 Days | Express A 800/1Pc.

⊗Express A is not available for $D^{+0.005}_{0}$ types.

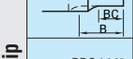
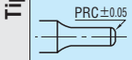
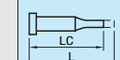
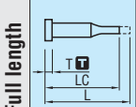
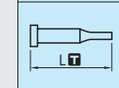
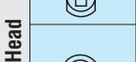
A flat charge of 2,160 yen for 3 pieces or more of the same size.

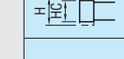
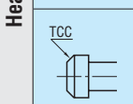
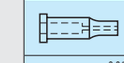
Benefit of Reinforced spring
It is twice the spring constant of standard type Jector punch. Due to the spring's larger load, more effective scrap removal can be expected.

P.38

Alteration

Catalog No.	L (LC·LCT·LMT)	P	W	R	(BC·HC·TC···etc.)
T—SJES 6	50	P5.48	W3.20		HC8.0—TC4.0

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓡ PRC≦(P−d_1−0.5)/2 Regarding dimension d_1, refer to P.186.	——	400
Full length		LC	Changes full length. LC<L 0.1mm increments (Combination with LKC→0.01mm increments) Ⓡ B is shortened by (L−LC). Ⓡ The projection length of the jector pin is 2mm.		200
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓡ) are the same as LC. TKC $T^{+0.3}_{0}\Rightarrow^{+0.02}_{0}$ + LC Changes full length tolerance. $L^{+0.3}_{0}\Rightarrow^{+0.1}_{0}$		300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓡ) are the same as LC. TKM $T^{+0.3}_{0}\Rightarrow^{0}_{-0.02}$ + LC Changes full length tolerance. $L^{+0.3}_{0}\Rightarrow^{+0.1}_{0}$		
		LKC	Changes full length tolerance. $L^{+0.3}_{0}\Rightarrow^{+0.05}_{0}$		400
Head		KC	Adds single key flat at head.	90° 0° 180° 270° Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKK	——	No key flat. ⊗Punch & retainer set not available.	0

Alterations		Code	Ⓐ	DREG	¥/1Code
Head		HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not available.		200
		TC	Changes head thickness 3.5≦TC<5 0.1mm increments (Combination with TKC・TKM・LCT・LMT →0.01mm incr.) Ⓡ L is shortened by (5−TC), When used with LC, LCT, LMT, L remains the same as specified. ⊗Punch & retainer set not available.		200
		TKC	Changes head thickness tolerance. $T^{+0.3}_{0}\Rightarrow^{+0.02}_{0}$		200
		TKM	Changes head thickness tolerance. $T^{+0.3}_{0}\Rightarrow^{0}_{-0.02}$		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓡ H≦5：TCC 0.5 ⊗SRC:Not applicable		200
		RC	Reduces head thickness by −0.04~0 from retainer surface. ⊗Not applicable $D^{+0.005}_{0}$ type.		200
		SRC	Modifies head to fit to select retainers (SLS). Ⓡ For details, refer to P.673. Ⓡ D10~25：Applicable ⊗Not applicable $D^{+0.005}_{0}$ type. ⊗Punch & retainer set not available.		300
Shank		SKC	Adds key flat on shank. Ⓐ DREG $\frac{D}{2}-0.5^{-0}_{-0.01}$ ・D4~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC・WKC・KFC：Not applicable ⊗Punch & retainer set not available.		600
		AC	AIR Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		−100
		NC	Removes the jector pin. ⊗AC：Not applicable		−200
		NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.		0

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 340 yen required.
Example：AT—SJAL10, the price is 3,780 (T—SJAL10 unit price) +340 = 4,120 yen (product unit)

M SKD11 or equivalent

D	Ⓐ	D	Ⓡ	Ⓔ	Ⓖ
	T—SJAS T—SJAL T—SJVAS T—SJVAL	T—SJDS T—SJDL T—SJVDS T—SJVDL	T—SJRS T—SJRL T—SJVRS T—SJVRL	T—SJES T—SJEL T—SJVES T—SJVEL	T—SJGS T—SJGL T—SJVGS T—SJVGL
4	(T-SJAS)3,360	(T-SJDS)4,340	(T-SJRS)5,690	(T-SJES)4,490	(T-SJGS)3,840
	(T-SJAL)3,720	(T-SJDL)4,720	(T-SJRL)6,370	(T-SJEL)4,850	(T-SJGL)4,480
5	3,270	4,240	5,610	4,450	4,070
6	3,270	4,240	5,610	4,450	4,070
8	3,460	4,250	5,620	4,450	4,070
10	3,780	4,540	5,690	4,760	4,270
13	4,160	5,090	6,340	5,530	4,610
16	4,440	5,810	7,160	6,300	5,250
20	4,910	6,700	8,090	7,150	6,070
25	5,490	7,500	8,850	8,230	6,780

M Powdered high-speed steel

D	Ⓐ	D	Ⓡ	Ⓔ	Ⓖ
	T—PJAS T—PJAL T—PJVAS T—PJVAL	T—PJDS T—PJDL T—PJVDS T—PJVDL	T—PJRS T—PJRL T—PJVRS T—PJVRL	T—PJES T—PJEL T—PJVES T—PJVEL	T—PJGS T—PJGL T—PJVGS T—PJVGL
4	(T-PJAS)4,030	(T-PJDS)5,200	(T-PJRS)6,950	(T-PJES)5,390	(T-PJGS)4,610
	(T-PJAL)4,340	(T-PJDL)5,520	(T-PJRL)7,530	(T-PJEL)5,680	(T-PJGL)5,190
5	3,910	5,100	6,840	5,340	4,860
6	3,910	5,220	6,840	5,340	4,860
8	4,850	5,530	7,310	5,800	5,290
10	5,290	5,900	7,390	6,170	5,550
13	5,800	7,330	8,860	7,740	6,790
16	7,110	8,990	11,090	9,200	8,650
20	8,480	10,810	12,950	10,940	10,410
25	10,230	12,760	14,730	12,970	12,370

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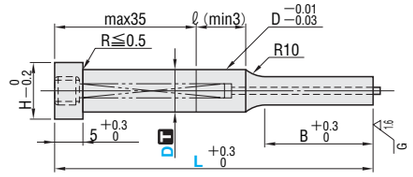
JECTOR PUNCHES —TiCN COATING TYPE—

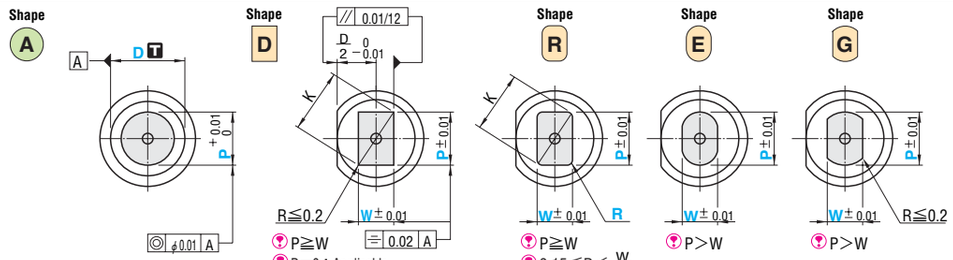
Punch & Retainer Set Available — Detail P.657

Quality Improved — PRODUCTS DATA P.1220

COATING PUNCHES—TiCN— QUALITY IMPROVED P.1217

- How to calculate the projection length of a jector pin (reference) P.191
- Refer to Jector punch blank for the details of jector hole. P.186
- Refer to Jector pin set for the details of Jector pin. P.189

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A~G shown below.
—TiCN coating type— RoHS Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable	D_{m5}	Powdered high-speed steel 64~67HRC	H—PJ H—PJV	A D R E G	S L	 The tip surface is ground before coating.
	$D^{+0.005}_{0}$	Powdered high-speed steel 64~67HRC	AH—PJ AH—PJV		Blade Length (B) L>S	



Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	R R	B	H
(D_{m5}) H—PJ Spring reinforced type H—PJV	A D R E G	S	(4)	40 50 60 70 80	1.00~ 3.99	3.97	1.00	0.15≦R<W/2 (R only)	8	7
			(5)	40 50 60 70 80	2.00~ 4.99	4.97	2.00			8
			(6)	40 50 60 70 80	2.00~ 5.99	5.97	2.00			9
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	3.00			13
			13	(40) 50 60 70 80 90 100	6.00~12.99	12.97	6.00			16
			16	(40) (50) 60 70 80 90 100	10.00~15.99	15.97	6.00		19	19
			20	(40) (50) 60 70 80 90 100	13.00~19.99	19.97	6.00			23
			25	(40) (50) 60 70 80 90 100	18.00~24.99	24.97	6.00			28
($D^{+0.005}_{0}$) AH—PJ Spring reinforced type AH—PJV		L	(4)	50 60 70 80	1.00~ 3.99	3.97	2.00		13	7
			(5)	50 60 70 80	2.00~ 4.99	4.97	2.00			8
			(6)	50 60 70 80	2.00~ 5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	3.00		19	11
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	3.00			13
			13	50 60 70 80 90 100	6.00~12.99	12.97	6.00			16
			16	60 70 80 90 100	10.00~15.99	15.97	6.00		25	19
			20	60 70 80 90 100	13.00~19.99	19.97	6.00			23
			25	60 70 80 90 100	18.00~24.99	24.97	6.00			28

- The spring constant of H-PJV and AH-PJV is as twice as that of H-PJ and AH-PJ.
- Ⓐ : P>D−0.03→ ℓ =0, When P>D−0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
- DREG : P・K>D−0.05→ ℓ = 0, When P・K>D−0.05 shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
- L(40)→B=6, When L(40), the blade length is fixed to 6mm.
- L(50)→B=13, When L(50), the blade length is fixed to 13mm.
- D(4), (5), (6) are applicable for H-PJ and AH-PJ only.

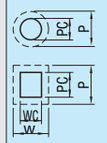
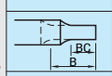
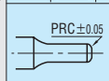
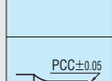
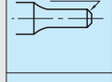
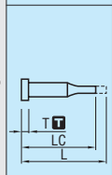
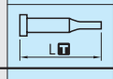
Order: Catalog No. — L — P — W — R (R only)
H—PJEL16 — 70 — P12.00 — W6.00

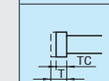
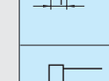
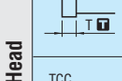
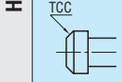
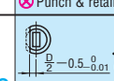
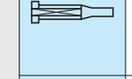
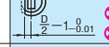
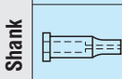
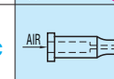
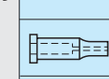
Delivery: 3 Days

Benefit of Reinforced spring
It is twice the spring constant of standard type Jector punch. Due to the spring's larger load, more effective scrap removal can be expected.

The volume discount rate is also applicable to alteration cost. P.39

Alteration — Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC···etc.)
H—PJDS 6 — LC58 — P3.00 — W2.80 — HC8

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧PCmin 0.01mm increments (Combination with PKC→ 0.001mm increments.) ⊗D4 : Not applicable	Changes dimension P・W. PC・WC≧PC・WCmin 0.01mm increments ⊗D4 : Not applicable	200
		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (P)PRC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.186. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (P)PCC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.186. ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P:0.001mm incr.) ⊗D>13:Not applicable	Changes tolerance on P(W). P・W±0.01 ⇨ $^{+0.01}_{0}$ ⊗D>13:Not applicable	600
Full length		LC	Changes full length. LC<L 0.1mm increments (P)B is shortened by (L−LC). (Combination with LKC→0.01mm increments) (P)The projection length of the jector pin is 2mm.		200
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks ((P)) are the same as LC. TKC T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC Changes full length tolerance. + L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks ((P)) are the same as LC. TKM T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC Changes full length tolerance. + L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
Head		KC	Adds single key flat at head.	90° 0° 180° 270° Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)
		KFC	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0

Alterations		Code	Ⓐ	DREG	¥/1Code
Head		HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not available.		200
		TC	Changes head thickness 3.5≦TC<5 0.1mm increments (Combination with TKC・TKM・LCT・LMT→0.01mm incr.) (P)L is shortened by (5−TC). When used with LC, LCT, LMT, L remains the same as specified. ⊗Punch & retainer set not available.		200
		TKC	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		200
		TKM	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 (P)H≦5 : TCC 0.5 ⊗SRC:Not applicable		200
		RC	Reduces head thickness by −0.04~0 from retainer surface. ⊗Cannot be applied to the D $^{+0.005}_{0}$ type.		200
		SRC	Modifies head to fit to select retainers (SLS). (P)For details, refer to P.673. (P)Applicable to D10~25 ⊗Not applicable D $^{+0.005}_{0}$ type. ⊗Punch & retainer set not available.		300
Shank		SKC	Adds key flat on shank. 	Ⓐ DREG D≦4 P≦D−1.2 W≦D−1.2 D5~6 P≦D−2.2 W≦D−2.2 (Machining width 0.5) D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC・WKC・KFC : Not applicable ⊗Punch & retainer set not available.	600
		AC	 Jector pin	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	−100
		NC		Removes the jector pin. ⊗AC : Not applicable	−200
		NDC	No press-in lead	ℓ ≧3 ⇨ ℓ =0 ⊗Punch & retainer set not available.	0

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

(P)To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : AH—PJAS8, the price is 3,870 (H—PJAS8 unit price) +200 = 4,070 yen (product unit)

W Powdered high-speed steel

D	Ⓐ H—PJAS H—PJAL H—PJVAS H—PJVAL	DREG H—PJ□S H—PJ□L H—PJV□S H—PJV□L
4	3,200	4,130
5	3,150	4,170
6	3,280	4,370
8	3,870	5,020
10	4,420	5,540
13	5,450	6,840
16	6,420	8,020
20	7,630	9,610
25	9,050	11,190

PRESS ADD.SPEC. Printed in Red

JECTOR PUNCHES
—WPC®TYPE / HW COATING TYPE—

Punch & Retainer Set Available
Detail P.657

Quality Improved

PRODUCTS DATA P.1221

WPC® PUNCHES
COATING PUNCHES—HW—
QUALITY IMPROVED P.1217

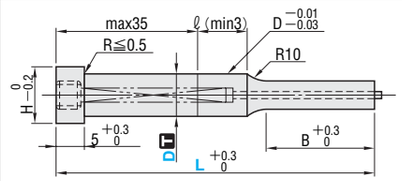
DELIVERY SHORTENED

How to calculate the projection length of a jector pin(reference) P.191

- Refer to Jector punch blank for the details of jector hole. P.186
- Refer to Jector pin set for the details of Jector pin. P.189

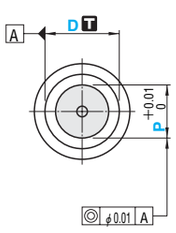
Type	M / H	Catalog No. Type: Shank dia. T D_{m5}	Catalog No. Type: Shank dia. T $D^{+0.005}_{0}$	Shape	B Blade length
—WPC® type— RoHS —HW coating type— Shank Dia.Tolerance D T $m5\ ^{+0.005}_{0}$ Selectable	D4~6 SKH51 61~64HRC Surface100~1100Hv	W—SJ W—SJV	AW—SJ AW—SJV	A D R E G	S L X Blade length (B) X>L>S
	D8~25 SKD11 or equivalent 60~63HRC Surface100~1100Hv				
	Powdered high-speed steel 64~67HRC Surface100~1100Hv	W—PJ W—PJV	AW—PJ AW—PJV		
	Powdered high-speed steel 64~67HRC Surface3000HV	HW—PJ HW—PJV	AHW—PJ AHW—PJV		

Select tip shape from Shape A~G shown below.

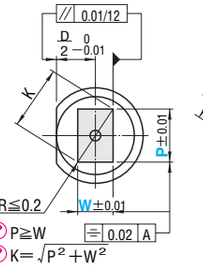


The tip is very slightly rounded.

Shape A

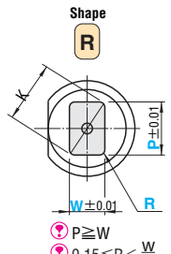


Shape D



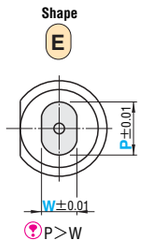
P≧W
$K=\sqrt{P^2+W^2}$

Shape R



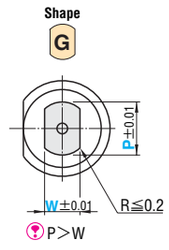
P≧W
$0.15 \leqq R < \frac{W}{2}$
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P·Kmax.	0.01mm increments DREG P·Wmin.	R	B	H
(D_{m5}) —WPC® type— W—SJ W—PJ Spring reinforced type W—SJV W—PJV —HW coating type— HW—PJ Spring reinforced type HW—PJV ($D^{+0.005}_{0}$) —WPC® type— AW—SJ AW—PJ Spring reinforced type AW—SJV AW—PJV —HW coating type— AHW—PJ Spring reinforced type AHW—PJV	S	S	(4)	40 50 60 70 80	1.00~ 3.99	3.97	1.00	0.15≦R<W/2 (Ⓡonly)	8	7
			(5)	40 50 60 70 80	2.00~ 4.99	4.97	2.00			8
			(6)	40 50 60 70 80	2.00~ 5.99	5.97	2.00			9
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	3.00			13
			13	(40) 50 60 70 80 90 100	6.00~ 12.99	12.97	6.00			16
			16	(40) (50) 60 70 80 90 100	10.00~ 15.99	15.97	6.00		19	19
			20	(40) (50) 60 70 80 90 100	13.00~ 19.99	19.97	6.00			23
			25	(40) (50) 60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
	A D R E G	L	(4)	50 60 70 80	1.00~ 3.99	3.97	2.00		13	7
			(5)	50 60 70 80	2.00~ 4.99	4.97	2.00			8
			(6)	50 60 70 80	2.00~ 5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	3.00		19	11
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	3.00			13
			13	50 60 70 80 90 100	6.00~ 12.99	12.97	6.00			16
			16	60 70 80 90 100	10.00~ 15.99	15.97	6.00		25	19
			20	60 70 80 90 100	13.00~ 19.99	19.97	6.00			23
			25	60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
(D_{m5}) —WPC® type— W—SJ Spring reinforced type W—SJV ($D^{+0.005}_{0}$) —WPC® type— AW—SJ Spring reinforced type AW—SJV		X	(5)	60 70 80	2.00~ 4.99	4.97	3.50		25	8
			(6)	60 70 80	2.00~ 5.99	5.97	3.50			9
			8	70 80 90 100	3.00~ 7.99	7.97	5.00		30	11
			10	70 80 90 100	3.00~ 9.99	9.97	6.00			13
			13	70 80 90 100	6.00~ 12.99	12.97	6.00			16
			16	80 90 100	10.00~ 15.99	—			40	19
			20	80 90 100	13.00~ 19.99					23
			25	80 90 100	18.00~ 24.99					28

- The spring constant of W-SJV, W-PJV, HW-PJV, AW-SJV, AW-PJV and AHW-PJV is as twice as that of W-SJ, W-PJ, HW-PJ, AW-SJ, AW-PJ and AHW-PJ.
- Ⓐ : P>D−0.03→ℓ=0, When P>D−0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
- DREG : P・K>D−0.05→ℓ=0, When P・K>D−0.05 shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
- L(40)→B=6, When L(40), the blade length is fixed to 6mm.
- L(50)→B=13, When L(50), the blade length is fixed to 13mm.
- D(4), (5), (6) are applicable for W-SJ, W-PJ, HW-PJ, AW-SJ, AW-PJ and AHW-PJ only.

Order Catalog No. — L — P — W — R(Ⓡonly)

W—SJDS 6 — 60 — P3.00 — W2.80
HW—PJEL 10 — 70 — P8.50 — W4.25

Delivery

■WPC® type (W— · AW—)

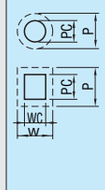
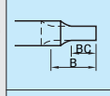
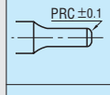
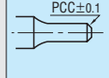
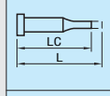
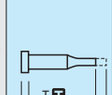
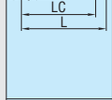
- Ⓐ: 3 Days / Express A 500/1Pc. P.38
  - A flat charge of 1,350 yen for 3 pieces or more of the same size.
- DREG: 3 Days / Express A 800/1Pc. P.38
  - A flat charge of 2,160 yen for 3 pieces or more of the same size.

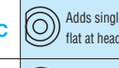
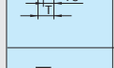
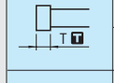
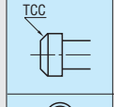
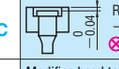
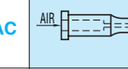
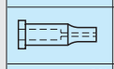
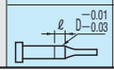
■HW coating type (HW— · AHW—)
3 Days

■Benefit of Reinforced spring
It is twice the spring constant of standard type Jector punch. Due to the spring's larger load, more effective scrap removal can be expected.

The volume discount rate is also applicable to alteration cost. P.39

Alteration — Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC···etc·)
W—SJDS 6 — LC58 — P3.00 — W2.80 — HC8— KC45

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧PCmin 0.01mm increments (Combination with PKC→0.001mm increments) D / PCmin: 4 0.900; 5 1.800; 6 1.800; 8 2.500; 10 2.800; 13 5.000; 16 8.000; 20 9.000; 25 9.000. ⊗PC<1.00 ⊗HW coating type:Not applicable	Changes dimension P・W. PC・WC≧PC・WCmin 0.01mm increments ⊗D4 : Not applicable ⊗Blade length X:Not applicable D / PC・WCmin: 5 1.80; 6 1.80; 8 2.50; 10 2.80; 13 5.00; 16 5.00; 20 5.00; 25 5.00	200
		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments ⊗For Blade length X with dimension D of 5 and 6: PC・WC 1.80~1.99 / Bmax 20		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (?)PRC≦(P−d1−0.5)/2 For dimension d1, refer to P.186. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (?)PCC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.186. ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ (?)(P:0.001mm incr.) ⊗HW coating type:Not applicable	Changes tolerance on P(W). $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	400
Full length		LC	Changes full length. LC<L 0.1mm increments (?)B is shortened by (L−LC). (Combination with LKC→0.01mm increments) (?)The projection length of the jector pin is 2mm.		200
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (?) are the same as LC. TKC $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ + LC Changes full length tolerance. $+ L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$		300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (?) are the same as LC. TKM $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ + LC Changes full length tolerance. $+ L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$		
		LKC	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		400

Alterations		Code	Ⓐ	DREG	¥/1Code
Head		KC	Adds single key flat at head.	 Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
		HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not available.		200
		TC	Changes head thickness 3.5≦TC<5 0.1mm incr.(Comb. with TKC・TKM・LCT・LMT →0.01mm incr.) (?)L is shortened by (5−TC). When used with LC, LCT, LMT, L remains the same as specified. ⊗Punch & retainer set not available.		200
		TKC	Changes head thickness tolerance. $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$		200
		TKM	Changes head thickness tolerance. $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 (?)H≦5 : TCC 0.5 ⊗SRC:Not applicable		200
		RC	 Reduces head thickness by −0.04~0 from retainer surface. ⊗Not applicable $D^{+0.005}_{0}$ type.		200
		SRC	Modifies head to fit to select retainers (SLS). (?)For details,refer to P.673. (?)D10~25 : Applicable ⊗Not applicable $D^{+0.005}_{0}$ type. ⊗Punch & retainer set not available.		300
Shank		AC	 Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		−100
		NC	Removes the jector pin. ⊗AC : Not applicable		−200
		NDC	No press-in lead	ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.	0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

(?)To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}.
For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : AHW—PJAS10, the price is 5,270 (HW—PJAS10 unit price) +200 = 5,470 yen (product unit)

■WSKH51・SKD11 or equivalent WPC® type

D	Ⓐ W—SJAS W—SJAL W—SJVAS W—SJVAL	Ⓐ W—SJAX W—SJVAX	DREG W—SJ□S W—SJ□L W—SJV□S W—SJV□L	DREG W—SJ□X W—SJV□X
4	2,190	—	2,980	—
5	2,130	2,690	2,940	3,330
6	2,130	2,760	2,940	3,330
8	2,210	2,900	2,940	3,430
10	2,300	2,980	3,130	3,670
13	2,410	3,190	3,450	4,060
16	2,640	3,460	3,930	—
20	2,840	3,810	4,430	
25	3,110	4,160	4,990	

■WPowdered high-speed steel WPC® type

D	Ⓐ W—PJAS W—PJAL W—PJVAS W—PJVAL	DREG W—PJ□S W—PJ□L W—PJV□S W—PJV□L
4	2,970	3,830
5	2,860	3,810
6	2,860	3,870
8	3,290	4,360
10	3,680	4,710
13	4,550	5,840
16	5,330	6,930
20	6,320	8,300
25	7,650	9,790

■HW coating type

D	Ⓐ HW—PJAS HW—PJAL HW—PJVAS HW—PJVAL	DREG HW—PJ□S HW—PJ□L HW—PJV□S HW—PJV□L
4	4,060	5,100
5	4,010	5,150
6	4,140	5,350
8	4,730	5,960
10	5,270	6,400
13	6,400	7,850
16	7,350	8,930
20	8,550	10,510
25	10,150	12,270

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JECTOR PUNCHES —LAPPING TYPE—

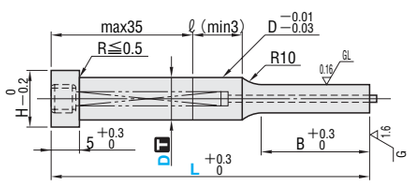
Punch & Retainer Set Available Detail P.657

How to calculate the projection length of a jector pin(reference) P.191

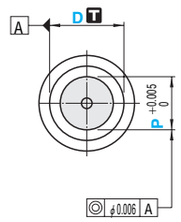
- Refer to Jector punch blank for the details of jector hole. P.186
- Refer to Jector pin set for the details of Jector pin. P.189

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A~G shown below.
—Lapping type— RoHS	D_{m5}	D4~6 SKH51 61~64HRC	L—SJ L—SJVV	A D R E G	S	
		D8~25 SKD11 or equivalent 60~63HRC	L—PJ L—PJVV		L	
		Powdered high-speed steel 64~67HRC			X	
	$D^{+0.005}_{0}$	D4~6 SKH51 61~64HRC	AL—SJ AL—SJVV			
		D8~25 SKD11 or equivalent 60~63HRC				
		Powdered high-speed steel 64~67HRC	AL—PJ AL—PJVV		Blade length(B) X>L>S	

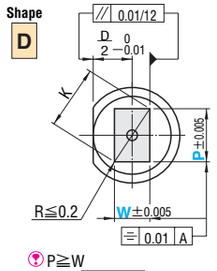
Shank Dia.Tolerance D T $m5\cdot {}^{+0.005}_{0}$ Selectable



Shape A

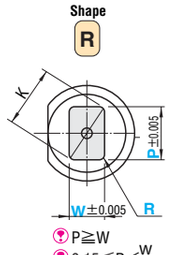


Shape D



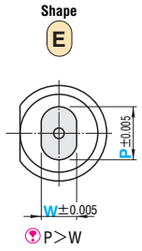
Ⓟ P≧W
Ⓟ $K=\sqrt{P^2+W^2}$

Shape R



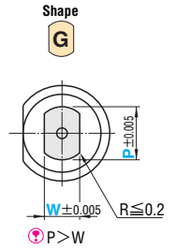
Ⓟ P≧W
Ⓟ $0.15\leqq R<\frac{W}{2}$
Ⓟ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



Ⓟ P>W

Shape G



Ⓟ P>W

Catalog No. Type	Shape	B Blade length	D	L	0.001mm increments Ⓐ min. P max.	0.001mm increments D R E G P·Kmax.	0.001mm increments D R E G P·Wmin.	0.01mm R	B	H
(D_{m5}) L—SJ L—PJ Spring reinforced type L—SJVV L—PJVV	A D R E G	S	(4)	40 50 60 70 80	1.000~ 3.990	3.970	1.000	$0.15\leqq R<\frac{W}{2}$ (Ⓡ only)	8	7
			(5)	40 50 60 70 80	2.000~ 4.990	4.970	2.000			8
			(6)	40 50 60 70 80	2.000~ 5.990	5.970	2.000			9
			8	(40) 50 60 70 80 90 100	3.000~ 7.990	7.970	3.000		13	11
			10	(40) 50 60 70 80 90 100	3.000~ 9.990	9.970	3.000			13
			13	(40) 50 60 70 80 90 100	6.000~12.990	12.970	6.000			16
			16	(40) (50) 60 70 80 90 100	10.000~15.990	15.970	6.000		19	19
			20	(40) (50) 60 70 80 90 100	13.000~19.990	19.970	6.000			23
			25	(40) (50) 60 70 80 90 100	18.000~24.990	24.970	6.000			28
($D^{+0.005}_{0}$) AL—SJ AL—PJ Spring reinforced type AL—SJVV AL—PJVV		L	(4)	50 60 70 80	1.000~ 3.990	3.970	2.000		13	7
			(5)	50 60 70 80	2.000~ 4.990	4.970	2.000			8
			(6)	50 60 70 80	2.000~ 5.990	5.970	2.000			9
			8	50 60 70 80 90 100	3.000~ 7.990	7.970	3.000		19	11
			10	50 60 70 80 90 100	3.000~ 9.990	9.970	3.000			13
			13	50 60 70 80 90 100	6.000~12.990	12.970	6.000			16
			16	60 70 80 90 100	10.000~15.990	15.970	6.000		25	19
			20	60 70 80 90 100	13.000~19.990	19.970	6.000			23
			25	60 70 80 90 100	18.000~24.990	24.970	6.000			28
(D_{m5}) L—SJ Spring reinforced type L—SJVV ($D^{+0.005}_{0}$) AL—SJ Spring reinforced type AL—SJVV		X	(5)	60 70 80	2.000~ 4.990	4.970	3.500		25	8
			(6)	60 70 80	2.000~ 5.990	5.970	3.500			9
			8	70 80 90 100	3.000~ 7.990	7.970	5.000		30	11
			10	70 80 90 100	3.000~ 9.990	9.970	6.000			13
			13	70 80 90 100	6.000~12.990	12.970	6.000			16
			16	80 90 100	10.000~15.990	—		—	40	19
			20	80 90 100	13.000~19.990					23
			25	80 90 100	18.000~24.990					28

Ⓟ The spring constant of L-SJV, L-PJV, AL-SJV, and AL-PJV is as twice as that of L-SJ, L-PJ, AL-SJ and AL-PJ.
Ⓟ Ⓐ : P>D−0.03→ ℓ =0, When P>D−0.03 round punch, $D^{-0.03}_{-0.83}$ (press-in lead) is not available.
Ⓟ D R E G : P・K>D−0.05→ ℓ =0, When P・K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓟ L(40)→B=6, When L(40), the blade length is fixed to 6mm.
Ⓟ L(50)→B=13, When L(50), the blade length is fixed to 13mm.
Ⓟ D(4), (5), (6) are applicable for L-SJ, L-PJ, AL-SJ and AL-PJ only.

Order

Catalog No.	L	P	W	R(Ⓡ only)
L—SJDS16	60	P9.000	W6.800	
AL—SJEL10	70	P8.500	W4.250	

■Benefit of Reinforced spring
It is twice the spring constant of standard type Jector punch. Due to the spring's larger load, more effective scrap removal can be expected.

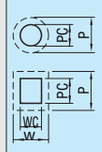
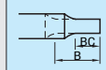
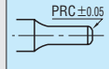
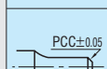
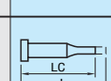
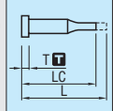
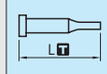
Delivery

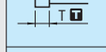
- Ⓐ: 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38
  Ⓟ A flat charge of 1,350 yen for 3 pieces or more of the same size.(excluding ExpressT)
- D R E G: 3 Days — Express A 800/1Pc. P.38
  Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No.	L(LC·LCT·LMT)	P(PC)	W(WC)	R	(BC·HC·TC···etc.)
L—SJDS 6	LC58	P3.000	W2.800		HC8

Alterations		Code	Ⓐ	D R E G	¥/1Code
Tip		PC WC	Changes dimension P. PC≧PCmin 0.001mm increments D / PCmin: 4 0.900; 5 1.800; 6 1.800; 8 2.500; 10 2.800; 13 5.000; 16 8.000; 20 9.000; 25 9.000	Changes dimension P・W. PC・WC≧PC・WCmin 0.001mm increments ⊗D4 : Not applicable ⊗Blade length X:Not applicable D / PC・WCmin: 5 1.800; 6 1.800; 8 2.500; 10 2.800; 13 5.000; 16 5.000; 20 5.000; 25 5.000	200
		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments Ⓟ For L-SJAX, AL-SJAX with dimension D of 5, 6 PC 1.80~1.99 / Bmax 20		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−d_1−0.5)/2 Regarding dimension d_1, refer to P.186. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−d_1−0.5)/2 Regarding dimension d_1, refer to P.186. ⊗PRC:Not applicable	——	200
Full length		LC	Changes full length. LC<L 0.1mm increments Ⓟ B is shortened by (L−LC). (Combination with LKC・LKZ→0.01mm increments) Ⓟ The projection length of the jector pin is 2mm.		200
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓟ) are the same as LC. TKC $T^{+0.3}_{0}\Rightarrow{}^{+0.02}_{0}$ + LC $L^{+0.3}_{0}\Rightarrow{}^{+0.1}_{0}$ Changes full length tolerance.		300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓟ) are the same as LC. TKM $T^{+0.3}_{0}\Rightarrow{}^{0}_{-0.02}$ + LC $L^{+0.3}_{0}\Rightarrow{}^{+0.1}_{0}$ Changes full length tolerance.		
		LKC	Changes full length tolerance. $L^{+0.3}_{0}\Rightarrow{}^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. $L^{+0.3}_{0}\Rightarrow{}^{+0.01}_{0}$		600

Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
		HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not available.		200
		TC	Changes head thickness 3.5≦TC<5 0.1mm increments(Combination with TKC・TKM・LCT・LMT→0.01mm incr.) Ⓟ L is shortened by (5−TC), When used with LC, LCT, LMT, L remains the same as specified. ⊗Punch & retainer set not available.		200
		TKC	Changes head thickness tolerance. $T^{+0.3}_{0}\Rightarrow{}^{+0.02}_{0}$		200
		TKM	Changes head thickness tolerance. $T^{+0.3}_{0}\Rightarrow{}^{0}_{-0.02}$		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓟ H≦5 : TCC 0.5		200
		RC	Reduces head thickness by −0.04~0 from retainer surface. ⊗Not applicable D $^{+0.005}_{0}$ type.		200
Shank		SKC	Adds key flat on shank. Ⓐ D R E G ・D4~6 P≧D−1.2 W≦D−1.2 (Machining width 0.5) ・D8~ P≧D−2.2 W≦D−2.2 (Machining width 1) ⊗KC・WKC・KFC : Not applicable ⊗Punch & retainer set not available.		600
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		−100
		NC	Removes the jector pin. ⊗AC : Not applicable		−200
		NDC	No press-in lead	ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.	0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : AL—PJAS4, the price is 3,080 (L—PJAS4 unit price) +200 = 3,280 yen (product unit)

■M SKH51・SKD11 or equivalent

D	Ⓐ L—SJAS L—SJAL L—SJVAS L—SJVAL	Ⓐ L—SJAX L—SJVAX	D R E G L—SJ□S L—SJ□L L—SJV□S L—SJV□L	D R E G L—SJ□X L—SJV□X
4	2,180	—	3,310	—
5	2,120	2,680	3,270	3,670
6	2,120	2,750	3,270	3,670
8	2,200	2,890	3,270	3,770
10	2,290	2,970	3,460	4,000
13	2,400	3,180	3,750	4,400
16	2,630	3,450	4,260	—
20	2,830	3,800	4,760	
25	3,100	4,150	5,320	

■M Powdered high-speed steel

D	Ⓐ L—PJAS L—PJAL L—PJVAS L—PJVAL	D R E G L—PJ□S L—PJ□L L—PJV□S L—PJV□L
4	3,080	4,400
5	2,970	4,390
6	2,970	4,440
8	3,400	4,930
10	3,790	5,280
13	4,660	6,410
16	5,440	7,420
20	6,430	8,790
25	7,760	10,280

PRESS NEW Printed in Red

JECTOR PUNCHES
—L SPECIFIED, DIM. B FIXED TYPE / STANDARD TYPE / WPC® TYPE—

RELATED PRODUCTS P.1221

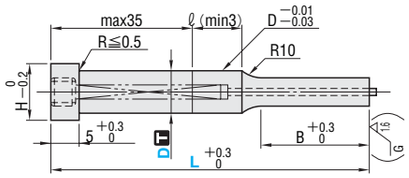
WPC® PUNCHES

※This Jector punch keeps the Dimension B the same even if L changes.

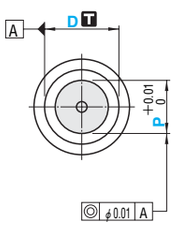
Punch & Retainer Set Available Detail P.657

The volume discount rate is also applicable to alteration cost. P.39

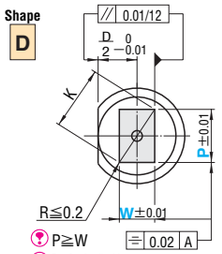
The projection length of the jector pin is 2mm.

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A~G shown below.
RoHS —WPC® type— Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable	D_{m5}	D5~6 SKH51 61~64HRC D8~25 SK011 or equivalent 60~63HRC —WPC® Type— Surface 1000~1100HV	LFSJ	A	S	 The tip surface is ground before coating. The tip is very slightly rounded.
	$D^{+0.005}_{0}$		W—LFSJ	D	L	
			A—LFSJ	R	Blade length (B) L>S	
			AW—LFSJ	E		
				G		

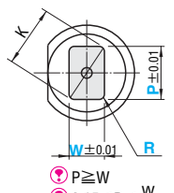
Shape A



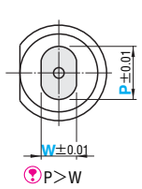
Shape D



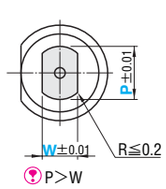
Shape R



Shape E



Shape G



Catalog No. Type	Shape	B Blade length	D	0.1mm increments L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	R	B	H
(D_{m5}) LFSJ W—LFSJ ($D^{+0.005}_{0}$) A—LFSJ AW—LFSJ	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	5	40.0~ 80.0	2.00~ 4.99	4.97	2.00	0.15≦R<W/2 (Ⓡ only)	8	8
			6		2.00~ 5.99	5.97	2.00			9
			8	45.0~100.0	3.00~ 7.99	7.97	3.00		13	11
			10		3.00~ 9.99	9.97	3.00			13
			13		6.00~ 12.99	12.97	6.00			16
			16	50.0~100.0	10.00~ 15.99	15.97	6.00		19	19
			20		13.00~ 19.99	19.97	6.00			23
			25		18.00~ 24.99	24.97	6.00			28
		L	5	40.0~ 80.0	2.00~ 4.99	4.97	2.00		13	8
			6		2.00~ 5.99	5.97	2.00			9
			8	50.0~100.0	3.00~ 7.99	7.97	3.00		19	11
			10		3.00~ 9.99	9.97	3.00			13
			13		6.00~ 12.99	12.97	6.00			16
			16	50.0~100.0	10.00~ 15.99	15.97	6.00		25	19
			20		13.00~ 19.99	19.97	6.00			23
			25	60.0~100.0	18.00~ 24.99	24.97	6.00			28

Shape DREG : When L—blade length<30mm, blade length is L—30mm.

Ⓐ : P>D—0.03→ ℓ =0, When P>D—0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

DREG : P・K>D—0.05→ ℓ = 0, When P・K>D—0.05 shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

Jector hole is based on the Jector punch SJ□□ on P.63.

Order

Catalog No.	L	P	W	R (Ⓡ only)
LFSJDS 6	60	P3.00	W2.80	
A—LFSJEL 10	75.3	P8.50	W4.25	

Delivery

- Ⓐ: 3 Days — Express T 1,000/1Pc., Express A 500/1Pc. ⊗Express service T is not availaible for WPC® type. P.38
  A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
- DREG: 3 Days — Express T 1,600/1Pc., Express A 800/1Pc. ⊗Express service T is not availaible for WPC® type. P.38
  A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration

Catalog No.	L	P(PC)	W(WC)	R	(BC・HC・TC…etc.)
LFSJDS 6	58	P3.00	W2.80		HC8 KFC225

Alterations	Code	Ⓐ	DREG	¥/1Code
Tip	PC WC	Changes dimension P. PC≧PCmin 0.01mm increments (Combination with PKC →0.001mm increments)	Changes dimension P・W. PC・WC≧PC・WCmin 0.01mm increments	200
Tip	BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
Tip	SC	Finishes blade with lapping. Dimension P tolerance and the specification unit remain the same. ⊗D shape is not applicable with a corner radius of 0. ⊗WPC® type : Not applicable		1,200 (only Ⓐ 800)
Tip	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 For dimension d1, refer to P.186. ⊗PCC:Not applicable WPC® type : PRC ±0.1	——	400
Tip	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.186. ⊗PRC:Not applicable WPC® type : PRC ±0.1	——	200
Tip	PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P : 0.001mm incr.)	Changes tolerance on P(W). P・W±0.01 ⇨ $^{+0.01}_{0}$	400
Full length	LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
Full length	LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗WPC® type : Not applicable		600

Alterations	Code	Ⓐ	DREG	¥/1Code
Head	KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
Head	WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)
Head	KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
Head	NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Head	HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not available.		200
Head	TC	Changes head thickness 3.5≦TC<5 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) The full length remains as specified. ⊗Punch & retainer set not available.		200
Head	TKC	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		200
Head	TKM	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		200
Head	TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 H≦5 : TCC 0.5 ⊗SRC:Not applicable		200
Head	RC	Reduces head thickness by −0.04~0 from retainer surface. ⊗Not applicable $D^{+0.005}_{0}$ type.		200
Head	SRC	Modifies head to fit to select retainers (SLS). For details,refer to P.673. D10~25 : applicable ⊗Not applicable $D^{+0.005}_{0}$ type. ⊗Punch & retainer set not available.		300
Shank	SKC	Adds key flat on shank. D8~ P≦D−2.2 W≦D−2.2 (Machining with 1) ⊗KC・WKC・KFC : Not applicable ⊗WPC® type : Not applicable ⊗Punch & retainer set not available.	Ⓐ DREG D5~6 P≦D−1.2 W≦D−1.2 (Machining with 0.5)	600
Shank	NC	Removes the jector pin.		−200
Shank	NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.		0

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.

Example : A—LFSJAS8, the price is 1,910 (LFSJAS8 unit price) +200 = 2,110 yen (product unit)

■ M SKH51,SKD11 or equivalent

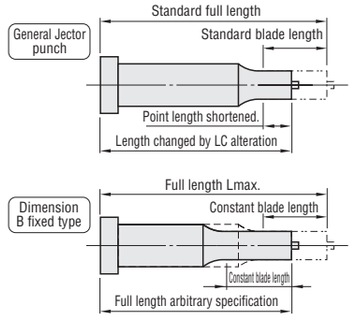
D	Ⓐ LFSJAS LFSJAL	DREG LFSJ□S LFSJ□L
5	1,700	2,490
6	1,790	2,560
8	1,910	2,620
10	2,030	2,790
13	2,190	3,190
16	2,460	3,760
20	2,760	4,360
25	2,950	4,980

■ M SKH51,SKD11 or equivalent, WPC® type

D	Ⓐ W—LFSJAS W—LFSJAL	DREG W—LFSJ□S W—LFSJ□L
5	2,660	3,430
6	2,700	3,510
8	2,830	3,570
10	2,940	3,740
13	3,090	4,150
16	3,360	4,760
20	3,650	5,360
25	3,840	5,980

■Features

The blade length B gets shortened when alternation LC is processed for general Jector punch, but Dim. B fixed type keeps the length no matter how long L is.



- Since Jector punch, Dim. B fixed type does not have side hole on the shank, it can be used as punch for air blowing if the jector pin is removed.

PRESS NEW

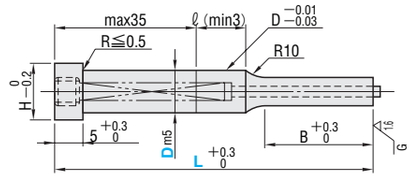
JECTOR PUNCHES
—LARGE DIAMETER PIN, STANDARD TYPE · LAPPING TYPE—

※ This Jector punch contains thicker（compared to our existing products）jector pin.

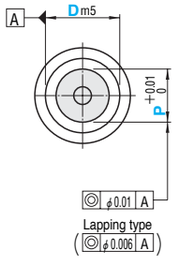
- Refer to Jector punch blank for the details of jector hole. P.186
- Refer to Jector pin set for the details of Jector pin. P.189

How to calculate the projection length of a jector pin(reference) P.191

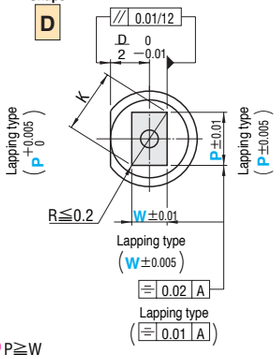
Type	Shank dia. D T	M H
RoHS —Lapping type—	D_{m5}	SKD11 or equivalent 60～63HRC

Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A～G shown below.
SJF	A D R E G	S	
Lapping L—SJF		L	Blade length (B) L>S

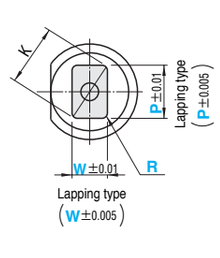
Shape A



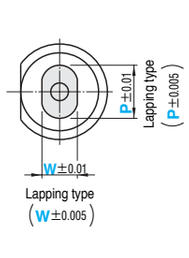
Shape D



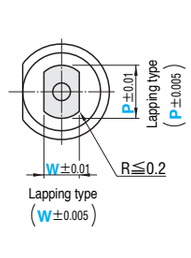
Shape R



Shape E



Shape G



P≧W
R=0：Applicable (Lapping type is not applicable)
K=$\sqrt{P^2+W^2}$

P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2+2R}$

P>W

P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments (Lapping type 0.001mm increments.) Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	R R	B	H
(D_{m5}) SJF	A D R E G	S	8	50 60 70 80 90 100	5.00～ 7.99	7.97	5.00	0.15≦R<$\frac{W}{2}$ (R only)	13	11
			10	50 60 70 80 90 100	5.00～ 9.99	9.97	5.00			13
			13	50 60 70 80 90 100	8.00～12.99	12.97	8.00			16
			16	(50) 60 70 80 90 100	10.00～15.99	15.97	8.00		19	19
			20	(50) 60 70 80 90 100	13.00～19.99	19.97	10.00			23
			25	(50) 60 70 80 90 100	18.00～24.99	24.97	10.00			28
Lapping L—SJF		L	8	50 60 70 80 90 100	5.00～ 7.99	7.97	5.00		19	11
			10	50 60 70 80 90 100	5.00～ 9.99	9.97	5.00			13
			13	50 60 70 80 90 100	8.00～12.99	12.97	8.00			16
			16	60 70 80 90 100	10.00～15.99	15.97	8.00		25	19
			20	60 70 80 90 100	13.00～19.99	19.97	10.00			23
			25	60 70 80 90 100	18.00～24.99	24.97	10.00			28

L(50)→B=13, When L(50), the blade length is fixed to 13mm.
Ⓐ：P>D−0.03→ℓ=0, When P>D−0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
DREG：P・K>D−0.05→ℓ=0, When P・K>D−0.05 shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order

Catalog No.	L	P	W	R (R only)
SJFDS 16	60	P12.50	W9.35	
L—SJFEL 10	70	P8.50	W6.75	

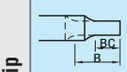
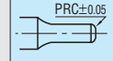
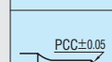
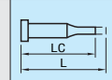
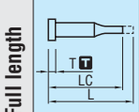
Delivery

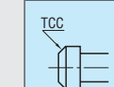
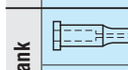
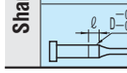
- Ⓐ: 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38
  A flat charge of 1,350 yen for 3 pieces or more of the same size（excluding Express T）.
- DREG: 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. P.38
  A flat charge of 2,160 yen for 3 pieces or more of the same size（excluding Express T）.
  Express service T is not available for lapping type.

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No.	L(LC·LCT·LMT)	P	W	R	—(BC·HC·TC···etc.)
SJFDS 13	LC58	P10.50	W9.50		HC15 KC45

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧PCmin 0.01mm increments (Lapping type, Combination with PKC→0.001mm increments) D: 8 10 13 16 20 25 / PCmin: 4.500 4.500 7.000 7.000 9.000 9.000	Changes dimension P・W. PC・WC≧PC・WCmin 0.01mm increments (Lapping type:0.001mm increments) D: 8 10 13 16 20 25 / PC・WCmin: 4.500 4.500 7.000 7.000 9.000 9.000	200
		BC	Changes blade length B.（Shorter than standard） 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.186. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.186. ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P：0.001mm incr.) ⊗Lapping type:Not applicable	Changes tolerance on P(W). P・W±0.01 ⇨ +0.01 0	400
Full length		LC	Changes full length. LC<L 0.1mm increments B is shortened by (L−LC). (Combination with LKC・LKZ→0.01mm increments) The projection length of the jector pin is 2mm.		200
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKC T +0.3 0 ⇨ +0.02 0 + LC Changes full length tolerance. L +0.3 0 ⇨ +0.1 0		300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKM T +0.3 0 ⇨ 0 −0.02 + LC Changes full length tolerance. L +0.3 0 ⇨ +0.1 0		
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0		600

Alterations		Code	Ⓐ	DREG	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat.	0
		HC	Changes head diameter. D≦HC<H 0.1mm increments		200
		TC	Changes head thickness 3.5≦TC<5 0.1mm incr.（Comb. with TKC・TKM・LCT・LMT→0.01mm incr.） L is shortened by (5−TC). When used with LC, LCT, LMT, L remains the same as specified.		200
		TKC	Changes head thickness tolerance. T +0.3 0 ⇨ +0.02 0		200
		TKM	Changes head thickness tolerance. T +0.3 0 ⇨ 0 −0.02		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 ⊗SRC:Not applicable		200
		RC	Reduces head thickness by −0.04～0 from retainer surface.		200
		SRC	Modifies head to fit to select retainers (SLS). For details,refer to P.673. D10～25：Applicable		300
Shank		NC	Removes the jector pin. ⊗AC：Not applicable		−200
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Ⓜ SKD11 or equivalent

D	Ⓐ SJFAS SJFAL	DREG SJF□S SJF□L
8	1,380	2,110
10	1,470	2,300
13	1,680	2,690
16	1,910	3,200
20	2,110	3,700
25	2,380	4,260

■Ⓜ SKD11 or equivalent Lapping type

D	Ⓐ L—SJFAS L—SJFAL	DREG L—SJF□S L—SJF□L
8	2,400	3,470
10	2,490	3,660
13	2,700	4,050
16	2,930	4,560
20	3,130	5,060
25	3,400	5,620

■Comparison

D	Large dia. pin SJF□□	Standard SJ□□
8	2.7	1.0
10	2.7	1.4
13	4.0	1.7
16	4.0	2.7
20	6.0	2.7
25	6.0	2.7

■Feature
- Standard type may have been caused scrap rise due to the rotation of scrap in the die. This product has thicker pin diameter, which allows larger contact area with scraps and stable scrap retention.
- The thicker pin diameter is superior in pin strength and rigidity than standard type.

PRESS ADD.SPEC. Printed in Red

SHOULDER PUNCHES
—QUILL, LAPPING TYPE / TiCN COATING TYPE—

Quality Improved

PRODUCTS DATA P.1220

COATING PUNCHES —TiCN— QUALITY IMPROVED P.1217

The volume discount rate is also applicable to alteration cost. P.39

Order: Catalog No. — L — P — W — R(Ⓡ only)
SHAS 1.6 — 30 — P1.31
L—PHDL 2.0 — 40 — P1.240 — W0.830

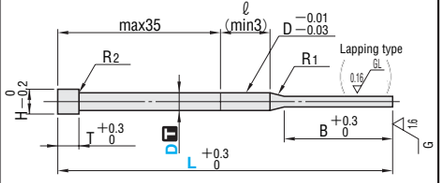
Delivery
- Ⓐ: 3 Days — Express T 1,000/1Pc., Express A 500/1Pc.
  ⊗Express service T・A is not available for TiCN coating type.
  ⊗Express service T・A is not available for alteration PKC. P.38
  A flat charge of 1,350 yen for 3 pieces or more of the same size(excluding Express T).
- DREG: 3 Days — Express T 1,600/1Pc., Express A 800/1Pc.
  ⊗Express service T・A is not available for TiCN coating type.
  ⊗Express service T is not available for lapping type.
  ⊗Express service T・A is not available for alteration PKC. P.38
  A flat charge of 2,160 yen for 3 pieces or more of the same size(excluding Express T).

Alteration: Catalog No. — L(LC・LCT・LMT) — P — W — R — (BC・HC・TC…etc.)
PHDL 2.0 — LC42 — P1.24 — W0.83 — HC2.8

Type	Shank dia. D T	M H	Catalog No. Type	Catalog No. Type Head thickness 5mm	Shape	B Blade length
RoHS —Lapping type—	D_{m5}	SKH51 61~64HRC	SH Lapping type	SHLT Lapping type	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S
			L—SH	L—SHLT		
		SKH51 61~64HRC Surface 3000HV	TiCN coating type	TiCN coating type		
			H—SH	H—SHLT		
		Powdered high-speed steel 64~67HRC	PH Lapping type	PHLT Lapping type		
			L—PH	L—PHLT		
		Powdered high-speed steel 64~67HRC Surface 3000HV	TiCN coating type	TiCN coating type		
			H—PH	H—PHLT		
—TiCN coating type—	$D^{+0.005}_{0}$	SKH51 61~64HRC	A—SH Lapping type	A—SHLT Lapping type		L
			AL—SH	AL—SHLT		
		SKH51 61~64HRC Surface 3000HV	TiCN coating type	TiCN coating type		
			AH—SH	AH—SHLT		
		Powdered high-speed steel 64~67HRC	A—PH Lapping type	A—PHLT Lapping type		
			AL—PH	AL—PHLT		
		Powdered high-speed steel 64~67HRC Surface 3000HV	TiCN coating type	TiCN coating type		
			AH—PH	AH—PHLT		

Shank Dia.Tolerance D T m5 · $+0.005\ 0$ Selectable

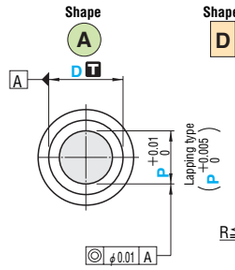
Select tip shape from Shape Ⓐ~Ⓖ shown below.



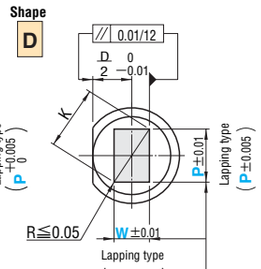
D	R1 Ⓐ	R1 DREG	R2
1.6	2~3	—	≦0.2
2.0		≦16	
2.5			≦0.5
3	—		

The tip grinding is processed before coating for TiCN coating products.

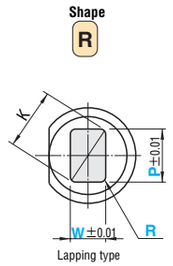
Shape Ⓐ



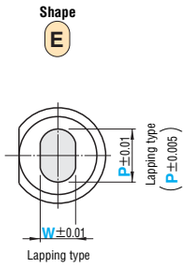
Shape Ⓓ



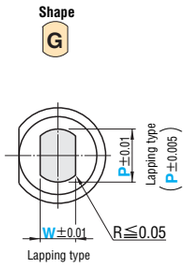
Shape Ⓡ



Shape Ⓔ



Shape Ⓖ



Ⓡ P≧W
Ⓡ R=0 : Applicable (Lapping type not applicable)
Ⓡ K= $\sqrt{P^2+W^2}$

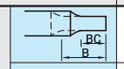
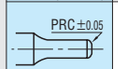
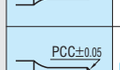
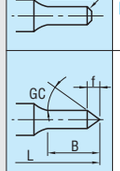
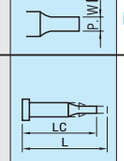
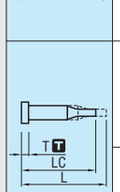
Ⓡ P≧W
Ⓡ $0.05 \leqq R < \frac{W}{2}$
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2+2R}$

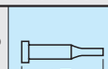
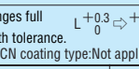
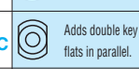
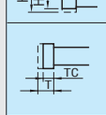
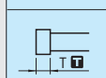
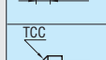
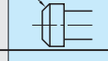
Ⓡ P>W

Ⓡ P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments (lapping type 0.001mm increments) Ⓐ min. P max.	Ⓐ B	DREG P・Kmax.	DREG P・Wmin.	DREG B	0.01mm R	H	T
(D_{m5}) ($D^{+0.005}_{0}$)	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	1.6	(20) (25) 30 35 40 50 60	0.30(1.00)~1.59	6	—	—	—	$0.05 \leqq R < \frac{W}{2}$ (Ⓡ only)	2.6	
SH A—SH			2.0	(20) (25) 30 35 40 50 60	0.50(1.00)~1.99	8	1.97	0.30(1.00)	4		3.0	3
PH A—PH			2.5	(20) (25) 30 35 40 50 60	0.80(1.00)~2.49		2.47	0.50(1.00)	6		3.5	
—Lapping type—			3	40 50 60 70 80	(P.53・57・61)	—	2.97	0.70(1.00)			5	5
L—SH AL—SH		L	1.6	30 35 40 50 60	0.50(1.00)~1.59	8	—	—	—		2.6	
L—PH AL—PH			2.0	30 35 40 50 60	0.80(1.00)~1.99	10	1.97	0.30(1.00)	6		3.0	3
—TiCN coating type—			2.5	30 35 40 50 60	0.80(1.00)~2.49	13	2.47	0.50(1.00)	8		3.5	
H—SH AH—SH			3	50 60 70 80	(P.53・57・61)	—	2.97	0.70(1.00)			5	5
H—PH AH—PH												
(D_{m5}) ($D^{+0.005}_{0}$)	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	1.6	(20) (25) 30 35 40 50 60	0.30(1.00)~1.59	6	—	—	—	$0.05 \leqq R < \frac{W}{2}$ (Ⓡ only)	2.6	
SHLT A—SHLT			2.0	(20) (25) 30 35 40 50 60	0.50(1.00)~1.99	8	1.97	0.30(1.00)	4		3.0	5
PHLT A—PHLT			2.5	(20) (25) 30 35 40 50 60	0.80(1.00)~2.49		2.47	0.50(1.00)	6		3.5	
—Lapping type—												
L—SHLT AL—SHLT		L	1.6	30 35 40 50 60	0.50(1.00)~1.59	8	—	—	—		2.6	
L—PHLT AL—PHLT			2.0	30 35 40 50 60	0.80(1.00)~1.99	10	1.97	0.30(1.00)	6		3.0	5
—TiCN coating type—			2.5	30 35 40 50 60	0.80(1.00)~2.49	13	2.47	0.50(1.00)	8		3.5	
H—SHLT AH—SHLT												
H—PHLT AH—PHLT												

Ⓡ When L(20)or (25), the blade length is fixed to 4mm.
Ⓡ Ⓐ: P>D−0.03→ ℓ =0, When P>D−0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓡ DREG : P・K>D−0.05→ ℓ = 0, When P・K>D−0.05 shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓡ P・W (1.00)•••▸TiCN coated punch is P・Wmin 1.00

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip 0.3≦PRC≦1 0.1mm increments Ⓡ PRC≦(P−0.2)/2 ⊗PCC・GC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓡ PCC≦(P−0.2)/2 ⊗PRC・GC:Not applicable	——	200
		GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B≧f+2 f=P/2×tan(90°−GC°) Ⓡ When used with SC, tip and edge are rounded. ⊗P<1.0:Not available ⊗LKC・LKZ・LCT・LMT・PRC・PCC:Not applicable	——	400
		PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ (P : 0.001mm incr.) ⊗ Express service:Not available	Changes tolerance on P(W). P・W±0.01 ⇨ $^{+0.01}_{0}$ ⊗ Lapping type : Not applicable	400 TiCN coating (600)
Full length		LC	Changes full length. Alternation is available within the following range. 0.1mm increments D: 1.6~2.5 / 3 — S: 20<LC<60 / 36<LC<80 — L: 30<LC<60 / 50<LC<80 Ⓡ When LC is 25mm or less, Blade B is all 4mm. (Combination with LKC・LKZ→0.01mm increments)		200
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓡ) are the same as LC. TKC $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ (Changes full length tolerance.)		300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓡ) are the same as LC. TKM $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ (Changes full length tolerance.)		

Alterations		Code	Ⓐ	DREG	¥/1Code
Full length		LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗TiCN coating type:Not applicable		600
Head		KC	Adds single key flat at head.	 Changes the position 90° 180° 270° 0° 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)
		KFC	 Adds 1 key flat at 0° and the other on another angle. 90° 180° 270° 0° 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 90° 180° 270° 0° 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat.	0
		HC	Changes head diameter. D≦HC<H 0.1mm increments		200
		TC	Changes head thickness 2≦TC<T 0.1mm incr. (Comb. with TKC・TKM・LCT・LMT→0.01mm incr.) Ⓡ L is shortened by (T−TC). When used with LC, LCT, LMT, L remains the same as specified.		200
		TKC	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		200
		TKM	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		200
		TCC	Adds Chamfering to head. Strengthen the punch head. Ordering method P.1223 TCC0.5 ⊗H<2.6:Not applicable		200
Shank		SKC	——	Adds key flat on shank. ・D3 W≦D−1.2 (Machining width 0.5) $\frac{D}{2}-0.5\ ^{0}_{-0.01}$ Ⓡ D3:Available ⊗KC・WKC・KFC: Not applicable	600
		NDC	No press-in lead	ℓ ≧3 ⇨ ℓ =0	0

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓡ To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 100 yen required.
Example : A—SHAS2.0, the price is 270 (SHAS2.0 unit price) +100 = 370 yen (product unit)

■M SKH51

D	Ⓐ SHAS SHAL SHLTAS SHLTAL	DRE SH□S SH□L SHLT□S SHLT□L	G SHGS SHGL SHLTGS SHLTGL	Ⓐ L—SHAS L—SHAL L—SHLTAS L—SHLTAL	DRE L—SH□S L—SH□L L—SHLT□S L—SHLT□L	G L—SHGS L—SHGL L—SHLTGS L—SHLTGL	Ⓐ H—SHAS H—SHAL H—SHLTAS H—SHLTAL	DRE H—SH□S H—SH□L H—SHLT□S H—SHLT□L	G H—SHGS H—SHGL H—SHLTGS H—SHLTGL
1.6	270	—	—	1,290	—	—	1,340	—	—
2.0	270	1,720	1,720	1,290	3,080	3,080	1,340	2,790	2,790
2.5	270	1,420	1,420	1,290	2,780	2,780	1,340	2,490	2,490
3	—	1,160	1,120	—	2,520	2,520	—	2,260	2,220

■M Powdered high-speed steel

D	Ⓐ PHAS PHAL PHLTAS PHLTAL	DRE PH□S PH□L PHLT□S PHLT□L	G PHGS PHGL PHLTGS PHLTGL	Ⓐ L—PHAS L—PHAL L—PHLTAS L—PHLTAL	DRE L—PH□S L—PH□L L—PHLT□S L—PHLT□L	G L—PHGS L—PHGL L—PHLTGS L—PHLTGL	Ⓐ H—PHAS H—PHAL H—PHLTAS H—PHLTAL	DRE H—PH□S H—PH□L H—PHLT□S H—PHLT□L	G H—PHGS H—PHGL H—PHLTGS H—PHLTGL
1.6	430	—	—	1,570	—	—	1,630	—	—
2.0	430	2,300	2,060	1,570	3,820	3,660	1,630	3,500	3,260
2.5	430	1,920	1,750	1,570	3,440	3,350	1,630	3,120	2,950
3	—	1,550	1,360	—	3,070	2,960	—	2,780	2,590

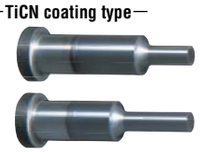
SHOULDER PUNCHES
—SHORT, STANDARD TYPE / TiCN COATING TYPE—

Quality Improved

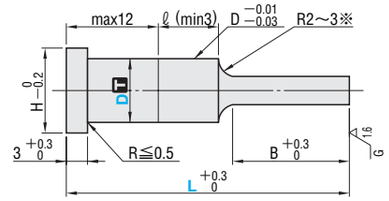
PRODUCTS DATA P.1220

COATING PUNCHES—TiCN— QUALITY IMPROVED P.1217

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. T D	M H	Catalog No. Type	Shape	B Blade length
RoHS —TiCN coating type—  Shank Dia.Tolerance D T m5・$^{+0.005}_{0}$ Selectable	D_{m5}	SKD11 or equivalent 60～63HRC	SS	A D R E G	S
		SKH51 61～64HRC	SSH		
		SKH51 61～64HRC Surface 3000HV	H—SSH		
		Powdered high-speed steel 64～67HRC	SSP		
		Powdered high-speed steel 64～67HRC Surface 3000HV	H—SSP		
	$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	A—SS		L
		SKH51 61～64HRC	A—SSH		
		SKH51 61～64HRC Surface 3000HV	AH—SSH		
		Powdered high-speed steel 64～67HRC	A—SSP		
		Powdered high-speed steel 64～67HRC Surface 3000HV	AH—SSP		

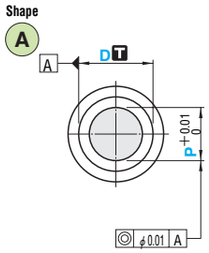
Select tip shape from Shape A～G shown below.



※Shape R E: When W＜3, R13.

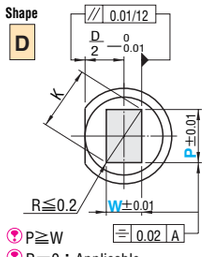
The tip grinding is processed before coating for TiCN coating products.

Shape A



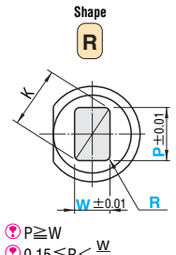
P≧W

Shape D



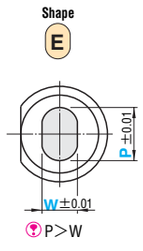
P≧W
R=0：Applicable
K=$\sqrt{P^2+W^2}$

Shape R



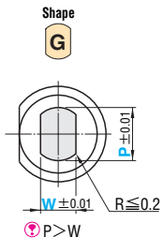
P≧W
0.15≦R＜$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Shape E



P＞W

Shape G



P＞W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P	Ⓐ max.	D R E G P·Kmax.	D R E G P·Wmin.	Ⓡ R	B	H
(D_{m5}) ($D^{+0.005}_{0}$) SS A—SS	A D R E G	S	3	25 30 35 40	1.00	2.99	2.95	1.00	0.15≦R＜$\frac{W}{2}$ (Ⓡ only)	8	5
SSH A—SSH			4		2.00	3.99	3.95	1.20			7
SSP A—SSP			5		2.00	4.99	4.95	1.20			8
			6		2.50	5.99	5.95	1.50			9
—TiCN coating—			8		5.00	7.99	7.95	2.00			11
H—SSH AH—SSH		L	10		7.00	9.99	9.95	2.50			13
H—SSP AH—SSP			3	30 35 40	1.00	2.99	2.95	1.00		13	5
			4		2.00	3.99	3.95	1.20			7
			5		2.00	4.99	4.95	1.20			8
			6		2.50	5.99	5.95	1.50			9
			8		5.00	7.99	7.95	2.00			11
			10		7.00	9.99	9.95	2.50			13

Ⓐ: P＞D−0.03→ℓ＝0, When P＞D−0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

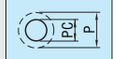
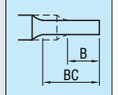
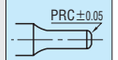
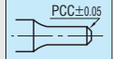
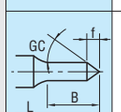
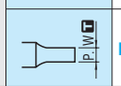
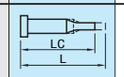
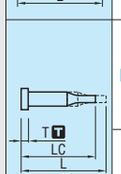
Order

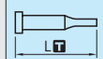
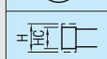
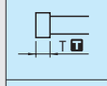
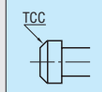
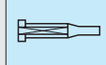
Catalog No.	L	P	W	R(Ⓡ only)
SSDS 4	30	P2.00	W1.20	
A—SSAL 5	40	P3.65		
H—SSHDS 4	30	P2.00	W1.20	

Delivery

- Ⓐ: 3 Days — Express A 500/1Pc. — Express service A is not available for TiCN coating type. P.38
  A flat charge of 1,350 yen for 3 pieces or more of the same size.
- D R E G: 3 Days — Express A 800/1Pc. — Express service A is not available for TiCN coating type. P.38
  A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC·LCT·LMT) — P(PC) — W — R — (BC·HC·TC···etc.)
SSAS 4 — LC28 — P3.02 — BC10

Alterations		Code	Ⓐ	D R E G	¥/1Code
Tip		PC	Changes dimension P. PC≧ Pmin 2 ⊗TiCN coating type, D3:Not available 0.01mm increments (Combination with PKC→ 0.001mm increments) P(PC) / Bmax: 0.500～0.999 / 10; 1.000～ / 20	——	200
		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓡ Full length L (LC) requires BC+15mm or more.	P·W / Bmax: 1.00～1.19 / 15; 1.20～ / 20 Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓡ Full length L (LC) requires BC+15mm or more.	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓡ PRC≦(P−0.2)/2 ⊗PCC·GC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓡ PCC≦(P−0.2)/2 ⊗PRC·GC:Not applicable	——	200
		GC	Changes to pointed tip. 20°≦GC＜90° 1° increments Blade length B≧f+2 f＝P/2×tan(90°−GC°) Ⓡ When used with SC, tip and edge are rounded. ⊗P＜1.0:Not applicable ⊗LKC·LKZ·LCT·LMT·PRC·PCC:Not applicable	——	400
		PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ (P：0.001mm incr.)	Changes tolerance on P(W). P·W±0.01 ⇨ $^{+0.01}_{0}$	400 TiCN coating (600)
Full length		LC	15+B(BC)≦LC＜L 0.1mm increments Ⓡ When LC—B (or BC) is 15mm or less, B (or BC) is LC—15mm. (Combination with LKC・LKZ→0.01mm incr. for LC)		200
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓡ) are the same as LC. TKC $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓡ) are the same as LC. TKM $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		

Alterations		Code	Ⓐ	D R E G	¥/1Code
Full length		LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗TiCN coating type:Not applicable		600
Head		KC	Adds single key flat at head.	90° 0° 180° 270° Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)
		KFC	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat.	0
		HC	Changes head diameter. D≦HC＜H 0.1mm increments		200
		TC	Changes head thickness 2≦TC＜3 0.1mm increments (Combination with TKC・TKM・LCT・LMT→0.01mm incr. for TC) Ⓡ L is shortened by (3−TC). When used with LC, LCT, LMT, L remains the same as specified.		200
		TKC	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		200
		TKM	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓡ H≦5：TCC 0.5		200
Shank		SKC	Adds key flat on shank. $\frac{D}{2}-0.5^{-0}_{-0.01}$ D3～6 D8～ (Machining width 0.5) (Machining width 1) Ⓐ P≦D−1.2 P≦D−2.2 D R E G W≦D−1.2 W≦D−2.2 ⊗KC・WKC・KFC:Not applicable		600
		NDC	No press-in lead $\ell^{-0.01}_{-0.03}$ ℓ≧3⇨ℓ＝0		0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example：A—SSAS5, the price is 280 (SSAS5 unit price) +200 = 480 yen (product unit)

■M SKD11 or equivalent

D	Ⓐ SSAS SSAL	D R E G SS□S SS□L
3	250	1,000
4	260	910
5	280	1,000
6	290	1,070
8	350	1,160
10	470	1,320

■M SKH51

D	Ⓐ SSHAS SSHAL	D R E G SSH□S SSH□L
3	340	1,320
4	360	1,220
5	360	1,320
6	390	1,420
8	500	1,620
10	670	1,770

■M Powdered high-speed steel

D	Ⓐ SSPAS SSPAL	D R E G SSP□S SSP□L
3	520	1,600
4	550	1,470
5	570	1,600
6	660	1,780
8	1,000	2,190
10	1,290	2,480

■M SKH51 (TiCN)

D	Ⓐ H—SSHAS H—SSHAL	D R E G H—SSH□S H—SSH□L
3	1,440	2,490
4	1,490	2,420
5	1,540	2,570
6	1,690	2,740
8	1,940	3,070
10	2,250	3,350

■M Powdered high-speed steel (TiCN)

D	Ⓐ H—SSPAS H—SSPAL	D R E G H—SSP□S H—SSP□L
3	1,750	2,890
4	1,810	2,800
5	1,890	2,990
6	2,120	3,310
8	2,600	3,880
10	3,060	4,340

SHOULDER PUNCHES
—DOUBLE STEPPED TYPE—

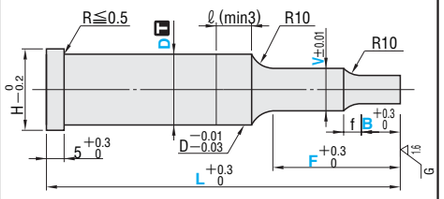
Detail P.657

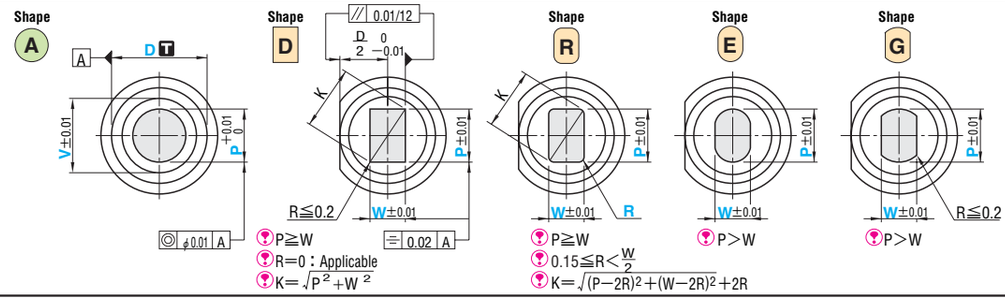
The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type	Shape
RoHS	D_{m5}	SKD 11 or equivalent 60~63HRC	SPTW	A
		SKH51 61~64HRC	SHTW	D
		Powdered high-speed steel 64~67HRC	PHTW	R
	$D^{+0.005}_{0}$	SKD 11 or equivalent 60~63HRC	A—SPTW	E
		SKH51 61~64HRC	A—SHTW	G
		Powdered high-speed steel 64~67HRC	A—PHTW	

Shank Dia.Tolerance D T $m5$ · $^{+0.005}_{0}$ Selectable

Select tip shape from Shape A~G shown below.





Ⓟ P≧W
Ⓟ R=0 : Applicable
Ⓟ $K=\sqrt{P^2+W^2}$

Ⓟ P≧W
Ⓟ $0.15 \leqq R < \frac{W}{2}$
Ⓟ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Ⓟ P>W

Ⓟ P>W

Catalog No. Type	Shape	D	L (Selection)	0.01mm increments / 0.1mm increments Ⓐ P	Ⓐ B	Diagonal Kmax	0.01mm increments / 0.1mm increments DREG P·W	DREG B	0.01mm R R	0.01mm increments V	0.1mm increments F	H
(D_{m5}) SPTW SHTW PHTW	A D R	3	40·50·60·70·80	0.500~ 0.999	2.0~10.0	2.96	0.70 ~ 1.49	2.0~ 8.0	0.15≦R<$\frac{W}{2}$ Ⓡ only	Ⓐ: D>V>P+0.01 DREG: D>V>(P·K)+0.03	B+f+2<F≦Fmax & Ⓐ: F≦L−25 DREG: F≦L−30	5
				1.000~ 1.999	2.0~20.0		1.50 ~ 1.99	2.0~13.0				
				2.000~ 2.980	2.0~35.0		2.00 ~ 2.96	2.0~19.0				
		4	40·50·60·70·80	0.500~ 0.999	2.0~10.0	3.96	0.80 ~ 1.49	2.0~ 8.0				7
				1.000~ 1.999	2.0~20.0		1.50 ~ 1.99	2.0~13.0				
				2.000~ 3.980	2.0~35.0		2.00 ~ 3.49	2.0~19.0				
				2.000~ 3.980	2.0~35.0		3.50 ~ 3.96	2.0~25.0				
		5	40·50·60·70·80	1.000~ 1.999	2.0~20.0	4.96	0.80 ~ 1.49	2.0~ 8.0				8
				2.000~ 3.999	2.0~35.0		1.50 ~ 1.99	2.0~13.0				
				4.000~ 4.980	2.0~45.0		2.00 ~ 3.49	2.0~19.0				
				4.000~ 4.980	2.0~45.0		3.50 ~ 4.96	2.0~25.0				
		6	40·50·60·70·80	1.000~ 1.999	2.0~20.0	5.96	0.80 ~ 1.49	2.0~ 8.0				9
				2.000~ 3.999	2.0~35.0		1.50 ~ 1.99	2.0~13.0				
				4.000~ 5.980	2.0~45.0		2.00 ~ 3.49	2.0~19.0				
				4.000~ 5.980	2.0~45.0		3.50 ~ 4.99	2.0~25.0				
				4.000~ 5.980	2.0~45.0		5.00 ~ 5.96	2.0~30.0				
		8	40·50·60·70·80·90·100	1.000~ 1.999	2.0~20.0	7.96	1.00 ~ 1.49	2.0~ 8.0				11
				2.000~ 3.999	2.0~35.0		1.50 ~ 1.99	2.0~13.0				
				4.000~ 5.999	2.0~45.0		2.00 ~ 3.49	2.0~19.0				
				6.000~ 7.980	2.0~60.0		3.50 ~ 4.99	2.0~25.0				
				6.000~ 7.980	2.0~60.0		5.00 ~ 7.96	2.0~30.0				
($D^{+0.005}_{0}$) A—SPTW A—SHTW A—PHTW	E G	10	40·50·60·70·80·90·100	1.500~ 1.999	2.0~20.0	9.96	1.25 ~ 1.49	2.0~ 8.0				13
				2.000~ 3.999	2.0~35.0		1.50 ~ 1.99	2.0~13.0				
				4.000~ 5.999	2.0~45.0		2.00 ~ 3.49	2.0~19.0				
				6.000~ 9.980	2.0~60.0		3.50 ~ 4.99	2.0~25.0				
				6.000~ 9.980	2.0~60.0		5.00 ~ 9.96	2.0~30.0				
		13	40·50·60·70·80·90·100	3.000~ 3.999	2.0~35.0	12.96	1.50 ~ 1.99	2.0~13.0				16
				4.000~ 5.999	2.0~45.0		2.00 ~ 3.49	2.0~19.0				
				6.000~12.980	2.0~60.0		3.50 ~ 4.99	2.0~25.0				
				6.000~12.980	2.0~60.0		5.00 ~ 12.96	2.0~30.0				
		16	40·50·60·70·80·90·100	5.000~ 5.999	2.0~45.0	15.96	2.00 ~ 3.49	2.0~19.0				19
				6.000~15.980	2.0~60.0		3.50 ~ 4.99	2.0~25.0				
				6.000~15.980	2.0~60.0		5.00 ~ 15.96	2.0~30.0				
		20	40·50·60·70·80·90·100	6.500~19.980	2.0~60.0	19.96	2.50 ~ 3.49	2.0~19.0				23
				6.500~19.980	2.0~60.0		3.50 ~ 4.99	2.0~25.0				
				6.500~19.980	2.0~60.0		5.00 ~ 19.96	2.0~30.0				
		25	40·50·60·70·80·90·100	9.000~24.980	2.0~60.0	24.96	3.00 ~ 3.49	2.0~19.0				28
				9.000~24.980	2.0~60.0		3.50 ~ 4.99	2.0~25.0				
				9.000~24.980	2.0~60.0		5.00 ~ 24.96	2.0~30.0				

V	Fmax
0.510~0.999	10
1.000~1.999	20
2.000~3.999	35
4.000~5.999	45
6.000~	60

For dimension f, make sure that (V−P)/2=X is true for Ⓐ and (V−W)/2=X for DREG and G referring to punch R lengths on P.1208.

Ⓟ V>D−0.03→ ℓ =0, When V>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead)is not available.

Order

Catalog No.	L	P	W	B	V	F	R(Ⓡ only)
SPTWA 10	80	P9.50		B30	V9.80	F45	
A—PHTWR13	80	P10.50	W7.34	B25	V12.00	F45	R0.5

Delivery • Ⓐ 3 Days | Express A 800/1Pc. P.38 • DREG 3 Days

Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration — Catalog No. — L(LC·LCT·LMT) — P — W — B — V — F — R(Ⓡ only) — (HC·TC·KC···etc·)

SPTWA 10 — LC72 — P4.80 — B10 — V6.80 — F40 — HC12

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		SC	Finishes blade with lapping. Ⓟ Dimension P tolerance and the specification unit remain the same. Ⓧ Ⓡ shape is not applicable with a corner radius of 0.		1,200 (only Ⓐ 800)
	PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−0.2)/2 Ⓧ PCC·GC:Not applicable	——	400
	PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−0.2)/2 Ⓧ PRC·GC:Not applicable	——	200
	GC	GC	20°≦GC<90° 1° increments Blade length B≧g+2 g=P/2×tan(90°−GC°) Ⓟ When used with SC, tip and edge are rounded. Ⓧ P<1.0:Not applicable Ⓧ LKC·LKZ·LCT·LMT·PRC·PCC:Not applicable	——	400
	P W	PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓟ (P : 0.001mm incr.)	Changes tolerance on P(W). P·W±0.01 ⇨ $^{+0.01}_{0}$	400
	V	VKC	Changes tolerance on V $V^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓟ (V : 0.001mm incr.)	Changes tolerance on V V±0.01 ⇨ $^{+0.01}_{0}$	400
Full length	LC	LC	Changes full length. 25+F≦LC<L 0.1mm increments (Combination with LKC·LKZ →0.01mm increments)	Changes full length. 30+F≦LC<L 0.1mm increments	200
	TC LC L	LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓟ) are the same as LC. TKC $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		300
	TC LC L	LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓟ) are the same as LC. TKM $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		
	L T	LKC	Changes full length tolerance.	$L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	400
		LKZ	Changes full length tolerance.	$L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$	600

Alterations		Code	Ⓐ	DREG	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC applicable	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments Ⓧ KC·WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments Ⓧ KC·WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. Ⓧ Punch & retainer set not applicable	0
	H HC	HC	Changes head diameter. D≦HC<H 0.1mm increments Ⓧ Punch & retainer set not available.		200
	TC T	TC	Changes head thickness 2≦TC<5 0.1mm incr.(Comb. with TKC·TKM·LCT·LMT →0.01mm incr.) Ⓟ L is shortened by (5—TC). When used with LC, LCT, LMT, L remains the same as specified. Ⓧ Punch & retainer set not available.		200
	T T	TKC	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		200
	T T	TKM	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		200
	TCC	TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓟ H≦5 : TCC 0.5		200
		RC	Reduces head thickness by $^{0}_{-0.04}$ from retainer surface. Ⓧ Not applicable $D^{+0.005}_{0}$ type.		200
Shank		SKC	Adds key flat on shank. ·D3~6 V≦D−1.2 (Machining width 0.5) ·D8~ V≦D−2.2 (Machining width 1) Ⓧ KC·WKC·KFC : Not applicable Ⓧ Punch & retainer set not available.		600
	ℓ D	NDC	No press-in lead ℓ ≧3⇨ℓ =0 Ⓧ Punch & retainer set not available.		0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 100 yen required.
Example : A—SHTWA5, the price is 940 (SHTWA5 unit price) +100 = 1,040 yen (product unit)

■M SKD11 or equivalent

D	Ⓐ SPTWA	DREG SPTW□
3	830	1,630
4	850	1,580
5	870	1,660
6	870	1,720
8	1,170	2,040
10	1,320	2,180
13	1,440	2,550
16	1,640	3,070
20	2,090	3,870
25	2,500	4,250

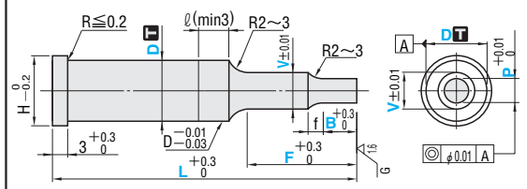
■M SKH51

D	Ⓐ SHTWA	DREG SHTW□
3	930	1,760
4	930	1,710
5	940	1,780
6	980	1,840
8	1,320	2,250
10	1,490	2,380
13	1,640	2,680
16	1,850	3,700
20	2,340	4,550
25	2,740	4,770

■M Powdered high-speed steel

D	Ⓐ PHTWA	DREG PHTW□
3	1,220	2,360
4	1,270	2,050
5	1,290	2,170
6	1,410	2,350
8	2,070	3,070
10	2,440	3,420
13	3,350	4,590
16	4,220	5,730
20	5,290	7,170
25	6,040	8,060

SHOULDER PUNCHES
—QUILL, DOUBLE STEPPED TYPE—

Type	Shank dia. D T	W H	Catalog No. Type	Catalog No. Shape	Shape
RoHS	D_{m5}	SKH51 61~64HRC	SHTW	Ⓐ	
		Powdered high-speed steel 64~67HRC	PHTW		
	$D^{+0.005}_{0}$	SKH51 61~64HRC	A—SHTW		
		Powdered high-speed steel 64~67HRC	A—PHTW		

Catalog No. Type	Shape	D	L	0.01mm increments Ⓐ P	0.1mm increments Ⓐ B	0.01mm increments V	0.1mm increments F	H
(D_{m5}) SHTW PHTW	Ⓐ	1.6	20 25 30 35 40 50 60	0.30~0.49	1.0~ 3.0	D>V>P+0.01	B+f+1<F≦Fmax F<L−12	2.6
				0.50~0.79	1.0~ 5.0			
				0.80~0.99	1.0~ 8.0			
				1.00~1.56	1.0~10.0			
($D^{+0.005}_{0}$) A—SHTW A—PHTW		2.0		0.50~0.79	1.0~ 5.0			3.0
				0.80~0.99	1.0~ 8.0			
				1.00~1.96	1.0~10.0			
		2.5		0.80~0.99	1.0~ 8.0			3.5
				1.00~2.46	1.0~10.0			

V	Fmax.
0.31~0.49	6
0.50~0.79	8
0.80~0.99	10
1.00~1.99	20
2.00~	35

For dimension **f**, make sure that (V−P)/2=X is true for Ⓐ referring to punch R lengths on P.1208.

Ⓨ V>D−0.03→ℓ=0, When V>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead)is not available.

Order

Catalog No.	L	P	B	V	F
A—SHTWA2.0	40	P0.85	B2	V1.50	F10

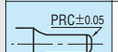
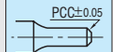
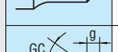
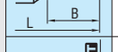
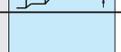
Delivery 3 Days — Express A 800/1Pc. ⊗Express service A is not available for alteration PKC. P.38

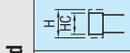
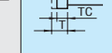
Ⓨ A flat charge of 2,160 yen for 3 pieces or more of the same size.

¥ The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No.	L(LC・LCT・LMT)	P	B	V	F	(HC・TC・KC…etc.)
A—SHTWA2.0	LC45	P0.76	B3	V1.2	F10	HC2.8

Alterations		Code	Ⓐ	¥/1Code
Tip		SC	Finishes blade with lapping. Ⓨ Dimension P tolerance and the specification unit remain the same.	800
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 ⊗PCC・GC:Not applicable	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 ⊗PRC・GC:Not applicable	200
		GC	20°≦GC<90° 1° increments Blade length B≧g+2 g=P/2×tan(90°−GC°) ⊗P<1.0:Not applicable Ⓨ When used with SC, tip and edge are rounded. ⊗LKC・LKZ・LCT・LMT・PRC・PCC:Not applicable	400
		PKC	Changes tolerance on P(W). $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P : 0.001mm incr.) ⊗Express service:Not applicable	400
Full length		LC	Changes full length. Alteration is available with the following range. 0.1mm increments D: 1.6~2.5, LC: 20<LC<60 Ⓨ When LC is less than 25, the blade length B is fixed to 4mm. (Combination with LKC・LKZ→0.01mm increments)	200
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKC T +0.3 0 ⇨ +0.02 0 + LC + Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKM T +0.3 0 ⇨ 0 −0.02 + LC + Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0	600

Alterations		Code	Ⓐ	¥/1Code
Head		KC	Adds single key flat at head.	200
		WKC	Adds double key flats in parallel.	400
		KFC	0° 90° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	600
		HC	Changes head diameter. D≦HC<H 0.1mm increments	200
		TC	Changes head thickness 2≦TC<3 0.1mm incr.(Comb. with TKC・TKM・LCT・LMT→0.01mm incr.) Ⓨ L is shortened by (3−TC). When used with LC, LCT, LMT, L remains the same as specified.	200
		TKC	Changes head thickness tolerance. T +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness tolerance. T +0.3 0 ⇨ 0 −0.02	200
		TCC	Adds Chamfering to head. (C0.5) Strengthen the punch head. P.1223 Ordering method TCC0.5 ⊗H<2.6:Not applicable	200
Shank		NDC	No press-in lead ℓ≧3⇨ℓ=0	0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 100 yen required.

Example : A—SHTWA1.6, the price is 690 (SHTWA1.6 unit price) +100 = 790 yen (product unit)

D	Ⓐ SHTWA	Ⓐ PHTWA
1.6	690	1,040
2.0	690	1,040
2.5	690	1,040

D-CUT SHOULDER PUNCHES
—STANDARD TYPE / TiCN COATING TYPE—

Quality Improved

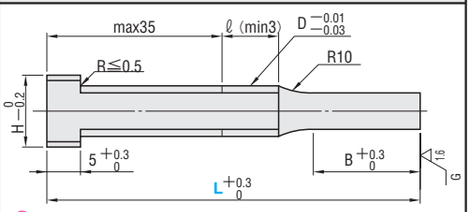
PRODUCTS DATA P.1220

COATING PUNCHES—TiCN— QUALITY IMPROVED P.1217

The volume discount rate is also applicable to alteration cost. P.39

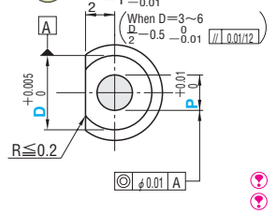
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length
RoHS	D +0.005 0	SKD 11 or equivalent 60~63HRC	G—SP	A D R E G	S
		SKH51 61~64HRC	G—SH		L
		Powdered high-speed steel 64~67HRC	G—PH		X
		SKH51 61~64HRC Surface 3000HV	TiCN coating GH—SH		Blade length(B) X>L>S
		Powdered high-speed steel 64~67HRC Surface 3000HV	TiCN coating GH—PH		

Select tip shape from shape A~G shown below.

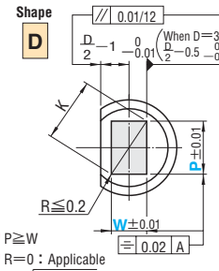


The tip grinding is processed before coating for TiCN coating products.

Shape A

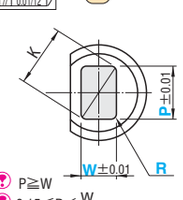


Shape D



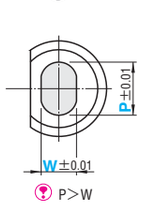
- P≧W
- R=0 : Applicable
- K=√(P²+W²)

Shape R



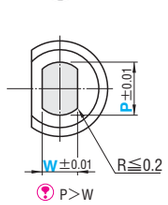
- P≧W
- 0.15≦R< W/2
- K=√((P−2R)²+(W−2R)²+2R

Shape E



- P>W

Shape G



- P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG W max.	DREG P·Wmin.	R R	B	H
G—SP	Ⓐ	S	3	40 50 60 70 80 90 100	1.00~ 1.80				0.15≦R< W/2 (R only)	8	5
G—SH	D		4	40 50 60 70 80 90 100	1.00~ 2.80	3.97	2.80	1.00			7
G—PH	R		5	40 50 60 70 80 90 100	2.00~ 3.80	4.97	3.80	1.20			8
TiCN coating GH—SH	E		6	40 50 60 70 80 90 100	2.00~ 4.80	5.97	4.80	1.50			9
GH—PH	G		8	(40) 50 60 70 80 90 100	3.00~ 5.80	7.97	5.80	2.00		13	11
			10	(40) 50 60 70 80 90 100	3.00~ 7.80	9.97	7.80	2.50			13
			13	(40) 50 60 70 80 90 100	6.00~10.80	12.97	10.80	3.00			16
			16	(40) 50 60 70 80 90 100	10.00~13.80	15.97	13.80	4.00		19	19
			20	(40) 50 60 70 80 90 100	13.00~17.80	19.97	17.80	5.00			23
			25	(40) 50 60 70 80 90 100	18.00~22.80	24.97	22.80	6.00			28
		L	3	40 50 60 70 80 90 100	1.00~ 1.80						7
			4	50 60 70 80 90 100	1.00~ 2.80	3.97	2.80	2.00		13	7
			5	50 60 70 80 90 100	2.00~ 3.80	4.97	3.80	2.00			8
			6	50 60 70 80 90 100	2.00~ 4.80	5.97	4.80	2.00			9
			8	50 60 70 80 90 100	3.00~ 5.80	7.97	5.80	2.50		19	11
			10	50 60 70 80 90 100	3.00~ 7.80	9.97	7.80	2.50			13
			13	50 60 70 80 90 100	6.00~10.80	12.97	10.80	3.00			16
			16	60 70 80 90 100	10.00~13.80	15.97	13.80	4.00		25	19
			20	60 70 80 90 100	13.00~17.80	19.97	17.80	5.00			23
			25	60 70 80 90 100	18.00~22.80	24.97	22.80	6.00			28
		X	3	50 60 70 80 90 100	1.20~ 1.80					19	5
			4	50 60 70 80 90 100	1.20~ 2.80	3.97	2.80	2.00			7
			5	60 70 80 90 100	2.00~ 3.80	4.97	3.80	3.50		25	8
			6	60 70 80 90 100	2.00~ 4.80	5.97	4.80	3.50			9
			8	60 70 80 90 100	3.00~ 5.80	7.97	5.80	5.00		30	11
			10	60 70 80 90 100	3.00~ 7.80	9.97	7.80	5.00			13
			13	60 70 80 90 100	6.00~10.80	12.97	10.80	5.00			16
			16	70 80 90 100	10.00~13.80					40	19
			20	70 80 90 100	13.00~17.80						23
			25	70 80 90 100	18.00~22.80						28

- L (40) → B=8, When L (40), the blade length is fixed to 8mm.
- DREG : P·K>D−0.05→ ℓ =0, When P·K>D−0.05 shaped punch, D −0.01 −0.03 (press-in lead) is not available.

When dimension D is 3~6, width a is 0.5mm.
When dimension D is 8~25, width a is 1.0mm.

Order

Catalog No. — L — P — W — R(R only)

G—PHDL 13 — 80 — P10.50 — W7.34

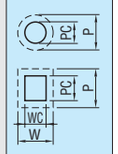
Delivery

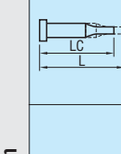
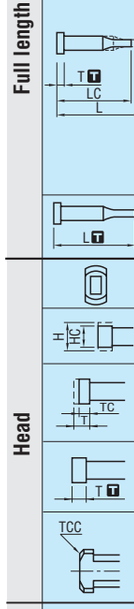
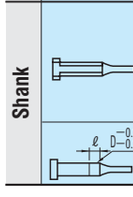
- Ⓐ 3 Days — Express A 500/1Pc.
  - ⊗Express service A is not available for GH-SH· GH-PH.
  - A flat charge of 1,350 yen for 3 pieces or more of the same size.
- DREG 3 Days — Express A 800/1Pc.
  - ⊗Express service A is not available for GH-SH· GH-PH.
  - A flat charge of 2,160 yen for 3 pieces or more of the same size.

P.38

Alteration Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC···etc.)

G—SPAS 10 — LC72 — PC2.80 — BC8

Alterations	Code	Ⓐ	DREG	¥/1Code
Tip 	PC WC	Changes dimension P. PC≧ Pmin./2 0.01mm increments (R)TiCN coating type: PC>Pmin/2>1.00 (Combination with PKC→ 0.001mm increments) P(PC) 0.500~0.799 10; 0.800~0.999 13; 1.000~1.999 20; 2.000~3.999 35; 4.000~4.999 45; 5.000~5.999 50; 6.000~ 60 (Bmax) Changes blade length B. 2≦BC≦Bmax 0.1mm increments (R)Full length L (LC) requires BC+25mm or more.	Changes dimension P·W. PC/WC ≧ P·Wmin./2 ≧0.80 0.01mm increments (R)TiCN coating type: PC/WC ≧ P·Wmin./2 ≧1.00 P(PC)·W(WC) 0.80~1.49 8; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30 (Bmax) Changes blade length B. 2≦BC≦Bmax 0.1mm increments (R)Full length L (LC) requires BC+30mm or more. ⊗Blade length X:Not applicable	200
	BC			200
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (R)PRC≦(P−0.2)/2 ⊗PCC·GC:Not applicable	——	400
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (R)PCC≦(P−0.2)/2 ⊗PRC·GC:Not applicable	——	200
	GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B≧f+2 f=P/2×tan(90°−GC°) (R)When used with SC, tip and edge are rounded. ⊗LKC·LKZ·LCT·LMT·PRC·PCC:Not applicable	——	400
	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P:0.001mm incr.) ⊗TiCN coating type, D>13:Not applicable	Changes tolerance on P(W). P·W±0.01 ⇨ +0.01 0	400 (TiCN coating 600)

Alterations	Code	Ⓐ	DREG	¥/1Code
Full length 	LC	Changes full length. 25+B(BC)≦LC<L 0.1mm increments (R)When LC—B (BC) is 25mm or less, B (BC) is LC—25mm.	Changes full length. 30+B(BC)≦LC<L 0.1mm increments (R)When LC—B (BC) is 30mm or less, B (BC) is LC—30mm. (Combination with LKC·LKZ→0.01mm increments)	200
	LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (R) are the same as LC. TKC T +0.3 0 ⇨ +0.02 0 + LC + L +0.3 0 ⇨ +0.1 0 Changes full length tolerance.		300
	LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (R) are the same as LC. TKM T +0.3 0 ⇨ 0 −0.02 + LC + L +0.3 0 ⇨ +0.1 0 Changes full length tolerance.		
	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
	LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0 ⊗TiCN coating type: Not applicable		600
Head 	WKC	Adds double key flats in parallel.		200
	HC	Changes head diameter. D≦HC<H 0.1mm increments		200
	TC	Changes head thickness 2≦TC<5 0.1mm incr. (Comb. with TKC·TKM·LCT·LMT→0.01mm incr.) (R)L is shortened by (5—TC) When used with LC, LCT, LMT, L remains the same as specified.		200
	TKC	Changes head thickness tolerance. T +0.3 0 ⇨ +0.02 0		200
	TKM	Changes head thickness tolerance. T +0.3 0 ⇨ 0 −0.02		200
	TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 (R)H≦5 : TCC 0.5		200
Shank 	SKF	Changes cutting width of flat cutting on the shank. SKF −0 −0.01 Ⓐ P≦2(SKF−0.1) 0.1mm increments DREG W≦2(SKF−0.1) 0.1mm increments 0.3D≦SKF≦D/2−0.1 ⊗WKC:Not applicable		200
	NDC	No press-in lead ℓ ≧3⇨ℓ =0		0

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

(R)To be quoted on price & lead time above Max. Q'ty.

M SKD 11 or equivalent

D	Ⓐ G—SPAS G—SPAL	Ⓐ G—SPAX	DREG G—SP□S G—SP□L	DREG G—SP□X
3	950	1,140	—	—
4	950	1,140	1,670	1,860
5	970	1,160	1,750	1,940
6	980	1,170	1,800	1,990
8	1,040	1,230	1,890	2,080
10	1,150	1,340	2,000	2,190
13	1,250	1,440	2,330	2,520
16	1,360	1,550	2,770	—
20	1,530	1,720	3,280	
25	1,980	2,170	3,710	

M SKH51

D	Ⓐ G—SHAS G—SHAL	Ⓐ G—SHAX	DREG G—SH□S G—SH□L	DREG G—SH□X
3	1,030	1,220	—	—
4	1,030	1,220	1,780	1,970
5	1,030	1,220	1,850	2,040
6	1,050	1,240	1,900	2,090
8	1,150	1,340	2,060	2,250
10	1,280	1,470	2,170	2,360
13	1,450	1,640	2,500	2,690
16	1,610	1,800	2,980	—
20	1,830	2,020	3,540	
25	2,460	2,650	4,010	

M Powdered high-speed steel

D	Ⓐ G—PHAS G—PHAL	Ⓐ G—PHAX	DREG G—PH□S G—PH□L	DREG G—PH□X
3	1,280	1,470	—	—
4	1,280	1,470	2,080	2,270
5	1,310	1,500	2,190	2,380
6	1,400	1,590	2,360	2,550
8	1,720	1,910	2,720	2,910
10	2,010	2,200	2,960	3,150
13	2,710	2,900	3,910	4,100
16	3,120	3,310	4,600	—
20	3,760	3,950	5,600	
25	4,510	4,700	6,540	

M SKH51 (TiCN coating)

D	Ⓐ GH—SHAS GH—SHAL	Ⓐ GH—SHAX	DREG GH—SH□S GH—SH□L	DREG GH—SH□X
3	2,160	2,330	—	—
4	2,160	2,350	2,910	3,100
5	2,210	2,400	3,030	3,220
6	2,350	2,540	3,200	3,390
8	2,590	2,780	3,500	3,690
10	2,860	3,050	3,750	3,940
13	3,180	3,370	4,230	4,420
16	3,510	3,700	4,880	—
20	3,920	4,110	5,630	
25	4,640	4,830	6,190	

M Powdered high-speed steel (TiCN coating)

D	Ⓐ GH—PHAS GH—PHAL	Ⓐ GH—PHAX	DREG GH—PH□S GH—PH□L	DREG GH—PH□X
3	2,450	2,640	—	—
4	2,450	2,640	3,340	3,530
5	2,530	2,720	3,510	3,700
6	2,740	2,930	3,810	4,000
8	3,200	3,390	4,330	4,520
10	3,630	3,820	4,710	4,900
13	4,490	4,680	5,840	6,030
16	5,070	5,260	6,580	—
20	5,900	6,090	7,760	
25	6,740	6,930	8,750	

PRESS NEW

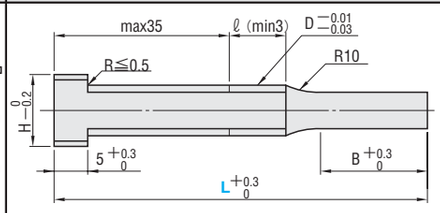
D-CUT SHOULDER PUNCHES
—WPC® TYPE / HW COATING TYPE—

PRODUCTS DATA P.1221

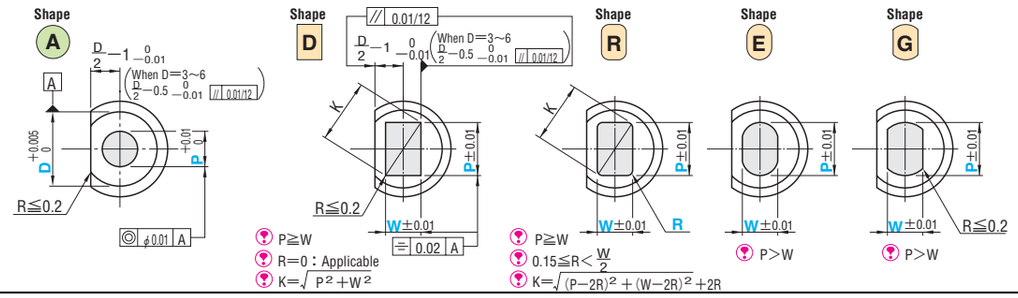
The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length
—WPC® type— RoHS	D +0.005 0	SKD 11 or equivalent 60～63HRC Surface 1000～1100HV	GW—SP	A D R E G	S
		SKH51 61～64HRC Surface 1000～1100HV	GW—SH		L
—HW coating—		Powdered high-speed steel 64～67HRC Surface 1000～1100HV	GW—PH		X
		SKH51 61～64HRC Surface 3000HV	GHW—SH		Blade length(B) X>L>S
		Powdered high-speed steel 64～67HRC Surface 3000HV	GHW—PH		

Select tip shape from shape A～G shown below.



The tip is very slightly rounded.



- Shape A: P≧W
- Shape D: R=0：Applicable; K=√(P²+W²)
- Shape R: P≧W; 0.15≦R<W/2; K=√((P−2R)²+(W−2R)²)+2R
- Shape E: P>W
- Shape G: P>W

Catalog No. Type	Shape	B Point length	D	L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG W max.	DREG P·Wmin.	Ⓡ R	B	H
—WPC®— GW—SP	A	S	3	40 50 60 70 80 90 100	1.00～ 1.80					8	5
			4	40 50 60 70 80 90 100	1.00～ 2.80	3.97	2.80	1.00			7
GW—SH	D		5	40 50 60 70 80 90 100	2.00～ 3.80	4.97	3.80	1.20			8
			6	40 50 60 70 80 90 100	2.00～ 4.80	5.97	4.80	1.50			9
GW—PH	R		8	(40) 50 60 70 80 90 100	3.00～ 5.80	7.97	5.80	2.00		13	11
			10	(40) 50 60 70 80 90 100	3.00～ 7.80	9.97	7.80	2.50			13
—HW coating—	E		13	(40) 50 60 70 80 90 100	6.00～10.80	12.97	10.80	3.00			16
			16	(40) 50 60 70 80 90 100	10.00～13.80	15.97	13.80	4.00		19	19
GHW—SH	G		20	(40) 50 60 70 80 90 100	13.00～17.80	19.97	17.80	5.00			23
			25	(40) 50 60 70 80 90 100	18.00～22.80	24.97	22.80	6.00			28
		L	3	40 50 60 70 80 90 100	1.00～ 1.80						7
GW—PH			4	50 60 70 80 90 100	1.00～ 2.80	3.97	2.80	2.00		13	7
			5	50 60 70 80 90 100	2.00～ 3.80	4.97	3.80	2.00			8
			6	50 60 70 80 90 100	2.00～ 4.80	5.97	4.80	2.00			9
			8	50 60 70 80 90 100	3.00～ 5.80	7.97	5.80	2.50	0.15≦R<W/2 (Ⓡ only)	19	11
			10	50 60 70 80 90 100	3.00～ 7.80	9.97	7.80	2.50			13
			13	50 60 70 80 90 100	6.00～10.80	12.97	10.80	3.00			16
			16	60 70 80 90 100	10.00～13.80	15.97	13.80	4.00		25	19
			20	60 70 80 90 100	13.00～17.80	19.97	17.80	5.00			23
			25	60 70 80 90 100	18.00～22.80	24.97	22.80	6.00			28
		X	3	50 60 70 80 90 100	1.20～ 1.80					19	5
			4	50 60 70 80 90 100	1.20～ 2.80	3.97	2.80	2.00			7
			5	60 70 80 90 100	2.00～ 3.80	4.97	3.80	3.50		25	8
			6	60 70 80 90 100	2.00～ 4.80	5.97	4.80	3.50			9
			8	60 70 80 90 100	3.00～ 5.80	7.97	5.80	5.00		30	11
			10	60 70 80 90 100	3.00～ 7.80	9.97	7.80	5.00			13
			13	60 70 80 90 100	6.00～10.80	12.97	10.80	5.00			16
			16	70 80 90 100	10.00～13.80				—	40	19
			20	70 80 90 100	13.00～17.80						23
			25	70 80 90 100	18.00～22.80						28

- L (40) → B=8, When L (40), the blade length is fixed to 8mm.
- DREG: P·K>D−0.05→ℓ=0, When P·K>D−0.05 shaped punch, D −0.01 −0.03 (press-in lead) is not available
- When dimension D is 3～6, width a is 0.5mm.
- When dimension D is 8～25, width a is 1.0mm.

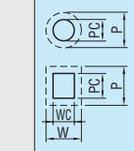
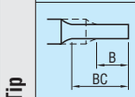
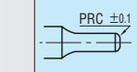
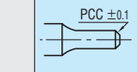
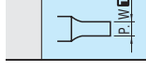
Order Catalog No. — L — P — W — R(Ⓡ only)
GW—PHDL 13 — 80 — P10.50 — W7.34

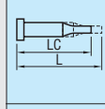
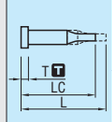
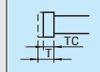
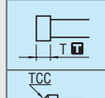
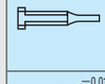
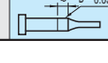
Delivery

■WPC® type (GW—)
- Ⓐ: 3 Days; Express A 500/1Pc. P.38
  - A flat charge of 1,350 yen for 3 pieces or more of the same size.
- DREG: 3 Days; Express A 800/1Pc. P.38
  - A flat charge of 2,160 yen for 3 pieces or more of the same size.

■HW coating (GHW—): 3 Days

Alteration Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC···etc.)
GW—SPAS 10 — LC72.0 — PC2.80 — BC8

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧P min./2 0.01mm increments (Combination with PKC→ 0.001mm increments) P(PC) / Bmax: 0.500～0.799 10; 0.800～0.999 13; 1.000～1.999 20; 2.000～3.999 35; 4.000～4.999 45; 5.000～5.999 50; 6.000～ 60 ⊗PC<1.00HW coating not applicable	Changes dimension P·W. PC≧P·Wmin./2≧0.80 0.01mm increments P(PC)·W(WC) / Bmax: 0.80～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	200
		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L (LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L (LC) requires BC+30mm or more. ⊗ Blade length X:Not applicable	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 Ⓨ (P:0.001mm incr.)	Changes tolerance on P(W). P·W±0.01 ⇨ +0.01 0	400
			⊗HW coating not applicable		

Alterations		Code	Ⓐ	DREG	¥/1Code
Full length		LC	Changes full length. 25+B(BC)≦LC<L 0.1mm increments Ⓨ When LC—B (BC) is 25mm or less, B (BC) is LC—25mm.	Changes full length. 30+B(BC)≦LC<L 0.1mm increments Ⓨ When LC—B (BC) is 30mm or less, B (BC) is LC—30mm.	200
			(Combination with LKC・LKZ→0.01mm increments)		
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKC T +0.3 0 ⇨ +0.02 0 + LC + Changes full length tolerance. L +0.3 0 ⇨ +0.1 0		300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKM T +0.3 0 ⇨ 0 −0.02 + LC + Changes full length tolerance. L +0.3 0 ⇨ +0.1 0		
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
Head		WKC	Adds double key flats in parallel.		200
		HC	Changes head diameter. D≦HC<H 0.1mm increments		200
		TC	Changes head thickness 2≦TC<5 0.1mm incr. (Comb. with TKC・TKM・LCT・LMT→0.01mm incr.) Ⓨ L is shortened by (5—TC). When used with LC, LCT, LMT, L remains the same as specified.		200
		TKC	Changes head thickness tolerance. T +0.3 0 ⇨ +0.02 0		200
		TKM	Changes head thickness tolerance. T +0.3 0 ⇨ 0 −0.02		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓨ H≦5：TCC 0.5		200
Shank		SKF	Changes cutting width of flat cutting on the shank. SKF −0 −0.01 Ⓐ P≦2(SKF−0.1) 0.1mm increments DREG W≦2(SKF−0.1) 0.1mm increments 0.3D≦SKF≦D/2−0.1 ⊗WKC:Not applicable		200
		NDC	No press-in lead ℓ≧3⇨ℓ=0		0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

■M SKD 11 or equivalent —WPC®—

D	Ⓐ GW—SPAS GW—SPAL	Ⓐ GW—SPAX	DREG GW—SP□S GW—SP□L	DREG GW—SP□X
3	1,940	2,040	—	—
4	1,960	2,050	2,660	2,850
5	1,970	2,090	2,740	2,930
6	1,980	2,100	2,790	2,980
8	2,050	2,190	2,880	3,070
10	2,150	2,290	3,000	3,180
13	2,250	2,410	3,330	3,520
16	2,360	2,540	3,770	—
20	2,530	2,720	4,280	
25	2,990	3,180	4,710	

■M SKH51 —WPC®—

D	Ⓐ GW—SHAS GW—SHAL	Ⓐ GW—SHAX	DREG GW—SH□S GW—SH□L	DREG GW—SH□X
3	2,000	2,110	—	—
4	2,030	2,120	2,770	2,960
5	2,040	2,150	2,850	3,040
6	2,050	2,170	2,900	3,080
8	2,160	2,300	3,060	3,240
10	2,310	2,450	3,170	3,350
13	2,480	2,630	3,490	3,680
16	2,790	2,960	4,660	—
20	3,190	3,370	5,410	
25	3,950	4,140	5,970	

■M Powdered high-speed steel —WPC®—

D	Ⓐ GW—PHAS GW—PHAL	Ⓐ GW—PHAX	DREG GW—PH□S GW—PH□L	DREG GW—PH□X
3	2,260	2,360	—	—
4	2,280	2,370	3,240	3,420
5	2,310	2,420	3,340	3,530
6	2,400	2,520	3,500	3,690
8	2,700	2,840	3,840	4,030
10	2,980	3,120	4,030	4,210
13	3,700	3,830	4,990	5,190
16	4,070	4,240	5,530	—
20	4,680	4,870	6,490	
25	5,410	5,600	7,370	

■M SKH51 —HW coating—

D	Ⓐ GHW—SHAS GHW—SHAL	Ⓐ GHW—SHAX	DREG GHW—SH□S GHW—SH□L	DREG GHW—SH□X
3	2,710	2,810	—	—
4	2,760	2,850	3,530	3,720
5	2,810	2,940	3,650	3,840
6	2,950	3,080	3,830	4,020
8	3,190	3,350	4,130	4,320
10	3,490	3,650	4,380	4,570
13	3,800	3,970	4,960	5,150
16	4,280	4,470	6,090	—
20	4,890	5,060	7,050	
25	5,720	5,870	7,720	

■M Powdered high-speed steel —HW coating—

D	Ⓐ GHW—PHAS GHW—PHAL	Ⓐ GHW—PHAX	DREG GHW—PH□S GHW—PH□L	DREG GHW—PH□X
3	2,990	3,080	—	—
4	3,090	3,140	4,060	4,250
5	3,160	3,240	4,220	4,420
6	3,380	3,460	4,500	4,700
8	3,830	3,920	4,990	5,180
10	4,260	4,340	5,320	5,510
13	5,090	5,170	6,590	6,790
16	5,660	5,750	7,390	—
20	6,470	6,560	8,780	
25	7,280	7,360	9,970	

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

PRESS ADD.SPEC. Printed in Red

D-CUT JECTOR PUNCHES
—STANDARD TYPE / TiCN COATING TYPE—

Quality Improved

PRODUCTS DATA P.1220

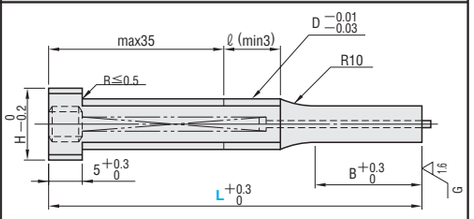
COATING PUNCHES—TiCN— QUALITY IMPROVED P.1217

How to calculate the projection length of a jector pin (reference) P.191

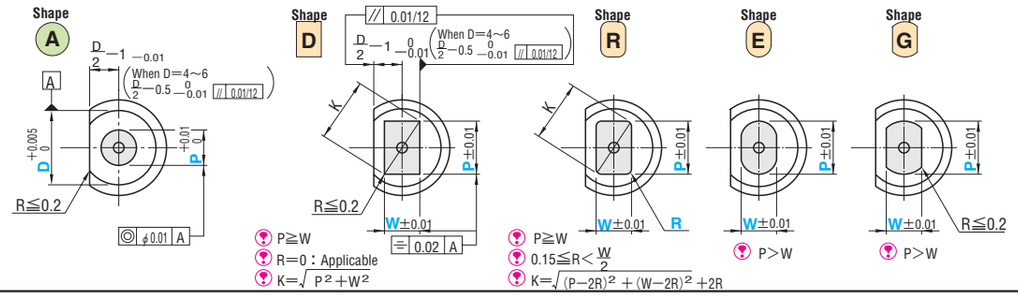
• Refer to Jector punch blank for the details of jector hole. P.186
• Refer to Jector pin set for the details of Jector pin. P.189

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length
RoHS	D +0.005 0	D4~6 SKH51 61~64HRC D8~25 SKD 11 or equivalent 60~63HRC	G-SJ G-SJV	A D R F G	S L X
		Powdered high-speed steel 64~67HRC	G-PJ G-PJV		
		Powdered high-speed steel 64~67HRC Surface 3000HV	TiCN coating type GH-PJ GH-PJV		Blade length(B) X>L>S

Select tip shape from shape A~G shown below.



The tip grinding is processed before coating for TiCN coating products.



P≧W
R=0 : Applicable
K=√(P²+W²)

P≧W
0.15≦R< W/2
K=√((P−2R)² + (W−2R)² +2R

P>W

P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	DREG P·K max.	DREG W max.	DREG P·W min.	Ⓡ R	B	H
G-SJ G-PJ Spring reinforced type G-SJV G-PJV	A	S	(4)	40 50 60 70 80	1.00~ 2.80	3.97	2.80	1.00	0.15≦R< W/2 (Ⓡ only)	8	7
			(5)	40 50 60 70 80	2.00~ 3.80	4.97	3.80	2.00			8
			(6)	40 50 60 70 80	2.00~ 4.80	5.97	4.80	2.00			9
			8	(40) 50 60 70 80 90 100	3.00~ 5.80	7.97	5.80	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00~ 7.80	9.97	7.80	3.00			13
			13	(40) 50 60 70 80 90 100	6.00~10.80	12.97	10.80	6.00			16
			16	(40) (50) 60 70 80 90 100	10.00~13.80	15.97	13.80	6.00		19	19
			20	(40) (50) 60 70 80 90 100	13.00~17.80	19.97	17.80	6.00			23
			25	(40) (50) 60 70 80 90 100	18.00~22.80	24.97	22.80	6.00			28
— TiCN coating — GH-PJ Spring reinforced type GH-PJV	D	L	(4)	50 60 70 80	1.00~ 2.80	3.97	2.80	2.00		13	7
			(5)	50 60 70 80	2.00~ 3.80	4.97	3.80	2.00			8
			(6)	50 60 70 80	2.00~ 4.80	5.97	4.80	2.00			9
	R		8	50 60 70 80 90 100	3.00~ 5.80	7.97	5.80	3.00		19	11
			10	50 60 70 80 90 100	3.00~ 7.80	9.97	7.80	3.00			13
			13	50 60 70 80 90 100	6.00~10.80	12.97	10.80	6.00			16
	F		16	60 70 80 90 100	10.00~13.80	15.97	13.80	6.00		25	19
			20	60 70 80 90 100	13.00~17.80	19.97	17.80	6.00			23
			25	60 70 80 90 100	18.00~22.80	24.97	22.80	6.00			28
G-SJ Spring reinforced type G-SJV	G	X	(5)	60 70 80	2.00~ 3.80	4.97	3.80	3.50		25	8
			(6)	60 70 80	2.00~ 4.80	5.97	4.80	3.50			9
			8	70 80 90 100	3.00~ 5.80	7.97	5.80	5.00		30	11
			10	70 80 90 100	3.00~ 7.80	9.97	7.80	6.00			13
			13	70 80 90 100	6.00~10.80	12.97	10.80	6.00			16
			16	80 90 100	10.00~13.80	—			—	40	19
			20	80 90 100	13.00~17.80						23
			25	80 90 100	18.00~22.80						28

The spring constant of G-SJV, G-PJV and GH-PJV is as twice as that of G-SJ, G-PJ, and GH-PJ.
L (40)→B=6, When L (40), the blade length is fixed to 6mm.
L (50)→B=13, When L (50), the blade length is fixed to 13mm.
DREG : P·K>D−0.05→ ℓ =0, When P·K>D−0.05 shaped punch, D −0.01 −0.03 (press-in lead) is not available.

When dimension D is 4~6, width a is 0.5mm.
When dimension D is 8~25, width a is 1.0mm.

D (4), (5), (6) are applicable for GW-SJ, GW-PJ and GHW-PJ only.

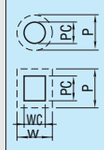
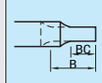
Order: Catalog No. — L — P — W — R(Ⓡ only)
G—SJDS 6 — 60 — P3.00 — W2.80

Benefit of Reinforced spring
It is twice the spring constant of standard type Jector punch. Due to the spring's larger load, more effective scrap removal can be expected.

Delivery
• Ⓐ: 3 Days — Express A 500/1Pc. — Express service A is not available for GH-PJ·GH-PJV. A flat charge of 1,350 yen for 3 pieces or more of the same size. P.38
• DREG: 3 Days — Express A 800/1Pc. — Express service A is not available for GH-PJ·GH-PJV. A flat charge of 2,160 yen for 3 pieces or more of the same size. P.38

The volume discount rate is also applicable to alteration cost. P.39

Alteration: Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC···etc.)
G—SJDS 6 — LC58 — P3.00 — W2.80 — HC8

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧PCmin 0.01mm increments (Combination with PKC →0.001mm increments) ⊗TiCN coating type, D4:Not applicable D≦4: PCmin 0.900; 5: 1.800; 6: 1.800; 8: 2.500; 10: 2.800; 13: 5.000; 16: 8.000; 20: 9.000; 25: 9.000	Changes dimension P·W. PC·WC≧PC·WCmin 0.01mm increments ⊗D4 : Not applicable. ⊗Blade length X:Not applicable D≦4: PC·WCmin 1.80; 5: 1.80; 6: 1.80; 8: 2.50; 10: 2.80; 13: 5.00; 16: 5.00; 20: 5.00; 25: 5.00	200
		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments For Blade length X type with dimension D of 5, 6 PC 1.80~1.99: Bmax 20		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 For dimension d1, refer to P.186. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 For dimension d1, refer to P.186. ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (Dimension P:0.001mm incr.) ⊗TiCN coating type, D>13:Not applicable	Changes tolerance on P(W). P·W±0.01 ⇨ +0.01 0	400 (TiCN coating 600)
Full length		LC	Changes full length. LC<L 0.1mm incr. (combination with LKC·LKZ→0.01mm incr.) B is shortened by (L—LC). The projection length of the jector pin is 2mm.		200
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (?) are the same as LC. TKC T +0.3 0 ⇨ +0.02 0 + LC. Changes full length tolerance. L +0.3 0 ⇨ +0.1 0		300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (?) are the same as LC. TKM T +0.3 0 ⇨ 0 −0.02 + LC. Changes full length tolerance. L +0.3 0 ⇨ +0.1 0		
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0 ⊗TiCN coating type:Not applicable		600

Alterations		Code	Ⓐ	DREG	¥/1Code
Head		WKC	Adds double key flats in parallel.		200
		HC	Changes head diameter. D≦HC<H 0.1mm increments		200
		TC	Changes head thickness 3.5≦TC<5 0.1mm incr. (Comb. with TKC·TKM·LCT·LMT →0.01mm incr.) L is shortened by (5—TC), When used with LC, LCT, LMT, L remains the same as specified.		200
		TKC	Changes head thickness tolerance. T +0.3 0 ⇨ +0.02 0		200
		TKM	Changes head thickness tolerance. T +0.3 0 ⇨ 0 −0.02		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 H≦5 : TCC 0.5		200
Shank		SKF	Changes cutting width of flat cutting on the shank. SKF 0 −0.01 Ⓐ P≦2(SKF−0.1) 0.1mm increments; DREG W≦2(SKF−0.1) 0.1mm increments. D4~6 D/2−0.5≦SKF≦D/2−0.1; D8~25 D/2−1.0≦SKF≦D/2−0.1 ⊗WKC:Not applicable		200
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		−100
		NC	Removes the jector pin. ⊗AC : Not applicable.		−200
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■MSKH51 · SKD 11 or equivalent

D	Ⓐ G-SJAS G-SJAL G-SJVAS G-SJVAL	Ⓐ G-SJAX G-SJVAX	DREG G-SJ□S G-SJ□L G-SJV□S G-SJV□L	DREG G-SJ□X G-SJV□X
4	1,850	—	2,630	—
5	1,790	2,160	2,600	3,130
6	1,790	2,160	2,600	3,130
8	1,870	2,350	2,600	3,260
10	1,960	2,460	2,790	3,500
13	2,070	2,610	3,110	3,910
16	2,290	2,880	3,590	
20	2,500	3,150	4,090	—
25	2,770	3,480	4,650	

■MPowdered high-speed steel

D	Ⓐ G-PJAS G-PJAL G-PJVAS G-PJVAL	DREG G-PJ□S G-PJ□L G-PJV□S G-PJV□L
4	2,710	3,610
5	2,600	3,590
6	2,600	3,650
8	3,030	4,140
10	3,420	4,490
13	4,290	5,620
16	5,070	6,670
20	6,060	8,040
25	7,390	9,530

■MPowdered high-speed steel (TiCN coating)

D	Ⓐ GH-PJAS GH-PJAL GH-PJVAS GH-PJVAL	DREG GH-PJ□S GH-PJ□L GH-PJV□S GHV-PJV□L
4	3,870	4,870
5	3,820	4,910
6	3,940	5,100
8	4,510	5,750
10	5,040	6,260
13	6,070	7,550
16	7,020	8,790
20	8,200	10,380
25	9,620	11,960

PRESS NEW

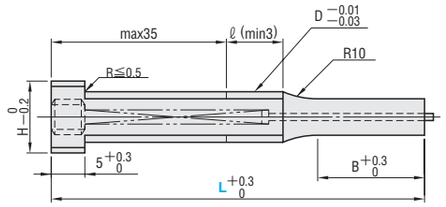
D-CUT JECTOR PUNCHES
—WPC® TYPE / HW COATING TYPE—

PRODUCTS DATA P.1221

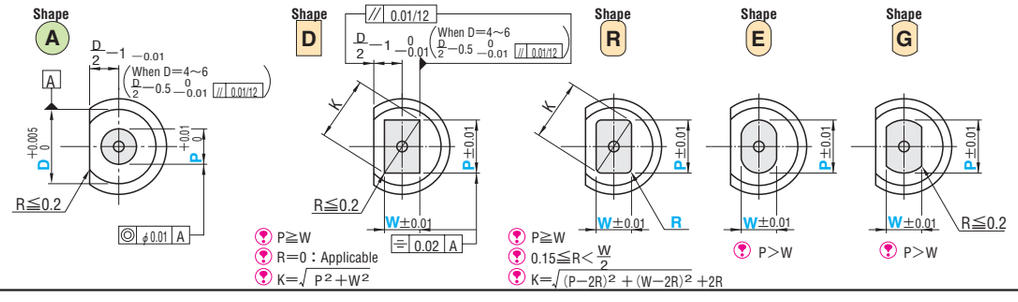
WPC® PUNCHES
COATING PUNCHES—HW—

• Refer to Jector punch blank for the details of jector hole. P.186
• Refer to Jector pin set for the details of Jector pin. P.189

How to calculate the projection length of a jector pin (reference) P.191

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from shape A~G shown below.
—WPC®type— RoHS —HW coating—	D +0.005 0	D4~6 SKH51 61~64HRC Surface1000~1100HV	GW—SJ GW—SJV	A D R E G	S L X	
		D8~25 SKD 11 or equivalent 60~63HRC Surface1000~1100HV				
		Powdered high-speed steel 64~67HRC Surface1000~1100HV	GW—PJ GW—PJV			
		Powdered high-speed steel 64~67HRC Surface 3000HV	GHW—PJ GHW—PJV		Blade length(B) X>L>S	

The tip is very slightly rounded.



Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	Ⓐ P·Kmax.	DREG W max.	DREG P·Wmin.	B R	B	H
—WPC®TYPE— GW—SJ GW—PJ Spring reinforced type GW—SJV GW—PJV —HW coating— GHW—PJ Spring reinforced type GHW—PJV	A D R E G	S	(4)	40 50 60 70 80	1.00~ 2.80	3.97	2.80	1.00	0.15≦R< W/2 (Ⓡ only)	8	7
			(5)	40 50 60 70 80	2.00~ 3.80	4.97	3.80	2.00			8
			(6)	40 50 60 70 80	2.00~ 4.80	5.97	4.80	2.00			9
			8	(40) 50 60 70 80 90 100	3.00~ 5.80	7.97	5.80	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00~ 7.80	9.97	7.80	3.00			13
			13	(40) 50 60 70 80 90 100	6.00~10.80	12.97	10.80	6.00			16
			16	(40) (50) 60 70 80 90 100	10.00~13.80	15.97	13.80	6.00		19	19
			20	(40) (50) 60 70 80 90 100	13.00~17.80	19.97	17.80	6.00			23
			25	(40) (50) 60 70 80 90 100	18.00~22.80	24.97	22.80	6.00			28
		L	(4)	50 60 70 80	1.00~ 2.80	3.97	2.80	2.00		13	7
			(5)	50 60 70 80	2.00~ 3.80	4.97	3.80	2.00			8
			(6)	50 60 70 80	2.00~ 4.80	5.97	4.80	2.00			9
			8	50 60 70 80 90 100	3.00~ 5.80	7.97	5.80	3.00		19	11
			10	50 60 70 80 90 100	3.00~ 7.80	9.97	7.80	3.00			13
			13	50 60 70 80 90 100	6.00~10.80	12.97	10.80	6.00			16
			16	60 70 80 90 100	10.00~13.80	15.97	13.80	6.00		25	19
			20	60 70 80 90 100	13.00~17.80	19.97	17.80	6.00			23
			25	60 70 80 90 100	18.00~22.80	24.97	22.80	6.00			28
—WPC®TYPE— GW—SJ Spring reinforced type GW—SJV		X	(5)	60 70 80	2.00~ 3.80	4.97	3.80	3.50		25	8
			(6)	60 70 80	2.00~ 4.80	5.97	4.80	3.50			9
			8	70 80 90 100	3.00~ 5.80	7.97	5.80	5.00		30	11
			10	70 80 90 100	3.00~ 7.80	9.97	7.80	6.00			13
			13	70 80 90 100	6.00~10.80	12.97	10.80	6.00			16
			16	80 90 100	10.00~13.80	—		—	—	40	19
			20	80 90 100	13.00~17.80						23
			25	80 90 100	18.00~22.80						28

The spring constant of GW-SJV, GW-PJV and GHW-PJV is as twice as that of GW-SJ, GW-PJ and GHW-PJ.
L(40)→B=6, When L(40), the blade length is fixed to 6mm.
L(50)→B=13, When L(50), the blade length is fixed to 13mm.
DREG : P·K>D−0.05→ℓ=0, When P·K>D−0.05 punch with other shape, D −0.01 −0.03 (press-in lead) is not available.

When dimension D is 4~6, width a is 0.5mm.
When dimension D is 8~25, width a is 1.0mm.
D(4), (5), (6) are applicable for GW-SJ, GW-PJ and GHW-PJ only.

Order / Delivery

Catalog No.	L	P	W	R(Ⓡ only)
GW—SJDS 6	60	P3.00	W2.80	

■WPC®type (GW—)
• Ⓐ 3 Days — Express A 500/1Pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.
• DREG 3 Days — Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

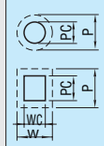
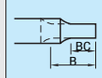
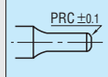
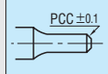
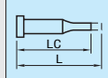
■Benefit of Reinforced spring
It is twice the spring constant of standard type Jector punch. Due to the spring's larger load, more effective scrap removal can be expected.

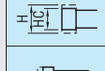
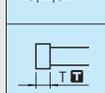
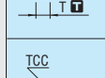
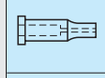
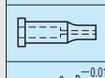
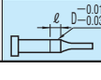
■HW coating (GHW—)
3 Days

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No.	L(LC·LCT·LMT)	P(PC)	W(WC)	R	(BC·HC·TC···etc.)
GW—SJDS 6	LC58	P3.00	W2.80		HC8

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧PCmin 0.01mm increments (Combination with PKC →0.001mm increments) D / PCmin: 4 0.900; 5 1.800; 6 1.800; 8 2.500; 10 2.800; 13 5.000; 16 8.000; 20 9.000; 25 9.000. ⊗PC<1.00HW coating : Not applicable	Changes dimension P·W. PC·WC≧PC·WCmin 0.01mm increments ⊗D4 : Not applicable. ⊗Blade length X:Not applicable. D / PC·WCmin: 5 1.80; 6 1.80; 8 2.50; 10 2.80; 13 5.00; 16 5.00; 20 5.00; 25 5.00	200
		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments For Blade length X type with dimension D of 5, 6. PC: 1.80~1.99 Bmax: 20		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.186. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.186. ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (Dimension P:0.001mm incr.) ⊗HW coating : Not applicable	Changes tolerance on P(W). P·W±0.01 ⇨ +0.01 0	400
Full length		LC	Changes full length. LC<L 0.1mm incr. (combination with LKC·LKZ→0.01mm incr.) B is shortened by (L−LC). The projection length of the jector pin is 2mm.		200
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (?) are the same as LC. TKC T +0.3 0 ⇨ +0.02 0 + LC	Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	300
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (?) are the same as LC. TKM T +0.3 0 ⇨ 0 −0.02 + LC	Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400

Alterations		Code	Ⓐ	DREG	¥/1Code
Head		WKC	Adds double key flats in parallel.		200
		HC	Changes head diameter. D≦HC<H 0.1mm increments		200
		TC	Changes head thickness 3.5≦TC<5 0.1mm incr. (Comb. with TKC·TKM·LCT·LMT →0.01mm incr.) L is shortened by (5−TC). When used with LC, LCT, LMT, L remains the same as specified.		200
		TKC	Changes head thickness tolerance. T +0.3 0 ⇨ +0.02 0		200
		TKM	Changes head thickness tolerance. T +0.3 0 ⇨ 0 −0.02		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 (?) H≦5 : TCC 0.5		200
Shank		SKF	Changes cutting width of flat cutting on the shank. SKF 0 −0.01 Ⓐ P≧2(SKF−0.1) 0.1mm increments DREG W≦2(SKF−0.1) 0.1mm increments D4~6 D/2−0.5≦SKF≦D/2−0.1 D8~25 D/2−1.0≦SKF≦D/2−0.1 ⊗WKC:Not applicable		200
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		−100
		NC	Removes the jector pin. ⊗AC : Not applicable.		−200
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

(?) To be quoted on price & lead time above Max. Q'ty.

■MSKH51 · SKD 11 or equivalent—WPC®—

D	Ⓐ GW—SJAS GW—SJAL GW—SJVAS GW—SJVAL	Ⓐ GW—SJAX GW—SJVAX	DREG GW—SJ□S GW—SJ□L GW—SJV□S GW—SJV□L	DREG GW—SJ□X GW—SJV□X
4	2,760	—	3,570	—
5	2,760	3,290	3,570	4,140
6	2,770	3,330	3,580	4,210
8	2,840	3,450	3,590	4,270
10	2,930	3,560	3,760	4,450
13	3,040	3,710	4,070	4,850
16	3,250	3,980	4,550	—
20	3,450	4,270	5,040	
25	3,720	4,460	5,600	

■MPowdered high-speed steel—WPC®—

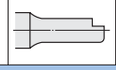
D	Ⓐ GW—PJAS GW—PJAL GW—PJVAS GW—PJVAL	DREG GW—PJ□S GW—PJ□L GW—PJV□S GW—PJV□L
4	3,660	4,670
5	3,710	4,920
6	3,720	5,020
8	4,160	5,480
10	4,570	5,790
13	5,490	7,060
16	6,300	8,000
20	7,360	9,450
25	8,760	10,990

■MPowdered high-speed steel—HW coating—

D	Ⓐ GHW—PJAS GHW—PJAL GHW—PJVAS GHW—PJVAL	DREG GHW—PJ□S GHW—PJ□L GHW—PJV□S GHW—PJV□L
4	4,650	5,680
5	4,660	5,720
6	4,720	5,960
8	5,280	6,570
10	5,840	7,000
13	6,890	8,400
16	7,890	9,470
20	9,100	11,100
25	10,550	12,750

PUNCHES WITH DOWEL
—FINISHED FOR RETAINERS—

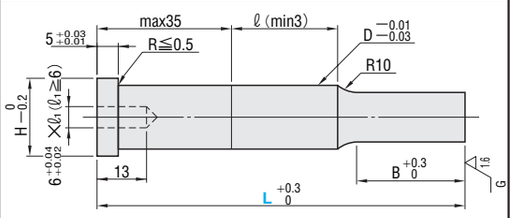
Detail P.657

Shear angle alteration P.182	1F	2F	3F	4F	5F	6F	7F
							

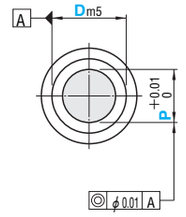
Type	A	Shank dia. D T	M H	Catalog No. Type	Shape	Blade length B	With dowel
With dowel	Dowel pin MS6—25	D m5	SKD 11 or equivalent 60～63HRC	SP	A D R E G	S L X	—C

RoHS

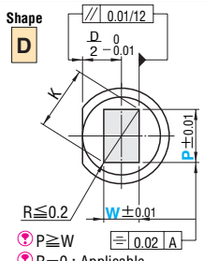
Select tip shape from shape A～G shown below.



Shape A

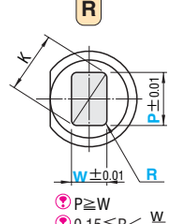


Shape D



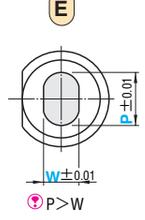
- P≧W
- R=0 : Applicable
- $K=\sqrt{P^2+W^2}$

Shape R



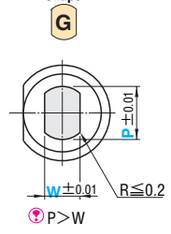
- P≧W
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



- P>W

Shape G



- P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.01mm increments Ⓡ R	B	H
S SPAS—C SPDS—C SPRS—C SPES—C SPGS—C	10	(40) 50 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50	0.15≦R<W/2 (Ⓡonly)	13	13
	13	(40) 50 60 70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	3.00			16
	16	(40) 50 60 70 80 90 100 110 120 130 140 150	10.00～15.99	15.97	4.00		19	19
	20	(40) 50 60 70 80 90 100 110 120 130 140 150	13.00～19.99	19.97	5.00			23
	25	(40) 50 60 70 80 90 100 110 120 130 140 150	18.00～24.99	24.97	6.00			28
	32	(40) (50) 60 70 80 90 100 110 120 130 140 150	20.00～31.99	31.97	7.00			35
	38	(40) (50) 60 70 80 90 100 110 120 130 140 150	28.00～37.99	37.97	8.00			41
	45	(40) (50) 60 70 80 90 100 110 120 130 140 150	35.00～44.99	44.97	9.00			48
L SPAL—C SPDL—C SPRL—C SPEL—C SPGL—C	10	50 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50		19	13
	13	50 60 70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	3.00			16
	16	60 70 80 90 100 110 120 130 140 150	10.00～15.99	15.97	4.00		25	19
	20	60 70 80 90 100 110 120 130 140 150	13.00～19.99	19.97	5.00			23
	25	60 70 80 90 100 110 120 130 140 150	18.00～24.99	24.97	6.00			28
	32	60 70 80 90 100 110 120 130 140 150	20.00～31.99	31.97	7.00			35
	38	60 70 80 90 100 110 120 130 140 150	28.00～37.99	37.97	8.00			41
	45	60 70 80 90 100 110 120 130 140 150	35.00～44.99	44.97	9.00			48
X SPAX—C SPDX—C SPRX—C SPEX—C SPGX—C	10	70 80 90 100 110 120 130 140 150	6.00～ 9.99	9.97	5.00		30	13
	13	70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	5.00			16
	16	80 90 100 110 120 130 140 150	10.00～15.99	—		—	40	19
	20	80 90 100 110 120 130 140 150	13.00～19.99					23
	25	80 90 100 110 120 130 140 150	18.00～24.99					28
	32	80 90 100 110 120 130 140 150	20.00～31.99					35
	38	80 90 100 110 120 130 140 150	28.00～37.99					41
	45	80 90 100 110 120 130 140 150	35.00～44.99					48

- L(40), D10～25→B=8, When L(40) and D(10～25), the blade length is fixed to 8 mm.
  L(40), D32～45→B=6, When L(40) and D(32～45), the blade length is fixed to 6 mm.
- L(50)→B=13, When L(50), the blade length is fixed to 13mm.
- Ⓐ : P>D−0.03→ℓ=0, When P>D−0.03 round punch, $D_{-0.03}^{-0.01}$ (press-in lead) is not available.
- D R E G: P・K>D−0.05→ℓ=0, When P・K>D−0.05 shaped punch, $D_{-0.03}^{-0.01}$ (press-in lead) is not available.

Order

Catalog No.	L	P	W	R (Ⓡonly)
SPAS—C 25	100	P18.05		

Example

■Punch with dowel is ;
Mainly used for dies of body of automobile with retainer which hold punch. Different from indirect positioning by retainer's dowel hole, it allows direct positioning by the dowel hole coaxially machined to punch, and improves the die precision. It is effective when used for die machining by NC process. It can also be used for dies of exterior panels of electrical appliances by setting with retainer or for attaching to punch plate of progressive die.

The volume discount rate is also applicable to alteration cost. P.39

Delivery

• ϕD 10～32 Ⓐ	3 Days	Express T 1,000/1Pc. / Express A 500/1Pc.	P.38	A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
• ϕD 10～32 D R E G	3 Days	Express T 1,600/1Pc. / Express A 800/1Pc.	P.38	A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).
• ϕD 38·45 Ⓐ D R E G	3 Days	Express A 1,500/1Pc.	P.38	A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration

Catalog No.	L(LC)	P(PC)	W(WC)	R	(BC·HC·TC···etc.)
SPAS—C 25	LC95	P18.05			BC30

Alterations	Code	Ⓐ	D R E G	¥/1Code
Tip	PC WC	Changes dimension P. PC≧Pmin/2, 0.01mm increments (Combination with PKC→0.01mm increments) P(PC) / Bmax: 1.500～1.999 / 20; 2.000～3.999 / 35; 4.000～5.999 / 45; 6.000～ / 60	Changes dimension P・W. PC/WC≧P・Wmin/2, 0.01mm increments ⊗Blade length X:Not applicable P(PC)・W(WC) / Bmax: 1.25～1.49 / 8; 1.50～1.99 / 13; 2.00～3.49 / 19; 3.50～4.99 / 25; 5.00～ / 30	200
	BC	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments ?Full L(LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments ?Full L(LC) requires BC+30mm or more.	200
	SC	Finishes blade with lapping. ?Dimension P tolerance and the specification unit remain the same. ⊗D shape is not applicable with a corner radius of 0.		1,200 (only Ⓐ 800)
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1, 0.1mm increments ?PRC≦(P−0.2)/2 ⊗PCC・GC:Not applicable	———	400
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1, 0.1mm increments ?PCC≦(P−0.2)/2 ⊗PRC・GC:Not applicable	———	200
	GC	20°≦GC<90°, 1° increments, Blade length B≧f+2, f=P/2×tan(90°−GC°) ?When used with SC, tip and edge are rounded. ⊗LKC・LKZ・PRC・PCC :Not applicable	———	400
	PKC	Changes tolerance on P. $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$?(P : 0.001mm incr.)	Changes tolerance on P(W). P・W±0.01⇨$^{+0.01}_{0}$	400
Full length	LC	Changes full length. 25+B(BC)≦LC<L, 0.1mm increments ?When LC−B(or BC) is 25mm or less, B(or BC) is LC−25mm. (Combination with LKC・LKZ→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L, 0.1mm increments ?When LC−B(BC)is 30mm or less, B(BC) is LC−30mm.	200
	LKC	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		400
	LKZ	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow {}^{+0.01}_{0}$ ⊗D>25:Not available		600
Head	KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
	WKC	Adds double key flats in parallel.	Adds double key flats in parallel. To change angle, add KC.	200 (only Ⓐ 400)

Alterations	Code	Ⓐ	D R E G	¥/1Code
Head	KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
	NKC	———	No key flat. ⊗Punch & retainer set not available.	0
	HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not applicable.		200
	TC	Changes head thickness 2≦TC<5 0.1mm increments ?L is shortened by (5−TC). When LC is combined, L=LC. ⊗Punch & retainer set not available.		200
	TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 ⊗SRC:Not applicable		200
	SRC	Modifies head to fit to select retainers (SLS). ?For details, refer to P.673. ?D10～32 : Applicable ⊗Punch & retainer set not available.		100
Shank	UC	Modifies shank to fit to urethane stripper (USN). Code / U / L / Applicable USN: UC40 / 37 / L≧80 / USN40; UC50 / 47 / L≧90 / USN50. ?P・Kmax.=D−1.1 ?For details, see P.674 ?Applicable to L≧80, L≧90 ?D10～32 : Applicable		400
	TPC	Replaces dowel pin. Attached MS6—25 to MSTP6—25 (tapped type). ⊗D38・45:Not applicable		100
	NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.		0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

?To be quoted on price & lead time above Max. Q'ty.

■ⓌSKD 11 or equivalent

D	Ⓐ SPAS—C SPAL—C	Ⓐ SPAX—C	D R E G SP□S—C SP□L—C	D R E G SP□X—C
10	720	890	1,490	1,680
13	800	970	1,810	2,000
16	910	1,080	2,230	—
20	1,100	1,270	2,730	
25	1,550	1,720	3,150	
32	3,020	3,190	5,460	
38	4,230	4,400	6,820	
45	5,180	5,350	8,060	

PUNCHES WITH DOWEL
—FINISHED FOR RETAINERS, DICOAT® TYPE—

PRODUCTS DATA P.1215

DICOAT®PUNCHES

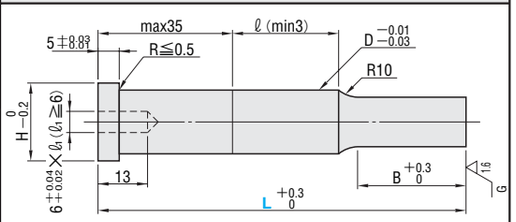
Punch & Retainer Set Available Detail P.657

The volume discount rate is also applicable to alteration cost. P.39

Type	Ⓐ	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	With dowel
With dowel Dicoat® type	Dowel pin MS6—25	Dm5	SKD 11 or equivalent 60~63HRC Surface 3000HV	T—SP	ⒶⒹⓇⒺⒼ	S L X	—C

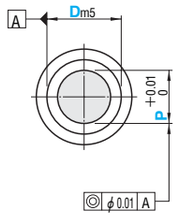
RoHS

Select tip shape from shape A~G shown below.

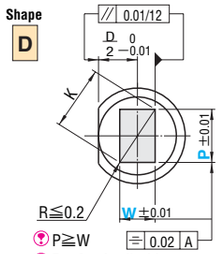


Blade length(B) L>S

Shape Ⓐ

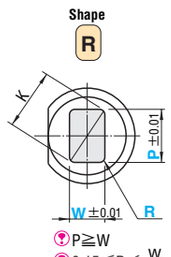


Shape Ⓓ



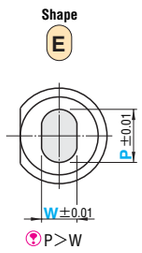
Ⓡ P≧W
Ⓡ R=0：Applicable
Ⓡ $K=\sqrt{P^2+W^2}$

Shape Ⓡ



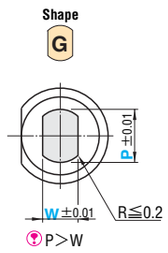
Ⓡ P≧W
Ⓡ $0.15 \leqq R < \frac{W}{2}$
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Shape Ⓔ



Ⓡ P>W

Shape Ⓖ



Ⓡ P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	ⒹⓇⒺⒼ P·Kmax.	ⒹⓇⒺⒼ P·Wmin.	Ⓡ R	B	H
S T—SPAS—C T—SPDS—C T—SPRS—C T—SPES—C T—SPGS—C	10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	2.50	0.15≦R<W/2 (Ⓡ only)	13	13
	13	(40) 50 60 70 80 90 100	6.00~12.99	12.97	3.00			16
	16	(40) 50 60 70 80 90 100	10.00~15.99	15.97	4.00		19	19
	20	(40) 50 60 70 80 90 100	13.00~19.99	19.97	5.00			23
	25	(40) 50 60 70 80 90 100	18.00~24.99	24.97	6.00			28
	32	(40) (50) 60 70 80 90 100 110 120	20.00~31.99	31.97	7.00			35
	38	(40) (50) 60 70 80 90 100 110 120	28.00~37.99	37.97	8.00			41
	45	(40) (50) 60 70 80 90 100 110 120	35.00~44.99	44.97	9.00			48
L T—SPAL—C T—SPDL—C T—SPRL—C T—SPEL—C T—SPGL—C	10	50 60 70 80 90 100	3.00~ 9.99	9.97	2.50		19	13
	13	50 60 70 80 90 100	6.00~12.99	12.97	3.00			16
	16	60 70 80 90 100	10.00~15.99	15.97	4.00		25	19
	20	60 70 80 90 100	13.00~19.99	19.97	5.00			23
	25	60 70 80 90 100	18.00~24.99	24.97	6.00			28
	32	60 70 80 90 100 110 120	20.00~31.99	31.97	7.00			35
	38	60 70 80 90 100 110 120	28.00~37.99	37.97	8.00			41
	45	60 70 80 90 100 110 120	35.00~44.99	44.97	9.00			48
X T—SPAX—C	10	70 80 90 100	6.00~ 9.99	——		—	30	13
	13	70 80 90 100	6.00~12.99					16
	16	80 90 100	10.00~15.99				40	19
	20	80 90 100	13.00~19.99					23
	25	80 90 100	18.00~24.99					28
	32	80 90 100 110 120	20.00~31.99					35
	38	80 90 100 110 120	28.00~37.99					41
	45	80 90 100 110 120	35.00~44.99					48

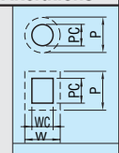
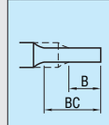
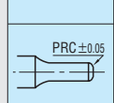
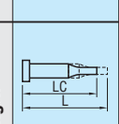
Ⓡ L(40), D10~25→B=8, When L(40) and D(10~25), the blade length is fixed to 8 mm.
L(40), D32~45→B=6, When L(40) and D(32~45), the blade length is fixed to 6 mm.
Ⓡ L(50)→B=13, When L(50), the blade length is fixed to 13mm.
Ⓐ：P>D−0.03→ℓ=0, When P>D−0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
ⒹⓇⒺⒼ：P・K>D−0.05→ℓ=0, When P・K>D−0.05 shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

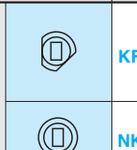
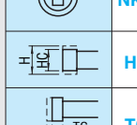
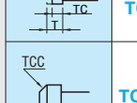
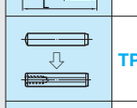
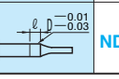
Order Catalog No. — L — P — W — R(Ⓡ only)
T-SPAS-C 25 — 100 — P18.05

Delivery
- ϕD 10~25: 3 Days — Express A 800/1Pc. P.38
- ϕD 32~45: 3 Days

Ⓡ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC…etc.)
T—SPAS—C 25 — LC95 — P18.05 — BC30

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Tip		PC WC	Changes dimension P. PC≧ Pmin/2, 0.01mm increments. P(PC): 1.50~1.99 Bmax 20; 2.00~3.99 35; 4.00~5.99 40; 6.00~ 45	Changes dimension P・W. PC/WC ≧ P・Wmin/2, 0.01mm increments. P(PC)・W(WC): 1.25~1.49 Bmax 8; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30	200
		BC	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments. Ⓡ Full length L(LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments. Ⓡ Full length L(LC) requires BC+30mm or more.	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1, 0.1mm increments. Ⓡ PRC≦(P−0.2)/2	——	400
Full length		LC	Changes full length. 25+B(BC)≦LC<L, 0.1mm increments. Ⓡ When LC−B(or BC) is 25mm or less, B(or BC) is LC−25mm.	Changes full length. 30+B(BC)≦LC<L, 0.1mm increments. Ⓡ When LC−B(BC) is 30mm or less, B(BC) is LC−30mm.	200
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. To change angle, add KC.	200 (only Ⓐ 400)

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Head		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments. Ⓧ KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments. Ⓧ KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. Ⓧ Punch & retainer set not available.	0
		HC	Changes head diameter. D≦HC<H 0.1mm increments. Ⓧ Punch & retainer set not available.		200
		TC	Changes head thickness 2≦TC<5 0.1mm increments. Ⓡ L is shortened by (5−TC). When LC is combined, L=LC. Ⓧ Punch & retainer set not available.		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments. 0.5≦TCC≦(H−D)/2. Ⓧ SRC:Not applicable		200
		SRC	Modifies head to fit to select retainers (SLS). Ⓡ For details, refer to P.673. Ⓡ D10~32：Applicable. Ⓧ Punch & retainer set not available.		100
Shank		UC	Modifies shank to fit to urethane stripper (USN). Ⓡ For details, refer to P.674. Ⓡ D10~32：Applicable		400
		TPC	Replaces dowel pin. Attached MS6—25 to MSTP6—25 (tapped type). Ⓧ D38・45:Not applicable		100
		NDC	No press-in lead ℓ≧3⇨ℓ=0. Ⓧ Punch & retainer set not available.		0

Example

■Punch with dowel is;
Mainly used for dies of body of automobile with retainer which hold punch. Different from indirect positioning by retainer's dowel hole, it allows direct positioning by the dowel hole coaxially machined to punch, and improves the die precision. It is effective when used for die machining by NC process. It can also be used for dies of exterior panels of electrical appliances by setting with retainer or for attaching to punch plate of progressive die.

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓡ To be quoted on price & lead time above Max. Q'ty.

■ⓂSKD 11 or equivalent

D	Ⓐ T—SPAS—C T—SPAL—C	Ⓐ T—SPAX—C	Ⓓ T—SPDS—C T—SPDL—C	Ⓡ T—SPRS—C T—SPRL—C	Ⓔ T—SPES—C T—SPEL—C	Ⓖ T—SPGS—C T—SPGL—C
10	2,910	3,100	4,050	5,430	4,290	3,850
13	3,190	3,380	4,620	6,150	4,780	4,340
16	3,580	3,770	5,390	6,960	5,630	5,100
20	4,120	4,310	6,330	7,960	6,540	6,010
25	4,820	5,010	7,040	8,770	7,330	6,710
32	8,190	8,380	11,560	14,750	12,140	10,970
38	10,910	11,100	14,770	18,080	15,680	14,060
45	13,140	13,330	17,430	20,330	18,350	16,510

PRESS NEW

PUNCHES WITH DOWEL
—FINISHED FOR RETAINERS, TiCN COATING TYPE—

PRODUCTS DATA P.1220

TiCN COATING PUNCHES

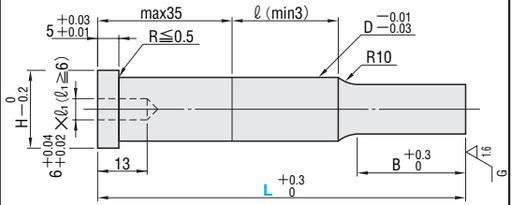
Punch & Retainer Set Available Detail P.657

The volume discount rate is also applicable to alteration cost. P.39

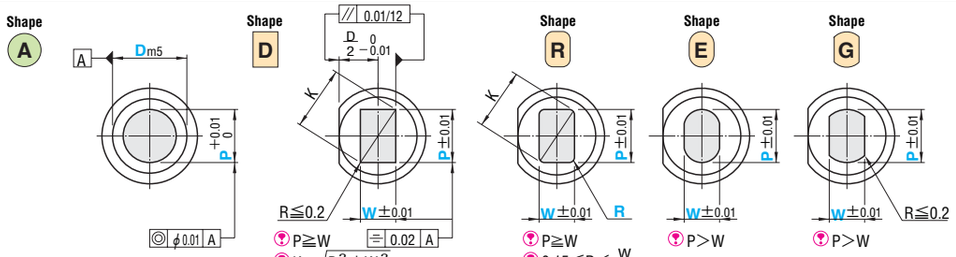
Type	A	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	With dowel
With dowel TiCN Coating type	Dowel pin MS6—25	D_{m5}	SKD 11 or equivalent 60~63HRC Surface 3000HV	H—SP	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S L X	—C

RoHS

Select tip shape from shape A~G shown below.



The tip surface is ground before coating.
Point length (B) X>L>S



P≧W
K=√(P²+W²)
0.15≦R< W/2
K=√((P−2R)²+(W−2R)²+2R
P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	ⒹⓇⒺⒼ P·Kmax.	ⒹⓇⒺⒼ P·Wmin.	Ⓡ R	B	H
S H—SPAS—C	10	(40) 50 60 70 80 90 100 110 120 130 140 150	3.00~ 9.99	9.97	2.50	0.15≦R< W/2 (Ⓡ only)	13	13
H—SPDS—C	13	(40) 50 60 70 80 90 100 110 120 130 140 150	6.00~12.99	12.97	3.00			16
H—SPRS—C	16	(40) 50 60 70 80 90 100 110 120 130 140 150	10.00~15.99	15.97	4.00		19	19
H—SPES—C	20	(40) 50 60 70 80 90 100 110 120 130 140 150	13.00~19.99	19.97	5.00			23
H—SPGS—C	25	(40) 50 60 70 80 90 100 110 120 130 140 150	18.00~24.99	24.97	6.00			28
L H—SPAL—C	10	50 60 70 80 90 100 110 120 130 140 150	3.00~ 9.99	9.97	2.50		19	13
H—SPDL—C	13	50 60 70 80 90 100 110 120 130 140 150	6.00~12.99	12.97	3.00			16
H—SPRL—C	16	60 70 80 90 100 110 120 130 140 150	10.00~15.99	15.97	4.00		25	19
H—SPEL—C	20	60 70 80 90 100 110 120 130 140 150	13.00~19.99	19.97	5.00			23
H—SPGL—C	25	60 70 80 90 100 110 120 130 140 150	18.00~24.99	24.97	6.00			28
X H—SPAX—C	10	70 80 90 100 110 120 130 140 150	6.00~ 9.99	9.97	5.00		30	13
H—SPDX—C	13	70 80 90 100 110 120 130 140 150	6.00~12.99	12.97	5.00			16
H—SPRX—C	16	80 90 100 110 120 130 140 150	10.00~15.99			—	40	19
H—SPEX—C	20	80 90 100 110 120 130 140 150	13.00~19.99	——				23
H—SPGX—C	25	80 90 100 110 120 130 140 150	18.00~24.99					28

L (40), D10~25→B=8, When L (40) and D (10~25), the blade length is fixed to 8 mm.
Ⓐ: P>D−0.03→ ℓ =0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
ⒹⓇⒺⒼ: P・K>D−0.05→ ℓ =0, When P・K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order Catalog No. — L — P — W — R (Ⓡ only)
H—SPAS—C 25 — 100 — P18.05

Delivery 3 Days

Alterations Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC…etc.)
H—SPAS—C 25 — LC95 — P18.05 — BC30

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Tip	PC W	PC WC	Changes dimension P. PC≧ Pmin/2, 0.01mm increments (Combination with PKC→0.001mm increments) P(PC) / B max: 1.500~1.999 / 20; 2.000~3.999 / 35; 4.000~5.999 / 45; 6.000~ / 60	Changes dimension P・W. PC/WC ≧ P・Wmin/2, 0.01mm increments ⊗Blade length X:Not applicable. P(PC)・W(WC) / B max: 1.25~1.49 / 8; 1.50~1.99 / 13; 2.00~3.49 / 19; 3.50~4.99 / 25; 5.00~ / 30	200
	BC	BC	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments. Ⓡ Full length L (LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments. Ⓡ Full length L (LC) requires BC+30mm or more.	200
	PRC	PRC	Adds Radius to blade tip. 0.3≦PRC≦1, 0.1mm increments. Ⓡ PRC≦(P−0.2)/2 ⊗PCC:Not available	——	400
	PCC	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1, 0.1mm increments. Ⓡ PCC≦(P−0.2)/2 ⊗PRC:Not applicable	——	200
	PKC	PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ (P : 0.001mm incr.) ⊗D>13 : Not applicable	Changes tolerance on P(W). P・W±0.01 ⇨ $^{+0.01}_{0}$ ⊗D>13 : Not applicable	600
Full length	LC	LC	Changes full length. 25+B(BC)≦LC<L, 0.1mm increments. Ⓡ When LC−B (or BC) is 25mm or less, B (or BC) is LC−25mm. (Combination with LKC→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L, 0.1mm increments. Ⓡ When LC−B(BC) is 30mm or less, B(BC) is LC−30mm.	200
	LKC	LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. To change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments. ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments. ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
		HC	Changes head diameter. D≦HC<H 0.1mm increments. ⊗Punch & retainer set not available.		200
		TC	Changes head thickness 2≦TC<5 0.1mm increments. Ⓡ L is shortened according to (5−TC). When LC is combined, L=LC. ⊗Punch & retainer set not available.		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments. 0.5≦TCC≦(H−D)/2 ⊗SRC:Not applicable		200
		SRC	Modifies head to fit to select retainers (SLS). Ⓡ For details, refer to P.673 ⊗Punch & retainer set not available.		100
Shank		UC	Modifies shank to fit to urethane stripper (USN). Code / U / L / Applicable USN: UC40 / 37 / L≧80 / USN40; UC50 / 47 / L≧90 / USN50. Ⓡ P・Kmax.=D−1.1 Ⓡ For details, see P.674 Ⓡ Applicable to L≧80, L≧90		400
		TPC	Replaces dowel pin. Attached MS6—25 to MSTP6—25 (tapped type).		100
		NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.		0

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓡ To be quoted on price & lead time above Max. Q'ty.

■ Ⓜ SKD 11 or equivalent

D	Ⓐ H—SPAS—C H—SPAL—C	Ⓐ H—SPAX—C	ⒹⓇⒺⒼ H—SP□S—C H—SP□L—C	ⒹⓇⒺⒼ H—SP□X—C
10	2,210	2,390	2,980	3,270
13	2,430	2,600	3,420	3,760
16	2,700	2,870	4,020	—
20	3,090	3,240	4,680	
25	3,650	3,800	5,190	

PRESS NEW Printed in Red

PUNCHES WITH DOWEL
—FINISHED FOR RETAINERS, WPC®TYPE / HW COATING TYPE—

PRODUCTS DATA P.1221

WPC®PUNCHES
COATING PUNCHES —HW—

Punch & Retainer Set Available Detail P.657

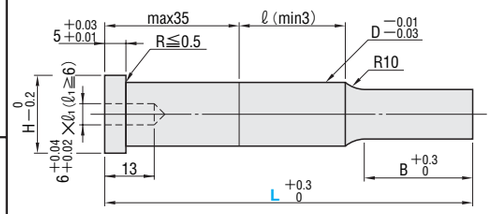
Type	A	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	With dowel
With dowel WPC®type	Dowel pin D10～32 MS6—25 D38・45 SJB—CMS	D_{m5}	SKD 11 or equivalent 60～63HRC Surface 1000—1100HV	W—SP	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S L X	—C
With dowel HW coating type		D_{m5}	SKD 11 or equivalent 60～63HRC Surface 3000HV	HW—SP			

—WPC®type—

—HW coating—

RoHS

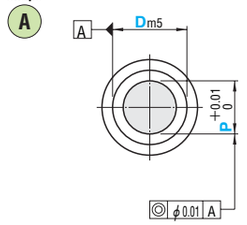
Select tip shape from shape A～G shown below.



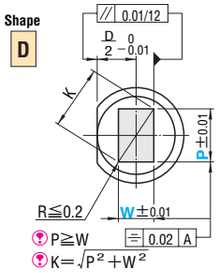
The tip is very slightly rounded.

Blade length (B) X>L>S

Shape A



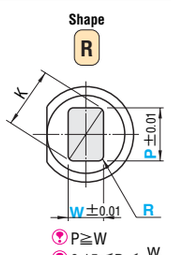
Shape D



P≧W

$K=\sqrt{P^2+W^2}$

Shape R

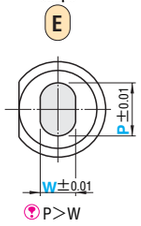


P≧W

$0.15 \leqq R < \frac{W}{2}$

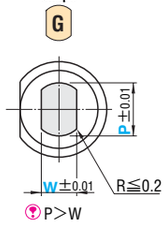
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P・Kmax.	Ⓓ Ⓡ Ⓔ Ⓖ P・Wmin.	Ⓡ R	B	H
S —WPC®type— W—SP□S—C —HW coating— HW—SP□S—C	10	(40) 50 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50	0.15≦R< W/2 (Ⓡonly)	13	13
	13	(40) 50 60 70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	3.00			16
	16	(40) 50 60 70 80 90 100 110 120 130 140 150	10.00～15.99	15.97	4.00		19	19
	20	(40) 50 60 70 80 90 100 110 120 130 140 150	13.00～19.99	19.97	5.00			23
	25	(40) 50 60 70 80 90 100 110 120 130 140 150	18.00～24.99	24.97	6.00			28
	(32)	(40) (50) 60 70 80 90 100 110 120 130 140 150	20.00～31.99	31.97	7.00			35
	(38)	(40) (50) 60 70 80 90 100 110 120 130 140 150	28.00～37.99	37.97	8.00			41
	(45)	(40) (50) 60 70 80 90 100 110 120 130 140 150	35.00～44.99	44.97	9.00			48
L —WPC®type— W—SP□L—C —HW coating— HW—SP□L—C	10	50 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50		19	13
	13	50 60 70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	3.00			16
	16	60 70 80 90 100 110 120 130 140 150	10.00～15.99	15.97	4.00		25	19
	20	60 70 80 90 100 110 120 130 140 150	13.00～19.99	19.97	5.00			23
	25	60 70 80 90 100 110 120 130 140 150	18.00～24.99	24.97	6.00			28
	(32)	60 70 80 90 100 110 120 130 140 150	20.00～31.99	31.97	7.00			35
	(38)	60 70 80 90 100 110 120 130 140 150	28.00～37.99	37.97	8.00			41
	(45)	60 70 80 90 100 110 120 130 140 150	35.00～44.99	44.97	9.00			48
X —WPC®type— W—SP□X—C —HW coating— HW—SP□X—C	10	70 80 90 100 110 120 130 140 150	6.00～ 9.99	9.97	5.00		30	13
	13	70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	5.00			16
	16	80 90 100 110 120 130 140 150	10.00～15.99				40	19
	20	80 90 100 110 120 130 140 150	13.00～19.99					23
	25	80 90 100 110 120 130 140 150	18.00～24.99					28
	(32)	80 90 100 110 120 130 140 150	20.00～31.99					35
	(38)	80 90 100 110 120 130 140 150	28.00～37.99					41
	(45)	80 90 100 110 120 130 140 150	35.00～44.99					48

Ⓟ L (40), D10～25→B=8, When L (40) and D (10～25), the blade length is fixed to 8 mm.
L (40), D32～45→B=6, When L (40) and D (32～45), the blade length is fixed to 6 mm.
Ⓟ L (50)→B=13, When L (50), the blade length is fixed to 13mm.
Ⓟ Ⓐ: P>D−0.03→ℓ=0, When P>D−0.03 round punch, $D_{-0.03}^{-0.01}$ (press-in lead) is not available.
Ⓟ Ⓓ Ⓡ Ⓔ Ⓖ: P・K>D−0.05→ℓ=0, When P・K>D−0.05 shaped punch, $D_{-0.03}^{-0.01}$ (press-in lead) is not available.
Ⓟ D (32), (38), and (45) are applicable for W—SP□□—C only.

Order

Catalog No.	L	P	W	Ⓡ (Ⓡ only)
W—SPAS—C 25	100		P18.05	

Example

■Punch with dowel is;
Mainly used for dies of body of automobile with retainer which hold punch. Different from indirect positioning by retainer's dowel hole, it allows direct positioning by the dowel hole coaxially machined to punch, and improves the die precision. It is effective when used for die machining by NC process. It can also be used for dies of exterior panels of electrical appliances by setting with retainer or for attaching to punch plate of progressive die.

The volume discount rate is also applicable to alteration cost. P.39

Delivery

■WPC® type (W—)

		Days				■HW coating (HW—)
● ϕD 10～32 Ⓐ	3	Express A	500/1Pc.	P.38		3 Days
		Ⓟ A flat charge of 1,350 yen for 3 pieces or more of the same size.				
● ϕD 10～32 Ⓓ Ⓡ Ⓔ Ⓖ	3	Express A	800/1Pc.	P.38		
		Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.				
● ϕD 38・45 Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	3	Express A	1,500/1Pc.	P.38		
		Ⓟ A flat charge of 4,050 yen for 3 pieces or more of the same size.				

Alteration

Catalog No.	L(LC)	P(PC)	W(WC)	R	(BC・HC・TC…etc.)
W—SPAS—C 25	LC95	P18.05			BC30

Alterations	Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Tip	PC WC	Changes dimension P. $PC \geqq \frac{P\,min.}{2}$ 0.01mm increments (Combination with PKC→0.001mm increments) P(PC) / B max: 1.500～1.999 / 20; 2.000～3.999 / 35; 4.000～5.999 / 45; 6.000～ / 60	Changes dimension P・W. $\frac{PC}{WC} \geqq \frac{P \cdot W\,min.}{2}$ 0.01mm increments ⊗Blade length X:Not applicable P(PC)・W(WC) / B max: 1.25～1.49 / 8; 1.50～1.99 / 13; 2.00～3.49 / 19; 3.50～4.99 / 25; 5.00～ / 30	200
	BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓟ Full length L (LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓟ Full length L (LC) requires BC+30mm or more.	200
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−0.2)/2 ⊗PCC:Not available	——	400
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−0.2)/2 ⊗PRC:Not applicable	——	200
	PKC	Changes tolerance on P. $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ Ⓟ (P : 0.001mm incr.) ⊗HW coating : Not applicable	Changes tolerance on P(W). $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	400
Full length	LC	Changes full length. 25+B(BC)≦LC<L 0.1mm increments Ⓟ When LC−B(or BC) is 25mm or less, B(or BC) is LC−25mm. (Combination with LKC→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L 0.1mm increments Ⓟ When LC−B(BC) is 30mm or less, B(BC) is LC−30mm.	200
	LKC	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		400

Alterations	Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Head	KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
	WKC	Adds double key flats in parallel.	Adds double key flats in parallel. To change angle, add KC.	200 (only Ⓐ 400)
	KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
	NKC	——	No key flat. ⊗Punch & retainer set not available.	0
	HC	Ⓟ Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not available.		200
	TC	Changes head thickness 2≦TC<5 0.1mm increments Ⓟ L is shortened by (5−TC). When LC is combined, L=LC. ⊗Punch & retainer set not available.		200
	TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 ⊗SRC:Not applicable		200
	SRC	Modifies head to fit to select retainers (SLS). Ⓟ For details, refer to P.673. Ⓟ D10～32 : applicable ⊗Punch & retainer set not available.		100
Shank	UC	Modifies shank to fit to urethane stripper (USN). Code / U / L / Applicable USN: UC40 / 37 / L≧80 / USN40; UC50 / 47 / L≧90 / USN50 Ⓟ P・Kmax.=D−1.1 Ⓟ For details, see P.674 Ⓟ Applicable to L≧80, L≧90 Ⓟ D10～32 : Applicable		400
	TPC	Replaces dowel pin. Attached MS6—25 to MSTP6—25 (tapped type). ⊗D38・45:Not available		100
	NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.		0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

■ⓂSKD 11 or equivalent —WPC®type—

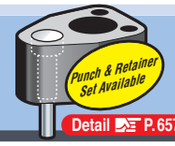
D	Ⓐ W—SPAS—C W—SPAL—C	Ⓐ W—SPAX—C	Ⓓ Ⓡ Ⓔ Ⓖ W—SP□S—C W—SP□L—C	Ⓓ Ⓡ Ⓔ Ⓖ W—SP□X—C
10	1,750	1,920	2,520	2,710
13	1,830	2,000	2,840	3,030
16	1,940	2,110	3,260	—
20	2,130	2,300	3,760	
25	2,580	2,750	4,180	
32	4,050	4,220	6,490	
38	5,260	5,430	7,850	
45	6,210	6,380	9,090	

■ⓂSKD 11 or equivalent —HW coating—

D	Ⓐ HW—SPAS—C HW—SPAL—C	Ⓐ HW—SPAX—C	Ⓓ Ⓡ Ⓔ Ⓖ HW—SP□S—C HW—SP□L—C	Ⓓ Ⓡ Ⓔ Ⓖ HW—SP□X—C
10	2,830	2,990	3,640	4,070
13	3,050	3,230	4,220	4,530
16	3,350	3,690	4,980	—
20	3,920	4,190	6,020	
25	4,550	4,790	6,640	

PRESS ADD.SPEC. Printed in Red

JECTOR PUNCHES WITH DOWEL
—FINISHED FOR RETAINERS—



Detail P.657

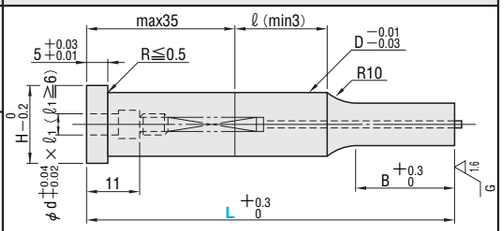
How to calculate the projection length of a jector pin(reference) P.191

- Refer to Jector punch blank for the details of jector hole. P.186
- Refer to Jector pin set for the details of Jector pin. P.189

Type	A	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	With dowel
With dowel	Dowel pin D10~32 MS6—25 D38・45 SJB—CMS	D_{m5}	SKD 11 or equivalent 60~63HRC	SJ –Spring reinforced type– SJV	A D R E G	S L X	—C

RoHS

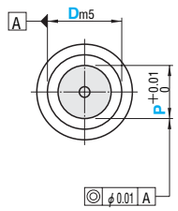
Select tip shape from shape A~G shown below.



D	d
10~32	6
38~45	10

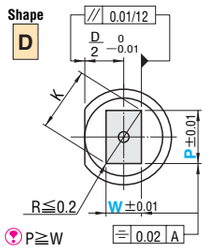
Blade length(B) X>L>S

Shape A



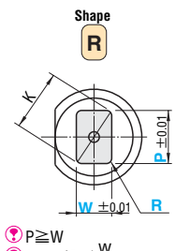
P≧W
R=0 : Applicable
$K=\sqrt{P^2+W^2}$

Shape D



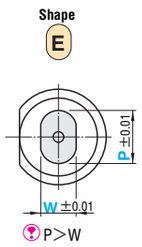
P≧W
R=0 : Applicable
$K=\sqrt{P^2+W^2}$

Shape R



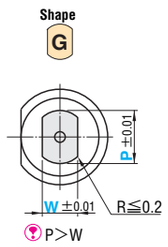
P≧W
$0.15 \leqq R < \frac{W}{2}$
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

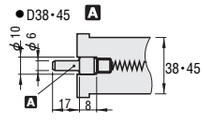
Catalog No. Type	D	L							0.01mm increments A min. P max.	D R E G P・Kmax.	D R E G P・Wmin.	R R	B	H
S Spring reinforced type SJAS—C SJVAS—C	10	60	70	80	90	100	110	120	3.00~ 9.99	9.97	3.00	$\frac{W}{2}$(R only) $0.15 \leqq R < \frac{W}{2}$	13	13
SJDS—C SJVDS—C	13	60	70	80	90	100	110	120	6.00~12.99	12.97	6.00			16
	16	(60)	70	80	90	100	110	120	10.00~15.99	15.97	6.00		19	19
	20	(60)	70	80	90	100	110	120	13.00~19.99	19.97	6.00			23
SJRS—C SJVRS—C	25	(60)	70	80	90	100	110	120	18.00~24.99	24.97	6.00			28
SJES—C SJVES—C	32	(60)	70	80	90	100	110	120	20.00~31.99	31.97	7.00			35
SJGS—C SJVGS—C	(38)	(60)	70	80	90	100	110	120	28.00~37.99	37.97	8.00			41
	(45)	(60)	70	80	90	100	110	120	35.00~44.99	44.97	9.00			48
L Spring reinforced type SJAL—C SJVAL—C	10		70	80	90	100	110	120	3.00~ 9.99	9.97	3.00		19	13
SJDL—C SJVDL—C	13		70	80	90	100	110	120	6.00~12.99	12.97	6.00			16
	16		70	80	90	100	110	120	10.00~15.99	15.97	6.00		25	19
	20		70	80	90	100	110	120	13.00~19.99	19.97	6.00			23
SJRL—C SJVRL—C	25		70	80	90	100	110	120	18.00~24.99	24.97	6.00			28
SJEL—C SJVEL—C	32		70	80	90	100	110	120	20.00~31.99	31.97	7.00			35
SJGL—C SJVGL—C	(38)		70	80	90	100	110	120	28.00~37.99	37.97	8.00			41
	(45)		70	80	90	100	110	120	35.00~44.99	44.97	9.00			48
X Spring reinforced type SJAX—C SJVAX—C	10					100	110	120	6.00~ 9.99	9.97	6.00		30	13
SJDX—C SJVDX—C	13					100	110	120	6.00~12.99	12.97	6.00			16
SJRX—C SJVRX—C	16					100	110	120	10.00~15.99	——	—		40	19
SJEX—C SJVEX—C	20					100	110	120	13.00~19.99					23
SJGX—C SJVGX—C	25					100	110	120	18.00~24.99					28
	32					100	110	120	20.00~31.99					35

The spring constant of SJV□□—C is as twice as that of SJ□□—C.
L (60)→B=13, When L (60), the blade length is fixed to 13 mm.
A: P>D−0.03→ ℓ =0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
D R E G: P・K>D−0.05→ ℓ =0, When P・K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
D (38) and (45) are applicable for SJ□□—C only.

■Benefit of Reinforced spring
It is twice the spring constant of standard type Jector punch. Due to the spring's larger load, more effective scrap removal can be expected.

Example

■Punch with dowel is;
Mainly used for dies of body of automobile with retainer which hold punch. Different from indirect positioning by retainer's dowel hole, it allows direct positioning by the dowel hole coaxially machined to punch, and improves the die precision. It is effective when used for die machining by NC process. It can also be used for dies of exterior panels of electrical appliances by setting with retainer or for attaching to punch plate of progressive die.



- Finished for retainer
- For retainers, see **P.653**~.
- When using backing plate, only ϕ38 and ϕ45 have ϕ10.2 stepped dowel pin hole. P.186

The volume discount rate is also applicable to alteration cost. P.39

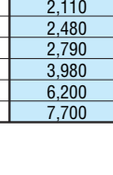
Order Catalog No. — L — P — W — R(R only)
SJDS—C 38 — 100 — P30.00 — W18.00

Delivery

● ϕD 10~32	A	3 Days	Express T 1,000/1Pc. Express A 500/1Pc.	P.38
			A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).	
● ϕD 10~32	D R E G	3 Days	Express T 1,600/1Pc. Express A 800/1Pc.	P.38
			A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).	
● ϕD 38・45	A D R E G	3 Days	Express A 1,500/1Pc.	P.38
			A flat charge of 4,050 yen for 3 pieces or more of the same size.	

Alteration Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC…etc.) — PKC
SJAS—C 25 — LC95 — P18.05

	Alterations	Code	A	D R E G	¥/1Code
Tip		PC WC	Changes dimension P. PC≧PCmin 0.01mm increments (Combination with PKC→0.001mm increments) D / PCmin: 10 2.800; 13 5.000; 16 8.000; 20 9.000; 25 9.000; 32 15.000; 38 23.000; 45 30.000	Changes dimension P・W. PC・WC≧PC・WCmin 0.01mm increments ⊗Blade length X:Not applicable D / PC・WCmin: 10 2.80; 13 5.00; 16 5.00; 20 5.00; 25 5.00; 32 6.00; 38 7.00; 45 8.00	200
		BC	Changes blade length B. (shorter than standard) 2≦BC<B 0.1mm increments		200
		SC	Dimension P tolerance and the specification unit remain the same. The full length remains as specified. ⊗D shape is not applicable with a corner radius of 0.		1,200 (only A 800)
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 For dimension d1, refer to P.186. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 For dimension d1, refer to P.186. ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ (P : 0.001mm incr.)	Changes tolerance on P(W). $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	400
Full length		LC	Changes full length. LC<L 0.1mm increments B is shortened by (L—LC). (Combination with LKC・LKZ→0.01mm increments) The projection length of the jector pin is 2mm.		200
		LKC	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow {}^{+0.01}_{0}$ ⊗D>25:Not applicable		600
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. To change angle, add KC.	200 (only A 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only A 600)

	Alterations	Code	A	D R E G	¥/1Code
Head		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
		HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not available.		200
		TC	Changes head thickness 3.5≦TC<5 0.1mm increments L is shortened by (5—TC), When LC is combined, L=LC. ⊗Punch & retainer set not available.		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H—D)/2 ⊗SRC:Not applicable		200
		SRC	Modifies head to fit to select retainers (SLS). For details, refer to P.673. D10~32 : Applicable ⊗Punch & retainer set not available.		100
Shank		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		—100
		NC	Removes the jector pin. ⊗AC : Not applicable.		—200
		TPC	Replaces dowel pin. Attached MS6—25 to MSTP6—25 (tapped type). ⊗D38・45:Not applicable		100
		NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.		0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■M SKD 11 or equivalent

D	A SJAS—C SJAL—C SJVAS—C SJVAL—C	A SJAX—C SJVAX—C	D R E G SJ□S—C SJ□L—C SJV□S—C SJV□L—C	D R E G SJ□X—C SJV□X—C
10	1,730	3,070	2,610	3,950
13	1,820	3,160	2,910	4,250
16	2,110	3,600	3,480	—
20	2,480	4,010	4,160	
25	2,790	4,330	4,780	
32	3,980	5,630	6,730	
38	6,200	—	9,140	
45	7,700	—	10,940	

PRESS ADD.SPEC. Printed in Red

JECTOR PUNCHES WITH DOWEL
—FINISHED FOR RETAINERS, DICOAT® TYPE—

PRODUCTS DATA P.1215

DICOAT®PUNCHES

Punch & Retainer Set Available Detail P.657

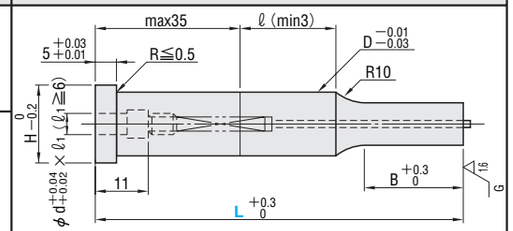
- Refer to Jector punch blank for the details of jector hole. P.186
- Refer to Jector pin set for the details of Jector pin. P.189

How to calculate the projection length of a jector pin(reference) P.191

Type	A	Shank dia D T	M H	Catalog No. Type	Shape	B Blade length	With dowel
With dowel Dicoat® Type	Dowel pin D10～32 MS6—25 D38・45 SJB—CMS	D m5	SKD 11 or equivalent 60～63HRC Surface 3000HV	T—SJ —Spring reinforced type— T—SJV	A D R E G	S L	—C

RoHS

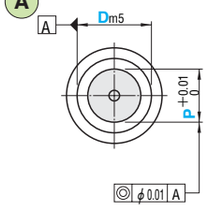
Select tip shape from shape A～G shown below.



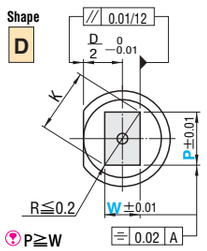
D	d
10～32	6
38～45	10

Blade length(B) L>S

Shape A

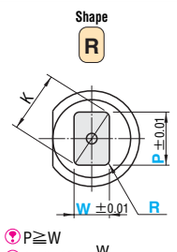


Shape D



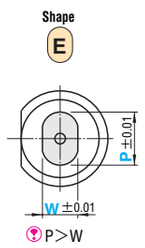
P≧W
R=0：Applicable
K=√(P²+W²)

Shape R



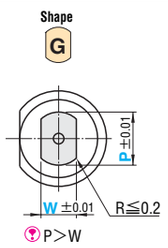
P≧W
0.15≦R< W/2
K=√((P−2R)²+(W−2R)²+2R

Shape E



P>W

Shape G



P>W

Catalog No. Type	D	L							0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P・K max.	Ⓓ Ⓡ Ⓔ Ⓖ P・W min.	Ⓡ R	B	H
S Spring reinforced type	10	60	70	80	90	100			3.00～ 9.99	9.97	3.00	0.15≦R< W/2 (Ⓡ only)	13	13
T—SJAS—C T—SJVAS—C	13	60	70	80	90	100			6.00～12.99	12.97	6.00			16
T—SJDS—C T—SJVDS—C	16	(60)	70	80	90	100			10.00～15.99	15.97	6.00		19	19
T—SJRS—C T—SJVRS—C	20	(60)	70	80	90	100			13.00～19.99	19.97	6.00			23
T—SJES—C T—SJVES—C	25	(60)	70	80	90	100			18.00～24.99	24.97	6.00			28
T—SJGS—C T—SJVGS—C	32	(60)	70	80	90	100	110	120	20.00～31.99	31.97	7.00			35
	(38)	(60)	70	80	90	100	110	120	28.00～37.99	37.97	8.00			41
	(45)	(60)	70	80	90	100	110	120	35.00～44.99	44.97	9.00			48
L Spring reinforced type	10		70	80	90	100			3.00～ 9.99	9.97	3.00		19	13
T—SJAL—C T—SJVAL—C	13		70	80	90	100			6.00～12.99	12.97	6.00			16
T—SJDL—C T—SJVDL—C	16		70	80	90	100			10.00～15.99	15.97	6.00		25	19
T—SJRL—C T—SJVRL—C	20		70	80	90	100			13.00～19.99	19.97	6.00			23
T—SJEL—C T—SJVEL—C	25		70	80	90	100			18.00～24.99	24.97	6.00			28
T—SJGL—C T—SJVGL—C	32		70	80	90	100	110	120	20.00～31.99	31.97	7.00			35
	(38)		70	80	90	100	110	120	28.00～37.99	37.97	8.00			41
	(45)		70	80	90	100	110	120	35.00～44.99	44.97	9.00			48

- The spring constant of T— SJV□□—C is as twice as that of T—SJ□□—C.
- L (60)→B=13, When L (60), the blade length is fixed to 13 mm.
- Ⓐ: P>D−0.03→ ℓ =0, When P>D−0.03 round punch, D $-0.01_{-0.03}$ (press-in lead) is not available.
- Ⓓ Ⓡ Ⓔ Ⓖ: P・K>D−0.05→ ℓ =0, When P・K>D−0.05 shaped punch, D $-0.01_{-0.03}$ (press-in lead) is not available.
- D (38) and (45) are applicable for T—SJ□□—C only.

Order: Catalog No. — L — P — W — R(Ⓡ only)
T—SJAS—C 25 — 100 — P18.05

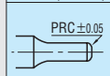
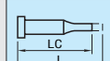
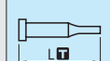
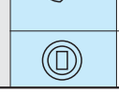
Delivery
- φD10～25: 3 Days — Express A 800/1Pc. P.38
- φD32～45: 3 Days

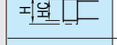
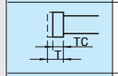
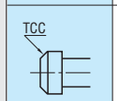
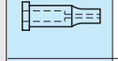
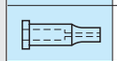
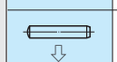
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Benefit of Reinforced spring
It is twice the spring constant of standard type Jector punch. Due to the spring's larger load, more effective scrap removal can be expected.

The volume discount rate is also applicable to alteration cost. P.39

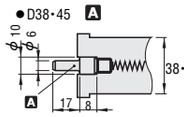
Alteration — Catalog No. — L(LC) — P — W — R — (BC・HC・TC…etc.)
T—SJDS—C 38 — 100 — P20.00 — W10.00 — BC13

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Tip		BC	Changes blade length B. (shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−d1−0.5)/2 For dimension d1, refer to P.186.	——	400
Full length		LC	Changes full length. LC<L 0.1mm increments Ⓨ B is shortened by (L—LC). (Combination with LKC→0.01mm increments) Ⓨ The projection length of the jector pin is 2mm.		200
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
Head		KC	Adds single key flat at head.	Adds single key flat at head. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. To change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗ Punch & retainer set not available.	0

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Head		HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗ Punch & retainer set not available.		200
		TC	Changes head thickness 3.5≦TC<5 0.1mm increments Ⓨ L is shortened according to (5—TC). When LC is combined, L=LC. ⊗ Punch & retainer set not available.		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H—D)/2 ⊗ SRC:Not applicable		200
		SRC	Modifies head to fit to select retainers (SLS). Ⓨ For details, refer to P.673. Ⓨ D10～32：Applicable ⊗ Punch & retainer set not available.		100
Shank		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		−100
		NC	Removes the jector pin. ⊗ AC：Not applicable.		−200
		TPC	Replaces dowel pin. Attached MS6—25 to MSTP6—25 (tapped type). ⊗ D38・45:Not applicable		100
		NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗ Punch & retainer set not available.		0

Example

■Punch with dowel is;
Mainly used for dies of body of automobile with retainer which hold punch. Different from indirect positioning by retainer's dowel hole, it allows direct positioning by the dowel hole coaxially machined to punch, and improves the die precision. It is effective when used for die machining by NC process. It can also be used for dies of exterior panels of electrical appliances by setting with retainer or for attaching to punch plate of progressive die.



- Finished for retainer
- For retainers, see **P.653**～.
- When using backing plate, only φ38 and φ45 have φ10.2 stepped dowel pin hole. **P.186**

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

■Ⓜ SKD 11 or equivalent

D	Ⓐ	Ⓓ	Ⓡ	Ⓔ	Ⓖ
	T—SJAS—C T—SJAL—C T—SJVAS—C T—SJVAL—C	T—SJDS—C T—SJDL—C T—SJVDS—C T—SJVDL—C	T—SJRS—C T—SJRL—C T—SJVRS—C T—SJVRL—C	T—SJES—C T—SJEL—C T—SJVES—C T—SJVEL—C	T—SJGS—C T—SJGL—C T—SJVGS—C T—SJVGL—C
10	4,510	5,860	7,450	6,050	5,460
13	4,810	6,480	8,400	6,720	5,950
16	5,470	7,520	9,460	7,800	6,930
20	6,290	8,760	10,850	9,140	8,260
25	6,880	9,780	11,950	10,250	9,300
32	10,180	14,230	17,990	14,920	13,550
38	13,990	18,360	21,980	19,360	17,580
45	16,970	21,850	25,010	22,850	20,840

PRESS NEW

JECTOR PUNCHES WITH DOWEL
—FINISHED FOR RETAINERS, TiCN COATING—

PRODUCTS DATA P.1220

COATING PUNCHES
—TiCN—

Punch & Retainer Set Available
Detail P.657

How to calculate the projection length of a jector pin(reference) P.191

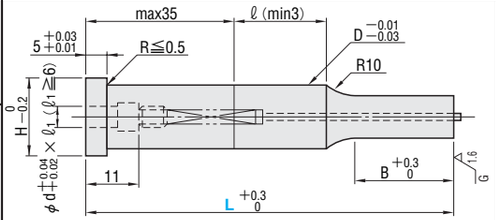
- Refer to Jector punch blank for the details of jector hole. P.186
- Refer to Jector pin set for the details of Jector pin. P.189

Type	A	Shank dia. D T	M H
With dowel TiCN coating type	Dowel pin MS6—25	D m5	SKD 11 or equivalent 60～63HRC Surface3000HV

Catalog No. Type	Shape	B Blade length	With dowel
H—SJ (Spring reinforced type— H—SJV)	A D R E G	S / L / X	—C

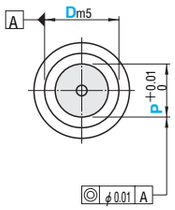
RoHS

Select tip shape from shape A～G shown below.

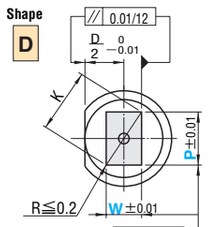


The tip surface is ground before coating.
Blade length(B) X>L>S

Shape A

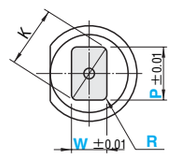


Shape D



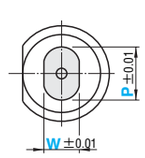
P≧W
K=√(P²+W²)

Shape R



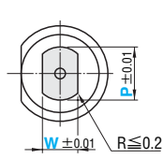
P≧W
0.15≦R< W/2
K=√((P−2R)²+(W−2R)²+2R

Shape E



P>W

Shape G



P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	H
S Spring reinforced type H—SJAS—C H—SJVAS—C	10	60 70 80 90 100 110 120	3.00～ 9.99	9.97	3.00	0.15≦R< W/2 (R only)	13	13
H—SJDS—C H—SJVDS—C	13	60 70 80 90 100 110 120	6.00～12.99	12.97	6.00			16
H—SJRS—C H—SJVRS—C	16	(60) 70 80 90 100 110 120	10.00～15.99	15.97	6.00		19	19
H—SJES—C H—SJVES—C	20	(60) 70 80 90 100 110 120	13.00～19.99	19.97	6.00			23
H—SJGS—C H—SJVGS—C	25	(60) 70 80 90 100 110 120	18.00～24.99	24.97	6.00			28
L Spring reinforced type H—SJAL—C H—SJVAL—C	10	70 80 90 100 110 120	3.00～ 9.99	9.97	3.00		19	13
H—SJDL—C H—SJVDL—C	13	70 80 90 100 110 120	6.00～12.99	12.97	6.00			16
H—SJRL—C H—SJVRL—C	16	70 80 90 100 110 120	10.00～15.99	15.97	6.00		25	19
H—SJEL—C H—SJVEL—C	20	70 80 90 100 110 120	13.00～19.99	19.97	6.00			23
H—SJGL—C H—SJVGL—C	25	70 80 90 100 110 120	18.00～24.99	24.97	6.00			28
X Spring reinforced type H—SJAX—C H—SJVAX—C	10	100 110 120	6.00～ 9.99	9.97	6.00		30	13
H—SJDX—C H—SJVDX—C	13	100 110 120	6.00～12.99	12.97	6.00			16
H—SJRX—C H—SJVRX—C	16	100 110 120	10.00～15.99			—	40	19
H—SJEX—C H—SJVEX—C	20	100 110 120	13.00～19.99	—				23
H—SJGX—C H—SJVGX—C	25	100 110 120	18.00～24.99					28

The spring constant of H—SJV□□—C is as twice as that of H—SJ□□—C.
L (60)→B=13, When L (60), the blade length is fixed to 13 mm.
Ⓐ: P>D−0.03→ ℓ =0, When P>D−0.03 round punch, D −0.01 −0.03 (press-in lead) is not available.
D R E G: P・K>D−0.05→ ℓ =0, When P・K>D−0.05 shaped punch, D −0.01 −0.03 (press-in lead) is not available.

Order — Catalog No. — L — P — W — R(R only)
H—SJEL—C 16 — 70 — P12.00 — W6.00

Delivery — 3 Days

Benefit of Reinforced spring
It is twice the spring constant of standard type Jector punch. Due to the spring's larger load, more effective scrap removal can be expected.

- Finished for retainer
- For retainers, see **P.653**～.

The volume discount rate is also applicable to alteration cost. P.39

Alteration — Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC…etc.)
H—SJAS—C 10 — LC95 — P9.50 — PKC

Alterations		Code	Ⓐ	D R E G	¥/1Code
Tip		PC WC	Changes dimension P. PC≧PCmin 0.01mm increments (Combination with PKC→0.001mm increments) D / PCmin: 10 2.800; 13 5.000; 16 8.000; 20 9.000; 25 9.000	Changes dimension P・W. PC・WC≧PC・WCmin 0.01mm increments ⊗Blade length X:Not applicable D / PC・WCmin: 10 2.80; 13 5.00; 16 5.00; 20 5.00; 25 5.00	200
		BC	Changes blade length B. (shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 For dimension d1, refer to P.186 ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 For dimension d1, refer to P.186 ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P : 0.001mm incr.) ⊗D>13 : Not applicable	Changes tolerance on P(W). P・W±0.01 ⇨ +0.01 0 ⊗D>13 : Not applicable	600
Full length		LC	Changes full length. LC<L 0.1mm increments B is shortened by (L—LC). (Combination with LKC→0.01mm increments) The projection length of the jector pin is 2mm.		200
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400

Price — ■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■M SKD 11 or equivalent

D	Ⓐ H—SJAS—C H—SJAL—C H—SJVAS—C H—SJVAL—C	Ⓐ H—SJAX—C H—SJVAX—C	D R E G H—SJ□S—C H—SJ□L—C H—SJV□S—C H—SJV□L—C	D R E G H—SJ□X—C H—SJV□X—C
10	3,180	4,560	4,090	4,430
13	3,410	4,780	4,580	5,040
16	3,870	5,380	5,390	—
20	4,440	5,970	6,290	
25	4,890	6,370	6,990	

Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. To change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
		HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not available.		200
		TC	Changes head thickness 3.5≦TC<5 0.1mm increments L is shortened according to (5—TC), When LC is combined, L=LC. ⊗Punch & retainer set not available.		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H—D)/2 ⊗SRC:Not applicable		200
		SRC	Modifies head to fit to select retainers (SLS). For details, refer to P.673. ⊗Punch & retainer set not available.		100
Shank		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		—100
		NC	Removes the jector pin. ⊗AC : Not applicable.		—200
		TPC	Replaces dowel pin. Attached MS6—25 to MSTP6—25 (tapped type).		100
		NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.		0

PRESS NEW Printed in Red

JECTOR PUNCHES WITH DOWEL
—FINISHED FOR RETAINERS, WPC®TYPE / HW COATING TYPE—

Quality Improved

PRODUCTS DATA P.1221

WPC®PUNCHES
COATING PUNCHES —HW—
QUALITY IMPROVED P.1217

Punch & Retainer Set Available
Detail P.657

- Refer to Jector punch blank for the details of jector hole. P.186
- Refer to Jector pin set for the details of Jector pin. P.189

How to calculate the projection length of a jector pin(reference) P.191

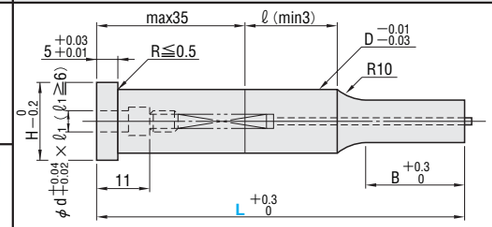
Type	A	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	With dowel
With dowel WPC®type	Dowel pin D10～32 MS6—25 D38・45 SJB—CMS	D_{m5}	SKD 11 or equivalent 60～63HRC Surface 1000～1100HV	W—SJ / W—SJV	A D R E G	S / L / X	—C
With dowel HW coating			SKD 11 or equivalent 60～63HRC Surface 3000HV	HW—SJ / HW—SJV			

—WPC®type—

—HW coating—

RoHS

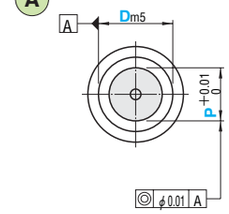
Select tip shape from shape A～G shown below.



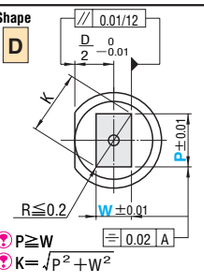
D	d
10～32	6
38～45	10

The tip is very slightly rounded.
Blade length(B) X>L>S

Shape A

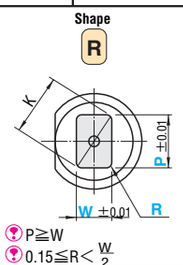


Shape D



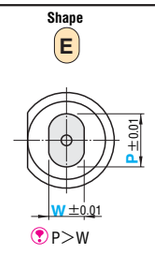
P≧W
K=√(P²+W²)

Shape R



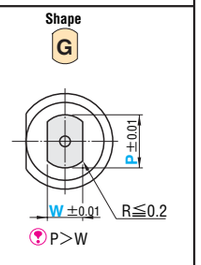
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R

Shape E



P>W

Shape G



P>W

Catalog No. Type	D	L							0.01mm increments A min. P max.	D R E G P・Kmax.	D R E G P・Wmin.	R R	B	H
—WPC®type—	10	60	70	80	90	100	110	120	3.00～ 9.99	9.97	3.00	W/2 (R only)	13	13
W—SJ□S—C	13	60	70	80	90	100	110	120	6.00～12.99	12.97	6.00			16
Spring reinforced type	16	(60)	70	80	90	100	110	120	10.00～15.99	15.97	6.00		19	19
W—SJV□S—C	20	(60)	70	80	90	100	110	120	13.00～19.99	19.97	6.00			23
—HW coating—	25	(60)	70	80	90	100	110	120	18.00～24.99	24.97	6.00			28
HW—SJ□S—C	(32)	(60)	70	80	90	100	110	120	20.00～31.99	31.97	7.00			35
Spring reinforced type	(38)	(60)	70	80	90	100	110	120	28.00～37.99	37.97	8.00			41
HW—SJV□S—C	(45)	(60)	70	80	90	100	110	120	35.00～44.99	44.97	9.00			48
—WPC®type—	10		70	80	90	100	110	120	3.00～ 9.99	9.97	3.00		19	13
W—SJ□L—C	13		70	80	90	100	110	120	6.00～12.99	12.97	6.00			16
Spring reinforced type	16		70	80	90	100	110	120	10.00～15.99	15.97	6.00		25	19
W—SJV□L—C	20		70	80	90	100	110	120	13.00～19.99	19.97	6.00			23
—HW coating—	25		70	80	90	100	110	120	18.00～24.99	24.97	6.00			28
HW—SJ□L—C	(32)		70	80	90	100	110	120	20.00～31.99	31.97	7.00			35
Spring reinforced type	(38)		70	80	90	100	110	120	28.00～37.99	37.97	8.00			41
HW—SJV□L—C	(45)		70	80	90	100	110	120	35.00～44.99	44.97	9.00			48
—WPC®type—	10					100	110	120	6.00～ 9.99	9.97	6.00		30	13
W—SJ□X—C	13					100	110	120	6.00～12.99	12.97	6.00			16
Spring reinforced type	16					100	110	120	10.00～15.99			—		19
W—SJV□X—C	20					100	110	120	13.00～19.99	———			40	23
—HW coating—	25					100	110	120	18.00～24.99					28
HW—SJ□X—C	(32)					100	110	120	20.00～31.99					35
Spring reinforced type														
HW—SJV□X—C														

The spring constant of W—SJV□□—C and HW—SJV□□—C is twice as that of W—SJ□□—C and HW—SJ□□—C.
L (60)→B=13, When L (60), the blade length is fixed to 13 mm.
A: P>D−0.03→ℓ=0, When P>D−0.03 round punch, D −0.01 −0.03 (press-in lead) is not available.
D R E G: P・K>D−0.05→ℓ=0, When P・K>D−0.05 shaped punch, D −0.01 −0.03 (press-in lead) is not available.
D (32) is applicable for W—SJ□□—C and W—SJV□□—C only.
D (38) and (45) are applicable for W—SJ□□—C only.

Order

Catalog No. — L — P — W — R(R only)
W—SJDS—C 38 — 100 — P30.00 — W18.00

Benefit of Reinforced spring
It is twice the spring constant of standard type Jector punch. Due to the spring's larger load, more effective scrap removal can be expected.

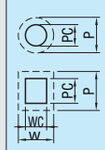
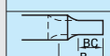
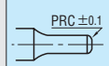
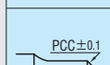
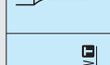
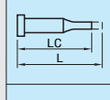
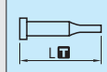
Delivery

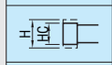
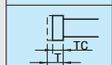
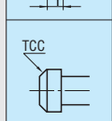
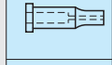
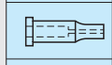
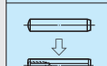
	WPC®type (W—)	HW coating (HW—)
● ϕD 10～32 A	3 Days / Express A / 500/1Pc. P.38	3 Days
	A flat charge of 1,350 yen for 3 pieces or more of the same size.	
● ϕD 10～32 D R E G	3 Days / Express A / 800/1Pc. P.38	
	A flat charge of 2,160 yen for 3 pieces or more of the same size.	
● ϕD 38・45 A D R E G	3 Days / Express A / 1,500/1Pc. P.38	
	A flat charge of 4,050 yen for 3 pieces or more of the same size.	

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC…etc.)
W—SJAS—C 25 — LC95 — P18.05 — PKC

Alterations		Code	A	D R E G	¥/1Code
Tip		PC WC	Changes dimension P. PC≧PCmin 0.01mm increments (Combination with PKC →0.001mm increments)	Changes dimension P・W. PC・WC≧PC・WCmin 0.01mm increments ⊗Blade length X:Not applicable	200
		BC	Changes blade length B. (shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (PRC≦(P−d1−0.5)/2 For dimension d1, refer to P.186. ⊗PCC:Not applicable	———	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (PCC≦(P−d1−0.5)/2 For dimension d1, refer to P.186. ⊗PRC:Not applicable	———	200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P : 0.001mm incr.)	Changes tolerance on P(W). P・W±0.01 ⇨ +0.01 0	400
Full length		LC	Changes full length. LC<L 0.1mm increments (B is shortened by (L—LC). (Combination with LKC→0.01mm increments) The projection length of the jector pin is 2mm.		200
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. To change angle, add KC.	200 (only A 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only A 600)

Alterations		Code	A	D R E G	¥/1Code
Head		NKC	———	No key flat. ⊗Punch & retainer set not available.	0
		HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Punch & retainer set not available.		200
		TC	Changes head thickness 3.5≦TC<5 0.1mm increments L is shortened by (5—TC), When LC is combined, L=LC. ⊗Punch & retainer set not available.		200
		TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 ⊗SRC:Not applicable		200
		SRC	Modifies head to fit to select retainers (SLS). For details, refer to P.673. D10～32 : Applicable ⊗Punch & retainer set not available.		100
Shank		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		—100
		NC	Removes the jector pin. ⊗AC : Not available.		—200
		TPC	Replaces dowel pin. Attached MS6—25 to MSTP6—25 (tapped type). ⊗D38・45:Not applicable		100
		NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.		0

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■M SKD 11 or equivalent WPC®type

D	A W—SJAS—C W—SJAL—C W—SJVAS—C W—SJVAL—C	A W—SJAX—C W—SJVAX—C	D R E G W—SJ□S—C W—SJ□L—C W—SJV□S—C W—SJV□L—C	D R E G W—SJ□X—C W—SJV□X—C
10	2,760	4,100	3,640	4,980
13	2,850	4,190	3,940	5,280
16	3,140	4,630	4,510	—
20	3,510	5,040	5,190	
25	3,820	5,360	5,810	
32	5,010	6,660	7,760	
38	7,230	—	10,170	
45	8,730	—	11,970	

■M SKD 11 or equivalent HW coating

D	A HW—SJAS—C HW—SJAL—C HW—SJVAS—C HW—SJVAL—C	A HW—SJAX—C HW—SJVAX—C	D R E G HW—SJ□S—C HW—SJ□L—C HW—SJV□S—C HW—SJV□L—C	D R E G HW—SJ□X—C HW—SJV□X—C
10	3,980	5,520	5,120	5,360
13	4,300	5,790	5,730	6,100
16	4,870	6,510	6,780	—
20	5,580	7,230	7,920	
25	6,170	7,710	8,780	

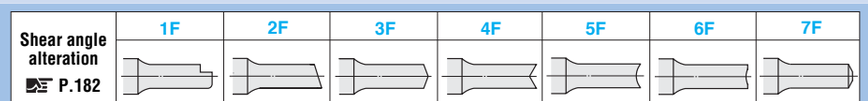
PRESS ADD.SPEC. Printed in Red

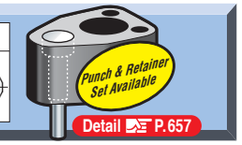
PUNCHES FOR HEAVY LOAD —FINISHED FOR RETAINERS—

PRODUCTS DATA P.1223

PUNCHES FOR HEAVY LOAD
TAPERED HEAD PUNCHES

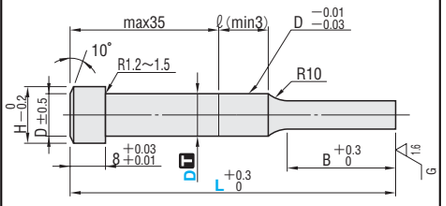
Shear angle alteration P.182



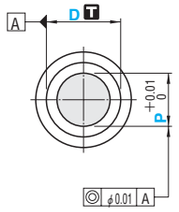


Detail P.657

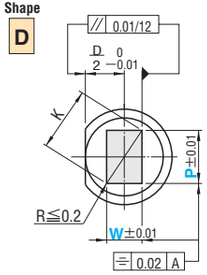
The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from shape A~G shown below.
RoHS Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable	D_{m5}	SKH51 61~64HRC	AP	A D R E G	S L	
		Powdered high-speed steel 64~67HRC	APH			
	$D^{+0.005}_{0}$	SKH51 61~64HRC	A—AP			
		Powdered high-speed steel 64~67HRC	A—APH		Blade length(B) L>S	

Shape A

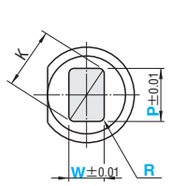


Shape D



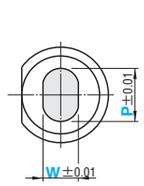
Ⓨ P≧W
Ⓨ R=0 : Applicable
Ⓨ $K=\sqrt{P^2+W^2}$

Shape R



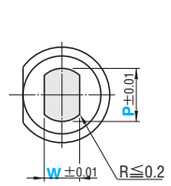
Ⓨ P≧W
Ⓨ 0.15≦R< $\frac{W}{2}$
Ⓨ $K=\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Shape E



Ⓨ P>W

Shape G



Ⓨ P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P·Kmax.	0.01mm increments DREG P·Wmin.	0.01mm Ⓡ R	B	H
(D_{m5}) AP APH ($D^{+0.005}_{0}$) A—AP A—APH	A D R E G	S	5	50 60 70 80 90 100	2.00~ 4.99	4.97	1.20	0.15≦R< $\frac{W}{2}$ (Ⓡ only)	8	10
			6	50 60 70 80 90 100	2.00~ 5.99	5.97	1.50			11
			8	(50) 60 70 80 90 100 110 120 130	3.00~ 7.99	7.97	2.00		13	13
			10	(50) 60 70 80 90 100 110 120 130	3.00~ 9.99	9.97	2.50			15
			13	(50) 60 70 80 90 100 110 120 130	6.00~12.99	12.97	3.00			18
			16	(50) 60 70 80 90 100 110 120 130	10.00~15.99	15.97	4.00		19	21
			20	(50) 60 70 80 90 100 110 120 130	13.00~19.99	19.97	5.00			25
			25	(50) 60 70 80 90 100 110 120 130	18.00~24.99	24.97	6.00			30
		L	5	60 70 80 90 100	2.00~ 4.99	4.97	1.20		13	10
			6	60 70 80 90 100	2.00~ 5.99	5.97	1.50			11
			8	60 70 80 90 100 110 120 130	3.00~ 7.99	7.97	2.00		19	13
			10	60 70 80 90 100 110 120 130	3.00~ 9.99	9.97	2.50			15
			13	60 70 80 90 100 110 120 130	6.00~12.99	12.97	3.00			18
			16	70 80 90 100 110 120 130	10.00~15.99	15.97	4.00		25	21
			20	70 80 90 100 110 120 130	13.00~19.99	19.97	5.00			25
			25	70 80 90 100 110 120 130	18.00~24.99	24.97	6.00			30

Ⓨ L(50)→B=8, When L(50), the blade length is fixed to 8mm.
Ⓨ Ⓐ : P>D−0.03→ℓ=0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓨ DREG : P·K>D−0.05→ℓ=0, When P·K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.

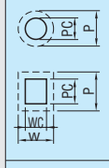
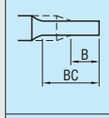
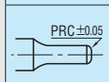
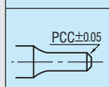
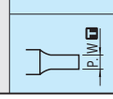
Order

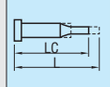
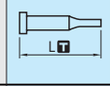
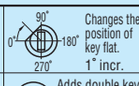
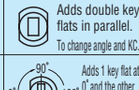
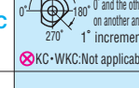
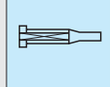
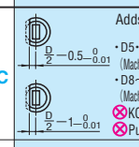
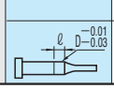
Catalog No.	L	P	W	R(Ⓡ only)
APAS 20	80	P15.00		

Delivery

- Ⓐ: 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38
  Ⓨ A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
- DREG: 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. P.38
  Ⓨ A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC···etc.)
APAS 20 — LC82 — PC12.00 — BC13

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧ $\frac{Pmin}{2}$ Ⓨ For D5 and 6, PC≧1.50 0.01mm increments (Combination with PKC →0.001mm increments) P(PC) Bmax: 1.500~1.999 20; 2.000~3.999 35; 4.000~5.999 45; 6.000~ 60	Changes dimension P·W. PC/WC ≧ $\frac{P \cdot Wmin}{2}$ Ⓨ For D5 and 6, PC/WC ≧1.00 0.01mm increments P(PC)·W(WC) Bmax: 1.00~1.49 8; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30	200
		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L(LC) requires BC+35mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L(LC) requires BC+40mm or more.	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $P^{+0.005}_{0}$ Ⓨ (P : 0.001mm incr.)	Changes tolerance on P(W). $P \cdot W \pm 0.01 \Rightarrow P \cdot W^{+0.01}_{0}$	400

Alterations		Code	Ⓐ	DREG	¥/1Code
Full length		LC	Changes full length. 35+B(BC)≦LC<L 0.1mm increments Ⓨ When LC−B(BC) is 35mm or less, B(BC) is LC−35mm. (Combination with LKC·LKZ→0.01mm increments)	Changes full length. 40+B(BC)≦LC<L 0.1mm increments Ⓨ When LC−B(BC) is 40mm or less, B(BC) is LC−40mm.	200
		LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		600
Head		KC	Adds single key flat at head.	 Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	 Adds double key flats in parallel. To change angle and KC.	200 (only Ⓐ 400)
		KFC	 Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		SKC	 Adds key flat on shank Ⓐ DREG ·D5·6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC·WKC·KFC : Not applicable ⊗Punch & retainer set not available.		600
		NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗ Punch & retainer set not available.		0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : A—APAL16, the price is 2,900 (APAL16 unit price) +200 = 3,100 yen (product unit)

■ⓂSKH51

D	Ⓐ APAS APAL L≦100	Ⓐ APAS APAL 100<L≦130	DREG APⓁS APⓁL L≦100	DREG APⓁS APⓁL 100<L≦130
5	1,970	—	2,700	—
6	2,050		2,800	
8	2,170	2,620	2,930	3,570
10	2,320	2,830	3,220	3,920
13	2,480	3,100	3,630	4,530
16	2,900	3,680	4,390	5,570
20	3,480	4,410	5,340	6,780
25	4,310	5,510	6,140	7,850

■ⓂPowdered high-speed steel

D	Ⓐ APHAS APHAL L≦100	Ⓐ APHAS APHAL 100<L≦130	DREG APHⓁS APHⓁL L≦100	DREG APHⓁS APHⓁL 100<L≦130
5	3,670	—	4,330	—
6	3,860		4,540	
8	4,140	5,090	4,890	6,010
10	4,530	5,610	5,360	6,640
13	4,820	6,070	5,890	7,420
16	5,660	7,240	7,160	9,160
20	6,630	8,550	8,680	11,190
25	8,080	10,660	9,950	13,130

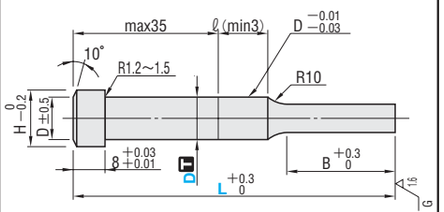
PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS, DICOAT®TYPE—

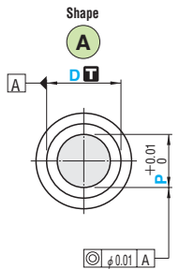
PRODUCTS DATA P.1215・1223

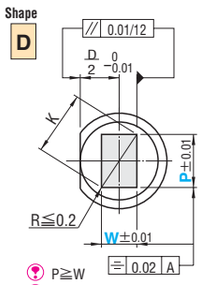
PUNCHES FOR HEAVY LOAD
DICOAT®PUNCHES

Punch & Retainer Set Available
Detail P.657

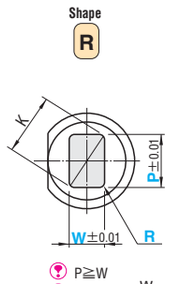
The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from shape A~G shown below.
—Dicoat® type— RoHS Shank Dia.Tolerance D T m5・$^{+0.005}_{0}$ Selectable	D_{m5} $D^{+0.005}_{0}$ (D5~13)	Powdered high-speed steel 62~64HRC Surface 3000HV	T—APH AT—APH	A D R E G	S L	Blade length(B) L>S 

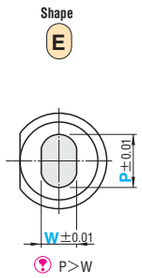
Shape A


Shape D


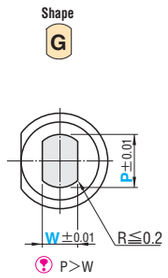
P≧W
R=0：Applicable
K=$\sqrt{P^2+W^2}$

Shape R


P≧W
0.15≦R< W/2
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E


P>W

Shape G


P>W

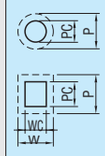
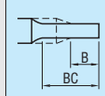
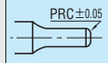
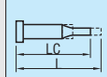
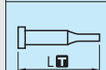
Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	Ⓡ R	B	H
(Dm5) T—APH	A D R E G	S	5	50 60 70 80	2.00~ 4.99	4.97	1.20	0.15≦R< W/2 (Ⓡ only)	8	10
			6	50 60 70 80	2.00~ 5.99	5.97	1.50			11
			8	(50) 60 70 80 90 100	3.00~ 7.99	7.97	2.00		13	13
			10	(50) 60 70 80 90 100	3.00~ 9.99	9.97	2.50			15
			13	(50) 60 70 80 90 100	6.00~12.99	12.97	3.00			18
			16	(50) 60 70 80 90 100	10.00~15.99	15.97	4.00		19	21
			20	(50) 60 70 80 90 100	13.00~19.99	19.97	5.00			25
			25	(50) 60 70 80 90 100	18.00~24.99	24.97	6.00			30
($D^{+0.005}_{0}$) AT—APH (D5~13)		L	5	60 70 80	2.00~ 4.99	4.97	1.20		13	10
			6	60 70 80	2.00~ 5.99	5.97	1.50			11
			8	60 70 80 90 100	3.00~ 7.99	7.97	2.00		19	13
			10	60 70 80 90 100	3.00~ 9.99	9.97	2.50			15
			13	60 70 80 90 100	6.00~12.99	12.97	3.00			18
			16	70 80 90 100	10.00~15.99	15.97	4.00		25	21
			20	70 80 90 100	13.00~19.99	19.97	5.00			25
			25	70 80 90 100	18.00~24.99	24.97	6.00			30

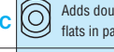
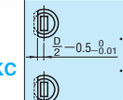
Ⓟ L(50)→B=8, When L(50), the blade length is fixed to 8mm.
Ⓟ Ⓐ : P>D−0.03→ℓ=0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓟ DREG : P・K>D−0.05→ℓ=0, When P・K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order Catalog No. — L — P — W — R(Ⓡ only)
T—APHDS 25 — 80 — P18.00 — W10.00

Delivery 3 Days | Express A 800/1Pc. ⊗ Express A is not available for $D^{+0.005}_{0}$ types. P.38
Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC…etc.)
T—APHAS 20 — LC82 — PC12.00 — BC13

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧ Pmin/2 Ⓟ For D5 and 6, PC≧1.50 0.01mm increments P(PC) | Bmax: 1.50~1.99 | 20; 2.00~3.99 | 35; 4.00~5.99 | 45; 6.00~ | 50	Changes dimension P・W. PC/WC ≧ P・Wmin/2 Ⓟ For D5 and 6, ≧1.00 0.01mm increments P(PC)・W(WC) | Bmax: 1.00~1.49 | 8; 1.50~1.99 | 13; 2.00~3.49 | 19; 3.50~4.99 | 25; 5.00~ | 30	200
		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓟ Full length L(LC) requires BC+35mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓟ Full length L(LC) requires BC+40mm or more.	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−0.2)/2	——	400
Full length		LC	Changes full length. 35+B(BC)≦LC<L 0.1mm increments Ⓟ When LC−B(BC) is 35mm or less, B(BC) is LC−35mm. (Combination with LKC→0.01mm increments)	Changes full length. 40+B(BC)≦LC<L 0.1mm increments Ⓟ When LC−B(BC) is 40mm or less, B(BC) is LC−40mm.	200
		LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400

Alterations		Code	Ⓐ	DREG	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	 Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗ KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗ KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗ Punch & retainer set not available.	0
Shank		SKC	 Adds key flat on shank. Ⓐ DREG ・D5・6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ KC・WKC・KFC：Not applicable ⊗ Punch & retainer set not available.	600
		NDC	No press-in lead	ℓ≧3⇨ℓ=0 ⊗ Punch & retainer set not available.	0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 300 yen required.
Example：AT—APHAS13, the price is 6,540 (T—APHAS13 unit price) +300 = 6,840 yen (product unit)

■M Powdered high-speed steel

D	Ⓐ T—APHAS T—APHAL	D T—APHDS T—APHDL	R T—APHRS T—APHRL	E T—APHES T—APHEL	G T—APHGS T—APHGL
5	4,820	5,550	7,190	5,550	5,530
6	5,120	5,900	7,560	5,900	5,810
8	5,580	6,410	7,960	6,410	6,270
10	6,120	6,980	8,250	6,940	6,760
13	6,540	7,770	9,130	7,770	7,430
16	7,560	9,230	10,530	9,230	9,230
20	8,740	10,830	12,310	10,830	10,830
25	10,280	12,250	13,950	12,250	12,250

PRESS ADD.SPEC. Printed in Red

PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS, TiCN COATING TYPE—

Quality Improved

PRODUCTS DATA P.1220 · 1223

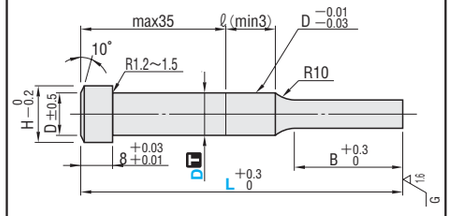
PUNCHES FOR HEAVY LOAD
COATING PUNCHES—TiCN—
QUALITY IMPROVED P.1217

Punch & Retainer Set Available Detail P.657

The volume discount rate is also applicable to alteration cost. P.39

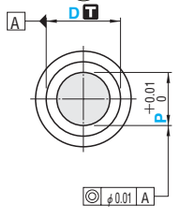
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from shape A~G shown below.
—TiCN coating type— RoHS	D_{m5}	SKH51 61~64HRC Surface 3000HV	H—AP	A D R E G	S	
		Powdered high-speed steel 64~67HRC Surface 3000HV	H—APH			
	$D^{+0.005}_{0}$	SKH51 61~64HRC Surface 3000HV	AH—AP		L	
		Powdered high-speed steel 64~67HRC Surface 3000HV	AH—APH			

Shank Dia.Tolerance D T $m5$ · $^{+0.005}_{0}$ Selectable

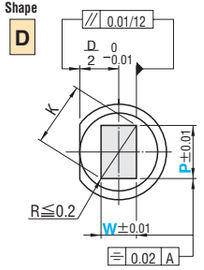


The tip surface is ground before coating.

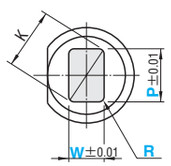
Shape A



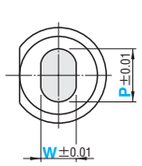
Shape D



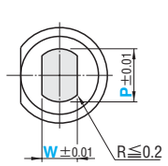
Shape R



Shape E



Shape G



- P≧W
- R=0 : Applicable
- $K=\sqrt{P^2+W^2}$

- P≧W
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

- P>W

- P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	R	B	H
(D_{m5}) H—AP H—APH	A D R E G	S	5	50 60 70 80 90 100	2.00~ 4.99	4.97	1.20	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	8	10
			6	50 60 70 80 90 100	2.00~ 5.99	5.97	1.50			11
			8	(50) 60 70 80 90 100 110 120 130	3.00~ 7.99	7.97	2.00		13	13
			10	(50) 60 70 80 90 100 110 120 130	3.00~ 9.99	9.97	2.50			15
			13	(50) 60 70 80 90 100 110 120 130	6.00~12.99	12.97	3.00			18
			16	(50) 60 70 80 90 100 110 120 130	10.00~15.99	15.97	4.00		19	21
			20	(50) 60 70 80 90 100 110 120 130	13.00~19.99	19.97	5.00			25
			25	(50) 60 70 80 90 100 110 120 130	18.00~24.99	24.97	6.00			30
($D^{+0.005}_{0}$) AH—AP AH—APH		L	5	60 70 80 90 100	2.00~ 4.99	4.97	1.20		13	10
			6	60 70 80 90 100	2.00~ 5.99	5.97	1.50			11
			8	60 70 80 90 100 110 120 130	3.00~ 7.99	7.97	2.00		19	13
			10	60 70 80 90 100 110 120 130	3.00~ 9.99	9.97	2.50			15
			13	60 70 80 90 100 110 120 130	6.00~12.99	12.97	3.00			18
			16	70 80 90 100 110 120 130	10.00~15.99	15.97	4.00		25	21
			20	70 80 90 100 110 120 130	13.00~19.99	19.97	5.00			25
			25	70 80 90 100 110 120 130	18.00~24.99	24.97	6.00			30

- L (50)→B=8, When L (50), the blade length is fixed to 8mm.
- Ⓐ : P>D−0.03→ ℓ =0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
- DREG : P · K>D−0.05→ ℓ =0, When P · K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.

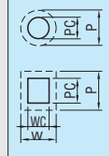
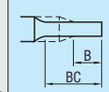
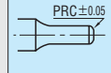
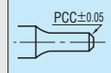
Order Catalog No. — L — P — W — R(Ⓡ only)

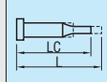
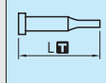
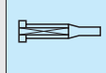
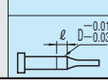
H—APAS 20 — 80 — P15.00

Delivery 3 Days

Alterations Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC···etc.)

H—APAS 20 — LC82 — PC12.00 — BC13

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧ Pmin/2 (For D5 and 6, PC≧1.50) 0.01mm increments (Combination with PKC →0.001mm increments.) P(PC) / Bmax: 1.500~1.999 / 20; 2.000~3.999 / 35; 4.000~5.999 / 45; 6.000~ / 60	Changes dimension P·W. PC/WC ≧ P·Wmin/2 (For D5 and 6, PC/WC≧1.00) 0.01mm increments P(PC)·W(WC) / Bmax: 1.00~1.49 / 8; 1.50~1.99 / 13; 2.00~3.49 / 19; 3.50~4.99 / 25; 5.00~ / 30	200
		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments (Full length L(LC) requires BC+35mm or more.)	Changes blade length B. 2≦BC≦Bmax 0.1mm increments (Full length L(LC) requires BC+40mm or more.)	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (PRC≦(P−0.2)/2 ⊗PCC:Not applicable)	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (PCC≦(P−0.2)/2 ⊗PRC:Not applicable)	——	200
		PKC	Changes tolerance on P. $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ (P:0.001mm incr.) ⊗D>13:Not applicable	Changes tolerance on P(W). P·W±0.01⇨+0.01 0 ⊗D>13:Not applicable	600

Alterations		Code	Ⓐ	DREG	¥/1Code
Full length		LC	Changes full length. 35+B(BC)≦LC<L 0.1mm increments (When LC−B(BC) is 35mm or less, B(BC) is LC−35mm. (Combination with LKC→0.01mm increments)	Changes full length. 40+B(BC)≦LC<L 0.1mm increments (When LC−B(BC) is 40mm or less, B(BC) is LC−40mm.	200
		LKC	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		400
Head		KC	Adds single key flat at head.	90° 0° 180° 270° Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		SKC	Adds key flat on shank. Ⓐ P≦D−1.2 DREG W≦D−1.2 ·D5·6 (Machining width 0.5) ·D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC · WKC · KFC : Not applicable ⊗Punch & retainer set not available.		600
		NDC	No press-in lead	ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.	0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : AH—APAS8, the price is 3,580 (H—APAS8 unit price) +200 = 3,780 yen (product unit)

■M SKH51

D	Ⓐ H—APAS H—APAL L≦100	Ⓐ H—APAS H—APAL 100<L≦130	DREG H—AP□S H—AP□L L≦100	DREG H—AP□S H—AP□L 100<L≦130
5	3,120	—	3,850	—
6	3,320		4,060	
8	3,580	4,330	4,330	5,230
10	3,870	4,720	4,760	5,800
13	4,170	5,210	5,310	6,630
16	4,760	6,040	6,230	7,910
20	5,520	7,010	7,360	9,340
25	6,430	8,230	8,240	10,540

■M Powdered high-speed steel

D	Ⓐ H—APHAS H—APHAL L≦100	Ⓐ H—APHAS H—APHAL 100<L≦130	DREG H—APH□S H—APH□L L≦100	DREG H—APH□S H—APH□L 100<L≦130
5	4,780	—	5,480	—
6	5,070		5,840	
8	5,540	6,810	6,340	7,790
10	6,060	7,510	6,920	8,580
13	6,490	8,170	7,650	9,630
16	7,490	9,580	9,080	11,620
20	8,660	11,170	10,730	13,840
25	10,180	13,430	12,130	16,010

PRESS ADD.SPEC. Printed in Red

PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS, WPC®TYPE / HW COATING TYPE—

Quality Improved

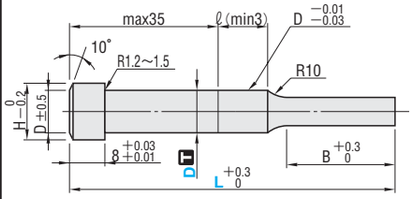
PRODUCTS DATA P.1221·1223

PUNCHES FOR HEAVY LOAD
TAPERED HEAD PUNCHES
WPC®PUNCHES
COATING PUNCHES —HW—
QUALITY IMPROVED P.1217

Punch & Retainer Set Available Detail P.657

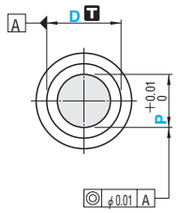
DELIVERY SHORTENED

¥ The volume discount rate is also applicable to alteration cost. P.39

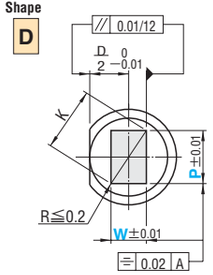
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from shape A~G shown below.
—WPC®type— RoHS —HW coating type— Shank Dia.Tolerance D T m5 · +0.005 0 Selectable	Dm5	SKH51 61~64HRC Surface1000~1100HV	W—AP	A D R E G	S L	
		Powdered high-speed steel 64~67HRC Surface1000~1100HV	W—APH			
		SKH51 61~64HRC Surface3000HV	HW—AP			
		Powdered high-speed steel 64~67HRC Surface3000HV	HW—APH			
	D +0.005 0	SKH51 61~64HRC Surface1000~1100HV	AW—AP			
		Powdered high-speed steel 64~67HRC Surface1000~1100HV	AW—APH			
		SKH51 61~64HRC Surface3000HV	AHW—AP		Blade length(B) L>S	
		Powdered high-speed steel 64~67HRC Surface3000HV	AHW—APH			

The tip is very slightly rounded.

Shape A

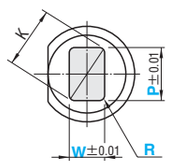


Shape D



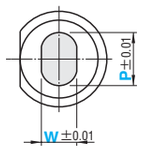
P≧W
K=√(P²+W²)

Shape R



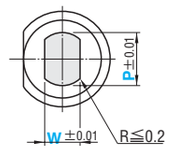
P≧W
0.15≦R< W/2
K=√((P−2R)²+(W−2R)²+2R

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P·Kmax.	0.01mm increments DREG P·Wmin.	0.01mm Ⓡ R	B	H
(Dm5) —WPC®type— W—AP W—APH —HW coating type— HW—AP HW—APH	A D R E G	S	5	50 60 70 80 90 100	2.00~ 4.99	4.97	1.20	0.15≦R< W/2 (Ⓡ only)	8	10
			6	50 60 70 80 90 100	2.00~ 5.99	5.97	1.50			11
			8	(50) 60 70 80 90 100 110 120 130	3.00~ 7.99	7.97	2.00		13	13
			10	(50) 60 70 80 90 100 110 120 130	3.00~ 9.99	9.97	2.50			15
			13	(50) 60 70 80 90 100 110 120 130	6.00~12.99	12.97	3.00			18
			16	(50) 60 70 80 90 100 110 120 130	10.00~15.99	15.97	4.00		19	21
			20	(50) 60 70 80 90 100 110 120 130	13.00~19.99	19.97	5.00			25
			25	(50) 60 70 80 90 100 110 120 130	18.00~24.99	24.97	6.00			30
(D +0.005 0) —WPC®type— AW—AP AW—APH —HW coating type— AHW—AP AHW—APH		L	5	60 70 80 90 100	2.00~ 4.99	4.97	1.20		13	10
			6	60 70 80 90 100	2.00~ 5.99	5.97	1.50			11
			8	60 70 80 90 100 110 120 130	3.00~ 7.99	7.97	2.00		19	13
			10	60 70 80 90 100 110 120 130	3.00~ 9.99	9.97	2.50			15
			13	60 70 80 90 100 110 120 130	6.00~12.99	12.97	3.00			18
			16	70 80 90 100 110 120 130	10.00~15.99	15.97	4.00		25	21
			20	70 80 90 100 110 120 130	13.00~19.99	19.97	5.00			25
			25	70 80 90 100 110 120 130	18.00~24.99	24.97	6.00			30

L (50)→B=8, When L (50), the blade length is fixed to 8mm.
Ⓐ : P>D−0.03→ ℓ =0, When P>D−0.03 round punch, D −0.01 −0.03 (press-in lead) is not available.
DREG : P·K>D−0.05→ ℓ =0, When P·K>D−0.05 shaped punch, D −0.01 −0.03 (press-in lead) is not available.

Order

Catalog No.	L	P	W	R(Ⓡ only)
W—APAS 20	80	P15.00		
HW—APAS 20	80	P16.50		

Delivery

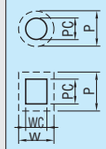
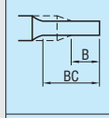
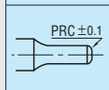
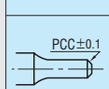
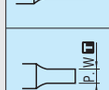
■WPC®type (W—·AW—)

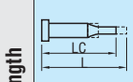
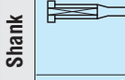
- Ⓐ: 3 Days — Express A 500/1Pc. P.38
  A flat charge of 1,350 yen for 3 pieces or more of the same size.
- DREG: 3 Days — Express A 800/1Pc. P.38
  A flat charge of 2,160 yen for 3 pieces or more of the same size.

■HW coating type (HW—·AHW—): 3 Days

Alteration

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC···etc.)
W—APAS 20 — LC82 — PC12.00 — BC13

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧ Pmin/2 For D5 and 6, PC≧1.50 0.01mm increments (Combination with PKC →0.01mm increments) P(PC) 1.500~1.999 20; 2.000~3.999 35; 4.000~5.999 45; 6.000~ 60	Changes dimension P·W. PC/WC ≧ P·Wmin/2 For D5 and 6, PC/WC≧1.00 0.01mm increments P(PC)·W(WC) 1.00~1.49 8; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30	200
		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Full length L(LC) requires BC+35mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Full length L(LC) requires BC+40mm or more.	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P : 0.001mm incr.) ⊗HW coating type:Not applicable	Changes tolerance on P(W). P·W±0.01 ⇨ +0.01 0	400

Alterations		Code	Ⓐ	DREG	¥/1Code
Full length		LC	Changes full length. 35+B(BC)≦LC<L 0.1mm increments When LC−B(BC) is 35mm or less, B(BC) is LC−35mm.	Changes full length. 40+B(BC)≦LC<L 0.1mm increments When LC−B(BC) is 40mm or less, B(BC) is LC−40mm. (Combination with LKC→0.01mm increments)	200
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
Head		KC	Adds single key flat at head.	90° 0° 180° 270° Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. To change angle and KC.	200 (only Ⓐ 400)
		KFC	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		SKC	Adds key flat on shank. Ⓐ DREG D/2 −0.5 0 −0.01 (Machining width 0.5) ·D5·6 P≦D−1.2 W≦D−1.2 ·D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC·WKC·KFC : Not applicable ⊗Punch & retainer set not available.		600
		NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.		0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

■The price table indicates the prices of products with shank diameter tolerance of Dm5. For shank tolerance of D +0.005 0, additional 200 yen required.
Example : AHW—APAL10, the price is 4,130 (HW—APAL10 unit price) +200 = 4,330 yen (product unit)

■MSKH51 WPC®type

D	Ⓐ W—APAS W—APAL L≦100	Ⓐ W—APAS W—APAL 100<L≦130	DREG W—AP□S W—AP□L L≦100	DREG W—AP□S W—AP□L 100<L≦130
5	3,000	—	3,730	—
6	3,080		3,830	
8	3,200	3,870	3,960	4,790
10	3,350	4,080	4,250	5,180
13	3,510	4,380	4,660	5,820
16	3,930	4,990	5,420	6,880
20	4,510	5,720	6,370	8,080
25	5,340	6,830	7,170	9,170

■MPowdered high-speed steel WPC®type

D	Ⓐ W—APHAS W—APHAL L≦100	Ⓐ W—APHAS W—APHAL 100<L≦130	DREG W—APH□S W—APH□L L≦100	DREG W—APH□S W—APH□L 100<L≦130
5	4,630	—	5,360	—
6	4,890		5,570	
8	5,170	6,350	5,920	7,280
10	5,560	6,890	6,390	7,920
13	5,850	7,370	6,920	8,710
16	6,690	8,560	8,190	10,480
20	7,660	9,880	9,710	12,520
25	9,110	12,020	10,980	14,490

■MSKH51 HW coating type

D	Ⓐ HW—APAS HW—APAL L≦100	Ⓐ HW—APAS HW—APAL 100<L≦130	DREG HW—AP□S HW—AP□L L≦100	DREG HW—AP□S HW—AP□L 100<L≦130
5	3,360	—	4,080	—
6	3,550		4,290	
8	3,840	4,640	4,600	5,560
10	4,130	5,030	5,020	6,120
13	4,430	5,530	5,580	6,970
16	5,470	6,940	6,950	8,820
20	6,240	7,920	8,090	10,270
25	7,250	9,280	9,060	11,590

■MPowdered high-speed steel HW coating type

D	Ⓐ HW—APHAS HW—APHAL L≦100	Ⓐ HW—APHAS HW—APHAL 100<L≦130	DREG HW—APH□S HW—APH□L L≦100	DREG HW—APH□S HW—APH□L 100<L≦130
5	5,020	—	5,750	—
6	5,320		6,090	
8	5,780	7,100	6,600	8,110
10	6,310	7,820	7,160	8,870
13	6,730	8,470	7,940	10,000
16	8,150	10,430	9,840	12,590
20	9,350	12,060	11,420	14,730
25	10,970	14,480	12,920	17,050

PRESS ADD.SPEC. Printed in Red

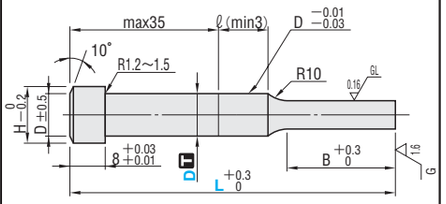
PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS, LAPPING TYPE—

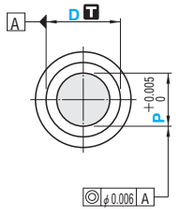
PRODUCTS DATA P.1223

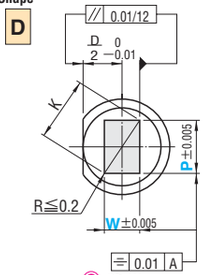
PUNCHES FOR HEAVY LOAD
TAPERED HEAD PUNCHES

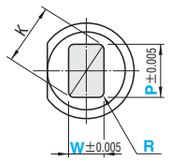
Punch & Retainer Set Available Detail P.657

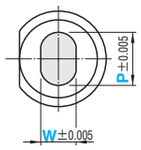
¥ The volume discount rate is also applicable to alteration cost. P.39

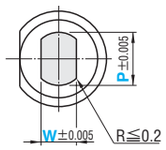
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from shape A~G shown below.
RoHS Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable	D_{m5}	SKH51 61~64HRC	L—AP	A D R E G	S	
		Powdered high-speed steel 64~67HRC	L—APH			
	$D^{+0.005}_{0}$	SKH51 61~64HRC	AL—AP		L	
		Powdered high-speed steel 64~67HRC	AL—APH		Blade length(B) L>S	

Shape A 

Shape D 

Shape R 

Shape E 

Shape G 

Ⓐ P≧W
Ⓐ K=$\sqrt{P^2+W^2}$

Ⓡ P≧W
Ⓡ 0.15≦R<$\frac{W}{2}$
Ⓡ K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Ⓔ P>W

Ⓖ P>W

Catalog No. Type	Shape	B Blade length	D	L	0.001mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P·Kmax.	Ⓓ Ⓡ Ⓔ Ⓖ P·Wmin.	0.01mm Ⓡ R	B	H
(D_{m5}) L—AP L—APH ($D^{+0.005}_{0}$) AL—AP AL—APH	A D R E G	S	5	50 60 70 80 90 100	2.000~ 4.990	4.970	1.200	0.15≦R<$\frac{W}{2}$ (Ⓡ only)	8	10
			6	50 60 70 80 90 100	2.000~ 5.990	5.970	1.500			11
			8	(50) 60 70 80 90 100 110 120 130	3.000~ 7.990	7.970	2.000		13	13
			10	(50) 60 70 80 90 100 110 120 130	3.000~ 9.990	9.970	2.500			15
			13	(50) 60 70 80 90 100 110 120 130	6.000~12.990	12.970	3.000			18
			16	(50) 60 70 80 90 100 110 120 130	10.000~15.990	15.970	4.000		19	21
			20	(50) 60 70 80 90 100 110 120 130	13.000~19.990	19.970	5.000			25
			25	(50) 60 70 80 90 100 110 120 130	18.000~24.990	24.970	6.000			30
		L	5	60 70 80 90 100	2.000~ 4.990	4.970	1.200		13	10
			6	60 70 80 90 100	2.000~ 5.990	5.970	1.500			11
			8	60 70 80 90 100 110 120 130	3.000~ 7.990	7.970	2.000		19	13
			10	60 70 80 90 100 110 120 130	3.000~ 9.990	9.970	2.500			15
			13	60 70 80 90 100 110 120 130	6.000~12.990	12.970	3.000			18
			16	70 80 90 100 110 120 130	10.000~15.990	15.970	4.000		25	21
			20	70 80 90 100 110 120 130	13.000~19.990	19.970	5.000			25
			25	70 80 90 100 110 120 130	18.000~24.990	24.970	6.000			30

Ⓣ L(50)→B=8, When L(50), the blade length is fixed to 8mm.
Ⓣ Ⓐ : P>D−0.03→ℓ=0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓣ Ⓓ Ⓡ Ⓔ Ⓖ : P·K>D−0.05→ℓ=0, When P·K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order

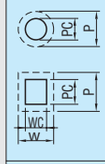
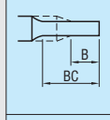
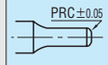
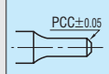
Catalog No.	L	P	W	R(Ⓡ only)
AL—APDS 25	80	P18.000	W10.000	

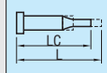
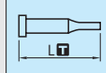
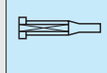
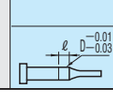
Delivery

- Ⓐ 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38
  Ⓣ A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
- Ⓓ Ⓡ Ⓔ Ⓖ 3 Days — Express A 800/1Pc. P.38
  Ⓣ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC···etc.)
L—APAS 20 — LC82 — PC12.000 — BC13

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Tip		PC WC	Changes dimension P. PC≧$\frac{Pmin}{2}$ Ⓣ For D5 and 6, PC≧1.500 0.001mm increments P(PC) / Bmax: 1.500~1.999 / 20; 2.000~3.999 / 35; 4.000~5.999 / 45; 6.000~ / 60	Changes dimension P·W. $\frac{PC}{WC}$≧$\frac{P\cdot Wmin}{2}$ Ⓣ For D5 and 6, $\frac{PC}{WC}$≧1.000 0.001mm increments P(PC)·W(WC) / Bmax: 1.000~1.490 / 8; 1.500~1.990 / 13; 2.000~3.490 / 19; 3.500~4.990 / 25; 5.000~ / 30	200
		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓣ Full length L(LC) requires BC+35mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓣ Full length L(LC) requires BC+40mm or more.	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓣ PRC≦(P−0.2)/2 ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓣ PCC≦(P−0.2)/2 ⊗PRC:Not applicable	——	200

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Full length		LC	Changes full length. 35+B(BC)≦LC<L 0.1mm increments Ⓣ When LC−B (or BC) is 35mm or less, B (or BC) is LC−35mm. (Combination with LKC·LKZ→0.01mm increments)	Changes full length. 40+B(BC)≦LC<L 0.1mm increments Ⓣ When LC−B (BC) is 40mm or less, B (BC) is LC−40mm.	200
		LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		600
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		SKC	Adds key flat on shank. Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ $\frac{D}{2}-0.5^{\ 0}_{-0.01}$ ·D5·6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) $\frac{D}{2}-1^{\ 0}_{-0.01}$ ⊗KC·WKC·KFC: Not applicable ⊗Punch & retainer set not available.		600
		NDC	No press-in lead	ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.	0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓣ To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : AL—APAS8, the price is 3,190 (L—APAS8 unit price) +200 = 3,390 yen (product unit)

■M SKH51

D	Ⓐ L—APAS L—APAL L≦100	Ⓐ 100<L≦130	Ⓓ Ⓡ Ⓔ Ⓖ L—AP□S L—AP□L L≦100	Ⓓ Ⓡ Ⓔ Ⓖ 100<L≦130
5	2,990	—	4,060	—
6	3,070		4,160	
8	3,190	3,850	4,290	5,190
10	3,340	4,070	4,580	5,580
13	3,500	4,370	4,990	6,230
16	3,920	4,970	5,750	7,300
20	4,500	5,710	6,700	8,500
25	5,330	6,820	7,500	9,600

■M Powdered high-speed steel

D	Ⓐ L—APHAS L—APHAL L≦100	Ⓐ 100<L≦130	Ⓓ Ⓡ Ⓔ Ⓖ L—APH□S L—APH□L L≦100	Ⓓ Ⓡ Ⓔ Ⓖ 100<L≦130
5	4,690	—	5,770	—
6	4,880		5,980	
8	5,170	6,350	6,330	7,780
10	5,560	6,890	6,760	8,380
13	5,840	7,350	7,330	9,230
16	6,690	8,560	8,600	11,000
20	7,660	9,880	10,100	13,020
25	9,110	12,020	11,390	15,030

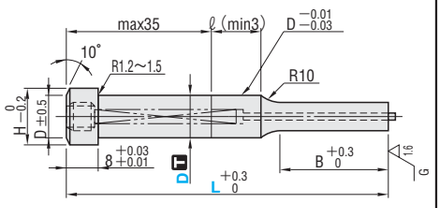
PRESS ADD.SPEC. Printed in Red

JECTOR PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS—

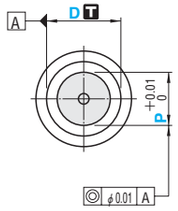
PRODUCTS DATA P.1223 — PUNCHES FOR HEAVY LOAD TAPERED HEAD PUNCHES
RELATED PRODUCTS P.129 — JECTOR PUNCHES —L SPECIFIED, DIM. B FIXED TYPE— Jector punch which keeps Dimension B length even if L changes.
Punch & Retainer Set Available Detail P.657

How to calculate the projection length of a jector pin (reference) P.191

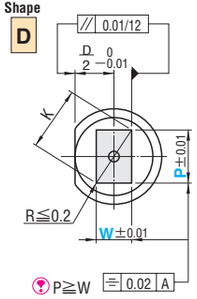
- Refer to Jector punch blank for the details of jector hole. P.188
- Refer to Jector pin set for the details of Jector pin. P.189

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from shape A~G shown below.
RoHS Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable	D_{m5}	Powdered high-speed steel 64~67HRC	APJ	A D R E G	S	
	$D^{+0.005}_{0}$		A—APJ		L	Blade length(B) L>S

Shape A

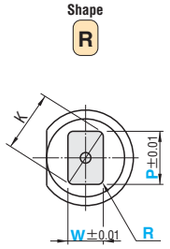


Shape D



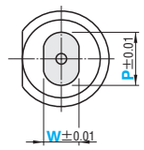
P≧W
R=0 : Applicable
$K=\sqrt{P^2+W^2}$

Shape R



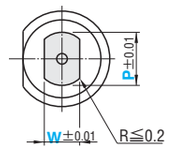
P≧W
0.15≦R< W/2
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

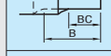
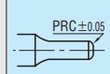
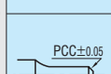
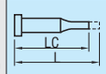
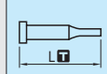
Shape G

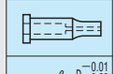
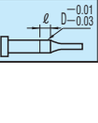


P>W

Alteration

Catalog No. — L(LC) — P — W — R — (BC·KC···etc.)
APJDS 20 — LC79 — P15.00 — W6.00 — KFC225

Alterations		Code	Ⓐ	D R E G	¥/1Code
Tip		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments ?PRC≦(P−d1−0.5)/2 For dimension d1, refer to P.188. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments ?PCC≦(P−d1−0.5)/2 For dimension d1, refer to P.188. ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$?(P : 0.001mm incr.)	Changes tolerance on P(W). P·W±0.01 ⇨ $^{+0.01}_{0}$	400
Full length		LC	Changes full length. LC<L 0.1mm incr. (combination with LKC · LKZ→0.01mm incr.) ?B is shortened by (L−LC). ?The projection length of the jector pin is 4mm.		200
		LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		600

Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		SKC	Adds key flat on shank. Ⓐ P≦D−2.2 D R E G W≦D−2.2 (Machining width 1) ⊗KC·WKC·KFC : Not applicable ⊗Punch & retainer set not available.		600
		AC	AIR Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		−100
		NC	Removes the jector pin. ⊗AC : Not applicable.		−200
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0 ⊗Punch & retainer set not available.	0

The volume discount rate is also applicable to alteration cost. P.39

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

?To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : A—APJAL13, the price is 6,660 (APJAL13 unit price) +200 = 6,860 yen (product unit)

M Powdered high-speed steel

D	Ⓐ APJAS APJAL L≦100	Ⓐ APJAS APJAL 100<L≦130	D R E G APJ□S APJ□L L≦100	D R E G APJ□S APJ□L 100<L≦130
8	5,800	7,130	6,840	8,410
10	6,290	7,790	7,420	9,200
13	6,660	8,390	8,190	10,310
16	8,050	10,300	9,970	12,760
20	9,260	11,940	12,030	15,510
25	11,490	15,160	13,970	18,440

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.01mm R	B	H
(D_{m5}) APJ	A D R E G	S	8	(50) 60 70 80 90 100 110 120 130	4.00~ 7.99	7.97	4.00	0.15≦R< W/2 (R only)	13	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~12.99	12.97	6.00			18
			16		10.00~15.99	15.97	6.00		19	21
			20		13.00~19.99	19.97	6.00			25
			25		18.00~24.99	24.97	6.00			30
($D^{+0.005}_{0}$) A—APJ		L	8		4.00~ 7.99	7.97	4.00		19	13
			10	60 70 80 90 100 110 120 130	5.00~ 9.99	9.97	5.00			15
			13		6.00~12.99	12.97	6.00			18
			16		10.00~15.99	15.97	6.00		25	21
			20	70 80 90 100 110 120 130	13.00~19.99	19.97	6.00			25
			25		18.00~24.99	24.97	6.00			30

? L (50)→B=8, When L (50), the blade length is fixed to 8mm.
? Ⓐ : P>D−0.03→ ℓ =0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
? D R E G : P·K>D−0.05→ ℓ =0, When P·K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order

Catalog No. — L — P — W — R(R only)
APJAS 20 — 80 — P15.00

Delivery

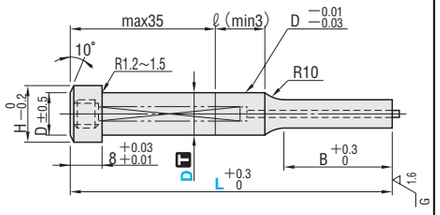
- Ⓐ 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38
  ?A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
- D R E G 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. P.38
  ?A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

JECTOR PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS, DICOAT®TYPE—

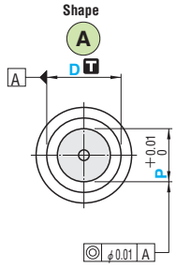
PRODUCTS DATA P.1215·1223
PUNCHES FOR HEAVY LOAD
DICOAT®PUNCHES
Punch & Retainer Set Available
Detail P.657

How to calculate the projection length of a jector pin (reference) P.191

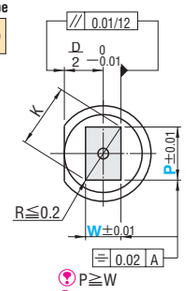
- Refer to Jector punch blank for the details of jector hole. P.188
- Refer to Jector pin set for the details of Jector pin. P.189

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from shape A~G shown below.
—Dicoat® type— RoHS Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable	D_{m5}	Powdered high-speed steel 62~64HRC Surface 3000HV	T—APJ	A D R E G	S L	
	$D^{+0.005}_{0}$ (D8~13)		AT—APJ		Blade length(B) L>S	

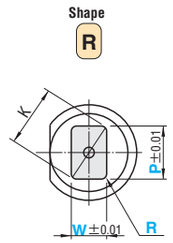
Shape A



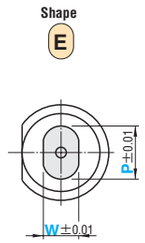
Shape D



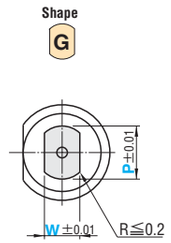
Shape R



Shape E



Shape G



- Ⓐ P≧W
- R=0 : Applicable
- K=$\sqrt{P^2+W^2}$
- Ⓓ Ⓡ Ⓔ Ⓖ P≧W
- $0.15 \leqq R < \frac{W}{2}$
- K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$
- Ⓔ P>W
- Ⓖ P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P·Kmax.	Ⓓ Ⓡ Ⓔ Ⓖ P·Wmin.	Ⓡ R	B	H
(D_{m5}) T—APJ	A D R E G	S	8	(50) 60 70 80 90 100	4.00~ 7.99	7.97	4.00	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	13	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~12.99	12.97	6.00			18
			16		10.00~15.99	15.97	6.00		19	21
			20		13.00~19.99	19.97	6.00			25
			25		18.00~24.99	24.97	6.00			30
($D^{+0.005}_{0}$) AT—APJ (D8~13)		L	8	60 70 80 90 100	4.00~ 7.99	7.97	4.00		19	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~12.99	12.97	6.00			18
			16	70 80 90 100	10.00~15.99	15.97	6.00		25	21
			20		13.00~19.99	19.97	6.00			25
			25		18.00~24.99	24.97	6.00			30

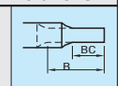
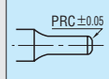
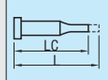
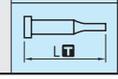
- L (50)→B=8, When L (50), the blade length is fixed to 8mm.
- Ⓐ : P>D−0.03→ ℓ =0, When P>D−0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
- Ⓓ Ⓡ Ⓔ Ⓖ : P·K>D−0.05→ ℓ =0, When P·K>D−0.05 shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

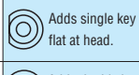
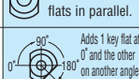
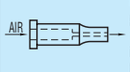
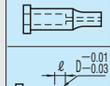
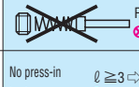
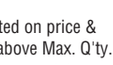
Order Catalog No. — L — P — W — R(Ⓡ only)
T—APJDS 25 — 80 — P18.00 — W10.00

Delivery 3 Days | Express A 800/1Pc. ⊗Express A is not available for D $^{+0.005}_{0}$ types. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

The volume discount rate is also applicable to alteration cost. P.39

Alteration Catalog No. — L(LC) — P — W — R — (BC·KC·WKC···etc.) — SKC
T—APJDS 20 — LC79 — P15.00 — W6.00

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Tip		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d_1−0.5)/2 Regarding dimension d_1, refer to P.188.	——	400
Full length		LC	Changes full length. LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) B is shortened by (L—LC). The projection length of the jector pin is 4mm.		200
		LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Head		KC	Adds single key flat at head.	 Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	 Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		SKC	 Adds key flat on shank. Ⓐ P≦D−2.2 Ⓓ Ⓡ Ⓔ Ⓖ W≦D−2.2 (Machining width 1) ⊗KC·WKC : Not applicable ⊗Punch & retainer set not available.		600
		AC	 Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		−100
		NC	Removes the jector pin. ⊗AC : Not applicable.		−200
		NDC	No press-in lead ℓ ≧3 ⇨ ℓ =0 ⊗Punch & retainer set not available.		0

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 340 yen required.
Example : AT—APJAL8, the price is 7,410 (T—APJAL8 unit price) +340 = 7,750 yen (product unit)

■ M Powdered high-speed steel

D	Ⓐ T—APJAS T—APJAL	Ⓓ T—APJDS T—APJDL	Ⓡ T—APJRS T—APJRL	Ⓔ T—APJES T—APJEL	Ⓖ T—APJGS T—APJGL
8	7,410	8,450	10,460	8,450	8,450
10	8,060	9,170	10,850	9,190	9,190
13	8,590	10,070	12,010	10,190	10,190
16	10,170	12,170	13,850	12,170	12,170
20	11,610	14,440	16,190	14,440	14,440
25	13,930	16,410	18,340	16,410	16,410

PRESS ADD.SPEC. Printed in Red

JECTOR PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS, TiCN COATING TYPE—

Quality Improved

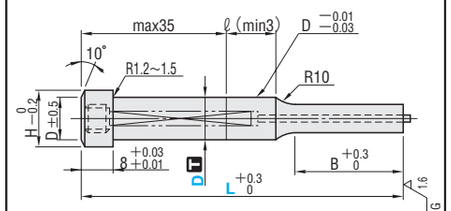
PRODUCTS DATA P.1220·1223

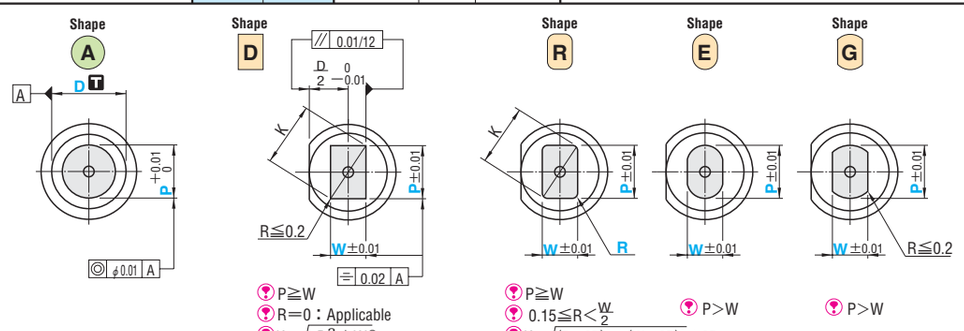
PUNCHES FOR HEAVY LOAD
COATING PUNCHES—TiCN—
QUALITY IMPROVED P.1217

Punch & Retainer Set Available Detail P.657

How to calculate the projection length of a jector pin (reference) P.191

- Refer to Jector punch blank for the details of jector hole. P.188
- Refer to Jector pin set for the details of Jector pin. P.189

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A~G shown below.
—TiCN coating type— RoHS	Dm5	Powdered high-speed steel 64~67HRC Surface 3000HV	H—APJ	A D R E G	S	
	D +0.005 0		AH—APJ		L	The tip surface is ground before coating.
Shank Dia.Tolerance D T m5 · +0.005 0 Selectable					Blade length(B) L>S	



Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	Ⓡ R	B	H
(Dm5) H—APJ	A D R E G	S	8	(50) 60 70 80 90 100 110 120 130	4.00~ 7.99	7.97	4.00	0.15≦R<W/2 (Ⓡ only)	13	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~12.99	12.97	6.00			18
			16		10.00~15.99	15.97	6.00		19	21
			20		13.00~19.99	19.97	6.00			25
			25		18.00~24.99	24.97	6.00			30
(D +0.005 0) AH—APJ		L	8	60 70 80 90 100 110 120 130	4.00~ 7.99	7.97	4.00		13	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~12.99	12.97	6.00		19	18
			16	70 80 90 100 110 120 130	10.00~15.99	15.97	6.00			21
			20		13.00~19.99	19.97	6.00		25	25
			25		18.00~24.99	24.97	6.00			30

Ⓣ L(50)→ B=8, When L(50), the blade length is fixed to 8mm.
Ⓣ Ⓐ : P>D−0.03 → ℓ =0, When P>D−0.03 round punch, D −0.01 −0.03 (press-in lead) is not available.
Ⓣ D R E G: P · K>D−0.05 → ℓ =0, When P · K>D−0.05 shaped punch, D −0.01 −0.03 (press-in lead) is not available.

Order

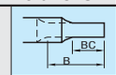
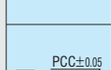
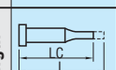
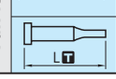
Catalog No.	L	P	W	R(Ⓡ only)
H—APJAS 20	80	P15.00		

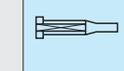
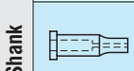
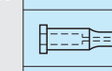
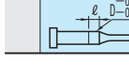
Delivery 3 Days

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No.	L(LC)	P	W	R	(BC·KC·WKC···etc.)
H—APJDS 20	LC79	P15.00	W6.00		BC13

Alterations		Code	Ⓐ	D R E G	¥/1Code
Tip		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓣ PRC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.188. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓣ PCC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.188. ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 Ⓣ (P:0.001mm incr.) ⊗D>13:Not applicable	Changes tolerance on P(W). P·W±0.01 ⇨ +0.01 0 ⊗D>13:Not applicable	600
Full length		LC	Changes full length. LC<L 0.1mm increments. (combination with LKC→0.01mm increments.) Ⓣ B is shortened by (L−LC). Ⓣ The projection length of the jector pin is 4mm.		200
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400

Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		SKC	Adds key flat on shank. Ⓐ P≦D−2.2 D R E G W≦D−2.2 (Machining width 1) ⊗KC·WKC·KFC : Not applicable ⊗Punch & retainer set not available.		600
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		−100
		NC	Removes the jector pin. ⊗AC : Not applicable.		−200
		NDC	No press-in lead ℓ≧3 ⇨ ℓ =0	⊗Punch & retainer set not available.	0

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓣ To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of Dm5. For shank tolerance of D +0.005 0, additional 200 yen required.
Example : AH—APJAL10, the price is 7,980 (H—APJAL10 unit price) +200 = 8,180 yen (product unit)

M Powdered high-speed steel

D	Ⓐ H-APJAS H-APJAL L≦100	Ⓐ H-APJAS H-APJAL 100<L≦130	D R E G H-APJ□S H-APJ□L L≦100	D R E G H-APJ□S H-APJ□L 100<L≦130
8	7,340	9,020	8,370	10,290
10	7,980	9,890	9,100	11,280
13	8,510	10,720	10,080	12,700
16	10,060	12,870	12,050	15,420
20	11,490	14,820	14,290	18,430
25	13,800	18,210	16,250	21,450

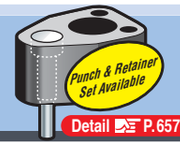
PRESS ADD.SPEC. Printed in Red

JECTOR PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS, WPC®TYPE/HW COATING TYPE—

Quality Improved

PRODUCTS DATA P.1221·1223

WPC®PUNCHES・COATING PUNCHES—HW—
QUALITY IMPROVED P.1217
PUNCHES FOR HEAVY LOAD
TAPERED HEAD PUNCHES

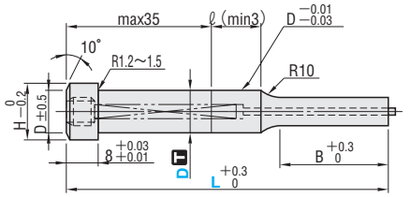


Detail P.657

DELIVERY SHORTENED

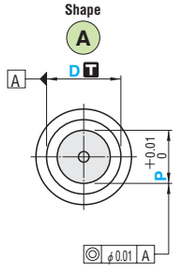
How to calculate the projection length of a jector pin (reference) P.191

- Refer to Jector punch blank for the details of jector hole. P.188
- Refer to Jector pin set for the details of Jector pin. P.189

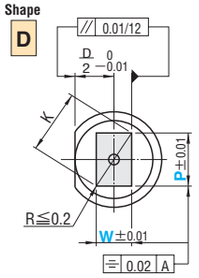
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A~G shown below.
—WPC®type— RoHS —HW coating type— Shank Dia.Tolerance D T m5・$^{+0.005}_{0}$ Selectable	D_{m5}	Powdered high-speed steel 64~67HRC Surface 1000~1100HV	W—APJ	A D R E G	S	
		Powdered high-speed steel 64~67HRC Surface3000HV	HW—APJ			
	$D^{+0.005}_{0}$	Powdered high-speed steel 64~67HRC Surface 1000~1100HV	AW—APJ		L	
		Powdered high-speed steel 64~67HRC Surface3000HV	AHW—APJ		Blade length(B) L>S	

The tip is very slightly rounded.

Shape A

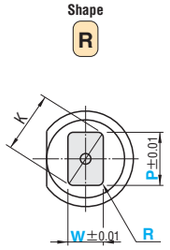


Shape D



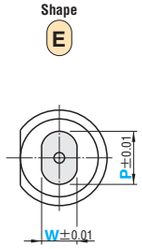
P≧W
K=$\sqrt{P^2+W^2}$

Shape R



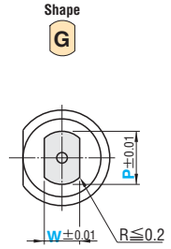
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.01mm Ⓡ R	B	H
(D_{m5}) —WPC®type— W—APJ —HW coating type— HW—APJ	A D R E G	S	8	(50) 60 70 80 90 100 110 120 130	4.00~ 7.99	7.97	4.00	0.15≦R<$\frac{W}{2}$ (Ⓡ only)	13	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~12.99	12.97	6.00			18
			16		10.00~15.99	15.97	6.00		19	21
			20		13.00~19.99	19.97	6.00			25
			25		18.00~24.99	24.97	6.00			30
($D^{+0.005}_{0}$) —WPC®type— AW—APJ —HW coating type— AHW—APJ		L	8		4.00~ 7.99	7.97	4.00		19	13
			10	60 70 80 90 100 110 120 130	5.00~ 9.99	9.97	5.00			15
			13		6.00~12.99	12.97	6.00			18
			16		10.00~15.99	15.97	6.00		25	21
			20	70 80 90 100 110 120 130	13.00~19.99	19.97	6.00			25
			25		18.00~24.99	24.97	6.00			30

L(50)→ B=8, When L(50), the blade length is fixed to 8mm.
Ⓐ : P>D−0.03 → ℓ =0, When P>D−0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
D R E G : P・K>D−0.05 → ℓ =0, When P・K>D−0.05 shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order

Catalog No.	L	P	W	R(Ⓡ only)
W—APJAS 20	80	P15.00		

Delivery

■WPC®type (W—・AW—)

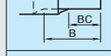
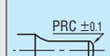
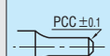
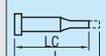
- Ⓐ: 3 Days — Express A 500/1Pc. P.38
  A flat charge of 1,350 yen for 3 pieces or more of the same size.
- D R E G: 3 Days — Express A 800/1Pc. P.38
  A flat charge of 2,160 yen for 3 pieces or more of the same size.

■HW coating type (HW—・AHW—): 3 Days

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No.	L(LC)	P	W	R	(BC・KC…etc.)
W—APJDS 20	LC79	P15.00	W6.00		BC13

Alterations		Code	Ⓐ	D R E G	¥/1Code
Tip		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (P) PRC≦(P−d_1−0.5)/2 Regarding dimension d_1, refer to P.188. (X) PCC:Not applicable	———	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (P) PCC≦(P−d_1−0.5)/2 Regarding dimension d_1, refer to P.188. (X) PRC:Not applicable	———	200
		PKC	Changes tolerance on P. P$^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P) (P : 0.001mm incr.)	Changes tolerance on P(W). P・W±0.01 ⇨ $^{+0.01}_{0}$ (X) HW-APJ・AHW-APJ:Not applicable	400
Full length		LC	Changes full length. LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) (P) B is shortened by (L—LC). (P) The projection length of the jector pin is 4mm.		200
		LKC	Changes full length tolerance. L$^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400

Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments (X) KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments (X) KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	———	No key flat. (X) Punch & retainer set not available.	0
Shank		SKC	Adds key flat on shank. Ⓐ P≦D−2.2 D R E G W≦D−2.2 (Machining width 1) (X) KC・WKC・KFC : Not applicable (X) Punch & retainer set not available.		600
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		−100
		NC	Removes the jector pin. (X) AC : Not applicable.		−200
		NDC	No press-in lead ℓ≧3 ⇨ ℓ =0 (X) Punch & retainer set not available.		0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

(P) To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : AW—APJAS8, the price is 6,830 (W—APJAS8 unit price) +200 = 7,030 yen (product unit)

■M Powdered high-speed steel WPC®type

D	Ⓐ W—APJAS W—APJAL L≦100	Ⓐ W—APJAS W—APJAL 100<L≦130	D R E G W—APJ□S W—APJ□L L≦100	D R E G W—APJ□S W—APJ□L 100<L≦130
8	6,830	8,400	7,870	9,680
10	7,320	9,070	8,450	10,470
13	7,690	9,680	9,220	11,610
16	9,080	11,620	11,000	14,080
20	10,290	13,270	13,060	16,840
25	12,520	16,520	15,000	19,800

■M Powdered high-speed steel HW coating type

D	Ⓐ HW—APJAS HW—APJAL L≦100	Ⓐ HW—APJAS HW—APJAL 100<L≦130	D R E G HW—APJ□S HW—APJ□L L≦100	D R E G HW—APJ□S HW—APJ□L 100<L≦130
8	7,930	9,750	8,960	11,020
10	8,580	10,630	9,700	12,020
13	9,100	11,460	10,690	13,460
16	10,870	13,910	12,850	16,440
20	12,690	16,370	15,490	19,980
25	15,280	20,160	17,740	23,410

PRESS ADD.SPEC. Printed in Red

JECTOR PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS, LAPPING TYPE—

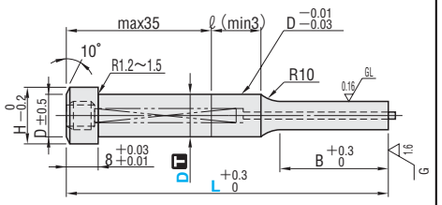
PRODUCTS DATA P.1223

PUNCHES FOR HEAVY LOAD
TAPERED HEAD PUNCHES

Punch & Retainer Set Available
Detail P.657

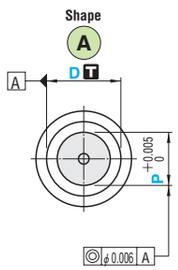
How to calculate the projection length of a jector pin (reference) P.191

• Refer to Jector punch blank for the details of jector hole. P.188
• Refer to Jector pin set for the details of Jector pin. P.189

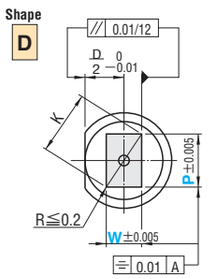
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A~G shown below.
RoHS	Dm5	Powdered high-speed steel 64~67HRC	L—APJ	A D R E G	S	
	D +0.005 0		AL—APJ		L	Blade length(B) L>S

Shank Dia.Tolerance D T m5 · +0.005 0 Selectable

Shape A

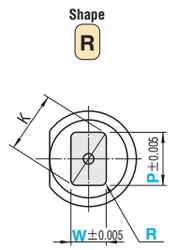


Shape D



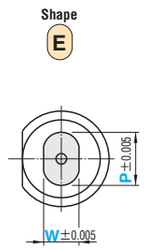
P≧W
K=√(P²+W²)

Shape R



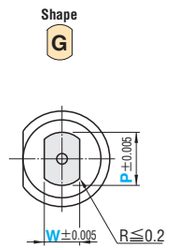
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R

Shape E



P>W

Shape G

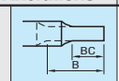
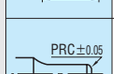
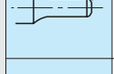
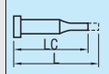
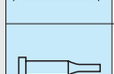


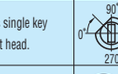
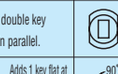
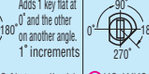
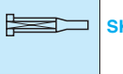
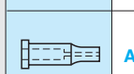
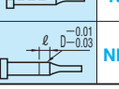
P>W

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No. — L(LC) — P — W — R — (BC·KC···etc.)
L—APJDS 20 — LC79 — P15.000 — W6.000 — BC13

Alterations		Code	Ⓐ	D R E G	¥/1Code
Tip		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments ⓡPRC≦(P−d1−0.5)/2 For dimension d1, refer to P.188. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments ⓡPCC≦(P−d1−0.5)/2 For dimension d1, refer to P.188. ⊗PRC:Not applicable	——	200
Full length		LC	Changes full length. LC<L 0.1mm incr. (combination with LKC · LKZ→0.01mm incr.) ⓡB is shortened by (L—LC). ⓡThe projection length of the jector pin is 4mm.		200
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0		600

Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		KC	Adds single key flat at head.	 90° 0° 180° 270° Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	 Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	 90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		SKC	D/2 −1 −0.01	Adds key flat on shank. Ⓐ D R E G (Machining width 1) P≦D−2.2 W≦D−2.2 ⊗KC·WKC·KFC : Not applicable ⊗Punch & retainer set not available.	600
		AC	AIR	Removes jector pin and plug up the side vent with ring type resin(ABS) from inside to make the jector hole for through air hole.	−100
		NC		Removes the jector pin. ⊗AC : Not applicable	−200
		NDC	ℓ D −0.01 −0.03	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.	0

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

ⓡTo be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of Dm5. For shank tolerance of D +0.005 0, additional 200 yen required.
Example : AL—APJAS13, the price is 7,800 (L—APJAS13 unit price) +200 = 8,000 yen (product unit)

M Powdered high-speed steel

D	Ⓐ L—APJAS L—APJAL		D R E G L—APJ□S L—APJ□L	
	L≦100	100<L≦130	L≦100	100<L≦130
8	6,940	8,530	8,370	10,290
10	7,430	9,210	8,940	11,080
13	7,800	9,820	9,780	12,320
16	9,190	11,760	11,570	14,800
20	10,400	13,410	13,610	17,550
25	12,630	16,670	15,490	20,440

Catalog No. Type	Shape	B Blade length	D	L	0.001mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	0.01mm Ⓡ R	B	H
(Dm5) L—APJ	A D R E G	S	8	(50) 60 70 80 90 100 110 120 130	4.000~7.990	7.970	4.000	0.15≦R<W/2 (Ⓡ only)	13	13
			10		5.000~9.990	9.970	5.000			15
			13		6.000~12.990	12.970	6.000			18
			16		10.000~15.990	15.970	6.000		19	21
			20		13.000~19.990	19.970	6.000			25
			25		18.000~24.990	24.970	6.000			30
(D +0.005 0) AL—APJ		L	8	60 70 80 90 100 110 120 130	4.000~7.990	7.970	4.000		19	13
			10		5.000~9.990	9.970	5.000			15
			13		6.000~12.990	12.970	6.000			18
			16	70 80 90 100 110 120 130	10.000~15.990	15.970	6.000		25	21
			20		13.000~19.990	19.970	6.000			25
			25		18.000~24.990	24.970	6.000			30

ⓡL(50)→B=8, When L(50), the blade length is fixed to 8mm.
ⓡⒶ : P>D−0.03→ℓ=0, When P>D−0.03 round punch, D −0.01 −0.03 (press-in lead) is not available.
ⓡD R E G : P · K>D−0.05→ℓ=0, When P · K>D−0.05 shaped punch, D −0.01 −0.03 (press-in lead) is not available.

Order

Catalog No. — L — P — W — R(Ⓡ only)
AL—APJDS 25 — 80 — P18.000 — W10.000

Delivery

• Ⓐ	3	Days	Express T	1,000/1Pc.	P.38
			Express A	500/1Pc.	

ⓡA flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

• D R E G	3	Days	Express A	800/1Pc.	P.38

ⓡA flat charge of 2,160 yen for 3 pieces or more of the same size.

PRESS NEW

JECTOR PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS, L SPECIFIED, DIM. B FIXED TYPE—

PRODUCTS DATA P.1223

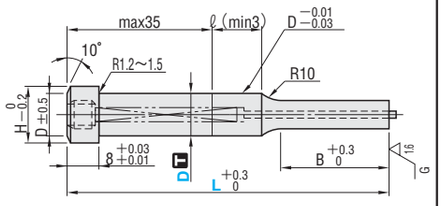
PUNCHES FOR HEAVY LOAD
TAPERED HEAD PUNCHES

※Jector punch which keeps Dimension B length even if L changes.

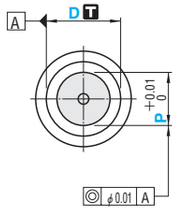
Punch & Retainer Set Available Detail P.657

The projection length of the jector pin is 4mm.

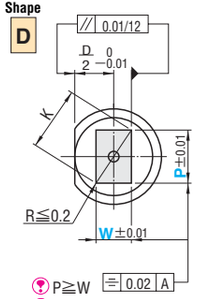
● Refer to Jector punch blank for the details of jector hole. P.188
● Refer to Jector pin set for the details of Jector pin. P.189

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A～G shown below.
RoHS Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable	D_{m5}	Powdered high-speed steel 64～67HRC	LFAPJ	A D R E G	S	
	$D^{+0.005}_{0}$		A—LFAPJ		L	Blade length (B) L>S

Shape A

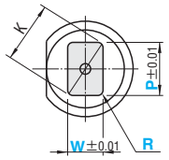


Shape D



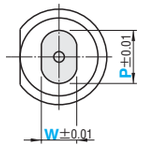
Ⓨ P≧W
Ⓨ R=0：Applicable
Ⓨ K=$\sqrt{P^2+W^2}$

Shape R



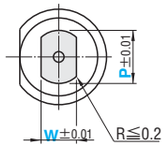
Ⓨ P≧W
Ⓨ 0.15≦R<$\frac{W}{2}$
Ⓨ K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



Ⓨ P>W

Shape G



Ⓨ P>W

Catalog No. Type	Shape	Blade length B	D	L 0.1mm increments	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P·Kmax.	Ⓓ Ⓡ Ⓔ Ⓖ P·Wmin.	0.01mm Ⓡ R	B	H
(Dm5) LFAPJ ($D^{+0.005}_{0}$) A—LFAPJ	A D R E G	S	8	60.0～130.0	4.00～ 7.99	7.97	4.00	0.15≦R<$\frac{W}{2}$ (Ⓡ only)	13	13
			10		5.00～ 9.99	9.97	5.00			15
			13		6.00～12.99	12.97	6.00			18
			16	70.0～130.0	10.00～15.99	15.97	6.00		19	21
			20		13.00～19.99	19.97	6.00			25
			25		18.00～24.99	24.97	6.00			30
		L	8	70.0～130.0	4.00～ 7.99	7.97	4.00		19	13
			10		5.00～ 9.99	9.97	5.00			15
			13		6.00～12.99	12.97	6.00			18
			16	80.0～130.0	10.00～15.99	15.97	6.00		25	21
			20		13.00～19.99	19.97	6.00			25
			25		18.00～24.99	24.97	6.00			30

Ⓨ Ⓐ : P>D−0.03 → ℓ =0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓨ Ⓓ Ⓡ Ⓔ Ⓖ : P・K>D−0.05 → ℓ =0, When P・K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓨ Jector hole is based on the Jector punch APJ□□ on P.119.

Order

Catalog No. — L — P — W — R (Ⓡ only)
LFAPJAS 20 — 80 — P15.00

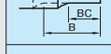
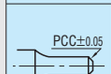
Delivery

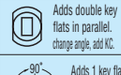
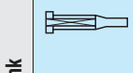
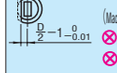
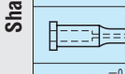
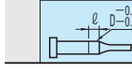
- Ⓐ: 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38
  Ⓨ A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
- Ⓓ Ⓡ Ⓔ Ⓖ: 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. P.38
  Ⓨ A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

¥ The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No. — L — P — W — R — (BC・KC…etc.)
LFAPJDS 20 — 79 — P15.00 — W6.00 — KFC225

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Tip		BC	Changes blade length B.(Shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−d1−0.5)/2 For dimension d1, refer to P.188. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−d1−0.5)/2 For dimension d1, refer to P.188. ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓨ (P：0.001mm incr.)	Changes tolerance on P(W). P・W±0.01 ⇨ $^{+0.01}_{0}$	400
Full length		LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		600

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	 Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		SKC	Adds key flat on shank. Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ  (Machining width 1) P≦D−2.2 W≦D−2.2 ⊗KC・WKC・KFC：Not applicable ⊗Punch & retainer set not available.		600
		NC		Removes the jector pin. ⊗AC：Not applicable.	−200
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0 ⊗Punch & retainer set not applicable.	0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

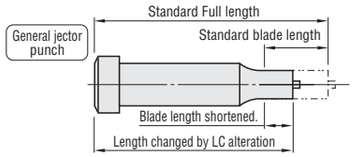
Ⓨ To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example：A—LFAPJAL13 (L≦100) the price is 7,350 (LFAPJAL13 unit price) +200 = 7,550 yen (product unit)

■M Powdered high-speed stee

D	Ⓐ LFAPJAS LFAPJAL L≦100	Ⓐ LFAPJAS LFAPJAL 100<L≦130	Ⓓ Ⓡ Ⓔ Ⓖ LFAPJ□S LFAPJ□L L≦100	Ⓓ Ⓡ Ⓔ Ⓖ LFAPJ□S LFAPJ□L 100<L≦130
8	6,430	7,900	7,430	9,130
10	6,930	8,590	7,990	9,900
13	7,350	9,260	8,870	11,170
16	8,780	11,230	10,700	13,690
20	9,990	12,880	12,760	16,460
25	12,250	16,170	14,670	19,360

■Features



- The blade length B gets shortened when alteration LC is processed for general Jector punch, but dimension. B fixed type keeps the length no matter how long L is.
- Since Jector punch, dimension. B fixed type does not have side hole on the shank, it can be used as punch for air blowing if the jector pin is removed.

PRESS NEW

JECTOR PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS, L SPECIFIED, DIM. B FIXED TYPE/TiCN COATING TYPE—

PRODUCTS DATA P.1220•1223

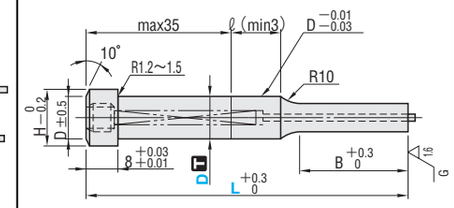
PUNCHES FOR HEAVY LOAD
COATING PUNCHES—TiCN—

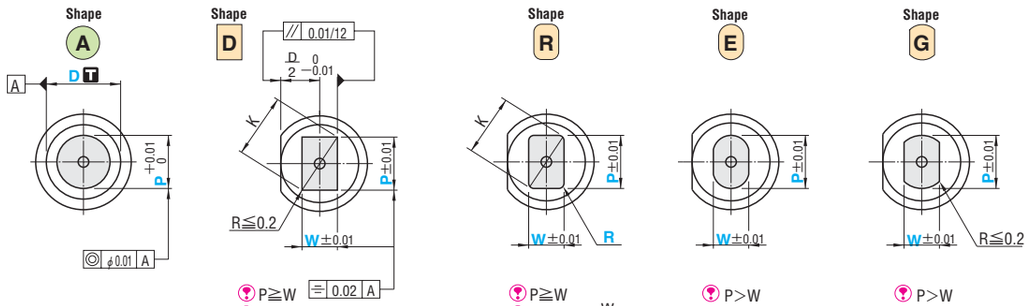
※Jector punch which keeps Dimension B length even if L changes.

Punch & Retainer Set Available Detail P.657

The projection length of the jector pin is 4mm.

- Refer to Jector punch blank for the details of jector hole. P.188
- Refer to Jector pin set for the details of Jector pin. P.189

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A~G shown below.
—TiCN coating type— RoHS	D_{m5}	Powdered high-speed steel 64~67HRC Surface 3000HV	H—LFAPJ	A D R E G	S	
	$D^{+0.005}_{0}$		AH—LFAPJ		L	
Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable					Blade length(B) L>S	The tip surface is ground before coating.



P≧W
R=0：Applicable
$K=\sqrt{P^2+W^2}$

P≧W
$0.15 \leqq R < \frac{W}{2}$
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

P>W

P>W

Catalog No. Type	Shape	B Blade length	D	L 0.1mm increments	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P·Kmax.	0.01mm increments DREG P·Wmin.	0.01mm Ⓡ R	B	H
(D_{m5}) H—LFAPJ ($D^{+0.005}_{0}$) AH—LFAPJ	A D R E G	S	8	60.0~130.0	4.00~ 7.99	7.97	4.00	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	13	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~12.99	12.97	6.00			18
			16	70.0~130.0	10.00~15.99	15.97	6.00		19	21
			20		13.00~19.99	19.97	6.00			25
			25		18.00~24.99	24.97	6.00			30
		L	8	70.0~130.0	4.00~ 7.99	7.97	4.00		13	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~12.99	12.97	6.00			18
			16	80.0~130.0	10.00~15.99	15.97	6.00		25	21
			20		13.00~19.99	19.97	6.00			25
			25		18.00~24.99	24.97	6.00			30

Ⓐ: P>D−0.03 → ℓ=0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
DREG: P・K>D−0.05 → ℓ=0, When P・K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
Jector hole is based on the Jector punch APJ□□ on P.119.

Order

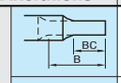
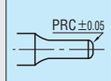
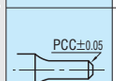
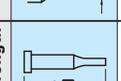
Catalog No.	L	P	W	R (Ⓡ only)
H—LFAPJAS 20	80	P15.00		

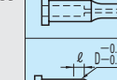
Delivery 3 Days

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No.	L	P	W	R	(BC・KC…etc.)
H—LFAPJDS 20	79	P15.00	W6.00		BC13

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d_1−0.5)/2 Regarding dimension d_1, refer to P.188. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−d_1−0.5)/2 Regarding dimension d_1, refer to P.188. ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P:0.001mm incr.) ⊗D>13:Not applicable	Changes tolerance on P(W). P・W±0.01 ⇨ $^{+0.01}_{0}$ ⊗D>13:Not applicable	600
Full length		LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		200

Alterations		Code	Ⓐ	DREG	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		SKC	Adds key flat on shank. Ⓐ DREG Machining width 1 P≦D−2.2 W≦D−2.2 ⊗KC・WKC・KFC：Not applicable ⊗Punch & retainer set not available.		600
		NC		Removes the jector pin. ⊗AC：Not applicable.	−200
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0 ⊗Punch & retainer set not available.	0

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

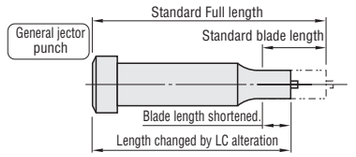
To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example：AH—LFAPJAL10(L≦100), the price is 8,650 (H—LFAPJAL10 unit price) +200 = 8,850 yen (product unit)

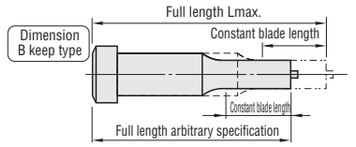
Powdered high-speed steel

D	Ⓐ H—LFAPJAS H—LFAPJAL L≦100	Ⓐ H—LFAPJAS H—LFAPJAL 100<L≦130	DREG H—LFAPJ□S H—LFAPJ□L L≦100	DREG H—LFAPJ□S H—LFAPJ□L 100<L≦130
8	7,990	9,820	8,980	11,040
10	8,650	10,720	9,750	12,090
13	9,250	11,650	10,750	13,540
16	10,870	13,910	12,800	16,380
20	12,350	15,930	15,070	19,440
25	14,650	19,330	17,060	22,510

■Features



The blade length B gets shortened when alteration LC is processed for general Jector punch, but dimension. B fixed type keeps the length no matter how long L is.



Since Jector punch, dimension. B fixed type does not have side hole on the shank, it can be used as punch for air blowing if the jector pin is removed.

PRESS NEW

JECTOR PUNCHES FOR HEAVY LOAD

—FINISHED FOR RETAINERS, L SPECIFIED, DIM. B FIXED TYPE, WPC®TYPE/HW COATING TYPE—

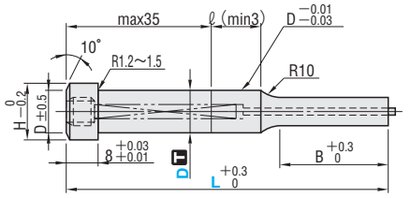
PRODUCTS DATA P.1221·1223

WPC®PUNCHES
COATING PUNCHES—HW—
PUNCHES FOR HEAVY LOAD
TAPERED HEAD PUNCHES
※Jector punch which keeps Dimension B length even if L changes.

Punch & Retainer Set Available Detail P.657

● Refer to Jector punch blank for the details of jector hole. P.188
● Refer to Jector pin set for the details of Jector pin. P.189

The projection length of the jector pin is 4mm.

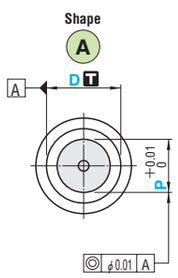
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A～G shown below.
—WPC®type— RoHS —HW coating type—	D_{m5}	Powdered high-speed steel 64～67HRC Surface 1000～1100HV	W—LFAPJ	A D R E G	S L	
		Powdered high-speed steel 64～67HRC Surface3000HV	HW—LFAPJ			
	$D^{+0.005}_{0}$	Powdered high-speed steel 64～67HRC Surface 1000～1100HV	AW—LFAPJ			
		Powdered high-speed steel 64～67HRC Surface3000HV	AHW—LFAPJ			

Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable

Blade length(B) L>S

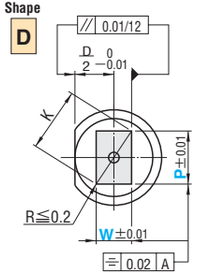
The tip is very slightly rounded.

Shape A



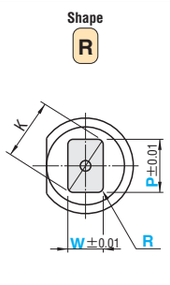
P≧W
K=$\sqrt{P^2+W^2}$

Shape D



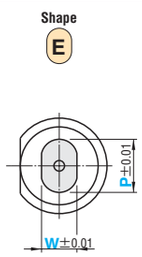
P≧W
K=$\sqrt{(P-2R)2+(W-2R)2+2R}$

Shape R



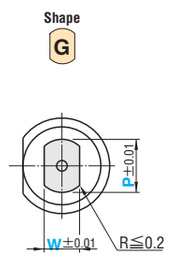
P>W

Shape E



P>W

Shape G



Catalog No. Type	Shape	B Blade length	D	L 0.1mm increments	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.01mm Ⓡ R	B	H
(D_{m5}) —WPC®type— W—LFAPJ —HW coating type— HW—LFAPJ	A D R E G	S	8	60.0～130.0	4.00～ 7.99	7.97	4.00	0.15≦R<$\frac{W}{2}$ (Ⓡ only)	13	13
			10		5.00～ 9.99	9.97	5.00			15
			13		6.00～12.99	12.97	6.00			18
			16	70.0～130.0	10.00～15.99	15.97	6.00		19	21
			20		13.00～19.99	19.97	6.00			25
			25		18.00～24.99	24.97	6.00			30
($D^{+0.005}_{0}$) —WPC®type— AW—LFAPJ —HW coating type— AHW—LFAPJ		L	8	70.0～130.0	4.00～ 7.99	7.97	4.00		19	13
			10		5.00～ 9.99	9.97	5.00			15
			13		6.00～12.99	12.97	6.00			18
			16	80.0～130.0	10.00～15.99	15.97	6.00		25	21
			20		13.00～19.99	19.97	6.00			25
			25		18.00～24.99	24.97	6.00			30

Ⓐ: P>D−0.03 → ℓ=0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
D R E G: P・K>D−0.05 → ℓ=0, When P・K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
Jector hole is based on the Jector punch APJ□□ on P.119.

Order

Catalog No. — L — P — W — R(Ⓡ only)
W—LFAPJAS 20 — 80 — P15.00

Delivery

■WPC®type (W—・AW—)

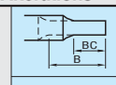
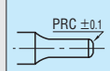
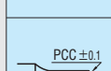
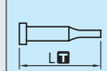
- Ⓐ: 3 Days; Express A 500/1Pc. P.38
  A flat charge of 1,350 yen for 3 pieces or more of the same size.
- D R E G: 3 Days; Express A 800/1Pc. P.38
  A flat charge of 2,160 yen for 3 pieces or more of the same size.

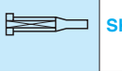
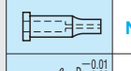
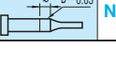
■HW coating type (HW— · AHW—): 3 Days

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No. — L — P — W — R — (BC・KC…etc.)
W—LFAPJDS 20 — 79 — P15.00 — W6.00 — BC13

Alterations		Code	Ⓐ	D R E G	¥/1Code
Tip		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments ▽PRC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.188. ⊗PCC:Not applicable	———	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments ▽PCC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.188. ⊗PRC:Not applicable	———	200
		PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $P^{+0.005}_{0}$ ▽(P : 0.001mm incr.)	Changes tolerance on P(W). P・W±0.01 ⇨ $^{+0.01}_{0}$ ⊗HW-LFAPJ・AHW-LFAPJ:Not applicable ⊗D>13:Not applicable	400
Full length		LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400

Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	———	No key flat. ⊗Punch & retainer set not available.	0
Shank		SKC	Adds key flat on shank. (Machining width 1) P≦D−2.2 W≦D−2.2 ⊗KC・WKC・KFC : Not applicable ⊗Punch & retainer set not available.	Ⓐ D R E G	600
		NC	Removes the jector pin. ⊗AC : Not applicable		−200
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0 ⊗Punch & retainer set not available.	0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : AW—LFAPJAS8 (L≦100), the price is 7,360 (W—LFAPJAS8 unit price) +200 = 7,560 yen (product unit)

■ W Powdered high-speed steel WPC®type

D	Ⓐ W—LFAPJAS W—LFAPJAL L≦100	Ⓐ W—LFAPJAS W—LFAPJAL 100<L≦130	D R E G W—LFAPJ□S W—LFAPJ□L L≦100	D R E G W—LFAPJ□S W—LFAPJ□L 100<L≦130
8	7,360	9,050	8,360	10,280
10	7,840	9,720	8,920	11,060
13	8,240	10,380	9,770	12,310
16	9,620	12,310	11,530	14,750
20	10,860	14,000	13,560	17,490
25	13,050	17,220	15,410	20,340

■ W Powdered high-speed steel HW coating type

D	Ⓐ HW—LFAPJAS HW—LFAPJAL L≦100	Ⓐ HW—LFAPJAS HW—LFAPJAL 100<L≦130	D R E G HW—LFAPJ□S HW—LFAPJ□L L≦100	D R E G HW—LFAPJ□S HW—LFAPJ□L 100<L≦130
8	8,450	10,390	9,430	11,590
10	9,100	11,280	10,160	12,590
13	9,650	12,150	11,160	14,060
16	11,220	14,360	13,120	16,790
20	12,680	16,350	15,370	19,820
25	14,970	19,760	17,330	22,870

PRESS NEW Printed in Red

TAPERED HEAD PUNCHES
—STANDARD TYPE/TiCN COATING TYPE/HW COATING TYPE—

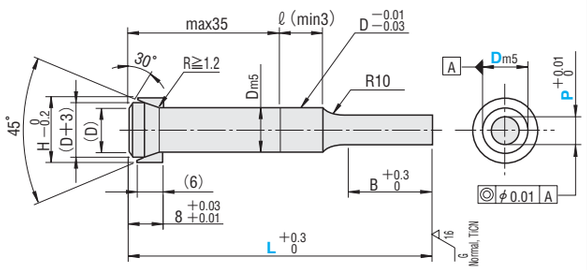
Quality Improved

PRODUCTS DATA P.1220·1221·1223

COATING PUNCHES—TiCN—
HW COATING TYPE
PUNCHES FOR HEAVY LOAD
TAPERED HEAD PUNCHES
QUALITY IMPROVED P.1217

PATENT PENDING

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS —TiCN coating type— —HW coating type—	Punch SKH51 61～64HRC TiCN coating Surface 3000HV HW coating Surface 3000HV Tapered ring NAK80 37～43HRC	TSSHAS TSSHAL —TiCN coating— H—TSSHAS H—TSSHAL —HW coating— HW—TSSHAS HW—TSSHAL	
	Punch Powdered high-speed steel 64～67HRC TiCN coating Surface 3000HV HW coating Surface 3000HV Tapered ring NAK80 37～43HRC	TSPHAS TSPHAL —TiCN coating— H—TSPHAS H—TSPHAL —HW coating— HW—TSPHAS HW—TSPHAL	

The tip surface of TiCN coated punch is grinded before the coating.
HW coating : The tip is very slightly rounded.

Type	D	L					0.01mm increments min. P max.	B	H
S TSSHAS TSPHAS —TiCN coating type— H—TSSHAS H—TSPHAS —HW coating type— HW—TSSHAS HW—TSPHAS	8	60	70	80	90	100	3.00～ 7.99	13	13
	10	60	70	80	90	100	3.00～ 9.99		15
	13	60	70	80	90	100	6.00～12.99		18
	16	60	70	80	90	100	10.00～15.99	19	21
	20	60	70	80	90	100	13.00～19.99		25
	25	60	70	80	90	100	18.00～24.99		30
L TSSHAL TSPHAL —TiCN coating type— H—TSSHAL H—TSPHAL —HW coating type— HW—TSSHAL HW—TSPHAL	8	60	70	80	90	100	3.00～ 7.99	19	13
	10	60	70	80	90	100	3.00～ 9.99		15
	13	60	70	80	90	100	6.00～12.99		18
	16	60	70	80	90	100	10.00～15.99	25	21
	20	60	70	80	90	100	13.00～19.99		25
	25	60	70	80	90	100	18.00～24.99		30

When P＞D—0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not available

Order Catalog No. — L — P
HW—TSSHAS 20 — 80 — P15.00

Delivery 3 Days | Express A 500/1Pc.
Express service A is not available for TiCN coating type, HW coating type. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■ M SKH51

D	TSSHAS TSSHAL
8	3,070
10	3,280
13	3,510
16	4,100
20	4,930
25	6,090

TiCN coating type

D	H—TSSHAS H—TSSHAL
8	4,760
10	5,140
13	5,540
16	6,330
20	7,390
25	8,650

HW coating type

D	HW—TSSHAS HW—TSSHAL
8	5,690
10	5,980
13	6,380
16	7,150
20	8,150
25	9,370

■ M Powdered high-speed steel

D	TSPHAS TSPHAL
8	4,880
10	5,320
13	5,660
16	6,650
20	7,810
25	9,530

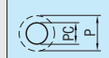
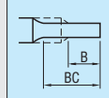
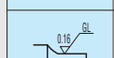
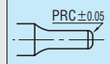
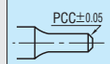
TiCN coating type

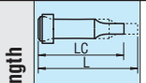
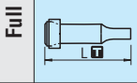
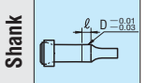
D	H—TSPHAS H—TSPHAL
8	6,570
10	7,180
13	7,690
16	8,880
20	10,270
25	12,090

HW coating type

D	HW—TSPHAS HW—TSPHAL
8	6,970
10	7,550
13	7,990
16	9,090
20	10,350
25	11,950

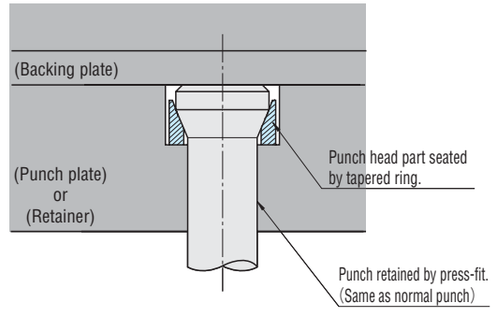
Alteration Catalog No. — L(LC) — P(PC) — (BC·SC···etc.)
TSSHAS 20 — LC82 — PC12.00 — BC13

	Alterations	Code	Spec.	¥/1Code
Tip		PC	Changes dimension P. PC≧ Pmin / 2 0.01mm increments (Combination with PKC→0.001mm increments) P: 1.500～1.999 Bmax 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	200
		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Full length L(LC) requires BC+35mm or more.	200
		SC	Finishes blade with lapping. Dimension P tolerance and the specification unit remain the same. TiCN coating & HW coating : Not applicable	800
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P—0.2)/2 PCC:Not applicable HW coating : PRC±0.1	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P—0.2)/2 PRC:Not applicable HW coating : PCC±0.1	200

	Alterations	Code	Spec.	¥/1Code
Tip		PKC	Changes tolerance on P(W). P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P : 0.001mm increments) TiCN coating type, D＞13:Not applicable HW coating : Not applicable	400 TiCN coating (600)
Full length		LC	Changes full length. 35+B(BC)≦LC＜L 0.1mm incr.(combination with LKC→0.01mm incr.) When LC→B(or BC) is 35mm or less, B (or BC) is LC—35mm.	200
		LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	400
Shank		NDC	No press-in lead ℓ≧3⇨ℓ=0	0

Example

■Features
- Tapered head punch has more enhanced strength at head part than existing punch for heavy load by making the head part tapered to loose the stress concentration.
- This punch is developed for stamping high tensile steel plate with tensile strength over 980MPa (100 kgf/mm²), spring steel or hardened steel, which applies heavy load to punch.
- When the Tapered head punch is used with attached tapered ring, no alterations for adding taper hole for punch plate and matching the plate and head thickness of punch is necessary.
- Since the head part of Tapered head punch is compatible with punch for heavy load, retainer of punch for heavy load can also be used for Tapered head punch.
- Guide for Tapered head punch. P.1223



■Caution
- Tapered head punch has the head thickness tolerance of 8 $^{+0.03}_{+0.01}$ by machining punch and tapered ring. Please use punch and tapered ring with same identification marks. When using punch and tapered ring with different identification marks, the head thickness may differ from the tolerance listed in the catalog.
- When replacing the punch, replace both punch and tapered ring as one set. (Punch and tapered ring are not available individually)

PRESS NEW

TAPERED HEAD JECTOR PUNCHES
—STANDARD TYPE/WPC® TYPE/TiCN COATING TYPE/HW COATING TYPE—

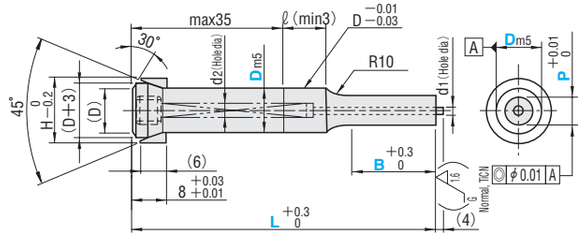
PATENT PENDING

PRODUCTS DATA P.1220·1221·1223

COATING PUNCHES —TiCN— PUNCHES FOR HEAVY LOAD TAPERED HEAD PUNCHES

WPC® PUNCHES COATING PUNCHES —HW—

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	S	Catalog No.	Shape
RoHS —WPC® type—	Punch SKH51 61～64HRC	—	TSSJAS TSSJAL	
		WPC® Surface1000 ～1100HV	W—TSSJAS W—TSSJAL	
—TiCN coating type—	Tapered ring NAK80 37～43HRC	TiCN coating Surface3000HV	H—TSSJAS H—TSSJAL	
		HW coating Surface3000HV	HW—TSSJAS HW—TSSJAL	
—HW coating type—	Punch Powdered high-speed steel 64～67HRC	—	TSPJAS TSPJAL	
		WPC® Surface1000 ～1100HV	W—TSPJAS W—TSPJAL	
	Tapered ring NAK80 37～43HRC	TiCN coating Surface3000HV	H—TSPJAS H—TSPJAL	
		HW coating Surface3000HV	HW—TSPJAS HW—TSPJAL	

The tip surface of TiCN coated punch is ground before the coating.
WPC®, HW coating : The tip is very slightly rounded.

Catalog No. Type	D	0.1mm increments L	0.01mm increments min. P max.	B	H	d1	d2
S —WPC® type— TSSJAS TSPJAS W—TSSJAS W—TSPJAS	8	50.0～ 80.0	4.00～ 7.99	13	13	1.5	3.4
	10	55.0～ 90.0	5.00～ 9.99		15	1.8	4.4
—TiCN coating type— —HW coating type— H—TSSJAS H—TSPJAS HW—TSSJAS HW—TSPJAS	13	65.0～100.0	6.00～12.99		18	2.8	
	16		10.00～15.99	19	21		
L —WPC® type— TSSJAL TSPJAL W—TSSJAL W—TSPJAL	8	60.0～ 80.0	4.00～ 7.99	19	13	1.5	3.4
	10	60.0～ 90.0	5.00～ 9.99		18	1.8	4.4
—TiCN coating type— —HW coating type— H—TSSJAL H—TSPJAL HW—TSSJAL HW—TSPJAL	13	70.0～100.0	6.00～12.99		15	2.8	
	16		10.00～15.99	25	21		

When P>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not available
Jector hole is based on the Jector punch APJ□□ on P.119.

Order Catalog No. — L — P
TSSJAS 10 — 82 — P8.30

Delivery 3 Days | Express A 500/1Pc.
Express service A is not available for TiCN coating type and HW coating type. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

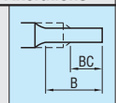
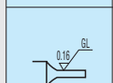
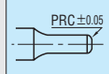
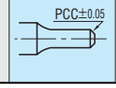
■ M SKH51

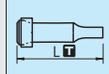
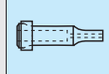
D	STANDARD TSSJAS TSSJAL	WPC® W—TSSJAS W—TSSJAL	TiCN coating type H—TSSJAS H—TSSJAL	HW coating HW—TSSJAS HW—TSSJAL
8	5,150	6,180	6,840	7,280
10	5,470	6,500	7,330	7,760
13	5,800	6,830	7,830	8,240
16	6,940	7,970	9,170	9,760

■ M Powdered high-speed steel

D	STANDARD TSPJAS TSPJAL	WPC® W—TSPJAS W—TSPJAL	TiCN coating type H—TSPJAS H—TSPJAL	HW coating HW—TSPJAS HW—TSPJAL
8	6,960	7,990	8,650	9,090
10	7,510	8,540	9,370	9,800
13	7,950	8,980	9,980	10,390
16	9,490	10,520	11,720	12,310

Alteration Catalog No. — L — P — (BC·SC···etc.)
W—TSSJAL 10 — 82 — 8.60 — PRC0.3

Alterations		Code	Spec.	¥/1Code
Tip		BC	Changes blade length B. (Shorter than standard) 2≦BC≦B 0.1mm increments	200
		SC	Finishes blade with lapping. Dimension P tolerance and the specification unit remain the same. ⊗TiCN coating type, WPC® type and HW coating type:Not applicable	800
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 ⊗PCC:Not applicable	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 ⊗PRC:Not applicable	200

Alterations		Code	Spec.	¥/1Code
Tip		PKC	Changes tolerance on P(W). alteration P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P：0.001mm increments) ⊗TiCN coating type, D16, HW coating type: Not applicable	400 TiCN coating (600)
Full length		LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	400
Shank		NC	Removes the jector pin.	−200
		NDC	No press-in lead ℓ≧3⇨ℓ=0	0

Example

■Features

- Tapered head jector punch is developed for pressing stainless steel, high tensile steel and general thick steel plates. The strength and convenience are enhanced by improving the followings compared to the existing product.

①The side hole on the shank, which might have caused the jector punch breakage, has eliminated.
②The existing jector punch had the problem of shortening blade length B when LC was machined, however, this product keeps the blade length B no matter how long dimension L is.

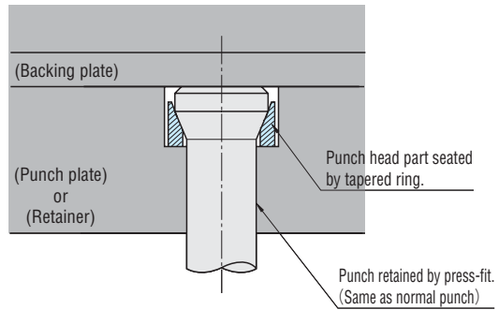
- When the Tapered head punch is used with attached tapered ring, no alterations for adding taper hole for punch plate and matching the plate and head thickness of punch is necessary.

- Guide for Tapered head punch P.1223

■Caution

- Tapered head punch has the head thickness tolerance of 8 $^{+0.03}_{+0.01}$ by machining punch and tapered ring. Please use punch and tapered ring with same identification marks. When using punch and tapered ring with different identification marks, the head thickness may differ from the tolerance listed in the catalog.

- When replacing the punch, replace both punch and tapered ring as one set. (Punch and tapered ring are not available individually)



PRESS ADD.SPEC. Printed in Red

PUNCHES WITH DOWEL FOR HEAVY LOAD
—FINISHED FOR RETAINERS—

PRODUCTS DATA P.1223

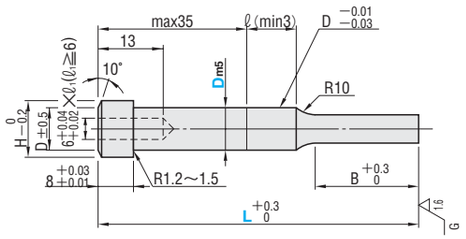
PUNCHES FOR HEAVY LOAD
TAPERED HEAD PUNCHES

Punch & Retainer Set Available Detail P.657

Type	A	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	With dowel
With dowel	Dowel pin MS6-25	D m5	SKH51 61~64HRC	AP	A D R E G	S	—C
			Powdered high-speed steel 64~67HRC	APH		L	

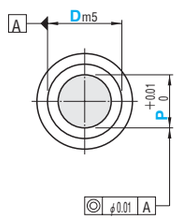
RoHS

Select tip shape from Shape A~G shown below.

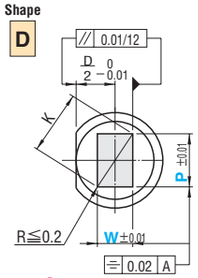


Blade length (B) L>S

Shape A

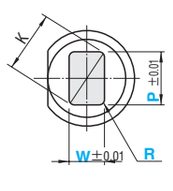


Shape D



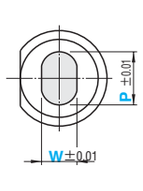
Ⓨ P≧W
Ⓨ R=0 : Applicable
Ⓨ $K=\sqrt{P^2+W^2}$

Shape R



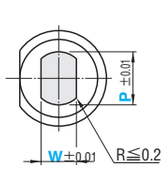
Ⓨ P≧W
Ⓨ $0.15 \leqq R < \frac{W}{2}$
Ⓨ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



Ⓨ P>W

Shape G



Ⓨ P>W

Catalog No. Type		D	L	0.01mm increments Ⓐ min. P	Ⓐ max.	ⒹⓇⒺⒼ P·Kmax.	ⒹⓇⒺⒼ P·Wmin.	Ⓡ R	B	H
S	APAS—C	APHAS—C	10	(50) 60 70 80 90 100 110 120 130 140 150	3.00~ 9.99	9.97	2.50	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	13	15
	APDS—C	APHDS—C	13	(50) 60 70 80 90 100 110 120 130 140 150	6.00~12.99	12.97	3.00			18
	APRS—C	APHRS—C	16	(50) 60 70 80 90 100 110 120 130 140 150	10.00~15.99	15.97	4.00		19	21
	APES—C	APHES—C	20	(50) 60 70 80 90 100 110 120 130 140 150	13.00~19.99	19.97	5.00			25
	APGS—C	APHGS—C	25	(50) 60 70 80 90 100 110 120 130 140 150	18.00~24.99	24.97	6.00			30
T	APAL—C	APHAL—C	10	60 70 80 90 100 110 120 130 140 150	3.00~ 9.99	9.97	2.50		19	15
	APDL—C	APHDL—C	13	60 70 80 90 100 110 120 130 140 150	6.00~12.99	12.97	3.00			18
	APRL—C	APHRL—C	16	70 80 90 100 110 120 130 140 150	10.00~15.99	15.97	4.00		25	21
	APEL—C	APHEL—C	20	70 80 90 100 110 120 130 140 150	13.00~19.99	19.97	5.00			25
	APGL—C	APHGL—C	25	70 80 90 100 110 120 130 140 150	18.00~24.99	24.97	6.00			30

Ⓨ L(50)→B=8, When L(50), the blade length is fixed to 8mm.
Ⓨ Ⓐ : P>D−0.03 → ℓ=0, When P>D−0.03 round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓨ ⒹⓇⒺⒼ : P·K>D−0.05 → ℓ=0, When P·K>D−0.05 shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order

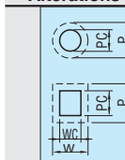
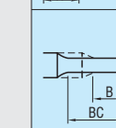
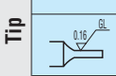
Catalog No.	L	P	W	R(Ⓡ only)
APAS—C 20	80	P15.00		
APDS—C 25	80	P18.00	W10.00	

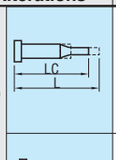
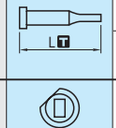
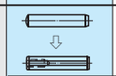
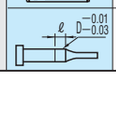
Delivery

- Ⓐ 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38
  Ⓨ A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
- ⒹⓇⒺⒼ 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. P.38
  Ⓨ A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

The volume discount rate is also applicable to alteration cost. P.39

Alteration Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC···etc.)
APAS—C 20 — LC82 — PC12.00 — BC13

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Tip		PC WC	Changes dimension P. PC≧Pmin/2, 0.01mm increments (Combination with PKC →0.001mm increments) P(PC) / Bmax: 1.500~1.999 / 20; 2.000~3.999 / 35; 4.000~5.999 / 45; 6.000~ / 60	Changes dimension P·W. PC/WC ≧ P·Wmin/2, 0.01mm increments P(PC)·W(WC) / Bmax: 1.25~1.49 / 8; 1.50~1.99 / 13; 2.00~3.49 / 19; 3.50~4.99 / 25; 5.00~ / 30	200
		BC	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments. Ⓨ Full length L(LC) requires BC+35mm or more.	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments. Ⓨ Full length L(LC) requires BC+40mm or more.	200
		SC	Finishes blade with lapping. Ⓨ Dimension P tolerance and the specification unit remain the same. ⊗D shape is not applicable with a corner radius of 0.		1,200 (only Ⓐ 800)
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1, 0.1mm increments. Ⓨ PRC≦(P−0.2)/2 ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1, 0.1mm increments. Ⓨ PCC≦(P−0.2)/2 ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ Ⓨ (P : 0.001mm incr.)	Changes tolerance on P(W). $P\cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	400

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Full length		LC	Changes full length. 35+B(BC)≦LC<L, 0.1mm increments. Ⓨ When LC—B (or BC) is 35mm or less, B (or BC) is LC—35mm. (Combination with LKC·LKZ→0.01mm increments)	Changes full length. 40+B(BC)≦LC<L, 0.1mm increments. Ⓨ When LC—B (BC) is 40mm or less, B (BC) is LC—40mm.	200
		LKC	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow {}^{+0.01}_{0}$		600
Head		KC	Adds single key flat at head.	Changes the position 0°~180° of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments. ⊗KC·WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments. ⊗KC·WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		TPC	Replaces dowel pin. Attached MS6—25 to MSTP6—25 (tapped type).		100
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0 ⊗Punch & retainer set not available.	0

Example

■Punch with dowel is;
Mainly used for dies of body of automobile with retainer which hold punch. Different from indirect positioning by retainer's dowel hole, it allows direct positioning by the dowel hole coaxially machined to punch, and improves the die precision. It is effective when used for die machining by NC process. It can also be used for dies of exterior panels of electrical appliances by setting with retainer or for attaching to punch plate of progressive die.

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

■ M SKH51

D	Ⓐ APAS-C APAL-C L≦100	Ⓐ APAS-C APAL-C 100<L≦150	ⒹⓇⒺⒼ AP□S-C AP□L-C L≦100	ⒹⓇⒺⒼ AP□S-C AP□L-C 100<L≦150
10	2,690	3,280	3,590	4,370
13	2,860	3,570	4,000	5,000
16	3,270	4,150	4,770	6,050
20	3,860	4,900	5,710	7,250
25	4,680	5,990	6,510	8,330

■ M Powdered high-speed steel

D	Ⓐ APHAS-C APHAL-C L≦100	Ⓐ APHAS-C APHAL-C 100<L≦150	ⒹⓇⒺⒼ APH□S-S APH□L-S L≦100	ⒹⓇⒺⒼ APH□S-S APH□L-S 100<L≦150
10	4,820	5,970	5,650	7,000
13	5,100	6,420	6,180	7,780
16	5,930	7,590	7,420	9,490
20	6,860	8,840	8,910	11,490
25	8,300	10,950	10,160	13,410

PRESS ADD.SPEC. Printed in Red

PUNCHES WITH DOWEL FOR HEAVY LOAD
—FINISHED FOR RETAINERS, TiCN COATING TYPE—

Quality Improved

PRODUCTS DATA P.1220·1223

PUNCHES FOR HEAVY LOAD
TAPERED HEAD PUNCHES
COATING PUNCHES—TiCN—
QUALITY IMPROVED P.1217

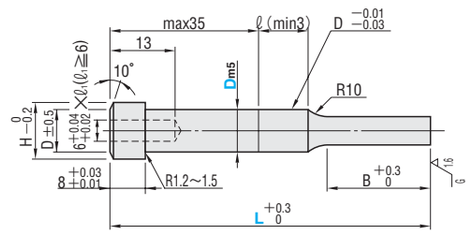
Punch & Retainer Set Available Detail P.657

¥ The volume discount rate is also applicable to alteration cost. P.39

Type	A	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	With dowel
with dowel TiCN coating	Dowel pin MS6-25	D m5	SKH51 61～64HRC Surface 3000HV	H—AP	A D R E G	S	—C
			Powdered high-speed steel 64～67HRC Surface 3000HV	H—APH		L	

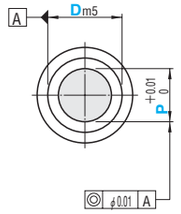
RoHS

Select tip shape from Shape A～G shown below.

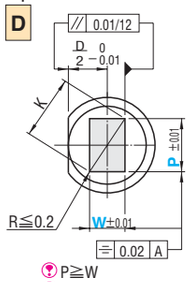


The tip surface is ground before coating.
Blade length (B) L>S

Shape A

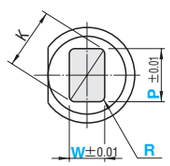


Shape D



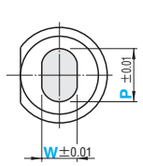
P≧W
R=0 : Applicable
K=$\sqrt{P^2+W^2}$

Shape R



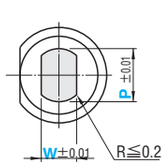
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	R	B	H
S H—APAS—C H—APHAS—C	10	(50) 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50	0.15≦R<W/2 (Ⓡ only)	13	15
H—APDS—C H—APHDS—C	13	(50) 60 70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	3.00			18
H—APRS—C H—APHRS—C	16	(50) 60 70 80 90 100 110 120 130 140 150	10.00～15.99	15.97	4.00		19	21
H—APES—C H—APHES—C	20	(50) 60 70 80 90 100 110 120 130 140 150	13.00～19.99	19.97	5.00			25
H—APGS—C H—APHGS—C	25	(50) 60 70 80 90 100 110 120 130 140 150	18.00～24.99	24.97	6.00			30
L H—APAL—C H—APHAL—C	10	60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50		19	15
H—APDL—C H—APHDL—C	13	60 70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	3.00			18
H—APRL—C H—APHRL—C	16	70 80 90 100 110 120 130 140 150	10.00～15.99	15.97	4.00		25	21
H—APEL—C H—APHEL—C	20	70 80 90 100 110 120 130 140 150	13.00～19.99	19.97	5.00			25
H—APGL—C H—APHGL—C	25	70 80 90 100 110 120 130 140 150	18.00～24.99	24.97	6.00			30

L(50)→ B=8, When L(50), the blade length is fixed to 8mm.
Ⓐ : P>D−0.03 → ℓ =0, When P>D−0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
D R E G : P・K>D−0.05 → ℓ =0, When P・K>D−0.05 shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

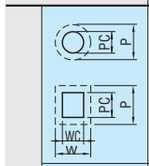
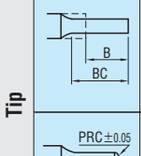
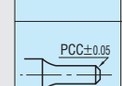
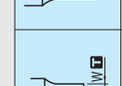
Order

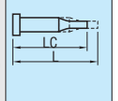
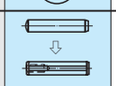
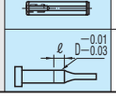
Catalog No.	L	P	W	R(Ⓡ only)
H—APAS—C 20	80	P15.00		
H—APDS—C 25	80	P18.00	W10.00	

Delivery 3 Days

Alteration

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC…etc.)
H—APAS—C 20 — LC82 — PC12.00 — — BC13

Alterations		Code	Ⓐ	D R E G	¥/1Code
Tip		PC WC	Changes dimension P. PC≧ Pmin/2 0.01mm increments (Combination with PKC →0.001mm increments.) P(PC) / Bmax: 1.500～1.999 / 20; 2.000～3.999 / 35; 4.000～5.999 / 45; 6.000～ / 60	Changes dimension P・W. PC/WC ≧ P・Wmin/2 0.01mm increments P(PC)・W(WC) / Bmax: 1.25～1.49 / 8; 1.50～1.99 / 13; 2.00～3.49 / 19; 3.50～4.99 / 25; 5.00～ / 30	200
		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓡ Full length L(LC) requires BC+35mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓡ Full length L(LC) requires BC+40mm or more.	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓡ PRC≦(P−0.2)/2 ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓡ PCC≦(P−0.2)/2 ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 Ⓡ (P:0.001mm incr.) ⊗D>13:Not applicable	Changes tolerance on P(W). P・W±0.01 ⇨ +0.01 0 ⊗D>13:Not applicable	600

Alterations		Code	Ⓐ	D R E G	¥/1Code
Full length		LC	Changes full length. 35+B(BC)≦LC<L 0.1mm increments Ⓡ When LC−B(BC) is 35mm or less, B(BC) is LC−35mm. (Combination with LKC→0.01mm increments)	Changes full length. 40+B(BC)≦LC<L 0.1mm increments Ⓡ When LC−B(BC) is 40mm or less, B(BC) is LC−40mm.	200
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
Head		KC	Adds single key flat at head.	90° 0° 180° 270° Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		TPC	Replaces dowel pin. Attached MS6−25 to MSTP6−25 (tapped type).		100
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0 ⊗Punch & retainer set not available.		0

Example

■Punch with dowel is;
Mainly used for dies of body of automobile with retainer which hold punch. Different from indirect positioning by retainer's dowel hole, it allows direct positioning by the dowel hole coaxially machined to punch, and improves the die precision. It is effective when used for die machining by NC process. It can also be used for dies of exterior panels of electrical appliances by setting with retainer or for attaching to punch plate of progressive die.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■ M SKH51

D	Ⓐ H—APAS—C H—APAL—C L≦100	Ⓐ 100<L≦150	D R E G H—AP□S—C H—AP□L—C L≦100	D R E G 100<L≦150
10	4,230	5,160	5,120	6,240
13	4,550	5,680	5,680	7,100
16	5,120	6,500	6,610	8,390
20	5,900	7,490	7,730	9,810
25	6,800	8,700	8,610	11,020

■ M Powdered high-speed steel

D	Ⓐ H—APHAS—C H—APHAL—C L≦100	Ⓐ 100<L≦150	D R E G H—APH□S—C H—APH□L—C L≦100	D R E G 100<L≦150
10	6,340	7,920	7,190	8,990
13	6,780	8,610	7,930	10,070
16	7,760	9,930	9,330	11,940
20	8,880	11,540	10,940	14,220
25	10,390	13,710	12,320	16,260

PRESS ADD.SPEC. Printed in Red

PUNCHES WITH DOWEL FOR HEAVY LOAD
—FINISHED FOR RETAINERS, WPC®TYPE/HW COATING TYPE—

Quality Improved

PRODUCTS DATA P.1221·1223

PUNCHES FOR HEAVY LOAD
TAPERED HEAD PUNCHES
WPC®PUNCHES
COATING PUNCHES—HW—
QUALITY IMPROVED P.1217

Punch & Retainer Set Available Detail P.657

DELIVERY SHORTENED

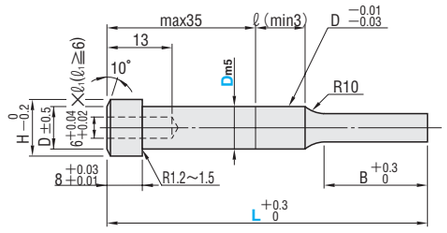
¥ The volume discount rate is also applicable to alteration cost. P.39

Type	A	Shank dia. DT	M H	Catalog No. Type	Shape	B Blade length	With dowel
With dowel WPC®type	Dowel pin MS6-25	Dm5	SKH51 61~64HRC Surface1000~1100HV	W—AP	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S L	—C
			Powdered high-speed steel 64~67HRC Surface1000~1100HV	W—APH			
With dowel HW coating type			SKH51 61~64HRC Surface3000HV	HW—AP			
			Powdered high-speed steel 64~67HRC Surface3000HV	HW—APH			

Select tip shape from Shape A~G shown below.

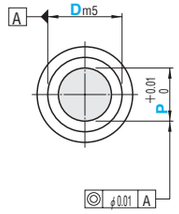
—WPC®type— RoHS

—HW coating type—

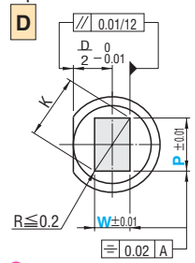


The tip is very slightly rounded.
Blade length (B) L>S

Shape A

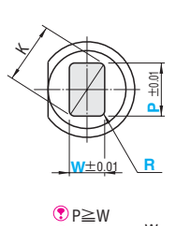


Shape D



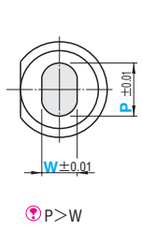
P≧W
K=√(P²+W²)

Shape R



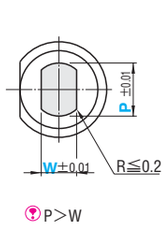
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	With dowel	D	L	0.01mm increments Ⓐ min. P max.	ⒹⓇⒺⒼ P·Kmax.	ⒹⓇⒺⒼ P·Wmin.	Ⓡ R	B	H
WPC®type (SKH51) W—AP (Powdered high-speed steel) W—APH	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	—C	10	(50) 60 70 80 90 100 110 120 130 140 150	3.00~ 9.99	9.97	2.50	W/2 (Ⓡ only) 0.15≦R<W/2	13	15
				13	(50) 60 70 80 90 100 110 120 130 140 150	6.00~12.99	12.97	3.00			18
				16	(50) 60 70 80 90 100 110 120 130 140 150	10.00~15.99	15.97	4.00		19	21
				20	(50) 60 70 80 90 100 110 120 130 140 150	13.00~19.99	19.97	5.00			25
				25	(50) 60 70 80 90 100 110 120 130 140 150	18.00~24.99	24.97	6.00			30
HW coating type (SKH51) HW—AP (Powdered high-speed steel) HW—APH		L		10	60 70 80 90 100 110 120 130 140 150	3.00~ 9.99	9.97	2.50		19	15
				13	60 70 80 90 100 110 120 130 140 150	6.00~12.99	12.97	3.00			18
				16	70 80 90 100 110 120 130 140 150	10.00~15.99	15.97	4.00		25	21
				20	70 80 90 100 110 120 130 140 150	13.00~19.99	19.97	5.00			25
				25	70 80 90 100 110 120 130 140 150	18.00~24.99	24.97	6.00			30

L(50)→B=8, When L(50), the blade length is fixed to 8mm.
Ⓐ : P>D−0.03→ℓ=0, When P>D−0.03 round punch, D −0.01 −0.03 (press-in lead) is not available.
ⒹⓇⒺⒼ : P·K>D−0.05→ℓ=0, When P·K>D−0.05 shaped punch, D −0.01 −0.03 (press-in lead) is not available.

Order

Catalog No. — L — P — W — R(Ⓡ only)

W—APAS—C 20 — 80 — P15.00
HW—APDS—C 25 — 80 — P18.00 — W10.00

Delivery

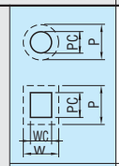
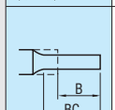
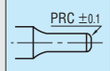
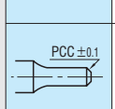
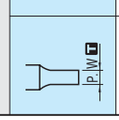
■WPC®type (W—)

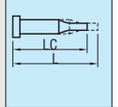
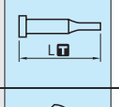
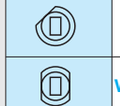
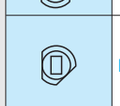
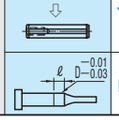
- Ⓐ: 3 Days; Express A 500/1Pc. P.38
  Ⓨ A flat charge of 1,350 yen for 3 pieces or more of the same size.
- ⒹⓇⒺⒼ: 3 Days; Express A 800/1Pc. P.38
  Ⓨ A flat charge of 2,160 yen for 3 pieces or more of the same size.

■HW coating type (HW—): 3 Days

Alteration

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC···etc.)
W—APAS—C 20 — LC82 — PC12.00 — BC13

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Tip		PC WC	Changes dimension P. PC≧Pmin/2 0.01mm increments (Combination with PKC →0.001mm increments) P(PC) 1.500~1.999 20; 2.000~3.999 35; 4.000~5.999 45; 6.000~ 60 Bmax	Changes dimension P·W. PC/WC ≧ P·Wmin/2 0.01mm increments P(PC)·W(WC) 1.25~1.49 8; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30 Bmax	200
		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L(LC) requires BC+35mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L(LC) requires BC+40mm or more.	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 Ⓧ PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 Ⓧ PRC:Not applicable	——	200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 Ⓨ (P : 0.001mm incr.) Ⓧ HW coating type:Not applicable	Changes tolerance on P(W). P·W±0.01 ⇨ +0.01 0 Ⓧ HW coating type:Not applicable	400

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Full length		LC	Changes full length. 35+B(BC)≦LC<L 0.1mm increments Ⓨ When LC—B(or BC) is 35mm or less, B(or BC) is LC—35mm. (Combination with LKC→0.01mm increments)	Changes full length. 40+B(BC)≦LC<L 0.1mm increments Ⓨ When LC—B(BC) is 40mm or less, B(BC) is LC—40mm.	200
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
Head		KC	Adds single key flat at head.	90° 0° 180° 270° Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments Ⓧ KC·WKC:Not applicable	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments Ⓧ KC·WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. Ⓧ Punch & retainer set not available.	0
Shank		TPC	Replaces dowel pin. Attached MS6—25 to MSTP6—25 (tapped type).		100
		NDC	No press-in lead	ℓ≧3⇨ℓ=0 Ⓧ Punch & retainer set not available.	0

Example

■Punch with dowel is;
Mainly used for dies of body of automobile with retainer which hold punch. Different from indirect positioning by retainer's dowel hole, it allows direct positioning by the dowel hole coaxially machined to punch, and improves the die precision. It is effective when used for die machining by NC process. It can also be used for dies of exterior panels of electrical appliances by setting with retainer or for attaching to punch plate of progressive die.

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

■Ⓜ SKH51 WPC® type

D	Ⓐ W—APAS—C W—APAL—C L≦100	Ⓐ 100<L≦150	ⒹⓇⒺⒼ W—AP□S—C W—AP□L—C L≦100	ⒹⓇⒺⒼ 100<L≦150
10	3,720	4,530	4,620	5,630
13	3,890	4,860	5,030	6,280
16	4,300	5,460	5,800	7,360
20	4,890	6,210	6,740	8,550
25	5,710	7,300	7,540	9,650

■Ⓜ Powdered high-speed steel WPC® type

D	Ⓐ W—APHAS—C W—APHAL—C L≦100	Ⓐ 100<L≦150	ⒹⓇⒺⒼ W—APH□S—C W—APH□L—C L≦100	ⒹⓇⒺⒼ 100<L≦150
10	4,860	6,070	6,040	7,550
13	5,160	6,550	6,700	8,510
16	5,940	7,600	7,830	10,020
20	6,820	8,860	9,250	12,020
25	7,820	10,320	10,330	13,640

■Ⓜ SKH51 HW coating type

D	Ⓐ HW—APAS—C HW—APAL—C L≦100	Ⓐ 100<L≦150	ⒹⓇⒺⒼ HW—AP□S—C HW—AP□L—C L≦100	ⒹⓇⒺⒼ 100<L≦150
10	5,850	7,130	6,680	8,140
13	6,130	7,660	7,210	9,010
16	6,960	8,830	8,450	10,730
20	7,890	10,020	9,940	12,620
25	9,330	11,940	11,190	14,320

■Ⓜ Powdered high-speed steel HW coating type

D	Ⓐ HW—APHAS—C HW—APHAL—C L≦100	Ⓐ 100<L≦150	ⒹⓇⒺⒼ HW—APH□S—C HW—APH□L—C L≦100	ⒹⓇⒺⒼ 100<L≦150
10	6,940	8,680	8,080	10,100
13	7,370	9,360	8,940	11,350
16	8,550	10,940	10,550	13,500
20	9,770	12,700	12,430	16,160
25	11,380	15,020	14,000	18,480

PRESS ADD.SPEC. Printed in Red

JECTOR PUNCHES WITH DOWEL FOR HEAVY LOAD
—FINISHED FOR RETAINERS—

PRODUCTS DATA P.1223

PUNCHES FOR HEAVY LOAD
TAPERED HEAD PUNCHES

Punch & Retainer Set Available Detail P.657

How to calculate the projection length of a jector pin (reference) P.191

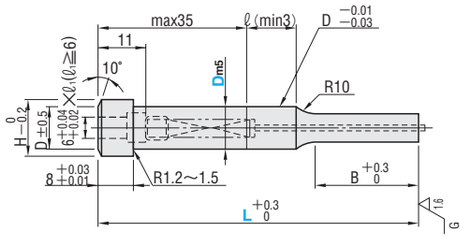
- Refer to Jector punch blank for the details of jector hole. P.188
- Refer to Jector pin set for the details of Jector pin. P.189

Type	Ⓐ	Shank dia. DT	M H
With dowel	Dowel pin MS6-25	Dm5	SKH51 61~64HRC

Catalog No. Type	Shape	B Blade length	With dowel
AHJ	ⒶⒹⓇⒺⒼ	S / L	—C

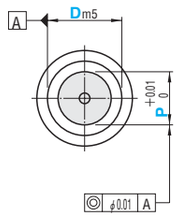
RoHS

Select tip shape from Shape A~G shown below.

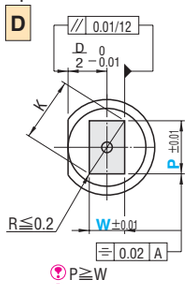


Blade length (B) L>S

Shape A

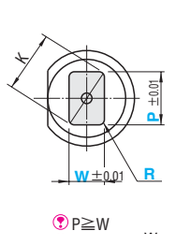


Shape D



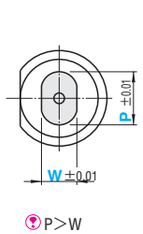
Ⓟ P≧W
Ⓟ R=0 : Applicable
Ⓟ $K=\sqrt{P^2+W^2}$

Shape R



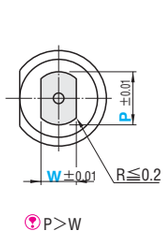
Ⓟ P≧W
Ⓟ $0.15 \leqq R < \frac{W}{2}$
Ⓟ $K=\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Shape E



Ⓟ P>W

Shape G



Ⓟ P>W

Catalog No. Type	D	L	Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	R R	B	H
AHJAS—C	10	(60) 70 80 90 100 110 120 130	5.00~ 9.99	9.97	5.00	0.15≦R<W/2 (R only)	13	15
AHJDS—C	13	(60) 70 80 90 100 110 120 130	6.00~12.99	12.97	6.00			18
AHJRS—C	16	(60) 70 80 90 100 110 120 130	10.00~15.99	15.97	6.00		19	21
AHJES—C	20	(60) 70 80 90 100 110 120 130	13.00~19.99	19.97	6.00			25
AHJGS—C	25	(60) 70 80 90 100 110 120 130	18.00~24.99	24.97	6.00			30
AHJAL—C	10	(60) 70 80 90 100 110 120 130	5.00~ 9.99	9.97	5.00		19	15
AHJDL—C	13	(60) 70 80 90 100 110 120 130	6.00~12.99	12.97	6.00			18
AHJRL—C	16	70 80 90 100 110 120 130	10.00~15.99	15.97	6.00		25	21
AHJEL—C	20	70 80 90 100 110 120 130	13.00~19.99	19.97	6.00			25
AHJGL—C	25	70 80 90 100 110 120 130	18.00~24.99	24.97	6.00			30

Ⓟ L(60)→B=8, When L(60), the blade length is fixed to 8mm.
Ⓟ Ⓐ : P>D−0.03 → ℓ=0, When P>D−0.03 round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
Ⓟ DREG : P・K>D−0.05 → ℓ=0, When P・K>D−0.05 shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order

Catalog No. — L — P — W — R(R only)

AHJAS—C 20 — 80 — P15.00
AHJDS—C 25 — 80 — P18.00 — W10.00

Delivery

- Ⓐ: 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38
  Ⓟ A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
- DREG: 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. P.38
  Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

¥ The volume discount rate is also applicable to alteration cost. P.39

Alterations Catalog No. — L(LC) — P — W — R — (BC·KC…etc.)
AHJAS—C 20 — LC82 — P13.00 — BC13

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip	BC	BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
	SC	SC	Finishes blade with lapping. Ⓟ Dimension P tolerance and the specification unit remain the same. ⊗R shape is not applicable with a corner radius of 0.		1,200 (only Ⓐ 800)
	PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.188. ⊗PCC:Not applicable	——	400
	PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.188. ⊗PRC:Not applicable	——	200
	P W	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 Ⓟ (P : 0.001mm incr.)	Changes tolerance on P(W). P·W±0.01 ⇨ +0.01 0	400
Full length	LC	LC	Changes full length. LC<L 0.1mm incr. (combination with LKC・LKZ→0.01mm incr.) Ⓟ B is shortened by (L—LC). Ⓟ The projection length of the jector pin is 4mm.		200
	LT	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0		600

Alterations		Code	Ⓐ	DREG	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not available	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not available	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		−100
		NC	Removes the jector pin. ⊗AC : Not applicable		−200
		TPC	Replaces dowel pin. Attached MS6—25 to MSTP6—25 (tapped type).		100
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0 ⊗Punch & retainer set not available.		0

Example

■Punch with dowel is;
Mainly used for dies of body of automobile with retainer which hold punch. Different from indirect positioning by retainer's dowel hole, it allows direct positioning by the dowel hole coaxially machined to punch, and improves the die precision. It is effective when used for die machining by NC process. It can also be used for dies of exterior panels of electrical appliances by setting with retainer or for attaching to punch plate of progressive die.

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

■M SKH51

D	Ⓐ AHJAS—C AHJAL—C L≦100	Ⓐ AHJAS—C AHJAL—C 100<L≦130	DREG AHJ□S—C AHJ□L—C L≦100	DREG AHJ□S—C AHJ□L—C 100<L≦130
10	4,670	5,690	5,960	7,270
13	4,930	6,160	6,610	8,260
16	5,920	7,510	7,950	10,090
20	6,790	8,620	9,610	12,200
25	8,470	10,840	11,030	14,110

PRESS ADD.SPEC. Printed in Red

JECTOR PUNCHES WITH DOWEL FOR HEAVY LOAD
—FINISHED FOR RETAINERS, TiCN COATING TYPE—

Quality Improved

PRODUCTS DATA P.1220・1223

PUNCHES FOR HEAVY LOAD
COATING PUNCHES—TiCN—
QUALITY IMPROVED P.1217

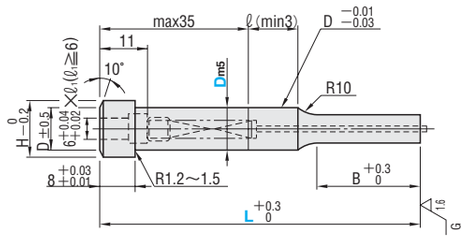
Punch & Retainer Set Available
Detail P.657

How to calculate the projection length of a jector pin (reference) P.191

- Refer to Jector punch blank for the details of jector hole. P.188
- Refer to Jector pin set for the details of Jector pin. P.189

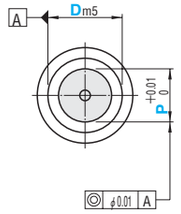
Type	Ⓐ	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	With dowel
With dowel TiCN coating	Dowel pin MS6-25	Dm5	SKH51 61～64HRC Surface 3000HV	H—AHJ	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S L	—C

Select tip shape from Shape A～G shown below.

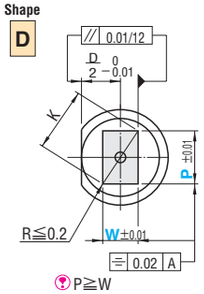


The tip surface is ground before coating.
Blade length (B) L>S

Shape A

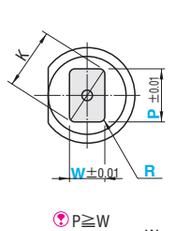


Shape D



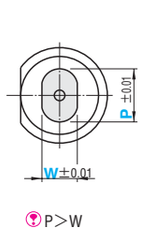
P≧W
R=0：Applicable
K=√(P²+W²)

Shape R



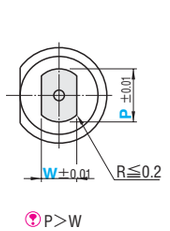
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R

Shape E



P>W

Shape G

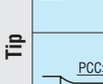


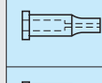
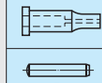
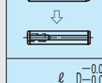
P>W

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No. — L(LC) — P — W — R — (BC・KC…etc.)
H—AHJAS—C 20 — LC82 — P15.00 — KFC225

Alterations		Code	Ⓐ	D R E G	¥/1Code
Tip		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments ⓘPRC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.188. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments ⓘPCC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.188. ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 ⓘ(P:0.001mm incr.) ⊗D>13:Not applicable	Changes tolerance on P(W). P・W±0.01 ⇨ +0.01 0 ⊗D>13:Not applicable	600
Full length		LC	Changes full length. LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) ⓘB is shortened by (L—LC). ⓘThe projection length of the jector pin is 4mm.		200
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400

Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		AC	AIR Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		−100
		NC	Removes the jector pin. AC：Not applicable		−200
		TPC	Replaces dowel pin. Attached MS6—25 to MSTP6—25 (tapped type).		100
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0 ⊗Punch & retainer set not available.	0

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P・Kmax.	D R E G P・Wmin.	R R	B	H
H—AHJAS—C	10	(60) 70 80 90 100 110 120 130	5.00～ 9.99	9.97	5.00	0.15≦R<W/2 (R only)	13	15
H—AHJDS—C	13	(60) 70 80 90 100 110 120 130	6.00～12.99	12.97	6.00			18
H—AHJRS—C	16	(60) 70 80 90 100 110 120 130	10.00～15.99	15.97	6.00		19	21
H—AHJES—C	20	(60) 70 80 90 100 110 120 130	13.00～19.99	19.97	6.00			25
H—AHJGS—C	25	(60) 70 80 90 100 110 120 130	18.00～24.99	24.97	6.00			30
H—AHJAL—C	10	(60) 70 80 90 100 110 120 130	5.00～ 9.99	9.97	5.00		19	15
H—AHJDL—C	13	(60) 70 80 90 100 110 120 130	6.00～12.99	12.97	6.00			18
H—AHJRL—C	16	70 80 90 100 110 120 130	10.00～15.99	15.97	6.00		25	21
H—AHJEL—C	20	70 80 90 100 110 120 130	13.00～19.99	19.97	6.00			25
H—AHJGL—C	25	70 80 90 100 110 120 130	18.00～24.99	24.97	6.00			30

ⓘ L(60)→B=8, When L(60), the blade length is fixed to 8mm.
ⓘ Ⓐ : P>D−0.03 → ℓ=0, When P>D−0.03 round punch, D −0.01 −0.03 (press-in lead) is not available.
ⓘ D R E G : P・K>D−0.05 → ℓ=0, When P・K>D−0.05 shaped punch, D −0.01 −0.03 (press-in lead) is not available.

Order

Catalog No. — L — P — W — R(R only)
H—AHJAS—C 20— 80 —P15.00
H—AHJDS—C 25— 80 —P18.00 —W10.00

Delivery 3 Days

Example

■Punch with dowel is;
Mainly used for dies of body of automobile with retainer which hold punch. Different from indirect positioning by retainer's dowel hole, it allows direct positioning by the dowel hole coaxially machined to punch, and improves the die precision. It is effective when used for die machining by NC process. It can also be used for dies of exterior panels of electrical appliances by setting with retainer or for attaching to punch plate of progressive die.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

ⓘTo be quoted on price & lead time above Max. Q'ty.

■M SKH51

D	Ⓐ H—AHJAS—C H—AHJAL—C L≦100	Ⓐ 100<L≦130	D R E G H—AHJ□S—C H—AHJ□L—C L≦100	D R E G 100<L≦130
10	6,470	7,890	7,750	9,450
13	6,900	8,620	8,560	10,700
16	8,070	10,240	10,080	12,800
20	9,160	11,630	11,950	15,170
25	10,920	13,970	13,460	17,220

PRESS ADD.SPEC. Printed in Red

JECTOR PUNCHES WITH DOWEL FOR HEAVY LOAD
—FINISHED FOR RETAINERS, WPC®TYPE/HW COATING TYPE—

Quality Improved

PRODUCTS DATA P.1221·1223

PUNCHES FOR HEAVY LOAD
TAPERED HEAD PUNCHES
WPC®PUNCHES
COATING PUNCHES—HW—
QUALITY IMPROVED P.1217

Punch & Retainer Set Available Detail P.657

DELIVERY SHORTENED

How to calculate the projection length of a jector pin (reference) P.191

• Refer to Jector punch blank for the details of jector hole. P.188
• Refer to Jector pin set for the details of Jector pin. P.189

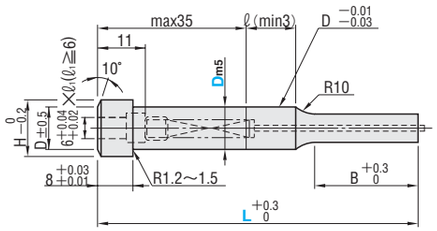
Type	Ⓐ	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	With dowel
With dowel WPC®type	Dowel pin MS6-25	D m5	SKH51 61～64HRC Surface1000～1200HV	W—AHJ	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S L	—C
With dowel HW coating type			SKH51 61～64HRC Surface3000HV	HW—AHJ			

—WPC®type—

RoHS

—HW coating type—

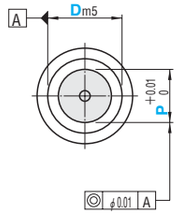
Select tip shape from Shape A～G shown below.



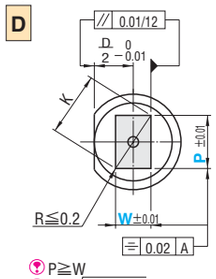
The tip is very slightly rounded.

Blade length (B) L>S

Shape A

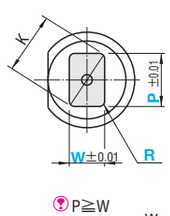


Shape D



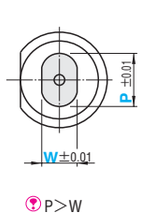
P≧W
K=√(P²+W²)

Shape R



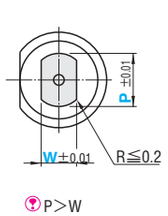
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R)

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	With dowel	D	L	0.01mm increments Ⓐ min. P max.	ⒹⓇⒺⒼ P·Kmax.	ⒹⓇⒺⒼ P·Wmin.	Ⓡ R	B	H
WPC®type W—AHJ	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	—C	10	(60) 70 80 90 100 110 120 130	5.00～ 9.99	9.97	5.00	0.15≦R<W/2 (Ⓡ only)	13	15
				13	(60) 70 80 90 100 110 120 130	6.00～12.99	12.97	6.00			18
				16	(60) 70 80 90 100 110 120 130	10.00～15.99	15.97	6.00		19	21
				20	(60) 70 80 90 100 110 120 130	13.00～19.99	19.97	6.00			25
				25	(60) 70 80 90 100 110 120 130	18.00～24.99	24.97	6.00			30
HW coating type HW—AHJ		L		10	(60) 70 80 90 100 110 120 130	5.00～ 9.99	9.97	5.00		19	15
				13	(60) 70 80 90 100 110 120 130	6.00～12.99	12.97	6.00			18
				16	70 80 90 100 110 120 130	10.00～15.99	15.97	6.00		25	21
				20	70 80 90 100 110 120 130	13.00～19.99	19.97	6.00			25
				25	70 80 90 100 110 120 130	18.00～24.99	24.97	6.00			30

L(60)→B=8, When L(60), the blade length is fixed to 8mm.
Ⓐ : P>D−0.03 → ℓ=0, When P>D−0.03 round punch, D −0.01 −0.03 (press-in lead) is not available.
ⒹⓇⒺⒼ : P・K>D−0.05 → ℓ=0, When P・K>D−0.05 shaped punch, D −0.01 −0.03 (press-in lead) is not available.

Order

Catalog No.	L	P	W	R(Ⓡ only)
W—AHJAS—C 20	80	P15.00		
HW—AHJDS—C 25	80	P18.00	W10.00	

Delivery

■WPC®type (W—)

• Ⓐ	3 Days	Express A	500/1Pc.	P.38
• ⒹⓇⒺⒼ	3 Days	Express A	800/1Pc.	P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.
A flat charge of 2,160 yen for 3 pieces or more of the same size.

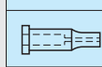
■HW coating type (HW—) 3 Days

The volume discount rate is also applicable to alteration cost. P.39

Alterations

Catalog No.	L(LC)	P	W	R	(BC·KC···etc.)
W—AHJAS—C 20	LC82	P15.00			KFC225—TPC

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Tip		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (PRC≦(P−d1−0.5)/2 For dimension d1, refer to P.188. ⊗PCC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (PCC≦(P−d1−0.5)/2 For dimension d1, refer to P.188. ⊗PRC:Not applicable	——	200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P：0.001mm incr.) ⊗HW coating type:Not applicable ⊗D>13:Not applicable	Changes tolerance on P(W). P·W±0.01 ⇨ +0.01 0 ⊗HW coating type:Not applicable ⊗D>13:Not applicable	400
Full length		LC	Changes full length. LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) (B is shortened by (L—LC). (The projection length of the jector pin is 4mm.		200
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Head		KC	Adds single key flat at head.	90° 0° 180° 270° Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		KFC	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	400 (only Ⓐ 600)
		NKC	——	No key flat. ⊗Punch & retainer set not available.	0
Shank		AC	AIR Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		−100
		NC	MAX Removes the jector pin. ⊗AC：Not applicable		−200
		TPC	Replaces dowel pin. Attached MS6—25 to MSTP6—25 (tapped type).		100
		NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.		0

Example

■Punch with dowel is;
Mainly used for dies of body of automobile with retainer which hold punch. Different from indirect positioning by retainer's dowel hole, i t allows direct positioning by the dowel hole coaxially machined to punch, and improves the die precision. It is effective when used for die machining by NC process. It can also be used for dies of exterior panels of electrical appliances by setting with retainer or for attaching to punch plate of progressive die.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■M SKH51 WPC®type

D	Ⓐ W—AHJAS—C W—AHJAL—C L≦100	Ⓐ 100<L≦130	ⒹⓇⒺⒼ W—AHJ□S—C W—AHJ□L—C L≦100	ⒹⓇⒺⒼ 100<L≦130
10	5,700	6,950	6,990	8,520
13	5,960	7,450	7,640	9,550
16	6,950	8,820	8,980	11,400
20	7,820	9,930	10,640	13,510
25	9,450	12,090	12,060	15,430

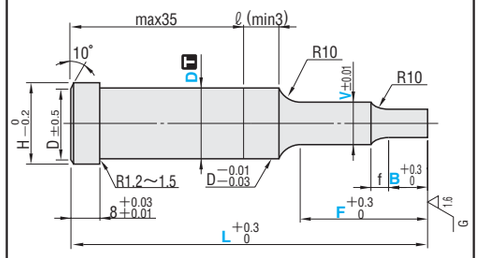
■M SKH51 HW coating type

D	Ⓐ HW—AHJAS—C HW—AHJAL—C L≦100	Ⓐ 100<L≦130	ⒹⓇⒺⒼ HW—AHJ□S—C HW—AHJ□L—C L≦100	ⒹⓇⒺⒼ 100<L≦130
10	6,840	8,340	8,410	10,260
13	7,230	9,030	9,310	11,630
16	8,590	10,900	11,010	13,980
20	9,750	12,380	13,150	16,700
25	11,610	14,860	14,850	19,000

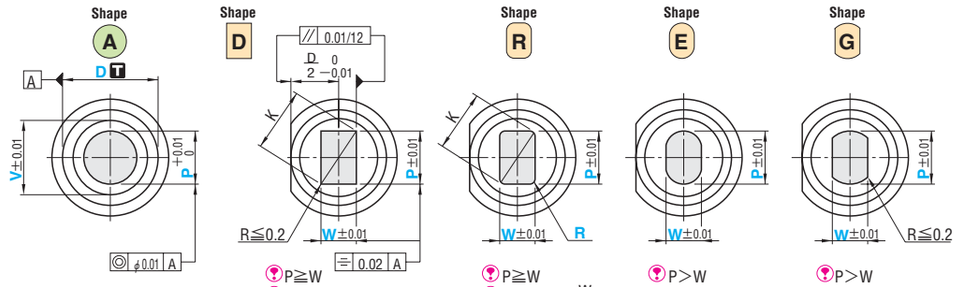
DOUBLE STEPPED SHOULDER PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS—

PRODUCTS DATA P.1223
PUNCHES FOR HEAVY LOAD
TAPERED HEAD PUNCHES
Punch & Retainer Set Available
Detail P.657

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type	Catalog No. Shape	Select tip shape from Shape A~G shown below.
RoHS	D_{m5}	SKH51 61~64HRC	APTW	A D R E G	
		Powdered high-speed steel 64~67HRC	APHTW		
	$D^{+0.005}_{0}$	SKH51 61~64HRC	A—APTW		
		Powdered high-speed steel 64~67HRC	A—APHTW		

Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable



- A: P≧W; R=0 : Applicable; $K=\sqrt{P^2+W^2}$
- D: P≧W; 0.15≦R< W/2; $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
- E: P>W
- G: P>W

Catalog No. Type	Shape	D	L	A P (0.01mm increments)	A B (0.1mm increments)	Diagonal Kmax	DREG P·W (0.01mm increments)	DREG B (0.1mm increments)	R R (0.01mm increments)	V (0.01mm increments)	F (0.1mm increments)	H
(D_{m5}) APTW APHTW ($D^{+0.005}_{0}$) A—APTW A—APHTW	A D R E G	5	50·60·70·80	1.50~ 1.99	2.0~20.0	4.96	1.00~ 1.49	2.0~ 8.0	0.15≦R< W/2 (R only)	A: D>V>P+0.01 DREG: D>V>(P,K)+0.03	B+f+2<F≦Fmax & A:F≦L−35 DREG:F≦L−40	10
				2.00~ 3.99	2.0~35.0		1.50~ 1.99	2.0~13.0				
				4.00~ 4.98	2.0~40.0		2.00~ 3.49	2.0~19.0				
				4.00~ 4.98	2.0~40.0		3.50~ 4.96	2.0~25.0				
		6	50·60·70·80	1.50~ 1.99	2.0~20.0	5.96	1.00~ 1.49	2.0~ 8.0				11
				2.00~ 3.99	2.0~35.0		1.50~ 1.99	2.0~13.0				
				4.00~ 5.98	2.0~40.0		2.00~ 3.49	2.0~19.0				
				5.00~ 5.98	2.0~40.0		3.50~ 4.99	2.0~25.0				
				5.00~ 5.98	2.0~40.0		5.00~ 5.96	2.0~30.0				
		8	50·60·70·80·90·100	1.50~ 1.99	2.0~20.0	7.96	1.00~ 1.49	2.0~ 8.0				13
				2.00~ 3.99	2.0~35.0		1.50~ 1.99	2.0~13.0				
				4.00~ 5.99	2.0~45.0		2.00~ 3.49	2.0~19.0				
				6.00~ 7.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				6.00~ 7.98	2.0~60.0		5.00~ 7.96	2.0~30.0				
		10	50·60·70·80·90·100	1.50~ 1.99	2.0~20.0	9.96	1.25~ 1.49	2.0~ 8.0				15
				2.00~ 3.99	2.0~35.0		1.50~ 1.99	2.0~13.0				
				4.00~ 5.99	2.0~45.0		2.00~ 3.49	2.0~19.0				
				6.00~ 9.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				6.00~ 9.98	2.0~60.0		5.00~ 9.96	2.0~30.0				
		13	50·60·70·80·90·100	3.00~ 3.99	2.0~35.0	12.96	1.50~ 1.99	2.0~13.0				18
				4.00~ 5.99	2.0~45.0		2.00~ 3.49	2.0~19.0				
				6.00~12.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				6.00~12.98	2.0~60.0		5.00~12.96	2.0~30.0				
		16	50·60·70·80·90·100	5.00~ 5.99	2.0~45.0	15.96	2.00~ 3.49	2.0~19.0				21
				6.00~15.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				6.00~15.98	2.0~60.0		5.00~15.96	2.0~30.0				
		20	50·60·70·80·90·100	6.50~19.98	2.0~60.0	19.96	2.50~ 3.49	2.0~19.0				25
				6.50~19.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				6.50~19.98	2.0~60.0		5.00~19.96	2.0~30.0				
		25	50·60·70·80·90·100	9.00~24.98	2.0~60.0	24.96	3.00~ 3.49	2.0~19.0				30
				9.00~24.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				9.00~24.98	2.0~60.0		5.00~24.96	2.0~30.0				

When V>D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order

Catalog No.	L	P	W	B	V	F	R(R only)
APTWA10	80	P 9.50		B30	V 9.80	F35	
A—APHTWR13	80	P10.50	W7.34	B25	V12.00	F35	R0.5

Delivery

- A: 3 Days — Express A 800/1Pc. P.38 — A flat charge of 2,160 yen for 3 pieces or more of the same size.
- DREG: 5 Days — Express B 800/1Pc. P.38 — A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration

Catalog No.	L(LC)	P	W	B	V	F	RR only	(KC·WKC···etc.)
APTWA 10	LC72	P4.80		B10	V6.80	F25		SKC

Alterations		Code	A	DREG	¥/1Code
Tip		SC	Finishes blade with lapping. Dimension P tolerance and the specification unit remain the same. ⊗R shape is not applicable with a corner radius of 0.		1,200 (only A 800)
	PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 ⊗PCC:Not applicable	———	400
	PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 ⊗PRC:Not applicable	———	200
	P W T	PKC	Changes tolerance on P. $P^{+0.01}_{0} \Rightarrow ^{+0.005}_{0}$ (P : 0.001mm incr.)	Changes tolerance on P(W). $P\cdot W\pm0.01 \Rightarrow ^{+0.01}_{0}$	400
	V T	VKC	Changes tolerance on V $V^{+0.01}_{0} \Rightarrow ^{+0.005}_{0}$ (V : 0.001mm incr.)	Changes tolerance on V $V\pm0.01 \Rightarrow ^{+0.01}_{0}$	400
Full length	LC	LC	Changes full length. 40+F≦LC<L 0.1mm increments (Combination with LKC·LKZ→0.01mm increments)		200
	L T	LKC	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow ^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow ^{+0.01}_{0}$		600

Alterations		Code	A	DREG	¥/1Code
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only A 400)
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC:Not applicable	400 (only A 600)
		NKC	———	No key flat. ⊗Punch & retainer set not available.	0
Shank		SKC	Adds key flat on shank. A DREG ·D5·6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC·WKC·KFC : Not applicable ⊗Punch & retainer set not available.		600
		NDC	No press-in lead	ℓ≧3⇨ℓ=0 ⊗Punch & retainer set not available.	0

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : A—APTWA6, the price is 2,900 (APTWA6 unit price) +200 = 3,100 yen (product unit)

M SKH51

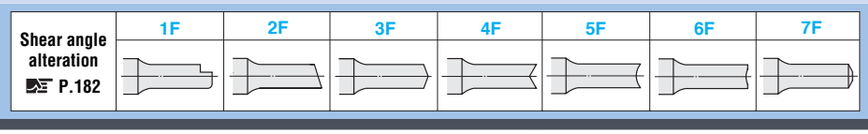
D	A APTWA	DREG APTW□
5	2,830	3,650
6	2,900	3,750
8	3,050	3,920
10	3,160	4,070
13	3,360	4,500
16	3,860	5,350
20	4,720	6,580
25	5,490	7,290

M Powdered high-speed steel

D	A APHTWA	DREG APHTW□
5	4,400	5,080
6	4,580	5,290
8	4,880	5,660
10	5,290	6,150
13	5,600	6,700
16	6,520	8,030
20	7,740	9,800
25	9,110	11,010

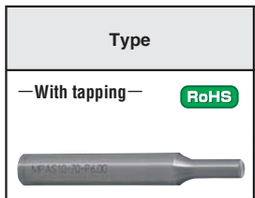
TAPPED PUNCHES

Shear angle alteration P.182

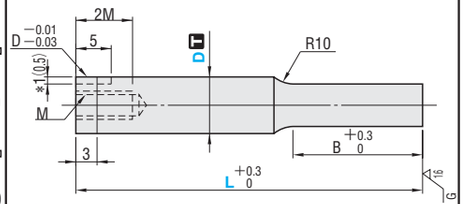


The volume discount rate is also applicable to alteration cost. P.39

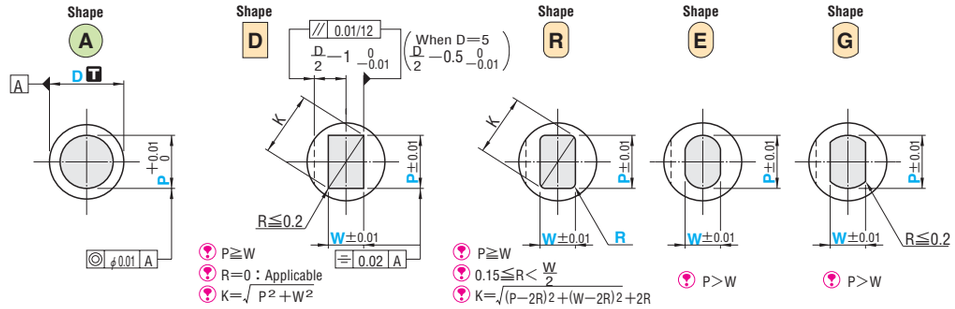
Type	M / H	Catalog No. Type: Shank dia. Dm5	Type: Shank dia. D +0.005 0	Shape	B Blade length	Select tip shape from Shape A~G shown below.
—With tapping— RoHS	SKD 11 or equivalent 60~63HRC	(D5~25) MP Large diameter tap type (D16~25) MPL	(D5~25) A—MP	A D R E G	S L X	
	Powdered high-speed steel 64~67HRC	(D5~25) MPH	(D5~25) A—MPH			



Shank Dia.Tolerance D T m5 · +0.005 0 Selectable



When D=5, the key slot depth is 0.5.



Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	Ⓡ R	B	M
(Dm5) MP MPH (D+0.005 0) A—MP A—MPH	A D R E G	S	5	40 50 60 70 80	2.00~ 4.99	4.97	1.20	0.15≦R< W/2 (Ⓡ only)	8	3
			6	40 50 60 70 80	2.00~ 5.99	5.97	1.50			
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	2.00		13	4
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	2.50			5
			13	(40) 50 60 70 80 90 100	6.00~12.99	12.97	3.00			6
			16	(40) 50 60 70 80 90 100	10.00~15.99	15.97	4.00		19	
			20	(40) 50 60 70 80 90 100	13.00~19.99	19.97	5.00			
			25	(40) 50 60 70 80 90 100	18.00~24.99	24.97	6.00			
		L	5	50 60 70 80	2.00~ 4.99	4.97	2.00		13	3
			6	50 60 70 80	2.00~ 5.99	5.97	2.00		19	4
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	2.50			5
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	2.50			6
			13	50 60 70 80 90 100	6.00~12.99	12.97	3.00		25	
			16	60 70 80 90 100	10.00~15.99	15.97	4.00			
			20	60 70 80 90 100	13.00~19.99	19.97	5.00			
			25	60 70 80 90 100	18.00~24.99	24.97	6.00			
		X	5	60 70 80	2.00~ 4.99	4.97	3.50		25	3
			6	60 70 80	2.00~ 5.99	5.97	3.50			4
			8	60 70 80 90 100	3.00~ 7.99	7.97	5.00		30	5
			10	60 70 80 90 100	3.00~ 9.99	9.97	5.00			6
			13	60 70 80 90 100	6.00~12.99	12.97	5.00			
			16	70 80 90 100	10.00~15.99	—			40	
			20	70 80 90 100	13.00~19.99					
			25	70 80 90 100	18.00~24.99					
Large diameter tap type (Dm5) MPL		S	16	(40) 50 60 70 80 90 100	10.00~15.99	15.97	4.00		19	8
			20	(40) 50 60 70 80 90 100	13.00~19.99	19.97	5.00			
			25	(40) 50 60 70 80 90 100	18.00~24.99	24.97	6.00			
		L	16	60 70 80 90 100	10.00~15.99	15.97	4.00		25	
			20	60 70 80 90 100	13.00~19.99	19.97	5.00			
			25	60 70 80 90 100	18.00~24.99	24.97	6.00			

L(40)→ B=8, When L(40), the blade length is fixed to 8mm.

Order

Catalog No.	L	P	W	R(Ⓡ only)
MPAL 13	80	P8.24		
MPLRS 20	60	P15.50	W7.25	R0.50

Delivery

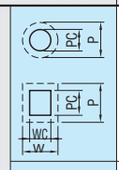
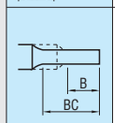
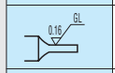
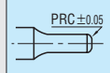
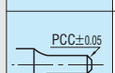
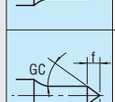
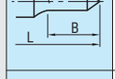
• Ⓐ			• DREG		
3 Days	Express T 1,000/1Pc. Express A 500/1Pc.	P.38	3 Days	Express T 1,600/1Pc. Express A 800/1Pc.	P.38

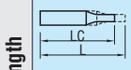
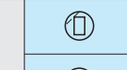
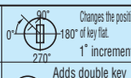
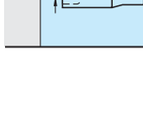
A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration

Catalog No.	L(LC)	P(PC)	W(WC)	R	(BC·KC·WKC···etc.)
MPAL 13	80	P8.24			KC LKC

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧ Pmin 2 0.01mm increments (Combination with PKC→ 0.001mm increments) P(PC) Bmax: 1.000~1.999 20; 2.000~3.999 35; 4.000~5.999 45; 6.000~ 60	Changes dimension P・W. PC WC ≧ P・Wmin 2 ≧0.80 0.01mm increments ⊗Blade length X:Not applicable P(PC)・W(WC) Bmax: 0.80~1.49 8; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30	200
		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L(LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L(LC) requires BC+30mm or more.	200
		SC	Finishes blade with lapping. Ⓨ Dimension P tolerance and the specification unit remain the same. ⊗D shape is not applicable with a corner radius of 0.		1,200 (only Ⓐ 800)
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 ⊗PCC・GC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 ⊗PRC・GC:Not applicable	——	200
		GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B≧f+2 f=P/2×tan(90°−GC°) Ⓨ When used with SC, tip and edge are rounded. ⊗LKC・LKZ・PRC・PCC :Not applicable	——	400
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 Ⓨ (P : 0.001mm incr.)	Changes tolerance on P(W). P・W±0.01 ⇨ +0.01 0	400

Alterations		Code	Ⓐ	DREG	¥/1Code
Full length		LC	Changes full length. 25+B(BC)≦LC<L 0.1mm increments Ⓨ When LC—B (BC) is 25mm or less, B (BC) is LC—25mm. (Combination with LKC・LKZ→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L 0.1mm increments Ⓨ When LC—B (BC) is 30mm or less, B (BC) is LC—30mm.	200
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0		600
Others		KC	Adds single key flat at head. ⊗D5 : Not applicable.	 Changes the position of key flat. 1° increments	200
		WKC	Adds double key flats in parallel. ⊗D5 : Not applicable.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		NKC	——	No key flat.	0
		SKC	Adds key flat on shank. Ⓐ DREG P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC・WKC : Not applicable		600

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of Dm5. For shank tolerance of D +0.005 0, additional 200 yen required.
Example : A—MPAL10, the price is 660 (MPAL10 unit price) +200 = 860 yen (product unit)

■ M SKD 11 or equivalent

D	Ⓐ MPAS MPAL	Ⓐ MPAX	DREG MP□S MP□L	DREG MP□X
5	480	610	1,230	1,420
6	490	620	1,310	1,500
8	560	710	1,400	1,590
10	660	840	1,520	1,710
13	760	950	1,850	2,040
16	870	1,060	2,290	—
20	1,040	1,230	2,800	
25	1,500	1,690	3,240	

■ Large diameter tap type M SKD 11 or equivalent

D	Ⓐ MPLAS MPLAL	DREG MPL□S MPL□L
5	—	—
6		
8		
10		
13		
16	920	2,340
20	1,090	2,850
25	1,550	3,290

■ M Powdered high-speed steel

D	Ⓐ MPHAS MPHAL	Ⓐ MPHAX	DREG MPH□S MPH□L	DREG MPH□X
5	1,060	1,180	2,160	2,350
6	1,290	1,420	2,420	2,610
8	1,750	1,930	2,940	3,130
10	2,040	2,230	3,170	3,360
13	3,070	3,260	4,550	4,740
16	3,550	3,740	5,190	—
20	4,240	4,430	6,590	
25	5,790	5,980	7,670	

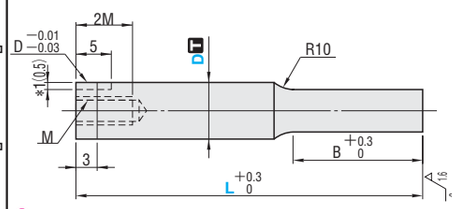
TAPPED PUNCHES
—TiCN COATING TYPE / DICOAT® TYPE—

Quality Improved
PRODUCTS DATA P.1215·1220
COATING PUNCHES—TiCN— QUALITY IMPROVED P.1217
DICOAT® PUNCHES

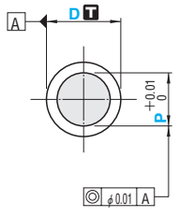
¥ The volume discount rate is also applicable to alteration cost. P.39

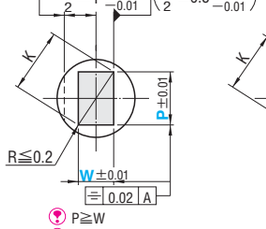
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length
—TiCN coating— RoHS Shank Dia.Tolerance D T m5・$^{+0.005}_{0}$ Selectable	D_{m5}	Powdered high-speed steel 64~67HRC Surface 3000HV	H—MPH	A D R E G	S L X
	$D^{+0.005}_{0}$	Powdered high-speed steel 64~67HRC Surface 3000HV	AH—MPH		
—Dicoat®— RoHS Shank Dia.Tolerance D T m5・$^{+0.005}_{0}$ Selectable	D_{m5}	SKD 11 or equivalent 60~63HRC Surface 3000HV	T—MP		
		Powdered high-speed steel 62~64HRC Surface 3000HV	T—MPH		
	$D^{+0.005}_{0}$	SKD 11 or equivalent 60~63HRC Surface 3000HV	AT—MP		
		Powdered high-speed steel 62~64HRC Surface 3000HV	AT—MPH		Blade length (B) X>L>S

Select tip shape from Shape A~G shown below.

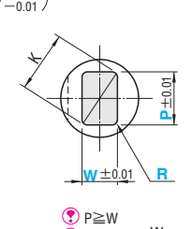


The tip grinding is processed before coating for TiCN coating products.
＊When D=5, the key slot depth is 0.5.

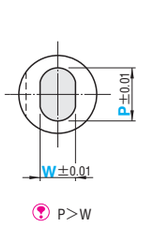
Shape A


Shape D


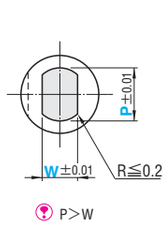
P≧W
R=0：Applicable
$K=\sqrt{P^2+W^2}$

Shape R


P≧W
0.15≦R＜W/2
$K=\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Shape E


P＞W

Shape G


P＞W

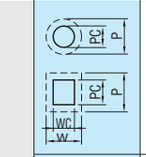
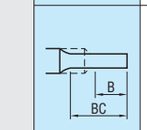
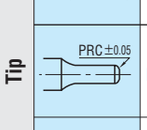
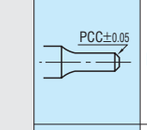
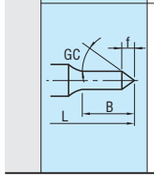
Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	ⒹⓇⒺⒼ P·Kmax.	ⒹⓇⒺⒼ P·Wmin.	Ⓡ R	B	M
(Dm5) H—MPH T—MP T—MPH (D+0.005 0) AH—MPH AT—MP AT—MPH	A D R E G	S	5	40 50 60 70 80	2.00~ 4.99	4.97	1.20	0.15≦R＜W/2 (Ⓡ only)	8	3
			6	40 50 60 70 80	2.00~ 5.99	5.97	1.50			
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	2.00		13	4
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	2.50			5
			13	(40) 50 60 70 80 90 100	6.00~12.99	12.97	3.00		19	6
			16	(40) 50 60 70 80 90 100	10.00~15.99	15.97	4.00			
			20	(40) 50 60 70 80 90 100	13.00~19.99	19.97	5.00			
			25	(40) 50 60 70 80 90 100	18.00~24.99	24.97	6.00			
		L	5	50 60 70 80	2.00~ 4.99	4.97	2.00		13	3
			6	50 60 70 80	2.00~ 5.99	5.97	2.00			
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	2.50		19	4
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	2.50			5
			13	50 60 70 80 90 100	6.00~12.99	12.97	3.00		25	6
			16	60 70 80 90 100	10.00~15.99	15.97	4.00			
			20	60 70 80 90 100	13.00~19.99	19.97	5.00			
			25	60 70 80 90 100	18.00~24.99	24.97	6.00			
		X	5	60 70 80	2.00~ 4.99	4.97	3.50		25	3
			6	60 70 80	2.00~ 5.99	5.97	3.50			
			8	60 70 80 90 100	3.00~ 7.99	7.97	5.00		30	4
			10	60 70 80 90 100	3.00~ 9.99	9.97	5.00			5
			13	60 70 80 90 100	6.00~12.99	12.97	5.00			
			16	70 80 90 100	10.00~15.99	—		—	40	6
			20	70 80 90 100	13.00~19.99					
			25	70 80 90 100	18.00~24.99					

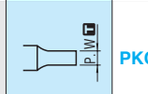
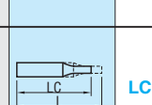
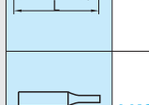
Ⓡ L(40)→B=8, When L(40), the blade length is fixed to 8mm.
Ⓡ The blade length X of Dicoat® type is available for shape Ⓐ only.

Order
Catalog No. — L — P — W — R(Ⓡ only)
AH—MPHRS 8 — 60 — P6.50 — W4.25 — R0.50
T—MPHAL 13 — 80 — P8.24

Delivery
■TiCN coating: 3 Days
■Dicoat®: 3 Days / Express A 800/1Pc.
⊗ Express A is not available for D $^{+0.005}_{0}$ types. P.38
Ⓡ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration
Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC・WKC…etc.)
T—MPHAL 13 — 80 — P8.24 — KC — LKC

Alterations	Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Tip 	PC WC	Changes dimension P. PC≧Pmin/2 0.01mm increments (Combination with PKC→0.001mm increments) P(PC) 1.000~1.999 2.000~3.999 4.000~5.999 6.000~ Bmax 20 35 40 (45) 45 (60) Ⓡ Values in ( ) are for coating type.	Changes dimension P・W. PC/WC≧P・Wmin/2≧1.00 0.01mm increments ⊗Blade length X:Not applicable P(PC)・W(WC) 1.00~1.49 1.50~1.99 2.00~3.49 3.50~4.99 5.00~ Bmax 8 13 19 25 30	200
	BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓡ Full length L(LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓡ Full length L(LC) requires BC+30mm or more.	200
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓡ PRC≦(P−0.2)/2 ⊗PCC・GC:Not applicable	——	400
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓡ PCC≦(P−0.2)/2 Ⓡ Applicable to TiCN coating type only. ⊗PRC・GC:Not applicable	——	200
	GC	20°≦GC<90° 1° increments Blade length B≧f+2 f=P/2×tan(90°−GC°) Ⓡ Applicable to TiCN coating type only. Ⓡ When used with SC, tip and edge are rounded. ⊗LKC・PRC・PCC: Not applicable	——	400

Alterations	Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Tip 	PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ (P:0.001mm increments) ⊗D>13:Not applicable Ⓡ Applicable to TiCN coating type only.	Changes tolerance on P(W). $P\cdot W\pm0.01$ ⇨ $^{+0.01}_{0}$ ⊗D>13:Not applicable	600
Full length 	LC	Changes full length. 25+B(BC)≦LC<L 0.1mm increments Ⓡ When LC−B(BC) is 25mm or less, B(BC) is LC−25mm. (Combination with LKC→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L 0.1mm increments Ⓡ When LC−B(BC) is 30mm or less, B(BC) is LC−30mm.	200
	LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
Others	KC	Adds single key flat at head. ⊗D5：Not applicable	90° 0° 180° 270° Changes the position of key flat. 1° increments	200
	WKC	Adds double key flats in parallel. ⊗D5：Not applicable	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
	NKC	——	No key flat.	0
	SKC	Adds key flat on shank. Ⓐ ⒹⓇⒺⒼ D/2 −0.5 0 −0.01・D5・6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) D/2 −1 0 −0.01 ⊗KC・WKC：Not applicable		600

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓡ To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank diameter tolerance of $D^{+0.005}_{0}$, additional 200 yen required for TiCN coating product, and additional 340 yen required for Dicoat® product.
Example：AH—MPHAL8, the price is 3,360 (H—MPHAL8 unit price) +200 = 3,560 yen (product unit)

■Ⓜ Powdered high-speed steel TiCN coating

D	Ⓐ H—MPHAS H—MPHAL	Ⓐ H—MPHAX	ⒹⓇⒺⒼ H—MPH□S H—MPH□L	ⒹⓇⒺⒼ H—MPH□X
5	2,380	2,570	3,550	3,740
6	2,740	2,930	3,900	4,090
8	3,360	3,550	4,600	4,790
10	3,810	4,000	4,940	5,130
13	5,000	5,190	6,480	6,670
16	5,670	5,860	7,310	—
20	6,580	6,770	8,930	
25	8,220	8,410	10,100	

■Ⓜ SKD 11 or equivalent Dicoat®

D	Ⓐ T—MPAS T—MPAL	Ⓐ T—MPAX	Ⓓ T—MPDS T—MPDL	Ⓡ T—MPRS T—MPRL	Ⓔ T—MPES T—MPEL	Ⓖ T—MPGS T—MPGL
5	2,300	2,490	3,390	5,140	3,780	3,260
6	2,520	2,710	3,680	5,460	4,110	3,590
8	2,750	2,940	3,980	5,880	4,390	3,860
10	3,070	3,260	4,310	6,190	4,760	4,260
13	3,380	3,570	4,920	6,940	5,340	4,820
16	3,800	3,990	5,750	7,870	6,310	5,700
20	4,320	4,510	6,710	8,950	7,280	6,670
25	5,080	5,270	7,470	9,900	8,200	7,480

■Ⓜ Powdered high-speed steel Dicoat®

D	Ⓐ T—MPHAS T—MPHAL	Ⓐ T—MPHAX	Ⓓ T—MPHDS T—MPHDL	Ⓡ T—MPHRS T—MPHRL	Ⓔ T—MPHES T—MPHEL	Ⓖ T—MPHGS T—MPHGL
5	3,020	3,210	4,460	7,220	5,060	4,240
6	3,500	3,690	4,920	7,870	5,630	4,760
8	4,150	4,340	5,680	9,280	6,460	5,470
10	4,660	4,850	6,100	9,600	6,960	6,000
13	5,960	6,150	7,800	12,200	8,710	7,580
16	6,780	6,970	8,800	13,080	9,940	8,700
20	7,740	7,930	10,680	15,030	11,640	10,390
25	9,610	9,800	12,070	16,790	13,600	11,830

PRESS NEW

TAPPED PUNCHES
—WPC® TYPE / HW COATING TYPE—

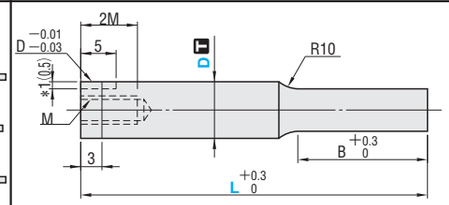
PRODUCTS DATA P.1221

WPC®PUNCHES
COATING PUNCHES—HW—

¥ The volume discount rate is also applicable to alteration cost. P.39

Type	M / H	Catalog No. Type: Shank dia. T D m5	Catalog No. Type: Shank dia. T D +0.005 0	Shape	B Blade length
—WPC® type— RoHS —HW coating type— Shank Dia.Tolerance D T m5 · +0.005 0 Selectable	SKD 11 or equivalent 60~63HRC Surface 1000~1100HV	W—MP	AW—MP	A D R E G	S L X
	Powdered high-speed steel 64~67HRC Surface 1000~1100HV	W—MPH	AW—MPH		
	Powdered high-speed steel 64~67HRC Surface 3000HV	HW—MPH	AHW—MPH		

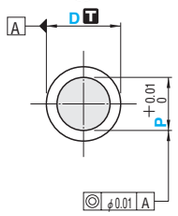
Select tip shape from Shape A~G shown below.



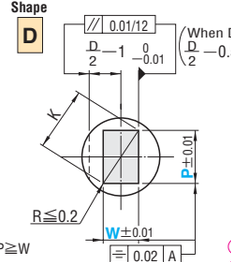
The tip is very slightly rounded.
* When D=5, the key depth is 0.5.

Blade length (B) X>L>S

Shape A

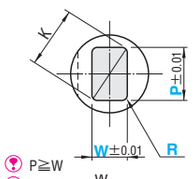


Shape D



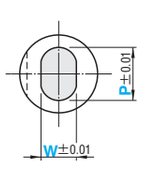
P≧W
R=0 : Applicable
K=√(P²+W²)

Shape R



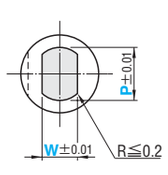
P≧W
0.15≦R< W/2
K=√((P−2R)²+(W−2R)²+2R

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P·Kmax.	0.01mm increments DREG P·Wmin.	0.01mm increments R	B	M
(Dm5) —WPC® type— W—MP W—MPH —HW coating type— HW—MPH	A D R E G	S	5	40 50 60 70 80	2.00~ 4.99	4.97	1.20	0.15≦R< W/2 (Ⓡonly)	8	3
			6	40 50 60 70 80	2.00~ 5.99	5.97	1.50			
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	2.00		13	4
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	2.50			5
			13	(40) 50 60 70 80 90 100	6.00~12.99	12.97	3.00		19	6
			16	(40) 50 60 70 80 90 100	10.00~15.99	15.97	4.00			
			20	(40) 50 60 70 80 90 100	13.00~19.99	19.97	5.00			
			25	(40) 50 60 70 80 90 100	18.00~24.99	24.97	6.00			
(D +0.005 0) —WPC® type— AW—MP AW—MPH —HW coating type— AHW—MPH		L	5	50 60 70 80	2.00~ 4.99	4.97	2.00		13	3
			6	50 60 70 80	2.00~ 5.99	5.97	2.00			
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	2.50		19	4
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	2.50			5
			13	50 60 70 80 90 100	6.00~12.99	12.97	3.00		25	6
			16	60 70 80 90 100	10.00~15.99	15.97	4.00			
			20	60 70 80 90 100	13.00~19.99	19.97	5.00			
			25	60 70 80 90 100	18.00~24.99	24.97	6.00			
		X	5	60 70 80	2.00~ 4.99	4.97	3.50		25	3
			6	60 70 80	2.00~ 5.99	5.97	3.50			
			8	60 70 80 90 100	3.00~ 7.99	7.97	5.00		30	4
			10	60 70 80 90 100	3.00~ 9.99	9.97	5.00			5
			13	60 70 80 90 100	6.00~12.99	12.97	5.00			
			16	70 80 90 100	10.00~15.99	—			40	6
			20	70 80 90 100	13.00~19.99					
			25	70 80 90 100	18.00~24.99					

Order: Catalog No. — L — P — W — R(Ⓡonly)
AW—MPDL 13 — 80 — P10.50 — W7.34

Delivery

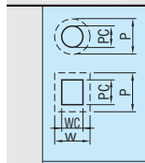
■WPC® type (W— · AW—)

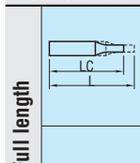
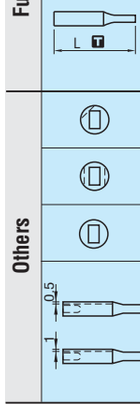
● Ⓐ: 3 Days | Express A 500/1Pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.

● DREG: 3 Days | Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

■HW coating type (HW— · AHW—): 3 Days

Alteration: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC·WKC···etc.)
W—MPHAL 13 — 80 — P8.24 — KC— LKC

Alterations	Code	Ⓐ	DREG	¥/1Code
Tip 	PC WC	Changes dimension P. PC≧ Pmin/2, 0.01mm increments (Combination with PKC→0.001mm increments) P(PC): 1.000~1.999 20; 2.000~3.999 35; 4.000~5.999 45; 6.000~ 60	Changes dimension P·W. PC/WC ≧ P·Wmin/2 ≧1.00, 0.01mm increments ⊗Blade length X:Not applicable. P(PC)·W(WC): 1.00~1.49 8; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30	200
	BC	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments. Full length L(LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax, 0.1mm increments. Full length L(LC) requires BC+30mm or more.	200
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1, 0.1mm increments. PRC≦(P−0.2)/2 ⊗PCC:Not applicable	——	400
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1, 0.1mm increments. PCC≦(P−0.2)/2 ⊗PRC:Not applicable	——	200
	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P:0.001mm incr.)	Changes tolerance on P(W). P·W±0.01 ⇨ +0.01 0	400
		Applicable to HW coating type only. ⊗D>13:Not applicable		

Alterations	Code	Ⓐ	DREG	¥/1Code
Full length 	LC	Changes full length. 25+B(BC)≦LC<L, 0.1mm increments. When LC—B(BC) is 25mm or less, B(BC) is LC—25mm. (Combination with LKC→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L, 0.1mm increments. When LC—B(BC) is 30mm or less, B(BC) is LC—30mm.	200
	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
Others 	KC	Adds single key flat at head. ⊗D5 : Not applicable.	Changes the position of key flat. 90° 180° 270° 0° 1° increments	200
	WKC	Adds double key flats in parallel. ⊗D5 : Not applicable.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
	NKC	——	No key flat.	0
	SKC	Adds key flat on shank. Ⓐ DREG D/2 −0.5 0 −0.01 ·D5·6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8~ P≦D−2.2 W≦D−2.2 (Machining width 1)		600
		⊗KC · WKC : Not applicable		

■The price table indicates the prices of products with shank diameter tolerance of Dm5. For shank diameter tolerance of D +0.005 0, additional 200 yen required.
Example : AW—MPHAL8, the price is 2,590 (W—MPHAL8 unit price) +200 = 2,790 yen (product unit)

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■ MSKD 11 or equivalent —WPC® type—

D	Ⓐ W—MPAS W—MPAL	Ⓐ W—MPAX	DREG W—MP□S W—MP□L	DREG W—MP□X
5	1,450	1,640	2,340	2,520
6	1,460	1,650	2,390	2,580
8	1,520	1,720	2,490	2,670
10	1,630	1,820	2,600	2,790
13	1,720	1,910	2,950	3,140
16	1,830	2,020	3,430	—
20	2,000	2,190	3,980	
25	2,430	2,630	4,440	

■ MPowdered high-speed steel —WPC® type—

D	Ⓐ W—MPHAS W—MPHAL	Ⓐ W—MPHAX	DREG W—MPH□S W—MPH□L	DREG W—MPH□X
5	1,960	2,150	3,050	3,230
6	2,170	2,370	3,230	3,410
8	2,590	2,790	3,720	3,900
10	2,850	3,050	3,890	4,070
13	3,790	3,990	5,150	5,340
16	4,230	4,430	5,740	—
20	5,220	5,420	7,020	
25	6,770	6,970	7,640	

■ MPowdered high-speed steelt —HW coating type—

D	Ⓐ HW—MPHAS HW—MPHAL	Ⓐ HW—MPHAX	DREG HW—MPH□S HW—MPH□L	DREG HW—MPH□X
5	2,900	3,090	4,170	4,350
6	3,250	3,460	4,560	4,760
8	3,820	4,030	5,290	5,470
10	4,300	4,480	5,700	5,890
13	5,480	5,660	7,200	7,390
16	6,200	6,290	8,160	—
20	7,120	7,300	9,930	
25	8,830	9,010	11,190	

PRESS NEW Printed in Red

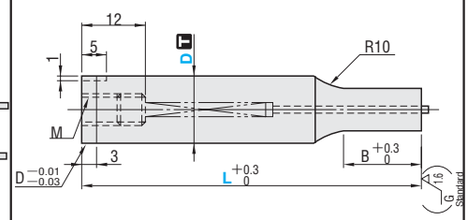
TAPPED JECTOR PUNCHES —STANDARD TYPE/WPC® TYPE—

PRODUCTS DATA P.1221

How to calculate the projection length of a jector pin (reference) P.191

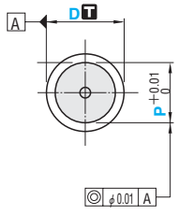
● Refer to Jector punch blank for the details of jector hole. P.188
● Refer to Jector pin set for the details of Jector pin. P.189

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length
RoHS —WPC® type— Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable	Dm5	SKD 11 or equivalent 60〜63HRC	MJ	A D R E G	S L
	$D^{+0.005}_{0}$	WPC® type 60〜63HRC Surface1000〜1100HV	W—MJ		
			A—MJ		
			AW—MJ		Blade length (B) L>S



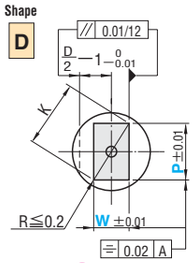
WPC®: The tip is very slightly rounded.

Shape A



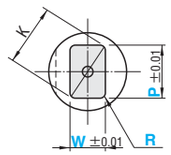
P≧W
R=0 : Applicable
$K=\sqrt{P^2+W^2}$

Shape D

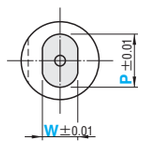


P≧W
$0.15 \leqq R < \frac{W}{2}$
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape R

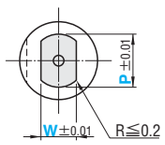


Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	Ⓡ R	B	M
(Dm5) MJ —WPC® Type— W—MJ	A D R E G	S	6	(40) 50 60 70 80	2.00〜 5.99	5.97	2.00	0.15≦R<W/2 (Ⓡ only)	8	3
			8	(40) 50 60 70 80 90 100	3.00〜 7.99	7.97	3.00		13	4
			10	(40) 50 60 70 80 90 100	3.00〜 9.99	9.97	3.00			5
			13	(40) 50 60 70 80 90 100	6.00〜12.99	12.97	6.00			6
			16	(40) (50) 60 70 80 90 100	10.00〜15.99	15.97	6.00		19	
			20	(40) (50) 60 70 80 90 100	13.00〜19.99	19.97	6.00			
			25	(40) (50) 60 70 80 90 100	18.00〜24.99	24.97	6.00			
($D^{+0.005}_{0}$) A—MJ —WPC® Type— AW—MJ	A D R E G	L	6	50 60 70 80	2.00〜 5.99	5.97	2.00		13	3
			8	50 60 70 80 90 100	3.00〜 7.99	7.97	3.00		19	4
			10	50 60 70 80 90 100	3.00〜 9.99	9.97	3.00			5
			13	50 60 70 80 90 100	6.00〜12.99	12.97	6.00			6
			16	60 70 80 90 100	10.00〜15.99	15.97	6.00		25	
			20	60 70 80 90 100	13.00〜19.99	19.97	6.00			
			25	60 70 80 90 100	18.00〜24.99	24.97	6.00			

L(40)→ B=6, When L(40), the blade length is fixed to 6mm.
L(50)→ B=13, When L(50), the blade length is fixed to 13mm.

Order

Catalog No.	L	P	W	R(Ⓡ only)
A—MJAL 13	80	P8.24		

Delivery

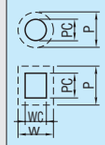
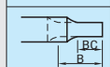
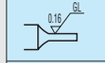
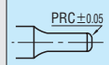
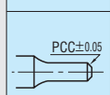
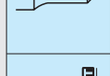
● Ⓐ — 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. — Express service T is not available for WPC®. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size. (excluding Express T)

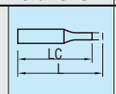
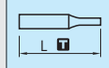
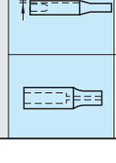
● DREG — 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. — Express service T is not available for WPC®. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size. (excluding Express T)

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No.	L(LC)	P(PC)	W(WC)	R	(BC·KC·WKC···etc.)
A—MJAL 13	80	P8.24			KC LKC

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧PCmin 0.01mm increments (Combination with PKC →0.001mm increments)	Changes dimension P・W. PC・WC≧PC・WCmin 0.01mm increments	200
		BC	Changes blade length B. (Shorter than standard) 2≦BC<B 0.1mm increments		200
		SC	Finishes blade with lapping. Dimension P tolerance and the specification unit remain the same. ⊗R shape is not applicable with a corner radius of 0. ⊗WPC®: Not applicable		1,200 (only Ⓐ 800)
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 For dimension d1, refer to P.188. ⊗PCC:Not applicable WPC®: PRC±0.1	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 For dimension d1, refer to P.188. ⊗PRC:Not applicable WPC®: PCC±0.1	——	200
		PKC	Changes tolerance on P. $P^{+0.01}_{0} \Rightarrow P^{+0.005}_{0}$ (P: 0.001mm incr.)	Changes tolerance on P(W). $P\cdot W\pm0.01 \Rightarrow {}^{+0.01}_{0}$	400

Alterations		Code	Ⓐ	DREG	¥/1Code
Full length		LC	Changes full length. LC<L 0.1mm increments. (combination with LKC・LKZ→0.01mm incr.) B is shortened by (L—LC). The projection length of the jector pin is 2mm.		200
		LKC	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow {}^{+0.01}_{0}$ ⊗WPC®: Not applicable		600
Others		KC	Adds single key flat at head.	90° 0° 180° 270° Changes the position of key flat. 1° increments	200
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		NKC	——	No key flat.	0
		SKC		Adds key flat on shank. Ⓐ DREG P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8〜 P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC・WKC: Not applicable ⊗WPC®: Not applicable	600
		AC		AIR Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	−100

Price

Volume discount rate P.37

Quantity	1〜9	10〜29	30〜99	100〜200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of Dm5. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example: A—MJAS6, the price is 1,160 (MJAS6 unit price) +200 = 1,360 yen (product unit)

M SKD 11 or equivalent

D	Ⓐ MJAS MJAL	DREG MJ□S MJ□L
6	1,160	1,950
8	1,230	2,000
10	1,330	2,150
13	1,440	2,430
16	1,550	2,910
20	1,720	3,430
25	2,170	3,820

M SKD 11 or equivalent WPC® type

D	Ⓐ W—MJAS W—MJAL	DREG W—MJ□S W—MJ□L
6	2,200	3,040
8	2,270	3,090
10	2,390	3,250
13	2,510	3,600
16	2,620	4,060
20	2,800	4,610
25	3,280	5,020

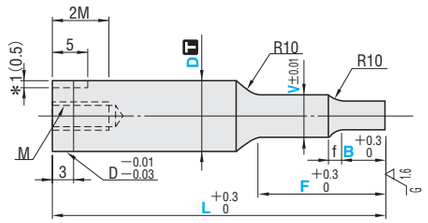
DOUBLE STEPPED TAPPED PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

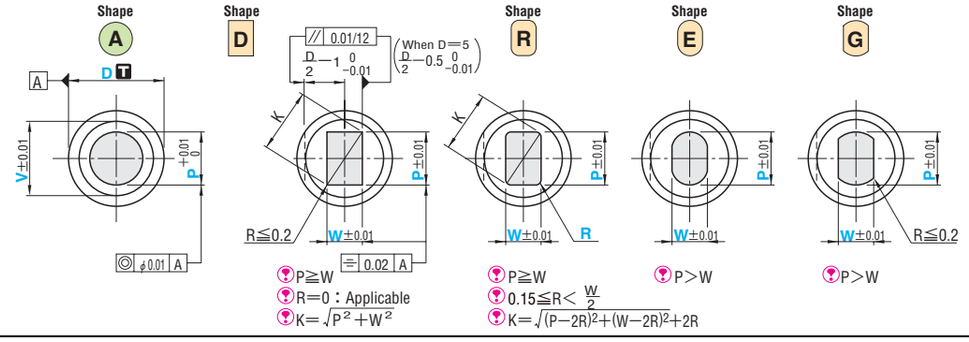
Type	M / H	Catalog No. Type: Shank dia. D_{m5}	Catalog No. Type: Shank dia. $D^{+0.005}_{0}$	Shape
—With tapping— RoHS	SKD 11 or equivalent 60~63HRC	MPTW Large diameter tapped type MPLTW	A—MPTW	A D R E G
	Powdered high-speed steel 64~67HRC	MPHTW	A—MPHTW	

Shank Dia.Tolerance D T m5・$^{+0.005}_{0}$ Selectable

Select tip shape from Shape A~G shown below.



*When D=5, the key depth is 0.5.



Catalog No. Type	Shape	D	L	0.01mm increments / 0.1mm increments Ⓐ P	Ⓐ B	Diagonal Kmax	0.01mm increments / 0.1mm increments D R E G P·W	D R E G B	Ⓡ R	0.01mm increments V	0.1mm increments F	M
Standard Type (D_{m5}) MPTW MPHTW ($D^{+0.005}_{0}$) A—MPTW A—MPHTW	A D R E G	5	40·50·60·70·80	1.00~ 1.99	2.0~20.0	4.96	0.80~ 1.49	2.0~ 8.0	0.15≦R< W/2 (Ⓡ only)	Ⓐ: D>V>P+0.01 D R E G: D>V>(P,K)+0.03	B+f+2<F≦Fmax & F≦L−30	3
				2.00~ 3.99	2.0~35.0		1.50~ 1.99	2.0~13.0				
				4.00~ 4.98	2.0~45.0		2.00~ 3.49	2.0~19.0				
				4.00~ 4.98	2.0~45.0		3.50~ 4.96	2.0~25.0				
		6	40·50·60·70·80	1.00~ 1.99	2.0~20.0	5.96	0.80~ 1.49	2.0~ 8.0				
				2.00~ 3.99	2.0~35.0		1.50~ 1.99	2.0~13.0				
				4.00~ 5.98	2.0~45.0		2.00~ 3.49	2.0~19.0				
				4.00~ 5.98	2.0~45.0		3.50~ 4.99	2.0~25.0				
				4.00~ 5.98	2.0~45.0		5.00~ 5.96	2.0~30.0				
		8	40·50·60·70·80·90·100	1.00~ 1.99	2.0~20.0	7.96	1.00~ 1.49	2.0~ 8.0				4
				2.00~ 3.99	2.0~35.0		1.50~ 1.99	2.0~13.0				
				4.00~ 5.99	2.0~45.0		2.00~ 3.49	2.0~19.0				
				6.00~ 7.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				6.00~ 7.98	2.0~60.0		5.00~ 7.96	2.0~30.0				
		10	40·50·60·70·80·90·100	1.50~ 1.99	2.0~20.0	9.96	1.25~ 1.49	2.0~ 8.0				5
				2.00~ 3.99	2.0~35.0		1.50~ 1.99	2.0~13.0				
				4.00~ 5.99	2.0~45.0		2.00~ 3.49	2.0~19.0				
				6.00~ 9.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				6.00~ 9.98	2.0~60.0		5.00~ 9.96	2.0~30.0				
		13	40·50·60·70·80·90·100	3.00~ 3.99	2.0~35.0	12.96	1.50~ 1.99	2.0~13.0				6
				4.00~ 5.99	2.0~45.0		2.00~ 3.49	2.0~19.0				
				6.00~12.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				6.00~12.98	2.0~60.0		5.00~12.96	2.0~30.0				
		16	40·50·60·70·80·90·100	5.00~ 5.99	2.0~45.0	15.96	2.00~ 3.49	2.0~19.0				
				6.00~15.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				6.00~15.98	2.0~60.0		5.00~15.96	2.0~30.0				
		20	40·50·60·70·80·90·100	6.50~19.98	2.0~60.0	19.96	2.50~ 3.49	2.0~19.0				
				6.50~19.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				6.50~19.98	2.0~60.0		5.00~19.96	2.0~30.0				
		25	40·50·60·70·80·90·100	9.00~24.98	2.0~60.0	24.96	3.00~ 3.49	2.0~19.0				
				9.00~24.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				9.00~24.98	2.0~60.0		5.00~24.96	2.0~30.0				
Large diameter tapped type MPLTW		16	40·50·60·70·80·90·100	5.00~ 5.98	2.0~45.0	15.96	2.00~ 3.49	2.0~19.0				8
				6.00~15.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				6.00~15.98	2.0~60.0		5.00~15.96	2.0~30.0				
		20	40·50·60·70·80·90·100	6.50~19.98	2.0~60.0	19.96	2.50~ 3.49	2.0~19.0				
				6.50~19.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				6.50~19.98	2.0~60.0		5.00~19.96	2.0~30.0				
		25	40·50·60·70·80·90·100	9.00~24.98	2.0~60.0	24.96	3.00~ 3.49	2.0~19.0				
				9.00~24.98	2.0~60.0		3.50~ 4.99	2.0~25.0				
				9.00~24.98	2.0~60.0		5.00~24.96	2.0~30.0				

For dimension f, make sure that (V−P)/2=X is true for Ⓐ and (V−W)/2=X for D R E and G referring to punch R lengths on P.1208

V	Fmax
0.83~0.99	10
1.00~1.99	20
2.00~3.99	35
4.00~5.99	45
6.00~	60

V>D−0.03→ℓ=0, When V>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order

Catalog No.	L	P	W	B	V	F	R(Ⓡ only)
MPTWA10	80	P9.50		B30	V9.80	F45	
A—MPHTWR13	80	P10.50	W7.34	B25	V12.00	F45	R0.5

Delivery

- Ⓐ: 3 Days — Express A 800/1Pc. P.38
  A flat charge of 2,160 yen for 3 pieces or more of the same size.
- D R E G: 3 Days

Alteration

Catalog No.	L(LC)	P	W	B	V	F	R Ⓡ only	—(KC・WKC…etc.)
MPTWA10	LC72	P4.80		B10	V6.80	F40		KC

Alterations		Code	Ⓐ	D R E G	¥/1Code
Tip	0.16 GL	SC	Finishes blade with lapping. Dimension P tolerance and the specification unit remain the same. ⊗D shape is not applicable with a corner radius of 0.		1,200 (only Ⓐ 800)
	PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 ⊗PCC・GC:Not applicable	——	400
	PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 ⊗PRC・GC:Not applicable	——	200
	GC, g, L, B	GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B≧g+2 g=P/2×tan(90°−GC°) When used with SC, tip and edge are rounded. ⊗LKC・LKZ・PRC・PCC :Not applicable	——	400
	P·W±0.01	PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P : 0.001mm increments)	Changes tolerance on P(W). P·W±0.01 ⇨ $^{+0.01}_{0}$	400

Alterations		Code	Ⓐ	D R E G	¥/1Code
Full length	L	LC	Changes full length. 30+F≦LC<L 0.1mm increments (Combination with LKC・LKZ→0.01mm increments)		200
	L T	LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		600
Others		KC	Adds single key flat at head. ⊗D5 : Not applicable.	0°, 90°, 180°, 270° Changes the position of key flat. 1° increments	200
		WKC	Adds double key flats in parallel. ⊗D5 : Not applicable.	Adds double key flats in parallel. change angle, add KC.	200 (only Ⓐ 400)
		NKC	——	No key flat.	0
		SKC	Adds key flat on shank. Ⓐ D R E G ・D5・6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC・WKC : Not applicable		600

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : A—MPTWA10, the price is 1,510 (MPTWA10 unit price) +200 = 1,710 yen (product unit)

■M SKD 11 or equivalent

D	Ⓐ MPTWA	D R E G MPTW□
5	1,070	1,860
6	1,090	1,900
8	1,380	2,230
10	1,510	2,370
13	1,630	2,720
16	1,830	3,240
20	2,280	4,040
25	2,680	4,400

■M SKD 11 or equivalent Large diameter tapped type

D	Ⓐ MPLTWA	D R E G MPLTW□
5	—	—
6		
8		
10		
13		
16	1,880	3,290
20	2,330	4,090
25	2,730	4,450

■M Powdered high-speed steel

D	Ⓐ MPHTWA	D R E G MPHTW□
5	1,660	2,720
6	1,880	2,970
8	2,560	3,730
10	2,880	3,950
13	3,870	5,270
16	4,430	5,960
20	5,750	7,610
25	7,290	8,150

D-CUT AND TAPPED PUNCHES
—STANDARD TYPE / TiCN COATING—

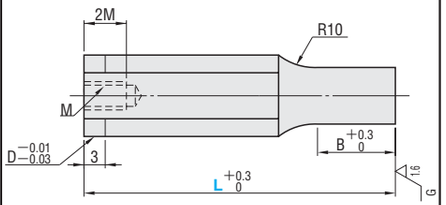
Quality Improved

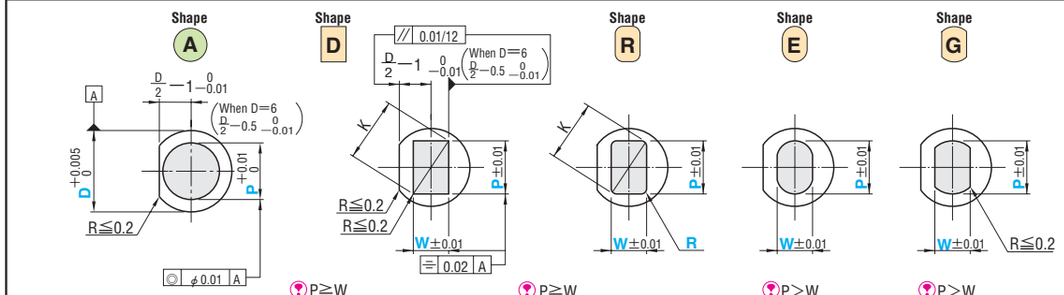
PRODUCTS DATA P.1220

COATING PUNCHES —TiCN— QUALITY IMPROVED P.1217

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from shape A~G shown below.
—With tapping— RoHS	$D^{+0.005}_{0}$	SKD 11 or equivalent 60~63HRC	G—MP	A D R E G	S L X	
		Powdere high-speed steel 64~67HRC TiCN coating Surface3000HV	G—MPH TiCN coating GH—MPH		Blade length(B) X>L>S	





- A: P≧W; R=0 : Applicable; $K=\sqrt{P^2+W^2}$
- D: P≧W; $0.15 \leqq R < \frac{W}{2}$; $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
- R: P>W
- G: P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P	Ⓐ max. P·K	DREG max. W	DREG min. P·W	Ⓡ R	B	M
G—MP	A D R E G	S	6	40 50 60 70 80	2.00~ 3.80	5.97	3.80	1.50	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	8	3
			8	(40) 50 60 70 80 90 100	3.00~ 5.80	7.97	5.80	2.00		13	4
			10	(40) 50 60 70 80 90 100	3.00~ 7.80	9.97	7.80	2.50			5
			13	(40) 50 60 70 80 90 100	6.00~10.80	12.97	10.80	3.00			6
			16	(40) 50 60 70 80 90 100	10.00~13.80	15.97	13.80	4.00		19	
			20	(40) 50 60 70 80 90 100	13.00~17.80	19.97	17.80	5.00			
			25	(40) 50 60 70 80 90 100	18.00~22.80	24.97	22.80	6.00			
G—MPH		L	6	50 60 70 80	2.00~ 3.80	5.97	3.80	2.00		13	3
			8	50 60 70 80 90 100	3.00~ 5.80	7.97	5.80	2.50		19	4
			10	50 60 70 80 90 100	3.00~ 7.80	9.97	7.80	2.50			5
			13	50 60 70 80 90 100	6.00~10.80	12.97	10.80	3.00			6
			16	60 70 80 90 100	10.00~13.80	15.97	13.80	4.00		25	
			20	60 70 80 90 100	13.00~17.80	19.97	17.80	5.00			
—TiCN coating— GH—MPH			25	60 70 80 90 100	18.00~22.80	24.97	22.80	6.00			
		X	6	60 70 80	2.00~ 3.80	5.97	4.80	3.50		25	3
			8	60 70 80 90 100	3.00~ 5.80	7.97	5.80	5.00		30	4
			10	60 70 80 90 100	3.00~ 7.80	9.97	7.80	5.00			5
			13	60 70 80 90 100	6.00~10.80	12.97	10.80	5.00			6
			16	70 80 90 100	10.00~13.80	—			—	45	
			20	70 80 90 100	13.00~17.80						
			25	70 80 90 100	18.00~22.80						

Ⓨ L(40)→B=8, When L(40), the blade length is fixed to 8mm.

Order Catalog No. — L — P — W — R(Ⓡ only)

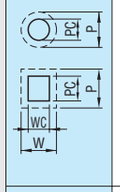
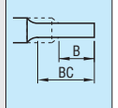
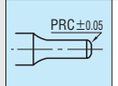
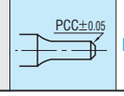
G—MPDS 13 — 60 — P10.65 — W6.55

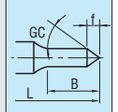
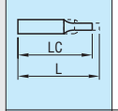
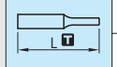
Delivery 3 Days | Express A 500/1Pc. ⊗ Express service A is not available for TiCN coating type. P.38

Ⓨ A flat charge of 1,350 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC) — P(PC) — W(WC) — R(Ⓡ only) — (BC・PKC・LKC…etc.)

G—MPES 8 — LC65.5 — P7.00 — W4.00

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧ Pmin/2, 0.01mm increments (Combination with PKC→0.001mm increments)	Changes dimension P·W. PC≧ P·Wmin/2 ≧0.80, 0.01mm increments ⊗ Blade length X:Not applicable Ⓨ TiCN coating: PC≧ P·Wmin/2 ≧1.00	200
			P(PC) / Bmax: 1.000~1.999 / 20; 2.000~3.999 / 35; 4.000~5.999 / 45; 6.000~ / 60	P(PC)·W(WC) / Bmax: 0.80~1.49 / 8; 1.50~1.99 / 13; 2.00~3.49 / 19; 3.50~4.99 / 25; 5.00~ / 30	
		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L(LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L(LC) requires BC+30mm or more.	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 ⊗ PCC・GC:Not applicable	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 ⊗ PRC・GC:Not applicable	——	200

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B≧f+2 f=P/2×tan(90°−GC°) Ⓨ When used with SC, tip and edge are rounded. ⊗ LKC・LKZ・PRC・PCC :Not applicable	——	400
		PKC	Changes tolerance on P. $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ Ⓨ (P : 0.001mm incr.) ⊗ TiCN coating, D>13:Not applicable	Changes tolerance on P(W). $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	400 TiCN coating (600)
Full length		LC	Changes full length. 25+B(BC)≦LC<L 0.1mm increments Ⓨ When LC−B (or BC) is 25mm or less, B (or BC) is LC−25mm. (Combination with LKC・LKZ→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L 0.1mm increments Ⓨ When LC−B (or BC) is 30mm or less, B (or BC) is LC−30mm.	200
		LKC	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. $L^{+0.3}_{0} \Rightarrow {}^{+0.01}_{0}$ ⊗ TiCN coating :Not applicable		600

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

■Ⓜ SKD 11 or equivalent

D	Ⓐ G—MPAS G—MPAL	Ⓐ G—MPAX	DREG G—MP□S G—MP□L	DREG G—MP□X
6	1,150	1,340	1,960	2,150
8	1,210	1,400	2,060	2,250
10	1,320	1,510	2,170	2,360
13	1,410	1,600	2,500	2,690
16	1,530	1,720	2,940	—
20	1,690	1,880	3,450	
25	2,160	2,350	3,880	

■Ⓜ Powdered high-speed steel

D	Ⓐ G—MPHAS G—MPHAL	Ⓐ G—MPHAX	DREG G—MPH□S G—MPH□L	DREG G—MPH□X
6	1,890	2,080	3,210	3,400
8	2,340	2,530	3,750	3,940
10	2,640	2,830	3,920	4,110
13	3,670	3,860	5,300	5,490
16	4,160	4,350	5,930	—
20	4,840	5,030	7,350	
25	6,400	6,590	8,420	

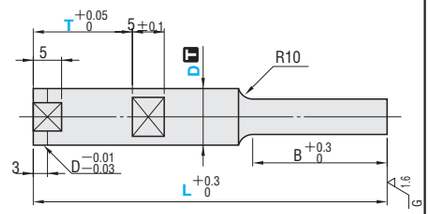
■Ⓜ Powdered high-speed steel TiCN coating type

D	Ⓐ GH—MPHAS GH—MPHAL	Ⓐ GH—MPHAX	DREG GH—MPH□S GH—MPH□L	DREG GH—MPH□X
6	3,220	3,410	4,540	4,740
8	3,820	4,010	5,220	5,410
10	4,260	4,450	5,540	5,730
13	5,450	5,640	7,080	7,270
16	6,110	6,300	7,890	—
20	6,980	7,170	9,490	
25	8,630	8,820	10,660	

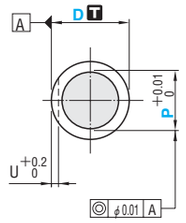
PUNCHES WITH KEY GROOVE

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length
RoHS Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable	D_{m5}	SKD 11 or equivalent 60〜63HRC	SK	A D R E G	S
		SKH51 61〜64HRC	SHK		L
		Powdered high-speed steel 64〜67HRC	PK		X
	$D^{+0.005}_{0}$	SKD 11 or equivalent 60〜63HRC	A—SK		Blade length(B) X>L>S
		SKH51 61〜64HRC	A—SHK		
		Powdered high-speed steel 64〜67HRC	A—PK		

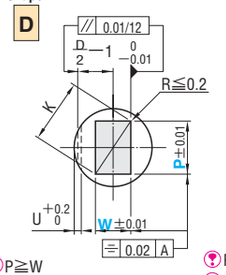
Select tip shape from shape A〜G shown below.



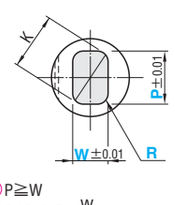
Shape A



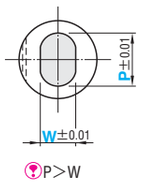
Shape D



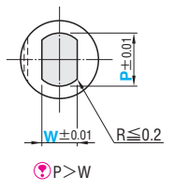
Shape R



Shape E



Shape G



Ⓟ P≧W
Ⓡ R=0 : Applicable
Ⓚ $K=\sqrt{P^2+W^2}$

Ⓟ P≧W
Ⓡ 0.15≦ $R<\frac{W}{2}$
Ⓚ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Ⓟ P>W

Ⓟ P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.1mm increments R	0.1mm increments T	B	U Key groove depth
(D_{m5}) SK SHK PK	A D R E G	S	3	40 50 60 70 80	1.00〜 2.99	—	—	$0.15\leqq R<\frac{W}{2}$ (Ⓡ only)	T>5.0	8	0.5
			4	40 50 60 70 80	1.00〜 3.99	3.97	1.00				1.0
			5	40 50 60 70 80	2.00〜 4.99	4.97	1.20			13	1.5
			6	40 50 60 70 80	2.00〜 5.99	5.97	1.50			19	
			8	(40) 50 60 70 80 90 100	3.00〜 7.99	7.97	2.00				
			10	(40) 50 60 70 80 90 100	3.00〜 9.99	9.97	2.50				
			13	(40) 50 60 70 80 90 100	6.00〜12.99	12.97	3.00				
			16	(40) 50 60 70 80 90 100	10.00〜15.99	15.97	4.00				
$(D^{+0.005}_{0})$ A—SK A—SHK A—PK		L	3	50 60 70 80	1.00〜 2.99	—	—			13	0.5
			4	50 60 70 80	1.00〜 3.99	3.97	2.00				1.0
			5	50 60 70 80	2.00〜 4.99	4.97	2.00			19	1.5
			6	50 60 70 80	2.00〜 5.99	5.97	2.00			25	
			8	50 60 70 80 90 100	3.00〜 7.99	7.97	2.50				
			10	50 60 70 80 90 100	3.00〜 9.99	9.97	2.50				
			13	50 60 70 80 90 100	6.00〜12.99	12.97	3.00				
			16	60 70 80 90 100	10.00〜15.99	15.97	4.00				
		X	3	50 60 70 80	1.20〜 2.99	—	—			19	0.5
			4	50 60 70 80	1.20〜 3.99	3.97	2.00				
			5	60 70 80	2.00〜 4.99	4.97	3.50			25	1.0
			6	60 70 80	2.00〜 5.99	5.97	3.50				
			8	60 70 80 90 100	3.00〜 7.99	7.97	5.00			30	1.5
			10	60 70 80 90 100	3.00〜 9.99	9.97	5.00				
			13	60 70 80 90 100	6.00〜12.99	12.97	5.00				
			16	60 70 80 90 100	10.00〜15.99	—	—			40	

Ⓟ L (40)→B=8, When L (40), the blade length is fixed to 8mm.
Ⓟ When key groove is not necessary, specify dimension T as same dimension as the full length L.

Order

Catalog No. — L — P — W — R (Ⓡ only) — T

SKEL 16 — 70 — P12.00 — W6.00 — T20.1
A—SKAS 3 — 40 — P 1.80 — T13.0

Ⓟ When key groove is not necessary, specify T=L.

Delivery

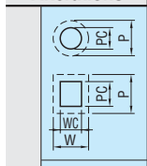
● Ⓐ: 3 Days — Express A 500/1Pc. P.38
Ⓟ A flat charge of 1,350 yen for 3 pieces or more of the same size.

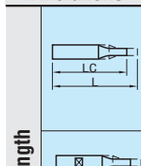
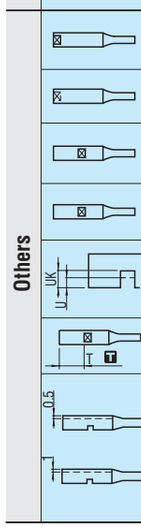
● D R E G: 3 Days — Express A 800/1Pc. P.38
Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

The volume discount rate is also applicable to alteration cost. P.39

Alteration Catalog No. — L(LC·LCT) — P(PC) — W(WC) — R — T — (BC·KC·PKC···etc.)

SKEL 16 — LC68 — P12.00 — W6.00 — T20.5 — PKC

Alterations	Code	Ⓐ	D R E G	¥/1Code
Tip 	PC WC	Changes dimension P. $PC\geqq\frac{P\,min.}{2}$ 0.01mm increments (Combination with PKC →0.001mm increments) P(PC) / Bmax: 0.500〜0.799 10; 0.800〜0.999 13; 1.000〜1.999 20; 2.000〜3.999 35; 4.000〜4.999 45; 5.000〜5.999 50; 6.000〜 60	Changes dimension P·W. $PC\geqq\frac{P\cdot Wmin.}{2}\geqq 0.80$ 0.01mm increments ⊗Blade length X:Not applicable P(PC)·W(WC) / Bmax: 0.80〜1.49 8; 1.50〜1.99 13; 2.00〜3.49 19; 3.50〜4.99 25; 5.00〜 30	200
	BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓟ Full length L (LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓟ Full length L (LC) requires BC+30mm or more.	200
	SC	Finishes blade with lapping. Ⓟ Dimension P tolerance and the specification unit remain the same. ⊗ shape is not applicable with a corner radius of 0.		1,200 (only Ⓐ 800)
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−0.2)/2 ⊗PCC·GC:Not applicable	——	400
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−0.2)/2 ⊗PRC·GC:Not applicable	——	200
	GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B≧f+2 f=P/2×tan(90°−GC°) Ⓟ When used with SC, tip and edge are rounded. ⊗P<1.0:Not applicable ⊗LKC·LKZ·LCT·PRC·PCC:Not applicable	——	400
	PKC	Changes tolerance on P. $P^{0}_{-0.01}\Rightarrow{}^{0}_{+0.005}$ Ⓟ (P : 0.001mm increments.)	Changes tolerance on P(W). $P\cdot W\pm 0.01\Rightarrow{}^{+0.01}_{0}$	400

Alterations	Code	Ⓐ	D R E G	¥/1Code
Full length 	LC	Changes full length. 25+B(BC)≦LC<L 0.1mm increments Ⓟ When LC−B (BC) is 25mm or less, B (BC) is LC−25mm. (Combination with LKC·LKZ→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L 0.1mm increments Ⓟ When LC−B (BC) is 30mm or less, B (BC) is LC−30mm.	200
	LCT	Changes dimension T tolerance and the full length in one code. Specifiable range, unit, remarks are the same as LC. TKC $T^{+0.05}_{0}\Rightarrow{}^{0}_{-0.02}$ + LC $L^{+0.3}_{0}\Rightarrow{}^{+0.1}_{0}$ Changes full length tolerance.		300
	LKC	Changes full length tolerance. $L^{+0.3}_{0}\Rightarrow{}^{+0.05}_{0}$		400
	LKZ	Changes full length tolerance. $L^{+0.3}_{0}\Rightarrow{}^{+0.01}_{0}$		600
Others 	KC	——	0°/90°/180°/270° Changes the position of key flat. 1° increments	200
	NKC	——	No key flat.	0
	KD	——	0°/90°/180°/270° Changes key groove position. 1° increments	200
	WKD	Adds parallel key grooves.	Adds parallel key grooves. Combination with KD is applicable	200
	UK	Changes key groove depth. ⊗D3 : Not applicable.	D / UK: 4·5 0.7; 6 1.2; 8〜16 1.7	200
	TKC	Changes dimension T tolerance. $T^{+0.05}_{0}\Rightarrow{}^{0}_{-0.02}$		200
	SKC	Adds key flat on shank. Ⓐ D R E G ·D4〜6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8〜 P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗D3 : Not applicable. ⊗KC·KD·WKD : Not applicable		600

Price

■Volume discount rate P.37

Quantity	1〜9	10〜29	30〜99	100〜200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : A—SKAL5, the price is 460 (SKAL5 unit price) +200 = 660 yen (product unit)

■M SKD 11 or equivalent

D	Ⓐ SKAS SKAL	Ⓐ SKAX	D R E G SK□S SK□L	D R E G SK□X
3	420	540	—	—
4	440	560	1,120	1,310
5	460	580	1,210	1,400
6	470	580	1,270	1,460
8	530	660	1,370	1,560
10	640	800	1,490	1,680
13	730	920	1,820	2,010
16	850	1,040	2,250	—

■M SKH51

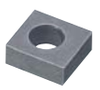
D	Ⓐ SHKAS SHKAL	Ⓐ SHKAX	D R E G SHK□S SHK□L	D R E G SHK□X
3	630	760	—	—
4	640	770	1,470	1,660
5	660	790	1,560	1,750
6	680	820	1,670	1,860
8	810	960	1,880	2,070
10	1,000	1,190	2,070	2,260
13	1,210	1,400	2,430	2,620
16	1,620	1,810	3,700	—

■M Powdered high-speed steel

D	Ⓐ PKAS PKAL	Ⓐ PKAX	D R E G PK□S PK□L	D R E G PK□X
3	950	1,040	—	—
4	980	1,070	1,780	1,970
5	1,010	1,110	1,900	2,090
6	1,170	1,280	2,100	2,290
8	1,620	1,790	2,550	2,740
10	1,940	2,130	2,830	3,020
13	2,910	3,100	3,980	4,170
16	3,370	3,560	4,720	—

■Fixing key P.195

PSKB PSKBH PSKS PSKJ

PSK PSKP PSKH  PSKW

PUNCHES WITH KEY GROOVE
—TiCN COATING TYPE—

Quality Improved

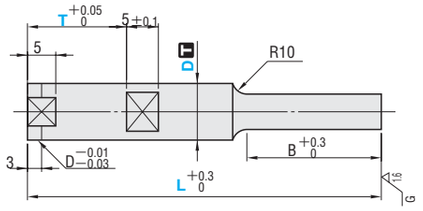
PRODUCTS DATA P.1220

COATING PUNCHES—TiCN— QUALITY IMPROVED P.1217

The volume discount rate is also applicable to alteration cost. P.39

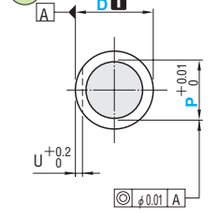
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length
—TiCN coating type— RoHS	D_{m5}	SKH51 61~64HRC Surface 3000HV	H—SHK	A D R E G	S L X
		Powdered high-speed steel 64~67HRC Surface 3000HV	H—PK		
Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable	$D^{+0.005}_{0}$	SKH51 61~64HRC Surface 3000HV	AH—SHK		Blade length(B) X>L>S
		Powdered high-speed steel 64~67HRC Surface 3000HV	AH—PK		

Select tip shape from shape A~G shown below.

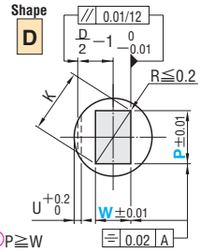


The tip surface is ground before coating.

Shape A

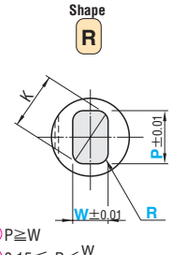


Shape D



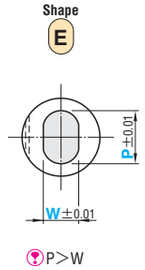
P≧W
R=0 : Applicable
$K=\sqrt{P^2+W^2}$

Shape R



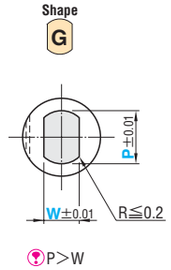
P≧W
0.15≦ R< W/2
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	0.1mm increments T	B	U Key groove depth
(D_{m5}) H—SHK H—PK	A D R E G	S	3	40 50 60 70 80	1.00~ 2.99	—	—	0.15≦R< W/2 (Ⓡ only)	T>5.0	8	0.5
			4	40 50 60 70 80	1.00~ 3.99	3.97	1.00				1.0
			5	40 50 60 70 80	2.00~ 4.99	4.97	1.20			13	1.5
			6	40 50 60 70 80	2.00~ 5.99	5.97	1.50				
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	2.00				
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	2.50				
			13	(40) 50 60 70 80 90 100	6.00~12.99	12.97	3.00				
			16	(40) 50 60 70 80 90 100	10.00~15.99	15.97	4.00			19	
		L	3	50 60 70 80	1.00~ 2.99	—	—			13	0.5
			4	50 60 70 80	1.00~ 3.99	3.97	2.00				1.0
			5	50 60 70 80	2.00~ 4.99	4.97	2.00			19	1.5
			6	50 60 70 80	2.00~ 5.99	5.97	2.00				
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	2.50				
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	2.50				
($D^{+0.005}_{0}$) AH—SHK AH—PK			13	50 60 70 80 90 100	6.00~12.99	12.97	3.00				
			16	60 70 80 90 100	10.00~15.99	15.97	4.00			25	
		X	3	50 60 70 80	1.20~ 2.99	—	—			19	0.5
			4	50 60 70 80	1.20~ 3.99	3.97	2.00				
			5	60 70 80	2.00~ 4.99	4.97	3.50			25	1.0
			6	60 70 80	2.00~ 5.99	5.97	3.50				
			8	60 70 80 90 100	3.00~ 7.99	7.97	5.00			30	1.5
			10	60 70 80 90 100	3.00~ 9.99	9.97	5.00				
			13	60 70 80 90 100	6.00~12.99	12.97	5.00				
			16	70 80 90 100	10.00~15.99	—	—			40	

L (40)→B=8, When L (40), the blade length is fixed to 8mm.
When key groove is not necessary, specify dimension T as same dimension as the full length L.

Order

Catalog No.	L	P	W	R(Ⓡ only)	T
H—SHKEL16	70	P12.00	W6.00		T20.1
AH—SHKAS3	40	P 1.80			T13.0

When key groove is not necessary, specify T=L.

Delivery: 3 Days

Alteration

Catalog No.	L(LC·LCT)	P(PC)	W(WC)	R	T	(BC·KC·LKC···etc.)
H—SHKEL 16	LC68	P12.00	W6.00		T20.5	LKC

Alterations	Code	Ⓐ	D R E G	¥/1Code
Tip	PC WC	Changes dimension P. PC≧ Pmin./2 ≧1.00 0.01mm increments (Combination with PKC→ 0.001mm increments) P(PC) / Bmax: 1.000~1.999 / 20; 2.000~3.999 / 35; 4.000~5.999 / 45; 6.000~ / 60	Changes dimension P·W. PC/WC ≧ P·Wmin./2 ≧1.00 0.01mm increments ⊗Blade length X:Not applicable P(PC)·W(WC) / Bmax: 1.00~1.49 / 8; 1.50~1.99 / 13; 2.00~3.49 / 19; 3.50~4.99 / 25; 5.00~ / 30	200
	BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Full length L (LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Full length L (LC) requires BC+30mm or more.	200
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 ⊗PCC·GC:Not applicable	——	400
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 ⊗PRC·GC:Not applicable	——	200
	GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B≧f+2 f=P/2×tan(90°−GC°) When used with SC, tip and edge are rounded. ⊗LKC·LCT·PRC·PCC :Not applicable	——	400
	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P:0.001mm incr.) ⊗D16:Not applicable	Changes tolerance on P(W). P·W±0.01 ⇨ +0.01 0 ⊗D16:Not applicable	600

Alterations	Code	Ⓐ	D R E G	¥/1Code
Full length	LC	Changes full length. 25+B(BC)≦LC<L 0.1mm increments When LC—B (BC) is 25mm or less, B (BC) is LC—25mm. (Combination with LKC→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L 0.1mm increments When LC—B (BC) is 30mm or less, B (BC) is LC—30mm.	200
	LCT	Changes dimension T tolerance and the full length in one code. Specifiable range, unit, remarks are the same as LC. TKC T +0.05 0 ⇨ 0 −0.02 + LC Changes full length tolerance. L +0.3 0 ⇨ +0.1 0		300
	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		400
Others	KC	——	0° 90° 180° 270° Changes the position of key flat. 1° increments	200
	NKC	——	No key flat.	0
	KD	——	0° 90° 180° 270° Changes key groove position. 1° increments	200
	WKD	Adds parallel key grooves.	Adds parallel key grooves. Combination with KD is applicable	200
	UK	Changes key groove depth. D / UK: 4·5 / 0.7; 6 / 1.2; 8~16 / 1.7 ⊗D3 : Not applicable.		200
	TKC	Changes dimension T tolerance. T +0.05 0 ⇨ 0 −0.02		200
	SKC	Adds key flat on shank. D/2 −0.5 0 −0.01 Ⓐ D R E G ·D4~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) D/2 −1 0 −0.01 ⊗D3 : Not applicable. ⊗KC·KD·WKD : Not applicable		600

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : AH—SHKAS4, the price is 1,770 (H—SHKAS4 unit price) +200 = 1,970 yen (product unit)

■ M SKH51

D	Ⓐ H—SHKAS H—SHKAL	Ⓐ H—SHKAX	D R E G H—SHK□S H—SHK□L	D R E G H—SHK□X
3	1,730	1,870	—	—
4	1,770	1,910	2,740	2,930
5	1,840	1,980	2,840	3,030
6	1,980	2,130	3,080	3,270
8	2,250	2,410	3,430	3,620
10	2,580	2,770	3,930	4,120
13	2,940	3,130	4,460	4,650
16	3,520	3,730	5,600	—

■ M Powdered high-speed steel

D	Ⓐ H—PKAS H—PKAL	Ⓐ H—PKAX	D R E G H—PK□S H—PK□L	D R E G H—PK□X
3	2,180	2,260	—	—
4	2,240	2,330	3,110	3,300
5	2,330	2,420	3,290	3,480
6	2,620	2,720	3,630	3,820
8	3,230	3,360	4,240	4,430
10	3,710	3,850	4,690	4,880
13	4,840	4,970	6,010	6,200
16	5,490	5,610	6,930	—

■ Fixing key P.195

PSKB PSKBH

PSKS PSKJ

PSK PSKP PSKH

PSKW

PRESS NEW

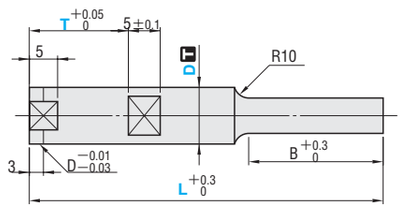
PUNCHES WITH KEY GROOVE
—WPC® TYPE / HW COATING TYPE—

PRODUCTS DATA P.1221

WPC® PUNCHES
COATING PUNCHES
—HW—

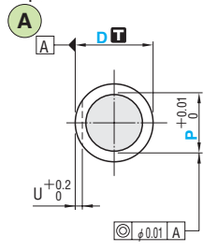
Type	Ⓜ Ⓗ	Catalog No. Type: Shank dia T D_{m5}	Catalog No. Type: Shank dia T $D^{+0.005}_{0}$	Shape	B Blade length
—WPC® type— RoHS	SKD 11 or equivalent 60～63HRC Surface1000～1100Hv	W—SK	AW—SK	A D R E G	S
	SKH51 61～64HRC Surface1000～1100Hv	W—SHK	AW—SHK		L
—HW coating type—	Powdered high-speed steel 64～67HRC Surface1000～1100Hv	W—PK	AW—PK		X
	SKH51 61～64HRC Surface3000HV	HW—SHK	AHW—SHK		Blade length(B) X>L>S
Shank Dia.Tolerance D T $m5$ · $^{+0.005}_{0}$ Selectable	Powdered high-speed steel 64～67HRC Surface3000HV	HW—PK	AHW—PK		

Select tip shape from shape A～G shown below.

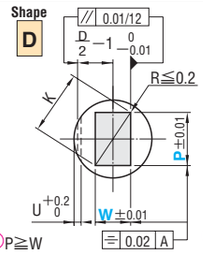


The tip is very slightly rounded.

Shape A

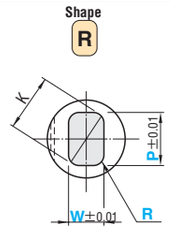


Shape D



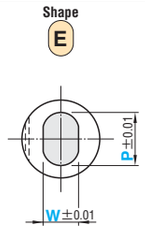
P≧W
R=0：Applicable
$K=\sqrt{P^2+W^2}$

Shape R



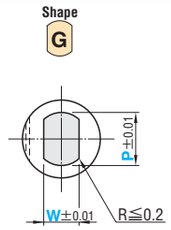
P≧W
0.15≦ R< W/2
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.01mm increments Ⓡ R	0.1mm increments T	B	U Key groove depth
(D m5) —WPC® type— W—SK W—SHK W—PK —HW coating type— HW—SHK HW—PK (D +0.005 0) —WPC® type— AW—SK AW—SHK AW—PK —HW coating type— AHW—SHK AHW—PK	A D R E G	S	3	40 50 60 70 80	1.00～ 2.99	—	—	W/2≦R<W (Ⓡ only)	T>5.0	8	0.5
			4	40 50 60 70 80	1.00～ 3.99	3.97	1.00				1.0
			5	40 50 60 70 80	2.00～ 4.99	4.97	1.20			13	1.5
			6	40 50 60 70 80	2.00～ 5.99	5.97	1.50				
			8	(40) 50 60 70 80 90 100	3.00～ 7.99	7.97	2.00				
			10	(40) 50 60 70 80 90 100	3.00～ 9.99	9.97	2.50				
			13	(40) 50 60 70 80 90 100	6.00～12.99	12.97	3.00				
			16	(40) 50 60 70 80 90 100	10.00～15.99	15.97	4.00			19	
		L	3	50 60 70 80	1.00～ 2.99	—	—			13	0.5
			4	50 60 70 80	1.00～ 3.99	3.97	2.00				1.0
			5	50 60 70 80	2.00～ 4.99	4.97	2.00			19	1.5
			6	50 60 70 80	2.00～ 5.99	5.97	2.00				
			8	50 60 70 80 90 100	3.00～ 7.99	7.97	2.50				
			10	50 60 70 80 90 100	3.00～ 9.99	9.97	2.50				
			13	50 60 70 80 90 100	6.00～12.99	12.97	3.00				
			16	60 70 80 90 100	10.00～15.99	15.97	4.00			25	
		X	3	50 60 70 80	1.20～ 2.99	—	—			19	0.5
			4	50 60 70 80	1.20～ 3.99	3.97	2.00				
			5	60 70 80	2.00～ 4.99	4.97	3.50			25	1.0
			6	60 70 80	2.00～ 5.99	5.97	3.50				
			8	60 70 80 90 100	3.00～ 7.99	7.97	5.00			30	1.5
			10	60 70 80 90 100	3.00～ 9.99	9.97	5.00				
			13	60 70 80 90 100	6.00～12.99	12.97	5.00				
			16	70 80 90 100	10.00～15.99	—	—			40	

L (40)→B=8, When L (40), the blade length is fixed to 8mm.
When key groove is not necessary, specify dimension T as same dimension as the full length L.

Order

Catalog No. — L — P — W — R(Ⓡ only)
AW—SKDL 13 — 80 — P10.50 — W7.34

Delivery

■WPC® type (W— · AW—)

- Ⓐ: 3 Days | Express A 500/1Pc. P.38
- D R E G: 3 Days | Express A 800/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.
A flat charge of 2,160 yen for 3 pieces or more of the same size.

■HW coating type (HW— · AHW—): 3 Days

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No.	L(LC·LCT)	P(PC)	W(WC)	R	T	(BC·KC·LKC…etc.)
HW—SHKEL 16 —	LC68	— P12.00	— W6.00		— T20.5	— LKC

Alterations	Code	Ⓐ	D R E G	¥/1Code
Tip	PC WC	Changes dimension P. PC≧ Pmin/2 ≧1.00 0.01mm increments (Combination with PKC →0.001mm increments)	Changes dimension P·W. PC/WC ≧ P·Wmin/2 ≧1.00 0.01mm increments Ⓡ Blade length X:Not applicable	200
	BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓡ Full length L (LC) requires BC+25mm or more.	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Ⓡ Full length L (LC) requires BC+30mm or more.	200
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓡ PRC≦(P−0.2)/2 Ⓧ PCC:Not applicable	——	400
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓡ PCC≦(P−0.2)/2 Ⓧ PRC:Not applicable	——	200
	PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ (P:0.001mm incr.) Ⓧ D16:Not applicable	Changes tolerance on P(W). P·W±0.01 ⇨ $^{+0.01}_{0}$ Ⓧ D16:Not applicable	600
		Ⓧ HW coating : Not applicable		

Alterations	Code	Ⓐ	D R E G	¥/1Code
Full length	LC	Changes full length. 25+B(BC)≦LC<L 0.1mm increments Ⓡ When LC—B (BC) is 25mm or less, B (BC) is LC—25mm. (Combination with LKC→0.01mm increments)	Changes full length. 30+B(BC)≦LC<L 0.1mm increments Ⓡ When LC—B (BC) is 30mm or less, B (BC) is LC—30mm.	200
	LCT	Changes dimension T tolerance and the full length in one code. Specifiable range, unit, remarks are the same as LC. TKC $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ + LC $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		300
	LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
Others	KC	——	Changes the position of key flat. 1° increments	200
	NKC	——	No key flat.	0
	KD	——	Changes key groove position. 1° increments	200
	WKD	Adds parallel key grooves.	Adds parallel key grooves. Combination with KD is applicable	200
	UK	Changes key groove depth. Ⓧ D3：Not applicable.	D: 4·5 / 6 / 8～16 — UK: 0.7 / 1.2 / 1.7	200
	TKC	Changes dimension T tolerance. $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		200
	SKC	Adds key flat on shank. Ⓐ D R E G ·D4～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) Ⓧ D3：Not applicable. Ⓧ KC·KD·WKD：Not applicable		600

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example：AW—SHKAS4, the price is 1,600 (W—SHKAS4 unit price) +200 = 1,800 yen (product unit)

■ⓂSKD 11 or equivalent WPC® type

D	Ⓐ W—SKAS W—SKAL	Ⓐ W—SKAX	D R E G W—SK□S W—SK□L	D R E G W—SK□X
3	1,390	1,590	—	—
4	1,410	1,610	2,120	2,310
5	1,430	1,630	2,200	2,390
6	1,440	1,640	2,240	2,430
8	1,500	1,700	2,340	2,520
10	1,600	1,810	2,450	2,630
13	1,700	1,900	2,770	2,960
16	1,800	2,010	3,200	—

■ⓂSKH51 WPC® type

D	Ⓐ W—SHKAS W—SHKAL	Ⓐ W—SHKAX	D R E G W—SHK□S W—SHK□L	D R E G W—SHK□X
3	1,580	1,780	—	—
4	1,600	1,800	2,530	2,710
5	1,610	1,810	2,580	2,770
6	1,640	1,840	2,700	2,880
8	1,760	1,960	2,900	3,080
10	1,940	2,140	3,320	3,510
13	2,140	2,340	3,800	3,980
16	2,540	2,740	4,500	—

■ⓂPowdered high-speed steel WPC® type

D	Ⓐ W—PKAS W—PKAL	Ⓐ W—PKAX	D R E G W—PK□S W—PK□L	D R E G W—PK□X
3	1,900	2,100	—	—
4	1,920	2,120	2,940	3,130
5	1,950	2,150	3,070	3,260
6	2,110	2,310	3,250	3,440
8	2,540	2,740	3,680	3,870
10	2,850	3,050	3,890	4,080
13	3,780	3,980	5,060	5,250
16	4,230	4,430	5,620	—

■ⓂSKH51 HW coating type

D	Ⓐ HW—SHKAS HW—SHKAL	Ⓐ HW—SHKAX	D R E G HW—SHK□S HW—SHK□L	D R E G HW—SHK□X
3	2,280	2,480	—	—
4	2,330	2,520	3,560	3,710
5	2,390	2,590	3,650	3,790
6	2,590	2,840	3,930	4,150
8	2,890	3,120	4,350	4,590
10	3,290	3,590	5,050	5,270
13	3,790	4,050	5,750	6,030
16	4,350	4,740	6,950	—

■Ⓜ Powdered high-speed steel HW coating type

D	Ⓐ HW—PKAS HW—PKAL	Ⓐ HW—PKAX	D R E G HW—PK□S HW—PK□L	D R E G HW—PK□X
3	2,720	2,870	—	—
4	2,790	2,940	4,060	4,210
5	2,850	3,030	4,250	4,370
6	3,320	3,430	4,670	4,790
8	3,930	4,070	5,370	5,480
10	4,510	4,660	5,850	5,950
13	5,750	5,880	7,320	7,410
16	6,490	6,620	8,280	—

■Fixing key P.195

PSKB PSKBH

PSKS PSKJ

PSK PSKP PSKH

PSKW

PRESS NEW Printed in Red

TAPPED JECTOR PUNCHES WITH KEY GROOVE
—STANDARD TYPE / WPC®TYPE—

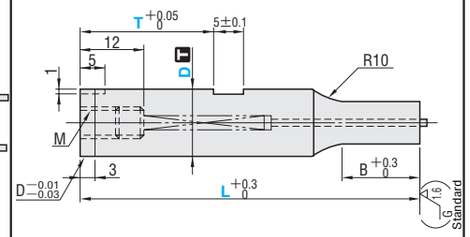
PRODUCTS DATA P.1221

WPC®PUNCHES

How to calculate the projection length of a jector pin (reference) P.191

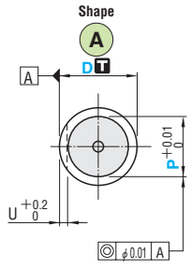
- Refer to Jector punch blank for the details of jector hole. P.188
- Refer to Jector pin set for the details of Jector pin. P.189

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length
RoHS —WPC®type— Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable	Dm5	SKD 11 or equivalent 60〜63HRC —WPC®type— Surface1000〜1100HV	SKJ	A D R E G	S
			W—SKJ		
	$D^{+0.005}_{0}$		A—SKJ		L
			AW—SKJ		Blade length(B) L>S



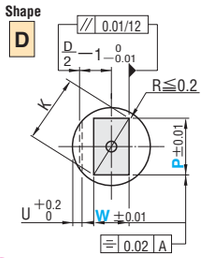
WPC®:The tip is very slightly rounded.

Shape A



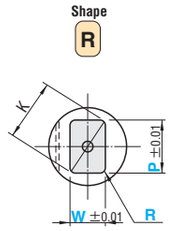
P≧W
R=0 : Applicable
K=√(P²+W²)

Shape D



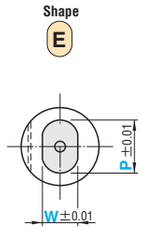
P≧W
0.15≦R< W/2 (R only)
K=√((P−2R)²+(W−2R)²+2R

Shape R



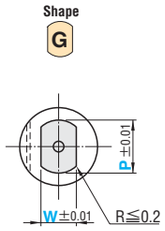
P>W

Shape E



P>W

Shape G



Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P·Kmax.	0.01mm increments DREG P·Wmin.	0.1mm increments R	0.1mm increments T	B	U Key groove depth	M
(Dm5) SKJ —WPC®type— W—SKJ	A D R E G	S	6	(40) 50 60 70 80	2.00〜 5.99	5.97	2.00	0.15≦R< W/2 (R only)	T>5.0	8	1.0	3
			8	(40) 50 60 70 80 90 100	3.00〜 7.99	7.97	3.00			13	1.5	4
			10	(40) 50 60 70 80 90 100	3.00〜 9.99	9.97	3.00					5
			13	(40) 50 60 70 80 90 100	6.00〜12.99	12.97	6.00					6
			16	(40) (50) 60 70 80 90 100	10.00〜15.99	15.97	6.00			19		
($D^{+0.005}_{0}$) A—SKJ —WPC®type— AW—SKJ		L	6	50 60 70 80	2.00〜 5.99	5.97	2.00			13	1.0	3
			8	50 60 70 80 90 100	3.00〜 7.99	7.97	3.00			19	1.5	4
			10	50 60 70 80 90 100	3.00〜 9.99	9.97	3.00					5
			13	50 60 70 80 90 100	6.00〜12.99	12.97	6.00					6
			16	60 70 80 90 100	10.00〜15.99	15.97	6.00			25		

L (40)→B=6, When L (40), the blade length is fixed to 6mm.
L (50)→B=13, When L (50), the blade length is fixed to 13mm.
When key groove is not necessary, specify dimension T as same dimension as the full length L.

Order

Catalog No.	L	P	W	R(Ronly)	T
A—SKJAS 13	80	P8.24			T20.0

When key groove is not necessary, specify T=L.

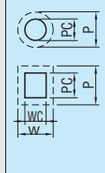
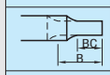
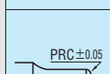
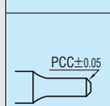
Delivery

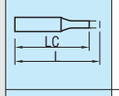
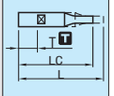
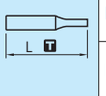
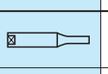
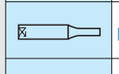
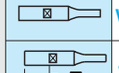
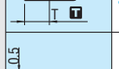
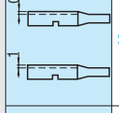
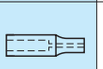
- Ⓐ 3 Days — Express A 500/1Pc. P.38
  A flat charge of 1,350 yen for 3 pieces or more of the same size.
- DREG 3 Days — Express A 800/1Pc. P.38
  A flat charge of 2,160 yen for 3 pieces or more of the same size.

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No.	L(LC・LCT)	P(PC)	W(WC)	R	T	(BC・KC・NKC…etc.)
A—SKJAL 13	80	P8.24			T20.0	LKC

Alterations		Code	Ⓐ	DREG	¥/1Code
Tip		PC WC	Changes dimension P. PC≧PCmin 0.01mm increments (Combination with PKC→0.001mm increments)	Changes dimension P・W. PC・WC≧PC・WCmin 0.01mm increments	200
		BC	Changes blade length B. 2≦BC<B 0.1mm increments		200
		SC	Finishes blade with lapping. Dimension P tolerance and the specification unit remain the same. ⊗D shape is not available with a corner radius of 0. ⊗WPC®type:Not applicable		1,200 (only Ⓐ 800)
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.188. ⊗PCC:Not applicable WPC®type:PRC±0.1	——	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 Regarding dimension d1, refer to P.188. ⊗PRC:Not applicable WPC®type:PCC±0.1	——	200
		PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P : 0.001mm incr.)	Changes tolerance on P(W). P・W±0.01 ⇨ $^{+0.01}_{0}$	400

Alterations		Code	Ⓐ	DREG	¥/1Code
Full length		LC	Changes full length. LC<L 0.1mm increments (combination with LKC・LKZ→0.01mm increments) B is shortened by (L—LC). The projection length of the jector pin is 2mm.		200
		LCT	Changes dimension T tolerance and the full length in one code. Specifiable range, unit, remarks are the same as LC. TKC $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ + LC Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		300
		LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗WPC®type:Not applicable		600
Others		KC	——	90° 0° 180° 270° Changes the position of key flat. 1° increments	200
		NKC	——	No key flat.	0
		KD	——	90° 0° 180° 270° Changes key groove position. 1° increments	200
		WKD	Adds parallel key grooves.	Adds parallel key grooves. Combination with KD is applicable	200
		TKC	Changes dimension T tolerance. $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		200
		SKC	Adds key flat on shank. Ⓐ DREG ・D6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8〜 P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC・KD・WKD:Not applicable ⊗WPC®type:Not applicable		600
		AC	AIR Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.		—100

Price

■Volume discount rate P.37

Quantity	1〜9	10〜29	30〜99	100〜200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of Dm5. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : A—SKJAS8, the price is 1,590 (SKJAS8 unit price) +200 = 1,790 yen (product unit)

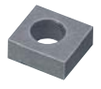
■MSKD 11 or equivalent

D	Ⓐ SKJAS SKJAL	DREG SKJ□S SKJ□L
6	1,520	2,390
8	1,590	2,430
10	1,720	2,590
13	1,830	2,910
16	1,950	3,430

■MSKD 11 or equivalent —WPC®type—

D	Ⓐ W—SKJAS W—SKJAL	DREG W—SKJ□S W—SKJ□L
6	2,450	3,300
8	2,520	3,340
10	2,640	3,490
13	2,750	3,800
16	2,870	4,300

■Fixing key P.195

PSKB PSKBH
PSKS PSKJ
PSK PSKP PSKH 
PSKW

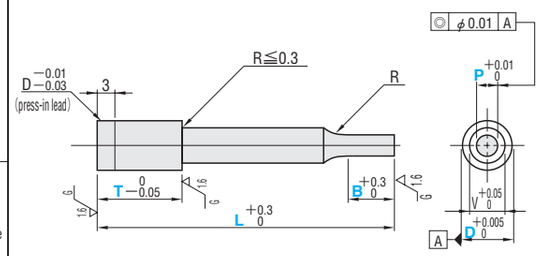
PRESS-FIT HEADED PUNCHES
—STANDARD TYPE / TiCN COATING TYPE—

Quality Improved

PRODUCTS DATA P.1220

COATING PUNCHES—TiCN—
QUALITY IMPROVED P.1217

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS	Powdered high-speed steel 64～67HRC	PHTAL	
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN coating type H—PHTAL	

TiCN coating type : The tip surface is ground before coating.

Catalog No. Type	D	L	0.01mm increments min. P max.	T	1mm increments B	V	R
PHTAL —TiCN coating type— H—PHTAL	4	40 50	0.50(1.00)～ 2.00	13 16 20 / 13 16 20 25	2 ～ 6 / 2 ～ 6	2	2～3
	5	40 50 60	1.00～ 3.00	13 16 20 / 13 16 20 25	2 ～ 8 / 2 ～ 8	3	10
	6	40 50 60 70	1.50～ 4.00	13 16 20 / 13 16 20 25	2 ～10 / 2 ～13	4	
	8	40 50 60 70	2.00～ 6.00	13 16 20 / 13 16 20 25	2 ～10 / 2 ～13	6	
	10	40 50 60 70	3.00～ 8.00	13 16 20 / 13 16 20 25	2 ～10 / 2 ～13	8	
	13	40 50 60 70	3.00～10.00	13 16 20 / 13 16 20 25	2 ～10 / 2 ～13	11	
	16	40 50 60 70	6.00～13.00	13 16 20 / 13 16 20 25	2 ～10 / 2 ～13	14	
	20	40 50 60 70	10.00～16.00	13 16 20 / 13 16 20 25	2 ～10 / 2 ～13	18	
	25	40 50 60 70	13.00～23.00	13 16 20 / 13 16 20 25	2 ～10 / 2 ～13	23	

P (1.00)•••▸TiCN coated punch is Pmin 1.00

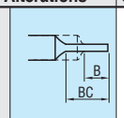
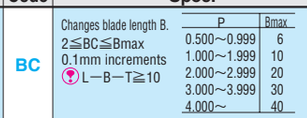
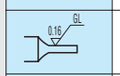
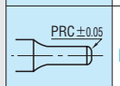
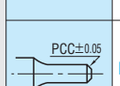
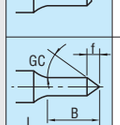
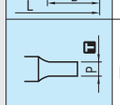
Order

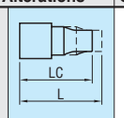
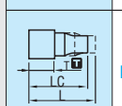
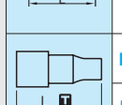
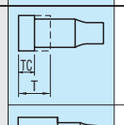
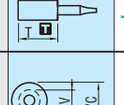
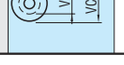
Catalog No.	L	P	T	B
PHTAL 5	60	P3.00	T20	B5

Delivery 3 Days

Alteration

Catalog No.	L(LC·LCT)	P	T(TC)	B(BC) —(PKC·LKC···etc.)
PHTAL 5	60	P3.00	TC15.0	B5

Alterations		Code	Spec.	¥/1Code
Tip		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments (P) L−B−T≧10 	200
		SC	Finishes blade with lapping. (P) Dimension P tolerance and the specification unit remain the same. (⊗) TiCN coating:Not applicable	800
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (P) PRC≦(P−0.2)/2 (⊗) PCC・GC:Not applicable	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (P) PCC≦(P−0.2)/2 (⊗) PRC・GC:Not applicable	200
		GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B≧f+2 f=P/2×tan(90°−GC°) (P) When used with SC, tip and edge are rounded. (⊗) LKC・LKZ・LCT・PRC・PCC:Not applicable (⊗) P<1.0:Not applicable	400
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P) (P : 0.001mm increments.) (⊗) TiCN coating, D>16:Not applicable	400 (TiCN coating) 600

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length. 40<LC<L 0.1mm increments (Combination with LKC・LKZ→0.01mm increments.) (P) When LC<50 T and TC are 20 or less. (P) When LC<50 and D=6 or 8, specifiable range of B is 2～10.	200
		LCT	Changes dimension T tolerance and the full length in one code. Specifiable range, unit, remarks are the same as LC. TKC T 0 −0.05 ⇨ 0 −0.02 + LC Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	300
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0 (⊗) TiCN coating :Not applicable	600
Head		TC	Changes dimension T. 13<TC<25 0.1mm increments (P) When L<50, specifiable range is 13<TC<20 (P) The full length L remains the same.	200
		TKC	Changes head thickness tolerance. T 0 −0.05 ⇨ 0 −0.02	200
Others		VC	Changes dimension V. D4～6 V−0.5≦VC≦D−1.2 D8～ V−2≦VC≦D−1.2 0.1mm increments	400

Price

■Volume discount rate P.37

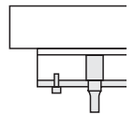
Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

(P) To be quoted on price & lead time above Max. Q'ty.

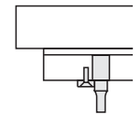
D	U/Price Q'ty : 1～4 PHTAL	H—PHTAL
4	1,320	2,560
5	1,410	2,700
6	1,610	3,040
8	2,090	3,680
10	2,430	4,180
13	3,450	5,380
16	3,990	6,110
20	5,010	7,350
25	6,200	8,630

Example

■Usage example of loosening prevention plate for punch

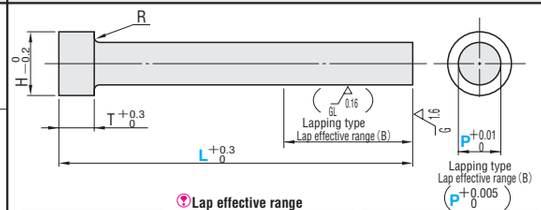


■Usage example of key for fixing punch



STRAIGHT PUNCHES
—STANDARD TYPE / LAPPING TYPE—

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS —Lapping type—	SKD 11 or equivalent 60～63HRC	SPC Lapping type L—SPC	
	SKH51 61～64HRC	SHC Lapping type L—SHC	
	Powdered high-speed steel 64～67HRC	PHC Lapping type L—PHC	

No.	R
1.0～2.5	≦0.2
3 ～25	≦0.5

Lap effective range

P	L	(B)
0.500～0.999	20≦L≦30	8
1.000～2.499	20≦L≦80	13
2.500～2.999	L＜23	L—10
	L≧23	13

P	L	(B)
3.000～9.999	L＜25	5
	25≦L＜40	L—20
	L≧40	19
10.000～	L＜25	5
	25≦L＜40	L—20
	L≧40	25

Catalog No. Type	No.	L	0.01mm increments (lapping type 0.001mm increments) min. P max.	H	T
—Lapping type— SHC PHC L—SHC L—PHC	1.0	20 25 30	0.50～ 1.00	2.0	3
	1.6	20 25 30 35 40 50 60	1.00～ 1.60	2.6	
	2.0	20 25 30 35 40 50 60	1.60～ 2.00	3.0	
	2.5	20 25 30 35 40 50 60	2.00～ 2.50	3.5	
—Lapping type— SPC SHC PHC L—SPC L—SHC L—PHC	3	40 50 60 70 80	2.00～ 3.00	5	5
	4	40 50 60 70 80	3.00～ 4.00	7	
	5	40 50 60 70 80	4.00～ 5.00	8	
	6	40 50 60 70 80	5.00～ 6.00	9	
	8	40 50 60 70 80 90 100	6.00～ 8.00	11	
	10	40 50 60 70 80 90 100	8.00～10.00	13	
	13	40 50 60 70 80 90 100 110 120	10.00～13.00	16	
	16	40 50 60 70 80 90 100 110 120	13.00～16.00	19	
	20	40 50 60 70 80 90 100 110 120	16.00～20.00	23	
	25	40 50 60 70 80 90 100 110 120	20.00～25.00	28	

Order

Catalog No.	—	L	—	P
PHC 6	—	40	—	P5.50
L—PHC 6	—	40	—	P5.500

Delivery

●No.1.0～2.5 ●No.13～25

3 Days — Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

●No.3～10

3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size. (excluding Express T)

Alteration

Catalog No. — L(LC·LCT·LMT) — P — (HC·TC·GC···etc.)

SPC 6 — LC45 — P5.50 — PKC—LKC

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

No.	SPC	SHC	PHC	L—SPC	L—SHC	L—PHC
1.0	—	270	490	—	1,290	1,630
1.6	—	270	490	—	1,290	1,630
2.0	—	270	490	—	1,290	1,630
2.5	—	270	490	—	1,290	1,630
3	260	340	550	1,280	1,360	1,690
4	280	340	560	1,300	1,360	1,700
5	290	360	590	1,310	1,380	1,730
6	300	380	700	1,320	1,400	1,840
8	400	470	1,010	1,420	1,490	2,150
10	470	570	1,270	1,490	1,590	2,410
13	1,560	1,890	3,540	2,580	2,910	4,680
16	1,720	2,060	4,060	2,740	3,080	5,200
20	2,080	2,500	5,030	3,100	3,520	6,170
25	2,280	2,920	5,860	3,300	3,940	7,000

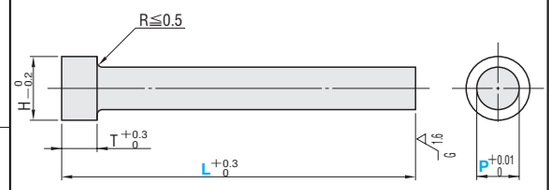
Alterations		Code	Spec.	¥/1Code
Tip	PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (P—0.2)/2 PCC·GC:Not applicable	400
	PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (P—0.2)/2 PRC·GC:Not applicable	200
	GC	GC	Changes to pointed tip. 20°≦GC＜90° 1° increments LKC·LKZ·LCT·LMT·PRC·PCC:Not applicable The edge of lapping type is rounded.	400
	P	PKC	Changes tolerance P +0.01 0 ⇨ +0.005 0 on P. (P：0.001mm incr.) Lapping：Not applicable	400
Full length	LC L	LC	Changes full length. 20≦LC＜L 0.1mm increments (Combination with LKC・LKZ→0.01mm increments)	200
	T LC L	LCT	Changes dimension T tolerance and the full length in one code. Specifiable range, unit, remarks are the same as LC. TKC T +0.3 0 ⇨ +0.02 0 + LC + Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	300
		LMT	Changes dimension T tolerance and the full length in one code. Specifiable range, unit, remarks are the same as LC. TKM T +0.3 0 ⇨ 0 —0.02 + LC + Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	

Alterations		Code	Spec.	¥/1Code
Full length	L T	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0	600
Head		KC	Adds single key flat at head. Applicable for No.3 or higher	200
		WKC	Adds double key flats in parallel. Applicable for No.3 or higher	400
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments Available for No.3 or higher KC·WKC:Not applicable	600
	H HC	HC	Changes head diameter. P≦HC＜H 0.1mm increments	200
	TC T	TC	Changes head thickness 2≦TC＜T 0.1mm increments (Combination with TKC·TKM·LCT·LMT→0.01mm increments.) L is shortened by (T—TC). When LC·LCT·LMT is combined, L=LC.	200
	T T	TKC	Changes head thickness tolerance. T +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness tolerance. T +0.3 0 ⇨ 0 —0.02	200
	TCC	TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H—D)/2 H≦5：TCC 0.5 H＜2.6:Not applicable	200

STRAIGHT PUNCHES
—TiCN COATING TYPE—

Quality Improved — PRODUCTS DATA P.1220 — COATING PUNCHES—TiCN— QUALITY IMPROVED P.1217

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
—TiCN coating type— RoHS	SKH51 61～64HRC Surface 3000HV	H—SHC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	H—PHC	

Blade surface and blade tip diameter (P) are coated but no coating on head.
The tip surface is ground before coating.

Catalog No. Type	No.	L	0.01mm increments min. P max.	H	T	U/Price Q'ty:1～9 H—SHC	H—PHC
H—SHC H—PHC	4	40 50 60 70 80	3.00～ 4.00	7	5	1,470	1,820
	5	40 50 60 70 80	4.00～ 5.00	8		1,540	1,910
	6	40 50 60 70 80	5.00～ 6.00	9		1,680	2,150
	8	40 50 60 70 80 90 100	6.00～ 8.00	11		1,910	2,620
	10	40 50 60 70 80 90 100	8.00～10.00	13		2,150	3,040
	13	40 50 60 70 80 90 100 110 120	10.00～13.00	16		3,620	5,470
	16	40 50 60 70 80 90 100 110 120	13.00～16.00	19		3,960	6,180
	20	40 50 60 70 80 90 100 110 120	16.00～20.00	23		4,590	7,370
	25	40 50 60 70 80 90 100 110 120	20.00～25.00	28		5,100	8,290

Order

Catalog No.	—	L	—	P
H—SHC 6	—	40	—	P5.50
H—PHC 8	—	70	—	P6.30

Delivery 3 Days

Alteration

Catalog No. — L(LC·LCT·LMT) — P — (TC·KC···etc.)

H—SHC 6 — LC45 — P5.50 — LKC

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alterations		Code	Spec.	¥/1Code
Tip	PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (P—0.2)/2 PCC·GC:Not applicable	400
	PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (P—0.2)/2 PRC·GC:Not applicable	200
	GC	GC	Changes to pointed tip. 20°≦GC＜90° 1° increments LKC·LCT·LMT·PRC·PCC:Not applicable	400
Full length	LC L	LC	Changes full length. 20≦LC＜L 0.1mm increments (Combination with LKC→0.01mm increments)	200
	T LC L	LCT	Changes dimension T tolerance and the full length in one code. Specifiable range, unit, remarks are the same as LC. TKC T +0.3 0 ⇨ +0.02 0 + LC + Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	300
		LMT	Changes dimension T tolerance and the full length in one code. Specifiable range, unit, remarks are the same as LC. TKM T +0.3 0 ⇨ 0 —0.02 + LC + Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	
	L T	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0 GC:Not applicable	400

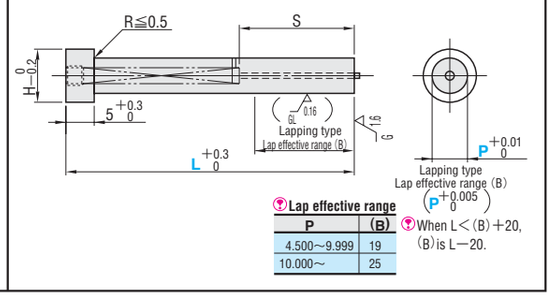
Alterations		Code	Spec.	¥/1Code
Head		KC	Adds single key flat at head.	200
		WKC	Adds double key flats in parallel.	400
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments KC·WKC:Not applicable	600
	TC T	TC	Changes head thickness 4.0≦TC＜T 0.1mm increments (Combination with TKC・TKM・LCT・LMT→0.01mm incr.) L is shortened by (T—TC). When LC・LCT・LMT is combined, L=LC.	200
	T T	TKC	Changes head thickness tolerance. T +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness tolerance. T +0.3 0 ⇨ 0 —0.02	200
	TCC	TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H—D)/2 H≦5：TCC 0.5	200

JECTOR STRAIGHT PUNCHES
—STANDARD TYPE / LAPPING TYPE—

The volume discount rate is also applicable to alteration cost. P.39

How to calculate the projection length of a jector pin (reference) P.191

● Refer to Jector punch blank for the details of jector hole. P.186 ● Refer to Jector pin set for the details of Jector pin. P.189

Type	M H	Catalog No.	Shape
RoHS —Lapping type—	(No.5・6) SKH51 61～64HRC (No.8～25) SKD 11 or equivalent 60～63HRC	SJC Lapping type L—SJC	 Lap effective range

P	(B)
4.500～9.999	19
10.000～	25

Catalog No. Type	No.	L	0.01mm increments (lapping type 0.001mm increments) min. P max.	H	S	U/Price Q'ty : 1～9 SJC	L—SJC
SJC —Lapping type— L—SJC	5	(40) 50 60 70 80	4.50～ 5.00	8	20	1,380	2,400
	6		5.00～ 6.00	9		1,390	2,410
	8	(40) 50 60 70 80 90 100	6.00～ 8.00	11	27	1,430	2,450
	10		8.00～10.00	13	28	1,500	2,520
	13		10.00～13.00	16		2,850	3,870
	16	(40) (50) 60 70 80 90 100	13.00～16.00	19	36	2,950	3,970
	20		16.00～20.00	23		3,430	4,450
	25		20.00～25.00	28		3,700	4,720

When L (40), dimension S of No.5～13 is 15mm and No.16～25 is 17mm.
When L (50), dimension S of No.16～25 is 24mm.

Order Catalog No. — L — P
SJC 6 — 50 — P5.50
L—SJC 6 — 50 — P5.500

Delivery 3 Days | Express A 500/1Pc. P.38
A flat charge of 1,350yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC・LCT・LMT) — P — (HC・TC…etc.)
SJC 6 — LC45.5 — P5.50 — AC — PKC

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

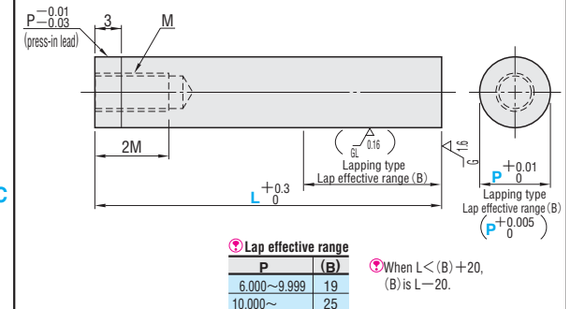
To be quoted on price & lead time above Max. Q'ty.

Alterations		Code	Spec.	¥/1Code
Tip	PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P—d1—0.5)/2 Regarding dimension d1, refer to P.186. ⊗PCC:Not applicable	400
	PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P—d1—0.5)/2 Regarding dimension d1, refer to P.186. ⊗PRC:Not applicable	200
	P	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P：0.001mm incr.) ⊗Lapping：Not applicable	400
Full length	LC L	LC	Changes full length. 30≦LC＜L 0.1mm increments (Combination with LKC・LKZ→0.01mm increments) S is shortened accordingly. The projection length of the jector pin is 2mm.	200
	T LC L	LCT	Changes dimension T tolerance and the full length in one code. Specifiable range, unit, remarks are the same as LC. TKC T +0.3 0 ⇨ +0.02 0 + LC Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	300
		LMT	Changes dimension T tolerance and the full length in one code. Specifiable range, unit, remarks are the same as LC. TKM T +0.3 0 ⇨ 0 −0.02 + LC Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	
	L T	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0	600

Alterations		Code	Spec.	¥/1Code
Head		KC	Adds single key flat at head.	200
		WKC	Adds double key flats in parallel.	400
		KFC	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	600
	H HC	HC	Changes head diameter. P≦HC＜H 0.1mm increments	200
	TC T	TC	Changes head thickness 3.5≦TC＜5 0.1mm incr. (Combination with TKC・TKM・LCT・LMT→0.01mm incr.) L is shortened by (5—TC) When LC・LCT・LMT is combined, L=LC.	200
	T T	TKC	Changes head thickness T +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness T +0.3 0 ⇨ 0 −0.02	200
	TCC	TCC	Adds Chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H—D)/2 H≦5：TCC 0.5	200
Shank	AIR	AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	−100
		NC	Removes the jector pin. ⊗AC：Not applicable.	−200

TAPPED STRAIGHT PUNCHES
—STANDARD TYPE / LAPPING TYPE—

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS —Lapping type—	SKD 11 or equivalent 60～63HRC	MSPC Lapping type L—MSPC	 Lap effective range

P	(B)
6.000～9.999	19
10.000～	25

Catalog No. Type	No.	L	0.01mm increments (lapping type 0.001mm increments) min. P max.	M	U/Price Q'ty : 1～9 MSPC	L—MSPC
MSPC —Lapping type— L—MSPC	8	40 50 60 70 80 90 100	6.00～ 8.00	3	810	1,830
	10		8.01～10.00	4	830	1,850
	13		10.01～13.00	6	2,060	3,080
	16		13.01～16.00		2,300	3,320
	20		16.01～20.00		2,760	3,780
	25		20.01～25.00		3,090	4,110

Order Catalog No. — L — P
MSPC 16 — 70 — P14.73
L—MSPC 16 — 70 — P14.730

Delivery 3 Days | Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC) — P — (KC…etc.)
MSPC 16 — LC67.3 — P14.73 — LKC

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

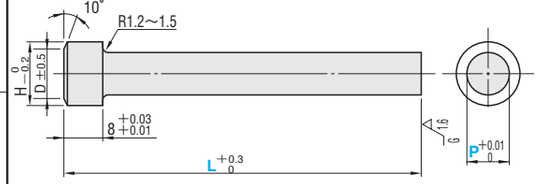
To be quoted on price & lead time above Max. Q'ty.

Alterations		Code	Spec.	¥/1Code
Tip	PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P—0.2)/2 ⊗PCC・GC:Not applicable	400
	PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P—0.2)/2 ⊗PRC・GC:Not applicable	200
	GC L	GC	Changes to pointed tip. 20°≦GC＜90° 1° increments ⊗LKC・LKZ・PRC・PCC:Not applicable	400
	P	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P：0.001mm incr.) ⊗Lapping：Not applicable	400

Alterations		Code	Spec.	¥/1Code
Full length	LC L	LC	Changes full length. 30≦LC＜100 0.1mm increments (Combination with LKC・LKZ→0.01mm increments)	200
	L T	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0	600
Others		KC	5 1 Adds single key flat at head.	200
		WKC	5 1 Adds double key flats in parallel.	400
	ℓ D −0.01 −0.03	NDC	No press-in lead ℓ=3⇨ℓ=0	0

PRESS NEW STRAIGHT PUNCHES FOR HEAVY LOAD

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS	SKH51 61～64HRC	AHC	
	Powdered high-speed steel 64～67HRC	APHC	

Catalog No. Type	No.	L	0.01mm increments min. P max.	H
AHC APHC	4	40 50 60 70 80	3.00 ～ 4.00	9
	5	40 50 60 70 80	4.00 ～ 5.00	10
	6	40 50 60 70 80	5.00 ～ 6.00	11
	8	40 50 60 70 80 90 100	6.00 ～ 8.00	13
	10	40 50 60 70 80 90 100	8.00 ～ 10.00	15
	13	40 50 60 70 80 90 100 110 120	10.00 ～ 13.00	18
	16	40 50 60 70 80 90 100 110 120	13.00 ～ 16.00	21
	20	40 50 60 70 80 90 100 110 120	16.00 ～ 20.00	25
	25	40 50 60 70 80 90 100 110 120	20.00 ～ 25.00	30

Order

Catalog No. — L — P

AHC 6 — 40 — P5.50

Delivery

●No.4～10: 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size. (excluding Express T)

●No.13～25: 3 Days — Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Alteration

Catalog No. — L(LC) — P — (PKC···etc.)

AHC 6 — LC45 — P5.50 — PKC—LKC

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

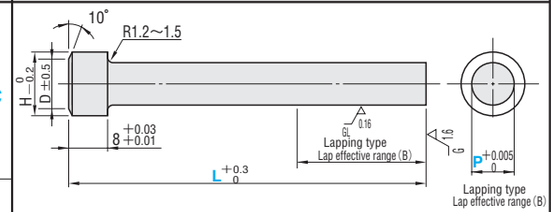
No.	AHC	APHC
4	2,040	3,640
5	2,110	3,750
6	2,150	3,970
8	2,290	4,320
10	2,350	4,790
13	3,350	6,120
16	3,490	6,950
20	4,150	8,190
25	4,570	9,350

Alterations		Code	Spec.	¥/1Code
Tip	PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments. PRC≦(P−0.2)/2 ⊗PCC:Not applicable	400
	PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments. PCC≦(P−0.2)/2 ⊗PRC:Not applicable	200
	P	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P：0.001mm incr.)	400
Full length	LC L	LC	Changes full length. 20≦LC＜L 0.1mm increments (Combination with LKC・LKZ→0.01mm increments)	200

Alterations		Code	Spec.	¥/1Code
Full length	L T	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0	600
Head		KC	Adds single key flat at head.	200
		WKC	Adds double key flats in parallel.	400
	90° 0° 180° 270°	KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	600

PRESS NEW STRAIGHT PUNCHES FOR HEAVY LOAD —LAPPING TYPE—

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS	SKH51 61～64HRC	L—AHC	
	Powdered high-speed steel 64～67HRC	L—APHC	

Lapping range

P	L	(B)
3.000～9.999	L＜25	5
	25≦L＜40	L−20
	L≧40	19
10.000～	L＜25	5
	25≦L＜40	L−20
	L≧40	25

Catalog No. Type	No.	L	0.001mm increments min. P max.	H
L—AHC L—APHC	4	40 50 60 70 80	3.000 ～ 4.000	9
	5	40 50 60 70 80	4.000 ～ 5.000	10
	6	40 50 60 70 80	5.000 ～ 6.000	11
	8	40 50 60 70 80 90 100	6.000 ～ 8.000	13
	10	40 50 60 70 80 90 100	8.000 ～ 10.000	15
	13	40 50 60 70 80 90 100 110 120	10.000 ～ 13.000	18
	16	40 50 60 70 80 90 100 110 120	13.000 ～ 16.000	21
	20	40 50 60 70 80 90 100 110 120	16.000 ～ 20.000	25
	25	40 50 60 70 80 90 100 110 120	20.000 ～ 25.000	30

Order

Catalog No. — L — P

L—APHC 6 — 40 — P5.500

Delivery

●No.4～10: 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size. (excluding Express T)

●No.13～25: 3 Days — Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Alteration

Catalog No. — L(LC) — P — (LKC···etc.)

L— AHC 6 — LC45 — P5.500 — LKC

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

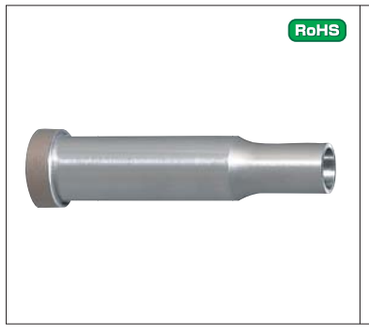
No.	L—AHC	L—APHC
4	3,030	4,690
5	3,060	4,820
6	3,130	4,970
8	3,270	5,340
10	3,380	5,880
13	4,370	7,210
16	4,520	8,060
20	5,150	9,270
25	5,550	10,420

Alterations		Code	Spec.	¥/1Code
Tip	PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments. PRC≦(P−0.2)/2 ⊗PCC:Not applicable	400
	PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments. PCC≦(P−0.2)/2 ⊗PRC:Not applicable	200
Full length	LC L	LC	Changes full length. 20≦LC＜L 0.1mm increments (Combination with LKC・LKZ→0.01mm increments)	200

Alterations		Code	Spec.	¥/1Code
Full length	L T	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0	600
Head		KC	Adds single key flat at head.	200
		WKC	Adds double key flats in parallel.	400
	90° 0° 180° 270°	KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC:Not applicable	600

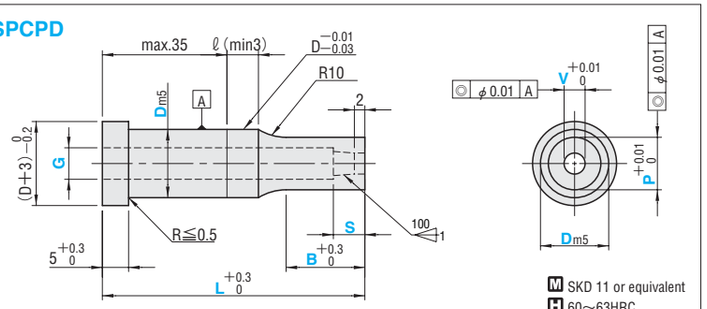
BLANKING PUNCHES

¥ The volume discount rate is also applicable to alteration cost. P.39



RoHS

SPCPD



M SKD 11 or equivalent
H 60～63HRC

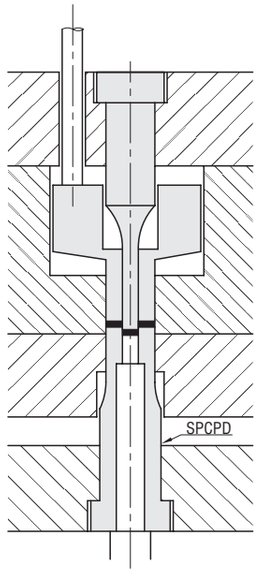
Catalog No. Type	D	0.1mm increments L	0.01mm increments P	V min.	V max.	0.1mm increments B	0.1mm increments S min.	S max.	G		U/Price Q'ty：1～9
SPCPD	8	35.0～60.0	4.80～ 7.99	1.50	G−0.5	4.0≦B≦19.0 and B≦L−27	3	(10)	G≦P×0.6 and (P−G)/2 ≧1.20	0.2mm increments	5,440
	10		4.80～ 9.99	1.50							5,440
	13		5.80～12.99	1.50							5,370
	16		9.80～15.99	2.50		4.0≦B≦25.0 and B≦L−27				0.5mm increments	5,370
	20		12.80～19.99	3.50				12			5,460
	25	40.0～60.0	17.80～24.99	5.00		4.0≦B≦25.0 and B≦L−32					6,720
	32		19.80～31.99	7.50				15			8,010

Smax (10) ･･･▸When V ≦ 1.99, S is maximum of 4 mm.
P>D−0.03→When P>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead)is not available.

Order Catalog No. — L — P — V — B — S — G

Example: SPCPD 20 — 55.0 — P14.65 — V7.35 — B8 — S10 — G8.5

When the difference between dimension P and dimension V or dimension G is thin-walled, it may lack the strength depending on the workpiece.



Delivery 5 Days

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

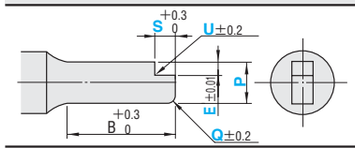
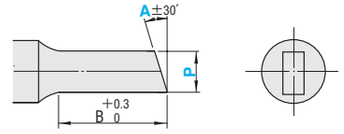
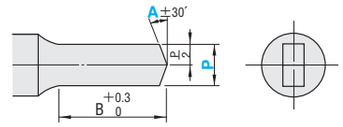
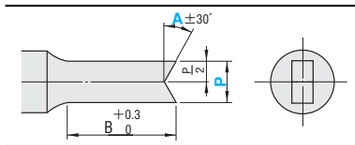
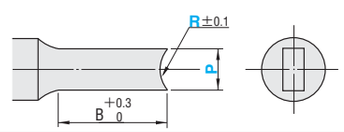
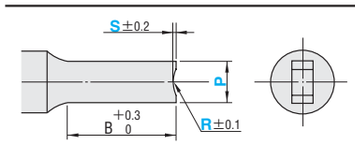
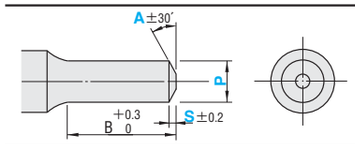
To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L — P — V — B — S — G — (TKC･LKC･･･etc.)

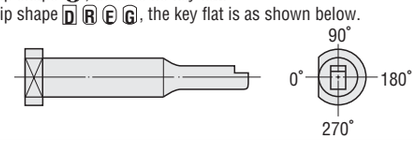
SPCPD 20 — 55.0 — P14.65 — V7.35 — B8 — S10 — G8.5 — TKC

Alterations		Code	Spec.	¥/1Code
Tip		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P：0.001mm incr.)	400
		VKC	changes dim. V tolerance V +0.01 0 ⇨ +0.005 0 (V：0.001mm incr.)	400
Full length		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	400
Head		KC	Adds single key flat at head.	200
		WKC	Adds double key flats in parallel.	400
		HC	Changes head diameter. D≦HC＜(D+3) 0.1mm increments	200
		TC	Changes head thickness 2≦TC＜5 0.1mm incr.(Comb. with TKC・TKM→0.01mm incr.) The Full length is as same as specified	200
		TKC	Changes head thickness tolerance. T +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness tolerance. T +0.3 0 ⇨ 0 −0.02	200
Shank		NDC	No press-in lead ℓ≧3⇨ℓ=0	0

SHEAR ANGLES ALTERATIONS

Shape	Code	Shape Ⓐ	Shape D R E G	¥／Code
	1F	—	●1≦S≦B ● S≦Smax ●1≦E≦P/2 ● U≦S−1 ●0.2≦U≦E ● Q=0or1≦Q≦P/2 ⊗LKC･LKZ:Not applicable ⊗Q：not applicable for E G S：0.1mm increments U：0.1mm increments E：0.01mm increments Q：0.01mm increments (P−E: 1.00～1.99 → 4.0; 2.00～2.49 → 7.0; 2.50～3.99 → 10.0; 4.00～ → 13.0)	1,800
	2F	● 0°＜A≦15° ● P tanA+2＜B ⊗LKC･LKZ:Not applicable ⊗PRC･PCC･GC:Not applicable ⊗KC･WKC･KFC:Not applicable A：1° increments	● 0°＜A≦15° ● P tanA+2＜B ⊗LKC･LKZ:Not applicable A：1° increments	600
	3F	● 0°＜A≦15° ● P/2 tanA+2＜B ⊗LKC･LKZ:Not applicable ⊗PRC･PCC･GC:Not applicable ⊗KC･WKC･KFC:Not applicable A：1° increments	● 0°＜A≦15° ● P/2 tanA+2＜B ⊗LKC･LKZ:Not applicable A：1° increments	1,200
	4F	● 0°＜A≦15° ● P/2 tanA＜B ⊗LKC･LKZ:Not applicable ⊗PRC･PCC･GC:Not applicable ⊗KC･WKC･KFC:Not applicable A：1° increments	● 0°＜A≦15° ● P/2 tanA＜B ⊗LKC･LKZ:Not applicable A：1° increments	1,200
	5F	● P+1 ≦R≦P+5 Full length tolerance L±0.3 No spherical surface ⊗LKC･LKZ:Not applicable ⊗PRC･PCC･GC:Not applicable ⊗KC･WKC･KFC:Not applicable ⊗PKC:Not applicable R：0.1mm increments	● P+1 ≦R≦P+5 Full length tolerance L±0.3 No spherical surface ⊗LKC･LKZ:Not applicable ⊗PKC:Not applicable R：0.1mm increments	1,000
	6F	● S＜R ● $2\sqrt{\{R^2-(R-S)^2\}}$＜P ⊗LKC･LKZ:Not applicable ⊗PRC･PCC･GC:Not applicable ⊗KC･WKC･KFC:Not applicable R：0.1mm increments S：0.1mm increments	● S＜R ● $2\sqrt{\{R^2-(R-S)^2\}}$＜P ⊗LKC･LKZ:Not applicable R：0.1mm increments S：0.1mm increments	1,000
	7F	● 0＜A≦45° ● S/tanA＜P/2−0.3 ⊗LKC･LKZ:Not applicable ⊗PRC･PCC･GC:Not applicable ⊗KC･WKC･KFC:Not applicable A：1° increments、S：0.1mm increments	—	400

Applicable range of the above alteration
Tip shape Ⓐ･･･▸R≧2.0 mm, B≧10P Tip shape D R E G･･･▸W≧2.0 mm, B≧10W
When tip shape Ⓐ, there is no key flat.
When tip shape D R E G, the key flat is as shown below.



■**Effectiveness of shear angle**
Adding shear angle to the punch tip, it enables to reduce the punching load, noise, and prevent scrap retention.

Order Standard order code: Catalog No. — L — Blade dimension (P,W,R) — Code — Increments (S,E,U,Q,A) — Punch shape alteration

SPEL 16 — 70 — P12.00 — W6.00 — 3F — A11

Delivery 3 Days | Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Punch code	Catalog No.	Refer page
	SP□□	P.53
	SH□□	
	PH□□	
	SP□□−C	P.93
	AP□□	P.109
	APH□□	
	MP□□	P.153

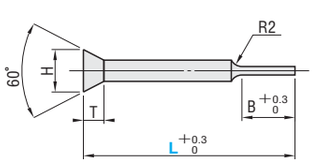
MINI PUNCHES

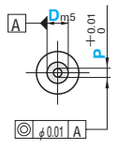
MINI STRAIGHT PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

RoHS

SHCL





M SKH51
H 61～64HRC
(Head 40～50HRC)

B	T	H	Catalog No. Type	D	L	0.01mm increments min. P max.	U/Price Q'ty : 1～9
4	1.1	2.9	SHCL	1.6	(25)	0.30～1.59	250
6	1.4	3.6		2.0	30 35 40	0.50～1.99	
8	1.8	4.5		2.5	50	1.00～2.49	

When L (25), the blade length is fixed to 4mm.

Order Catalog No. — L — P

SHCL 2.0 — 30 — P0.88

Delivery 3 Days

Express	T	1,000/1Pc.
Express	A	500/1Pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC) — P(PC) — (BC・GC・LKC…etc.)

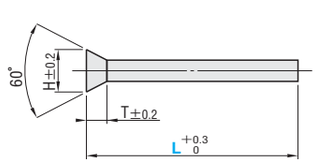
SHCL 2.0 — LC28 — P0.88

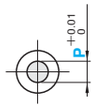
Alterations		Code	Spec.	¥/1Code
Tip	PC, P	PC	Changes dimension P. D2.0：PC≧0.30 D2.5：PC≧0.50 0.01mm increments Blade length is all 4mm. ⊗D1.6：Not applicable.	200
	BC, B	BC	Changes blade length B. 2≦BC＜B 0.1mm increments	200
	PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 ⊗PCC・GC:Not applicable	400
	PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 ⊗PRC・GC:Not applicable	200
	GC, f, l	GC	Changes to pointed tip. ⊗Combination with 20°≦GC＜90° PRC・PCC・LKC is not applicable 1° increments Blade length B≧f+2	400

Alterations		Code	Spec.	¥/1Code
Full length	LC, L	LC	Changes full length. 25＜LC＜50 0.1mm incr. (combination with LKC→0.01mm incr.) When LC＜30, B is 4mm.	200
	L T	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0 ⊗GC:Not applicable	400

RoHS

SH





M SKH51
H 61～64HRC
(Head 40～50HRC)

T	H	Catalog No. Type	P	L	U/Price Q'ty : 1～9
0.7	1.8	SH	1.0	25	110
0.8	2.0		1.1		
0.8	2.1		1.2		
0.9	2.3		1.3		
1.0	2.6		1.4		
1.1	2.8		1.5		
1.1	2.9		1.6		
1.2	3.1		1.7		
1.3	3.3		1.8	30	
1.3	3.4		1.9		
1.4	3.6		2.0	35	
1.5	3.8		2.1		
1.5	3.9		2.2	40	140
1.6	4.1		2.3		
1.7	4.4		2.4	50	
1.8	4.5		2.5		
1.8	4.7		2.6		
1.9	4.9		2.7		
2.0	5.1		2.8		
2.0	5.2		2.9		
2.1	5.4		3.0		

Order Catalog No. — L

SH 1.5 — 40

Delivery 3 Days

Express	T	1,000/1Pc.
Express	A	500/1Pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC) — (LKC)

SH 1.5 — LC38 — LKC

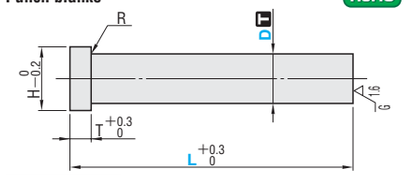
Alterations		Code	Spec.	¥/1Code
Full length	LC, L	LC	Changes full length. 25＜LC＜50 0.1mm increments (Combination with LKC→0.01mm increments)	200
	L T	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	400

PUNCH BLANKS

PRESS ADD.SPEC. Printed in Red

¥ The volume discount rate is also applicable to alteration cost. P.39

Punch blanks RoHS



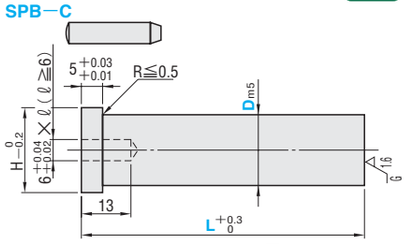
D	R
1.0～2.5	R≦0.2
3～25	R≦0.5

Catalog No.	T	M	H	Applicable dim. D
SPB	D m5	SKD 11 or equivalent	60～63HRC	D3 ～25
SHB		SKH51	61～64HRC	D1.0～25
PHB		Powdered high-speed steel	64～67HRC	D1.6～25
A—SPB	D +0.005 0	SKD 11 or equivalent	60～63HRC	D3 ～25
A—SHB		SKH51	61～64HRC	D1.0～25
A—PHB		Powdered high-speed steel	64～67HRC	D1.6～25

H	T	Catalog No. Type	D	10mm increments L	U/Price Q'ty：1～9 SPB	SHB	PHB	A—SPB	A—SHB	A—PHB
2.0	3	(Dm5) SPB SHB PHB (D +0.005 0) A—SPB A—SHB A—PHB	1.0	30～50	—	210	—	—	310	—
2.6			1.6		—	210	400	—	310	490
3.0			2.0		—	210	400	—	310	490
3.5			2.5		—	210	400	—	310	490
5	5		3	40～100	220	270	400	320	370	490
7			4		240	280	430	340	380	520
8			5		250	290	470	350	390	560
9			6		270	310	550	370	410	630
11			8	40～100	310	370	820	410	470	900
13			10		400	520	1,110	500	620	1,170
16			13		500	680	1,830	600	780	1,880
19			16		600	830	2,080	700	930	2,110
23			20		760	1,030	2,810	860	1,130	2,830
28			25		1,190	1,590	3,410	1,290	1,690	3,410

Punch blanks —With dowel— RoHS

SPB—C



M SKD 11 or equivalent
H 60～63HRC
A MS6—25

H	Catalog No. Type	D	10mm increments L	U/Price Q'ty：1～9
13	SPB—C	10	40～150	680
16		13		780
19		16		880
23		20		1,080
28		25		1,510
35		32		2,870
41		38		4,210
48		45		5,060

¥ Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration — Catalog No. — L(LC) — (HC·TC···etc.)

SHB 3 — LC65

Punch blanks other than jector

Alterations		Code	Spec.	¥/1Code
Full length	LC	LC	• SPB ·SHB A—SPB ·A—SHB ···▸15≦LC＜L • SPB—C ···▸20≦LC＜L • PHB·A—PHB ···▸30≦LC＜L 0.1mm increments (Combination with LKC·LKZ→0.01mm increments)	200
	L T	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0 ⊗D＞25:Not applicable, L(LC)＜16:Not applicable	600
Head		KC	Adds single key flat at head.	200
		WKC	Adds double key flats in parallel.	400
	H HC	HC	Changes head diameter. D≦HC＜H 0.1mm increments	200
	T TC	TC	2≦TC＜T 0.1mm increments (Combination with TKC·TKM→0.01mm incr.) L is shortened by (T—TC). When LC, L=LC.	200
	T T	TKC	Changes head thickness T +0.3 0 ⇨ +0.02 0 tolerance.	200
		TKM	Changes head thickness T +0.3 0 ⇨ 0 −0.02 tolerance.	200

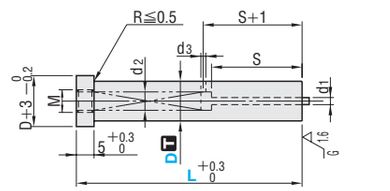
Jector punch blanks

Alterations		Code	Spec.	¥/1Code
Full length	LC L	LC	• SJB ·PJB ·SJFB A—SJB ·A—PJB ···▸30≦LC＜L • SJXB ·SJB—C ·SJBL A—SJXB ·A—PJBL ·A—SJBL ···▸40≦LC＜L 0.1mm increments S is shortened accordingly. (Combination with LKC·LKZ→0.01mm increments)	200
	L T	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0 ⊗D＞25:Not applicable	600
Head		KC	Adds single key flat at head.	200
		WKC	Adds double key flats in parallel.	400
	H HC	HC	Changes head diameter. D≦HC＜H 0.1mm increments	200
	T TC	TC	3.5≦TC＜5 0.1mm increments (Combination with TKC·TKM→0.01mm incr.) L is shortened by (5—TC). When LC, L=LC.	200
	T T	TKC	Changes head thickness T +0.3 0 ⇨ +0.02 0 tolerance.	200
		TKM	Changes head thickness T +0.3 0 ⇨ 0 −0.02 tolerance.	200
Shank	AIR	AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	−100
	M	NC	Removes the jector pin. ⊗AC：Not applicable.	−200

¥ The volume discount rate is also applicable to alteration cost. P.39

How to calculate the projection length of a jector pin (reference) P.191

Jector punch blanks RoHS



SJFB does not have d3 (Side hole)

Catalog No.	Shank diameter tolerance	M	H
SJB	D m5	D4～6 SKH51 D6～25 SKD 11 or equivalent	61～64HRC 60～63HRC
SJBL			
SJXB			
SJFB			
PJB		Powdered high-speed steel	64～67HRC
PJBL			
A—SJB	D +0.005 0	D4～6 SKH51 D6～25 SKD 11 or equivalent	61～64HRC 60～63HRC
A—SJBL			
A—SJXB			
A—PJB		Powdered high-speed steel	64～67HRC
A—PJBL			

For jector pins, P.189

Jector pin diameter	d1 hole (diameter)	d2	d3	S	M	Catalog No. Type	D	10mm increments L	U/Price Q'ty：1～9 SJB	PJB	A—SJB	A—PJB
0.35	0.4	2.1	1.0	13	2.5	(Dm5) SJB PJB (D +0.005 0) A—SJB A—PJB	4	40～80	1,090	1,710	1,290	1,910
0.65	0.7			20			5	(40)～80	1,040	1,620	1,240	1,820
0.65	0.7	2.6		20	3		6		1,040	1,620	1,240	1,820
1.0	1.1	3.4		27	4		8	(40)～100	1,090	1,980	1,290	2,180
1.4	1.5	4.4	1.5	28	5		10		1,160	2,330	1,360	2,530
1.7	1.8						13		1,220	3,090	1,420	3,290
2.7	2.8			36			16		1,400	3,760	1,600	3,960
							20	(40)(50)～100	1,650	4,640	1,850	4,840
							25		1,850	5,790	2,050	5,990

L(40) ···▸ φD 5～13=S15 φD16～25=S17 L(50) ···▸ φD16～25=S24

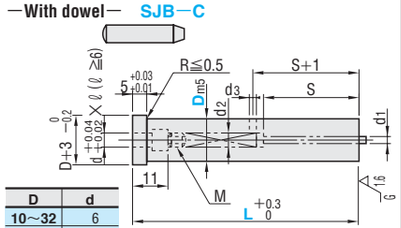
Jector pin diameter	d1 hole (diameter)	d2	d3	S	M	Catalog No. Type	D	10mm increments L	U/Price Q'ty：1～9 SJBL	PJBL	A—SJBL	A—PJBL
0.35	0.4	2.1	1.0	20	2.5	(Dm5) SJBL PJBL (D +0.005 0) A—SJBL A—PJBL	4	50～80	1,560	2,010	1,760	2,210

Jector pin diameter	d1 hole (diameter)	d2	d3	S	M	Catalog No. Type	D	10mm increments L	U/Price Q'ty：1～9 SJXB	A—SJXB
0.65	0.7	2.1	1.0	32	2.5	(Dm5) SJXB (D +0.005 0) A—SJXB	5	60～80	1,560	1,760
0.65	0.7	2.6			3		6		1,570	1,770
1.0	1.1	3.4			4		8	70～100	1,590	1,790
1.4	1.5	4.4	1.5	40	5		10		1,700	1,900
1.7	1.8						13		1,800	2,000
2.7	2.8			50			16	80～100	2,030	2,230
							20		2,260	2,460
							25		2,570	2,770

Jector pin diameter	d1 hole (diameter)	d2	S	M	Catalog No. Type	D	10mm increments L	U/Price Q'ty：1～9
2.7	2.8	4.4	27	5	(Dm5) SJFB (D +0.005 0)	8	(50)～100	1,090
			28			10		1,160
4.0	4.2	6.9		8		13		1,220
			36			16		1,400
6.0	6.2	8.7		10		20		1,650
						25		1,850

L(50) ···▸ φD16～25=S24

Jector punch blanks —With dowel— SJB—C RoHS



D	d
10～32	6
38・45	10

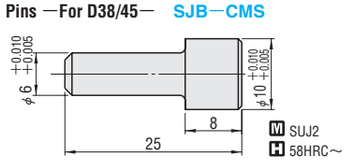
For jector pins, P.189

M SKD 11 or equivalent
H 60～63HRC
A D10～32 ···▸ MS6—25
D38・45 ···▸ SJB—CMS

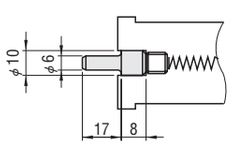
Jector pin diameter	d1 hole (diameter)	d2	d3	S	M	Catalog No. Type	D	10mm increments L	U/Price Q'ty：1～9 SJB—C
1.4	1.5	4.4	1.5	28	5	SJB—C	10	60～120	1,570
1.7	1.8						13		1,640
2.7	2.8			36			16	(60)～120	1,900
							20		2,250
							25		2,500
							32		3,580
4.0	4.2	6.9		37	8		38		5,630
							45		6,950

L(60) ···▸ φD16～45=S24

Pins —For D38/45— SJB—CMS



Catalog No.	U/Price Q'ty：1～9
SJB—CMS	1,070



Order — Catalog No. — L — SHB 3 — 50

Delivery

● Dm5 TYPE

3	Days

Express T	300/1Pc.
Express A	100/1Pc.

P.38

A flat charge of 270 yen for 3 pieces or more of the same size (excluding Express T).

● D +0.005 0 TYPE

3	Days

Express A	500/1Pc.

P.38

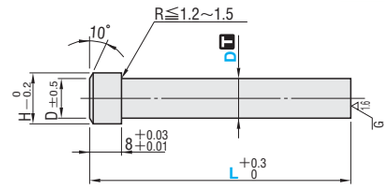
A flat charge of 1,350 yen for 3 pieces or more of the same size.

PUNCH BLANKS

The volume discount rate is also applicable to alteration cost. P.39

Punch blanks –For heavy load–

RoHS

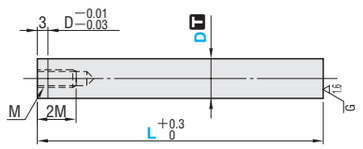


Catalog No.	Shank diameter tolerance	M	H
APB	D m5	SKH51	61~64HRC
AHB	D m5	Powdered high-speed steel	64~67HRC
A—APB	D +0.005 0	SKH51	61~64HRC
A—AHB	D +0.005 0	Powdered high-speed steel	64~67HRC

H	Catalog No. Type	D	10mm increments L	U/Price Q'ty : 1~9 APB	AHB	A—APB	A—AHB
10	(Dm5) APB AHB (D +0.005 0) A—APB A—AHB	5	50~ 80	1,570	3,590	1,770	3,790
11		6		1,630	3,770	1,830	3,970
13		8	50~100	1,770	4,070	1,970	4,270
15		10		2,090	4,450	2,290	4,650
18		13		2,230	4,690	2,430	4,890
21		16		2,620	5,380	2,820	5,580
25		20		3,120	6,410	3,320	6,610
30		25		3,880	7,710	4,080	7,910

Tapped punch blanks

RoHS

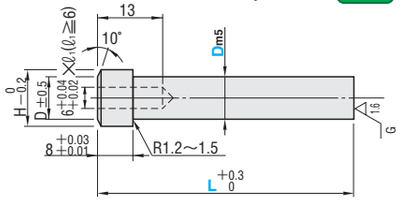


Catalog No.	Shank diameter tolerance	M	H
MPB	D m5	SKD11 or equivalent	60~63HRC
MPHB	D m5	Powdered high-speed steel	64~67HRC
A—MPB	D +0.005 0	SKD11 or equivalent	60~63HRC
A—MPHB	D +0.005 0	Powdered high-speed steel	64~67HRC

M	Catalog No. Type	D	10mm increments L	U/Price Q'ty : 1~9 MPB	A—MPB	MPHB	A—MPHB
3	(Dm5) MPB MPHB (D +0.005 0) A—MPB A—MPHB	5	40~ 80	460	660	1,020	1,220
		6		480	680	1,230	1,430
4		8	40~100	520	720	1,620	1,820
5		10		610	810	1,870	2,070
6		13		720	920	2,870	3,070
		16		820	1,020	3,170	3,370
		20		960	1,160	3,710	3,910
		25		1,400	1,600	5,080	5,280

Punch blanks with dowel –For heavy load–

RoHS



Catalog No.	Shank diameter tolerance	M	H
APB—C	D m5	SKH51	61~64HRC
AHB—C	D m5	Powdered high-speed steel	64~67HRC

H	Catalog No. Type	D	10mm increments L	U/Price Q'ty : 1~9 APB—C	AHB—C
15	(Dm5) APB—C AHB—C	10	50~100	2,480	4,770
18		13		2,630	5,010
21		16		3,010	5,650
25		20		3,520	6,690
30		25		4,270	7,940

Order

Catalog No.	—	L
MPB 10	—	90

Delivery

● Dm5 TYPE

3	Days	Express T 300/1Pc. / Express A 100/1Pc.

P.38

A flat charge of 270 yen for 3 pieces or more of the same size (excluding Express T).

● D +0.005 0 TYPE · PUNCH BLANKS FOR HEAVY LOAD

3	Days	Express A 500/1Pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

● D +0.005 0 TYPE · TAPPED PUNCH BLANKS

3	Days	Express A 300/1Pc.

P.38

A flat charge of 810 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

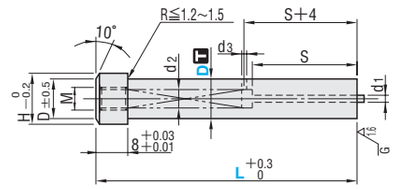
To be quoted on price & lead time above Max. Q'ty.

The volume discount rate is also applicable to alteration cost. P.39

How to calculate the projection length of a jector pin (reference) P.191

Jector punch blanks –For heavy load–

RoHS



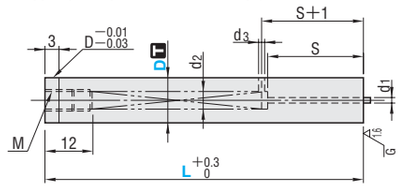
Catalog No.	Shank diameter tolerance	M	H
AJB	D m5	Powdered high-speed steel	64~67HRC
A—AJB	D +0.005 0	Powdered high-speed steel	64~67HRC

Jector pin diameter	d1 (hole diameter)	d2	d3	S	M	H	Catalog No. Type	D	10mm increments L	U/Price Q'ty : 1~9 AJB	A—AJB
1.4	1.5	3.4	1.5	28	4	13	(Dm5) AJB (D +0.005 0) A—AJB	8	(50)~100	5,630	5,830
1.7	1.8	4.4			5	15		10		6,070	6,270
2.7	2.8			36		18		13		6,300	6,500
						21		16		7,610	7,810
						25		20		8,690	8,890
3.0	3.1					30		25		10,790	10,990

L(50) ···▸S=24 For jector pins, P.189

Tapped jector punch blanks (Tapped jector punch blanks with key groove)

RoHS



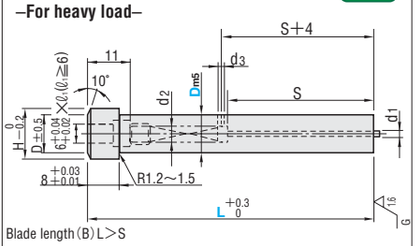
Catalog No.	Shank diameter tolerance	M	H
MJB	D m5	SKD11	60~63HRC
A—MJB	D +0.005 0	SKD11	60~63HRC

Jector pin diameter	d1 (hole diameter)	d2	d3	S	M	Catalog No. Type	D	10mm increments L	U/Price Q'ty : 1~9 MJB	A—MJB
0.65	0.7	2.6	1.0	20	3	(Dm5) MJB (D +0.005 0) A—MJB	6	(40)~80	1,180	1,380
1.0	1.1	3.4	1.5	27	4		8		1,220	1,420
1.4	1.5	4.4		28	5		10	(40)~100	1,310	1,510
1.7	1.8				6		13		1,410	1,610
2.7	2.8			36			16	(40)(50)~100	1,500	1,700
							20		1,650	1,850
							25		2,060	2,260

L(40) ···▸ φD 6~13=S15, φD16~25=S17 L(50) ···▸ φD16~25=S24 For jector pins, P.189

Jector punch blanks with dowel –For heavy load–

RoHS



Blade length (B) L>S

Catalog No.	Shank diameter tolerance	M	H
AHJB—C	D m5	SKH51	61~64HRC

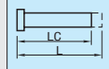
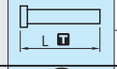
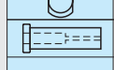
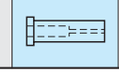
Jector pin diameter	d1 (hole diameter)	d2	d3	S	M	H	Catalog No. Type	D	10mm increments L	U/Price Q'ty : 1~9
1.7	1.8	4.4	1.5	28	5	15	(Dm5) AHJB—C	10	(60)~100	4,220
2.7	2.8			36		18		13		4,360
						21		16		5,430
						25		20		5,980
3.0	3.1					30		25		7,610

L(60) ···▸S=24 For jector pins, P.189

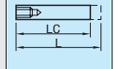
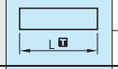
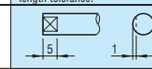
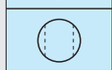
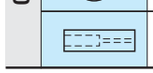
Alteration

Catalog No.	—	L(LC)	— (KC・WKC···etc.)
MPB 10	—	LC85	

■・APB ・A—APB ・APB—C ・AJB ・AHJB—C ・AHB ・A—AHB ・AHB—C ・A—AJB

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length. APB・AHB・A—APB・A—AHB・APB—C・AHB—C 20≦L<LC 0.1mm increments AJB・A—AJB 40≦L<LC 0.1mm increments AHJB—C 50≦L<LC 0.1mm increments S is shortened accordingly. (Combination with LKC・LKZ→0.01mm increments)	200
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0	600
Others		KC	Adds single key flat at head.	200
		WKC	Adds double key flats in parallel.	400
		NC	Removes the jector pin. AC : Not applicable.	−200
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	−100

■・MPB ・A—MPB ・MJB ・MPHB ・A—MPHB ・A—MJB

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length. MPB・A—MPB・MPHB・A—MPHB 20≦L<L 0.1mm increments MJB・A—MJB 30≦LC<L 0.1mm increments S is shortened accordingly. (Combination with LKC・LKZ→0.01mm increments)	200
		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0	600
Others		KC	 Adds single key flat at head. D5 : Not applicable.	200
		WKC	Adds double key flats in parallel. D5 : Not applicable.	400
		NC	Removes the jector pin.	−200

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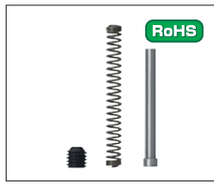
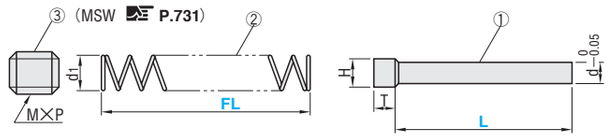
JECTOR PIN SETS



RoHS

SJ
AJ
VJ
FJ4·5

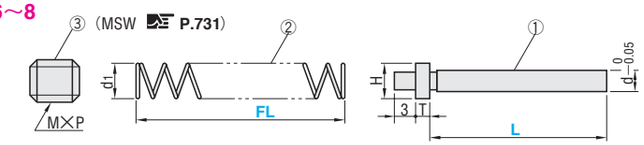


① M SKD61
H 40HRC～
②Spring constant
SJ・FJ：0.49N／mm {0.05kgf/mm}
VJ：0.98N／mm {0.1kgf/mm}
AJ：0.78～0.98N／mm {0.08～0.1kgf/mm}

Punch blank Type	Punch Diameter ϕD	Catalog No.	Pin length ①L	②FL (spring length) Punch length 40L	50L	60L	70L	80L	90L	100L	110L	120L	130L	d	H	T	d1	③MSW (M×P)
SJB PJB SJBL PJBL	4	(Set) SJ1 (①only) SJ1P (②only) SJ1F	14	30	40	50	60	70						0.35	1.6	1.5	2.0	MSW2.5 (2.5X0.45)
	4	(Set) SJL1 (①only) SJL1P (②only) SJL1F	21		33	43	53	63										
	5	(Set) SJ2 (①only) SJ2P (②only) SJ2F	16	28										0.65	1.6	1.5	2.0	
			21		33	43	53	63										
	6	(Set) SJ3 (①only) SJ3P (②only) SJ3F	16	28										0.65	2.0	1.5	2.2	MSW3 (3X0.5)
			21		33	43	53	63										
	8	(Set) SJ4 (①only) SJ4P (②only) SJ4F	16.5	29										1.0	2.8	2.0	3.0	MSW4 (4X0.7)
			28.5		27	37	47	57	67	77								
	10	(Set) SJ5 (①only) SJ5P (②only) SJ5F	16.5	27										1.4	3.6	2.0	3.8	MSW5 (5X0.8)
			29.5		27	37	47	57	67	77								
	13	(Set) SJ6 (①only) SJ6P (②only) SJ6F	16.5	27										1.7	3.6	2.0	3.8	
			29.5		27	37	47	57	67	77								
	16	(Set) SJ7	18.5	27										2.7	3.6	2.0	3.8	
	20	(①only) SJ7P	25.5		27													
	25	(②only) SJ7F	37.5			27	37	47	57	67								
SJB—C	10	(Set) SJ5 (①only) SJ5P (②only) SJ5F	29.5			20	27	37	47	57	67	77		1.4	3.6	2.0	3.8	MSW5 (5X0.8)
	13	(Set) SJ6 (①only) SJ6P (②only) SJ6F	29.5			20	27	37	47	57	67	77		1.7	3.6	2.0	3.8	
	16·20	(Set) SJ7 (①only) SJ7P (②only) SJ7F	25.5			27								2.7	3.6	2.0	3.8	
	25·32		37.5				27	37	47	57	67	77						
SJXB	5	(Set) SJX2 (①only) SJX2P (②only) SJX2F	33			31	41	51						0.65	1.6	1.5	2.0	MSW2.5 (2.5X0.45)
	6	(Set) SJX3 (①only) SJX3P (②only) SJX3F	33			31	41	51						0.65	2.0	1.5	2.2	MSW3 (3X0.5)
	8	(Set) SJX4 (①only) SJX4P (②only) SJX4F	41.5				33	43	53	63				1.0	2.8	2.0	3.0	MSW4 (4X0.7)
	10	(Set) SJX5 (①only) SJX5P (②only) SJX5F	41.5				33	43	53	63				1.4	3.6	2.0	3.8	
	13	(Set) SJX6 (①only) SJX6P (②only) SJX6F	41.5				33	43	53	63				1.7	3.6	2.0	3.8	MSW5 (5X0.8)
	16·20 25	(Set) SJX7 (①only) SJX7P (②only) SJX7F	51.5					43	43	53				2.7	3.6	2.0	3.8	
MJB	6	(Set) SJ3 (①only) SJ3P (②only) SJ3F	16	24										0.65	2.0	1.5	2.2	MSW3 (3X0.5)
			21		28	33	43	53										
	8	(Set) SJ4 (①only) SJ4P (②only) SJ4F	16.5	20										1.0	2.8	2.0	3.0	MSW4 (4X0.7)
			28.5		17	27	37	47	57	67								
	10	(Set) SJ5 (①only) SJ5P (②only) SJ5F	16.5	20										1.4	3.6	2.0	3.8	MSW5 (5X0.8)
			29.5		17	27	37	47	57	67								
	13	(Set) SJT6 (①only) SJ6P (②only) SJ6F	16.5	20										1.7	3.6	2.0	3.8	
			29.5		17	27	37	47	57	67								MSW6 (6X1.0)
	16	(Set) SJT7	18.5	17										2.7	3.6	2.0	3.8	
	20	(①only) SJ7P	25.5		17													
	25	(②only) SJ7F	37.5			17	27	37	47	57								
AJB	8	(Set) AJ4 (①only) AJ4P (②only) AJ4F	28		28									1.4	2.8	2.0	3.2	MSW4 (4X0.7)
			32			34	44	54	64	74	84	94	104					
	10	(Set) AJ5 (①only) AJ5P (②only) AJ5F	28		26									1.7	3.6	2.0	4.3	MSW5 (5X0.8)
			32			32	42	52	62	72	82	92	102					
	13 16 20	(Set) AJ6 (①only) AJ6P (②only) AJ6F	28		26									2.7	3.6	2.0	4.3	
			40			24	34	44	54	64	74	84	94					
	25	(Set) AJ7 (①only) AJ7P (②only) AJ7F	28		26									3.0	3.6	3.0	4.3	
			40			24	34	44	54	64	74	84	94					
AHJB—C	10	(Set) AJ5 (①only) AJ5P (②only) AJ5F	28			26								1.7	3.6	2.0	4.3	MSW5 (5X0.8)
			32				32	42	52	62	72	82	92					
	13 16 20	(Set) AJ6 (①only) AJ6P (②only) AJ6F	28			26								2.7	3.6	2.0	4.3	
			40				24	34	44	54	64	74	84					
	25	(Set) AJ7 (①only) AJ7P (②only) AJ7F	28			26								3.0	3.6	3.0	4.3	
			40				24	34	44	54	64	74	84					

RoHS

FJ6～8



① M SK4
H 53～58HRC (Head part annealing below 45HRC)
②Spring constant
1.0～1.5N／mm {0.1～0.15kgf/mm}

Punch blank Type	Punch Diameter ϕD	Catalog No.	Pin length ①L	②FL (spring length) Punch length 40L	50L	60L	70L	80L	90L	100L	110L	120L	d	H	T	d1	③MSW (M×P)
SJB□ (Spring reinforced type)	8	(Set) VJ4 (①only) VJ4P (②only) VJ4F	16.5	25									1.0	2.8	2.0	3.2	MSW4 (4X0.7)
			28.5		23	35	45	55	65	75							
	10	(Set) VJ5 (①only) VJ5P (②only) VJ5F	16.5	26									1.4	3.6	2.0	4.3	
			29.5		22	33	43	53	63	73							
	13	(Set) VJ6 (①only) VJ6P (②only) VJ6F	16.5	26									1.7	3.6	2.0	4.3	MSW5 (5X0.8)
			29.5		22	33	43	53	63	73							
	16	(Set) VJ7	18.5	26									2.7	3.6	2.0	4.3	
	20	(①only) VJ7P	25.5		29												
	25	(②only) VJ7F	37.5			27	37	47	57	67							
SJB—C (Spring reinforced type)	10	(Set) VJ5 (①only) VJ5P (②only) VJ5F	29.5			21	32	42	52	62	72	82	1.4	3.6	2.0	4.3	MSW5 (5X0.8)
	13	(Set) VJ6 (①only) VJ6P (②only) VJ6F	29.5			21	32	42	52	62	72	82	1.7	3.6	2.0	4.3	
	16·20	(Set) VJ7 (①only) VJ7P (②only) VJ7F	25.5			28							2.7	3.6	2.0	4.3	
	25·32		37.5				26	36	46	56	66	76					
SJB□ (Spring reinforced type)	8	(Set) VJX4 (①only) VJX4P (②only) VJX4F	41.5				32	42	52	62			1.0	2.8	2.0	3.2	MSW4 (4X0.7)
	10	(Set) VJX5 (①only) VJX5P (②only) VJX5F	41.5				31	41	51	61			1.4	3.6	2.0	4.3	MSW5 (5X0.8)
	13	(Set) VJX6 (①only) VJX6P (②only) VJX6F	41.5				31	41	51	61			1.7	3.6	2.0	4.3	
	16·20	(Set) VJX7 (①only) VJX7P (②only) VJX7F	51.5					33	43	53			2.7	3.6	2.0	4.3	
	25																
SJFB	8	(Set) FJ4 (①only) FJ4P (②only) FJ4F	29.0		27	37	47	57	67	77			2.7	3.6	2.0	3.8	MSW5 (5X0.8)
	10	(Set) FJ5 (①only) FJ5P (②only) FJ5F	30.0		27	37	47	57	67	77			2.7	3.6	2.0	3.8	
	13	(Set) FJ6 (①only) FJ6P (②only) FJ6F	30.0		15	25	35	45	55	65			4.0	6.0	3.0	6.0	MSW8 (8X1.25)
	16	(Set) FJ7 (①only) FJ7P (②only) FJ7F	26.0		20								4.0	6.0	3.0	6.0	
			38.0			15	30	40	50	60							
	20	(Set) FJ8 (①only) FJ8P (②only) FJ8F	26.0		15								6.0	8.0	3.0	8.0	MSW10 (10X1.5)
	25		38.0			15	25	35	45	55							

Order

	Catalog No.		L		FL
①②③ (Set)	SJ3	—	21	—	43
① (Pin only)	SJ5P	—	16.5		
② (Spring only)	SJ5F			—	47
	Catalog No.		L		FL
①②③ (Set)	AJ4	—	28	—	28
① (Pin only)	AJ5P	—	32		
② (Spring only)	AJ5F			—	42
	Catalog No.		L		FL
①②③ (Set)	VJ5	—	29.5	—	42
① (Pin only)	VJ5P	—	16.5		
② (Spring only)	VJ5F			—	52

Delivery

3 Days

Express T 600/1Pc.
Express A 300/1Pc.

P.38

A flat charge of 810 yen for 3 pieces or more of the same size. (excluding Express T)

Price

P.191

■ For SJB—C D38 and 45
(Sets not available. Use following components.)

ϕD	L	SJB—C
38 45	60	LPS4—28—WL20
	70	LPS4—40—WL30
	80	LPS4—40—WL40
	90	LPS4—40—WL50
	100	LPS4—40—WL60
	110	LPS4—40—WL70
	120	LPS4—40—WL80

WL P.1061
LPS P.773

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JECTOR PIN SETS

Catalog No.	Page	Reference Punch blank	Page
SJ□□	P.63	SJB□	P.186
PJ□□		PJB□	
SJV□□		SJB□ (Spring reinforced type)	
A—SJ□□		A—SJB□	
A—PJ□□		A—PJB□	
T—SJ□□	P.65	SJB□	
T—PJ□□		PJB□	
T—SJV□□		SJB□ (Spring reinforced type)	
AT—SJ□□		A—SJB□	
AT—PJ□□		A—PJB□	
H—PJ□□	P.67	PJB□	
AH—PJ□□		A—PJB□	
W—SJ□□	P.69	SJB□	
W—PJ□□		PJB□	
W—SJV□□		SJB□ (Spring reinforced type)	
AW—SJ□□		A—SJB□	
AW—PJ□□		A—PJB□	
HW—PJ□□		PJB□	
AHW—PJ□□		A—PJB□	
L—SJ□□	P.71	SJB□	
L—PJ□□		PJB□	
L—SJV□□		SJB□ (Spring reinforced type)	
AL—SJ□□		A—SJB□	
AL—PJ□□		A—PJB□	
SJF□□	P.75	SJFB□	
L—SJF□□			
G—SJ□□	P.89	SJB□	
G—SJV□□		SJB□ (Spring reinforced type)	
G—PJ□□		PJB□	
GH—PJ□□			
GW—SJ□□	P.91	SJB□	
G—PJ□□		PJB□	
GW—SJV□□		SJB□ (Spring reinforced type)	
GHW—PJ□□		PJB□	

Catalog No.	Page	Reference Punch blank	Page
SJ□□—C	P.101	SJB—C	P.186
SJV□□—C		SJB—C (Spring reinforced type)	
T—SJ□□—C	P.103	SJB—C	
T—SJV□□—C		SJB—C (Spring reinforced type)	
H—SJ□□—C	P.105	SJB—C	
H—SJV□□—C		SJB—C (Spring reinforced type)	
W—SJ□□—C	P.107	SJB—C	
W—SJV□□—C		SJB—C (Spring reinforced type)	
HW—SJ□□—C		SJB—C	
HW—SJV□□—C		SJB—C (Spring reinforced type)	
APJ□□	P.119	AJB	P.188
A—APJ□□		A—AJB	
T—APJ□□	P.121	AJB	
AT—APJ□□		A—AJB	
H—APJ□□	P.123	AJB	
AH—APJ□□		A—AJB	
W—APJ□□	P.125	AJB	
AW—APJ□□		A—AJB	
HW—APJ□□		AJB	
AHW—APJ□□		A—AJB	
L—APJ□□	P.127	AJB	
AL—APJ□□		A—AJB	
AHJ□□—C	P.145	AHJB—C	
H—AHJ□□—C	P.147		
W—AHJ□□—C	P.149		
HW—AHJ□□—C			
MJ□□	P.159	MJB	
A—MJ□□		A—MJB	
W—MJ□□		MJB	
AW—MJ□□		A—MJB	
SKJ□□	P.171	MJB	
A—SKJ□□		A—MJB	
W—SKJ□□		MJB	
AW—SKJ□□		A—MJB	
SJC	P.177	SJB	P.186
L—SJC			

Price

Components	Catalog No.	U/Price Q'ty:1~4	5~9	10~19	20~50
①②③	SJ1~7	410	290	160	130
①	SJ1P~7P	290	160	90	70
②	SJ1F~7F	290	160	90	70
①②③	SJL1	410	290	160	130
①	SJL1P	290	160	90	70
②	SJL1F	290	160	90	70
①②③	SJX2~7	530	320	230	190
①	SJX2P~7P	370	250	160	130
②	SJX2F~7F	290	160	90	70
①②③	SJT6・7	410	290	160	130
①②③	AJ4~7	530	320	230	190
①	AJ4P~7P	370	250	160	130
②	AJ4F~7F	290	160	90	70
①②③	VJ4~7	530	320	230	190
①	VJ4P~7P	370	250	160	130
②	VJ4F~7F	290	160	90	70
①②③	VJX4~7	530	320	230	190
①	VJX4P~7P	370	250	160	130
②	VJX4F~7F	290	160	90	70
①②③	FJ4~8	530	320	230	190
①	FJ4P~8P	370	250	160	130
②	FJ4F~8F	290	160	90	70

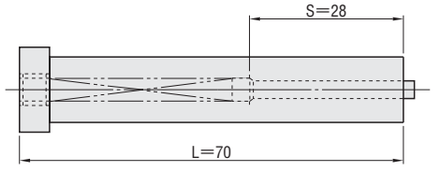
■How to calculate the projection length of a jector pin (reference)

Dimension L of jector pin — Dimension S of applicable punch blank

(Ex.) When SJEL10—70—P8.50—W4.25

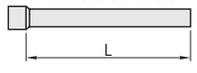
・Applicable punch blank：SJB10—70

Dimension S—28



・Applicable jector pin：SJ5P

Dimension L 29.5



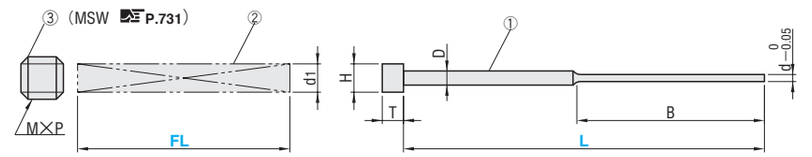
The projection length of jector pin：29.5—28=1.5

JECTOR PIN SETS/PUSHING PINS
—LONG TYPE—

The volume discount rate is also applicable to alteration cost. P.39

LJ

RoHS



Adaptable punch diameter φD	Catalog No.	① B Punch length 40L	50L	60L	70L	80L	90L	100L	d	D	H	T	② Spring length WL30 Wire diameter	WL30 Fmax	WL35 Wire diameter	WL35 Fmax	WL40 Wire diameter	WL40 Fmax	WL50 Wire diameter	WL50 Fmax	WL60 Wire diameter	WL60 Fmax	d1	③ MSW (M×P)
5	LJ2	20	30	30	40	50	60	70	0.65	1.9	4	3	0.55	12	0.55	14	0.6	16	0.6	20	0.65	24	4	MSW5 (5×0.8)
6	LJ3								0.65	2.3	4.5	3	0.55	12	0.55	14	0.6	16	0.6	20	0.65	24	4	MSW6 (6×1.0)
8	LJ4								1.05	3.1	6	3	0.7	12	0.7	14	0.7	16	0.75	20	0.8	24	6	MSW8 (8×1.25)
10	LJ5		35	40					1.4	3.9	8	4	0.8	12	0.8	14	0.8	16	0.85	20	0.9	24	8	MSW10 (10×1.5)
13	LJ6								1.7	3.9	8	4	0.8	12	0.8	14	0.8	16	0.85	20	0.9	24	8	
16・20・25	LJ7								2.7	3.9	8	4	0.8	12	0.8	14	0.8	16	0.85	20	0.9	24	8	

Adaptable punch diameter φD	Catalog No.	①L Punch length 40L	50L	60L	70L	80L	90L	100L	②FL
5	(Set) LJ2 (① only) LJ2P	41	51	61	71	81			30
6	(Set) LJ3 (① only) LJ3P	41	51	61	71	81			35
8	(Set) LJ4 (① only) LJ4P	41.5	51.5	61.5	71.5	81.5	91.5	101.5	40
10	(Set) LJ5 (① only) LJ5P	41.5	51.5	61.5	71.5	81.5	91.5	101.5	50
13	(Set) LJ6 (① only) LJ6P	41.5	51.5	61.5	71.5	81.5	91.5	101.5	60
16・20・25	(Set) LJ7 (① only) LJ7P	42	52	62	72	82	92	102	

Order — Catalog No. — L — FL

①②③ LJ2 — 61 — 40

① LJ5P — 81.5

Delivery — 3 Days — Express T 600/1Pc. / Express A 300/1Pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

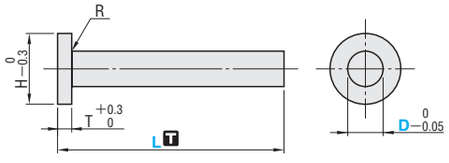
Price

Components	Catalog No.	U/Price Q'ty:1~4	5~9	10~19	20~50
①②③Set	LJ2~7	530	410	380	370
①only	LJ2~7P	480	360	340	320

To be quoted on price & lead time above Max. Q'ty.

RoHS

JP
JPW
JPWH



Catalog No.	L T	R
JP	L +0.3 0	R≦0.3
JPW JPWH	L±0.1	0.5≦R≦1.0

JP・JPW: M DH2F H 40HRC～

JPWH: M SKD61 H 50HRC～

T	H	Catalog No. Type	D	L 0.1mm increments	U/Price Q'ty：1～49 L5.0～29.9	L30.0	L30.1～49.9	L50.0	L50.1～69.9	L70.0
2	3	JP	1	5.0～70.0	320	240	320	240	320	240
	3		1.5		270	180	270	180	270	180
	4		2		250	170	250	170	250	170
	5		2.5		250	160	250	160	250	160
	6		3		240	180	240	180	240	180
3	8		4		260	190	260	190	260	190
	9		5		290	200	290	200	290	200

T	H	Catalog No. Type	D	L 0.1mm increments	U/Price Q'ty：1～49 L10.0～29.9	L30.0	L30.1～49.9	L50.0	L50.1～69.9	L70.0	L70.1～99.9	L100.0
5	5	JPW	2	10.0～100.0	260	200	260	200	260	200	330	280
	8		3		300	230	300	230	300	240	390	320
	10		4		340	260	340	260	340	260	450	370
	12		5		420	270	420	270	510	360	640	490
	14		6		470	320	470	320	580	440	760	610
	16		8		580	440	640	490	800	650	1,000	860
	18		10		640	480	800	650	970	830	1,240	1,100

T	H	Catalog No. Type	D	L 0.1mm increments	U/Price Q'ty：1～49 L10.0～29.9	L30.0	L30.1～49.9	L50.0	L50.1～69.9	L70.0	L70.1～99.9	L100.0
5	5	JPWH	2	10.0～100.0	330	250	370	290	390	300	420	340
	8		3		370	290	430	350	460	380	500	420
	10		4		510	380	560	430	610	480	670	530
	12		5		610	480	670	540	770	640	860	730
	14		6		730	600	860	720	940	810	1,060	930
	16		8		830	690	970	840	1,070	940	1,240	1,100
	18		10		940	810	1,150	1,020	1,290	1,160	1,500	1,370

Order — Catalog No. — L

JP 4 — 28.5

Delivery — 3 Days — Express A 300/1Pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size.

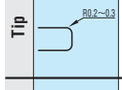
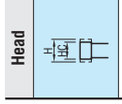
Price — ■Volume discount rate P.37

Quantity	1~49	50~99	100~199	200~500
Rate	—	5%	10%	15%

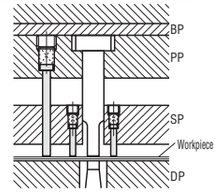
To be quoted on price & lead time above Max. Q'ty.

Alteration — Catalog No. — L — (RC・HC)

JP5 — 70.0 — RC — HC8.0

Alterations		Code	Spec.	¥/1Code
Tip		RC	Changes tip radius by 0.2～0.3.	200
Head		HC	Changes head diameter. D≦HC<H 0.1mm increments	200

Example

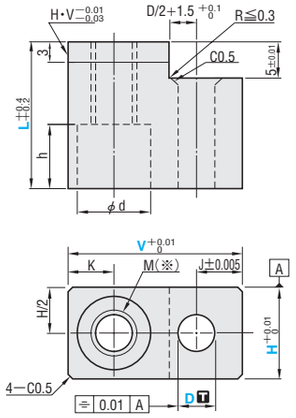


PUNCH HOLDERS
—BOLT FIXING TYPE / CAVITY INSERTS TYPE—

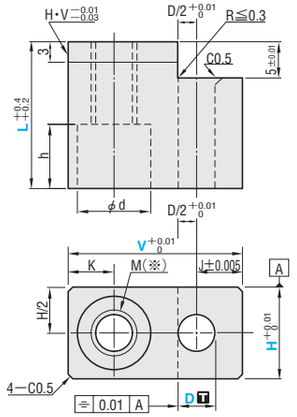
The volume discount rate is also applicable to alteration cost. P.39

—Bolt fixing type— RoHS

BBPH (For round punch)



BBPHC (For shaped punch)



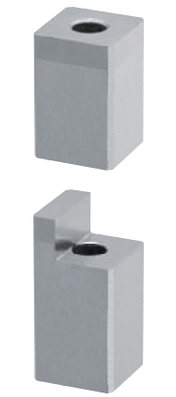
※M
Bolt for tapped hole is larger than mounting bolt by 1 size.

Mounting bolt	M extraction tapping hole
M3	M4
M4	M5
M6	M8
M8	M10

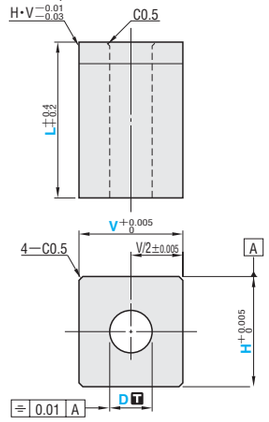
D	T
3 ～ 6	+0.012 +0.004
8・10	+0.015 +0.007
13・16	+0.018 +0.010

M SKD 11 or equivalent
H 60～63HRC

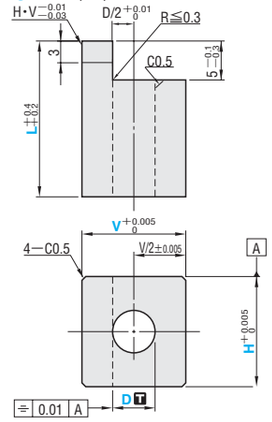
—Cavity inserts type— RoHS



KBPH (For round punch)



KBPHC (For shaped punch)



D	T
1.6 ～ 2.5	+0.008 +0.002
3 ～ 6	+0.012 +0.004
8・10	+0.015 +0.007
13・16	+0.018 +0.010

H・V3～5
M SKH51
H 61～64HRC
H・V8～25
M SKD 11 or equivalent
H 60～63HRC

K	Mounting bolt d	h	Size	J	Catalog No.	V	H	L	D	U/Price Q'ty : 1～9 BBPH	BBPHC
4	6	7.5	M3	4	BBPH (For round punch) BBPHC (For shaped punch)	16	8	16 20 22 25 30	3	3,730	4,130
5	8	8.5	M4	4		18	10		3・4	3,960	4,360
6.5	11	10.5	M6	6.5		25	13		4・5・6	4,250	4,650
6.5	11	10.5	M6	8		28	16		8・10	4,600	5,000
8	14	12.5	M8	10		35	20		10・13	4,720	5,120
8	14	12.5	M8	12.5		40	25		13・16	4,910	5,310

Catalog No.	V	H	L	D	U/Price Q'ty : 1～9
KBPH (For round punch)	3	3	7・10・13 17・19・22	1.6	8,420
	4	4		1.6・2.0	8,130
	5	5		2.5	8,020
	8	8	11 15 17 20 25	3・4	4,940
	10	10		3・4・5	5,190
	13	13		4・5・6・8	6,370
	16	16		8・10	7,170
	20	20		10・13	8,250
	25	25		13・16	9,100

Catalog No.	V	H	L	D	U/Price Q'ty : 1～9
KBPHC (For shaped punch)	8	8	16 20 22 25 30	3・4	6,140
	10	10		3・4・5	6,390
	13	13		4・5・6・8	7,570
	16	16		8・10	8,570
	20	20		10・13	9,650
	25	25		13・16	10,500

Order

Catalog No.	V	H	—	L	—	D
BBPH	16	08	—	20	—	D3
KBPH	04	04	—	10	—	D1.6

Delivery

3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

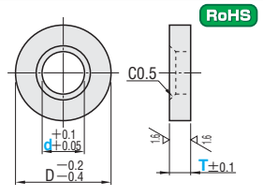
To be quoted on price & lead time above Max. Q'ty.

Alteration Right page

SPACERS & SHIMS FOR PUNCHES

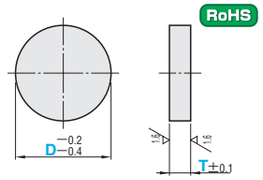
The volume discount rate is also applicable to alteration cost. P.39

PWA —Spacers for punch— RoHS



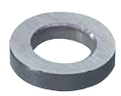
M SKS3 H 58～62HRC

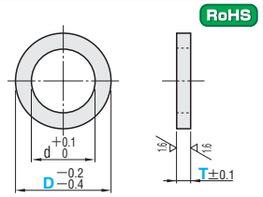
PWB —Shims for punch— RoHS



M SKS3 H 58～62HRC

PWC —Spacer for tapped punch— RoHS





M SKS3 H 58～62HRC

D	Catalog No. Type	d	T(Thickness) T±0.1	U/Price Q'ty : 1～19	20～49	50～99	100～200
5	PWA	3	0.5 (d3～13 only)	120	110	100	90
7		4		120	110	100	90
8		5		120	110	100	90
9		6	1	140	130	120	110
11		8		140	130	120	110
13		10	2	140	130	120	110
16		13	3	140	140	130	120
19		16	4	230	210	200	190
23		20	5	310	290	270	250
28		25		350	330	320	300

⊗ T0.5 can not be selected for d16 or higher. To be quoted on price & lead time above Max. Q'ty.
(C0.5) ••• When T0.5, chamfering is between C0.2 and 0.3

D	Catalog No. Type	D	T(Thickness) T±0.1	U/Price Q'ty : 1～19	20～49	50～99	100～200
5	PWB	5	0.5 (D5～16 only)	120	110	100	90
7		7		120	110	100	90
8		8		120	110	100	90
9		9	1	140	130	120	110
11		11		140	130	120	110
13		13	2	140	130	120	110
16		16	3	140	140	130	120
19		19	4	230	210	200	190
23		23	5	310	290	270	250
28		28		350	330	320	300

⊗ T0.5 can not be selected for D19 or higher. To be quoted on price & lead time above Max. Q'ty.

d	Catalog No. Type	D	T(Thickness) T±0.1	U/Price Q'ty : 1～19	20～49	50～99	100～200
3.5	PWC	5	0.5 (D5～16 only)	120	110	100	90
		6		120	110	100	90
4.5		8	1	120	110	100	90
5.5		10	2	140	130	120	110
6.5		13	3	140	130	120	110
		16		230	210	200	190
		20	4	310	290	270	250
		25	5	350	330	320	300

⊗ T0.5 can not be selected for D20 or higher. To be quoted on price & lead time above Max. Q'ty.

Order

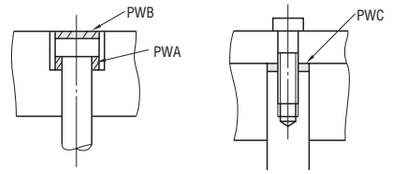
Catalog No.	—	T
PWA 3	—	0.5

Delivery

3 Days

Example

Use for adjustment when regrinding the blade tip.



Alteration

Catalog No.	—	T	—	TKC
PWB 5	—	0.5	—	TKC2

5 Days

Alteration	Code	Spec.	¥/1Code
Thickness	TKC	Changes thickness tolerance. No. 1 Tolerance +0.05; No. 2 +0.01; No. 3 +0.005	No. 1 ¥50; 2 ¥70; 3 ¥150

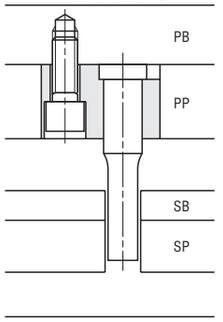
Alteration Catalog No. | V | H | — | L(LC) | — | D | — (LKC・VKC1 ••• etc.)

BBPH 16 08 —LC21.1 — D3

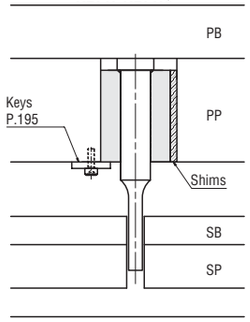
Example

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length. BBPH・BBPHC・KBPH 16<L<30 KBPH V・H：3～5 7<L<25 V・H：8～25 11<L<25 0.1mm incr. (combination with LKC・LKZ→0.01mm incr.) Punch holding part (5±0.01), press-in lead (3), and Counterbore depth for bolt (h) will not be changed.	200
		LKC	Changes full length tolerance. L +0.4 +0.2 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance. L +0.4 +0.2 ⇨ +0.01 0	600
Shank		VKC1	Changes V and H tolerances. V・H +0.01 0 ⇨ V・H +0.005 0 ⊗ KBPH・KBPHC:Not applicable.	600
		VKC2	Changes V and H tolerances. V・H +0.01 0 ⇨ V・H 0 −0.005	600
		NDC	No press-in lead	0

BBPH・BBPHC



KBPH・KBPHC

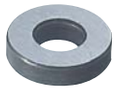


Punch position is adjustable by inserting shim between punch plate and punch holder.

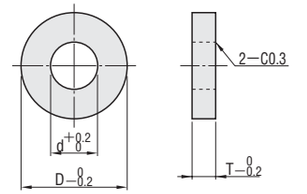
KEYS

KEYS

RoHS



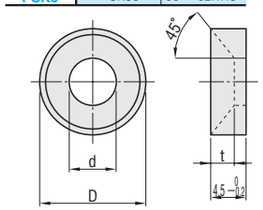
Catalog No.	M	H	S
PSKB	S45C	45～55HRC	—
PSKBH	SKS3	58～62HRC	Chromate plating



Bolt	D	d	T	Catalog No. Type	Catalog No. No.	U/Price Q'ty: 1～19	20～49	50～99	100～200
M4	10	4.2	3	PSKB	4	90	80	70	60
			4.5		4-4.5				
M5	12	5.2	3		5	100	90	80	70
			4.5		5-4.5				
M6	14	6.2	3		6	110	100	90	80
			4.5		6-4.5				
M4	10	4.2	3	PSKBH	4	110	100	90	80
			4.5		4-4.5				
M5	12	5.2	3		5	120	110	100	90
			4.5		5-4.5				
M6	14	6.2	3		6	130	120	110	100
			4.5		6-4.5				

RoHS

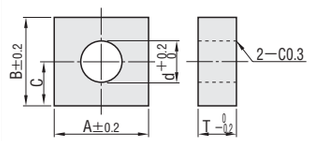
Catalog No.	M	H
PSKS	S45C	45～55HRC
PSKJ	SKS3	58～62HRC



Bolt	D	d	t	Catalog No. Type	Catalog No. No.	U/Price Q'ty: 1～19	20～49	50～99	100～200
M4	10	4.5	2.5	PSKS	4	120	110	100	90
M5	13	5.5	3		5	130	120	110	100
M4	12	4.2	2.5	PSKJ	4	140	130	120	110
M5	15	5.2	3		5	140	140	130	120

RoHS

Catalog No.	M	H	S
PSK	S45C	45～55HRC	—
PSKP			
PSKH	SKS3	58～62HRC	Chromate plating

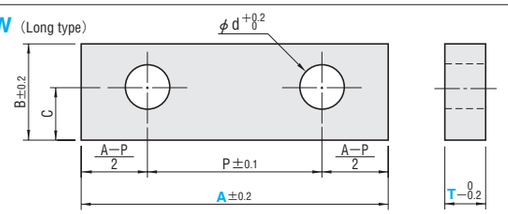


Bolt	A	B	C	d	T	Catalog No. Type	Catalog No. No.	U/Price Q'ty: 1～19	20～49	50～99	100～200
M4	10	11	6	4.2	3	PSK	4-3	130	120	110	100
					4.5		4				
M5				5.2	3		5-3				
					4.5		5				
M6	12	14	7	6.2	3		6-3	140	140	130	120
					4.5		6				
M4	11	11	5.5	4.2	3	PSKP	4-3	140	130	120	110
					4.5		4				
M5				5.2	3		5-3				
					4.5		5				
M6	14	14	7	6.2	3		6-3	150	140	140	130
					4.5		6				
M4	10	11	6	4.2	3	PSKH	4-3	140	140	130	120
					4.5		4				
M5				5.2	3		5-3				
					4.5		5				
M6	12	14	7	6.2	3		6-3	180	170	160	150
					4.5		6				

Since PSKP has a hole at the center, it can be mounted in any direction.
To be quoted on price & lead time above Max. Q'ty.

RoHS

PSKW (Long type)



Bolt	B	C	d	P A=21～30	P A=31～40	P A=41～50	P A=51～60	Catalog No. Type	Catalog No. No.	T (Selection)	A 1mm increments	U/Price Q'ty: 1～19 A21～30	A31～40	A41～50	A51～60
M4	11	6	4.2	10	20	30	—	PSKW	4	3	21～50	340	350	360	—
M5			5.2	—	20	30	40		5	4.5	31～60	—			370

Order: Catalog No. — T — A
PSKB 4
PSKS 5
PSKP 5
PSKW 4 — 3 — 40

Delivery: 1 Day

• PSKW (LONG TYPE) ONLY
3 Days — Express A 300/1Pc. P.38
A flat charge of 810 yen for 3 pieces or more of the same size.

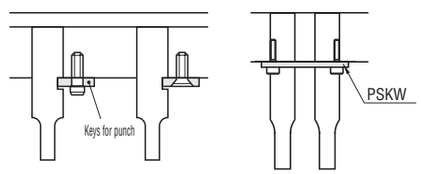
Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

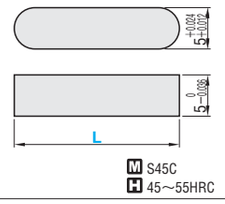
Example



The volume discount rate is also applicable to alteration cost. P.39

RoHS

KE



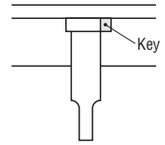
Catalog No. Type	L	U/Price Q'ty: 1～199	200～399	400～599	600～1000
KE	8	21	18	16	15
	10				
	12	24	22	19	18
	15				
	20	29	25	23	21
	25				
	30	34	29	25	24

To be quoted on price & lead time above Max. Q'ty.

Order: Catalog No. — KE 12

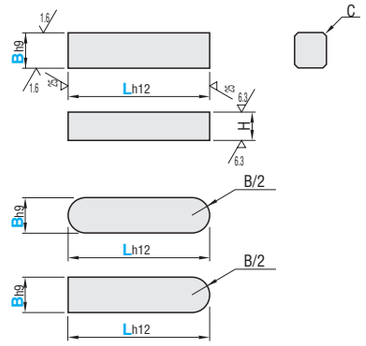
Delivery: 1 Day

Example



RoHS

KED
KES
KEG



L	T
10	0 −0.15
15	0 −0.18
20・25・30	0 −0.21
35・40・45・50	0 −0.25
55・60・70・80	0 −0.30
90・100・110	0 −0.35

JIS B 1301—1996

Type	M
KED KES KEG	S45C

Tensile strength 600N/mm² or more

Bh9		H tolerance		C	Catalog No. Type	B	L	U/Price Q'ty: 1～9 KED	KES	KEG
2	0 −0.025	2	0 −0.025	0.16～0.25	KED KES KEG	2	10 15 20	120	140	130
3		3				3	10 15 20 25 30	100	120	110
4	0 −0.030	4	0 −0.030	0.25～0.40		4	10 15 20 25 30 35 40 45 50	100	120	110
5		5				5	10 15 20 25 30 35 40 45 50	110	130	120
6		6				6	10 15 20 25 30 35 40 45 50 55 60	110	130	120
7	0 −0.036	7	0 −0.036			7	15 20 25 30 35 40 45 50 55 60	130	160	140
8						8	15 20 25 30 35 40 45 50 55 60 70 80	140	160	150
10		8	0 −0.090	0.40～0.60		10	15 20 25 30 35 40 45 50 55 60 70 80	170	190	180
12	0 −0.043					12	20 25 30 35 40 45 50 55 60 70 80	180	210	200
14		9				14	30 35 40 45 50 55 60 70 80 90	280	330	310
15		10				15	30 35 40 45 50 55 60 70 80 90	310	360	350
16						16	40 45 50 55 60 70 80 90 100	360	410	400
18		11	0 −0.110			18	40 45 50 55 60 70 80 90 100 110	410	470	440

Order: Catalog No. — L
KED 6 — 30

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery

• B=2～12
1 Day

• B=14～18
3 Days
Express A 200/1Pc. P.38

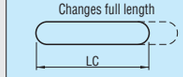
A flat charge of 540 yen for 3 pieces or more of the same size.

Alteration

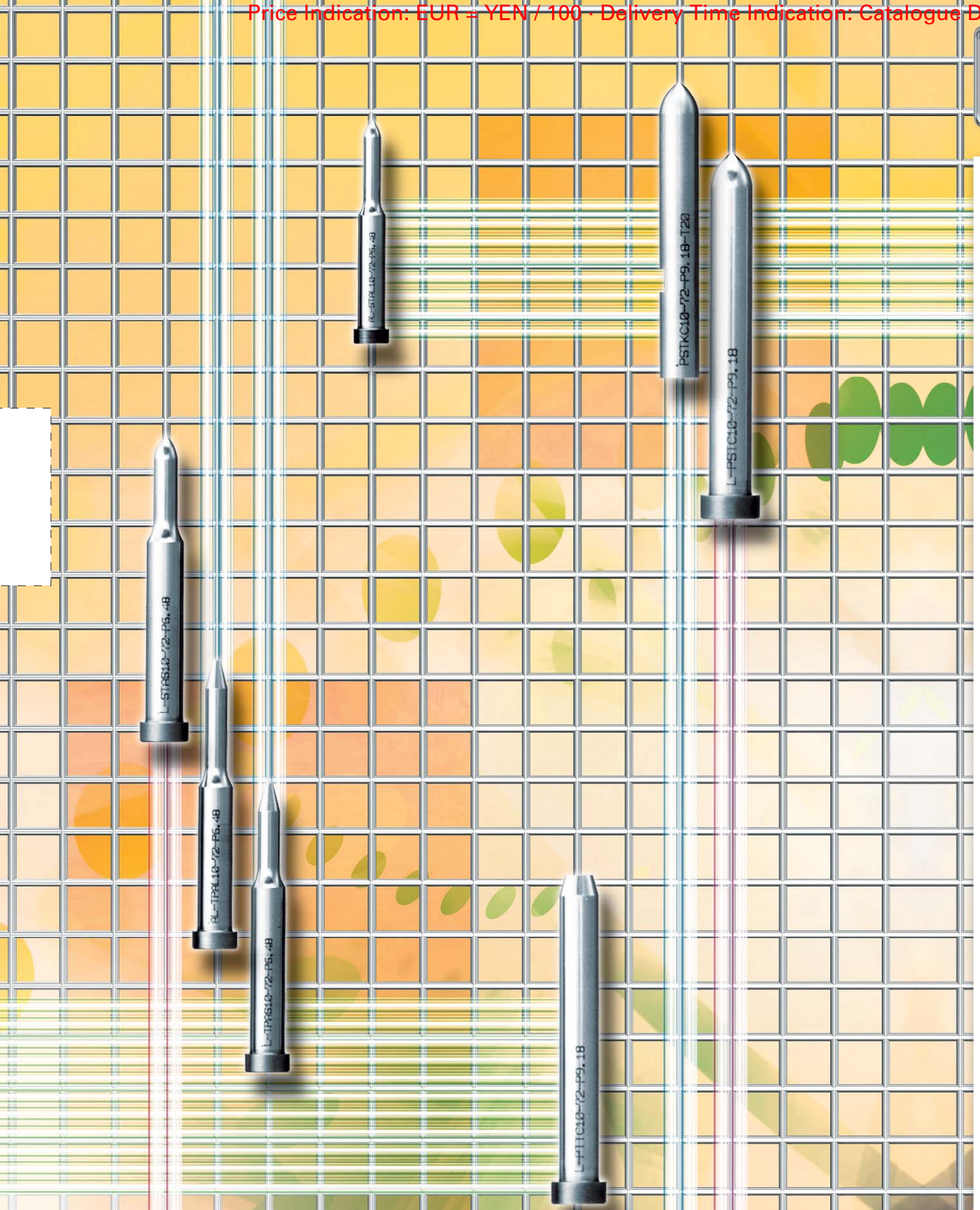
Catalog No. — L(LC)
KED 6 — LC28

3 Days — Express A 200/1Pc. P.38

A flat charge of 540 yen for 3 pieces or more of the same size.

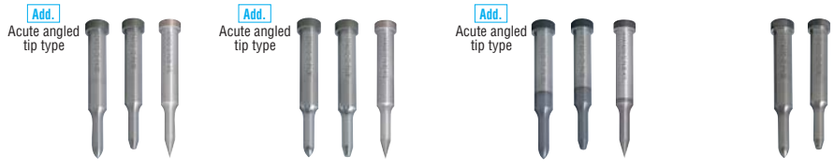
Alteration	Code	Spec.	¥/1Code
Full length 	LC	LC=1mm incremants B: 2 LC range 5～20; 3 6～30; 4 8～50; 5 8～50; 6 10～60; 7 15～60; 8 15～80; 10 15～80; 12 20～80; 14 25～90; 15 25～90; 16 35～100; 18 35～110	200

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.



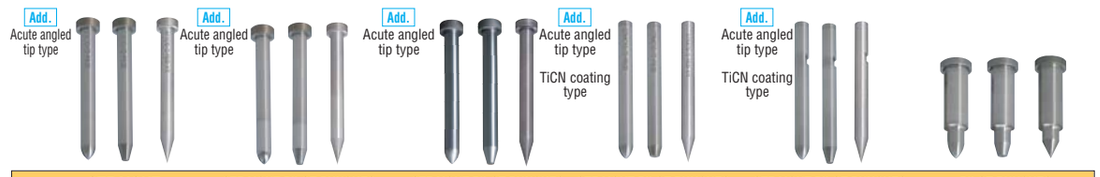
PILOT PUNCHES

PILOT PUNCHES



Name / Catalog No.	PILOT PUNCHES	PILOT PUNCHES —Lapping type—	PILOT PUNCHES —TiCN coating type—	PILOT PUNCHES —Dicoat ® type—
Delivery	③Ⓣ Ⓐ	③Ⓣ Ⓐ	③	③Ⓐ
Page	201	203	205	207

PILOT PUNCHES WITH DOWEL	PILOT PUNCHES —Normal type—	PILOT PUNCHES —Configurable type— —Dicoat ® type—	PILOT PUNCHES PRESS-FIT TYPE	PILOT PUNCHES WITH TAP HOLE	PILOT PUNCHES WITH KEY GROOVE
③Ⓣ Ⓐ ③	③Ⓐ	③	③	③Ⓣ Ⓐ ③	③Ⓐ ③
209	211	211	212	213	215



STRAIGHT PILOT PUNCHES	STRAIGHT PILOT PUNCHES —Lapping type—	STRAIGHT PILOT PUNCHES —TiCN coating type—	STRAIGHT PILOT PUNCHES WITH TAP HOLE	STRAIGHT PILOT PUNCHES WITH KEY GROOVE	PILOT PUNCHES —Fixed in stripper plate—
③Ⓐ	③Ⓐ	③	③Ⓐ ③	③Ⓐ ③	③Ⓣ Ⓐ
217	219	221	223	225	227

PILOT PUNCHES —Fixed in stripper plate— —Lapping type—	PILOT PUNCHES —Fixed in stripper plate— —TiCN coating type—	SHAPED PILOT PUNCHES —Fixed in stripper plate—	PILOT PUNCHES —Fixed in stripper plate— —Normal type—	—Straight type— —Lapping type, Coating type—
③Ⓣ Ⓐ	③	③Ⓐ	③Ⓣ Ⓐ	③Ⓣ Ⓐ ③
227	229	231	233	233 233

PILOT PUNCHES —Fixed in stripper plate— —Normal type, Lapping type, Coating type—	STRAIGHT PILOT PUNCHES —Fixed in stripper plate— —Normal type, Lapping type, Coating type—	PILOT PUNCHES —Movable, type— —Normal type, Lapping type, Coating type—	PILOT PUNCHES —Movable, type— —Normal type, Lapping type, Coating type—
③Ⓐ ③Ⓐ ③	③Ⓐ ③Ⓐ ③	③Ⓣ Ⓐ ③Ⓣ Ⓐ ③	③Ⓣ Ⓐ ③Ⓣ Ⓐ ③
235 235 235	236 236 236	237 237 238	239 239 240

PILOT PUNCHES —Fixed point diameter type—	PILOT EJECTOR BUSHINGS MEG
③Ⓣ Ⓐ	③Ⓣ Ⓐ
241	242

PILOT PUNCHES
—GUIDE—

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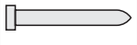
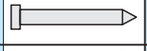
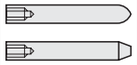
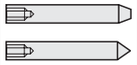
Shank shape		Tip	M	Shank diameter tolerance	Standard (Normal)		Lapping		TiCN COATING		DICOAT®	
Standard		R	SKD11 or equivalent	Dm5	STA□	P.201	L—STA□	P.203	H—HSTA□	P.205	T—STA□	P.207
				D +0.005 0	A—STA□		AL—STA□		AH—HSTA□		AT—STA□	
			SKH51	Dm5	HSTA□		L—HSTA□		H—PSTA□		T—PSTA□	P.207
				D +0.005 0	A—HSTA□		AL—HSTA□		AH—PSTA□		AT—PSTA□	
			Powdered high -speed steel	Dm5	PSTA□		L—PSTA□					
				D +0.005 0	A—PSTA□		AL—PSTA□					
		Taper	SKD11 or equivalent	Dm5	TPA□	P.201	L—TPA□	P.203	H—HTPA□	P.205	T—TPA□	P.207
				D +0.005 0	A—TPA□		AL—TPA□		AH—HTPA□		AT—TPA□	
			SKH51	Dm5	HTPA□		L—HTPA□		H—PTPA□		T—PTPA□	P.207
				D +0.005 0	A—HTPA□		AL—HTPA□		AH—PTPA□		AT—PTPA□	
			Powdered high -speed steel	Dm5	PTPA□		L—PTPA□					
				D +0.005 0	A—PTPA□		AL—PTPA□					
		Acute-angle	SKD11 or equivalent	Dm5	ATA□	P.201	L—ATA□	P.203	H—HATA□	P.205		
				D +0.005 0	A—ATA□		AL—ATA□		AH—HATA□			
			SKH51	Dm5	HATA□		L—HATA□		H—PATA□			
				D +0.005 0	A—HATA□		AL—HATA□		AH—PATA□			
			Powdered high -speed steel	Dm5	PATA□		L—PATA□					
				D +0.005 0	A—PATA□		AL—PATA□					
With dowel		R	SKD11 or equivalent	Dm5	STA□C	P.209			H—STA□C	P.209	T-STA□C	P.209
		Taper	SKD11 or equivalent	Dm5	TPA□C	P.209			H—TPA□C	P.209	T-TPA□C	P.209
		Acute-angle	SKD11 or equivalent	Dm5	ATA□C	P.209			H—ATA□C	P.209		
Configurable type		Taper	SKD11 or equivalent	Dm5	RTP	P.211					T—RTP	P.211
					RTPE						T—RTPE	
Press fit head		R	Powdered high -speed steel	D +0.005 0	PSTHAL	P.212	Alteration SC	P.212	H—PSTHAL	P.212		
		Taper	Powdered high -speed steel	D +0.005 0	PTPHAL	P.212			H—PTPHAL	P.212		
		Acute-angle	Powdered high -speed steel	D +0.005 0	PATHAL	P.212			H—PATHAL	P.212		
With tap hole		R	SKD11 or equivalent	Dm5	STMA□	P.213	Alteration SC	P.214				
				D +0.005 0	A—STMA□				H—PSTMA□	P.213		
			Powdered high -speed steel	Dm5	PSTMA□				AH—PSTMA□			
				D +0.005 0	A—PSTMA□							
		Taper	SKD11 or equivalent	Dm5	TPMA□	P.213						
				D +0.005 0	A—TPMA□				H—PTPMA□	P.213		
			Powdered high -speed steel	Dm5	PTPMA□				AH—PTPMA□			
				D +0.005 0	A—PTPMA□							
		Acute-angle	SKD11 or equivalent	Dm5	ATMA□	P.213						
				D +0.005 0	A—ATMA□							
			Powdered high -speed steel	Dm5	PATMA□				H—PATMA□	P.213		
				D +0.005 0	A—PATMA□				AH—PATMA□			
With key groove		R	SKD11 or equivalent	Dm5	STKA□	P.215	Alteration SC	P.216				
				D +0.005 0	A—STKA□				H—HSTKA□	P.215		
			SKH51	Dm5	HSTKA□				AH—HSTKA□			
				D +0.005 0	A—HSTKA□							
			Powdered high -speed steel	Dm5	PSTKA□				H—PSTKA□	P.215		
				D +0.005 0	A—PSTKA□				AH—PSTKA□			
		Taper	SKD11 or equivalent	Dm5	TPKA□	P.215						
				D +0.005 0	A—TPKA□				H—HTPKA□	P.215		
			SKH51	Dm5	HTPKA□				AH—HTPKA□			
				D +0.005 0	A—HTPKA□							
			Powdered high -speed steel	Dm5	PTPKA□				H—PTPKA□	P.215		
				D +0.005 0	A—PTPKA□				AH—PTPKA□			
		Acute-angle	SKD11 or equivalent	Dm5	ATKA□	P.215						
				D +0.005 0	A—ATKA□				H—HATKA□	P.215		
			SKH51	Dm5	HATKA□				AH—HATKA□			
				D +0.005 0	A—HATKA□							
			Powdered high -speed steel	Dm5	PATKA□				H—PATKA□	P.215		
				D +0.005 0	A—PATKA□				AH—PATKA□			
Straight		R	SKD11 or equivalent	—	STC	P.217	L—STC	P.219				
			SKH51	—	HSTC		L—HSTC		H—HSTC	P.221		
			Powdered high -speed steel	—	PSTC		L—PSTC		H—PSTC			
		Taper	SKD11 or equivalent	—	TTC	P.217	L—TTC	P.219				
			SKH51	—	HTTC		L—HTTC		H—HTTC	P.221		
			Powdered high -speed steel	—	PTTC		L—PTTC		H—PTTC			
		Acute-angle	SKD11 or equivalent	—	ATTC	P.217	L—ATTC	P.219				
			SKH51	—	HATTC		L—HATTC		H—HATTC	P.221		
			Powdered high -speed steel	—	PATTC		L—PATTC		H—PATTC			
Straight with tap hole		R	SKD11 or equivalent	—	STMC	P.223	Alteration SC	P.224				
			Powdered high -speed steel	—	PSTMC				H—PSTMC	P.223		
		Taper	SKD11 or equivalent	—	TTMC	P.223						
			Powdered high -speed steel	—	PTTMC				H—PTTMC	P.223		
		Acute-angle	SKD11 or equivalent	—	ATTMC	P.223						
			Powdered high -speed steel	—	PATMC				H—PATMC	P.223		

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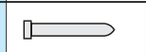
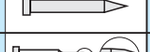
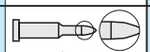
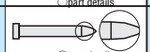
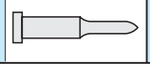
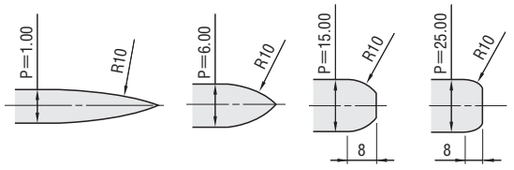
Shank shape		Tip	M	Shank diameter tolerance	Standard (Normal)		Lapping		TiCN COATING		DICOAT®	
Straight with key groove		R	SKD11 or equivalent	—	STKC	P.225	Alteration SC	P.226				
			SKH51	—	HSTKC				H—HSTKC	P.225		
			Powdered high -speed steel	—	PSTKC				H—PSTKC			
		Taper	SKD11 or equivalent	—	TTKC	P.225						
			SKH51	—	HTTKC				H—HTTKC	P.225		
			Powdered high -speed steel	—	PTTKC				H—PTTKC			
		Acute-angle	SKD11 or equivalent	—	ATTKC	P.225						
			SKH51	—	HATKC				H—HATKC	P.225		
			Powdered high -speed steel	—	PATKC				H—PATKC			
Fixed in stripper plate		R	SKD11 or equivalent	Dm5	SPTP	P.227	L—SPTP	P.227				
				D +0.005 0	A—SPTP		AL—SPTP					
			SKH51	Dm5	HTPFR		L—HTPFR		H—HTPFR	P.229		
				D +0.005 0	A—HTPFR		AL—HTPFR		AH—HTPFR			
			Powdered high -speed steel	Dm5	PTPFR		L—PTPFR		H—PTPFR			
				D +0.005 0	A—PTPFR		AL—PTPFR		AH—PTPFR			
		Taper	SKD11 or equivalent	Dm5	TPTP	P.227	L—TPTP	P.227				
				D +0.005 0	A—TPTP		AL—TPTP					
			SKH51	Dm5	HTPFT		L—HTPFT		H—HTPFT	P.229		
				D +0.005 0	A—HTPFT		AL—HTPFT		AH—HTPFT			
			Powdered high -speed steel	Dm5	PTPFT		L—PTPFT		H—PTPFT			
				D +0.005 0	A—PTPFT		AL—PTPFT		AH—PTPFT			
		Acute-angle	SKD11 or equivalent	Dm5	APTP	P.227	L—APTP	P.227				
				D +0.005 0	A—APTP		AL—APTP					
			SKH51	Dm5	HTPFA		L—HTPFA		H—HTPFA	P.229		
				D +0.005 0	A—HTPFA		AL—HTPFA		AH—HTPFA			
			Powdered high -speed steel	Dm5	PTPFA		L—PTPFA		H—PTPFA			
				D +0.005 0	A—PTPFA		AL—PTPFA		AH—PTPFA			
Fixed in stripper plate —Shape type—		Taper	SKD11 or equivalent	Dm5	TPDP	P.231						
					TPEP							
				D +0.005 0	A—TPDP							
					A—TPEP							
Fixed in stripper plate —Straight type—		R	SKD11 or equivalent	—	SPT	P.233	L—SPT	P.233				
			SKH51	—	HTFR		L—HTFR		H—HTFR	P.233		
			Powdered high -speed steel	—	PTFR		L—PTFR		H—PTFR			
		Taper	SKD11 or equivalent	—	TPT	P.233	L—TPT	P.233				
			SKH51	—	HTFT		L—HTFT		H—HTFT	P.233		
			Powdered high -speed steel	—	PTFT		L—PTFT		H—PTFT			
		Acute-angle	SKD11 or equivalent	—	APT	P.233	L—APT	P.233				
			SKH51	—	HTFA		L—HTFA		H—HTFA	P.233		
			Powdered high -speed steel	—	PTFA		L—PTFA		H—PTFA			
Fixed in stripper plate	 ○part details	R & Taper	SKD11 or equivalent	Dm5	SPTPF	P.235	L—SPTPF	P.235				
			SKH51	Dm5	HTFPRF		L—HTFPRF		H—HTFPRF	P.235		
			Powdered high -speed steel	Dm5	PTFPRF		L—PTFPRF		H—PTFPRF			
Fixed in stripper plate	 ○part details	R & Taper	SKD11 or equivalent	—	SPTF	P.236	L—SPTF	P.236				
			SKH51	—	HTFRF		L—HTFRF		H—HTFRF	P.236		
			Powdered high -speed steel	—	PTFRF		L—PTFRF		H—PTFRF			
Movable with head		Acute-angle	SKD11 or equivalent	Dg6	UPTH	P.237	L—UPTH	P.237				
			SKH51	Dg6	HUPTH		L—HUPTH		H—HUPTH	P.238		
			Powdered high -speed steel	Dg6	PUPTH		L—PUPTH		H—PUPTH			
		R & Taper	SKD11 or equivalent	Dg6	UPTHF	P.237	L—UPTHF	P.237				
			SKH51	Dg6	HUPTHF		L—HUPTHF		H—HUPTHF	P.238		
			Powdered high -speed steel	Dg6	PUPTHF		L—PUPTHF		H—PUPTHF			
Movable		Acute-angle	SKD11 or equivalent	Dg6	UPT	P.239	L—UPT	P.239				
				D −0.005 −0.010	A—UPT		AL—UPT					
			SKH51	Dg6	HUPT		L—HUPT		H—HUPT	P.240		
				D −0.005 −0.010	A—HUPT		AL—HUPT		AH—HUPT			
			Powdered high -speed steel	Dg6	PUPT		L—PUPT		H—PUPT			
				D −0.005 −0.010	A—PUPT		AL—PUPT		AH—PUPT			
		R & Taper	SKD11 or equivalent	Dg6	UPTF	P.239	L—UPTF	P.239				
				D −0.005 −0.010	A—UPTF		AL—UPTF					
			SKH51	Dg6	HUPTF		L—HUPTF		H—HUPTF	P.240		
				D −0.005 −0.010	A—HUPTF		AL—HUPTF		AH—HUPTF			
			Powdered high -speed steel	Dg6	PUPTF		L—PUPTF		H—PUPTF			
				D −0.005 −0.010	A—PUPTF		AL—PUPTF		AH—PUPTF			
Tip diameter Selective		R	SKD11 or equivalent	Dm5	STAZ	P.241						

■Outer shape of tip R

Outer shape of tip R changes depending on dimension P.



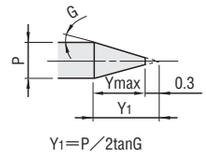
■Specifiable range of alteration YC

The range of YC has been extended.

1≦YC≦Ymax≦18

Ymax=P／2tanG−0.3

- When P<2.0, G=10
  ···›Ymax=P×2.83−0.3
- When P≧2.0, G=15
  ···›Ymax=P×1.86−0.3
- When combining with GC,
  ···›Ymax=P／2tanGC−0.3



Y1=P／2tanG

PRESS ADD.SPEC. Printed in Red

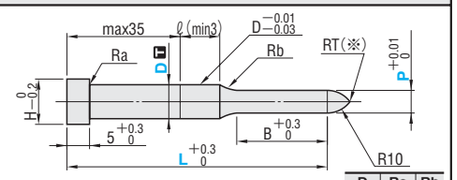
PILOT PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type	Tip length B
–Tip R– RoHS	D_{m5}	SKD11 or equivalent 60～63HRC	STA	S L X
		SKH51 61～64HRC	HSTA	
		Powdered high-speed steel 64～67HRC	PSTA	
	$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	A—STA	
		SKH51 61～64HRC	A—HSTA	
		Powdered high-speed steel 64～67HRC	A—PSTA	
–Tip tapered– RoHS	D_{m5}	SKD11 or equivalent 60～63HRC	TPA	
		SKH51 61～64HRC	HTPA	
		Powdered high-speed steel 64～67HRC	PTPA	
	$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	A—TPA	
		SKH51 61～64HRC	A—HTPA	
		Powdered high-speed steel 64～67HRC	A—PTPA	
–Tip acute-angle– RoHS	D_{m5}	SKD11 or equivalent 60～63HRC	ATA	
		SKH51 61～64HRC	HATA	
		Powdered high-speed steel 64～67HRC	PATA	
	$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	A—ATA	
		SKH51 61～64HRC	A—HATA	
		Powdered high-speed steel 64～67HRC	A—PATA	

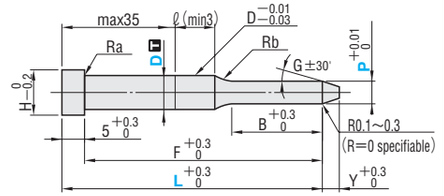
Outer shape of R changes depending on dimension P. P.200
Shank Dia. Tolerance D T m5 $^{+0.005}_{0}$ Selectable

Shape



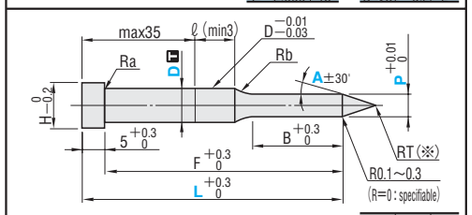
D	Ra	Rb
D≧3	≦0.5	10
D<3	≦0.2	2

RT(※)•••▸P<8 tip is rounded for safety purpose.
When tip should stay sharp, specify RT=0.
(When P≧8, tip end is flat. P.1208)
Refer to the product data "R length of Punch" for the length of tip R. P.1208



P	G
P≦1.999	10°
P≧2.000	15°

D	Ra	Rb
D≧3	≦0.5	10
D<3	≦0.2	2



D	Ra	Rb
D≧3	≦0.5	10
D<3	≦0.2	2

Tip length (B)
X>L>S

RT(※)•••▸The tip is rounded for safety purpose.
When tip should stay sharp, specify RT=0.

Catalog No. Type	B Tip length	D	L	0.01mm increments min. P max.	A	B	H	Y
(D_{m5})	S	1.6	42 52 62	0.30～ 1.59	(10) (15) (20) 25 30	(6)	2.6	(1)
M SKD11 or equivalent STA		2.0	42 52 62	0.50～ 1.99		8	3	
(D3～25) TPA		2.5	42 52 62	1.00～ 2.49			3.5	2
ATA		3	42 52 62 72 82 (92)	1.00～ 2.99		10	5	
M SKH51 HSTA		4	42 52 62 72 82 (92)	1.00～ 3.99			7	
HTPA		5	42 52 62 72 82 (92)	2.00～ 4.99			8	3
HATA		6	42 52 62 72 82 (92)	2.50～ 5.99			9	
M Powdered high-speed steel PSTA		8	(42) 52 62 72 82 (92) (102) (112)	3.00～ 7.99		15	11	5
PTPA		10	(42) 52 62 72 82 (92) (102) (※)	3.00～ 9.99			13	
PATA		13	(42) 52 62 72 82 (92) (102) (※)	6.00～12.99			16	
		16	(42) 52 62 72 82 (92) (102) (※)	10.00～15.99		21	19	8
		20	(42) 52 62 72 82 (92) (102) (※)	13.00～19.99			23	
		25	(42) 52 62 72 82 (92) (102) (※)	18.00～24.99			28	
($D^{+0.005}_{0}$)	L	1.6	42 52 62	0.50～ 1.59	(10) (15) (20) 25 30	8	2.6	(1)
M SKD11 or equivalent A—STA		2.0	42 52 62	0.50～ 1.99		10	3	
(D3～25) A—TPA		2.5	42 52 62	1.00～ 2.49		13	3.5	2
A—ATA		3	52 62 72 82 (92)	1.00～ 2.99		15	5	
M SKH51 A—HSTA		4	52 62 72 82 (92)	1.00～ 3.99			7	
A—HTPA		5	52 62 72 82 (92)	2.00～ 4.99			8	3
A—HATA		6	52 62 72 82 (92)	2.50～ 5.99			9	
M Powdered high-speed steel A—PSTA		8	52 62 72 82 (92) (102) (112)	3.00～ 7.99		21	11	5
A—PTPA		10	52 62 72 82 (92) (102) (※)	3.00～ 9.99			13	
A—PATA		13	52 62 72 82 (92) (102) (※)	6.00～12.99			16	
		16	62 72 82 (92) (102) (※)	10.00～15.99		27	19	8
		20	62 72 82 (92) (102) (※)	13.00～19.99			23	
		25	62 72 82 (92) (102) (※)	18.00～24.99			28	
	X	3	52 62 72 82 (92)	1.20～ 2.99	(10) (15) (20) 25 30	21	5	2
		4	52 62 72 82 (92)	1.20～ 3.99			7	
		5	62 72 82 (92)	2.00～ 4.99		27	8	3
		6	62 72 82 (92)	2.50～ 5.99			9	
		8	62 72 82 (92) (102) (112)	3.00～ 7.99		32	11	5
		10	62 72 82 (92) (102) (※)	3.00～ 9.99			13	
		13	62 72 82 (92) (102) (※)	6.00～12.99			16	
		16	72 82 (92) (102) (※)	10.00～15.99		42	19	8
		20	72 82 (92) (102) (※)	13.00～19.99			23	
		25	72 82 (92) (102) (※)	18.00～24.99			28	

When L(42), tip length B is fixed to 10mm. L(102)(112)•••▸L102 and L112 of D8 are applicable only to m5 SKD11.
L(92)(102)(112)•••▸L92 and L102 and L112 are applicable only to Tip R type and Tip tapered type.
A(10)•••▸When P≧6.0, A(10) not selectable. A(15)•••▸When P≧15.0, A(15) not selectable. A(20)•••▸When P≧20.0, A(20) not selectable.
B(6)•••▸When P<0.5, tip length B is fixed to 2mm. Y(1)•••▸When P<0.5, dimension Y is fixed to 0.5mm.
P>D−0.03•••▸When ℓ=0, P>D−0.03,D $^{-0.01}_{-0.03}$ (press-in lead) is not available. (※)For D10-25 L102 or a larger type, refer to pilot punches with dowel on P.209 (Applicable only to SKD11 of Dm5.)

Order

Catalog No.	L	P	A	(RT=0 R=0)
A—STAS 6	72	P5.02		RT0
PTPAS 6	52	P4.97		
ATAS 6	52	P2.60	A15	R0

A is applicable to acute angle type only.
Only RT=0 can be specified. (Applicable to tip R type P<8)
Only R=0 can be specified. (Applicable to tip tapered type)

Delivery

3 Days

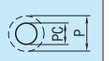
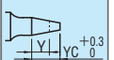
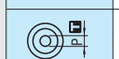
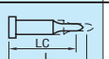
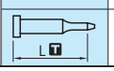
Express	T	1,000/1Pc.
Express	A	500/1Pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

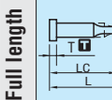
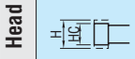
Alteration

Catalog No. — L(LC·LCT·LMT) — P(PC) — A — (RT=0 R=0) — (BC·HC·TC···etc.)
A—STAS 8 — LC76 — PC1.50 — HC10.0

Alterations		Code	Tip R	Tip tapered·acute-angle	¥/1Code
Tip		PC	Changes tip diameter P. PC≧Pmin/2 ≧0.3 0.01mm increments (Combination with PKC → 0.001mm increments)	Changes tip diameter P. PC≧Pmin/2 ≧0.3 0.01mm increments (Combination with PKC → 0.001mm increments) Y max.=YC max.	200
		BC	Changes tip length B. 2≦BC≦Bmax. 0.1mm increments Full length L(LC) requires BC+25mm or more.		200
		RLC	Cuts tip R flat. 2≦RLC<√P(10−P/4) 0.1mm increments Applicable to P<8	——	200
		YC	——	Changes tip taper length Y. ・P<2.0 1≦YC≦PX2.83−0.3 ・P≧2.0 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax+8 0.1mm increments Tip acute-angle type : Not applicable P0.300～0.499 : Not applicable	200
		PKC	Changes tip diameter P +0.01 0 ⇨ +0.005 0 P tolerance. (P : 0.001mm increments.)		400
Full length		LC	Changes the full length L 25+B(BC)≦LC<L 0.1mm increments When LC−B (or BC) is 25mm or less, B (BC) is LC−25mm.		200
		LKC	——	Changes tolerance L. +0.3 0 ⇨ +0.05 0	1,000

P(PC)	Bmax.
0.300～0.499	2
0.500～0.999	10
1.000～1.999	20
2.000～3.999	35
4.000～5.999	45
6.000～	60

P(PC)	Bmax.
0.300～0.499	2
0.500～0.999	8
1.000～1.199	15
1.200～1.999	20
2.000～2.999	30
3.000～3.999	35
4.000～5.999	45
6.000～	60

Alterations		Code	Tip R	Tip tapered·acute-angle	¥/1Code
Full length		LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKC (Thickness) + LC (Length) T +0.3 0 ⇨ +0.02 0		300
		LMT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKM (Thickness) + LC (Length) T +0.3 0 ⇨ 0 −0.02		
Head		KC	Adds single key flat.		200
		WKC	Adds double key flats in parallel.		400
		RC	Reduces head thickness by −0.04～0 from retainer surface. D +0.005 0 type : Not applicable		200
		HC	Changes head diameter H. D≦HC<H 0.1mm increments		200
		TC	Changes head thickness T. 2≦TC<5 0.1mm increments (Combination with LCT·LMT·TKC·TKM→0.01mm increments) L is shortened by (5−TC). When LC is combined, L=LC.		200
		TKC	Changes head thickness tolerance. T +0.3 0 ⇨ +0.02 0		200
		TKM	Changes head thickness tolerance. T +0.3 0 ⇨ 0 −0.02		200
Shank		FKC	——	Changes dimension F tolerance. +0.3 0 ⇨ +0.05 0 Combination with LKC : Not applicable	1,000
		NDC	No press-in lead ℓ≧3⇨ℓ=0		0

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 100 yen required.
Example : A—STAS8, the price is 590 (STAS8 unit price) +100 = 690 yen (product unit)

Tip R type T D_{m5}

D	SKD11 STAS STAL	SKD11 STAX	SKH51 HSTAS HSTAL	SKH51 HSTAX	Powdered high-speed steel PSTAS PSTAL	Powdered high-speed steel PSTAX
1.6	—	—	590	—	800	—
2.0	—	—	590	—	800	—
2.5	—	—	590	—	800	—
3	420	560	540	680	750	890
4	440	580	570	710	800	940
5	470	620	600	770	840	1,020
6	480	640	650	810	940	1,110
8	590	760	900	1,070	1,380	1,570
10	760	930	1,140	1,320	1,760	1,950
13	850	1,100	1,510	1,690	2,560	2,750
16	1,010	1,180	1,810	1,990	3,080	3,270
20	1,260	1,430	2,250	2,430	3,810	4,000
25	1,990	2,160	3,060	3,240	4,760	4,950

Tip tapered type · Tip acute-angle type T D_{m5}

D	SKD11 TPAS TPAL ATAS ATAL	SKD11 TPAX ATAX	SKH51 HTPAS HTPAL HATAS HATAL	SKH51 HTPAX HATAX	Powdered high-speed steel PTPAS PTPAL PATAS PATAL	Powdered high-speed steel PTPAX PATAX
1.6	—	—	670	—	890	—
2.0	—	—	670	—	890	—
2.5	—	—	670	—	890	—
3	490	640	620	760	840	990
4	530	650	660	790	890	1,040
5	550	690	690	850	920	1,110
6	560	710	740	900	1,040	1,210
8	690	860	990	1,160	1,470	1,650
10	850	1,020	1,230	1,410	1,850	2,040
13	930	1,100	1,600	1,780	2,660	2,850
16	1,090	1,260	1,890	2,080	3,170	3,360
20	1,340	1,510	2,330	2,510	3,900	4,090
25	2,070	2,240	3,160	3,330	4,860	5,050

Express service system P.38 · MISUMI Press 2007 · http://misumi.jp/press/ · For inquiry, ordering and other information, refer to P.1269

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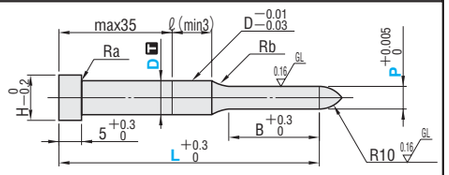
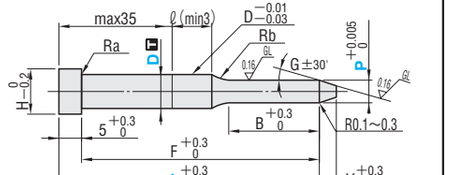
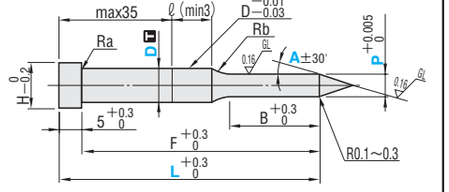
PILOT PUNCHES —LAPPING TYPE—

Type	Shank dia. D T	M H	Catalog No. Type	Catalog No. B Tip length	Shape
—Tip R, Lapping— RoHS Outer shape of R changes depending on dimension P. P.200 Shank Dia. Tolerance D T m5 $^{+0.005}_{0}$ Selectable	D_{m5}	SKD11 or equivalent 60～63HRC	L—STA		 Refer to the product data "R length of Punch" for the length of tip R. P.1208
		SKH51 61～64HRC	L—HSTA		
		Powdered high-speed steel 64～67HRC	L—PSTA		
	$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	AL—STA		
		SKH51 61～64HRC	AL—HSTA		
		Powdered high-speed steel 64～67HRC	AL—PSTA		
—Tip tapered, Lapping— RoHS Shank Dia. Tolerance D T m5 $^{+0.005}_{0}$ Selectable	D_{m5}	SKD11 or equivalent 60～63HRC	L—TPA	S	
		SKH51 61～64HRC	L—HTPA		
		Powdered high-speed steel 64～67HRC	L—PTPA	L	
	$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	AL—TPA		
		SKH51 61～64HRC	AL—HTPA	X	
		Powdered high-speed steel 64～67HRC	AL—PTPA		
—Tip acute-angle, lapping— RoHS Shank Dia. Tolerance D T m5 $^{+0.005}_{0}$ Selectable	D_{m5}	SKD11 or equivalent 60～63HRC	L—ATA		
		SKH51 61～64HRC	L—HATA		
		Powdered high-speed steel 64～67HRC	L—PATA		
	$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	AL—ATA		
		SKH51 61～64HRC	AL—HATA		
		Powdered high-speed steel 64～67HRC	AL—PATA	Tip length (B) X>L>S	

Catalog No. Type	B Tip length	D	L	0.001mm increments min. P max.	A	B	H	Y
(D_{m5})	S	1.6	42 52 62	0.300～ 1.590		(6)	2.6	(1)
M SKD11 or equivalent L—STA		2.0	42 52 62	0.500～ 1.990		8	3	
(D3～25) L—TPA		2.5	42 52 62	1.000～ 2.490			3.5	2
L—ATA		3	42 52 62 72 82 (92)	1.000～ 2.990	(10)	10	5	
M SKH51 L—HSTA		4	42 52 62 72 82 (92)	1.000～ 3.990	(15)		7	
L—HTPA		5	42 52 62 72 82 (92)	2.000～ 4.990	(20)		8	3
L—HATA		6	42 52 62 72 82 (92)	2.500～ 5.990			9	
M Powdered high-speed steel L—PSTA		8	(42) 52 62 72 82 (92) (102)	3.000～ 7.990	25	15	11	5
L—PTPA		10	(42) 52 62 72 82 (92) (102)	3.000～ 9.990			13	
L—PATA		13	(42) 52 62 72 82 (92) (102)	6.000～12.990	30		16	8
		16	(42) 52 62 72 82 (92) (102)	10.000～15.990		21	19	
		20	(42) 52 62 72 82 (92) (102)	13.000～19.990			23	
		25	(42) 52 62 72 82 (92) (102)	18.000～24.990			28	
($D^{+0.005}_{0}$)	L	1.6	42 52 62	0.500～ 1.590		8	2.6	(1)
M SKD11 or equivalent AL—STA		2.0	42 52 62	0.500～ 1.990		10	3	
(D3～25) AL—TPA		2.5	42 52 62	1.000～ 2.490		13	3.5	2
AL—ATA		3	52 62 72 82 (92)	1.000～ 2.990	(10)	15	5	
M SKH51 AL—HSTA		4	52 62 72 82 (92)	1.000～ 3.990	(15)		7	
AL—HTPA		5	52 62 72 82 (92)	2.000～ 4.990	(20)		8	3
AL—HATA		6	52 62 72 82 (92)	2.500～ 5.990			9	
M Powdered high-speed steel AL—PSTA		8	52 62 72 82 (92) (102)	3.000～ 7.990	25	21	11	5
AL—PTPA		10	52 62 72 82 (92) (102)	3.000～ 9.990			13	
AL—PATA		13	52 62 72 82 (92) (102)	6.000～12.990	30		16	8
		16	62 72 82 (92) (102)	10.000～15.990		27	19	
		20	62 72 82 (92) (102)	13.000～19.990			23	
		25	62 72 82 (92) (102)	18.000～24.990			28	
	X	3	52 62 72 82 (92)	1.200～ 2.990		21	5	2
		4	52 62 72 82 (92)	1.200～ 3.990	(10)		7	
		5	62 72 82 (92)	2.000～ 4.990	(15)	27	8	3
		6	62 72 82 (92)	2.500～ 5.990	(20)		9	
		8	62 72 82 (92) (102)	3.000～ 7.990		32	11	5
		10	62 72 82 (92) (102)	3.000～ 9.990	25		13	
		13	62 72 82 (92) (102)	6.000～12.990			16	8
		16	72 82 (92) (102)	10.000～15.990	30	42	19	
		20	72 82 (92) (102)	13.000～19.990			23	
		25	72 82 (92) (102)	18.000～24.990			28	

L(42) ⋯▸ When L(42), tip length B is fixed to 10mm. L(102) ⋯▸ L102 of D8 is applicable only to m5 SKD11.
L(92) (102) ⋯▸ L92 and L102 are applicable only to Tip R type and Tip tapered type.
A(10) ⋯▸ When P≧6.0, A(10) not selectable. A(15) ⋯▸ When P≧15.0, A(15) not selectable. A(20) ⋯▸ When P≧20.0, A(20) not selectable.
B(6) ⋯▸ When P<0.5, tip length B is fixed to 2mm. Y(1) ⋯▸ When P<0.5, dimension Y is fixed to 0.5mm.
P>D−0.03 ⋯▸ When ℓ=0, P>D−0.03,$D^{-0.01}_{-0.03}$ (press-in lead) is not available.

The volume discount rate is also applicable to alteration cost. P.39

Order

Catalog No.	L	P	A
AL—STAS 6	72	P5.020	
L—PTPAS 6	52	P4.970	
L—ATAS 6	52	P2.600	A15

A is applicable to acute angle type only.

Delivery

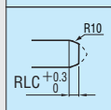
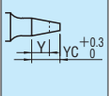
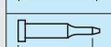
3	Days	
Express	T	1,000/1Pc.
Express	A	500/1Pc.

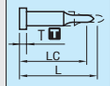
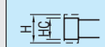
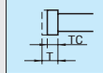
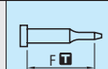
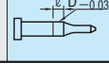
P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Alteration

Catalog No. — L(LC·LCT·LMT) — P(PC) — A — (BC·HC·TC⋯etc.)
L—STAS 8 — LCT76 — PC1.50 — HC10.0

Alterations		Code	Tip R	Tip tapered·acute-angle	¥/1Code
Tip		PC	Changes tip diameter P. PC≧ $\frac{Pmin}{2}$ ≧0.3 0.001mm increments	Changes tip diameter P. PC≧ $\frac{Pmin}{2}$ ≧0.3 0.001mm increments Y max.=YC max.	200
			P(PC) / Bmax: 0.300～0.499 / 2; 0.500～0.999 / 10; 1.000～1.999 / 20; 2.000～3.999 / 35; 4.000～5.999 / 45; 6.000～ / 60	P(PC) / Bmax: 0.300～0.499 / 2; 0.500～0.999 / 8; 1.000～1.199 / 15; 1.200～1.999 / 20; 2.000～2.999 / 30; 3.000～3.999 / 35; 4.000～5.999 / 45; 6.000～ / 60	
		BC	Changes tip length B. 2≦BC≦Bmax. 0.1mm increments Full length L (LC) requires BC+25mm or more.		200
		RLC	Cuts tip R flat. 2≦RLC<$\sqrt{P(10-P/4)}$ 0.1mm increments Applicable to P<8	———	200
		YC	———	Changes tip taper length Y. ・P<2.0 1≦YC≦PX2.83−0.3 ・P≧2.0 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax+8 0.1mm increments Tip acute-angle type : Not applicable P0.300～0.499 : Not applicable	200
Full length		LC	Changes the full length L 25+B(BC)≦LC<L 0.1mm increments When LC−B (BC) is 25mm or less, B (BC) is LC−25mm.		200
		LKC	———	Changes tolerance L. $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	1,000

Alterations		Code	Tip R	Tip tapered·acute-angle	¥/1Code
Full length		LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKC (Thickness) + LC (Length) T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		300
		LMT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKM (Thickness) + LC (Length) T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
Head		KC	Adds single key flat.		200
		WKC	Adds double key flats in parallel.		400
		RC	Reduces head thickness by −0.04～0 from retainer surface. ⊗D $^{+0.005}_{0}$ type : Not applicable		200
		HC	Changes head diameter H. D≦HC<H 0.1mm increments		200
		TC	Changes head thickness T. 2≦TC<5 0.1mm increments (Combination with LCT·LMT·TKC·TKM→0.01mm increments) L is shortened by (5−TC). When LC is combined, L=LC.		200
		TKC	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		200
		TKM	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		200
Shank		FKC	———	Changes dimension F tolerance. F $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ Combination with LKC : Not applicable	1,000
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		0

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}.
For shank tolerance of $D^{+0.005}_{0}$, additional 100 yen required.
Example : AL—STAS8, the price is 1,950 (L—STAS8 unit price) +100 = 2,050 yen (product unit)

Tip R type T D_{m5}

D	SKD11 L—STAS L—STAL	SKD11 L—STAX	SKH51 L—HSTAS L—HSTAL	SKH51 L—HSTAX	Powdered high-speed steel L—PSTAS L—PSTAL	Powdered high-speed steel L—PSTAX
1.6	—	—	1,950	—	2,320	—
2.0	—	—	1,950	—	2,320	—
2.5	—	—	1,950	—	2,320	—
3	1,780	1,920	1,900	2,050	2,270	2,410
4	1,800	1,940	1,940	2,080	2,320	2,460
5	1,830	1,980	1,970	2,140	2,360	2,540
6	1,840	2,000	2,020	2,180	2,460	2,630
8	1,950	2,120	2,270	2,440	2,900	3,090
10	2,120	2,290	2,510	2,690	3,280	3,470
13	2,210	2,460	2,880	3,050	4,080	4,270
16	2,370	2,540	3,180	3,360	4,600	4,790
20	2,620	2,790	3,610	3,790	5,330	5,520
25	3,350	3,520	4,430	4,610	6,280	6,470

Tip tapered type・Tip acute-angle type T D_{m5}

D	SKD11 L—TPAS L—TPAL L—ATAS L—ATAL	SKD11 L—TPAX L—ATAX	SKH51 L—HTPAS L—HTPAL L—HATAS L—HATAL	SKH51 L—HTPAX L—HATAX	Powdered high-speed steel L—PTPAS L—PTPAL L—PATAS L—PATAL	Powdered high-speed steel L—PTPAX L—PATAX
1.6	—	—	2,040	—	2,410	—
2.0	—	—	2,040	—	2,410	—
2.5	—	—	2,040	—	2,410	—
3	1,850	2,000	1,990	2,130	2,360	2,510
4	1,890	2,010	2,030	2,160	2,410	2,560
5	1,910	2,050	2,060	2,220	2,440	2,630
6	1,920	2,070	2,100	2,270	2,560	2,730
8	2,050	2,220	2,360	2,530	2,990	3,170
10	2,210	2,380	2,600	2,780	3,370	3,560
13	2,290	2,460	2,970	3,150	4,180	4,370
16	2,450	2,620	3,260	3,440	4,690	4,880
20	2,700	2,870	3,700	3,880	5,420	5,610
25	3,430	3,600	4,530	4,700	6,380	6,570

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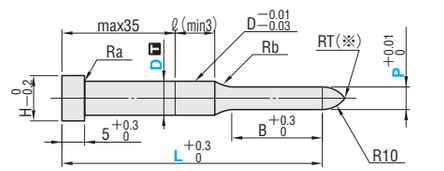
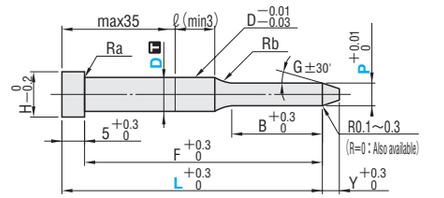
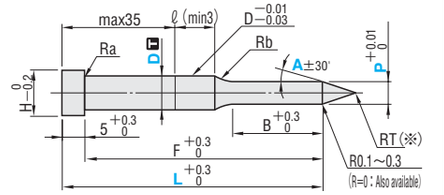
PILOT PUNCHES —TiCN COATING—

PRODUCTS DATA P.1220

COATING PUNCHES —TiCN—

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type	Catalog No. B Tip length	Shape
—Tip R, TiCN coating— RoHS Outer shape of R changes depending on dimension P. P.200 Shank Dia. Tolerance D T m5 $^{+0.005}_{0}$ Selectable	D_{m5}	SKH51 61～64HRC Surface 3000HV	H—HSTA		 RT(※)•••▸The P＜8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208) Refer to the product data "R length of Punch" for the length of tip R. P.1208
		Powdered high-speed steel 64～67HRC Surface 3000HV	H—PSTA		
	$D^{+0.005}_{0}$	SKH51 61～64HRC Surface 3000HV	AH—HSTA		
		Powdered high-speed steel 64～67HRC Surface 3000HV	AH—PSTA		
—Tip tapered, TiCN coating— RoHS Shank Dia. Tolerance D T m5 $^{+0.005}_{0}$ Selectable	D_{m5}	SKH51 61～64HRC Surface 3000HV	H—HTPA	S L X	
		Powdered high-speed steel 64～67HRC Surface 3000HV	H—PTPA		
	$D^{+0.005}_{0}$	SKH51 61～64HRC Surface 3000HV	AH—HTPA		
		Powdered high-speed steel 64～67HRC Surface 3000HV	AH—PTPA		
—Tip acute-angle, TiCN coating— RoHS Shank Dia. Tolerance D T m5 $^{+0.005}_{0}$ Selectable	D_{m5}	SKH51 61～64HRC Surface 3000HV	H—HATA		 RT(※)•••▸The tip is rounded for safety purpose. When tip should stay sharp, specify RT=0.
		Powdered high-speed steel 64～67HRC Surface 3000HV	H—PATA		
	$D^{+0.005}_{0}$	SKH51 61～64HRC Surface 3000HV	AH—HATA		
		Powdered high-speed steel 64～67HRC Surface 3000HV	AH—PATA	Tip length (B) X>L>S	

Catalog No. Type	B Tip length	D	L (0.001mm increments) min.	P max.	A	B	H	Y
(Dm5) M SKH51 H—HSTA H—HTPA H—HATA M Powdered high-speed steel H—PSTA H—PTPA H—PATA	S	1.6	42 52 62	1.00～ 1.59		6	2.6	1
		2.0	42 52 62	1.00～ 1.99		8	3	
		2.5	42 52 62	1.00～ 2.49			3.5	2
		3	42 52 62 72 82 (92)	1.00～ 2.99	(10)	10	5	
		4	42 52 62 72 82 (92)	1.00～ 3.99	(15)		7	
		5	42 52 62 72 82 (92)	2.00～ 4.99	(20)		8	3
		6	42 52 62 72 82 (92)	2.50～ 5.99			9	
		8	(42) 52 62 72 82 (92)	3.00～ 7.99	25	15	11	5
		10	(42) 52 62 72 82 (92) (102)	3.00～ 9.99			13	
		13	(42) 52 62 72 82 (92) (102)	6.00～12.99	30		16	
		16	(42) 52 62 72 82 (92) (102)	10.00～15.99		21	19	8
		20	(42) 52 62 72 82 (92) (102)	13.00～19.99			23	
		25	(42) 52 62 72 82 (92) (102)	18.00～24.99			28	
(D $^{+0.005}_{0}$) M SKH51 AH—HSTA AH—HTPA AH—HATA M Powdered high-speed steel AH—PSTA AH—PTPA AH—PATA	L	1.6	42 52 62	1.00～ 1.59		8	2.6	1
		2.0	42 52 62	1.00～ 1.99		10	3	
		2.5	42 52 62	1.00～ 2.49		13	3.5	2
		3	52 62 72 82 (92)	1.00～ 2.99	(10)	15	5	
		4	52 62 72 82 (92)	1.00～ 3.99	(15)		7	
		5	52 62 72 82 (92)	2.00～ 4.99	(20)		8	3
		6	52 62 72 82 (92)	2.50～ 5.99			9	
		8	52 62 72 82 (92)	3.00～ 7.99	25	21	11	5
		10	52 62 72 82 (92) (102)	3.00～ 9.99			13	
		13	52 62 72 82 (92) (102)	6.00～12.99	30		16	
		16	62 72 82 (92) (102)	10.00～15.99		27	19	8
		20	62 72 82 (92) (102)	13.00～19.99			23	
		25	62 72 82 (92) (102)	18.00～24.99			28	
	X	3	52 62 72 82 (92)	1.20～ 2.99		21	5	2
		4	52 62 72 82 (92)	1.20～ 3.99	(10)		7	
		5	62 72 82 (92)	2.00～ 4.99	(15)	27	8	3
		6	62 72 82 (92)	2.50～ 5.99			9	
		8	62 72 82 (92)	3.00～ 7.99	(20)	32	11	5
		10	62 72 82 (92) (102)	3.00～ 9.99			13	
		13	62 72 82 (92) (102)	6.00～12.99	25		16	
		16	72 82 (92) (102)	10.00～15.99		42	19	8
		20	72 82 (92) (102)	13.00～19.99	30		23	
		25	72 82 (92) (102)	18.00～24.99			28	

L(42)•••▸When L(42), tip length B is fixed to 10mm.
L(92)(102)•••▸L92 and L102 are applicable only to Tip R type and Tip tapered type only.
A(10)•••▸When P≧6.0, A(10) not selectable. A(15)•••▸When P≧15.0, A(15) not selectable. A(20)•••▸When P≧20.0, A(20) not selectable.
P＞D−0.03 •••▸When ℓ=0, P＞D−0.03,D$^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order

Catalog No.	L	P	A	(RT=0 R=0)
H—HSTAS 6	72	P5.02		RT0
H—PTPAS 6	52	P4.97		
AH—HATAS 6	52	P2.60	A15	R0

A is applicable to acute angle type only.
Only RT=0 can be specified. (Applicable to tip R type of P＜8)
Only R=0 can be specified. (Applicable to tip tapered type)

Delivery 3 Days

Alteration Catalog No. — L(LC·LCT·LMT) — P(PC) — A — (RT=0 R=0) — (BC·HC·TC···etc.)
H—PSTAS 8 — LMT76 — PC1.50 — HC10.0

Alterations	Code	Tip R	Tip tapered·acute-angle	¥/1Code
Tip	PC	Changes tip diameter P. PC≧ $\frac{Pmin}{2}$ ≧1.00 0.01mm increments (Combination with PKC→ 0.001mm increments) P(PC) Bmax. 1.000～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 50	Changes tip diameter P. PC≧ $\frac{Pmin}{2}$ ≧1.00 0.01mm increments (Combination with PKC→ 0.001mm increments) Y max.=YC max. P(PC) Bmax. 1.000～1.199 15; 1.200～1.999 20; 2.000～2.999 30; 3.000～3.999 35; 4.000～5.999 45; 6.000～ 50	200
	BC	Changes tip length B. 2≦BC≦Bmax 0.1mm increments L requires BC+25mm or more.		200
	RLC	Cuts tip R flat. 2≦RLC＜√P(10−P/4) 0.1mm increments Applicable to P＜8	———	200
	YC	———	Changes tip taper length Y. ・P＜2.0 1≦YC≦PX2.83−0.3 ・P≧2.0 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax+8 0.1mm increments Tip acute-angle type : Not applicable	200
	SC	Finishes tip with lapping. Dimension P tolerances remain the same. The base material is finished before coating. R=0, RT=0:Not available		1,200
	PKC	Changes tolerance on P. P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P:0.001mm increments.) D＞13:Not applicable		600
Full length	LC	Changes the full length L 25+B(BC)≦LC＜L 0.1mm increments When LC−B(BC)is 25mm or less, B(BC)is LC−25mm.		200
	LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKC (Thickness) + LC (Length) T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		300
	LMT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKM (Thickness) + LC (Length) T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
Head	KC	Adds single key flat.		200
	WKC	Adds double key flats in parallel.		400
	RC	Reduces head thickness by −0.04～0 from retainer surface. $^{+0.005}_{0}$ type : Not applicable		200
	HC	Changes head diameter H. D≦HC＜H 0.1mm increments		200
	TC	Changes head thickness T. 2≦TC＜5 0.1mm increments (Combination with LCT·LMT·TKC·TKM→0.01mm increments) L is shortened by (5−TC). When LC is applied, L=LC.		200
	TKC	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		200
	TKM	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		200
Shank	NDC	No press-in lead ℓ≧3⇨ℓ=0		0

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}.
For shank tolerance of $D^{+0.005}_{0}$, additional 100 yen required.
Example : AH—HSTAS8, the price is 2,340 (H—HSTAS8 unit price) +100 = 2,440 yen (product unit)

Tip R type T D_{m5}

D	SKH51 H—HSTAS H—HSTAL	SKH51 H—HSTAX	Powdered high-speed steel H—PSTAS H—PSTAL	Powdered high-speed steel H—PSTAX
1.6	1,720	—	1,930	—
2.0	1,720	—	1,930	—
2.5	1,720	—	1,930	—
3	1,640	1,780	1,850	1,990
4	1,710	1,850	1,930	2,070
5	1,790	1,960	2,020	2,200
6	1,960	2,120	2,240	2,410
8	2,340	2,510	2,820	3,010
10	2,730	2,910	3,340	3,530
13	3,250	3,420	4,290	4,480
16	3,720	3,900	4,980	5,170
20	4,350	4,530	5,900	6,090
25	5,250	5,430	6,940	7,130

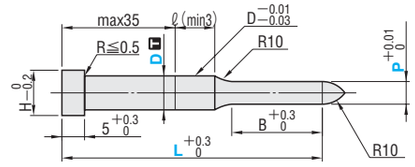
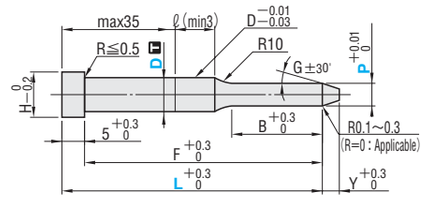
Tip tapered type · Tip acute-angle type T D_{m5}

D	SKH51 H—HTPAS H—HTPAL H—HATAS H—HATAL	SKH51 H—HTPAX H—HATAX	Powdered high-speed steel H—PTPAS H—PTPAL H—PATAS H—PATAL	Powdered high-speed steel H—PTPAX H—PATAX
1.6	1,800	—	2,150	—
2.0	1,800	—	2,150	—
2.5	1,800	—	2,150	—
3	1,720	1,870	2,070	2,220
4	1,800	1,930	2,150	2,300
5	1,880	2,040	2,240	2,430
6	2,050	2,210	2,490	2,660
8	2,440	2,610	3,080	3,260
10	2,820	3,000	3,620	3,810
13	3,340	3,520	4,590	4,780
16	3,800	3,980	5,290	5,480
20	4,430	4,610	6,240	6,430
25	5,340	5,510	7,290	7,480

PILOT PUNCHES
—DICOAT® —

PRODUCTS DATA P.1215

DICOAT® PUNCHES

Type	Shank dia. D T	M / H	Catalog No. Type	Catalog No. B Tip length	Shape
–Tip R, Dicoat®– RoHS Outer shape of R changes depending on dimension P. P.200 ⓟShank Dia. Tolerance D T m5 +0.005 0 Selectable	Dm5	SKD11 or equivalent 60～63HRC Surface 3000HV	T—STA	S L X	 ⓟRefer to the product data "R length of Punch" for the length of tip R. P.1208
		Powdered high-speed steel 62～64HRC Surface 3000HV	T—PSTA		
	D +0.005 0	SKD11 or equivalent 60～63HRC Surface 3000HV	AT—STA		
		Powdered high-speed steel 62～64HRC Surface 3000HV	AT—PSTA		
– Tip tapered, Dicoat®– RoHS ⓟShank Dia. Tolerance D T m5 +0.005 0 Selectable	Dm5	SKD11 or equivalent 60～63HRC Surface 3000HV	T—TPA		 P: P≦1.99 10°, P≧2.00 15°
		Powdered high-speed steel 62～64HRC Surface 3000HV	T—PTPA		
	D +0.005 0	SKD11 or equivalent 60～63HRC Surface 3000HV	AT—TPA		
		Powdered high-speed steel 62～64HRC Surface 3000HV	AT—PTPA	Tip length (B) X>L>S	

Catalog No. Type	B Point length	D	L	0.01mm increments min. P max.	B	H	Y
(Dm5) M SKD11 or equivalent T—STA T—TPA	S	3	42 52 62 72	1.00～ 2.99	10	5	2
		4	42 52 62 72	1.00～ 3.99		7	
		5	42 52 62 72	2.00～ 4.99		8	3
		6	42 52 62 72	2.50～ 5.99		9	
		8	(42) 52 62 72 82 92	3.00～ 7.99	15	11	5
		10	(42) 52 62 72 82 92 102	3.00～ 9.99		13	
		13	(42) 52 62 72 82 92 102	6.00～12.99		16	8
		(16)	(42) 52 62 72 82 92 102	10.00～15.99	21	19	
		(20)	(42) 52 62 72 82 92 102	13.00～19.99		23	
		(25)	(42) 52 62 72 82 92 102	18.00～24.99		28	
M Powdered high-speed steel T—PSTA T—PTPA	L	3	52 62 72	1.00～ 2.99	15	5	2
		4	52 62 72	1.00～ 3.99		7	
		5	52 62 72	2.00～ 4.99		8	3
		6	52 62 72	2.50～ 5.99		9	
		8	52 62 72 82 92	3.00～ 7.99	21	11	5
		10	52 62 72 82 92 102	3.00～ 9.99		13	
		13	52 62 72 82 92 102	6.00～12.99		16	8
		(16)	62 72 82 92 102	10.00～15.99	27	19	
		(20)	62 72 82 92 102	13.00～19.99		23	
		(25)	62 72 82 92 102	18.00～24.99		28	
(D +0.005 0) M SKD11 or equivalent AT—STA AT—TPA	X	3	52 62 72	2.00～ 2.99	21	5	2
		4	52 62 72	2.00～ 3.99		7	
		5	62 72	2.00～ 4.99	27	8	3
		6	62 72	2.50～ 5.99		9	
		8	62 72 82 92	3.00～ 7.99	32	11	5
		10	62 72 82 92 102	3.00～ 9.99		13	
		13	62 72 82 92 102	6.00～12.99		16	8
		(16)	72 82 92 102	10.00～15.99	42	19	
		(20)	72 82 92 102	13.00～19.99		23	
M Powdered high-speed steel AT—PSTA AT—PTPA		(25)	72 82 92 102	18.00～24.99		28	

ⓟD=(16)·(20)·(25) are available for shank diameter tolerance Dm5 type only.
ⓟL(42) ⋯› When L(42), tip length B is fixed to 10mm.
ⓟP>D–0.03 ⋯› When ℓ=0, P>D–0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.

The volume discount rate is also applicable to alteration cost. P.39

Order

Catalog No.	–	L	–	P	–	(R=0)
T—STAS 10	–	72	–	P6.48		
T—PTPAL 8	–	82	–	P3.50	–	R0

ⓟOnly R=0 can be specified. (Applicable to tip tapered type)

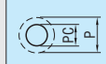
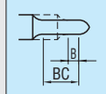
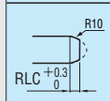
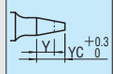
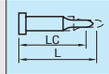
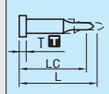
Delivery

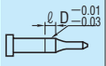
3	Days		
Express	A	800/1Pc.	P.38

⊗ Express A is not available for $D^{+0.005}_{0}$ types.
ⓟA flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration

Catalog No.	–	L(LC·LCT·LMT)	–	P(PC)	–	(R=0)	–	(BC·HC·TC···etc.)
T—STAS 10	–	LC75	–	PC2.25			–	BC13

Alterations		Code	Tip R	Tip tapered	¥/1Code
Tip		PC	Changes tip diameter P. PC≧ Pmin/2 ≧1.00 0.01mm increments P(PC) / Bmax.: 1.00～1.19 15; 1.20～1.99 17; 2.00～2.99 27; 3.00～3.99 32; 4.00～5.99 42; 6.00～ 47	Changes tip diameter P. PC≧ Pmin/2 ≧1.00 0.01mm increments ⓟY=Y max. (Reffer to YC) P(PC) / Bmax.: 1.00～1.19 15; 1.20～1.99 17; 2.00～2.99 27; 3.00～3.99 32; 4.00～5.99 42; 6.00～ 47	200
		BC	Changes tip length B. 2≦BC≦Bmax. 0.1mm increments ⓟL requires BC+25mm or more.		200
		RLC	Cuts tip R flat. 2≦RLC<√P(10—P/4) 0.1mm increments ⓟApplicable to P<8	——	200
		YC	——	Changes tip taper length Y. • P<2.0 1≦YC≦PX2.83—0.3 • P≧2.0 1≦YC≦PX1.86—0.3≦18 L(LC)+YC≦Lmax+8 0.1mm increments	200
Full length		LC	Changes the full length L 30+B(BC)≦LC<L 0.1mm increments ⓟWhen LC—B(or BC)is 25mm or less, B(BC)is LC—25mm.		200
		LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKC (Thickness) + LC (Length) $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		300
		LMT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKM (Thickness) + LC (Length) $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		

Alterations		Code	Tip R / Tip tapered	¥/1Code
Head		KC	Adds single key flat.	200
		WKC	Adds double key flats in parallel.	400
		RC	Reduces head thickness by $^{0}_{-0.04}$ —0.04～0 from retainer surface.	200
		HC	Changes head diameter H. D≦HC<H 0.1mm increments	200
		TC	Changes head thickness T. 2≦TC<5 0.1mm increments (Combination with LCT·LMT·TKC·TKM→0.01mm increments) ⓟL is shortened by (5—TC). When LC is applied, L=LC.	200
		TKC	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	200
		TKM	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	200
Shank		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

ⓟTo be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of Dm5. For shank tolerance of $D^{+0.005}_{0}$, additional 340 yen required.
Example : AT—STAS8, the price is 3,180 (T—STAS8 unit price) +340 = 3,520 yen (product unit)

■Tip R type T Dm5

D	SKD11 T—STAS T—STAL	SKD11 T—STAX	Powdered high-speed steel T—PSTAS T—PSTAL	Powdered high-speed steel T—PSTAX
3	2,330	2,530	2,660	2,860
4	2,420	2,620	2,780	2,980
5	2,650	2,850	3,020	3,220
6	2,850	3,050	3,320	3,520
8	3,180	3,380	3,950	4,150
10	3,480	3,680	4,480	4,680
13	3,910	4,110	5,660	5,860
16	4,440	4,640	6,560	6,760
20	5,020	5,220	7,630	7,830
25	5,710	5,910	8,910	9,110

■Tip tapered type T Dm5

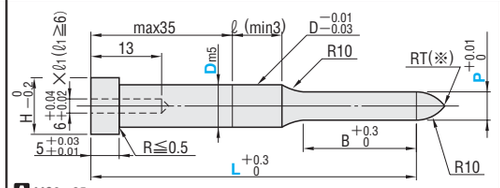
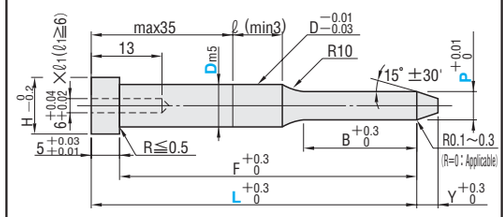
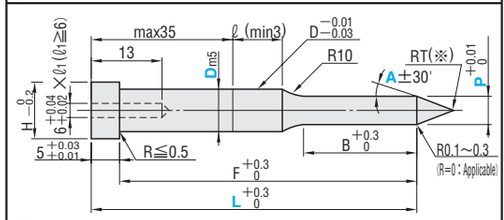
D	SKD11 T—TPAS T—TPAL	SKD11 T—TPAX	Powdered high-speed steel T—PTPAS T—PTPAL	Powdered high-speed steel T—PTPAX
3	2,480	2,680	2,860	3,060
4	2,580	2,780	2,960	3,160
5	2,790	2,990	3,200	3,400
6	3,010	3,210	3,520	3,720
8	3,320	3,520	4,150	4,350
10	3,640	3,840	4,790	4,990
13	4,060	4,260	5,960	6,160
16	4,590	4,790	6,880	7,080
20	5,220	5,420	8,050	8,250
25	5,920	6,120	9,350	9,550

PRESS ADD.SPEC. Printed in Red

PILOT PUNCHES WITH DOWEL
—NORMAL / TiCN COATING / DICOAT®—

PRODUCTS DATA P.1215 ·1220
COATING PUNCHES —TiCN— DICOAT® PUNCHES

¥ The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type	B Tip length	With dowel hole	Shape
—Tip R— RoHS Outer shape of R changes depending on dimension P. P.200	D_{m5}	SKD11 or equivalent 60~63HRC	STA	S L X	C	
		SKD11 or equivalent 60~63HRC Surface 3000HV	TiCN Coating H—STA			
		SKD11 or equivalent 60~63HRC Surface 3000HV	Dicoat® T—STA			
—Tip tapered— RoHS 	D_{m5}	SKD11 or equivalent 60~63HRC	TPA			
		SKD11 or equivalent 60~63HRC Surface 3000HV	TiCN Coating H—TPA			
		SKD11 or equivalent 60~63HRC Surface 3000HV	Dicoat® T—TPA			
—Tip acute-angle— RoHS 	D_{m5}	SKD11 or equivalent 60~63HRC	ATA			
		SKD11 or equivalent 60~63HRC Surface 3000HV	TiCN Coating H—ATA	Tip length (B) X>L>S		

A MS6—25
RT(※)•••▸ The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0.(When Dicoat®, RT=0 : Not applicable) (When P≧8, tip end is flat. P.1208)
Refer to the product data "R length of Punch" for the length of tip R. P.1208

Catalog No. Type	B Tip length	With dowel hole	D	L	0.01mm increments min. P max.	A	B	H	Y
—Normal— STA TPA ATA	S	C	10	(42) 52 62 72 82 92 102 112 122 (132) (142)	3.00~ 9.99	(10)	15	13	5
			13		6.00~12.99	(15)		16	8
			16		10.00~15.99	(20)	21	19	
			20		13.00~19.99	25		23	
			25		18.00~24.99	30		28	
—TiCN Coating— H—STA H—TPA H—ATA	L		10	52 62 72 82 92 102 112 122 (132) (142)	3.00~ 9.99	(10)	21	13	5
			13		6.00~12.99	(15)		16	8
			16	62 72 82 92 102 112 122 (132) (142)	10.00~15.99	(20)	27	19	
			20		13.00~19.99	25		23	
			25		18.00~24.99	30		28	
—Dicoat®— T—STA T—TPA	X		10	62 72 82 92 102 112 122 (132) (142)	3.00~ 9.99	(10)	32	13	5
			13		6.00~12.99	(15)		16	8
			16	72 82 92 102 112 122 (132) (142)	10.00~15.99	(20)	42	19	
			20		13.00~19.99	25		23	
			25		18.00~24.99	30		28	

L(42) •••▸ When L(42), tip length B is fixed to 10mm.
L(132)(142) •••▸ L132 and L142 are applicable only to Tip R type and Tip tapered type.
A(10) •••▸ When P≧9.0, A(10) not selectable. A(15) •••▸ When P≧15.0, A(15) not selectable. A(20) •••▸ When P≧20.0, A(20) not selectable.
P>D−0.03 •••▸ When ℓ=0, P>D−0.03,$D^{-0.01}_{-0.03}$ (press-in lead) is not adaptable.

Order

Catalog No.	—	L	—	P	—	A	—	RT=0 / R=0
STASC 10	—	72	—	P5.50				
H—ATASC 10	—	62	—	P3.80	—	A20	—	R0

A is applicable to acute angle type only.
Only RT=0 can be specified. (Applicable to tip R type of P<8, acute-angle type)
Only R=0 can be specified. (Applicable to tip tapered type, acute-angle type)

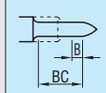
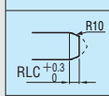
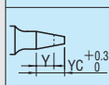
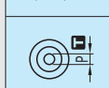
Delivery 3 Days

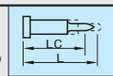
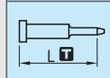
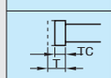
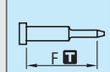
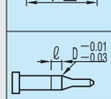
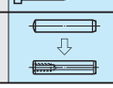
Express	T	1,000/1Pc.
Express	A	500/1Pc.

P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
Express service T and A are not available for TiCN coating type and Dicoat® type.

Alteration

Catalog No.	—	L(LC)	—	P(PC)	—	A	—	RT=0 / R=0	—	(BC·YC·HC···etc.)
STASC 16	—	72	—	PC8.505					—	PKC

Alterations		Code	Tip R	Tip tapered · acute-angle	¥/1Code
Tip		PC	Changes tip diameter P. PC≧ Pmin/2 0.01mm increments (Combination with PKC →0.001mm increments) P(PC) / Bmax.: 1.500~1.999 / 20; 2.000~3.999 / 35; 4.000~5.999 / 45; 6.000~ / (60)	Changes tip diameter P. PC≧ Pmin/2 0.01mm increments (Combination with PKC →0.001mm increments) Ymax=YCmax P(PC) / Bmax.: 1.500~1.999 / 20; 2.000~2.999 / 30; 3.000~3.999 / 35; 4.000~5.999 / 45; 6.000~ / (60)	200
		BC	Changes tip length B. 2≦BC≦Bmax. 0.1mm increments L requires BC+30mm or more. TiCN coating : Bmax.=50, Dicoat® : Bmax.=47		200
		RLC	Cuts tip R flat. 2≦RLC<√P(10−P/4) 0.1mm increments Applicable to P<8	———	200
		YC	———	Changes tip taper length Y. 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax+8 0.1mm increments Tip acute-angle type : Not applicable	200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P : 0.001mm increments.) D>13 of TiCN coating · Dicoat® : Not applicable		400 (TiCN Coating 600)

Alterations		Code	Tip R	Tip tapered · acute-angle	¥/1Code
Full length		LC	Changes the full length L 30+B(BC)≦LC<L 0.1mm increments When LC—B (BC) is 30mm or less, B (BC) is LC—30mm.		200
		LKC	———	Changes tolerance L. L +0.3 0 ⇨ +0.05 0 TiCN coating · Dicoat® : Not applicable	1,000
Head		HC	Changes head diameter H. D≦HC<H 0.1mm increments		200
		TC	Changes head thickness T. 2≦TC<5 0.1mm increments L is shortened by (5−TC). When LC is applied, L=LC.		200
		KC	Adds single key flat.		200
		WKC	Adds double key flats in parallel.		400
Shank		FKC	———	Changes dimension F tolerance. F +0.3 0 ⇨ +0.05 0 TiCN coating · Dicoat® : Not applicable Add with LKC : Not applicable	1,000
		NDC	No press-in lead ℓ≧3⇨ℓ=0		0
Others		TPC	Replaces dowel pin From attached MS6-25 to MSTP6-25(tapped type).		100

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Tip R type

D	Normal STASC STALC	Normal STAXC	TiCN Coating H—STASC H—STALC	TiCN Coating H—STAXC	Dicoat® T—STASC T—STALC	Dicoat® T—STAXC
10	1,190	1,360	2,780	2,950	3,910	4,110
13	1,280	1,450	3,030	3,200	4,340	4,460
16	1,480	1,650	3,400	3,570	4,910	5,110
20	1,870	2,040	3,980	4,150	5,630	5,830
25	2,620	2,790	4,810	4,980	6,340	6,540

■Tip tapered type · Tip acute-angle type

D	Normal TPASC TPALC ATASC ATALC	Normal TPAXC ATAXC	TiCN Coating H—TPASC H—TPALC H—ATASC H—ATALC	TiCN Coating H—TPAXC H—ATAXC	Dicoat® T—TPASC T—TPALC	Dicoat® T—TPAXC
10	1,280	1,450	2,870	3,040	4,070	4,270
13	1,380	1,550	3,130	3,300	4,510	4,710
16	1,570	1,740	3,480	3,650	5,070	5,270
20	1,950	2,120	4,060	4,230	5,830	6,030
25	2,710	2,880	4,910	5,080	6,560	6,760

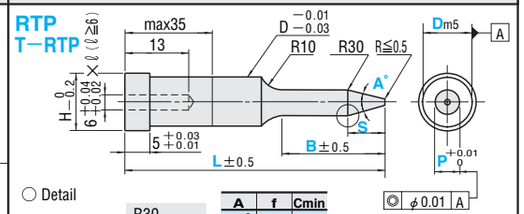
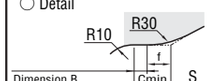
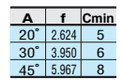
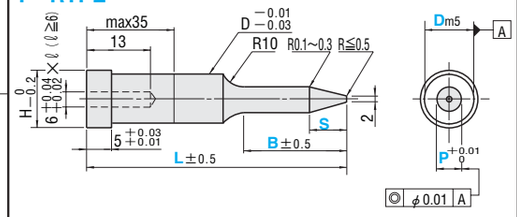
PILOT PUNCHES —CONFIGURABLE—

PRESS ADD.SPEC. Printed in Red

PRODUCTS DATA P.1215

DICOAT® PUNCHES

¥ The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No.	Shape
– Normal – RoHS	Dm5	SKD11 or equivalent 60～63HRC	RTP	RTP T—RTP  ○ Detail  Dimension B straight portion, min2  f is a calculated value. Dimension B must be at least S+Cmin. for machining. S is dimension before R30 processing. A MS6—25
– Dicoat® – RoHS	Dm5	SKD11 or equivalent 60～63HRC Surface3000HV	T—RTP	
– Normal – RoHS	Dm5	SKD11 or equivalent 60～63HRC	RTPE	(Economy type) RTPE T—RTPE  A MS6—25
– Dicoat® – RoHS	Dm5	SKD11 or equivalent 60～63HRC Surface3000HV	T—RTPE	

H	Catalog No. Type	D	1mm increments L	0.01mm increments min. P max.	1mm increments B	1mm increments S	A	U/Price Q'ty : 1～9 RTP	T—RTP 70≦L≦100	T—RTP 100<L≦150
13	RTP T—RTP	(10)	70～(200)	6.00～ 9.99	20～(100)	10～50 S≦B—Cmin	20 30 45	3,170	—	—
16		13		6.00～12.99				3,270	6,510	8,190
19		16		8.00～15.99				3,620	7,150	9,250
23		20		11.00～19.99				4,350	8,420	10,980
28		25		16.00～24.99				5,400	10,360	13,320
35		(32)		18.00～31.99				6,750	—	—

Center hole remains at the tip end. Flat face at the tip end must be over 2mm for center hole. P—2Stan(A/2)≧2 (L—35)≧B≧(S+Cmin)
⊗D(10)(32)•••▸ T-RTP:Not applicable ⊗L(200)•••▸ D10 of RTP and T-RTP is available up to L150. ⊗B(100)•••▸ When D=10, dimension B is up to B50.

H	Catalog No. Type	D	1mm increments L	0.01mm increments min. P max.	1mm increments B	1mm increments S	U/Price Q'ty : 1～9 RTPE	T—RTPE 70≦L≦100	T—RTPE 100<L≦150
13	RTPE T—RTPE	(10)	70～150	6.00～ 9.99	10～50	8～45 S≦B—2	2,320	—	—
16		13		6.00～12.99			2,420	5,460	7,260
19		16		8.00～15.99			2,680	5,980	7,960
23		20		11.00～19.99			3,220	6,890	9,140
28		25		16.00～24.99			3,980	7,940	10,360
35		(32)		18.00～31.99			5,000	—	—

(L—35)≧B≧(S+2) ⊗D(10)(32)•••▸T-RTPE:Not applicable

Order

Catalog No.	L	P	B	S	A
RTP 20	160	P15.20	B43	S20	A30
RTPE 20	150	P15.20	B43	S20	
T—RTP 20	120	P15.20	B43	S20	A30

Alteration Catalog No. — L — P — B — S — A —(HC・TC・LKC…etc.)

RTP 20	160	P15.20	B43	S20	A30	HC22.0
RTPE 20	150	P15.20	B43	S20		HC22.0

Delivery 3 Days — Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.
⊗Express A is not available for Dicoat® types.

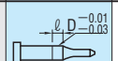
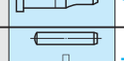
Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alterations		Code	Spec.	¥/1Code
Head		HC	Changes head diameter H. D≦HC<H 0.1mm increments	200
		TC	Changes head thickness T. 2≦TC<5 0.1mm increments	200
		KC	Adds single key flat.	200

Alterations		Code	Spec.	¥/1Code
Full length		LKC	Changes tolerance L. L±0.5⇨L±0.05 ⊗Dicoat® type is not available. 0.1mm incr. available for L with LKC. The tips R shape remains as is.	400
Shank		NDC	No press-in lead ℓ≧3⇨ℓ=0	0
Others		TPC	Replaces dowel pin From attached MS6-25 to MSTP6-25 (tapped type).	100

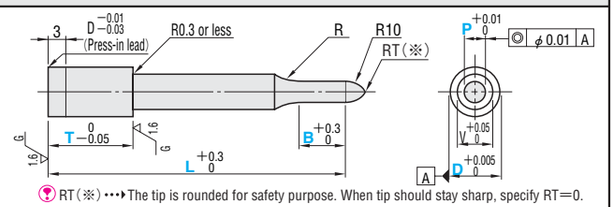
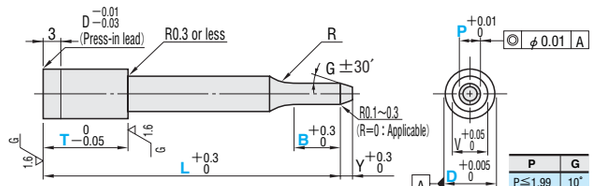
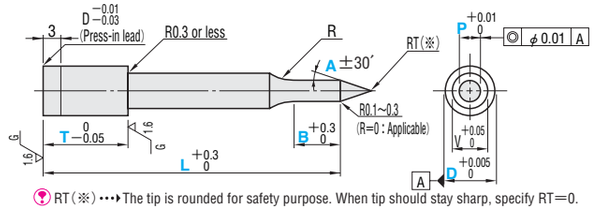
PILOT PUNCHES PRESS FIT HEAD TYPE —NORMAL / TiCN COATING—

PRESS ADD.SPEC. Printed in Red

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

¥ The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
—Tip R— RoHS	Powdered high-speed steel 64～67HRC	PSTHAL	
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN Coating H—PSTHAL	
—Tip tapered— RoHS	Powdered high-speed steel 64～67HRC	PTPHAL	 P≦1.99 G 10° P≧2.00 15°
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN Coating H—PTPHAL	
—Tip acute-angle— RoHS	Powdered high-speed steel 64～67HRC	PATHAL	
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN Coating H—PATHAL	

RT(※)•••▸The tip is rounded for safety purpose. When tip should stay sharp, specify RT=0.
Refer to the product data "R length of Punch" for the length of tip R. P.1208

Catalog No. Type	D	L	0.01mm increments min. P max.	A	T	1mm increments B	V	Y	R
—Normal— PSTHAL PTPHAL PATHAL —TiCN Coating— H—PSTHAL H—PTPHAL H—PATHAL	4	42 52	0.50(1.00) ～ 2.00	10 15 20 25 30	13 16 20 / 13 16 20 25	2 ～ 6	2	1	2～3
	5	42 52 (62)	1.00 ～ 3.00		13 16 20 / 13 16 20 25	2 ～ 8	3	2	10
	6	42 52 62 (72)	1.50 ～ 4.00		13 16 20 / 13 16 20 25	2 ～10 / 2 ～13	4	3	
	8	42 52 62 (72)	2.00 ～ 6.00		13 16 20 / 13 16 20 25	2 ～10 / 2 ～13	6		

L(62)(72)•••▸L62 of D5, L72 of D6 / 8 are applicable to tip R type & tip tapered type. P(1.00)•••▸TiCN coating type is Pmin. 1.00.

Order

Catalog No.	L	P	A	T	B	(RT=0 R=0)
PSTHAL 5	62	P3.00		T20	B5	RT0
H—PATHAL 6	52	P2.03～A15		T13	B4	

A is applicable to acute angle type only.
Only RT=0 can be specified. (Applicable to tip R type of P<8, tip acute-angle type)
Only R=0 can be specified. (Applicable to tip tapered type, tip acute-angle type)

Delivery 3 Days

Alteration Catalog No. — L(LC・LCT) — P — A — T(TC) — B — (RT=0 R=0) — (PKC・LKC…etc.)

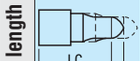
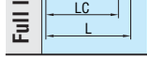
PSTHAL 5 — LC60 — P3.00 — TC15.0 — B5 — PKC

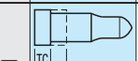
■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	Tip R type PSTHAL	Tip R type H—PSTHAL	Tip tapered・acute-angle type PTPHAL PATHAL	Tip tapered・acute-angle type H-PTPHAL H-PATHAL
4	1,700	2,860	1,800	2,950
5	1,800	3,000	1,900	3,110
6	2,020	3,360	2,120	3,460
8	2,680	4,150	2,770	4,240

Alterations		Code	Tip R	Tip tapered・acute-angle	¥/1Code
Tip		RLC	Cuts tip R flat. 2≦RLC<√P(10—P/4) 0.1mm increments	——	200
		SC	Finishes tip with lapping. The dimension P tolerances and specification units remain the same. ⊗R=0, RT=0:Not available TiCN coating type : The base material is finished before coating.	1,200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P:0.001mm increments.) ⊗TiCN coating type is not applicable.	400
Full length		LC	Changes the full length L 40<LC<L 0.1mm increments (Conbination with LKC → 0.01mm increments) When LC<50 : T and TC are 20 or less. When LC<50 and D=6 or 8, specifiable range of B is 2～10.	200

Alterations		Code	Tip R	Tip tapered・acute-angle	¥/1Code
Full length		LKC	——	Changes tolerance L. +0.3 0 ⇨ +0.05 0 ⊗TiCN coating type is not applicable.	1,000
		LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKC + LC 0 0 T—0.05 ⇨ —0.02		300
Head		TC	Changes head thickness T. 13<TC<25 0.1mm increments When L<50, designation range is 13<TC<20 The full length L remains the same.		200
		TKC	Changes head thickness tolerance. T 0 −0.05 ⇨ 0 −0.02		200

PRESS ADD.SPEC. Printed in Red

PILOT PUNCHES WITH TAP HOLE
—NORMAL / TiCN COATING—

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

The volume discount rate is also applicable to alteration cost. P.39

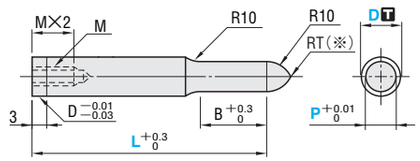
Type	Shank dia. D T	M H	Catalog No. Type: Normal	Catalog No. Type: TiCN Surface 3000HV	B Tip length
—Tip R— RoHS	D_{m5}	SKD11 or equivalent 60~63HRC	STMA Large diameter tap (D16~25) STMLA	—	S / L / X
		Powdered high-speed steel 64~67HRC	PSTMA	H—PSTMA	
	$D^{+0.005}_{0}$	SKD11 or equivalent 60~63HRC	A—STMA	—	
		Powdered high-speed steel 64~67HRC	A—PSTMA	AH—PSTMA	
—Tip tapered— RoHS	D_{m5}	SKD11 or equivalent 60~63HRC	TPMA Large diameter tap (D16~25) TPMLA	—	
		Powdered high-speed steel 64~67HRC	PTPMA	H—PTPMA	
	$D^{+0.005}_{0}$	SKD11 or equivalent 60~63HRC	A—TPMA	—	
		Powdered high-speed steel 64~67HRC	A—PTPMA	AH—PTPMA	
—Tip acute-angle— RoHS	D_{m5}	SKD11 or equivalent 60~63HRC	ATMA Large diameter tap (D16~25) ATMLA	—	
		Powdered high-speed steel 64~67HRC	PATMA	H—PATMA	
	$D^{+0.005}_{0}$	SKD11 or equivalent 60~63HRC	A—ATMA	—	
		Powdered high-speed steel 64~67HRC	A—PATMA	AH—PATMA	

Outer shape of R changes depending on dimension P. P.200

Shank Dia. Tolerance D T $m5^{+0.005}_{0}$ Selectable

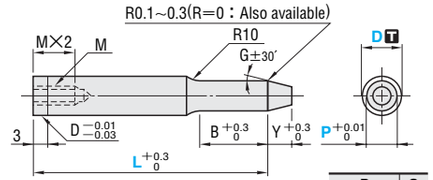
Tip length (B) X>L>S Large diameter tap S・L only

Shape

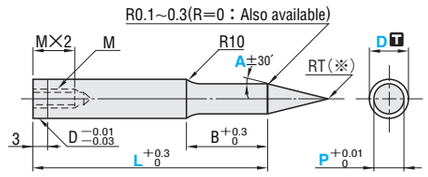


(※)・・・The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208)

Refer to the product data "R length of Punch" for the length of tip R. P.1208



P	G
P≦1.999	10°
P≧2.000	15°



(※)・・・The tip is rounded for safety purpose. When tip should stay sharp, specify RT=0.

Catalog No. Type	B Point length	D	L (min. P max.)	0.01mm increments	A	B	Y	M Standard	M Large diameter
—Normal— (D_{m5}) STMA TPMA ATMA	S	5	42 52 62 (72)	2.00~ 4.99	(10) (15) (20) 25 30	10	3	3	—
		6	42 52 62 (72)	2.50~ 5.99					
		8	(42) 52 62 72 82 (92)	3.00~ 7.99		15	5	4	
		10	(42) 52 62 72 82 (92) (102)	3.00~ 9.99				5	
		13	(42) 52 62 72 82 (92) (102)	6.00~12.99			8		
		16	(42) 52 62 72 82 (92) (102)	10.00~15.99		21		6	8
		20	(42) 52 62 72 82 (92) (102)	13.00~19.99					
		25	(42) 52 62 72 82 (92) (102)	18.00~24.99					
—Large diameter tap— (D16~25) STMLA TPMLA ATMLA	L	5	52 62 (72)	2.00~ 4.99	(10) (15) (20) 25 30	15	3	3	—
		6	52 62 (72)	2.50~ 5.99					
		8	52 62 72 82 (92)	3.00~ 7.99		21	5	4	
		10	52 62 72 82 (92) (102)	3.00~ 9.99				5	
		13	52 62 72 82 (92) (102)	6.00~12.99			8		
		16	62 72 82 (92) (102)	10.00~15.99		27		6	8
		20	62 72 82 (92) (102)	13.00~19.99					
		25	62 72 82 (92) (102)	18.00~24.99					
—Normal— ($D^{+0.005}_{0}$) A—STMA A—TPMA A—ATMA	S	5	42 52 62 (72)	2.00~ 4.99	(10) (15) (20) 25 30	10	3	3	—
		6	42 52 62 (72)	2.50~ 5.99					
		8	(42) 52 62 72 82 (92)	3.00~ 7.99		15	5	4	
		10	(42) 52 62 72 82 (92) (102)	3.00~ 9.99				5	
		13	(42) 52 62 72 82 (92) (102)	6.00~12.99			8		
		16	(42) 52 62 72 82 (92) (102)	10.00~15.99		21		6	8
		20	(42) 52 62 72 82 (92) (102)	13.00~19.99					
		25	(42) 52 62 72 82 (92) (102)	18.00~24.99					
—Large diameter tap— (D16~25) A—STMLA A—TPMLA A—ATMLA	L	5	52 62 (72)	2.00~ 4.99	(10) (15) (20) 25 30	15	3	3	—
		6	52 62 (72)	2.50~ 5.99					
		8	52 62 72 82 (92)	3.00~ 7.99		21	5	4	
		10	52 62 72 82 (92) (102)	3.00~ 9.99				5	
		13	52 62 72 82 (92) (102)	6.00~12.99			8		
		16	62 72 82 (92) (102)	10.00~15.99		27		6	8
		20	62 72 82 (92) (102)	13.00~19.99					
		25	62 72 82 (92) (102)	18.00~24.99					
—Normal— (D_{m5}) PSTMA PTPMA PATMA	S	5	52 62 72	2.00~ 4.99	(10) (15) (20) 25 30	27	3	3	—
		6	52 62 72	2.50~ 5.99					
		8	62 72 82 (92)	3.00~ 7.99		32	5	4	
		10	62 72 82 (92) (102)	3.00~ 9.99				5	
		13	62 72 82 (92) (102)	6.00~12.99			8		
		16	72 82 (92) (102)	10.00~15.99		42		6	
		20	72 82 (92) (102)	13.00~19.99					
		25	72 82 (92) (102)	18.00~24.99					
—Large diameter tap— (D16~25) A—PSTMA A—PTPMA A—PATMA	L	5	52 62 72	2.00~ 4.99	(10) (15) (20) 25 30	27	3	3	—
		6	52 62 72	2.50~ 5.99					
		8	62 72 82 (92)	3.00~ 7.99		32	5	4	
		10	62 72 82 (92) (102)	3.00~ 9.99				5	
		13	62 72 82 (92) (102)	6.00~12.99			8		
		16	72 82 (92) (102)	10.00~15.99		42		6	
		20	72 82 (92) (102)	13.00~19.99					
		25	72 82 (92) (102)	18.00~24.99					
—TiCN coating— H—PSTMA H—PTPMA H—PATMA	X (Large diameter tap : Not available)	5	52 62 72	2.00~ 4.99	(10) (15) (20) 25 30	27	3	3	—
		6	52 62 72	2.50~ 5.99					
		8	62 72 82 (92)	3.00~ 7.99		32	5	4	
		10	62 72 82 (92) (102)	3.00~ 9.99				5	
		13	62 72 82 (92) (102)	6.00~12.99			8		
		16	72 82 (92) (102)	10.00~15.99		42		6	
		20	72 82 (92) (102)	13.00~19.99					
		25	72 82 (92) (102)	18.00~24.99					
—TiCN coating— AH—PSTMA AH—PTPMA AH—PATMA	S	5	42 52 62 (72)	2.00~ 4.99	(10) (15) (20) 25 30	10	3	3	—
		6	42 52 62 (72)	2.50~ 5.99					
		8	(42) 52 62 72 82 (92)	3.00~ 7.99		15	5	4	
		10	(42) 52 62 72 82 (92) (102)	3.00~ 9.99				5	
		13	(42) 52 62 72 82 (92) (102)	6.00~12.99			8		
		16	(42) 52 62 72 82 (92) (102)	10.00~15.99		21		6	8
		20	(42) 52 62 72 82 (92) (102)	13.00~19.99					
		25	(42) 52 62 72 82 (92) (102)	18.00~24.99					
—TiCN coating— AH—PSTMA AH—PTPMA AH—PATMA	L	5	52 62 (72)	2.00~ 4.99	(10) (15) (20) 25 30	15	3	3	—
		6	52 62 (72)	2.50~ 5.99					
		8	52 62 72 82 (92)	3.00~ 7.99		21	5	4	
		10	52 62 72 82 (92) (102)	3.00~ 9.99				5	
		13	52 62 72 82 (92) (102)	6.00~12.99			8		
		16	62 72 82 (92) (102)	10.00~15.99		27		6	8
		20	62 72 82 (92) (102)	13.00~19.99					
		25	62 72 82 (92) (102)	18.00~24.99					
—TiCN coating— AH—PSTMA AH—PTPMA AH—PATMA	X (Large diameter tap : Not available)	5	52 62 72	2.00~ 4.99	(10) (15) (20) 25 30	27	3	3	—
		6	52 62 72	2.50~ 5.99					
		8	62 72 82 (92)	3.00~ 7.99		32	5	4	
		10	62 72 82 (92) (102)	3.00~ 9.99				5	
		13	62 72 82 (92) (102)	6.00~12.99			8		
		16	72 82 (92) (102)	10.00~15.99		42		6	
		20	72 82 (92) (102)	13.00~19.99					
		25	72 82 (92) (102)	18.00~24.99					

(42)・・・B=10 When L(42), tip length B is fixed to 10mm.

(72) (92) (102)・・・L72 of D5 / 6, L92・102 of D8~25 are applicable to tip R type & tip tapered type.

(10)・・・When P≧6.0, A(10) not selectable. (15)・・・When P≧15.0, A(15) not selectable. (20)・・・When P≧20.0, A(20) not selectable.

Order

Catalog No.	L	P	A	(RT=0 / R=0)
A—STMAS 6	72	P5.02		RT0
PTPMAS 6	52	P4.97		
A—ATMAL 10	52	P3.40	A15	R0

A is applicable to acute angle type only.

Only RT=0 can be specified. (Applicable to tip R type of P<8, acute-angle type)

Only R=0 can be specified. (Applicable to tip tapered type, acute-angle type)

Delivery

3 Days

Express	T	1,000/1Pc.
Express	A	500/1Pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Express service T & A is not available for TiCN coating type.

Alteration

Catalog No.	L(LC)	P(PC)	A	(RT=0 / R=0)	(BC・YC…etc.)
TPMAS 13	82	P8.24			KC LKC

Alterations	Code	Tip R type	Tip tapered・acute-angle type	¥/1Code
Tip	PC	Changes tip diameter P. PC≧ Pmin/2 0.01mm increments (Combination with PKC→ 0.001mm increments)	Changes tip diameter P. PC≧ Pmin/2 0.01mm increments (Combination with PKC→ 0.001mm increments) Y max.=YC max.	200
	BC	Changes tip length B. 2≦BC≦Bmax. 0.1mm increments L requires BC+30mm or more. TiCN coating type : Bmax. =50		200
	RLC	Cuts tip R flat. 2≦RLC<√P(10−P/4) 0.1mm increments Applicable to P<8		200
	YC		Changes tip taper length Y. ・P<2.0 1≦YC≦PX2.83−0.3 ・P≧2.0 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax+8 0.1mm increments Tip acute-angle type : Not applicable	200
	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P:0.001mm increments.) TiCN coating D>13 : Not available		400 (TiCN coating 600)
	SC	Finishes tip with lapping. Dimension P tolerances remain the same. R=0, RT=0:Not available TiCN coating type : The base material is finished before coating.		1,200

Alterations	Code	Tip R type	Tip tapered・acute-angle type	¥/1Code
Full length	LC	Changes the full length L. 30+B(BC)≦LC<L 0.1mm increments When LC—B(BC) is 30mm or less, B(BC) is LC−30mm.		200
	LKC	—	Changes tolerance L. +0.3 0 ⇨ +0.05 0 TiCN coating type : Not applicable.	1,000
Head	KC	Adds single key flat. D5 : Not applicable.		200
	WKC	Adds double key flats in parallel. D5 : Not applicable.		400
Shank	SKC	Adds key flat on the shank. P≦D−2.2 KC・WKC : Not applicable D5 / 6 : Not applicable		600

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.

Example : A—STMAS8, the price is 1,040 (STMAS8 unit price) +200 = 1,240 yen (product unit)

■Tip R type T D_{m5}

D	SKD11 STMAS STMAL	SKD11 STMAX	SKD11 STMLAS STMLAL	Powdered high-speed steel PSTMAS PSTMAL	Powdered high-speed steel PSTMAX	Powdered high-speed steel H—PSTMAS H—PSTMAL	Powdered high-speed steel H—PSTMAX
5	910	1,070	—	1,320	1,510	2,530	2,720
6	930	1,100	—	1,430	1,610	2,770	2,940
8	1,040	1,210	—	1,870	2,060	3,340	3,540
10	1,220	1,390	—	2,270	2,470	3,880	4,080
13	1,310	1,480	—	3,080	3,420	4,850	5,040
16	1,460	1,630	1,510	3,610	3,940	5,550	5,750
20	1,780	1,970	1,830	4,340	4,530	6,480	6,680
25	2,520	2,710	2,570	5,290	5,480	7,520	7,720

■Tip tapered type Tip acute-angle type T D_{m5}

D	SKD11 TPMAS TPMAL ATMAS ATMAL	SKD11 TPMAX ATMAX	SKD11 TPMLAS TPMLAL ATMLAS ATMLAL	Powdered high-speed steel PTPMAS PTPMAL PATMAS PATMAL	Powdered high-speed steel PTPMAX PATMAX	Powdered high-speed steel H—PTPMAS H—PTPMAL H—PATMAS H—PATMAL	Powdered high-speed steel H—PTPMAX H—PATMAX
5	1,040	1,180	—	1,410	1,600	2,610	2,810
6	1,050	1,200	—	1,530	1,690	2,870	3,020
8	1,200	1,370	—	1,980	2,160	3,450	3,620
10	1,300	1,470	—	2,370	2,560	3,980	4,180
13	1,380	1,550	—	3,170	3,360	4,940	5,140
16	1,560	1,730	1,610	3,710	3,900	5,660	5,850
20	1,870	2,060	1,920	4,440	4,630	6,580	6,780
25	2,610	2,800	2,660	5,400	5,590	7,630	7,820

Express service system P.38

MISUMI Press 2007 http://misumi.jp/press/

For inquiry, ordering and other information, refer to P.1269

PRESS ADD.SPEC. Printed in Red

PILOT PUNCHES WITH KEY GROOVE
—NORMAL / TiCN COATING—

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

Type	Shank dia. D T	M H	Catalog No. Type: Normal	Catalog No. Type: TiCN coating Surface 3000RV	B Tip length
—Tip R— RoHS	D_{m5}	SKD11 or equivalent 60~63HRC	STKA	—	S L X
		SKH51 61~64HRC	HSTKA	H—HSTKA	
		Powdered high-speed steel 64~67HRC	PSTKA	H—PSTKA	
	$D^{+0.005}_{0}$	SKD11 or equivalent 60~63HRC	A—STKA	—	
		SKH51 61~64HRC	A—HSTKA	AH—HSTKA	
		Powdered high-speed steel 64~67HRC	A—PSTKA	AH—PSTKA	
—Tip tapered— RoHS	D_{m5}	SKD11 or equivalent 60~63HRC	TPKA	—	
		SKH51 61~64HRC	HTPKA	H—HTPKA	
		Powdered high-speed steel 64~67HRC	PTPKA	H—PTPKA	
	$D^{+0.005}_{0}$	SKD11 or equivalent 60~63HRC	A—TPKA	—	
		SKH51 61~64HRC	A—HTPKA	AH—HTPKA	
		Powdered high-speed steel 64~67HRC	A—PTPKA	AH—PTPKA	
—Tip acute-angle— RoHS	D_{m5}	SKD11 or equivalent 60~63HRC	ATKA	—	
		SKH51 61~64HRC	HATKA	H—HATKA	
		Powdered high-speed steel 64~67HRC	PATKA	H—PATKA	
	$D^{+0.005}_{0}$	SKD11 or equivalent 60~63HRC	A—ATKA	—	
		SKH51 61~64HRC	A—HATKA	AH—HATKA	
		Powdered high-speed steel 64~67HRC	A—PATKA	AH—PATKA	

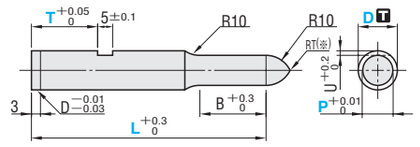
Outer shape of R changes depending on dimension P. P.200

Shank Dia. Tolerance D T D_{m5} $^{+0.005}_{0}$ Selectable

Shank Dia. Tolerance D T $D^{+0.005}_{0}$ Selectable

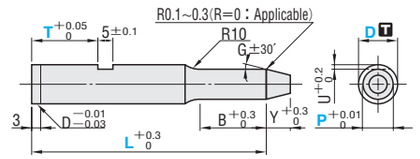
Tip length (B) X>L>S

Shape

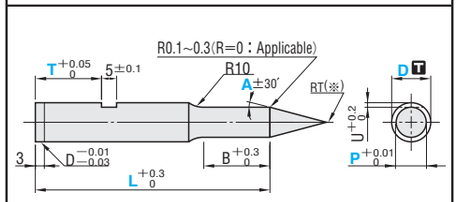


RT(※)••• The P<8 tip is rounded for safety purpose.
When tip should stay sharp, specify RT=0.
(When P≧8, tip end is flat. P.1208)

Refer to the product data "R length of Punch" for the length of tip R. P.1208



P	G
P≦1.999	10°
P≧2.000	15°



RT(※)••• The tip is rounded for safety purpose.
When tip should stay sharp, specify RT=0.

Catalog No. Type	B Point length	D	L	0.01mm increments min. P max.	A	0.1mm increments T	B	Y	U
—Normal— (D_{m5}) ($D^{+0.005}_{0}$)									
M SKD11 or equivalent STKA A—STKA	S	3	42 52 62 (72)	1.00~ 2.99	(10)	T>5.0	10	2	0.5
TPKA A—TPKA		4	42 52 62 (72)	1.00~ 3.99	(15)			3	1.0
ATKA A—ATKA		5	42 52 62 (72)	2.00~ 4.99	20				
		6	42 52 62 72 (92)	2.50~ 5.99	25		15	5	1.5
M SKH51 HSTKA A—HSTKA		8	(42) 52 62 72 82 (92)	3.00~ 7.99	30				
HTPKA A—HTPKA		10	(42) 52 62 72 82 (92)(102)	3.00~ 9.99			21	8	
HATKA A—HATKA		13	(42) 52 62 72 82 (92)(102)	6.00~12.99					
—TiCN coating—		16	(42) 52 62 72 82 (92)(102)	10.00~15.99					
H—HSTKA AH—HSTKA	L	3	52 62 (72)	1.00~ 2.99	(10)	T>5.0	15	2	0.5
H—HTPKA AH—HTPKA		4	52 62 (72)	1.00~ 3.99	(15)			3	1.0
H—HATKA AH—HATKA		5	52 62 (72)	2.00~ 4.99	20				
		6	52 62 72 82 (92)	2.50~ 5.99	25		21	5	1.5
—Normal—		8	52 62 72 82 (92)(102)	3.00~ 7.99	30				
M Powdered high-speed steel PSTKA A—PSTKA		10	52 62 72 82 (92)(102)	3.00~ 9.99			27	8	
PTPKA A—PTPKA		13	52 62 72 82 (92)(102)	6.00~12.99					
PATKA A—PATKA		16	52 62 72 82 (92)(102)	10.00~15.99					
—TiCN coating—	X	3	52 62 (72)	1.20~ 2.99	(10)	T>5.0	21	2	0.5
H—PSTKA AH—PSTKA		4	52 62 (72)	1.20~ 3.99	(15)			3	1.0
H—PTPKA AH—PTPKA		5	62 (72)	2.00~ 4.99	20		27		
H—PATKA AH—PATKA		6	62 (72)	2.50~ 5.99	25			5	1.5
		8	62 72 82 (92)	3.00~ 7.99	30		32		
		10	62 72 82 (92)(102)	3.00~ 9.99				8	
		13	62 72 82 (92)(102)	6.00~12.99			42		
		16	72 82 (92)(102)	10.00~15.99					

L(42) ••• B=10 When L(42), tip length B is fixed to 10mm.
L(72)(92)(102) ••• L72 of D3~6, L92 / 102 of D8~16 are applicable to tip R type & tip tapered type.
A(10) ••• P≧6.0, A(10) not selectable. A(15) ••• When P≧15.0, A(15) not selectable.

The volume discount rate is also applicable to alteration cost. P.39

Order

Catalog No.	L	P	A	T	(RT=0 R=0)
A—STKAS 6	72	P5.02		T20.0	RT0
PTPKAS 6	52	P4.97		T15.0	
H—HATKAL 10	62	P5.01	A15	T16.0	R0

When key groove is not required, specify T=L.
Only RT=0 can be specified. (Applicable to tip R type of P<8, acute-angle type)
Only R=0 can be specified. (Applicable to tip tapered type, acute-angle type)
A is applicable to acute angle type only.

Delivery

3 Days | Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.
Express service A is not available for TiCN coating type.

Alteration

Catalog No.	L(LC·LCT)	P(PC)	A	T	(RT=0 R=0)	(BC·YC···etc.)
A—STKAS 8	82	PC1.50		T20.0		YC1.0

Alterations	Code	Tip R	Tip tapered·acute-angle	¥/1Code
Tip	PC	Changes tip diameter P. PC≧ Pmin/2 0.01mm increments (Combination with PKC→ 0.001mm increments) ⊗TiCN coating PC<1: Not applicable P(PC) | Bmax. 0.500~0.999 | 10 1.000~1.999 | 20 2.000~3.999 | 35 4.000~5.999 | 45 6.000~ | (60)	Changes tip diameter P. PC≧ Pmin/2 ≧1.00 0.01mm increments (Combination with PKC→ 0.001mm increments) Ymax=YCmax P(PC) | Bmax. 1.000~1.199 | 15 1.200~1.999 | 20 2.000~2.999 | 30 3.000~3.999 | 35 4.000~5.999 | 45 6.000~ | (60)	200
	BC	Changes tip length B. 2≦BC≦Bmax. 0.1mm increments L requires BC+30mm or more. TiCN coating type : Bmax. =50		200
	YC	———	Changes tip taper length Y. ・P<2.0 1≦YC≦PX2.83−0.3 ・P≧2.0 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax+8 0.1mm increments ⊗Tip acute-angle type : Not applicable	200
	RLC	Cuts tip R flat. 2≦RLC<√P(10−P/4) 0.1mm increments Applicable to P<8	———	200
	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P:0.001mm increments.) ⊗TiCN coating D>13 : Not applicable		400 (TiCN Coating 600)

Alterations	Code	Tip R	Tip tapered·acute-angle	¥/1Code
Tip	SC	Finishes tip with lapping. Dimension P tolerances remain the same. TiCN coating type : The base material is finished before coating.		1,200
Full length	LC	Changes the full length L 30+B(BC)≦LC<L 0.1mm increments When LC−B(BC) is 30mm or less, B(BC) is LC−30mm.		200
	LKC	———	Changes tolerance L. +0.3 0 ⇨ +0.05 0 ⊗TiCN coating : Not applicable	1,000
	LCT	TKC Changes head thickness tolerance. + LC Changes full length	T +0.05 0 ⇨ 0 −0.02	300
Key groove	WKD	Adds parallel key grooves		200
	TKC	Changes head thickness tolerance. T +0.05 0 ⇨ 0 −0.02		200
	UK	Changes depth of the key groove. ⊗Not applicable to D3.	D | UK 4~5 | 0.7 6 | 1.2 8~16 | 1.7	200

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 200 yen required.
Example : A—STKAS8, the price is 920 (STKAS8 unit price) +200 = 1,120 yen (product unit)

■Tip R type T D_{m5}

D	SKD11 or equivalent: STKAS STKAL	SKD11 or equivalent: STKAX	SKH51: HSTKAS HSTKAL	SKH51: HSTKAX	SKH51: H—HSTKAS H—HSTKAL	SKH51: H—HSTKAX	Powdered high-speed steel: PSTKAS PSTKAL	Powdered high-speed steel: PSTKAX	Powdered high-speed steel: H—PSTKAS H—PSTKAL	Powdered high-speed steel: H—PSTKAX
3	700	860	850	1,000	1,950	2,100	1,090	1,240	2,220	2,360
4	740	880	890	1,040	2,030	2,180	1,150	1,310	2,310	2,470
5	770	940	930	1,110	2,110	2,290	1,190	1,380	2,390	2,580
6	780	950	980	1,150	2,290	2,460	1,310	1,490	2,640	2,830
8	920	1,030	1,250	1,390	2,690	2,840	1,790	1,980	3,250	3,450
10	1,110	1,280	1,530	1,710	3,120	3,300	2,220	2,410	3,840	4,030
13	1,210	1,380	1,940	2,120	3,680	3,860	3,110	3,300	4,870	5,070
16	1,380	1,550	2,270	2,450	4,170	4,360	3,680	3,870	5,620	5,810

■Tip tapered type・Tip acute-angle type T D_{m5}

D	SKD11 or equivalent: TPKAS TPKAL ATKAS ATKAL	SKD11 or equivalent: TPKAX ATKAX	SKH51: HTPKAS HTPKAL HATKAS HATKAL	SKH51: HTPKAX HATKAX	SKH51: H—HTPKAS H—HTPKAL H—HATKAS H—HATKAL	SKH51: H—HTPKAX H—HATKAX	Powdered high-speed steel: PTPKAS PTPKAL PATKAS PATKAL	Powdered high-speed steel: PTPKAX PATKAX	Powdered high-speed steel: H—PTPKAS H—PTPKAL H—PATKAS H—PATKAL	Powdered high-speed steel: H—PTPKAX H—PATKAX
3	830	980	960	1,110	2,070	2,210	1,190	1,350	2,300	2,470
4	880	1,030	1,020	1,160	2,160	2,300	1,250	1,410	2,410	2,570
5	910	1,060	1,040	1,210	2,230	2,400	1,280	1,470	2,490	2,680
6	920	1,080	1,100	1,270	2,410	2,580	1,410	1,590	2,740	2,920
8	1,080	1,190	1,390	1,530	2,840	2,980	1,900	2,090	3,370	3,560
10	1,200	1,370	1,630	1,810	3,220	3,400	2,330	2,520	3,940	4,140
13	1,290	1,460	2,030	2,210	3,770	3,950	3,200	3,390	4,970	5,160
16	1,490	1,660	2,370	2,550	4,280	4,460	3,780	3,970	5,730	5,920

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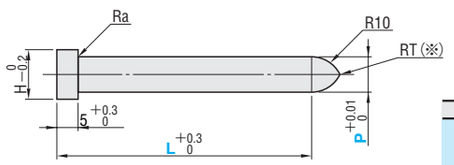
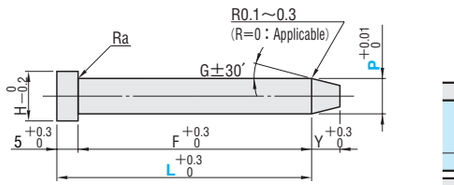
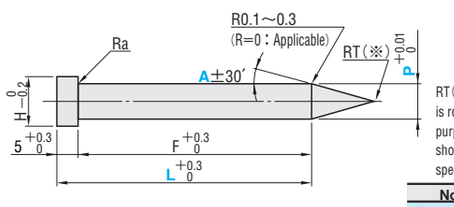
STRAIGHT PILOT PUNCHES

Type	M H	Catalog No.	View
—Tip R— RoHS Outer shape of R changes depending on dimension P. P.200	SKD11 or equivalent 60～63HRC	STC	
	SKH51 61～64HRC	HSTC	
	Powdered high-speed steel 64～67HRC	PSTC	
—Tip tapered— RoHS 	SKD11 or equivalent 60～63HRC	TTC	
	SKH51 61～64HRC	HTTC	
	Powdered high-speed steel 64～67HRC	PTTC	
—Tip acute-angle— RoHS 	SKD11 or equivalent 60～63HRC	ATTC	
	SKH51 61～64HRC	HATTC	
	Powdered high-speed steel 64～67HRC	PATTC	

No.	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

RT(※)･･･▸The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208)

Refer to the product data "R length of Punch" for the length of tip R. P.1208

No.	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

P	G
1.000～1.999	10°
2.000～	15°

RT(※)･･･▸The tip is rounded for safety purpose. When tip should stay sharp, specify RT=0.

No.	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

Catalog No. Type	No.	L	0.01mm increments min.Pmax.	A	Y	H
M SKD11 or equivalent (D3～25) STC TTC ATTC	1.6	42 52 62	1.00～ 1.60		2	2.6
	2.0	42 52 62	1.00～ 2.00			3
	2.5	42 52 62	1.50～ 2.50			3.5
	3	42 52 62 72 82 (92)	2.00～ 3.00			5
M SKH51 HSTC HTTC HATTC	4	42 52 62 72 82 (92)	3.00～ 4.00	(10)		7
	5	42 52 62 72 82 (92)	4.00～ 5.00	(15)	3	8
	6	42 52 62 72 82 (92)	5.00～ 6.00	(20)		9
	8	42 52 62 72 82 (92) (102)	6.00～ 8.00	25	5	11
M Powdered high-speed steel PSTC PTTC PATTC	10	42 52 62 72 82 (92) (102)	8.00～10.00	30		13
	13	42 52 62 72 82 (92) (102)	10.00～13.00		8	16
	16	42 52 62 72 82 (92) (102)	13.00～16.00			19
	20	42 52 62 72 82 (92) (102)	16.00～20.00			23
	25	42 52 62 72 82 (92) (102)	20.00～25.00			28

L (102) ･･･▸ L102 of D8 is applicable only to SKD11.
L (92) (102) ･･･▸ L92 & 102 are applicable to tip R type & tip tapered type.
A (10) ･･･▸ When P≧6.0, A(10) not selectable.
A (15) ･･･▸ When P≧15.0, A(15) not selectable.
A (20) ･･･▸ When P≧20.0, A(20) not selectable.

The volume discount rate is also applicable to alteration cost. P.39

Order

Catalog No.	L	P	A	(RT=0 R=0)
STC 6	72	P5.02		RT0
PATTC 8	42	P7.03	A15	

A is applicable to acute angle type only.
Only RT=0 can be specified. (Applicable to tip R type of P<8, acute-angle type)
Only R=0 can be specified. (Applicable to tip tapered type, acute-angle type)

Delivery

3 Days | Express A | 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Alteration

Catalog No. — L(LC･LCT･LMT) — P — A — (RT=0 R=0) — (YC･HC･TC･･･etc.)
PSTC 10 — LC65 — P8.50 — HC12

Alterations		Code	Tip R	Tip tapered･acute-angle	¥/1Code
Tip	YC +0.3 0	YC	———	Changes dimension Y. ･P<2.0 1≦YC≦PX2.83−0.3 ･P≧2.0 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax+8 0.1mm increments ⊗Tip acute-angle type is not available	200
	RLC +0.3 0	RLC	Cuts tip R flat. 2≦RLC<√P(10−P/4) 0.1mm increments Applicable to P<8	———	200
	P	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P:0.001mm increments.)		400
Full length	LC L	LC	Changes the full length L 25≦LC<L 0.1mm increments		200
	L T	LKC	———	Changes tolerance L. L +0.3 0 ⇨ +0.05 0	1,000
	T LC L	LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKC (Thickness) T +0.3 0 ⇨ +0.02 0 + LC (Length)		300
		LMT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKM (Thickness) T +0.3 0 ⇨ 0 −0.02 + LC (Length)		

Alterations		Code	Tip R	Tip tapered･acute-angle	¥/1Code
Head	H	HC	Changes head diameter H. P≦HC<H 0.1mm increments		200
	TC T	TC	Changes head thickness T. 2≦TC<5 0.1mm increments (Combination with LCT･LMT･TKC･TKM→0.01mm increments) L is shortened by (5−TC). When LC is applied, L=LC.		200
		KC	Adds single key flat.		200
		WKC	Adds double key flats in parallel.		400
	T T	TKC	Changes head thickness tolerance.	T +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness tolerance.	T +0.3 0 ⇨ 0 −0.02	200
Shank	F T	FKC	———	Changes dimension F tolerance. F +0.3 0 ⇨ +0.05 0 ⊗Add with LKC : Not applicable	1,000

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Tip R type

No.	STC	HSTC	PSTC
1.6	—	610	820
2	—	610	820
2.5	—	610	820
3	420	560	770
4	460	590	810
5	470	600	840
6	490	680	980
8	630	900	1,340
10	790	1,150	1,740
13	2,500	3,380	4,770
16	2,740	3,790	5,460
20	3,350	4,490	6,330
25	3,900	5,040	6,890

■Tip tapered･acute-angle type

No.	TTC ATTC	HTTC HATTC	PTTC PATTC
1.6	—	690	920
2	—	690	920
2.5	—	690	920
3	510	640	870
4	530	670	890
5	560	690	920
6	570	750	1,060
8	700	980	1,430
10	870	1,240	1,830
13	2,760	3,810	5,490
16	3,030	4,290	6,280
20	3,430	4,570	6,420
25	3,980	5,120	6,980

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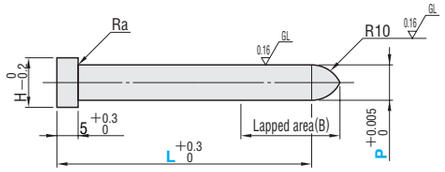
STRAIGHT PILOT PUNCHES
—LAPPING TYPE—

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
—Tip R, Lapping— RoHS Outer shape of R changes depending on dimension P. P.200	SKD11 or equivalent 60～63HRC	L—STC	
	SKH51 61～64HRC	L—HSTC	
	Powdered high-speed steel 64～67HRC	L—PSTC	

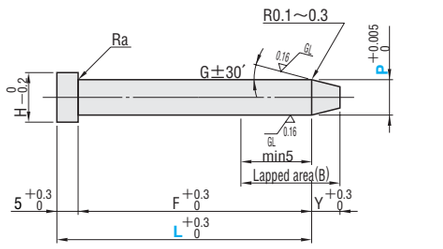
Lapped area (B)

P	(B)
2.000～2.999	13
3.000～9.999	19
10.000～	25

If L＜(B)＋20, (B) is L—20.

No.	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

Refer to the product data "R length of Punch" for the length of tip R. P.1208

Type	M H	Catalog No.	Shape
—Tip tapered, Lapping— RoHS 	SKD11 or equivalent 60～63HRC	L—TTC	
	SKH51 61～64HRC	L—HTTC	
	Powdered high-speed steel 64～67HRC	L—PTTC	

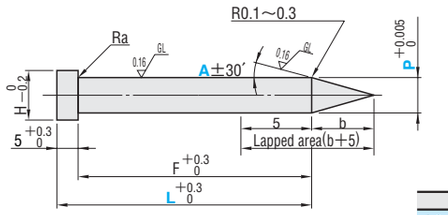
Lapped area (B)

P	(B)
2.000～2.999	13
3.000～9.999	19
10.000～	25

If L＜(B)＋20, (B) is L—20.

No.	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

P	G
1.000～1.999	10°
2.000～	15°

Type	M H	Catalog No.	Shape
—Tip acute-angle, Lapping— RoHS 	SKD11 or equivalent 60～63HRC	L—ATTC	
	SKH51 61～64HRC	L—HATTC	
	Powdered high-speed steel 64～67HRC	L—PATTC	

No.	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

Catalog No. Type	No.	L	0.001mm increments min.Pmax.	A	Y	H
M SKD11 or equivalent (D3～25) L—STC L—TTC L—ATTC	1.6	42 52 62	1.000～ 1.600		2	2.6
	2.0	42 52 62	1.000～ 2.000			3
	2.5	42 52 62	1.500～ 2.500			3.5
	3	42 52 62 72 82 (92)	2.000～ 3.000			5
	4	42 52 62 72 82 (92)	3.000～ 4.000	(10)		7
M SKH51 L—HSTC L—HTTC L—HATTC	5	42 52 62 72 82 (92)	4.000～ 5.000	(15)	3	8
	6	42 52 62 72 82 (92)	5.000～ 6.000	(20)		9
	8	42 52 62 72 82 (92) (102)	6.000～ 8.000	25	5	11
	10	42 52 62 72 82 (92) (102)	8.000～10.000	30		13
M Powdered high-speed steel L—PSTC L—PTTC L—PATTC	13	42 52 62 72 82 (92) (102)	10.000～13.000		8	16
	16	42 52 62 72 82 (92) (102)	13.000～16.000			19
	20	42 52 62 72 82 (92) (102)	16.000～20.000			23
	25	42 52 62 72 82 (92) (102)	20.000～25.000			28

L(102) ···› L102 of D8 is applicable only to SKD11.
L(92)(102) ···›L92 / 102 are applicable to tip R type & tip tapered type.
A(10) ···› When P≧6.0, A(10) not selectable. A(15) ···› When P≧15.0, A(15) not selectable.
A(20) ···› When P≧20.0, A(20) not selectable.

Order

Catalog No.	—	L	—	P	—	A
L—STC 10	—	72	—	P8.200		
L—HATTC 2.5	—	52	—	P1.600	—	A15

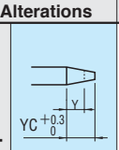
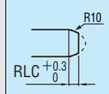
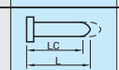
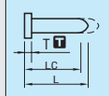
A is applicable to acute angle type only.

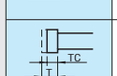
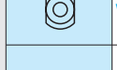
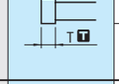
Delivery 3 Days — Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC·LCT·LMT) — P — A —(YC·HC·TC···etc.)

L—PSTC 10 — LC65 — P8.500 — HC12

Alterations		Code	Tip R	Tip tapered · acute-angle	¥/1Code
Tip		YC	——	Changes dimension Y. ・P＜2.0 1≦YC≦PX2.83−0.3 ・P≧2.0 1≦YC≦PX1.86−0.3≦18 L(LC)＋YC≦Lmax＋8 0.1mm increments ⊗Tip acute-angle type is not applicable	200
		RLC	Cuts tip R flat. 2≦RLC＜√P(10−P/4) 0.1mm increments Applicable to P＜8	——	200
Full length		LC	Changes the full length L 25≦LC＜L 0.1mm increments		200
		LKC	——	Changes tolerance L. L +0.3 0 ⇨ +0.05 0	1,000
		LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKC + LC T +0.3 0 ⇨ +0.02 0		300
		LMT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKM + LC T +0.3 0 ⇨ 0 −0.02		

Alterations		Code	Tip R	Tip tapered · acute-angle	¥/1Code
Head		HC	Changes head diameter H. P≦HC＜H 0.1mm increments		200
		TC	Changes head thickness T. 2≦TC＜5 0.1mm increments (Combination with LCT·LMT·TKC·TKM→0.01mm increments) L is shortened by (5−TC). When LC is applied, L=LC.		200
		KC	Adds single key flat.		200
		WKC	Adds double key flats in parallel.		400
		TKC	Changes head thickness tolerance. T +0.3 0 ⇨ +0.02 0		200
		TKM	Changes head thickness tolerance. T +0.3 0 ⇨ 0 −0.02		200
Shank		FKC	——	Changes dimension F tolerance. F +0.3 0 ⇨ +0.05 0 ⊗Add with LKC : Not applicable	1,000

Price Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Tip R · Lapping type

No.	L—STC	L—HSTC	L—PSTC
1.6	—	1,970	2,340
2	—	1,970	2,340
2.5	—	1,970	2,340
3	1,780	1,920	2,290
4	1,820	1,960	2,330
5	1,830	1,970	2,360
6	1,850	2,050	2,500
8	1,990	2,270	2,860
10	2,150	2,520	3,260
13	3,860	4,740	6,290
16	4,100	5,160	6,980
20	4,720	5,860	7,730
25	5,270	6,410	8,290

■Tip tapered · acute-angle, Lapping type

No.	L—TTC L—ATTC	L—HTTC L—HATTC	L—PTTC L—PATTC
1.6	—	2,060	2,440
2	—	2,060	2,440
2.5	—	2,060	2,440
3	1,870	2,010	2,390
4	1,890	2,040	2,410
5	1,920	2,060	2,440
6	1,930	2,120	2,580
8	2,060	2,350	2,950
10	2,230	2,610	3,350
13	4,120	5,180	7,010
16	4,390	5,660	7,800
20	4,800	5,940	7,810
25	5,350	6,490	8,380

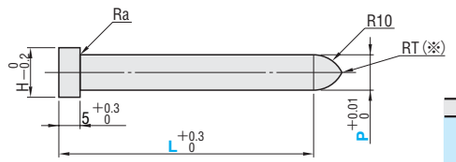
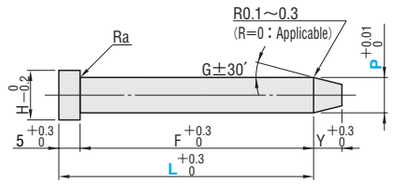
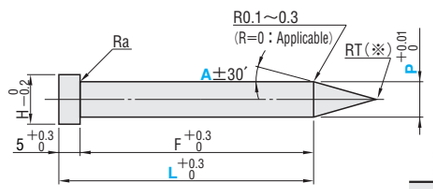
PRESS ADD.SPEC. Printed in Red

STRAIGHT PILOT PUNCHES
—TiCN COATING—

PRODUCTS DATA P.1220

COATING PUNCHES —TiCN—

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
—Tip R— RoHS Outer shape of R changes depending on dimension P. P.200	SKH51 61～64HRC Surface 3000HV	H—HSTC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	H—PSTC	
—Tip tapered— RoHS 	SKH51 61～64HRC Surface 3000HV	H—HTTC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	H—PTTC	
—Tip acute-angle— RoHS 	SKH51 61～64HRC Surface 3000HV	H—HATTC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	H—PATTC	

No.	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

RT(※)•••▸The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208)

Refer to the product data "R length of Punch" for the length of tip R. P.1208

No.	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

P	G
1.00～1.99	10°
2.00～	15°

RT(※)•••▸The tip is rounded for safety purpose. When tip should stay sharp, specify RT=0.

No.	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

Catalog No. Type	No.	L	0.01mm increments min.Pmax.	A	Y	H
M SKH51 H—HSTC H—HTTC H—HATTC	1.6	42 52 62	1.00～ 1.60		2	2.6
	2.0	42 52 62	1.00～ 2.00			3
	2.5	42 52 62	1.50～ 2.50			3.5
	3	42 52 62 72 82 (92)	2.00～ 3.00			5
	4	42 52 62 72 82 (92)	3.00～ 4.00	(10)		7
	5	42 52 62 72 82 (92)	4.00～ 5.00	(15)	3	8
	6	42 52 62 72 82 (92)	5.00～ 6.00	(20)		9
M Powdered high-speed steel H—PSTC H—PTTC H—PATTC	8	42 52 62 72 82 (92)	6.00～ 8.00	25	5	11
	10	42 52 62 72 82 (92) (102)	8.00～10.00	30		13
	13	42 52 62 72 82 (92) (102)	10.00～13.00		8	16
	16	42 52 62 72 82 (92) (102)	13.00～16.00			19
	20	42 52 62 72 82 (92) (102)	16.00～20.00			23
	25	42 52 62 72 82 (92) (102)	20.00～25.00			28

L(92)(102)••• L92 & 102 are applicable to tip R type & tip tapered type.
A(10) ••• When P≧6.0, A(10) not selectable. A(15) ••• When P≧15.0, A(15) not selectable.
A(20) ••• When P≧20.0, A(20) not selectable.

Order

Catalog No.	L	P	A	(RT=0 R=0)
H—PSTC 6	72	P5.02		RT0
H—HATTC 8	42	P7.03	A15	

A is applicable to acute angle type only.
Only RT=0 can be specified. (Applicable to tip R type of P<8, acute-angle type)
Only R=0 can be specified. (Applicable to tip tapered type, acute-angle type)

Delivery 3 Days

Alteration Catalog No. — L(LC·LCT·LMT) — P — A — (RT=0 R=0) — (YC·HC·TC···etc.)
H—PSTC 10 — LC65 — P8.50 — KC

Alterations	Code	Tip R	Tip tapered・acute-angle	¥/1Code
Tip	YC	———	Changes dimension Y. ・P<2.0 1≦YC≦PX2.83−0.3 ・P≧2.0 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax+8 0.1mm increments Tip acute-angle type is not applicable	200
	RLC	Cuts tip R flat. 2≦RLC<√P(10−P/4) 0.1mm increments Applicable to P<8	———	200
	SC	Finishes tip with lapping. Dimension P tolerances remain the same. Lapped area (B): P 1.00～2.99 (B) 13; 3.00～9.99 (B) 19; 10.00～ (B) 25 If L<(B)+20, (B) becomes L−20. R=0, RT=0:Not available Lapping area of straight part is min. 5mm.	1,200
Full length	LC	Changes the full length L 25≦LC<L 0.1mm increments		200
	LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKC (Thickness) + LC (Length) T +0.3 0 ⇨ +0.02 0		300
	LMT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKM (Thickness) + LC (Length) T +0.3 0 ⇨ 0 −0.02		

Alterations	Code	Tip R	Tip tapered・acute-angle	¥/1Code
Head	HC	Changes head diameter H. P≦HC<H 0.1mm increments 2.6≦HC<H		200
	TC	Changes head thickness T. 4≦TC<5 0.1mm increments (Combination with LCT·LMT·TKC·TKM→0.01mm increments) L is shortened by (5−TC). When LC is applied, L=LC.		200
	KC	Adds single key flat.		200
	WKC	Adds double key flats in parallel.		400
	TKC	Changes head thickness tolerance. T +0.3 0 ⇨ +0.02 0		200
	TKM	Changes head thickness tolerance. T +0.3 0 ⇨ 0 −0.02		200

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Tip R type

No.	H—HSTC	H—PSTC
1.6	1,770	2,110
2	1,770	2,110
2.5	1,770	2,110
3	1,690	2,030
4	1,730	2,070
5	1,790	2,160
6	1,990	2,430
8	2,340	2,950
10	2,740	3,510
13	5,120	6,700
16	5,700	7,580
20	6,590	8,470
25	7,220	9,120

■Tip tapered・acute-angle type

No.	H—HTTC H—HATTC	H—PTTC H—PATTC
1.6	1,850	2,190
2	1,850	2,190
2.5	1,850	2,190
3	1,770	2,110
4	1,810	2,150
5	1,880	2,240
6	2,070	2,510
8	2,430	3,040
10	2,830	3,600
13	5,550	7,420
16	6,200	8,400
20	6,670	8,560
25	7,310	9,210

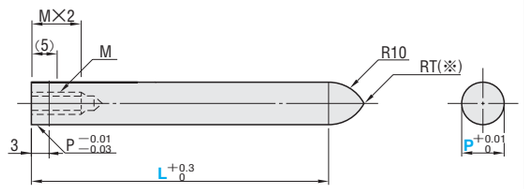
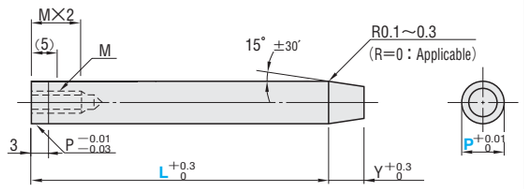
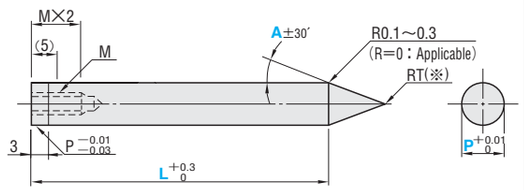
PRESS ADD.SPEC. Printed in Red

STRAIGHT PILOT PUNCHES WITH TAP HOLE
—NORMAL / TiCN COATING—

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

¥ The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
—Tip R— RoHS Outer shape of R changes depending on dimension P. P.200	SKD11 or equivalent 60～63HRC	STMC	 (5)⋯5mm from the end is not coated. (TiCN coating) RT(※)⋯The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208) Refer to the product data "R length of Punch" for the length of tip R. P.1208
	Powdered high-speed steel 64～67HRC	PSTMC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN coating type H—PSTMC	
—Tip tapered— RoHS	SKD11 or equivalent 60～63HRC	TTMC	 (5)⋯5mm from the end is not coated. (TiCN coating)
	Powdered high-speed steel 64～67HRC	PTTMC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN coating type H—PTTMC	
—Tip acute-angle— RoHS	SKD11 or equivalent 60～63HRC	ATTMC	 (5)⋯5mm from the end is not coated. (TiCN coating) RT(※)⋯The tip is rounded for safety purpose. When tip should stay sharp, specify RT=0.
	Powdered high-speed steel 64～67HRC	PATMC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN coating type H—PATMC	

Catalog No. Type	No.	L	0.01mm increments min. P max.	A	Y	M
M SKD11 or equivalent —Normal— STMC TTMC ATTMC / M Powdered high-speed steel —Normal— PSTMC PTTMC PATMC —TiCN coating— H—PSTMC H—PTTMC H—PATMC	8	42 52 62 72 (82) (92)	6.00～ 8.00		5	3
	10		8.00～ 10.00	(15)		4
	13		10.00～ 13.00	(20)	8	6
	16		13.00～ 16.00	25		
	20		16.00～ 20.00	30		
	25		20.00～ 25.00			

L(82)(92) ⋯L82 & 92 are applicable to tip R type & tip tapered type.
A(15) ⋯ When P≧15.0, A(15) not selectable. A(20) ⋯ When P≧20.0, A(20) not selectable.

Order

Catalog No.	—	L	—	P	—	A	—	(RT=0 / R=0)
STMC 8	—	72	—	P6.20			—	RT0
H—PATMC 10	—	62	—	P8.50	—	A15		

A is applicable to acute angle type only.
Only RT=0 can be specified. (Applicable to tip R type of P<8, acute-angle type)
Only R=0 can be specified. (Applicable to tip tapered type, acute-angle type)

Delivery

3 Days | Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.
Express service A is not available for TiCN coating type.

Alteration

Catalog No.	—	L(LC)	—	P	—	A	—	(RT=0 / R=0)	— (YC⋯etc.)
STMC 10	—	LC65	—	P8.50					— YC1

Alterations	Code	Tip R	Tip tapered・acute-angle	¥/1Code
Tip	YC	———	Changes dimension Y. 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax+8 0.1mm increments ⊗Tip acute-angle type is not applicable.	200
	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P:0.001mm increments.) ⊗TiCN coating type is not applicable.		400
	RLC	Cuts tip R flat. 2≦RLC<√P(10−P/4) 0.1mm increments Applicable to P<8	———	200
	SC	Finishes tip with lapping. Dimension P tolerances remain the same. TiCN coating type : The base material is finished before coating. Lapped area (B): P 6.000～9.999 (B) 19; 10.000～ (B) 25. When L<(B)+20, (B) is L−20. ⊗R=0, RT=0:Not applicable. Lapping area of straight part is min. 5mm.		1,200

Alterations	Code	Tip R	Tip tapered・acute-angle	¥/1Code
Full length	LC	Changes the full length L 25≦LC<L 0.1mm increments		200
	LKC	———	Changes tolerance L. L +0.3 0 ⇨ +0.05 0 ⊗TiCN coating type is not applicable.	1,000
Shank	KC	Adds single key flat.		200
	WKC	Adds double key flats in parallel.		400
	NDC	No press-in lead ℓ=3 ⇨ ℓ=0		0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Tip R type

No.	STMC	PSTMC	H—PSTMC
8	1,320	2,290	3,770
10	1,410	2,460	4,080
13	2,420	4,220	6,000
16	3,330	5,820	7,770
20	4,700	8,160	10,310
25	5,500	9,550	11,780

■Tip tapered type・Tip acute-angle type

No.	TTMC ATTMC	PTTMC PATMC	H—PTTMC H—PATMC
8	1,470	2,570	4,050
10	1,490	2,590	4,210
13	2,510	4,390	6,160
16	3,420	5,990	7,940
20	4,830	8,390	10,540
25	5,650	9,820	12,050

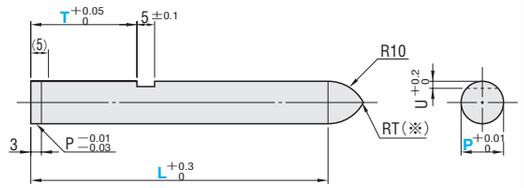
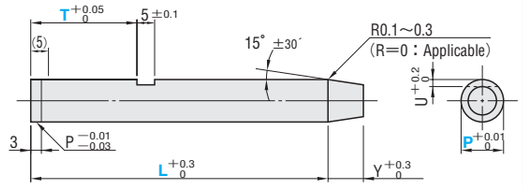
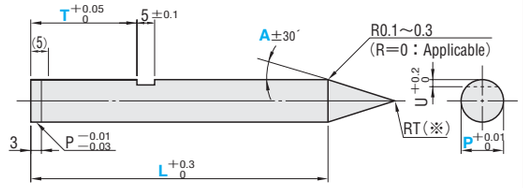
PRESS ADD.SPEC. Printed in Red

STRAIGHT PILOT PUNCHES WITH KEY GROOVE
—NORMAL / TiCN / COATING—

PRODUCTS DATA P.1220

COATING PUNCHES —TiCN—

¥ The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
—Tip R— RoHS Outer shape of R changes depending on dimension P. P.200	SKD11 or equivalent 60～63HRC	STKC	 (5) ···▸ 5mm from the end is not coated. (TiCN coating) RT(※) ···▸ The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208) Refer to the product data "R length of Punch" for the length of tip R. P.1208
	SKH51 61～64HRC	HSTKC	
	SKH51 61～64HRC Surface 3000HV	TiCN coating type H—HSTKC	
	Powdered high-speed steel 64～67HRC	PSTKC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN coating type H—PSTKC	
—Tip tapered— RoHS	SKD11 or equivalent 60～63HRC	TTKC	 (5) ···▸ 5mm from the end is not coated. (TiCN coating)
	SKH51 61～64HRC	HTTKC	
	SKH51 61～64HRC Surface 3000HV	TiCN coating type H—HTTKC	
	Powdered high-speed steel 64～67HRC	PTTKC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN coating type H—PTTKC	
—Tip acute-angle— RoHS	SKD11 or equivalent 60～63HRC	ATTKC	 (5) ···▸ 5mm from the end is not coated. (TiCN coating) RT(※) ···▸ The tip is rounded for safety purpose. When tip should stay sharp, specify RT=0.
	SKH51 61～64HRC	HATKC	
	SKH51 61～64HRC Surface 3000HV	TiCN coating type H—HATKC	
	Powdered high-speed steel 64～67HRC	PATKC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN coating type H—PATKC	

Catalog No. Type	No.	L	0.01mm increments min. P max.	A	0.1mm increments T	Y	U
M SKD11 or equivalent M SKH51 —Normal— STKC TTKC ATTKC —Normal— HSTKC HTTKC HATKC —TiCN coating— H—HSTKC H—HTTKC H—HATKC	3	42 52 62 (72)	2.00～ 3.00	(10) (15) 20 25 30	T>5.0	2	0.5
	4	42 52 62 (72)	3.00～ 4.00				
	5	42 52 62 (72)	4.00～ 5.00			3	1.0
	6	42 52 62 (72)	5.00～ 6.00				
M Powdered high-speed steel —Normal— PSTKC PTTKC PATKC —TiCN coating— H—PSTKC H—PTTKC H—PATKC	8	42 52 62 72 (82) (92)	6.00～ 8.00			5	1.5
	10	42 52 62 72 (82) (92)	8.00～10.00				
	13	42 52 62 72 (82) (92)	10.00～13.00			8	
	16	42 52 62 72 (82) (92)	13.00～16.00				

L(72)(82)(92) ···▸ L72 of D3～6, L82・92 of D8～16 are applicable to tip R type・tip tapered type.
A(10) ···▸ When P≧6.0, A(10) not selectable. A(15) ···▸ When P≧15.0, A(15) not selectable.

Order

Catalog No.	L	P	A	T	RT=0 R=0
STKC 6	72	P5.02		T20.0	
H—HATKC 4	62	P3.80	A15	T16.0	R0

A is applicable to acute angle type only.
When key groove is not required, specify T=L.
Only RT=0 can be specified. (Applicable to tip R type of P<8, acute-angle type)
Only R=0 can be specified. (Applicable to tip tapered type, acute-angle type)

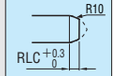
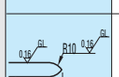
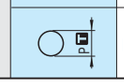
Delivery

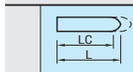
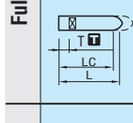
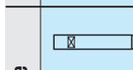
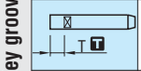
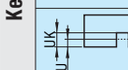
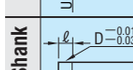
3 Days | Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.
Express service A is not available for TiCN coating type.

Alteration

Catalog No.	L(LC・LCT)	P	A	T	RT=0 R=0	(YC···etc.)
PSTKC 10	LC65	P8.50		T20.0		YC1

Alterations		Code	Tip R	Tip tapered・acute-angle	¥/1Code
Tip		RLC	Cuts tip R flat. 2≦RLC<√P(10—P/4) 0.1mm increments Applicable to P<8	———	200
		YC	———	Changes dimension Y. ・P<2.0 1≦YC≦PX2.83—0.3 ・P≧2.0 1≦YC≦PX1.86—0.3≦18 L(LC)+YC≦Lmax+8 0.1mm increments Tip acute-angle type is not applicable.	200
		SC	Finishes tip with lapping. Dimension P tolerances remain the same. TiCN coating type : The base material is finished before coating. Lapped area (B): P 2.000～2.999 (B) 13; 3.000～9.999 19; 10.000～ 25	If L<(B)+20, (B) becomes L—20. R=0, RT=0:Not applicable Lapping area of straight part is min. 5mm.	1,200
		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P:0.001mm increments.) TiCN coating type : Not applicable.		400

Alterations		Code	Tip R	Tip tapered・acute-angle	¥/1Code
Full length		LC	Changes the full length L 25≦LC<L 0.1mm increments		200
		LKC	———	Changes tolerance L. L +0.3 0 ⇨ +0.05 0 TiCN coating type : Not applicable.	1,000
		LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKC (Thickness) T +0.05 0 ⇨ 0 −0.02 + LC (Length)		300
Key groove		WKD	Adds parallel key grooves		200
		TKC	Changes head thickness tolerance. T +0.05 0 ⇨ 0 −0.02		200
		UK	Changes depth of the key groove. No.3 : Not applicable	No. 4～5 UK 0.7; 6 1.2; 8～16 1.7	200
Shank		NDC	No press-in lead ℓ=3 ⇨ ℓ=0		0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Tip R type

No.	STKC	HSTKC	H—HSTKC	PSTKC	H—PSTKC
3	780	940	2,160	1,210	2,460
4	810	970	2,210	1,250	2,510
5	830	1,000	2,270	1,280	2,570
6	860	1,080	2,520	1,440	2,900
8	1,020	1,340	2,880	1,880	3,410
10	1,240	1,680	3,350	2,370	4,100
13	1,380	2,020	3,830	2,850	4,790
16	1,550	2,430	4,380	3,420	5,540

■Tip tapered type・Tip acute-angle type

No.	TTKC ATTKC	HTTKC HATKC	H—HTTKC H—HATKC	PTTKC PATKC	H—PTTKC H—PATKC
3	900	1,060	2,280	1,330	2,580
4	930	1,090	2,330	1,360	2,620
5	950	1,120	2,390	1,390	2,680
6	980	1,190	2,630	1,550	3,010
8	1,130	1,460	3,000	1,990	3,520
10	1,370	1,790	3,460	2,480	4,210
13	1,460	2,150	3,960	2,970	4,910
16	1,660	2,590	4,540	3,570	5,690

PILOT PUNCHES FIXED IN STRIPPER PLATE
—NORMAL TYPE / LAPPING TYPE—

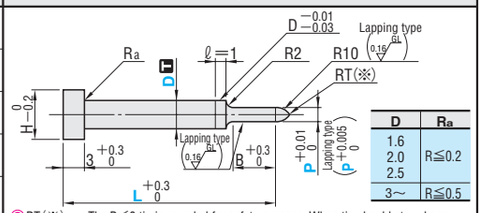
The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Normal	Catalog No. Lapping type
—Tip R, type normal— RoHS	D_{m5}	SKD11 or equivalent 60～63HRC	SPTP	L—SPTP
		SKH51 61～64HRC	HTFPR	L—HTFPR
—Tip R, Lapping—		Powdered high-speed steel 64～67HRC	PTFPR	L—PTFPR
	$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	A—SPTP	AL—SPTP
		SKH51 61～64HRC	A—HTFPR	AL—HTFPR
		Powdered high-speed steel 64～67HRC	A—PTFPR	AL—PTFPR
—Tip tapered, Normal— RoHS	D_{m5}	SKD11 or equivalent 60～63HRC	TPTP	L—TPTP
		SKH51 61～64HRC	HTFPT	L—HTFPT
—Tip tapered, Lapping—		Powdered high-speed steel 64～67HRC	PTFPT	L—PTFPT
	$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	A—TPTP	AL—TPTP
		SKH51 61～64HRC	A—HTFPT	AL—HTFPT
		Powdered high-speed steel 64～67HRC	A—PTFPT	AL—PTFPT
—Tip acute-angle, Normal— RoHS	D_{m5}	SKD11 or equivalent 60～63HRC	APTP	L—APTP
		SKH51 61～64HRC	HTFPA	L—HTFPA
—Tip acute-angle, Lapping—		Powdered high-speed steel 64～67HRC	PTFPA	L—PTFPA
	$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	A—APTP	AL—APTP
		SKH51 61～64HRC	A—HTFPA	AL—HTFPA
		Powdered high-speed steel 64～67HRC	A—PTFPA	AL—PTFPA

Outer shape of R changes depending on dimension P. P.200

Shank Dia. Tolerance D T $m5\cdot {}^{+0.005}_{0}$ Selectable

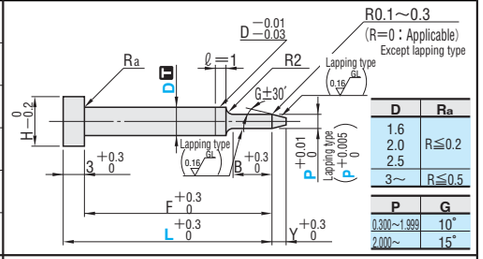
Shape



D	Ra
1.6	R≦0.2
2.0	
2.5	
3～	R≦0.5

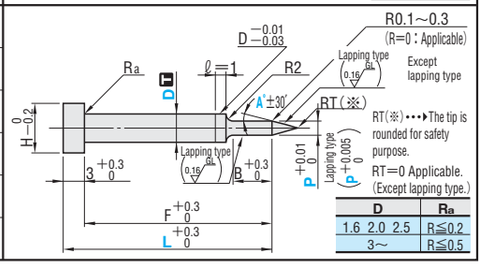
(※)•••The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208)

Refer to the product data "R length of Punch" for the length of tip R. P.1208



D	Ra
1.6	R≦0.2
2.0	
2.5	
3～	R≦0.5

P	G
0.300～1.999	10°
2.000～	15°



(※)•••The tip is rounded for safety purpose.
RT=0 Applicable. (Except lapping type.)

D	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

Catalog No. Type	D	0.1mm increments L	0.01mm increments (lapping type 0.001mm increments) min. P max.	A	B	Y	H
M SKD11 or equivalent —Normal— (D_{m5}) SPTP TPTP APTP; —Lapping— ($D^{+0.005}_{0}$) A—SPTP A—TPTP A—APTP; (D_{m5}) L—SPTP L—TPTP L—APTP; ($D^{+0.005}_{0}$) AL—SPTP AL—TPTP AL—APTP	1.6	10.0 ～ 40.0	0.30～ 1.59	(10)	(4)	(1)	2.6
	2.0		0.50～ 1.99				3
	2.5		1.00～ 2.49			2	3.5
	3		1.00～ 2.99	15			5
	4		2.00～ 3.99	20			7
M SKH51 HTFPR A—HTFPR L—HTFPR AL—HTFPR; HTFPT A—HTFPT L—HTFPT AL—HTFPT; HTFPA A—HTFPA L—HTFPA AL—HTFPA	5		2.00～ 4.99	25		3	8
	6		2.50～ 5.99				9
	8		5.00～ 7.99	30		5	11
M Powdered high-speed steel PTFPR A—PTFPR L—PTFPR AL—PTFPR; PTFPT A—PTFPT L—PTFPT AL—PTFPT; PTFPA A—PTFPA L—PTFPA AL—PTFPA	10		7.00～ 9.99				13
	13		10.00～12.99			8	16
	16		13.00～15.99				19

P>D−0.03 •••▸ When ℓ=0, P>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not applicable.
When L<12mm, the point length B is 2mm.
B (4) •••▸ When P<0.5, the point length B is 2mm.
A (10) •••▸ P<2.00 When P≧2.00, A=10 not selectable.
Y (1) •••▸ When P<0.5, Y is 0.5mm.

Order

Catalog No. — L — P — A — (RT=0 / R=0)

SPTP 3 — 28.0 — P2.48
APTP 4 — 32.0 — P3.50 — A15 — RT0
TPTP 5 — 25.0 — P2.06 — R0

A is applicable to acute angle type only.
Only R=0 can be specified. (Applicable to tip tapered and tip acute-angle type except the lapping type.)
Only RT=0 can be specified. (Applicable to tip R of P<8 and tip acute-angle type except the lapping type.)

Delivery

3 Days

Express T 1,000/1Pc.
Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Alteration

Catalog No. — L — P — A(AC) — (RT=0 / R=0) — (BC·YC·GC···etc.)
PTFPA 3 — 28.0 — P2.48 — AC18 — BC3.0

Alterations		Code	Tip R	Tapered/Acute-angle	¥/1Code
Tip		BC	Changes tip length B. 2≦BC≦Bmax. 0.1mm increments. ⊗P0.300～0.499 are not applicable. (P)L requires BC+8mm or more.	P: 0.500～0.999 Bmax.: 8; 1.000～1.199: 15; 1.200～1.999: 20; 2.000～: 24	200
		RLC	Cuts tip R flat. $2\leqq RLC<\sqrt{P(10-P/4)}$ 0.1mm increments (P)Applicable to P<8	———	200
		YC	———	Changes tip taper length Y. • P<2.0 $1\leqq YC\leqq PX2.83-0.3$ • P≧2.0 $1\leqq YC\leqq PX1.86-0.3\leqq 18$ 0.1mm increments ⊗Not applicable for tip acute-angle type ⊗P.0300～0.499 are not applicable.	200
		GC	———	Changes tip angle 1.000≦P≦1.999 •••▸ 5°≦GC<10° 2.000≦P≦5.999 •••▸ 5°≦GC<15° (P)Applicable to P1.000～5.999. (P)Applicable to D2.5～D6. YC≦P/2tan GC−0.3≦18 ⊗Not applicable for tip acute-angle type	200
		AC	———	Changes tip angle 15°<AC≦45° 1° incr. ⊗Not applicable for tip tapered type	400
		PKC	Changes tolerance on P.	$^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗Lapping type : Not applicable (P)(P:0.001mm increments.)	400
Head	Full length	LKC	———	Changes tolerance L. $^{+0.3}_{L\ 0}$ ⇨ $^{+0.05}_{0}$	1,000
		HC	Changes head diameter H. D≦HC<H 0.1mm increments		200
		TC	Changes head thickness T. 2≦TC<3 0.1mm increments (Combination with TKC·TKM→0.01mm increments) (P)The full length remains as specified.		200
		KC	Adds single key flat.		200
		WKC	Adds double key flats in parallel.		400
		TKC	Changes head thickness tolerance. $^{+0.3}_{T\ 0}$ ⇨ $^{+0.02}_{0}$	Changes head thickness tolerance. $^{+0.3}_{T\ 0}$ ⇨ $^{+0.02}_{0}$ ($^{+0.3}_{F\ 0}$ ⇨ $^{+0.1}_{0}$)	200
		TKM	Changes head thickness tolerance. $^{+0.3}_{T\ 0}$ ⇨ $^{0}_{-0.02}$	Changes head thickness tolerance. $^{+0.3}_{T\ 0}$ ⇨ $^{0}_{-0.02}$ ($^{+0.3}_{F\ 0}$ ⇨ $^{+0.1}_{0}$)	200
		TNK	Adds undercut. (Relief less than 0.2)		200
Shank		FKC	———	Changes dimension F tolerance. $^{+0.3}_{F\ 0}$ ⇨ $^{+0.05}_{0}$ ⊗Add with LKC : Not applicable	1,000
		NDC	No press-in lead	ℓ=1 ⇨ ℓ=0	0

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 100 yen required.
Example : AL—SPTP8, the price is 2,170 (L—SPTP8 unit price) +100 = 2,270 yen (product unit)

Tip R type T D_{m5}

D	SKD11 or equivalent SPTP	SKD11 or equivalent L—SPTP	SKH51 HTFPR	SKH51 L—HTFPR	Powdered high-speed steel PTFPR	Powdered high-speed steel L—PTFPR
1.6	780	2,140	950	2,320	1,230	2,750
2.0	780	2,140	950	2,320	1,230	2,750
2.5	780	2,140	950	2,320	1,230	2,750
3	780	2,140	950	2,320	1,230	2,750
4	640	2,000	800	2,170	1,060	2,580
5	670	2,030	840	2,210	1,130	2,650
6	690	2,050	900	2,270	1,230	2,750
8	810	2,170	1,130	2,490	1,620	3,140
10	1,000	2,360	1,400	2,770	2,050	3,570
13	1,090	2,450	1,630	3,000	2,490	4,010
16	1,250	2,610	1,960	3,330	3,110	4,630

Tip tapered type T D_{m5}

D	SKD11 or equivalent TPTP	SKD11 or equivalent L—TPTP	SKH51 HTFPT	SKH51 L—HTFPT	Powdered high-speed steel PTFPT	Powdered high-speed steel L—PTFPT
1.6	870	2,230	1,040	2,410	1,330	2,850
2.0	870	2,230	1,040	2,410	1,330	2,850
2.5	870	2,230	1,040	2,410	1,330	2,850
3	870	2,230	1,040	2,410	1,330	2,850
4	720	2,080	890	2,260	1,170	2,690
5	750	2,110	930	2,290	1,230	2,750
6	770	2,130	980	2,350	1,330	2,850
8	900	2,260	1,220	2,590	1,740	3,260
10	1,090	2,450	1,500	2,860	2,160	3,680
13	1,170	2,530	1,710	3,080	2,580	4,100
16	1,330	2,690	2,060	3,420	3,200	4,720

Tip acute-angle type T D_{m5}

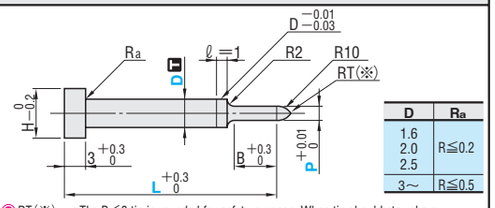
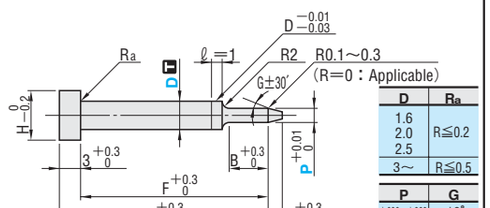
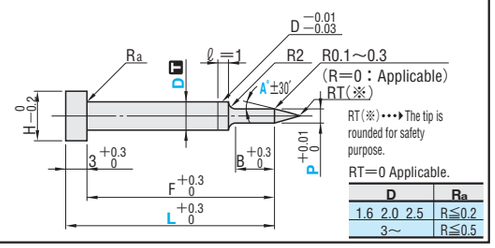
D	SKD11 or equivalent APTP	SKD11 or equivalent L—APTP	SKH51 HTFPA	SKH51 L—HTFPA	Powdered high-speed steel PTFPA	Powdered high-speed steel L—PTFPA
1.6	870	2,230	1,040	2,410	1,330	2,850
2.0	870	2,230	1,040	2,410	1,330	2,850
2.5	870	2,230	1,040	2,410	1,330	2,850
3	870	2,230	1,040	2,410	1,330	2,850
4	720	2,080	890	2,260	1,170	2,690
5	750	2,110	930	2,290	1,230	2,750
6	770	2,130	980	2,350	1,330	2,850
8	900	2,260	1,220	2,590	1,740	3,260
10	1,090	2,450	1,500	2,860	2,160	3,680
13	1,170	2,530	1,710	3,080	2,580	4,100
16	1,330	2,690	2,060	3,420	3,200	4,720

PILOT PUNCHES—FIXED IN STRIPPER PLATE—
—TiCN COATING TYPE—

PRODUCTS DATA P.1220

COATING PUNCHES —TiCN—

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No.	Shape
—Tip R, TiCN coating— RoHS Outer shape of R changes depending on dimension P. P.200 Shank Dia. Tolerance DTm5 · $^{+0.005}_{0}$ Selectable	D_{m5}	SKH51 61～64HRC Surface 3000HV	H—HTFPR	
		Powdered high-speed steel 64～67HRC Surface 3000HV	H—PTFPR	
	$D^{+0.005}_{0}$	SKH51 61～64HRC Surface 3000HV	AH—HTFPR	
		Powdered high-speed steel 64～67HRC Surface 3000HV	AH—PTFPR	
—Tip tapered, TiCN coating— RoHS Shank Dia. Tolerance DTm5 · $^{+0.005}_{0}$ Selectable	D_{m5}	SKH51 61～64HRC Surface 3000HV	H—HTFPT	
		Powdered high-speed steel 64～67HRC Surface 3000HV	H—PTFPT	
	$D^{+0.005}_{0}$	SKH51 61～64HRC Surface 3000HV	AH—HTFPT	
		Powdered high-speed steel 64～67HRC Surface 3000HV	AH—PTFPT	
—Tip acute-angle, TiCN coating— RoHS Shank Dia. Tolerance DTm5 · $^{+0.005}_{0}$ Selectable	D_{m5}	SKH51 61～64HRC Surface 3000HV	H—HTFPA	 RT(※)•••The tip is rounded for safety purpose. RT=0 Applicable.
		Powdered high-speed steel 64～67HRC Surface 3000HV	H—PTFPA	
	$D^{+0.005}_{0}$	SKH51 61～64HRC Surface 3000HV	AH—HTFPA	
		Powdered high-speed steel 64～67HRC Surface 3000HV	AH—PTFPA	

D	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

P	G
1.000～1.999	10°
2.000～	15°

RT(※)•••The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0.（When P≧8, tip end is flat. P.1208）

Refer to the product data "R length of Punch" for the length of tip R. P.1208

Catalog No. Type	D	0.1mm increments L	0.01mm increments min. P max.	A	B	Y	H
M SKH51 (D_{m5}) ($D^{+0.005}_{0}$) H—HTFPR AH—HTFPR H—HTFPT AH—HTFPT H—HTFPA AH—HTFPA	1.6	10.0～40.0	1.00～ 1.59	(10) 15 20 25 30	4	1	2.6
	2.0		1.00～ 1.99				3
	2.5		1.00～ 2.49			2	3.5
	3		1.00～ 2.99				5
	4		2.00～ 3.99				7
	5		2.00～ 4.99			3	8
M Powdered high-speed steel (D_{m5}) ($D^{+0.005}_{0}$) H—PTFPR AH—PTFPR H—PTFPT AH—PTFPT H—PTFPA AH—PTFPA	6		2.50～ 5.99				9
	8		5.00～ 7.99			5	11
	10		7.00～ 9.99				13
	13		10.00～12.99			8	16
	16		13.00～15.99				19

P>D—0.03 •••When ℓ=0, P>D—0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not applicable.

When L<12mm, the point length B is 2mm.

The shank also has thin coating layer.

A (10) •••P<2.00 When P≧2.00, A=10 not selectable.

Order

Catalog No. — L — P — A — (RT=0 / R=0)

AH—PTFPR 6 — 30.2 — P4.50 — RT0

H—PTFPA 4 — 32.0 — P3.50 — A15

H—PTFPT 8 — 15.1 — P5.85

A is applicable to acute angle type only.

Only R=0 can be specified. （Applicable to tip tapered and tip acute-angle types.）

Only RT=0 can be specified. （Applicable to tip R of P<8 and tip acute-angle types.）

Delivery 3 Days

Alteration

Catalog No. — L — P — A(AC) — (R) — (RT) — (BC・YC・GC…etc.)

H—PTFPA 3 — 28.0 — P2.48 — AC18 — BC3.0

Alterations	Code	Tip R	Tapered/Acute-angle	¥/1Code
Tip	BC	Changes tip length B. 2≦BC≦Bmax.≦L/2 0.1mm increments L requires BC+8mm or more.	P: 1.000～1.199 Bmax.: 15; 1.200～ 20	200
	RLC	Cuts tip R flat. 2≦RLC<$\sqrt{P(10-P/4)}$ 0.1mm increments Applicable to P<8	———	200
	YC	———	Changes tip taper length Y. • P<2.0 1≦YC≦PX2.83—0.3 • P≧2.0 1≦YC≦PX1.86—0.3≦18 0.1mm increments Not applicable for tip acute-angle type	200
	GC	———	Changes tip angle 1.000≦P≦1.999 •••5°≦GC<10° 2.000≦P≦5.999 •••5°≦GC<15° Applicable to P1.000～5.999. Applicable to Ø2.5～Ø6. YC≦P/2tan GC—0.3≦18 Not applicable for tip acute-angle type	200
	AC	———	Changes tip angle 15°<AC≦45° 1° increments Not applicable for tip tapered type	400
	SC	Finishes tip with lapping. Dimension P tolerances remain the same. The base material is finished before coating. R=0, RT=0 specification is not applicable.		1,200
	PKC	Changes tolerance on P. P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P:0.001mm increments.) D>13:Not applicable		600

Alterations	Code	Tip R	Tapered/Acute-angle	¥/1Code
Head	HC	Changes head diameter H. D≦HC<H 0.1mm increments		200
	TC	Changes head thickness T. 2≦TC<3 0.1mm increments (Combination with TKC・TKM→0.01mm increments) The full length remains as specified.		200
	KC	Adds single key flat.		200
	WKC	Adds double key flats in parallel.		400
	TKC	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ (F $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$)	200
	TKM	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ (F $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$)	200
	TNK	Adds undercut. （Relief less than 0.2）		200
Shank	NDC	No press-in lead ℓ=1⇨ℓ=0		0

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The price table indicates the prices of products with shank diameter tolerance of D_{m5}. For shank tolerance of $D^{+0.005}_{0}$, additional 100 yen required.

Example：AH—HTFPR8, the price is 2,570（H—HTFPR8 unit price）+100 = 2,670 yen（product unit）

Tip R type T D_{m5}

D	H—HTFPR	H—PTFPR
1.6	2,060	2,430
2.0	2,060	2,430
2.5	2,060	2,430
3	2,060	2,460
4	1,940	2,320
5	2,030	2,450
6	2,210	2,680
8	2,570	3,230
10	2,990	3,820
13	3,370	4,420
16	3,870	5,230

Tip tapered type T D_{m5}

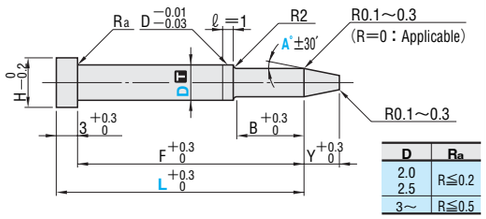
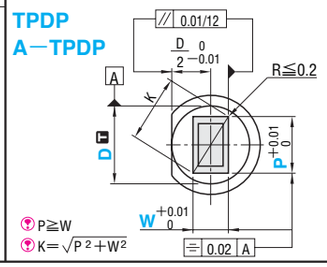
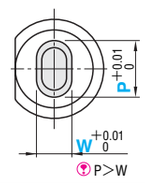
D	H—HTFPT	H—PTFPT
1.6	2,140	2,530
2.0	2,140	2,530
2.5	2,140	2,530
3	2,140	2,560
4	2,030	2,430
5	2,110	2,550
6	2,290	2,780
8	2,660	3,350
10	3,080	3,930
13	3,450	4,510
16	3,970	5,320

Tip acute-angle type T D_{m5}

D	H—HTFPA	H—PTFPA
1.6	2,140	2,530
2.0	2,140	2,530
2.5	2,140	2,530
3	2,140	2,560
4	2,030	2,430
5	2,110	2,550
6	2,290	2,780
8	2,660	3,350
10	3,080	3,930
13	3,450	4,510
16	3,970	5,320

SHAPED PILOT PUNCHES—FIXED IN STRIPPER PLATE—

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No.	Shape
RoHS Shank Dia. Tolerance D T m5 $^{+0.005}_{0}$ Selectable	D_{m5}	SKD11 or equivalent 60～63HRC	TPDP TPEP	 D: 2.0, 2.5 → Ra≦0.2; 3～ → Ra≦0.5
	$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	A—TPDP A—TPEP	TPDP A—TPDP  P≧W K=√(P²+W²) TPEP A—TPEP  P>W

Catalog No. Type	D	0.1mm increments L	0.01mm increments P·K max.	P·W min.	A	B	Y	H
TPDP TPEP A—TPDP A—TPEP	2.0	12.0 ～ 32.0	1.95	0.30	5 10 15	4	(4)	3
	2.5		2.45	0.50				3.5
	3		2.95	0.70				5
	4		3.95	1.00				7

Y may be less than 4 depending on P・W・A.

Order

Catalog No.	L	P	W	A	(R)
TPDP 2.0	15.5	P1.40	W1.25	A5	
A—TPDP 3	15.0	P2.50	W1.50	A10	R0

Only R=0 can be specified.

Delivery 3 Days — Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

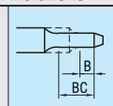
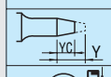
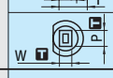
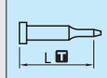
Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

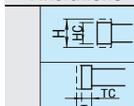
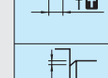
To be quoted on price & lead time above Max. Q'ty.

D	TPDP	TPEP	A—TPDP	A—TPEP
2.0	5,650	6,790	5,990	7,130
2.5	4,700	5,650	5,040	5,990
3	4,170	4,900	4,510	5,240
4	3,740	4,420	4,080	4,760

Alteration

Catalog No.	L	P	W	A	(R)	(BC・YC・HC…etc.)
TPDP 2.0	15.5	P1.40	W1.25	A5		BC3—HC2.5

Alterations		Code	Spec.	¥/1Code
Tip		BC	Changes tip length B. 2≦BC≦BCmax. 0.1mm increments ⊗P0.30～0.49 are not applicable. L requires BC+8mm or more. P·W: 0.50～0.99 → BCmax 8; 1.00～1.19 → 15; 1.20～1.99 → 20; 2.00～ → 24	200
		YC	Changes tip taper length Y. 1≦YC≦4 YC≦ W/(2tanA) −0.2 0.1mm increments	200
		PKC	Changes tolerance on P. P·W +0.01 0 ⇨ +0.005 0	400
Full length		LKC	Changes tolerance L. L +0.3 0 ⇨ +0.05 0	1,000

Alterations		Code	Spec.	¥/1Code
Head		HC	Changes head diameter H. D≦HC<H 0.1mm increments	200
		TC	Changes head thickness T. 2≦TC<3 0.1mm increments The full length remains as specified.	200
		WKC	Adds double key flats in parallel.	200
		TKC	Changes head thickness tolerance. T +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness tolerance. T +0.3 0 ⇨ 0 −0.02	200
		TNK	Adds undercut. (Relief less than 0.2)	200
Shank		FKC	Changes dimension F tolerance. F +0.3 0 ⇨ +0.05 0 ⊗Add with LKC：Not applicable	1,000
		NDC	No press-in lead ℓ=1⇨ℓ=0	0

STRAIGHT PILOT PUNCHES
—FIXED IN STRIPPER PLATE / NORMAL / LAPPING TYPE / TiCN COATING—

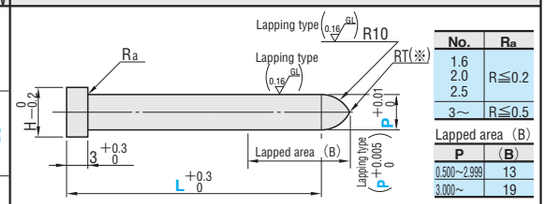
PRODUCTS DATA P.1220

COATING PUNCHES —TiCN—

The volume discount rate is also applicable to alteration cost. P.39

Type	M / H	Catalog No. Normal	Lapping	TiCN coating Surface 3000HV
—Tip R, Normal— RoHS	SKD11 or equivalent 60~63HRC	SPT	L—SPT	—
—Tip R, Lapping—	SKH51 61~64HRC	HTFR	L—HTFR	H—HTFR
—Tip R, TiCN coating— Outer shape of R changes depending on dimension P. P.200	Powdered high-speed steel 64~67HRC	PTFR	L—PTFR	H—PTFR
—Tip tapered, Normal— RoHS	SKD11 or equivalent 60~63HRC	TPT	L—TPT	—
—Tip tapered, Lapping—	SKH51 61~64HRC	HTFT	L—HTFT	H—HTFT
—Tip tapered, TiCN coating—	Powdered high-speed steel 64~67HRC	PTFT	L—PTFT	H—PTFT
—Tip acute-angle, Normal— RoHS	SKD11 or equivalent 60~63HRC	APT	L—APT	—
—Tip acute-angle, Lapping—	SKH51 61~64HRC	HTFA	L—HTFA	H—HTFA
—Tip acute-angle, TiCN coating—	Powdered high-speed steel 64~67HRC	PTFA	L—PTFA	H—PTFA

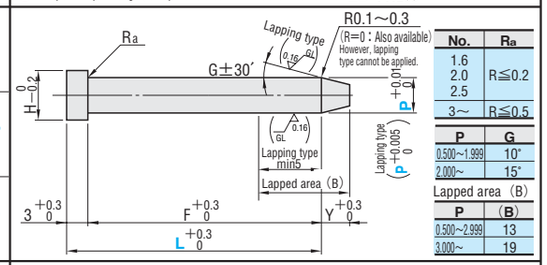
Shape



No.	Ra
1.6 2.0 2.5	R≦0.2
3~	R≦0.5

Lapped area (B) P	(B)
0.500~2.999	13
3.000~	19

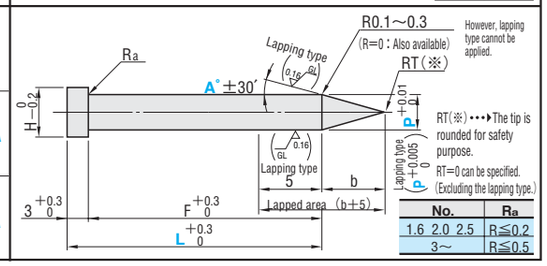
(?) RT(※)•••▸The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208)
(?) For point R part length, see products data RADIUS OF PUNCHES P.1208



No.	Ra
1.6 2.0 2.5	R≦0.2
3~	R≦0.5

P	G
0.500~1.999	10°
2.000~	15°

Lapped area (B) P	(B)
0.500~2.999	13
3.000~	19



No.	Ra
1.6 2.0 2.5	R≦0.2
3~	R≦0.5

Catalog No. Type	No.	0.1mm increments L	0.01mm increments (lapping type 0.001mm increments) min. P max.	A	Y	H
M SKD11 or equivalent —Normal— SPT TPT APT —Lapping type— L—SPT L—TPT L—APT	1.6	10.0 ~ 40.0	0.50(1.00)~ 1.60	(10)	(2)	2.6
	2.0		1.00~ 2.00			3
	2.5		1.50~ 2.50			3.5
	3		2.00~ 3.00			5
M SKH51 —Normal— HTFR HTFT HTFA —Lapping— L—HTFR L—HTFT L—HTFA —TiCN coating— H—HTFR H—HTFT H—HTFA	4		3.00~ 4.00	15		7
	5		4.00~ 5.00	20	3	8
	6		5.00~ 6.00	25		9
M Powdered high-speed steel —Normal— PTFR PTFT PTFA —Lapping— L—PTFR L—PTFT L—PTFA —TiCN coating— H—PTFR H—PTFT H—PTFA	8		6.00~ 8.00	30	5	11
	10		8.00~10.00			13
	13		10.00~13.00		8	16
	16		13.00~16.00			19

(?) P (1.00)•••▸TiCN coated punch is Pmin 1.00 (?) Y(2) When P≦0.8, Y is 0.8mm. (?) A(10)•••▸P<2.00 When P≧2.00, A=10 not selectable.

Order

Catalog No. — L — P — A — (RT=0 / R=0)

PTFR 6 — 18.2 — P5.80 — RT0
APT 3 — 32.0 — P3.00 — A15
TPT 6 — 18.3 — P5.73

(?) A is applicable to acute angle type only.
(?) Only R=0 can be specified. (Applicable to tip tapered and tip acute-angle type except lapping type.)
(?) Only RT=0 can be specified. (Applicable to tip R of P < 8 and tip acute-angle type except lapping type.)

Delivery 3 Days

Express	T	1,000/1Pc.
Express	A	500/1Pc.

⊗ Express service T & A are not available for TiCN coating type.

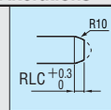
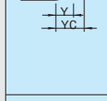
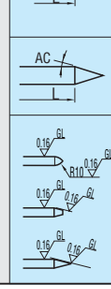
(?) A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

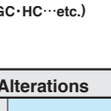
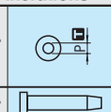
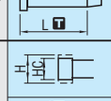
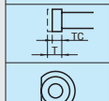
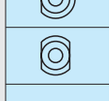
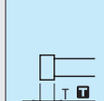
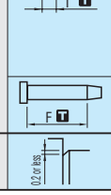
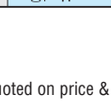
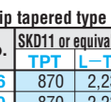
P.38

Alteration

Catalog No. — L — P — A(AC) — (RT=0 / R=0) — (YC·GC·HC···etc.)

APT 6 — 20.0 — P5.02 — AC18

Alterations		Code	Tip R	Tapered/Acute-angle	¥/1Code
Tip		RLC	Cuts tip R flat. 2≦RLC<√P(10−P/4) 0.1mm increments (?) Applicable to P<8	———	200
		YC	———	Changes tip taper length Y. • P<2.0 1≦YC≦PX2.83−0.3 • P≧2.0 1≦YC≦PX1.86−0.3≦18 0.1mm increments ⊗ Not applicable for tip acute-angle type	200
		GC	———	Changes tip angle 1.000≦P≦1.999 •••▸5°≦GC<10° 2.000≦P≦5.999 •••▸5°≦GC<15° (?) P1.000~5.999 are not applicable. (?) Applicable to No.2.5~No.6 YC≦P/2tan GC−0.3≦18 ⊗ Not applicable for tip acute-angle type	200
		AC	———	Changes tip angle 15°<AC≦45° 1° increments ⊗ Not applicable for tip tapered type	400
		SC	Finishes tip with lapping. (?) Applicable to TiCN coating type only. (?) Dimension P tolerances remain the same. The base material is finished before coating. ⊗ R=0, RT=0 specification is not applicable.		1,200

Alterations		Code	Tip R	Tapered/Acute-angle	¥/1Code
Tip		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (?) (P:0.001mm increments.) ⊗ Lapping type : Not applicable ⊗ TiCN coating type, P>13:Not applicable		400 (TiCN coating 600)
Full length		LKC	———	Changes tolerance L. +0.3 0 +0.05 0 ⇨ L 0 0	1,000
Head		HC	Changes head diameter H. P≦HC<H 0.1mm increments (?) TiCN coating type: 2.6≦P≦HC<H		200
		TC	Changes head thickness T. 2≦TC<3 0.1mm increments (Combination with TKC・TKM→0.01mm increments) (?) The full length remains as specified. ⊗ TiCN coating type:Not applicable		200
		KC	Adds single key flat.		200
		WKC	Adds double key flats in parallel.		400
		TKC	Changes head thickness tolerance. +0.3 0 +0.02 0 T 0 0	Changes head thickness tolerance. +0.3 0 +0.02 0 T 0 0 +0.3 0 +0.1 0 F 0 0	200
		TKM	Changes head thickness tolerance. +0.3 0 +0.3 0 T 0 0 ⇨−0.02	Changes head thickness tolerance. +0.3 0 0 T 0 0 ⇨−0.02 +0.3 0 +0.1 0 F 0 0	200
		FKC	———	Changes dimension F tolerance. +0.3 0 +0.05 0 F 0 ⇨ 0 ⊗ Combination with LKC not available	1,000
Shank		TNK	The full length remains as specified. (Relief less than 0.2) (?) P≧1.00		200

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

(?) To be quoted on price & lead time above Max. Q'ty.

■Tip R type

No.	SKD11 or equivalent SPT	L—SPT	SKH51 HTFR	L—HTFR	H—HTFR	Powdered high-speed steel PTFR	L—PTFR	H—PTFR
1.6	780	2,140	950	2,320	2,020	1,230	2,750	2,300
2.0	780	2,140	950	2,320	2,020	1,230	2,750	2,300
2.5	780	2,140	950	2,320	2,020	1,230	2,750	2,300
3	780	2,140	950	2,320	2,020	1,230	2,750	2,330
4	640	2,000	790	2,160	1,930	1,060	2,580	2,190
5	670	2,030	840	2,210	2,030	1,130	2,650	2,310
6	690	2,050	900	2,270	2,210	1,230	2,750	2,530
8	810	2,170	1,130	2,490	2,570	1,620	3,140	3,060
10	1,000	2,360	1,400	2,770	2,990	2,050	3,570	3,630
13	1,250	2,610	1,720	3,090	3,460	2,490	4,010	4,220
16	1,450	2,810	2,100	3,470	4,010	3,140	4,660	5,040

■Tip tapered type

No.	SKD11 or equivalent TPT	L—TPT	SKH51 HTFT	L—HTFT	H—HTFT	Powdered high-speed steel PTFT	L—PTFT	H—PTFT
1.6	870	2,230	1,040	2,410	2,110	1,330	2,850	2,400
2.0	870	2,230	1,040	2,410	2,110	1,330	2,850	2,400
2.5	870	2,230	1,040	2,410	2,110	1,330	2,850	2,400
3	870	2,230	1,040	2,410	2,110	1,330	2,850	2,430
4	720	2,080	890	2,260	2,030	1,170	2,690	2,300
5	750	2,110	930	2,290	2,110	1,230	2,750	2,410
6	770	2,130	980	2,350	2,290	1,330	2,850	2,630
8	900	2,260	1,220	2,590	2,660	1,740	3,260	3,180
10	1,090	2,450	1,500	2,860	3,080	2,160	3,680	3,740
13	1,330	2,690	1,810	3,180	3,550	2,580	4,100	4,310
16	1,540	2,900	2,190	3,560	4,100	3,240	4,760	5,140

■Tip acute-angle type

No.	SKD11 or equivalent APT	L—APT	SKH51 HTFA	L—HTFA	H—HTFA	Powdered high-speed steel PTFA	L—PTFA	H—PTFA
1.6	870	2,230	1,040	2,410	2,110	1,330	2,850	2,400
2.0	870	2,230	1,040	2,410	2,110	1,330	2,850	2,400
2.5	870	2,230	1,040	2,410	2,110	1,330	2,850	2,400
3	870	2,230	1,040	2,410	2,110	1,330	2,850	2,430
4	720	2,080	890	2,260	2,030	1,170	2,690	2,300
5	750	2,110	930	2,290	2,110	1,230	2,750	2,410
6	770	2,130	980	2,350	2,290	1,330	2,850	2,630
8	900	2,260	1,220	2,590	2,660	1,740	3,260	3,180
10	1,090	2,450	1,500	2,860	3,080	2,160	3,680	3,740
13	1,330	2,690	1,810	3,180	3,550	2,580	4,100	4,310
16	1,540	2,900	2,190	3,560	4,100	3,240	4,760	5,140

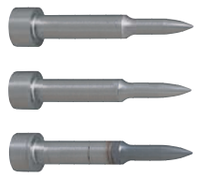
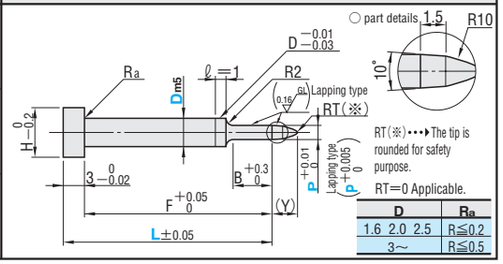
PILOT PUNCHES—FIXED IN STRIPPER PLATE—
—NORMAL / LAPPING TYPE / TiCN COATING TYPE—

PRESS ADD.SPEC. Printed in Red

PRODUCTS DATA P.1220

Price Cut : Reduced Price

The volume discount rate is also applicable to alteration cost. P.39

Type	M / H	Catalog No. Normal	Lapping	TiCN coating Surface3000HV	Shape
RoHS 	SKD11 or equivalent 60~63HRC	SPTPF	L—SPTPF	—	
	SKH51 61~64HRC	HTFPRF	L—HTFPRF	H—HTFPRF	
	Powdered high-speed steel 64~67HRC	PTFPRF	L—PTFPRF	H—PTFPRF	

D	Ra
1.6 2.0 2.5	R≦0.2
3~	R≦0.5

Catalog No. Type	D	0.1mm increments L	0.01mm increments (lapping type 0.001mm incr.) min. P max.	B	H
	1.6	10.0 ~ 40.0	1.00 ~ 1.59	(4)	2.6
	2.0		1.00 ~ 1.99		3.0
	2.5		1.50 ~ 2.49		3.5
	3		2.00 ~ 2.99		5
	4		2.00 ~ 3.99		7
	5		2.00 ~ 4.99		8
	6		2.50 ~ 5.99		9
	8		5.00 ~ 7.99		11

	Normal	Lapping	TiCN coating
M SKD11 or equivalent	SPTPF	L—SPTPF	
M SKH51	HTFPRF	L—HTFPRF	H—HTFPRF
M Powdered high-speed steel	PTFPRF	L—PTFPRF	H—PTFPRF

P>D−0.03 ••• When ℓ=0, P>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not applicable.
TiCN coating:The shank also has thin coating layer.
B (4) ••• When the full length L<12mm, the tip length B is 2mm.
(Y) ••• Dimension Y =0.6+$\sqrt{(P-0.2)(40.2-P)/4}$

Order Catalog No. — L — P — (RT=0)
SPTPF 2.0 — 28.0 — P1.90 — RT0
HTFPRF 2.5 — 35.0 — P2.20
Only RT=0 can be specified. (Except the lapping type.)

■Features
- This product is developed for press dies stamping thin plates.
- Dimension F (shank length) is highly precise and tip is finished with smooth R shape

Delivery 3 Days | Express A | 500/1Pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.
Express service A is not available for TiCN coating type.

Alteration Catalog No. — L — P — (RT=0) — (BC···etc.)
SPTPF 3 — 28.0 — P2.48 — TC2.5

Alterations		Code	Spec.	¥/1Code
Tip	PC	PC	Changes tip diameter P. PC≧Pmin./2≧1.00 0.01mm increments (lapping type 0.001mm increments) (Combination with PKC→0.001mm increments)	200
	BC	BC	Changes tip length B. 2≦BC≦Bmax. 0.1mm increments L requires BC+8mm or more. (P: 1.000~1.199 → Bmax. 15; 1.200~1.999 → 20; 2.000~ → 24)	200
	RLC	RLC	Cuts tip R flat. 3≦RLC<Ymax. 0.1mm increments RT=0 is not applicable. (P(PC): 1.000~1.499 → Ymax. 3; 1.500~2.499 → 4; 2.500~3.499 → 5; 3.500~4.999 → 6; 5.000~6.999 → 7; 7.000~7.990 → 8)	200
	SC	SC	Finishes tip with lapping. Available to TiCN coating type only. Dimension P tolerances remain the same. The base material is finished before coating. RT=0 is not applicable.	1,200
	PKC	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 Lapping type:Not applicable (P:0.001mm increments.)	400 (TiCN coating 600)
Head	HC	HC	Changes head diameter H. D+0.1≦HC<H 0.1mm increments	200
	TC	TC	Changes head thickness T. 2≦TC<3 0.1mm increments The full length remains as specified.	200
	KC	KC	Adds single key flat.	200
	WKC	WKC	Adds double key flats in parallel.	400
	TNK	TNK	Adds undercut. (Relief less than 0.2)	200
Full length	LKC	LKC	Changes tolerance L. L±0.05 ⇨ +0.05 0 Dimension F tolerance F +0.05 0 ⇨ ±0.05	0
Shank	NDC	NDC	No press-in lead ℓ=1 ⇨ ℓ=0	0

Price ■Volume discount rate P.37

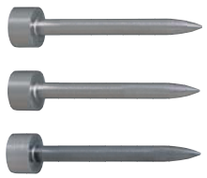
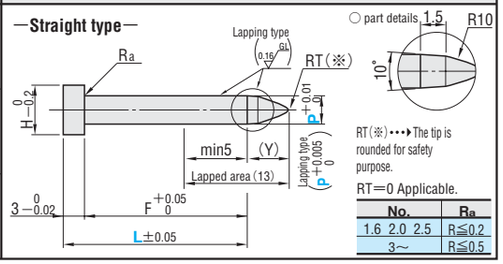
Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	SKD11 or equivalent Normal SPTPF	SKD11 or equivalent Lapping type L—SPTPF	SKH51 Normal HTFPRF	SKH51 Lapping type L—HTFPRF	SKH51 TiCN coating type H—HTFPRF	Powdered high-speed steel Normal PTFPRF	Powdered high-speed steel Lapping type L—PTFPRF	Powdered high-speed steel TiCN coating type H—PTFPRF
1.6	1,790	3,150	1,960	3,330	3,070	2,240	3,760	3,440
2.0	1,790	3,150	1,960	3,330	3,070	2,240	3,360	3,440
2.5	1,790	3,150	1,960	3,330	3,070	2,240	3,360	3,440
3	1,790	3,150	1,960	3,330	3,070	2,240	3,360	3,440
4	1,650	3,010	1,810	3,180	2,950	2,070	3,590	3,330
5	1,680	3,040	1,850	3,220	3,040	2,140	3,660	3,460
6	1,700	3,060	1,910	3,280	3,220	2,240	3,760	3,690
8	1,820	3,180	2,140	3,500	3,580	2,630	4,150	4,240

STRAIGHT PILOT PUNCHES—FIXED IN STRIPPER PLATE—
—NORMAL / LAPPING TYPE / TiCN COATING TYPE—

PRESS ADD.SPEC. Printed in Red
PRODUCTS DATA P.1220
Price Cut : Reduced Price
The volume discount rate is also applicable to alteration cost. P.39

Type	M / H	Catalog No. Normal	Lapping	TiCN coating Surface3000HV	Shape
RoHS 	SKD11 or equivalent 60~63HRC	SPTF	L—SPTF	—	
	SKH51 61~64HRC	HTFRF	L—HTFRF	H—HTFRF	
	Powdered high-speed steel 64~67HRC	PTFRF	L—PTFRF	H—PTFRF	

No.	Ra
1.6 2.0 2.5	R≦0.2
3~	R≦0.5

Catalog No. Type	D	0.1mm increments L	0.01mm increments (lapping type 0.001mm incr.) min. P max.	H
	1.6	10.0 ~ 40.0	1.00 ~ 1.60	2.6
	2.0		1.00 ~ 2.00	3.0
	2.5		1.50 ~ 2.50	3.5
	3		2.00 ~ 3.00	5
	4		3.00 ~ 4.00	7
	5		4.00 ~ 5.00	8
	6		5.00 ~ 6.00	9
	8		6.00 ~ 8.00	11

	Normal	Lapping	TiCN coating
M SKD11 or equivalent	SPTF	L—SPTF	
M SKH51	HTFRF	L—HTFRF	H—HTFRF
M Powdered high-speed steel	PTFRF	L—PTFRF	H—PTFRF

(Y) ••• Dimension Y =0.6+$\sqrt{(P-0.2)(40.2-P)/4}$

Order Catalog No. — L — P — (RT=0)
SPTF 2.0 — 28.0 — P1.90 — RT0
PTFRF 2.5 — 35.0 — P2.20
Only RT=0 can be specified. (Except the lapping type.)

■Features
- This product is developed for press dies stamping thin plates.
- Dimension F (shank length) is highly precise and tip is finished with smooth R shape.

Delivery 3 Days | Express A | 500/1Pc. P.38
Express service A is not available for TiCN coating type.
A flat charge of 1,350 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L — P — (RT=0) — (RLC·HC·TC···etc.)
SPTF 3 — 28.0 — P2.48 — TC2.5

Alterations		Code	Spec.	¥/1Code
Tip	RLC	RLC	Cuts tip R flat. 3≦RLC<Ymax. 0.1mm increments RT=0 is not applicable. (P(PC): 1.000~1.499 → Ymax. 3; 1.500~2.499 → 4; 2.500~3.499 → 5; 3.500~4.999 → 6; 5.000~6.999 → 7; 7.000~8.000 → 8)	200
	SC	SC	Finishes tip with lapping. Applicable to TiCN coating type only. Dimension P tolerances remain the same. The base material is finished before coating. RT=0 is not applicable.	1,200
	PKC	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 Lapping type:Not applicable (P:0.001mm increments.)	400 (TiCN coating 600)
Head	HC	HC	Changes head diameter H. 2.6≦P+0.1≦HC<H 0.1mm increments	200
	TC	TC	Changes head thickness T. 2≦TC<3 0.1mm increments The full length remains as specified. TiCN coating type:Not applicable	200
	KC	KC	Adds single key flat.	200
	WKC	WKC	Adds double key flats in parallel.	400
	TNK	TNK	Adds undercut. (Relief less than 0.2)	200
Full length	LKC	LKC	Changes tolerance L. L±0.05 ⇨ +0.05 0 Dimension F tolerance F +0.05 0 ⇨ ±0.05	0

Price ■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	SKD11 or equivalent Normal SPTF	SKD11 or equivalent Lapping type L—SPTF	SKH51 Normal HTFRF	SKH51 Lapping type L—HTFRF	SKH51 TiCN coating type H—HTFRF	Powdered high-speed steel Normal PTFRF	Powdered high-speed steel Lapping type L—PTFRF	Powdered high-speed steel TiCN coating type H—PTFRF
1.6	1,790	3,150	1,960	3,330	3,030	2,240	3,760	3,310
2.0	1,790	3,150	1,960	3,330	3,030	2,240	3,360	3,310
2.5	1,790	3,150	1,960	3,330	3,030	2,240	3,360	3,310
3	1,790	3,150	1,960	3,330	3,030	2,240	3,360	3,310
4	1,650	3,010	1,800	3,170	2,940	2,070	3,590	3,200
5	1,680	3,040	1,850	3,220	3,040	2,140	3,660	3,320
6	1,700	3,060	1,910	3,280	3,220	2,240	3,760	3,540
8	1,820	3,180	2,140	3,500	3,580	2,630	4,150	4,070

PRESS ADD.SPEC. Printed in Red

PILOT PUNCHES
—MOVABLE / HEADED, NORMAL TYPE / LAPPING TYPE—

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D	M H	Catalog No. Normal	Catalog No. Lapping	Shape
—Tip acute-angle— RoHS	D g6	SKD11 or equivalent 60～63HRC	UPTH	L—UPTH	Have tip machined depending on the spec.
		SKH51 61～64HRC	HUPTH	L—HUPTH	
		Powdered high-speed steel 64～67HRC	PUPTH	L—PUPTH	
—Tip R & taper Combined— RoHS		SKD11 or equivalent 60～63HRC	UPTHF	L—UPTHF	○ part details
		SKH51 61～64HRC	HUPTHF	L—HUPTHF	RT(※)•••▸The tip is rounded for safety purpose.
		Powdered high-speed steel 64～67HRC	PUPTHF	L—PUPTHF	RT=0 Applicable.

H	Catalog No. Type	D	L (Dimension L is from the head bottom.)	0.01mm increments (lapping type 0.001mm incr.) min. P max.	0.1mm increments B
6	—Normal— —Lapping— UPTH L—UPTH / UPTHF L—UPTHF	3	42 52 62 72	1.00～2.50	2.0～25.0
		4	42 52 62 72	1.50～3.50	
8	HUPTH L—HUPTH / HUPTHF L—HUPTHF	5	42 52 62 72	2.00～4.50	
	PUPTH L—PUPTH / PUPTHF L—PUPTHF	6	42 52 62 72	2.50～5.50	
10		8	42 52 62 72 82	3.00～7.50	

Features
- Since a large spring can be used for this type, it can bear heavier loads and high-speed revolution.
- As this type has a head, it will not come off even if the stripper plate is removed while trial or adjustment.

At bottom dead center

DS BP PP BP SP Work DP

Order

Catalog No. — L — P — B — (RT=0)

UPTH 4 — 52 — P2.55 — B2.5

L—HUPTHF 6 — 62 — P3.00 — B8.0 — RT0

Only RT=0 can be specified. (Applicable to the tip R & taper combined type, Except the lapping type.)

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery

3 Days

Express	T	1,000/1Pc.
Express	A	500/1Pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Express service T is not available for the tip R & taper integrated type.

D	Tip acute-angle type UPTH	L—UPTH	HUPTH	L—HUPTH	PUPTH	L—PUPTH	Tip R & taper Combined type UPTHF	L—UPTHF	HUPTHF	L—HUPTHF	PUPTHF	L—PUPTHF
3	1,100	2,460	1,340	2,710	1,760	3,280	1,300	2,660	1,540	2,910	1,960	3,480
4	920	2,280	1,130	2,490	1,470	2,990	1,120	2,480	1,330	2,690	1,670	3,190
5	930	2,290	1,150	2,520	1,520	3,040	1,130	2,490	1,350	2,720	1,720	3,240
6	980	2,340	1,210	2,580	1,580	3,100	1,180	2,540	1,410	2,780	1,780	3,300
8	1,210	2,570	1,500	2,860	1,960	3,480	1,410	2,770	1,700	3,060	2,160	3,680

Alteration

Catalog No. — L(LC) — P(PC) — B — (RT=0) — (GC・PKC…etc.)

UPTH 8 — LC70 — P5.882 — B20 — GC30 — PKC

Alterations		Code	Spec.	¥/1Code
Tip	PC	PC	Changes tip diameter P. Tip acute-angle type PC≧Pmin/2≧0.5 Tip R & taper combined type PC≧Pmin/2≧1.0 0.01mm increments (lapping type 0.001mm increments) (Combination with PKC→0.001mm increments) When PC is 0.5～0.99, Bmax. is 8mm.	200
	GC	GC	Changes tip angle 15°＜GC≦45° 1° increments Tip R & taper combined type : Not applicable	400
	R10	RC	Changes tip radius R. The tip is machined at R10. Tip R & taper combined type : Not applicable	200
	R10 RLC +0.3 0	RLC	Cuts tip R flat. 3≦RLC＜Ymax. 0.1mm increments RT=0 is not applicable. Tip acute-angle type : Not applicable P＜P1 : Not applicable	200

P(PC)	Ymax.
1.000～1.499	3
1.500～2.499	4
2.500～3.499	5
3.500～4.999	6
5.000～6.999	7
7.000～7.500	8

Alterations		Code	Spec.	¥/1Code
Tip	PKC	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P:0.001mm increments.) Lapping type:Not available	400
	BKC	BKC	Changes blade length tolerance. B +0.3 0 ⇨ +0.05 0 RC:Not applicable (B:0.01mm increments)	400 (Tip R・taper integrated type 800)
Full length	LC	LC	Changes the full length L B+15≦LC＜L 0.1mm increments	200
Head	HC	HC	Changes head diameter H. D≦HC＜H 0.1mm increments	200
	TC	TC	Changes head thickness T. 2≦TC＜5 0.1mm increments	200

PRESS ADD.SPEC. Printed in Red

PILOT PUNCHES
—MOVABLE / HEADED, TiCN COATING TYPE—

PRODUCTS DATA P.1220

COATING PUNCHES —TiCN—

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D	M H	Catalog No.	Shape
—Tip acute-angle— RoHS	D g6	SKH51 61～64HRC Surface:3000HV	H—HUPTH	Have tip machined depending on the spec.
		Powdered high-speed steel 64～67HRC Surface:3000HV	H—PUPTH	
—Tip R & taper Combined— RoHS		SKH51 61～64HRC Surface:3000HV	H—HUPTHF	○ part details
		Powdered high-speed steel 64～67HRC Surface:3000HV	H—PUPTHF	RT(※)•••▸The tip is rounded for safety purpose. RT=0 Applicable.

H	Catalog No. Type	D	L (Dimension L is from the head bottom.)	0.01mm increments min. P max.	0.1mm increments B	U/Price Q'ty：1～9 H—HUPTH	H—PUPTH	H—HUPTHF	H—PUPTHF
6	H—HUPTH H—HUPTHF H—PUPTH H—PUPTHF	3	42 52 62 72	1.00～2.50	2.0～25.0 and B≦L/2	2,450	2,990	2,650	3,190
		4	42 52 62 72	1.50～3.50		2,270	2,730	2,470	2,930
8		5	42 52 62 72	2.00～4.50		2,340	2,840	2,540	3,040
		6	42 52 62 72	2.50～5.50		2,520	3,030	2,720	3,230
10		8	42 52 62 72 82	3.00～7.50		2,940	3,570	3,140	3,770

TiCN coating type：The shank also has thin coating layer.

Order

Catalog No. — L — P — B — (RT=0)

H—PUPTH 4 — 52 — P2.55 — B2.5

H—HUPTHF 6 — 62 — P3.00 — B8.0 — RT0

Only RT=0 can be specified. (Applicable to the tip R & taper combined type, Except alteration SC)

Delivery

3 Days

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. — L(LC) — P(PC) — B — (RT=0) — (GC・PKC…etc.)

H—HUPTH 8 — LC70 — P5.88 — B20 — GC30 — PKC

Example

Features
- Since a large spring can be used for this type, it can bear heavier loads and high-speed revolution.
- As this type has a head, it will not come off even if the stripper plate is removed while trial or adjustment.

At bottom dead center

DS BP PP BP SP Work DP

Alterations		Code	Spec.	¥/1Code
Tip	PC	PC	Changes tip diameter P. PC≧Pmin./2≧1.00 0.01mm increments (Combination with PKC→0.001mm increments)	200
	GC	GC	Changes tip angle 15°＜GC≦45° 1° increments Tip R & taper combined type : Not applicable	400
	R10	RC	Changes tip radius R. The tip is machined at R10. Tip R & taper combined type : Not applicable	200
	R10 RLC +0.3 0	RLC	Cuts tip R flat. 3≦RLC＜Ymax. 0.1mm increments RT=0 is not applicable. Tip acute-angle type : Not applicable	200
	BKC	BKC	Changes blade length tolerance. B +0.3 0 ⇨ +0.05 0 RC:Not applicable (B:0.01mm increments)	400 (Tip R・taper integrated type 800)

P(PC)	Ymax.
1.000～1.499	3
1.500～2.499	4
2.500～3.499	5
3.500～4.999	6
5.000～6.999	7
7.000～7.500	8

Alterations		Code	Spec.	¥/1Code
Tip	0.15 G 0.16 G	SC	Finishes tip with lapping. Dimension P tolerances remain the same..The base material is finished before coating. RT=0 specification is not available.	1,200
	PKC	PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0 (P:0.001mm increments.)	600
Full length	LC	LC	Changes the full length L B+15≦LC＜L 0.1mm increments	200
Head	HC	HC	Changes head diameter H. D≦HC＜H 0.1mm increments	200
	TC	TC	Changes head thickness T. 2≦TC＜5 0.1mm increments	200

PILOT PUNCHES —MOVABLE NORMAL / LAPPING TYPE—

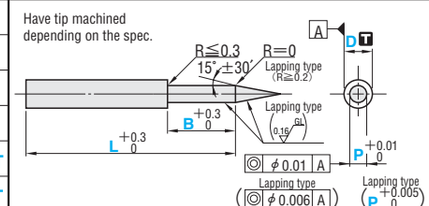
PRESS ADD.SPEC. Printed in Red

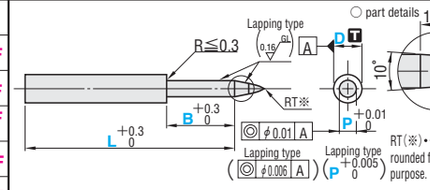
The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Normal	Catalog No. Lapping
—Tip acute-angle— RoHS	D_{g6}	SKD11 or equivalent 60～63HRC	UPT (D3～8)	L—UPT (D3～8)
		SKH51 61～64HRC	HUPT	L—HUPT
		Powdered high-speed steel 64～67HRC	PUPT	L—PUPT
	$D^{-0.005}_{-0.010}$	SKD11 or equivalent 60～63HRC	A—UPT (D3～8)	AL—UPT (D3～8)
		SKH51 61～64HRC	A—HUPT	AL—HUPT
		Powdered high-speed steel 64～67HRC	A—PUPT	AL—PUPT
—Tip R & taper combined— RoHS	D_{g6}	SKD11 or equivalent 60～63HRC	UPTF (D3～8)	L—UPTF (D3～8)
		SKH51 61～64HRC	HUPTF	L—HUPTF
		Powdered high-speed steel 64～67HRC	PUPTF	L—PUPTF
	$D^{-0.005}_{-0.010}$	SKD11 or equivalent 60～63HRC	A—UPTF (D3～8)	AL—UPTF (D3～8)
		SKH51 61～64HRC	A—HUPTF	AL—HUPTF
		Powdered high-speed steel 64～67HRC	A—PUPTF	AL—PUPTF

Shape

Have tip machined depending on the spec.



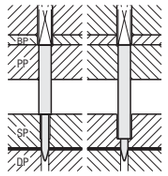


RT(※)•••The tip is rounded for safety purpose.
RT=0 Applicable.

Catalog No. Type	D	L	0.01mm increments (lapping type 0.001mm increments) min. P max.	0.1mm increments B
—Normal— (D_{g6}) ($D^{-0.005}_{-0.010}$) —Lapping— (D_{g6}) ($D^{-0.005}_{-0.010}$)	2.0	32 42	0.50(1.00)～1.50	2.0～(23.0)
UPT A—UPT L—UPT AL—UPT	2.5	32 42	1.00～2.00	
UPTF A—UPTF L—UPTF AL—UPTF	3	42 52 62 72	1.00～2.50	
HUPT A—HUPT L—HUPT AL—HUPT	4	42 52 62 72	1.50～3.50	
HUPTF A—HUPTF L—HUPTF AL—HUPTF	5	42 52 62 72	2.00～4.50	
PUPT A—PUPT L—PUPT AL—PUPT	6	42 52 62 72	2.50～5.50	
PUPTF A—PUPTF L—PUPTF AL—PUPTF	8	42 52 62 72 82	3.00～7.50	

(P) B(23) •••When P＜1.0, range of B is 2.0～8.0 (P) P(1.00)•••Tip R & taper combined type is Pmin.1.00.

ex Example



Order

Catalog No. — L — P — B — (RT=0)

UPTF 8 — 72 — P5.88 — B20.0 — RT0

(P) Only RT=0 can be specified. (P) Applicable to Tip R & taper combined type. Except the lapping type.

Delivery

3 Days

Express T	1,000/1Pc.
Express A	500/1Pc.

P.38

(P) A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
⊗ Express service T is not available for Tip R & taper combined type.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

(P) To be quoted on price & lead time above Max. Q'ty.

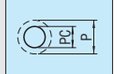
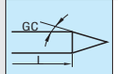
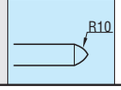
■The price table indicates the prices of products with shank diameter tolerance of D_{g6}.
For shank tolerance of $D^{-0.005}_{-0.016}$, additional 100 yen required.
Example：AL—UPT5,
the price is 2,170（L—UPT5 unit price）＋100 ＝ 2,270 yen（product unit）

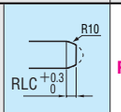
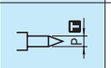
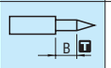
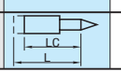
D	Tip acute-angle type UPT	L—UPT	HUPT	L—HUPT	PUPT	L—PUPT	Tip R & taper combined type UPTF	L—UPTF	HUPTF	L—HUPTF	PUPTF	L—PUPTF
2.0	—	—	1,210	2,580	1,570	3,090	—	—	1,410	2,780	1,770	3,290
2.5	—	—	1,210	2,580	1,570	3,090	—	—	1,410	2,780	1,770	3,290
3	950	2,310	1,160	2,530	1,520	3,040	1,150	2,510	1,360	2,730	1,720	3,240
4	800	2,160	980	2,350	1,280	2,800	1,000	2,360	1,180	2,550	1,480	3,000
5	810	2,170	1,000	2,370	1,320	2,840	1,010	2,370	1,200	2,570	1,520	3,040
6	860	2,220	1,050	2,420	1,370	2,890	1,060	2,420	1,250	2,620	1,570	3,090
8	1,050	2,410	1,300	2,660	1,700	3,220	1,250	2,610	1,500	2,860	1,900	3,420

Alteration

Catalog No. — L(LC) — P(PC) — B — (RT=0) — (GC・RC・PKC・BKC)

UPT 8 — LC70 — P5.88 — B20.0 — GC30 — PKC

Alterations		Code	Spec.	¥/1Code
Tip		PC	Changes tip diameter P. Tip acute-angle type PC≧Pmin/2≧0.5 Tip R & taper combined type PC≧Pmin/2≧1.0 0.01mm increments (lapping type 0.001mm increments) (Combination with PKC→0.001mm increments) (P) When PC is 0.5～0.99, Bmax. is 8mm.	200
		GC	Changes tip angle 15°＜GC≦45° 1° increments (P) Tip R & taper combined type : Not applicable	400
		RC	Changes tip radius R. The tip is machined at R10. (P) Tip R & taper combined type : Not applicable	200

Alterations		Code	Spec.	¥/1Code
Tip		RLC	Cuts tip R flat. 3≦RLC≦Ymax. 0.1mm increments ⊗ RT=0 is not applicable. ⊗ Tip acute-angle type : Not applicable ⊗ P＜1 : Not available	200
		PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P) (P:0.001mm increments.) ⊗ Lapping type:Not applicable	400
		BKC	Changes blade length tolerance. $B^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ (P) (B:0.01mm increments.) ⊗ RC:Not applicable	400 (Tip R・taper combined type 800)
Full length		LC	Changes the full length L B+9≦LC＜L 0.1mm increments	200

P(PC)	Ymax.
1.000～1.499	3
1.500～2.499	4
2.500～3.499	5
3.500～4.999	6
5.000～6.999	7
7.000～7.500	8

PILOT PUNCHES —MOVABLE/TiCN COATING TYPE—

PRESS ADD.SPEC. Printed in Red

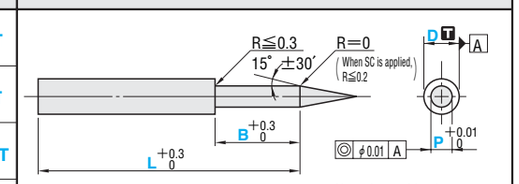
PRODUCTS DATA P.1220

COATING PUNCHES —TiCN—

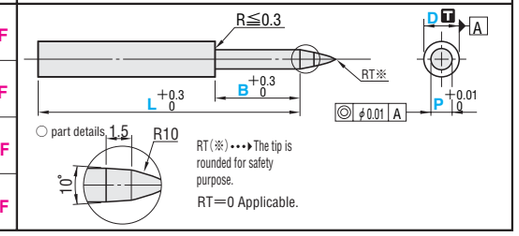
The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No.
—Tip acute-angle— RoHS	D_{g6}	SKH51 61～64HRC Surface 3000HV	H—HUPT
		Powdered high-speed steel 64～67HRC Surface 3000HV	H—PUPT
	$D^{-0.005}_{-0.010}$	SKH51 61～64HRC Surface 3000HV	AH—HUPT
		Powdered high-speed steel 64～67HRC Surface 3000HV	AH—PUPT
—Tip R & taper combined— RoHS	D_{g6}	SKH51 61～64HRC Surface 3000HV	H—HUPTF
		Powdered high-speed steel 64～67HRC Surface 3000HV	H—PUPTF
	$D^{-0.005}_{-0.010}$	SKH51 61～64HRC Surface 3000HV	AH—HUPTF
		Powdered high-speed steel 64～67HRC Surface 3000HV	AH—PUPTF

Shape



Have tip machined depending on the spec.



RT(※)•••The tip is rounded for safety purpose.
RT=0 Applicable.

Catalog No. Type	D	L	0.01mm increments min. P max.	0.1mm increments B
M SKH51 H—HUPT	2.0	32 42	1.00～1.50	2.0～23.0 (B≦L/2)
H—HUPTF	2.5	32 42	1.00～2.00	
AH—HUPT	3	42 52 62 72	1.00～2.50	
AH—HUPTF	4	42 52 62 72	1.50～3.50	
M Powdered high-speed steel H—PUPT	5	42 52 62 72	2.00～4.50	
H—PUPTF	6	42 52 62 72	2.50～5.50	
AH—PUPT	8	42 52 62 72 82	3.00～7.50	
AH—PUPTF				

(P) TiCN coating type：The shank also has thin coating layer.

Order

Catalog No. — L — P — B — (RT=0)

H—PUPT 8 — 72 — P5.88 — B20.0

H—HUPTF 6 — 62 — P4.50 — B8.0 — RT0

(P) Only RT=0 can be specified.（Applicable to Tip R & taper combined type. Except alteration SC.）

Delivery

3 Days

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

(P) To be quoted on price & lead time above Max. Q'ty.

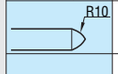
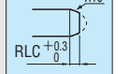
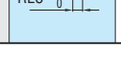
■The price table indicates the prices of products with shank diameter tolerance of D_{g6}.
For shank tolerance of $D^{-0.005}_{-0.016}$, additional 100 yen required.
Example：AH—HUPT5, the price is 2,190（H—HUPT5 unit price）＋100 ＝ 2,290 yen（product unit）

D	Tip acute-angle type H—HUPT	H—PUPT	Tip R & taper combined type H—HUPTF	H—PUPTF
2.0	2,350	2,830	2,550	3,030
2.5	2,350	2,830	2,550	3,030
3	2,270	2,750	2,470	2,950
4	2,120	2,540	2,320	2,740
5	2,190	2,640	2,390	2,840
6	2,360	2,820	2,560	3,020
8	2,740	3,310	2,940	3,510

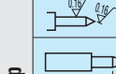
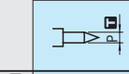
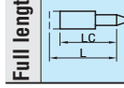
Alteration

Catalog No. — L(LC) — P(PC) — B — (RT=0) — (GC・RC・SC…etc.)

H—PUPT 8 — LC70 — P5.88 — B20.0 — BKC

Alterations		Code	Spec.	¥/1Code
Tip		PC	Changes tip diameter P. PC≧Pmin./2≧1.00 0.01mm increments (Combination with PKC→0.001mm increments)	200
		GC	Changes tip angle 15°＜GC≦45° 1° increments (P) Tip R・taper integrated type : Not applicable	400
		RC	Changes tip radius R. The tip is machined at R10. (P) Tip R・taper integrated type : Not applicable	200
		RLC	Cuts tip R flat. 3≦RLC＜Ymax. 0.1mm increments ⊗ RT=0 specification is not applicable. ⊗ Tip acute-angle type : Not applicable	200

P(PC)	Ymax.
1.000～1.499	3
1.500～2.499	4
2.500～3.499	5
3.500～4.999	6
5.000～6.999	7
7.000～7.500	8

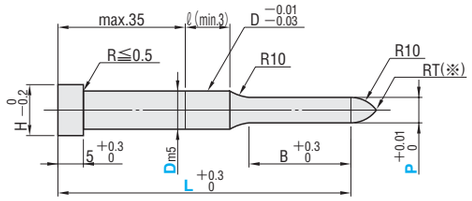
Alterations		Code	Spec.	¥/1Code
Tip		SC	Finishes tip with lapping. (P) Dimension P tolerances remain the same. The base material is finished before coating. ⊗ RT=0 specification is not applicable.	1,200
		BKC	Changes blade length tolerance. $B^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ ⊗ (B:0.01mm increments.) ⊗ RC:Not applicable	400 (Tip R・taper combined type 800)
		PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P) (P:0.001mm increments.)	600
Full length		LC	Changes the full length L B+9≦LC＜L 0.1mm increments	200

PILOT PUNCHES
—TIP DIAMETERS SELECTIVE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

STAZ



- RT(※)‥‥› The P＜8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208)
- Refer to the product data "R length of Punch" for the length of tip R. P.1208

M SKD11
H 60～63HRC

Catalog No. Type	D	L	P	B	H	U/Price Q'ty：1～9
STAZ	3	(42) 52 62 72	1.5 2.0 2.5	15	5	310
	4		2.0 2.5 3.0 3.5		7	330
	5		3.0 3.5 4.0 4.5		8	350
	6		4.0 4.5 5.0 5.5		9	360
	8	52 62 72 82	6.0 7.0	21	11	450
	10		8.0 9.0		13	580

- L(42) ‥‥› B=10 When L(42), point length B is 10mm.

Order Catalog No. — L — P — (RT=0)

STAZ 6 — 62 — P4.5 — RT0
STAZ10 — 72 — P8.0

- Only RT=0 can be specified. (Applicable to P＜8)

Delivery 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38

- A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Price

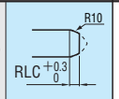
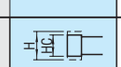
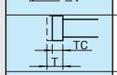
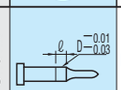
■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

- To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L — P — (HC･TC…etc.)

STAZ 6 — 62 — P4.5 — TC4.0

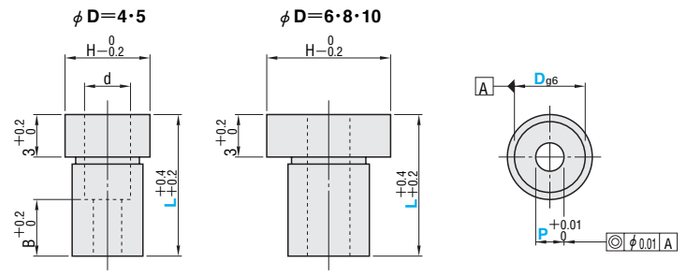
Alterations		Code	Spec.	¥/1Code
Tip		RLC	Cuts tip R flat. 2≦RLC＜$\sqrt{P(10-P/4)}$ 0.1mm increments ● Applicable to P＜8	200
Head		HC	Changes head diameter H. D≦HC＜H 0.1mm increments	200
		TC	Changes head thickness T. 2≦TC＜5 0.1mm increments ● L is shortened by (5−TC).	200
		KC	Adds single key flat.	200
		WKC	Adds double key flats in parallel.	400
Shank		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	0

PILOT EJECTOR BUSHINGS

The volume discount rate is also applicable to alteration cost. P.39

RoHS

MEG



M SKD11
H 60～63HRC

Catalog No. Type	D	L	0.01mm increments min. P max.	B	d	H	U/Price Q'ty：1～9
MEG	4	10	1.00 ～ 2.00	2	2.4	5	2,060
	5		1.00 ～ 3.00	4	3.2	6	1,790
	6		2.50 ～ 4.00	10	—	9	1,340
	8		3.00 ～ 6.00			11	1,340
	10		5.00 ～ 8.00			13	1,340

Order Catalog No. — L — P

MEG 5 — 10 — P2.00

Delivery 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38

- A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Price

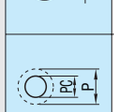
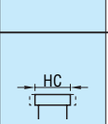
■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

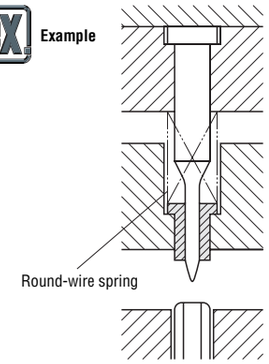
- To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L — P — (HC･PKC･PC)

MEG 5 — 10 — P2.00 — PKC

Alterations		Code	Spec.	¥/1Code
Guide		PKC	Changes tolerance on P. P +0.01 0 ⇨ +0.005 0	400
		PC	Changes guide hole diameter. 2.5≦PC＜P 0.01mm increments ⊗D4～6：Not applicable	200
Head		HC	Changes head diameter H. D≦HC＜H 0.1mm increments	200

Example



- When thin material is punched by progressive dies, a pilot ejector bushing prevents the material from biting the pilot punch.
- Wire springs P.1055

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

PUNCH GUIDE BUSHINGS

PUNCH GUIDE BUSHINGS

Add. Shank dia. tolerance D $^{+0.005}_{0}$

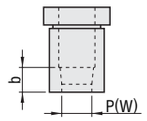
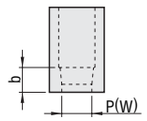
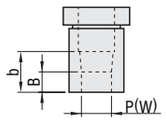
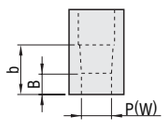
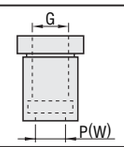
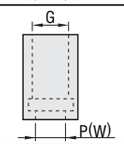
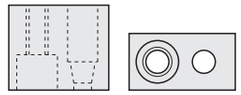
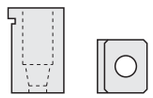
Add. Shank dia. tolerance D $^{+0.005}_{0}$

Name	PUNCH GUIDE BUSHINGS		—Long type—		—Super Long type—	
Catalog No.	Head type	Straight type	Head type	Straight type	Head type	Straight type
Delivery	③Ⓣ Ⓐ		③Ⓣ Ⓐ		③	
Page	245		247		249	

—Two stepped guide type—		—Block type—	
Head type	Straight type	Bolt fixing type	Flanged type
③		③Ⓐ	
250		251	

PUNCH GUIDE BUSHINGS
—GUIDE—

Printed in red are new products

Punch guide bushing type		Material	Type	Shank dia. Ⓣ	Round	Shaped	Features	Page
Head type		SKH51 (φ3～5)	Regular type	D m5	MHG	HG□	——	P.245
		SKD11 or equivalent (φ6～16)		D m5	MHG	HG□		
				D $^{+0.005}_{0}$	A—MHG	A—HG□		
Straight type		SKH51 (φ3～5)	Regular type	D n5	MSG	SG□	——	
		SKD11 or equivalent (φ6～16)		D n5	MSG	SG□		
				D $^{+0.005}_{0}$	A—MSG	A—SG□		
Head type		SKH51 (φ3～5)	Long type	D m5	LMHG	LHG□	The guide length (dimension b), which is the depth of the dimension P(W) hole, has been lengthened compared to the regular types in order to support long strokes.	P.247
		SKD11 or equivalent (φ6～16)		D m5	LMHG	LHG□		
				D $^{+0.005}_{0}$	A-LMHG	A-LHG□		
Straight type		SKH51 (φ3～5)	Long type	D n5	LMSG	LSG□		
		SKD11 or equivalent (φ6～16)		D n5	LMSG	LSG□		
				D $^{+0.005}_{0}$	A-LMSG	A-LSG□		
Head type		SKH51 (φ4・5) SKD11 or equivalent (φ6～10)	Super long type	D m5	SLMHG	——	The guide length (dimensions b and B) has been further lengthened (dimension B=max. dimension P(W)×5) to support longer stokes.	P.249
Straight type		SKH51 (φ4・5) SKD11 or equivalent (φ6～10)	Super long type	D n5	SLMSG	——		
Head type		SKH51 (φ3～5) SKD11 or equivalent (φ6・8)	Two-stepped guide type	D $^{+0.005}_{0}$	FMHG	——	To enable the busing to guide a punch at both the point and the shank in cases where the point of punch is thin, etc., relief hole dimension (G) has been made specifiable. Thus the tolerances of dimensions D and P and the concentricity have been improved.	P.250
Straight type		SKH51 (φ3～5) SKD11 or equivalent (φ6・8)	Two-stepped guide type	D $^{+0.005}_{0}$	FMSG	——		
Bolt fixing type		SKD11 or equivalent	Block type	H $^{+0.01}_{0}$ V $^{+0.01}_{0}$	BBG	BBG□	By using shims, etc., it is possible to adjust the punch position minutely. As this type allows replacement of bolt from the die side, its maintenance is easy. (Shim tapes FGSM·FGSM□ P.752 / Laminated plates for spacer LHP P.751 / Precision multipurpose plates UTPB P.753)	P.251
Flanged type		SKD11 or equivalent	Block type	H $^{+0.005}_{0}$ V $^{+0.005}_{0}$	BGF	BGF□	By using shims, etc., it is possible to adjust the punch position minutely. As the flange thickness is same as that of the round type punch guide bushings, this type can be used with the round type, at the places where a strict positional accuracy is required. (Shim tapes FGSM·FGSM□ P.752 / Laminated plates for spacer LHP P.751 / Precision multipurpose plates UTPB P.753)	

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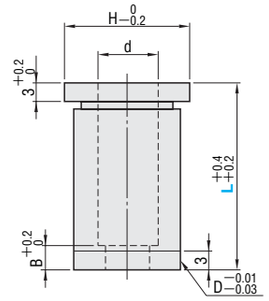
PUNCH GUIDE BUSHINGS

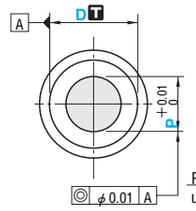
The volume discount rate is also applicable to alteration cost. P.39

—Head type— RoHS

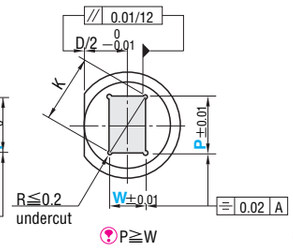
Shank dia. D T	M H	Shank D	Catalog No.
D_{m5}	SKH51 61～64HRC	D3～ 5	A MHG
	SKD11 or equivalent 60～63HRC	D6～16	
	SKD11 or equivalent 60～63HRC	D6～16	D HGD R HGR E HGE G HGG
$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	D6～16	A A—MHG D A—HGD R A—HGR E A—HGE G A—HGG



Shape A

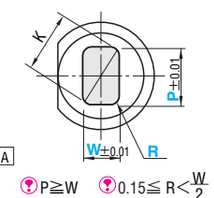


Shape D



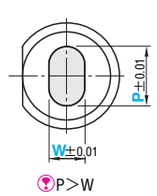
Ⓡ P≧W
Ⓡ $K=\sqrt{P^2+W^2}$

Shape R



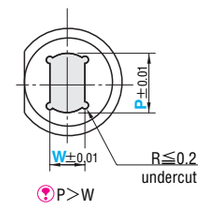
Ⓡ P≧W Ⓡ $0.15 \leqq R < \frac{W}{2}$
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



Ⓡ P>W

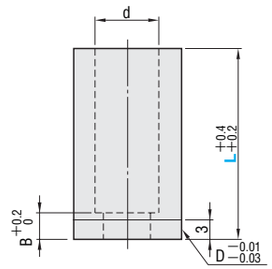
Shape G



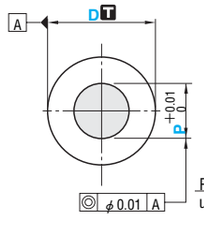
Ⓡ P>W

—Straight type— RoHS

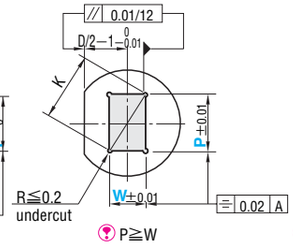
Shank dia. D T	M H	Shank D	Catalog No.
D_{n5}	SKH51 61～64HRC	D3～ 5	A MSG
	SKD11 or equivalent 60～63HRC	D6～16	
	SKD11 or equivalent 60～63HRC	D8～16	D SGD R SGR E SGE G SGG
$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	D6～16	A A—MSG
		D8～16	D A—SGD R A—SGR E A—SGE G A—SGG



Shape A

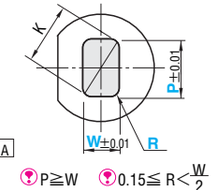


Shape D



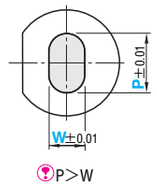
Ⓡ P≧W
Ⓡ $K=\sqrt{P^2+W^2}$

Shape R



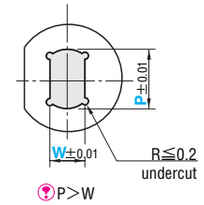
Ⓡ P≧W Ⓡ $0.15 \leqq R < \frac{W}{2}$
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



Ⓡ P>W

Shape G



Ⓡ P>W

D	D T m5	D T n5	D T +0.005 0
3	+0.006 +0.002	+0.008 +0.004	—
4	+0.009 +0.004	+0.013 +0.008	
5			
6			+0.005 0
8	+0.012 +0.006	+0.016 +0.010	
10			
13	+0.015 +0.007	+0.020 +0.012	
16			

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	Ⓡ R	B	d	H
(SKH51) Head type (D_{m5}) Straight type (D_{n5}) Ⓐ MHG MSG	(3)	10 13 16 20	0.30～ 0.70	—	—	—	2	2.0	4
	(4)	10 13 16 20 22 25	0.30～ 2.00	—	—			2.4	5
	(5)	10 13 16 20 22 25	0.50～ 2.50	—	—			2.9	6
(SKD11 or equivalent) Head type (D_{m5} $D^{+0.005}_{0}$) Straight type (D_{n5} $D^{+0.005}_{0}$)	(6)	10 13 16 20 22 25	1.00～ 3.00	3.00	1.00	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	3	3.4	9
Ⓐ MHG A—MHG MSG A—MSG	8	10 13 16 20 22 25	1.00～ 4.00	4.00	1.00		4	4.4	11
D HGD A—HGD SGD A—SGD	10	10 13 16 20 22 25	2.00～ 6.00	6.00	1.20			6.4	13
R HGR A—HGR SGR A—SGR	13	10 13 16 20 22 25	3.00～ 8.00	8.00	1.50		6	8.4	16
E HGE A—HGE SGE A—SGE	16	10 13 16 20 22 25	3.00～10.00	10.00	2.00			10.6	19
G HGG A—HGG SGG A—SGG									

Ⓡ D=(6)straight type is only available in shape Ⓐ.
Ⓡ D=(3)(4)(5) are only available with m5 and n5.
Ⓡ As the part underneath D3's head is thin, be careful not to damage it while mounting.

Order

Catalog No. — L — P — W — R(Ⓡ only)

MHG 8 — 20 — P3.01
SGR 13 — 16 — P7.22 — W3.22 — R0.15

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓡ To be quoted on price & lead time above Max. Q'ty.

Delivery 3 Days

Express	T	1,600/1pc.
	A	800/1pc.

P.38

Ⓡ A flat charge of 2,160 yen for 3 pieces or more of the same size(excluding Express T).

■Head type

D	MHG	A—MHG	HGD·HGR HGE·HGG	A—HGD·A—HGR A—HGE·A—HGG
3	2,300	—	—	—
4	1,710	—	—	—
5	1,710	—	—	—
6	940	1,140	3,480	3,680
8	910	1,110	3,480	3,680
10	910	1,110	3,480	3,680
13	830	1,030	3,630	3,830
16	830	1,030	3,920	4,120

■Straight type

D	MSG	A—MSG	SGD·SGR SGE·SGG	A—SGD·A—SGR A—SGE·A—SGG
3	2,170	—	—	—
4	1,550	—	—	—
5	1,550	—	—	—
6	800	1,000	—	—
8	760	960	3,480	3,680
10	760	960	3,480	3,680
13	680	880	3,630	3,830
16	680	880	3,920	4,120

Alteration

Catalog No. — L(LC) — P(PC) — W(WC) — R — (HC·TC·KC···etc.)
MHG 8 — LC15 — P3.01 — KC

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole		PC WC	Changes dimension P min: P>PC≧ Pmin/2 ≧0.50 0.01mm increments Ⓡ D13・16 : When PC is 1.50～1.99, B is 4mm. max: P<PC≦P+0.2	Changes dimension P and W min: P/W>PC/WC≧ P·Wmin/2 ≧1.00 0.01mm increments max: P/W< PC/WC ≦P・Kmax+0.2	200
		PKC	Changes tolerance on P $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗P<1.00 : Not available	Changes tolerance on P and W P·W ±0.01 ⇨ $^{+0.01}_{0}$ ⊗P·W<1.00 : Not available	400
Full length		LC	Changes dimension L (full length) (From point end) 10≦LC<L 0.1mm incr. (combination with LKC・LKZ→0.01mm incr.) Ⓡ B and lead are shortened by(L—LC). Changes dimension L (full length) 10≦LC<L 0.1mm incr. (combination with LKC・LKZ→0.01mm incr.)		200
		LKC	Changes tolerance on L $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		400
		LKZ	Changes tolerance on L $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗L(LC)<16 : Not available		600

Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		KC	Adds single key flat	Changes position of single key flat 1° incr.	200
			Adds single key flat ⊗D3～6 : Not available	Changes position of single key flat 1° incr.	
		WKC	Adds double key flats in parallel Combination with KC : available ⊗L(LC)<16 : Not available ⊗Straight type D3～6 : Not available		200 (Ⓐ =400)
		HC	Changes dimension H (head diameter) D≦HC<H 0.1mm increments		200
		TC	Changes dimension T (head thickness) 2≦TC<3 0.1mm incr.(Combination with TKC・TKM→0.01mm incr) Ⓡ L is shortened according to(3—TC). When LC is applied, L is equal to LC.		200
		TKC	Changes tolerance on T $T^{+0.2}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗L(LC)<16 : Not available		200
		TKM	Changes tolerance on T $T^{+0.2}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗L(LC)<16 : Not available		200
Shank		SKC	Adds key flat on the shank Ⓡ Applicable to head type only. Ⓡ Applicable to D≧8, L(LC)≧20 ⊗Combination with KC and WKC : Not available		600

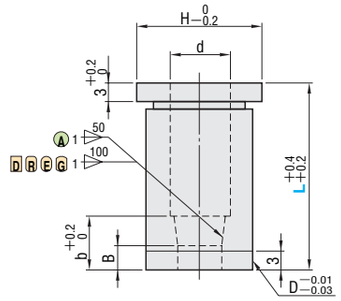
PRESS ADD.SPEC. Printed in Red

PUNCH GUIDE BUSHINGS
—LONG TYPE—

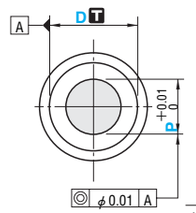
The volume discount rate is also applicable to alteration cost. P.39

—Head type— RoHS

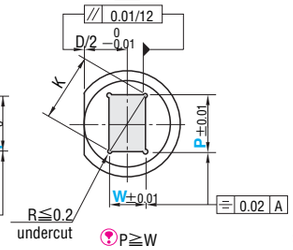
Shank dia. D T	M H	Shank D	Catalog No.
D_{m5}	SKH51 61～64HRC	D3～ 5	Ⓐ LMHG
	SKD11 or equivalent 60～63HRC	D6～16	
	SKD11 or equivalent 60～63HRC	D6～16	Ⓓ LHGD Ⓡ LHGR Ⓔ LHGE Ⓖ LHGG
$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	D6～16	Ⓐ A—LMHG
	SKD11 or equivalent 60～63HRC	D6～16	Ⓓ A—LHGD Ⓡ A—LHGR Ⓔ A—LHGE Ⓖ A—LHGG



Shape Ⓐ

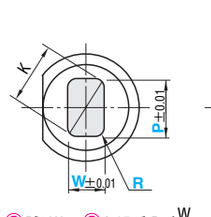


Shape Ⓓ



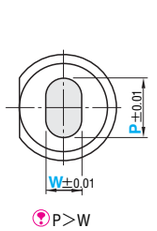
Ⓟ P≧W
Ⓟ K=√(P²+W²)

Shape Ⓡ



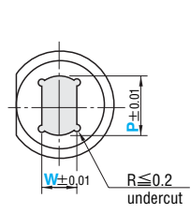
Ⓟ P≧W Ⓟ 0.15≦R<W/2
Ⓟ K=√((P−2R)²+(W−2R)²+2R

Shape Ⓔ



Ⓟ P>W

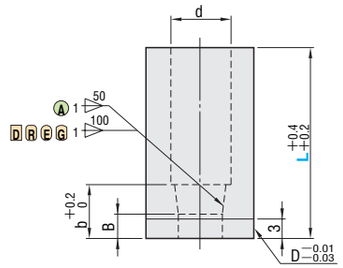
Shape Ⓖ



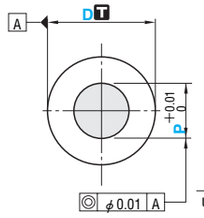
Ⓟ P>W

—Straight type— RoHS

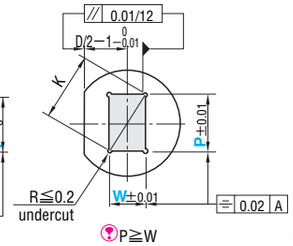
Shank dia. D T	M H	Shank D	Catalog No.
D_{n5}	SKH51 61～64HRC	D3～ 5	Ⓐ LMSG
	SKD11 or equivalent 60～63HRC	D6～16	
	SKD11 or equivalent 60～63HRC	D8～16	Ⓓ LSGD Ⓡ LSGR Ⓔ LSGE Ⓖ LSGG
$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	D6～16	Ⓐ A—LMSG
	SKD11 or equivalent 60～63HRC	D8～16	Ⓓ A—LSGD Ⓡ A—LSGR Ⓔ A—LSGE Ⓖ A—LSGG



Shape Ⓐ

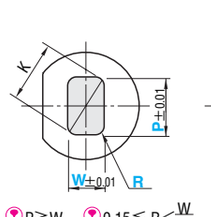


Shape Ⓓ



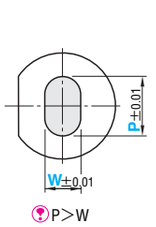
Ⓟ P≧W
Ⓟ K=√(P²+W²)

Shape Ⓡ



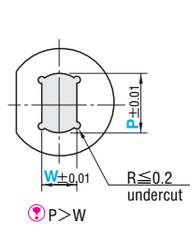
Ⓟ P≧W Ⓟ 0.15≦R<W/2
Ⓟ K=√((P−2R)²+(W−2R)²+2R

Shape Ⓔ



Ⓟ P>W

Shape Ⓖ



Ⓟ P>W

D T D	m5	n5	+0.005 0	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P·Kmax.	Ⓓ Ⓡ Ⓔ Ⓖ P·Wmin.	Ⓡ R	B	b	d	H
3	+0.006 +0.002	+0.008 +0.004	—	(SKH51) Head type (D_{m5}) Ⓐ LMHG; Straight type (D_{n5}) LMSG	(3)	10 13 16 20	0.30～ 0.70	—	—	—	2	4	2.0	4
4	+0.009 +0.004	+0.013 +0.008			(4)	10 13 16 20 22 25	0.30～ 2.00	—	—	—			2.4	5
5					(5)	10 13 16 20 22 25	0.50～ 2.50	—	—			5	2.9	6
6				(SKD11 or equivalent) Head type (D_{m5}) ($D^{+0.005}_{0}$) Straight type (D_{n5}) ($D^{+0.005}_{0}$) Ⓐ LMHG A—LMHG LMSG A—LMSG; Ⓓ LHGD A—LHGD LSGD A—LSGD; Ⓡ LHGR A—LHGR LSGR A—LSGR; Ⓔ LHGE A—LHGE LSGE A—LSGE; Ⓖ LHGG A—LHGG LSGG A—LSGG	(6)	10 13 16 20 22 25	1.00～ 3.00	3.00	1.00	0.15≦R＜W/2 (Ⓡ only)	3	6	3.4	9
8	+0.012 +0.006	+0.016 +0.010			8	10 13 16 20 22 25	1.00～ 4.00	4.00	1.00		4	8	4.4	11
10					10	10 13 16 20 22 25	2.00～ 6.00	6.00	1.20				6.4	13
13	+0.015 +0.007	+0.020 +0.012			13	10 13 16 20 22 25	3.00～ 8.00	8.00	1.50		6		8.4	16
16					16	10 13 16 20 22 25	3.00～10.00	10.00	2.00				10.6	19

Ⓟ D=(6) straight type is only available in shape Ⓐ.
Ⓟ D=(3) (4) (5) are only available with m5 and n5.
Ⓟ As the part underneath D3's head is thin, be careful not to damage it while mounting.

Order

Catalog No.	L	P	W	R(Ⓡ only)
LMHG 8	20	P3.01		
LSGR 13	16	P7.22	W3.22	R0.50

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

Delivery

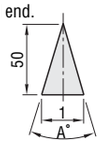
3 Days

Express T	1,600/1pc.	
Express A	800/1pc.	

P.38

Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

• $_{1}\triangleright^{50}_{A^{\circ}}$ indicates a taper having a length of 50mm with 1mm of broadened end.



Taper	1/50	1/100
Angle(A°)	1.146°	0.573°

■Head type

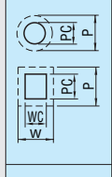
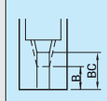
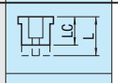
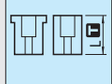
D	LMHG	A—LMHG	LHGD·LHGR LHGE·LHGG	A—LHGD·A—LHGR A—LHGE·A—LHGG
3	2,570	—	—	—
4	2,040	—	—	—
5	1,990	—	—	—
6	1,450	1,650	3,820	4,020
8	1,450	1,650	3,820	4,020
10	1,410	1,610	3,820	4,020
13	1,290	1,490	3,890	4,090
16	1,290	1,490	4,160	4,360

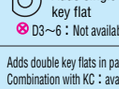
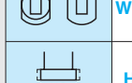
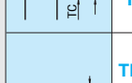
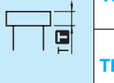
■Straight type

D	LMSG	A—LMSG	LSGD·LSGR LSGE·LSGG	A—SGD·A—SGR A—SGE·A—SGG
3	2,440	—	—	—
4	1,860	—	—	—
5	1,820	—	—	—
6	1,270	1,470	—	—
8	1,270	1,470	3,820	4,020
10	1,210	1,410	3,820	4,020
13	1,090	1,290	3,890	4,090
16	1,090	1,290	4,160	4,360

Alteration

Catalog No.	L(LC)	P(PC)	W(WC)	R	(BC·HC·TC…etc.)
LMHG 8	LC15.5	P3.01			KC

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Shaped hole		PC WC	Changes dimension P min: P>PC≧Pmin/2 ≧0.50; 0.01mm increments; Ⓟ D13・16: When PC is 1.50～1.99, B is 4mm. max: P<PC≦P+0.2	Changes dimension P and W min: P/W>PC/WC≧P·Wmin/2 ≧1.00; 0.01mm increments; max: P/W<PC/WC≦P·Kmax+0.2	200
		BC	Changes dimension B (guide length) 1≦BC≦Bmax; 1≦BC≦b; 0.1mm increments; ⊗P<1.00: Not available		200
		PKC	Changes tolerance on P P +0.01 0 ⇨ +0.005 0; ⊗P<1.00: Not available	Changes tolerance on P and W P·W ±0.01 ⇨ +0.01 0; ⊗P·W<1.00: Not available	400
Full length		LC	Changes dimension L (full length) (From point end) 10≦LC<L; 0.1mm incr. (combination with LKC・LKZ→0.01mm incr.); Ⓟ b and lead are shortened by (L—LC).		200
			Changes dimension L (full length) 10≦LC<L; 0.1mm incr. (combination with LKC・LKZ→0.01mm incr.)		
		LKC	Changes tolerance on L L +0.4 +0.2 ⇨ +0.05 0		400
		LKZ	Changes tolerance on L L +0.4 +0.2 ⇨ +0.01 0; ⊗L(LC)<16: Not available		600

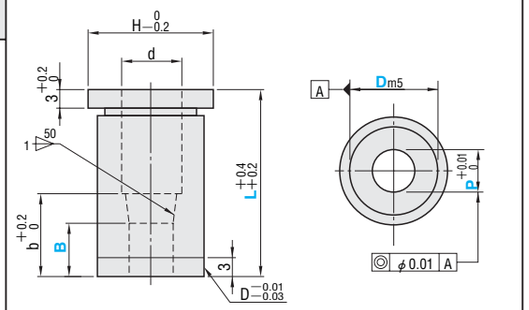
Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Head		KC	Adds single key flat	Changes position of single key flat 1° incr.	200
			Adds single key flat ⊗D3～6: Not available	 Changes position of single key flat 1° incr.	
		WKC	Adds double key flats in parallel Combination with KC: available ⊗L(LC)<16: Not available ⊗Straight type D3～6: Not available		200 (Ⓐ =400)
		HC	Changes dimension H (head diameter) D≦HC<H; 0.1mm increments		200
		TC	Changes dimension T (head thickness) 2≦TC<3; 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) Ⓟ L is shortened according to (3—TC). When LC is applied, L is equal to LC.		200
		TKC	Changes tolerance on T T +0.2 0 ⇨ +0.02 0 ⊗L(LC)<16: Not available		200
		TKM	Changes tolerance on T T +0.2 0 ⇨ 0 −0.02 ⊗L(LC)<16: Not available		200
Shank		SKC	Adds key flat on the shank Ⓟ Applicable to head type only. Ⓟ Applicable to D≧8, L(LC)≧20 ⊗Combination with KC and WKC: Not available		600

PUNCH GUIDE BUSHINGS
—SUPER LONG TYPE—

The volume discount rate is also applicable to alteration cost. P.39

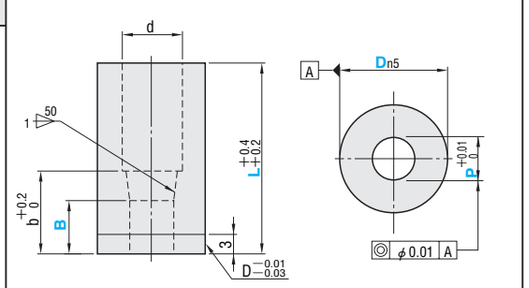
—Head type— RoHS

Shank dia. D T	M H	Shank dia.	Catalog No.
D_{m5}	SKH51 61～64HRC	D4・5	SLMHG
	SKD11 or equivalent 60～63HRC	D6～10	



—Straight type— RoHS

Shank dia. D T	M H	Shank dia.	Catalog No.
D_{n5}	SKH51 61～64HRC	D4・5	SLMSG
	SKD11 or equivalent 60～63HRC	D6～10	



D T			Catalog No.		L			0.01mm increments	0.1mm increments	b	d	H
D	m5	n5	Type	D				min. P max.	B			
4	+0.009 +0.004	+0.013 +0.008	Head type m5 SLMHG Straight type n5 SLMSG	4	16	20		0.80～1.50	2≦B≦b and B≦(P×5)	10	2.4	5
5				5	16	20	25	0.80～2.00		11	2.9	6
6				6	16	20	25	1.00～2.50		12	3.4	9
8	+0.012 +0.006	+0.016 +0.010		8	16	20	25	1.00～3.50		14	4.4	11
10				10	16	20	25	2.00～5.50			6.4	13

■Features
Since the guide length（dimension B）is long, this type can be used for drawing or bending processes, which requires guiding with long strokes.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Order

Catalog No.	—	L	—	P	—	B
SLMHG 4	—	16	—	P0.80	—	B3.5
SLMSG 5	—	16	—	P1.00	—	B4.0

Delivery: 3 Days

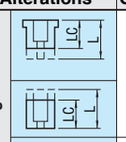
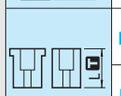
Alteration: Catalog No. — L(LC) — P — B — (HC・TC…etc.)
SLMHG 8 — LC15.0 — P3.01 — B10.0 — HC10.0

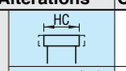
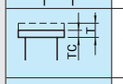
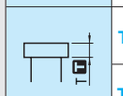
■Head type

D	SLMHG
4	3,160
5	
6	2,680
8	
10	2,620

■Straight type

D	SLMSG
4	2,980
5	
6	2,500
8	
10	2,440

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes dimension L (full length) (From point end) 10≦LC＜L 0.1mm incr. (combination with LKC・LKZ→0.01mm incr.) b is shortened according to (L−LC).	200
			Changes dimension L (full length) 10≦LC＜L 0.1mm incr. (combination with LKC・LKZ→0.01mm incr.)	
		LKC	Changes tolerance on L $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$	400
		LKZ	Changes tolerance on L $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.01}_{0}$ ⊗L (LC)＜16：Not available	600

Alterations		Code	Spec.	¥/1Code
Head		HC	Changes dimension H (head diameter) D≦HC＜H 0.1mm increments	200
		TC	Changes dimension T (head thickness) 2≦TC＜3 0.1mm incr. (combination with TKC・TKM→0.01mm incr.) L is shortened according to (3−TC). When LC is applied, L is equal to LC.	200
		TKC	Changes tolerance on T $T^{+0.2}_{0} \Rightarrow {}^{+0.02}_{0}$ ⊗L (LC)＜16：Not available	200
		TKM	Changes tolerance on T $T^{+0.2}_{0} \Rightarrow {}^{0}_{-0.02}$ ⊗L (LC)＜16：Not available	200

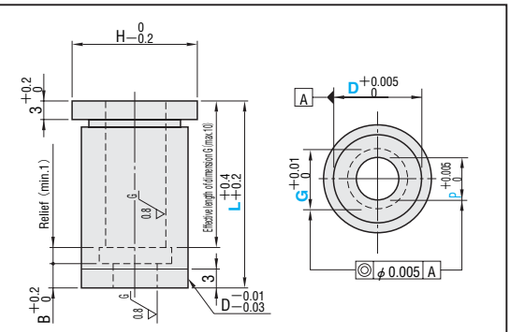
PUNCH GUIDE BUSHINGS
—TWO-STEPPED GUIDE TYPE—

PRESS ADD.SPEC. Printed in Red

The volume discount rate is also applicable to alteration cost. P.39

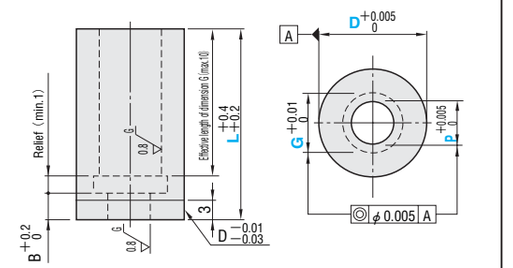
—Head type— RoHS

M H	Shank dia.	Catalog No.
SKH51 61～64HRC	D3～5	FMHG
SKD11 or equivalent 60～63HRC	D6・8	



—Straight type— RoHS

M H	Shank dia.	Catalog No.
SKH51 61～64HRC	D3～5	FMSG
SKD11 or equivalent 60～63HRC	D6・8	



Catalog No.			0.01mm increments		B	H
Type	D	L	min. P max.	min. G max.		
Head type FMHG Straight type FMSG	3	10 13 16	0.80 ～ 1.98	2.00	2	4
	4	10 13 16	0.80 ～ 2.38	2.00 ～ 2.40		5
	5	10 13 16	0.80 ～ 2.88	2.00 ～ 2.90		6
	6	10 13 16 20	0.80 ～ 3.38	3.00 ～ 3.40	3	9
	8	10 13 16 20	0.80 ～ 4.38	3.00 ～ 4.40	4	11

The part underneath the head and the undercut may become thin. Be careful not to damage them while mounting. When D=3, only 2.00 can be specified for dimension G.

Order

Catalog No.	—	L	—	P	—	G
FMHG 3	—	10	—	P0.80	—	G2.00
FMSG 5	—	16	—	P1.00	—	G2.50

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery: 3 Days

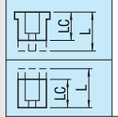
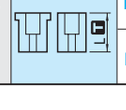
Alteration: Catalog No. — L(LC) — P — G — (HC・TC…etc.)
FMHG 8 — LC15.0 — P3.01 — G4.00 — HC10.0

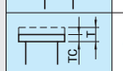
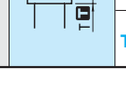
■Head type

D	FMHG
3	6,260
4	
5	
6	5,810
8	

■Straight type

D	FMSG
3	6,090
4	
5	5,640
6	
8	

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes dimension L (full length) (From point end) 10≦LC＜L 0.1mm incr. (combination with LKC・LKZ→0.01mm incr.)	200
			Changes dimension L (full length) 10≦LC＜L 0.1mm incr. (combination with LKC・LKZ→0.01mm incr.)	
		LKC	Changes tolerance on L $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$	400
		LKZ	Changes tolerance on L $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.01}_{0}$ ⊗L (LC)＜16：Not available	600

Alterations		Code	Spec.	¥/1Code
Head		HC	Changes dimension H (head diameter) D≦HC＜H 0.1mm increments	200
		TC	Changes dimension T (head thickness) 2≦TC＜3 0.1mm incr. (combination with TKC・TKM→0.01mm incr.) L is shortened according to (3−TC). When LC is applied, L is equal to LC.	200
		TKC	Changes tolerance on T $T^{+0.2}_{0} \Rightarrow {}^{+0.02}_{0}$ ⊗L (LC)＜16：Not available	200
		TKM	Changes tolerance on T $T^{+0.2}_{0} \Rightarrow {}^{0}_{-0.02}$ ⊗L (LC)＜16：Not available	200

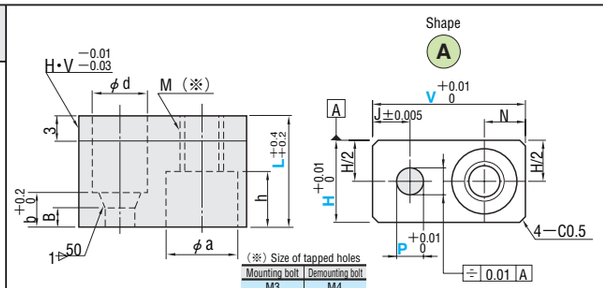
PUNCH GUIDE BUSHINGS
—BLOCK TYPE—

The volume discount rate is also applicable to alteration cost. P.39

—Bolt fixing type— RoHS

M / H	Catalog No.
SKD11 or equivalent 60～63HRC	Ⓐ BBG Ⓓ BBGD Ⓡ BBGR Ⓔ BBGE Ⓖ BBGG

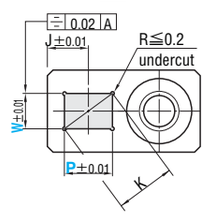
Shape Ⓐ



(※) Size of tapped holes

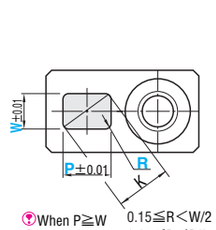
Mounting bolt	Demounting bolt
M3	M4
M4	M5
M6	M8
M8	M10

Shape Ⓓ



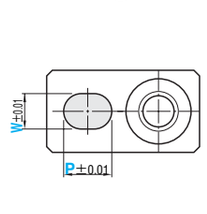
Ⓟ K= $\sqrt{P^2+W^2}$

Shape Ⓡ



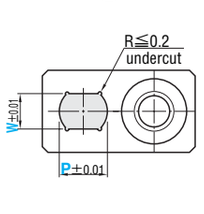
Ⓟ When P≧W 0.15≦R＜W/2
Ⓟ When P＜W 0.15≦R＜P/2
Ⓟ K= $\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Shape Ⓔ

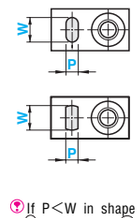


⊗P=W not specifiable

Shape Ⓖ



⊗P=W not specifiable

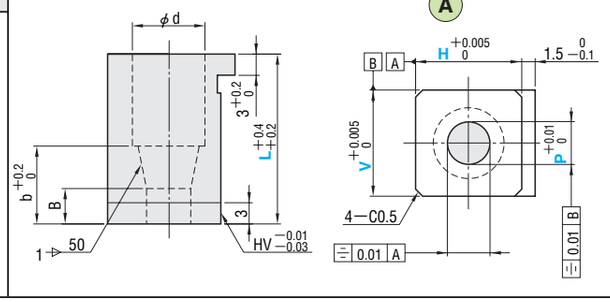


Ⓟ If P＜W in shape Ⓔ and shape Ⓖ please be careful of the shape.

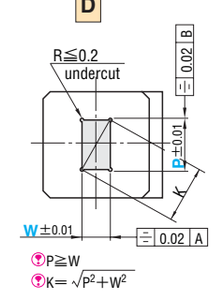
—Flanged type— RoHS

M / H	Catalog No.
SKD11 or equivalent 60～63HRC	Ⓐ BGF Ⓓ BGFD Ⓡ BGFR Ⓔ BGFE Ⓖ BGFG

Shape Ⓐ

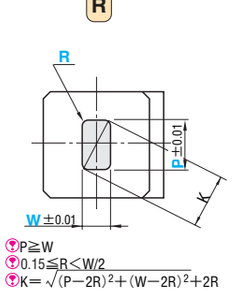


Shape Ⓓ



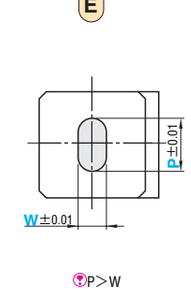
Ⓟ P≧W
Ⓟ K= $\sqrt{P^2+W^2}$

Shape Ⓡ



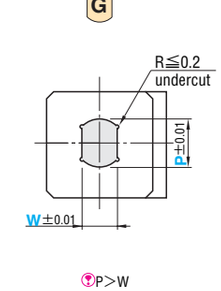
Ⓟ P≧W
Ⓟ 0.15≦R＜W/2
Ⓟ K= $\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Shape Ⓔ



Ⓟ P＞W

Shape Ⓖ



Ⓟ P＞W

■Bolt fixing type

B	b	d	N	Mounting bolt a	Mounting bolt h	Mounting bolt Size	J	Catalog No.	V	H	L	0.01mm increments Ⓐ min. P max.	0.01mm increments ⒹⓇⒺⒼ P·W·Kmax.	0.01mm increments ⒹⓇⒺⒼ P·Wmin.	0.01mm increments Ⓡ R (note)	U/Price Q'ty:1～9 BBG	U/Price Q'ty:1～9 BBG□
4	8	4.4	4	6	7.5	M3	4	Ⓐ BBG	16	8	16 20 22 25 30 35	1.00～ 4.00	4.00	1.00	0.15≦R＜W/2 (Ⓡ only)	4,150	4,360
		6.4	5	8	8.5	M4	4	Ⓓ BBGD	18	10	16 20 22 25 30 35	1.00～ 6.00	6.00	1.00		4,270	4,760
6		8.4	6.5	11	10.5	M6	6.5	Ⓡ BBGR	25	13	16 20 22 25 30 35	1.00～ 8.00	8.00	1.00		5,640	6,200
		10.6					8	Ⓔ BBGE	28	16	16 20 22 25 30 35	1.00～ 10.00	10.00	1.00		6,550	7,250
	10	13.8	8	14	12.5	M8	10	Ⓖ BBGG	35	20	16 20 22 25 30 35	1.50～ 13.00	13.00	1.50		7,650	8,630
		16.8					12.5		40	25	16 20 22 25 30 35	1.50～ 16.00	16.00	1.50		8,950	10,210

■Flanged type

R(note) ···· When P＜W, 0.15≦R＜P／2.

B	b	d	Catalog No.	V	H	L	0.01mm increments Ⓐ min. P max.	0.01mm increments ⒹⓇⒺⒼ P·Kmax.	0.01mm increments ⒹⓇⒺⒼ P·Wmin.	0.01mm increments Ⓡ R	U/Price Q'ty:1～9 BGF	U/Price Q'ty:1～9 BGF□
4	8	4.4	Ⓐ BGF	6	6	16 20 22 25 30 35	1.00～ 3.00	3.00	1.00	0.15≦R＜W/2 (Ⓡ only)	5,360	5,840
		6.4	Ⓓ BGFD	8	8	16 20 22 25 30 35	1.00～ 4.00	4.00	1.00		5,630	6,130
		8.4	Ⓡ BGFR	10	10	16 20 22 25 30 35	1.00～ 6.00	6.00	1.00		6,040	6,570
6		11.0	Ⓔ BGFE	13	13	16 20 22 25 30 35	1.00～ 8.00	8.00	1.00		7,400	8,050
		14.0	Ⓖ BGFG	16	16	16 20 22 25 30 35	1.00～ 10.00	10.00	1.00		8,760	9,530
	10	17.0		20	20	16 20 22 25 30 35	1.50～ 13.00	13.00	1.50		10,250	11,160
		21.0		25	25	16 20 22 25 30 35	1.50～ 16.00	16.00	1.50		11,140	12,110

Ⓟ ⒶⒹ shapes ···· P≧W　　ⓇⒺⒼ shapes ···· P＞W

Order

Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (Ⓡ only)
BBGE	25	13	—	20	—	P6.34	—	W4.65		
BGFR	20	20	—	16	—	P9.50	—	W2.50	—	R0.25

Ⓟ When specifying P＜W dimension, pay attention to its resulting shape.

Delivery

3	Days	P.38
Express A	800/1pc.	

Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

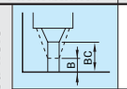
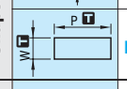
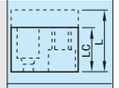
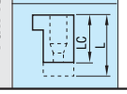
■Volume discount rate P.37

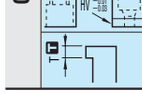
Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. V H — L(LC) — P—W—R — (BC・PKC···etc.)
BBG 25 13 — LC18 — P1.50 — BC3— LKC

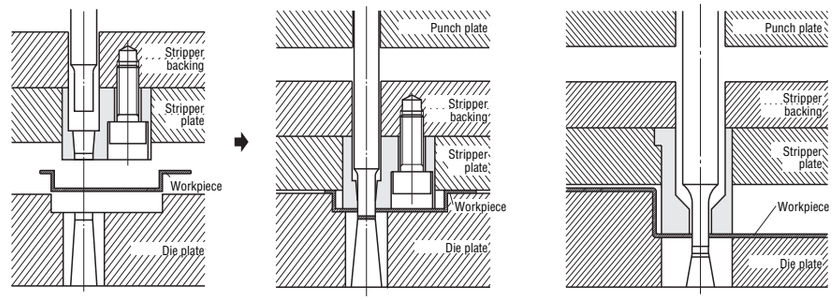
Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Shaped hole		BC	Changes dimension B (guide length) 1≦BC≦b 0.1mm increments		200
		PKC	Changes tolerance on P P +0.01 0 ⇨ +0.005 0	Changes tolerance on P and W P·W ±0.01 ⇨ +0.01 0	400
Full length		LC	Changes dimension L (full length) 16＜LC＜35 0.1mm increments. (combination with LKC・LKZ→0.01mm increments.)		200
			Changes dimension L (full length) 10≦LC＜L When LC≦12, there is no lead-in part for flange type. 0.1mm incr. (combination with LKC→0.01mm incr.) Ⓟ b is shortened by (L—LC).		

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Full length		LKC	Changes tolerance on L L +0.4 +0.2 ⇨ +0.05 0		400
		LKZ	Changes tolerance on L L +0.4 +0.2 ⇨ +0.01 0		600
Others		VKC1	Changes V/H tolerance V·H +0.01 0 ⇨ V·H +0.005 0 ⊗Flange type : Not available.		600
		VKC2	Changes V/H tolerance V·H +0.01 0 ⇨ V·H 0 −0.005 ⊗Flange type : Not available.		600
		NDC	No press-in lead		0
		TKC	Changes head thickness tolerance L +0.3 0 ⇨ +0.02 0	⊗Bolt fixing type is not available.	200

Example

■Features 1. By using shims, etc., it is possible to adjust the punch position minutely.
2. It can also be used as a stripper plate insert.

Shim tapes FGSM・FGSM□ P.752
Laminated plates for spacer LHP P.751
Precision multipurpose plates UTPB P.753



Example of use as a workpiece holder after bending.

Express service system P.38

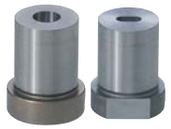
MISUMI Press 2007 http://misumi.jp/press/

For inquiry, ordering and other information, refer to P.1269

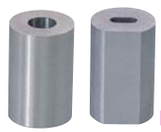
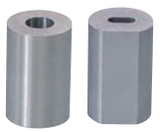
Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

BUTTON DIES

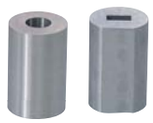
BUTTON DIES



Name / Catalog No.	BUTTON DIES —Headed type—(Regular)	BUTTON DIES —Headed type—(Economy)	BUTTON DIES —Straight type—(Regular)	BUTTON DIES —Straight type—(Economy)
Delivery	③Ⓣ Ⓐ	③Ⓣ Ⓐ	③Ⓣ Ⓐ	③Ⓣ Ⓐ
Page	257	259	261	263

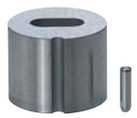
SCRAP RETENTION BUTTON DIES —Headed type—(Regular)	SCRAP RETENTION BUTTON DIES —Headed type—(Economy)	SCRAP RETENTION BUTTON DIES —Straight type—(Regular)	SCRAP RETENTION BUTTON DIES —Straight type—(Economy)
③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ
265	267	269	271



BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP —Headed type—	BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP —Straight type—	ANGULAR BUTTON DIES —Headed type—	ANGULAR BUTTON DIES —Straight type—	SCRAP RETENTION ANGULAR BUTTON DIES —Headed type—
③	③	③Ⓐ	③Ⓐ	③Ⓐ
273	273	275	277	279

SCRAP RETENTION ANGULAR BUTTON DIES —Straight type—	LONG POINT BUTTON DIES —Headed type— —Straight type—	FREE LENGTH BUTTON DIES —Headed type— —Straight type—	SCRAP RETENTION FREE LENGTH BUTTON DIES —Headed type— —Straight type—
③Ⓐ	③Ⓣ Ⓐ	⑤	⑤
281	283	285	287

FREE SIZE BUTTON DIES —Headed type— —Straight type—	SCRAP RETENTION FREE SIZE BUTTON DIES —Headed type— —Straight type—	BUTTON DIES —Dowel slot type—	SCRAP RETENTION BUTTON DIES —Dowel slot type—
⑤	⑤	③Ⓣ Ⓐ	③Ⓐ
289	291	293	294

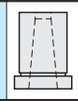
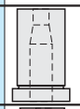
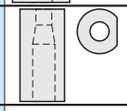
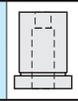
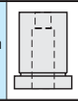
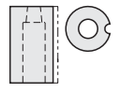
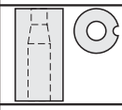
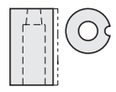


TILTING BUTTON DIES —Dowel slot type—	UNHARDENED BUTTON DIES —Dowel slot type—	SCRAP VACUUM UNIT	SHOOTING UNIT
③Ⓣ Ⓐ	⑤Ⓑ	③Ⓐ	③Ⓐ
295	296	297	298

SCRAP REMOVER	BUTTON DIE BLANKS —Headed type— —Straight type—	ANGULAR BUTTON DIE BLANKS —Headed type— —Straight type—
①	③Ⓣ Ⓐ	③Ⓣ Ⓐ
299·300	301	302

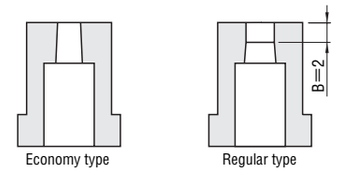
SPACERS —For angular button die—	SPACERS —For straight button die drain hole—	COLLARS FOR BUTTON DIES
③Ⓐ	①	③
303	303	304

BUTTON DIES LIST

Button die type		Material	Type	Shank dia. tolerance	Normal: Round	Normal: Shaped	Page	For scrap retention: Round	For scrap retention: Shaped	Page	Non-clogging type: Round	Page
Headed		SKD11 or equivalent	Regular type	D_{m5}	MHD	HD□	P.257	SR−MHD	SR−HD□	P.265	SV−MHD	P.273
				$D^{+0.005}_{0}$	A−MHD	A−HD□		SRA−MHD	SRA−HD□			
			Economy type	D_{m5}	EMHD	EHD□	P.259	SR−EMHD	SR−EHD□	P.267		
				$D^{+0.005}_{0}$	A−EMHD	A−EHD□		SRA−EMHD	SRA−EHD□			
		Powdered high-speed steel	Regular type	D_{m5}	PMHD	PHD□	P.257	SR−PMHD	SR−PHD□	P.265	SV−PMHD	P.273
				$D^{+0.005}_{0}$	A−PMHD	A−PHD□		SRA−PMHD	SRA−PHD□			
			Economy type	D_{m5}	EPMHD	EPHD□	P.259	SR−EPMHD	SR−EPHD□	P.267		
				$D^{+0.005}_{0}$	A−EPMHD	A−EPHD□		SRA−EPMHD	SRA−EPHD□			
Straight		SKD11 or equivalent	Regular type	D_{n5}	MSD	SD□	P.261	SR−MSD	SR−SD□	P.269	SV−MSD	P.273
				$D^{+0.005}_{0}$	A−MSD	A−SD□		SRA−MSD	SRA−SD□			
			Economy type	D_{n5}	EMSD	ESD□	P.263	SR−EMSD	SR−ESD□	P.271		
				$D^{+0.005}_{0}$	A−EMSD	A−ESD□		SRA−EMSD	SRA−ESD□			
		Powdered high-speed steel	Regular type	D_{n5}	PMSD	PSD□	P.261	SR−PMSD	SR−PSD□	P.269	SV−PMSD	P.273
				$D^{+0.005}_{0}$	A−PMSD	A−PSD□		SRA−PMSD	SRA−PSD□			
			Economy type	D_{n5}	EPMSD	EPSD□	P.263	SR−EPMSD	SR−EPSD□	P.271		
				$D^{+0.005}_{0}$	A−EPMSD	A−EPSD□		SRA−EPMSD	SRA−EPSD□			
Angular Headed		SKD11 or equivalent	Regular type	D_{m5}	AHD	AHD□	P.275	SR−AHD	SR−AHD□	P.279		
				$D^{+0.005}_{0}$	A−AHD	A−AHD□		SRA−AHD	SRA−AHD□			
		Powdered high-speed steel		D_{m5}	PAHD	PAHD□	P.275	SR−PAHD	SR−PAHD□	P.279		
				$D^{+0.005}_{0}$	A−PAHD	A−PAHD□		SRA−PAHD	SRA−PAHD□			
Angular Straight		SKD11 or equivalent	Regular type	D_{n5}	ASD	ASD□	P.277	SR−ASD	SR−ASD□	P.281		
				$D^{+0.005}_{0}$	A−ASD	A−ASD□		SRA−ASD	SRA−ASD□			
		Powdered high-speed steel		D_{n5}	PASD	PASD□	P.277	SR−PASD	SR−PASD□	P.281		
				$D^{+0.005}_{0}$	A−PASD	A−PASD□		SRA−PASD	SRA−PASD□			
Long shaped hole Headed		SKD11 or equivalent	Regular type	D_{m5}	MHDS	HD□S	P.283					
Long shaped hole Straight		SKD11 or equivalent	Regular type	D_{n5}	MSDS	SD□S	P.283					
Full length specified Headed		SKD11 or equivalent	Regular type	D_{m5}	S−MHD S−MHDS	S−HD□ S−HD□S	P.285	SRS−MHD SRS−MHDS	SRS−HD□ SRS−HD□S	P.287		
Full length specified Straight		SKD11 or equivalent	Regular type	D_{n5}	S−MSD S−MSDS	S−SD□ S−SD□S	P.285	SRS−MSD SRS−MSDS	SRS−SD□ SRS−SD□S	P.287		
Free size Full length, shaped hole length and relief hole specified type Headed		SKD11 or equivalent	Regular type	D_{m5}	FMHD FMHDS	FHD□ FHD□S	P.289	SR−FMHD SR−FMHDS	SR−FHD□ SR−FHD□S	P.291		
Free size Full length, shaped hole length and relief hole specified type Straight		SKD11 or equivalent	Regular type	D_{n5}	FMSD FMSDS	FSD□ FSD□S	P.289	SR−FMSD SR−FMSDS	SR−FSD□ SR−FSD□S	P.291		
Dowel slot		SKD11 or equivalent	Economy type	D_{n5}	EKSD	EKD□	P.293	SR−EKSD	SR−EKD□	P.294		
			Regular type		KSD	KD□		SR−KSD	SR−KD□			
Slanted Dowel slot		SKD11 or equivalent	Regular type	D_{n5}	KSDS	KD□S	P.295					
Unhardened Dowel slot		SX105V	Regular type	D_{n5}	HKSDS	HKD□S	P.296					

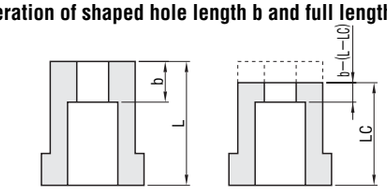
MACHINING GUIDE FOR BUTTON DIES

■The difference between Economy type and Regular type

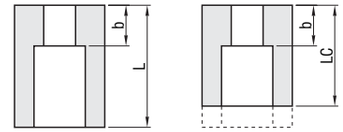


●While shaped hole of regular type has straight part B (2mm), that of economy type does not. Therefore, alteration PKC (change of shaped hole diameter tolerance) cannot be applied.

■Alteration of shaped hole length b and full length LC

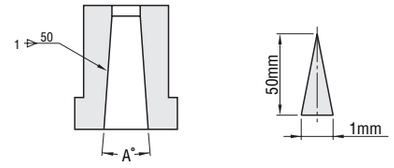


●Since the head thickness is predetermined for the head type button dies, the alteration for LC is made from the shaped hole side, shortening point length b. Though the straight part B of regular type is set to 2mm, when b−(L−LC)<2, B=b−(L−LC). In this case, tapered part of 1 is eliminated.



●In the case of straight type button dies, the alteration for LC is made from the relief hole side, leaving shaped hole length b unaffected.
(This applies to alteration CKC and MKC as well.)

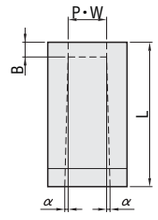
■Notation for dimensions of button dies' relief angle



1 ▷ 50 indicates a taper having a length of 50mm with 1mm of broadened end.

Taper	1/50	1/100	1/150
Angle (A°)	1.146°	0.573°	0.382°

■Relation between dimension L and broadening width of dimension P・W



Dimension of (α×2) : Broadening width of P/W (when B=2)
Values of table below are those of (α×2)

L \ Taper	1/50	1/100	1/150
16	0.28	0.14	0.09
20	0.36	0.18	0.12
22	0.40	0.20	0.13
25	0.46	0.23	0.15
30	0.56	0.28	0.19
35	0.66	0.33	0.22
40	0.76	0.38	0.25

When LC or the like is specified,

$$2\alpha = \frac{LC - B}{\text{(denominator of the taper)}}$$

■Scrap retention button dies (For details, see P.1229)

The scrap retention button dies have two or more slanted grooves on the inside wall. If this button die is used, a scrap punched out initially in the punching process has small projections formed corresponding to the slanted grooves in the die. When this scrap is further pushed down by downward stroke of the punching, the projections on them are compressed (ironed) from the die's inner wall, preventing the scrap from being pulled up.

●Applicable range
1. Hole diameter ··· φ1.0～φ16
2. Workpiece material···With tensile strength of up to 120kgf/mm² (1177N/mm²)
3. Workpiece thickness···0.15mm or more
4. The scrap retention effect cannot be expected when the clearance (C) is greater than 20% of workpiece thickness (MT). Therefore, keep the difference to 20% or less when using this type.
   Clearance (C) < workpiece thickness (MT) ×20%

The scrap retention button dies prevent a scrap from being pulled up by forming small protrusions on the scrap. Therefore, this type is not appropriate when precision holes are required or punched−out scraps are sold as product.

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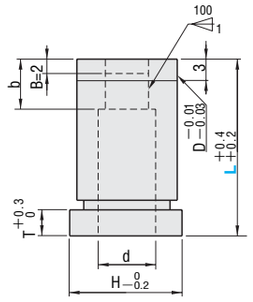
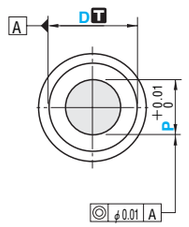
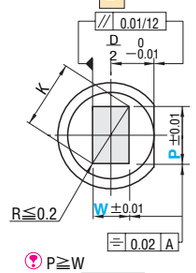
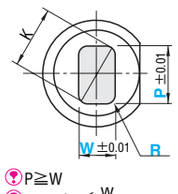
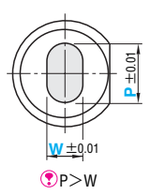
BUTTON DIES
—HEADED TYPE (REGULAR)—

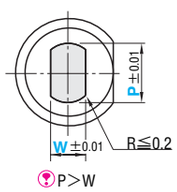
Headed type	Shank dia. D T	M / H	Shank dia.	Catalog No.	For shape, select from ⒶⒹⓇⒺⒼ shown below.
RoHS Shank Dia.Tolerance D T m5・ $^{+0.005}_{0}$ Selection	D_{m5}	SKH51 61～64HRC	D3～ 5	MHD	Regular type 
		SKD11 or equivalent 60～63HRC	D6～56	HD□	
		SKD11 or equivalent 60～63HRC	D6～56	PMHD	
		Powdered high-speed steel 64～67HRC	D6～25	PHD□	
	$D\ ^{+0.005}_{0}$	SKH51 61～64HRC	D3～ 5	A—MHD	
		SKD11 or equivalent 60～63HRC	D6～16	A—HD□	
		Powdered high-speed steel 64～67HRC	D6～16	A—PMHD	
				A—PHD□	

Shape Ⓐ 
P≧W
K=$\sqrt{P^2+W^2}$

Shape Ⓓ 
P≧W

Shape Ⓡ 
P≧W
0.15≦R＜$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Shape Ⓔ 
P＞W

Shape Ⓖ 
P＞W

D T D	m5	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	Ⓐ P·Kmax.	Ⓐ P·Wmin.	ⓇⒺⒼ R	b	d	H	T
3	$^{+0.006}_{+0.002}$	(SKH51)	(3)	16 20	0.30～ 1.00	—	—	—	2	2.0	4	3
4	$^{+0.009}_{+0.004}$	(D_{m5}) ($D\ ^{+0.005}_{0}$)	(4)	16 20 22 25 28 30	0.50～ 2.00	—	—			2.4	5	
5		Ⓐ MHD A—MHD	(5)	16 20 22 25 28 30	0.50～ 2.50	—	—			2.9	6	
6			6	16 20 22 25 28 30 32 35	1.00～ 3.00	3.00	1.00	0.15≦R＜$\frac{W}{2}$ (Ⓡ only)	3	3.4	9	5
8	$^{+0.012}_{+0.006}$		8	16 20 22 25 28 30 32 35 40	1.00～ 4.00	4.00	1.00		4	4.4	11	
10		(SKD11 or equivalent)	10	16 20 22 25 28 30 32 35 40 (45)	2.00～ 6.00	6.00	1.20		6	6.4	13	
13	$^{+0.015}_{+0.007}$	(D_{m5}) ($D\ ^{+0.005}_{0}$)	13	16 20 22 25 28 30 32 35 40 (45)	3.00～ 8.00	8.00	1.50		8	8.4	16	
16		Ⓐ MHD A—MHD	16	16 20 22 25 28 30 32 35 40 (45)	5.00～10.00	10.00	2.00			10.6	19	
20		Ⓓ HDD A—HDD	(20)	16 20 22 25 28 30 32 35 40 (45)	7.00～12.00	12.00	3.00			12.6	23	
22	$^{+0.017}_{+0.008}$	Ⓡ HDR A—HDR	(22)	16 20 22 25 28 30 32 35 40 (45)	8.00～14.00	14.00	3.00			14.6	25	
25		Ⓔ HDE A—HDE	(25)	16 20 22 25 28 30 32 35 40 (45)	10.00～16.00	16.00	3.00			16.6	28	
32		Ⓖ HDG A—HDG	(32)	16 20 22 25 28 30 32 35	15.00～20.00	20.00	4.00			20.6	35	
38	$^{+0.020}_{+0.009}$		(38)	16 20 22 25 30 35	19.00～26.00	26.00	5.00			26.6	41	
45			(45)	20 22 25 30 35	25.00～35.00	35.00	6.00			36.0	48	
50			(50)	20 22 25 30 35	33.00～40.00	40.00	7.00			41.0	53	
56	$^{+0.024}_{+0.011}$		(56)	20 22 25 30 35	38.00～45.00	45.00	8.00			46.0	59	
6	$^{+0.009}_{+0.004}$	(Powdered high-speed steel)	6	16 20 22 25 30 35	1.00～ 3.00	3.00	1.00		3	3.4	9	5
8	$^{+0.012}_{+0.006}$	(D_{m5}) ($D\ ^{+0.005}_{0}$)	8	16 20 22 25 30 35	1.00～ 4.00	4.00	1.00		4	4.4	11	
10		Ⓐ PMHD A—PMHD	10	16 20 22 25 30 35	2.00～ 6.00	6.00	1.20		6	6.4	13	
13	$^{+0.015}_{+0.007}$	Ⓓ PHDD A—PHDD	13	16 20 22 25 30 35	3.00～ 8.00	8.00	1.50		8	8.4	16	
16		Ⓡ PHDR A—PHDR	16	16 20 22 25 30 35	5.00～10.00	10.00	2.00			10.6	19	
20	$^{+0.017}_{+0.008}$	Ⓔ PHDE A—PHDE	(20)	16 20 22 25 30 35	7.00～12.00	12.00	3.00			12.6	23	
25		Ⓖ PHDG A—PHDG	(25)	16 20 22 25 30 35	10.00～16.00	16.00	3.00			16.6	28	

Ⓨ The die wall around head undercut part of D(3) is thin, pay attention when installing.
Ⓨ D(3)(4)(5) is available for shape Ⓐ(round) only. Shapes ⒹⓇⒺⒼ are not available.
Ⓨ D=(20)(22)(25)(32)(38)(45)(50)(56) is available for shank dia. tolerance Dm5 only.
Ⓨ L=(45) is available for shank dia. tolerance of Dm5 only.

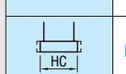
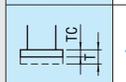
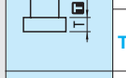
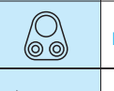
The volume discount rate is also applicable to alteration cost. P.39

Order Catalog No. — L — P — W — R (Ⓡ only)
MHD 13 — 30 — P7.00

Delivery 3 Days | Express T 1,600/1Pc. | Express A 800/1Pc.
⊗Express T is not available for D3・4・5・45・50・56 P.38
Ⓨ A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC・CKC・MKC…etc.)
MHD 13 — 30 — P7.00 — TC4.0 — KFC90

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Shaped hole		PC WC	Changes shaped hole diameter P min: P>PC≧$\frac{Pmin}{2}$≧0.50 0.01mm increments Ⓨ When PC is 1.00～1.99, b is 4mm. max: $\frac{P}{W}<\frac{PC}{WC}$≦P・Kmax+0.2 0.01mm increments	Changes shaped hole dimension P・W min: $\frac{P}{W}>\frac{PC}{WC}$≧$\frac{P・Wmin}{2}$≧1.00 0.01mm increments	200
		BC	Changes shaped hole depth B 1≦BC≦b 0.1mm increments ⊗P<1.00：Not available		200
		PKC	Changes shaped hole tolerance P $^{+0.01}_{0}$⇨$^{+0.005}_{0}$ ⊗P<1.00：Not available	Changes shaped hole tolerance P・W P・W ±0.01⇨$^{+0.01}_{0}$	400
Full length		LC	Changes full length L 10≦L<(b−1)≦LC<L 0.1mm incr. (combination with LKC・LKZ・CKC・MKC →0.01mm incr.) Ⓨ b and lead are shortened by (L−LC).		200
		LKC	Changes full length tolerance L $^{+0.4}_{+0.2}$⇨$^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance L $^{+0.4}_{+0.2}$⇨$^{+0.01}_{0}$ ⊗L(LC)<16：Not available ⊗D>25：Not available		600
		CKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks (Ⓨ) are the same as that of each combined alteration code. ⊗L(LC)<16：Not available TKC + LKC T $^{+0.3}_{0}$⇨$^{+0.02}_{0}$ L $^{+0.4}_{+0.2}$⇨$^{+0.05}_{0}$		500
		MKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks (Ⓨ) are the same as that of each combined alteration code. ⊗L(LC)<16：Not available TKM + LKC T $^{+0.3}_{0}$⇨$^{0}_{-0.02}$ L $^{+0.4}_{+0.2}$⇨$^{+0.05}_{0}$		500

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Head		KC	Adds key flat	270° 180° 0° 90° Changes key flat position 1° incr.	200
		WKC	Adds key flats in parallel	Adds key flats in parallel For changing angle, add KC	200 (Ⓐ only 400)
		KFC	270° 180° 0° 90° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC：Not available ⊗L(LC)<16, D>25:Not available	270° 180° 0° 90° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC：Not available ⊗L(LC)<16, D>25:Not available	200 (Ⓐ only 400)
		HC	Changes head diameter H D≦HC<H 0.1mm increments		200
		TC	Changes head thickness 2≦TC<T 0.1mm incr. (Comb. with TKC・TKM・CKC・MKC →0.01mm incr.) Ⓨ L is shortened by (T−TC), When LC is applied, L is equal to LC.		200
		TKC	Changes head thickness tolerance T $^{+0.3}_{0}$⇨$^{+0.02}_{0}$ ⊗L(LC)<16：Not available		200
		TKM	Changes head thickness tolerance T $^{+0.3}_{0}$⇨$^{0}_{-0.02}$ ⊗L(LC)<16：Not available		200
		RC	0 −0.04 Reduces head thickness by −0.04～0 from retainer surface ⊗L(LC)<30：Not available		200
Others		SKC	Adds key flat on shank Ⓨ Applicable to D≧8, L(LC)≧20 ⊗Combination with KC・WKC・KFC：Not available		600

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

■Ⓜ SKH51・SKD11 or equivalent

D	MHD	A—MHD	HDD HDR HDE HDG	A—HDD A—HDR A—HDE A—HDG
3	2,230	2,430	—	—
4	1,650	1,850	—	—
5	1,650	1,850	—	—
6	1,010	1,210	3,460	3,660
8	980	1,180	3,460	3,660
10	980	1,180	3,460	3,660
13	910	1,110	3,600	3,800
16	910	1,110	3,890	4,090
20	980	—	4,100	—
22	1,240	—	4,280	—
25	1,420	—	4,410	—
32	1,810	—	4,700	—
38	2,610	—	5,060	—
45	5,320	—	10,270	—
50	6,560	—	11,510	—
56	7,860	—	12,730	—

■Ⓜ Powdered high-speed steel

D	PMHD	A—PMHD	PHDD PHDR PHDE PHDG	A—PHDD A—PHDR A—PHDE A—PHDG
6	2,180	2,380	6,680	6,880
8	2,120	2,320	6,680	6,880
10	2,120	2,320	6,680	6,880
13	2,080	2,280	7,400	7,600
16	2,080	2,280	8,000	8,200
20	2,390	—	8,930	—
25	3,440	—	9,590	—

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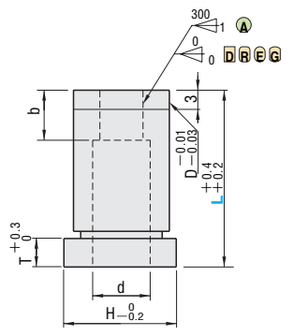
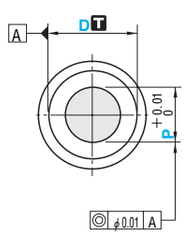
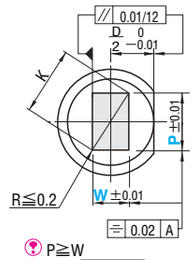
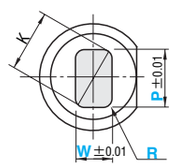
BUTTON DIES
—HEADED TYPE (ECONOMY)—

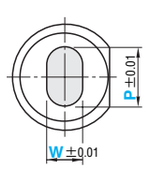
The volume discount rate is also applicable to alteration cost. P.39

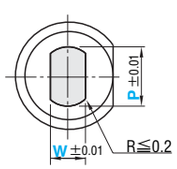
Headed type	Shank dia. D T	M H	Shank dia.	Catalog No.	For shape, select from Ⓐ D R E G shown below.
RoHS Shank Dia.Tolerance D T m5, $^{+0.005}_{0}$ Selection	D_{m5}	SKD11 or equivalent 60～63HRC	D6～56	EMHD	Economy type 
				EHD□	
		Powdered high-speed steel 64～67HRC	D6～25	EPMHD	
				EPHD□	
	$D^{+0.005}_{0}$	SKD11 or equivalent 60～63HRC	D6～16	A—EMHD	
				A—EHD□	
		Powdered high-speed steel 64～67HRC	D6～16	A—EPMHD	
				A—EPHD□	

Shape Ⓐ 
P≧W
K=$\sqrt{P^2+W^2}$

Shape D 
P≧W
K=$\sqrt{P^2+W^2}$

Shape R 
P≧W
0.15≦R＜$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Shape E 
P＞W

Shape G 
P＞W

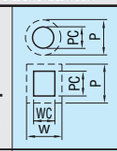
D T			Catalog No.	L	0.01mm increments				b	d	H	T
D	m5	$^{+0.005}_{0}$	Type	D		Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	Ⓡ R				
6	$^{+0.009}_{+0.004}$	$^{+0.005}_{0}$	(SKD11 or equivalent) (Dm5) (D $^{+0.005}_{0}$)	6	16 20 22 25 28 30 32 35	1.00～ 3.00	3.00	1.00	0.15≦R＜$\frac{W}{2}$ (Ⓡ only)	3	3.4	9	5
8	$^{+0.012}_{+0.006}$			8	16 20 22 25 28 30 32 35 40	1.00～ 4.00	4.00	1.00		4	4.4	11	
10				10	16 20 22 25 28 30 32 35 40 (45)	2.00～ 6.00	6.00	1.20		6	6.4	13	
13	$^{+0.015}_{+0.007}$		Ⓐ EMHD A—EMHD	13	16 20 22 25 28 30 32 35 40 (45)	3.00～ 8.00	8.00	1.50		8	8.4	16	
16				16	16 20 22 25 28 30 32 35 40 (45)	5.00～10.00	10.00	2.00			10.6	19	
20	$^{+0.017}_{+0.008}$		Ⓓ EHDD A—EHDD	(20)	16 20 22 25 28 30 32 35 40 (45)	7.00～12.00	12.00	3.00			12.6	23	
22				(22)	16 20 22 25 28 30 32 35 40 (45)	8.00～14.00	14.00	3.00			14.6	25	
25			Ⓡ EHDR A—EHDR	(25)	16 20 22 25 28 30 32 35 40 (45)	10.00～16.00	16.00	3.00			16.6	28	
32		—	Ⓔ EHDE A—EHDE	(32)	16 20 22 25 28 30 32 35	15.00～20.00	20.00	4.00			20.6	35	
38	$^{+0.020}_{+0.009}$		Ⓖ EHDG A—EHDG	(38)	16 20 22 25 30 35	19.00～26.00	26.00	5.00			26.6	41	
45				(45)	20 22 25 30 35	25.00～35.00	35.00	6.00			36.0	48	
50				(50)	20 22 25 30 35	33.00～40.00	40.00	7.00			41.0	53	
56	$^{+0.024}_{+0.011}$			(56)	20 22 25 30 35	38.00～45.00	45.00	8.00			46.0	59	
6	$^{+0.009}_{+0.004}$	$^{+0.005}_{0}$	(Powdered high-speed steel) (Dm5) (D $^{+0.005}_{0}$)	6	16 20 22 25 30 35	1.00～ 3.00	3.00	1.00		3	3.4	9	5
8	$^{+0.012}_{+0.006}$			8	16 20 22 25 30 35	1.00～ 4.00	4.00	1.00		4	4.4	11	
10				10	16 20 22 25 30 35	2.00～ 6.00	6.00	1.20		6	6.4	13	
13	$^{+0.015}_{+0.007}$		Ⓐ EPMHD A—EPMHD	13	16 20 22 25 30 35	3.00～ 8.00	8.00	1.50		8	8.4	16	
16				16	16 20 22 25 30 35	5.00～10.00	10.00	2.00			10.6	19	
20	$^{+0.017}_{+0.008}$	—	Ⓓ EPHDD A—EPHDD	(20)	16 20 22 25 30 35	7.00～12.00	12.00	3.00			12.6	23	
25			Ⓡ EPHDR A—EPHDR	(25)	16 20 22 25 30 35	10.00～16.00	16.00	3.00			16.6	28	
			Ⓔ EPHDE A—EPHDE										
			Ⓖ EPHDG A—EPHDG										

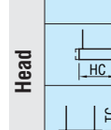
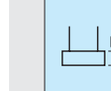
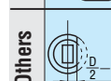
Ⓟ D=(20) (22) (25) (32) (38) (45) (50) (56) is available for shank dia. tolerance of Dm5 only.
Ⓟ L=(45) is available for shank dia. tolerance Dm5 only.

Order Catalog No. — L — P — W — R (Ⓡ only)
EMHD 13 — 30 — P7.00

Delivery 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc.
⊗Express T is not available for D45・50・56 P.38
ⓅA flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration Catalog No. — L(LC) — P(PC) — W(WC) — R — (HC・TC・CKC・MKC…etc.)
EMHD 13 — 30 — P7.00 — TC4.0 — KFC90

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole		PC WC	Changes shaped hole diameter P min.: P＞PC≧$\frac{Pmin}{2}$≧0.50 0.01mm increments Ⓟ When PC is 1.00～1.99, b is 4mm.	Changes shaped hole dimension P·W min.: P W＞PC WC≧$\frac{P\cdot Wmin}{2}$≧1.00 0.01mm increments	200
			max.: P W＜PC WC≦P·Kmax+0.2 0.01mm increments		
Full length		LC	Changes full length (Cutting from the shaped hole side) 10≦L—(b—1)≦LC＜L 0.1mm incr. (combination with LKC・LKZ・CKC・MKC→0.01mm incr.) Ⓟ b and lead are shortened by (L—LC).		200
		LKC	Changes full length tolerance L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance L $^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗L(LC)＜16：Not available ⊗D＞25：Not available		600
		CKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code. ⊗L(LC)＜16：Not available TKC + LKC T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		500
		MKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code. ⊗L(LC)＜16：Not available TKM + LKC T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		500

Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		KC	Adds key flat	270° 180° 0° 90° Changes key flat position 1° incr.	200
		WKC	Adds key flats in parallel	Adds key flats in parallel For changing angle, add KC	200 (Ⓐ only 400)
		KFC	270° 180° 0° 90° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC：Not available ⊗L(LC)＜16, D＞25:Not available	270° 180° 0° 90° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC：Not available ⊗L(LC)＜16, D＞25:Not available	200 (Ⓐ only 400)
		HC	Changes head diameter H D≦HC＜H 0.1mm increments		200
		TC	Changes head thickness 2≦TC＜5 0.1mm incr. (Comb. with TKC・TKM・CKC・MKC→0.01mm incr.) Ⓟ L is shortened by (5—TC), When LC is applied, L is equal to LC.		200
		TKC	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗L(LC)＜16：Not available		200
		TKM	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗L(LC)＜16：Not available		200
		RC	Reduces head thickness by —0.04～0 from retainer surface ⊗L(LC)＜30：Not available		200
Others		SKC	Adds key flat on shank Ⓟ Applicable to D≧8, L(LC)≧20 ⊗ Combination with KC・WKC・KFC ：Not available		600

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

Ⓜ SKD11 or equivalent

D	EMHD	A—EMHD	EHDD EHDR A—EHDE EHDG	A—EHDD A—EHDR A—EHDE A—EHDG
6	870	1,070	3,250	3,450
8	840	1,040	3,250	3,450
10	840	1,040	3,250	3,450
13	770	970	3,400	3,600
16	770	970	3,620	3,820
20	860	—	3,830	—
22	1,100	—	4,000	—
25	1,280	—	4,130	—
32	1,670	—	4,350	—
38	2,460	—	4,720	—
45	5,180	—	9,820	—
50	6,380	—	11,120	—
56	7,730	—	12,350	—

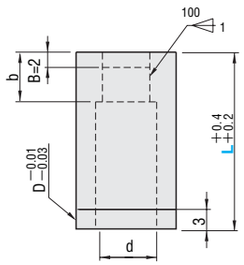
Ⓜ Powdered high-speed steel

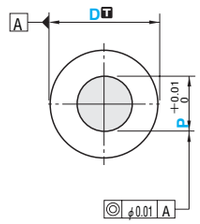
D	EPMHD	A—EPMHD	EPHDD EPHDR EPHDE EPHDG	A—EPHDD A—EPHDR A—EPHDE A—EPHDG
6	1,880	2,080	6,270	6,470
8	1,820	2,020	6,270	6,470
10	1,820	2,020	6,270	6,470
13	1,770	1,970	6,960	7,160
16	1,770	1,970	7,430	7,630
20	2,050	—	8,320	—
25	3,120	—	8,980	—

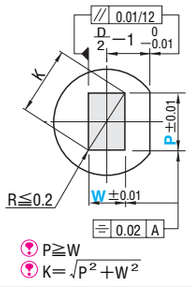
PRESS ADD.SPEC. Printed in Red

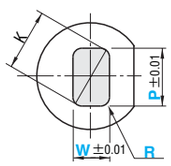
BUTTON DIES
—STRAIGHT TYPE (REGULAR) —

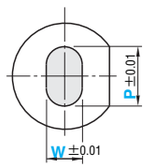
The volume discount rate is also applicable to alteration cost. P.39

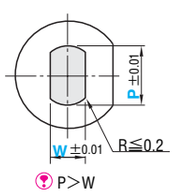
Straight type	Shank dia. D T	M / H	Shank dia.	Catalog No.	For shape, select from ⒶⒹⓇⒺⒼ shown below.
RoHS Shank Dia.Tolerance D T n5· $^{+0.005}_{0}$ Selection	D_{n5}	SKH51 61~64HRC	D3 ~ 5	MSD	Regular type 
		SKD11 or equivalent 60~63HRC	D6~56		
		SKD11 or equivalent 60~63HRC	D8~56	SD□	
		Powdered high-speed steel 64~67HRC	D6~25	PMSD	
			D8~25	PSD□	
	$D^{+0.005}_{0}$	SKH51 61~64HRC	D3 ~ 5	A—MSD	
		SKD11 or equivalent 60~63HRC	D6~16		
		SKD11 or equivalent 60~63HRC	D8~16	A—SD□	
		Powdered high-speed steel 64~67HRC	D6~16	A—PMSD	
			D8~16	A—PSD□	

Shape Ⓐ 

Shape Ⓓ 

Shape Ⓡ 

Shape Ⓔ 

Shape Ⓖ 

Ⓐ P≧W
Ⓐ $K=\sqrt{P^2+W^2}$
Ⓡ P≧W
Ⓡ $0.15 \leqq R < \frac{W}{2}$
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Ⓔ P>W
Ⓖ P>W

D T D	D T n5	D T $^{+0.005}_{0}$	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments ⒹⓇⒺⒼ P·Kmax.	0.01mm increments ⒹⓇⒺⒼ P·Wmin.	0.01mm increments Ⓡ R	b	d
3	$^{+0.008}_{+0.004}$	$^{+0.005}_{0}$	(SKH51) (D_{n5}) ($D^{+0.005}_{0}$) Ⓐ MSD A—MSD	(3)	16 20	0.30~ 1.00	—	—	—	2	2.0
4				(4)	16 20 22 25 28 30	0.50~ 2.00	—	—			2.4
5	$^{+0.013}_{+0.008}$			(5)	16 20 22 25 28 30	0.50~ 2.50	—	—			2.9
6			(SKD11 or equivalent) (D_{n5}) ($D^{+0.005}_{0}$) Ⓐ MSD A—MSD Ⓓ SDD A—SDD Ⓡ SDR A—SDR Ⓔ SDE A—SDE Ⓖ SDG A—SDG	(6)	16 20 22 25 28 30 32 35	1.00~ 3.00	—	—		3	3.4
8	+0.016			8	16 20 22 25 28 30 32 35	1.00~ 4.00	4.00	1.00	0.15≦R<W/2 (Ⓡ only)	4	4.4
10	+0.010			10	16 20 22 25 28 30 32 35(40)	2.00~ 6.00	6.00	1.20		6	6.4
13	+0.020			13	16 20 22 25 28 30 32 35(40)	3.00~ 8.00	8.00	1.50		8	8.4
16	+0.012			16	16 20 22 25 28 30 32 35(40)	5.00~10.00	10.00	2.00			10.6
20	+0.024	—		(20)	16 20 22 25 28 30 32 35(40)	7.00~12.00	12.00	3.00			12.6
22	+0.015			(22)	16 20 22 25 28 30 32 35(40)	8.00~14.00	14.00	3.00			14.6
25				(25)	16 20 22 25 28 30 32 35(40)	10.00~16.00	16.00	3.00			16.6
32				(32)	16 20 22 25 28 30 32 35	15.00~20.00	20.00	4.00			20.6
38	+0.028			(38)	16 20 22 25 30 35	19.00~26.00	26.00	5.00			26.6
45	+0.017			(45)	20 22 25 30 35	25.00~35.00	35.00	6.00			36.0
50				(50)	20 22 25 30 35	33.00~40.00	40.00	7.00			41.0
56	$^{+0.033}_{+0.020}$			(56)	20 22 25 30 35	38.00~45.00	45.00	8.00			46.0
6	$^{+0.013}_{+0.008}$	$^{+0.005}_{0}$	(Powdered high-speed steel) (D_{n5}) ($D^{+0.005}_{0}$) Ⓐ PMSD A—PMSD Ⓓ PSDD A—PSDD Ⓡ PSDR A—PSDR Ⓔ PSDE A—PSDE Ⓖ PSDG A—PSDG	(6)	16 20 22 25 30 35	1.00~ 3.00	—	—		3	3.4
8	+0.016			8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00		4	4.4
10	+0.010			10	16 20 22 25 30 35	2.00~ 6.00	6.00	1.20		6	6.4
13	+0.020			13	16 20 22 25 30 35	3.00~ 8.00	8.00	1.50		8	8.4
16	+0.015			16	16 20 22 25 30 35	5.00~10.00	10.00	2.00			10.6
20	+0.024	—		(20)	16 20 22 25 30 35	7.00~12.00	12.00	3.00			12.6
25	+0.015			(25)	16 20 22 25 30 35	10.00~16.00	16.00	3.00			16.6

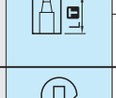
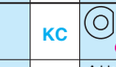
Ⓓ D(3)(4)(5)(6) is available for shape Ⓐ (round) only. Shapes ⒹⓇⒺⒼ are not available.
Ⓓ D=(20) (22) (25) (32) (38) (45) (50) (56) is available for shank dia. tolerance of D_{n5} only.
Ⓓ L=(40) is available for shank dia. tolerance of D_{n5} only.

Order Catalog No. — L — P — W — R (Ⓡ only)
MSD 13 — 30 — P7.00

Delivery 3 Days | Express T 1,600/1Pc. | Express A 800/1Pc.
⊗Express T is not available for D3・4・5・45・50・56 P.38
Ⓓ A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration Catalog No. — L(LC・SLC) — P(PC) — W(WC) — R — (BC・KC・WKC…etc.)
SDD 38 — 35 — P21.03 — W6.83 — BC4.0

Alterations	Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Shaped hole	PC WC	Changes shaped hole diameter P min.: P>PC≧ Pmin/2 ≧0.50, 0.01mm increments Ⓓ When PC is 1.00~1.99, b is 4mm. max.: P/W < PC/WC ≦ P·Kmax+0.2	Changes shaped hole dimension P·W min.: P/W > PC/WC ≧ P·Wmin/2 ≧1.00, 0.01mm increments 0.01mm increments	200
	BC	Changes shaped hole depth B 1≦BC≦b 0.1mm increments ⊗P<1.00: Not available		200
	PKC	Changes shaped hole tolerance P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗P<1.00: Not available	Changes shaped hole tolerance P·W P·W $^{+0.01}_{0}$ ⇨ $^{+0.01}_{0}$	400

Alterations	Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Full length	LC	Changes full length 10≦LC<L 0.1mm incr. (combination with LKC・LKZ→0.01mm incr.) Ⓓ Press-in lead is (L—LC) shorter.		200
	SLC	Changes full length and its tolerance in one code. Specifiable range, unit, and remarks (Ⓓ) are the same as that of each combined alteration code. LC + LKC $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ Ⓓ 0.01mm increments		500
	LKC	Changes full length tolerance $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		400
	LKZ	Changes full length tolerance $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗L(LC)<16: Not available ⊗D>25: Not available		600
Others	KC	Adds key flat ⊗D3~6: Not available  Changes key flat position 1° incr.		200
	WKC	Adds key flats in parallel ⊗D3~6: Not available Ⓓ For changing angle, add KC		200 (Ⓐ only 400)

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓓ To be quoted on price & lead time above Max. Q'ty.

M SKH51・SKD11 or equivalent

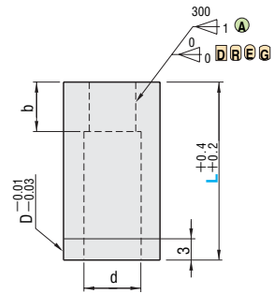
D	MSD	A—MSD	SDD SDR SDE SDG	A—SDD A—SDR A—SDE A—SDG
3	2,090	2,290	—	—
4	1,500	1,700	—	—
5	1,500	1,700	—	—
6	870	1,070	—	—
8	830	1,030	3,460	3,660
10	830	1,030	3,460	3,660
13	750	950	3,600	3,800
16	750	950	3,890	4,090
20	830	—	4,100	—
22	990	—	4,280	—
25	1,100	—	4,410	—
32	1,420	—	4,700	—
38	2,040	—	5,060	—
45	4,720	—	10,270	—
50	5,710	—	11,510	—
56	7,080	—	12,730	—

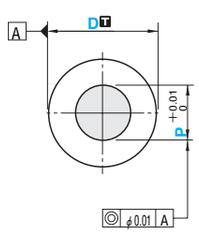
M Powdered high-speed steel

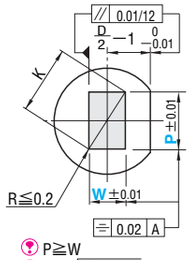
D	PMSD	A—PMSD	PSDD PSDR PSDE PSDG	A—PSDD A—PSDR A—PSDE A—PSDG
6	1,880	2,080	—	—
8	1,800	2,000	6,680	6,880
10	1,800	2,000	6,680	6,880
13	1,710	1,910	7,400	7,600
16	1,710	1,910	8,000	8,200
20	2,010	—	8,930	—
25	2,660	—	9,590	—

PRESS ADD.SPEC. Printed in Red

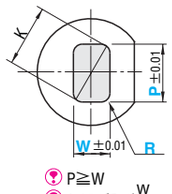
BUTTON DIES
—STRAIGHT TYPE (ECONOMY)—

Straight type	Shank dia. D T	M H	Shank dia.	Catalog No.	For shape, select from Ⓐ D R E G shown below.
RoHS Shank Dia.Tolerance D T n5· $^{+0.005}_{0}$ Selection	D_{n5}	SKD11 or equivalent 60~63HRC	D6~56	EMSD	Economy type 
			D8~56	ESD□	
		Powdered high-speed steel 64~67HRC	D6~25	EPMSD	
			D8~25	EPSD□	
	$D^{+0.005}_{0}$	SKD11 or equivalent 60~63HRC	D6~16	A—EMSD	
			D8~16	A—ESD□	
		Powdered high-speed steel 64~67HRC	D6~16	A—EPMSD	
			D8~16	A—EPSD□	

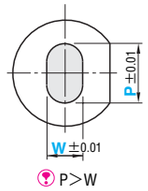
Shape Ⓐ


Shape D


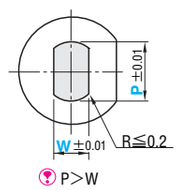
Ⓟ P≧W
Ⓟ K=√(P²+W²)

Shape R


Ⓟ P≧W
Ⓟ 0.15≦R<W/2
Ⓟ K=√((P−2R)²+(W−2R)²+2R

Shape E


Ⓟ P>W

Shape G


Ⓟ P>W

D	D T n5	+0.005 0	Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P · Kmax.	0.01mm increments D R E G P · Wmin.	0.01mm increments Ⓡ R	b	d
6	+0.013 +0.008		(SKD11 or equivalent) (D_{n5}) ($D^{+0.005}_{0}$)	(6)	16 20 22 25 28 30 32 35	1.00~ 3.00	—	—	—	3	3.4
8	+0.016			8	16 20 22 25 28 30 32 35	1.00~ 4.00	4.00	1.00		4	4.4
10	+0.010	+0.005 0		10	16 20 22 25 28 30 32 35 (40)	2.00~ 6.00	6.00	1.20		6	6.4
13	+0.020			13	16 20 22 25 28 30 32 35 (40)	3.00~ 8.00	8.00	1.50		8	8.4
16	+0.012		Ⓐ EMSD A—EMSD	16	16 20 22 25 28 30 32 35 (40)	5.00~10.00	10.00	2.00			10.6
20	+0.024	—	D ESDD A—ESDD	(20)	16 20 22 25 28 30 32 35 (40)	7.00~12.00	12.00	3.00			12.6
22	+0.015		R ESDR A—ESDR	(22)	16 20 22 25 28 30 32 35 (40)	8.00~14.00	14.00	3.00			14.6
25			E ESDE A—ESDE	(25)	16 20 22 25 28 30 32 35 (40)	10.00~16.00	16.00	3.00			16.6
32			G ESDG A—ESDG	(32)	16 20 22 25 28 30 32 35	15.00~20.00	20.00	4.00			20.6
38	+0.028			(38)	16 20 22 25 30 35	19.00~26.00	26.00	5.00			26.6
45	+0.017			(45)	20 22 25 30 35	25.00~35.00	35.00	6.00			36.0
50				(50)	20 22 25 30 35	33.00~40.00	40.00	7.00			41.0
56	+0.033 +0.020			(56)	20 22 25 30 35	38.00~45.00	45.00	8.00			46.0
6	+0.013 +0.008		(Powdered high-speed steel) (D_{n5}) ($D^{+0.005}_{0}$)	(6)	16 20 22 25 30 35	1.00~ 3.00	—	—	0.15≦R<W/2 (Ⓡ only)	3	3.4
8	+0.016			8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00		4	4.4
10	+0.010	+0.005 0	Ⓐ EPMSD A—EPMSD	10	16 20 22 25 30 35	2.00~ 6.00	6.00	1.20		6	6.4
13	+0.020		D EPSDD A—EPSDD	13	16 20 22 25 30 35	3.00~ 8.00	8.00	1.50		8	8.4
16	+0.015		R EPSDR A—EPSDR	16	16 20 22 25 30 35	5.00~10.00	10.00	2.00			10.6
20	+0.024	—	E EPSDE A—EPSDE	(20)	16 20 22 25 30 35	7.00~12.00	12.00	3.00			12.6
25	+0.015		G EPSDG A—EPSDG	(25)	16 20 22 25 30 35	10.00~16.00	16.00	3.00			16.6

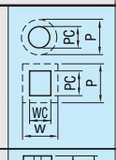
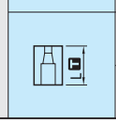
Ⓟ D(6) is available for shape Ⓐ (round) only. Shapes D R E G are not available.
Ⓟ D=(20) (22) (25) (32) (38) (45) (50) (56) is available for shank dia. tolerance of D_{n5} only.
Ⓟ L=(40) is available for shank dia. tolerance of D_{n5} only.

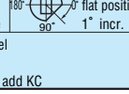
The volume discount rate is also applicable to alteration cost. P.39

Order Catalog No. — L — P — W — R (Ⓡ only)
EMSD 13 — 30 — P7.00

Delivery 3 Days | Express T 1,600/1Pc. | Express A 800/1Pc.
⊗Express T is not available for D45・50・56 P.38
Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration Catalog No. — L(LC・SLC) — P(PC) — W(WC) — R — (KC・WKC···etc.)
ESDD 38 — 35 — P21.03 — W6.83 — — KC90

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole		PC WC	Changes shaped hole diameter P min.: $P > PC \geqq \frac{Pmin}{2} \geqq 0.50$ 0.01mm increments Ⓟ When PC is 1.00~1.99, b is 4mm. max.: $\frac{P}{W} < \frac{PC}{WC} \leqq P \cdot Kmax + 0.2$ 0.01mm increments	Changes shaped hole dimension P・W min.: $\frac{P}{W} > \frac{PC}{WC} \geqq \frac{P \cdot Wmin}{2} \geqq 1.00$ 0.01mm increments	200
Full length		LC	Changes full length 10≦LC<L 0.1mm incr. (combination with LKC・LKZ→0.01mm incr.) Ⓟ Press-in lead is (L—LC) shorter.		200
		SLC	Changes full length and its tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code. LC + LKC $L^{+0.4}_{+0.2} \Rightarrow ^{+0.05}_{0}$ Ⓟ 0.01mm increments		500
		LKC	Changes full length tolerance $L^{+0.4}_{+0.2} \Rightarrow ^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance $L^{+0.4}_{+0.2} \Rightarrow ^{+0.01}_{0}$ ⊗L(LC)<16 : Not available ⊗D>25 : Not available		600

Alterations		Code	Ⓐ	D R E G	¥/1Code
Others		KC	Adds key flat ⊗D6 : Not available	 Changes key flat position 1° incr.	200
		WKC	Adds key flats in parallel ⊗D6 : Not available Ⓟ For changing angle, add KC		200 (Ⓐ only 400)

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

M SKD11 or equivalent

D	EMSD	A—EMSD	ESDD ESDR ESDE ESDG	A—ESDD A—ESDR A—ESDE A—ESDG
6	720	920	—	—
8	690	890	3,250	3,450
10	690	890	3,250	3,450
13	610	810	3,400	3,600
16	610	810	3,620	3,820
20	690	—	3,830	—
22	850	—	4,000	—
25	960	—	4,130	—
32	1,280	—	4,350	—
38	1,900	—	4,720	—
45	4,590	—	9,820	—
50	5,580	—	11,120	—
56	6,950	—	12,350	—

M Powdered high-speed steel

D	EPMSD	A—EPMSD	EPSDD EPSDR EPSDE EPSDG	A—EPSDD A—EPSDR A—EPSDE A—EPSDG
6	1,580	1,780	—	—
8	1,510	1,710	6,270	6,470
10	1,510	1,710	6,270	6,470
13	1,410	1,610	6,960	7,160
16	1,410	1,610	7,430	7,630
20	1,670	—	8,320	—
25	2,340	—	8,980	—

PRESS ADD.SPEC. Printed in Red

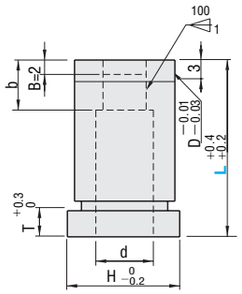
SCRAP RETENTION BUTTON DIES
—HEADED TYPE (REGULAR)—

PRODUCTS DATA P.1229

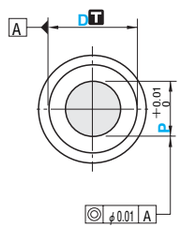
SCRAP RETENTION DIES

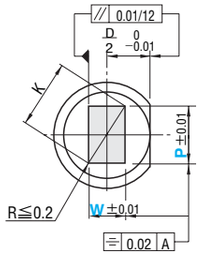
Price Cut : Reduced Price

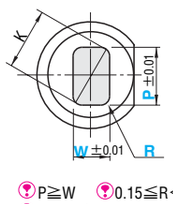
The volume discount rate is also applicable to alteration cost. P.39

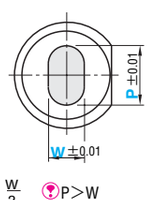
Headed type	Shank dia. D T	M H	Shank dia.	Catalog No.	For shape, select from ⒶⒹⓇⒺⒼ shown below.
RoHS	D_{m5}	SKH51 61~64HRC	D4·5	SR−MHD	Regular type 
		SKD11 or equivalent 60~63HRC	D6~56	SR−HD□	
		SKD11 or equivalent 60~63HRC	D6~56	SR−PMHD	
		Powdered high-speed steel 64~67HRC	D6~25	SR−PHD□	
	$D^{+0.005}_{0}$	SKH51 61~64HRC	D4·5	SRA−MHD	
		SKD11 or equivalent 60~63HRC	D6~16	SRA−HD□	
		SKD11 or equivalent 60~63HRC	D6~16	SRA−PMHD	
		Powdered high-speed steel 64~67HRC	D6~16	SRA−PHD□	

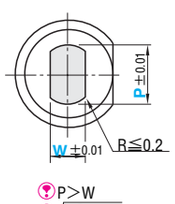
Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selection

Shape Ⓐ 

Shape Ⓓ 

Shape Ⓡ 

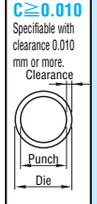
Shape Ⓔ 

Shape Ⓖ 

Ⓐ P−0.4≧1.5(Dimension P straight part 1.5mm or more)
Ⓐ P≧W K=$\sqrt{P^2+W^2}$

Ⓡ P≧W Ⓡ 0.15≦R< $\frac{W}{2}$ Ⓔ P>W
Ⓡ P−2R≧1.5(Dimension P straight part 1.5mm or more)
Ⓡ K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Ⓖ P>W
Ⓖ $\sqrt{P^2-W^2}$ ≧1.5 (Dimension P straight part 1.5mm or more)

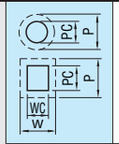
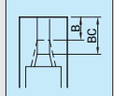
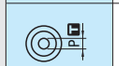
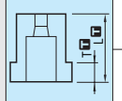
D T D	m5	+0.005 0	Type	D	L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	R R	MT (Material thickness)	0.005mm increments C (Clearance)	b	d	H	T
4	+0.009 +0.004	+0.005 0	(SKH51) (Dm5) (D+0.005 0) Ⓐ SR−MHD SRA−MHD	(4)	16 20 22 25 28 30	1.00~ 2.00	—	—	—	MT≧0.15 Specifiable with material thickness 0.15mm or more.	C≧0.010 Specifiable with clearance 0.010 mm or more. 	2	2.4	5	3
5				(5)	16 20 22 25 28 30	1.00~ 2.50	—	—	—				2.9	6	
6			(SKD11 or equivalent) (Dm5) (D+0.005 0) Ⓐ SR−MHD SRA−MHD Ⓓ SR−HDD SRA−HDD Ⓡ SR−HDR SRA−HDR Ⓔ SR−HDE SRA−HDE Ⓖ SR−HDG SRA−HDG	6	16 20 22 25 28 30 32 35	1.00~ 3.00	3.00	1.00	W/2 (Ⓡ only) 0.15≦R< W/2			3	3.4	9	5
8	+0.012 +0.006			8	16 20 22 25 28 30 32 35 40	1.00~ 4.00	4.00	1.00				4	4.4	11	
10				10	16 20 22 25 28 30 32 35 40 (45)	2.00~ 6.00	6.00	1.20				6	6.4	13	
13	+0.015 +0.007			13	16 20 22 25 28 30 32 35 40 (45)	3.00~ 8.00	8.00	1.50				8	8.4	16	
16				16	16 20 22 25 28 30 32 35 40 (45)	5.00~10.00	10.00	2.00					10.6	19	
20	+0.017 +0.008	—		(20)	16 20 22 25 28 30 32 35 40 (45)	7.00~12.00	12.00	3.00					12.6	23	
22				(22)	16 20 22 25 28 30 32 35 40 (45)	8.00~14.00	14.00	3.00					14.6	25	
25				(25)	16 20 22 25 28 30 32 35 40 (45)	10.00~16.00	16.00	3.00					16.6	28	
32	+0.020 +0.009			(32)	16 20 22 25 28 30 32 35	15.00~20.00	20.00	4.00					20.6	35	
38				(38)	16 20 22 25 28 30 32 35	19.00~26.00	26.00	5.00					26.6	41	
45				(45)	20 22 25 30 35	25.00~35.00	35.00	6.00					36.0	48	
50				(50)	20 22 25 30 35	33.00~40.00	40.00	7.00					41.0	53	
56	+0.024 +0.011			(56)	20 22 25 30 35	38.00~45.00	45.00	8.00					46.0	59	
6	+0.009 +0.004	+0.005 0	(Powdered high-speed steel) (Dm5) (D+0.005 0) Ⓐ SR−PMHD SRA−PMHD Ⓓ SR−PHDD SRA−PHDD Ⓡ SR−PHDR SRA−PHDR Ⓔ SR−PHDE SRA−PHDE Ⓖ SR−PHDG SRA−PHDG	6	16 20 22 25 30 35	1.00~ 3.00	3.00	1.00				3	3.4	9	5
8	+0.012 +0.006			8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00				4	4.4	11	
10				10	16 20 22 25 30 35	2.00~ 6.00	6.00	1.20				6	6.4	13	
13	+0.015 +0.007			13	16 20 22 25 30 35	3.00~ 8.00	8.00	1.50				8	8.4	16	
16				16	16 20 22 25 30 35	5.00~10.00	10.00	2.00					10.6	19	
20	+0.017 +0.008	—		(20)	16 20 22 25 30 35	7.00~12.00	12.00	3.00					12.6	23	
25				(25)	16 20 22 25 30 35	10.00~16.00	16.00	3.00					16.6	28	

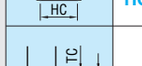
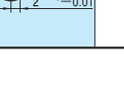
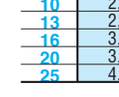
Ⓡ Applied only to the material which has the tensile strength up to 1177N/mm²(120kgf/mm²)
Ⓡ Worked material thickness and clearance are used as scrap retention working data.Specify the point with the finishing dimension (P・W・R) as the button dies at present.
Ⓐ D(4)(5) is available for shape Ⓐ (round) only. Shapes ⒹⓇⒺⒼ are not available.
Ⓡ D=(20)(22)(25)(32)(38)(45)(50)(56) is available for shank dia. tolerance of D_{m5} only.
Ⓡ L=(45) is available for shank dia. tolerance of D_{m5} only.

Order Catalog No. — L — P — W — R(Ⓡ only) — MT — C
SR−MHD 13 — 30 — P7.00 — MT1.50 — C0.105

Delivery 3 Days | Express A 800/1Pc. P.38
Ⓡ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC) — P(PC) — W(WC) — R — MT — C — (BC・HC・TC・CKC・MKC…etc.)
SR−MHD 13 — 30 — P7.00 — MT1.50 — C0.105 — TC3

Alterations		Code	Ⓐ	DREG	¥/1Code
Shaped hole		PC WC	Changes shaped hole dimension P・W min : $\frac{P}{W} > \frac{PC}{WC} \geqq \frac{P \cdot Wmin}{2} \geqq 1.00$ 0.01mm increments Ⓡ Ⓐ : When PC is 1.00~1.99, b is 4mm. max : $\frac{P}{W} < \frac{PC}{WC} \leqq P \cdot Kmax + 0.2$ 0.01mm increments		200
		BC	Changes shaped hole depth B P: 1.00~1.99 Bmax. 3; 2.00~3.99 5; 4.00~ 6 1≦BC≦Bmax. 1≦BC≦b 0.1mm increments	Changes shaped hole depth B 1≦BC<2 0.1mm increments	200
		PKC	Changes shaped hole tolerance P $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	Changes shaped hole tolerance P・W $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	400
Full length		LC	Changes full length (Cutting from the shaped hole side) 10≦L−(b−1)≦LC<L 0.1mm incr. (combination with LKC・LKZ・CKC・MKC →0.01mm incr.) Ⓡ b and lead are shortened by (L−LC).		200
		LKC	Changes full length tolerance $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.01}_{0}$ ⊗L(LC)<16 : Not available ⊗D>25 : Not available		600
		CKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks (Ⓡ) are the same as that of each combined alteration code. ⊗L(LC)<16 : Not available TKC + LKC $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$		500
		MKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks (Ⓡ) are the same as that of each combined alteration code. ⊗L(LC)<16 : Not available TKM + LKC $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$		500

Alterations		Code	Ⓐ	DREG	¥/1Code
Head		KC	Adds key flat	270° 180° 0° 90° Changes key flat position 1° incr.	200
		WKC	Adds key flats in parallel For changing angle, add KC		200 (Ⓐ only 400)
		KFC	270° 180° 0° 90° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC : Not available ⊗L(LC)<16, D>25:Not available	270° 180° 0° 90° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC : Not available ⊗L(LC)<16, D>25:Not available	200 (Ⓐ only 400)
		HC	Changes head diameter H D≦HC<H 0.1mm increments		200
		TC	Changes head thickness 2≦TC<T 0.1mm incr. (Comb. with TKC・TKM・CKC・MKC →0.01mm incr.) Ⓡ L is shortened by (T−TC), When LC is applied, L is equal to LC.		200
		TKC	Changes head thickness tolerance $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ ⊗L(LC)<16 : Not available		200
		TKM	Changes head thickness tolerance $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ ⊗L(LC)<16 : Not available		200
		RC	Reduces head thickness by −0.04~0 from retainer surface ⊗L(LC)<30 : Not available		200
Others		SKC	Adds key flat on shank Ⓡ Applicable to D≧8, L(LC)≧20 ⊗ Combination with KC・WKC・KFC : Not available		600

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓡ To be quoted on price & lead time above Max. Q'ty.

M SKH51・SKD11 or equivalent

D	SR−MHD	SRA−MHD	SR−HDD SR−HDR SR−HDE SR−HDG	SRA−HDD SRA−HDR SRA−HDE SRA−HDG
4	2,660	2,860	—	—
5	2,660	2,860	—	—
6	2,010	2,210	5,070	5,270
8	1,770	1,970	4,670	4,870
10	1,770	1,970	4,670	4,870
13	1,710	1,910	4,820	5,020
16	1,910	2,110	5,510	5,710
20	1,980	—	5,730	—
22	2,240	—	5,910	—
25	2,420	—	6,030	—
32	2,820	—	6,330	—
38	3,620	—	6,690	—
45	6,540	—	12,120	—
50	7,800	—	13,380	—
56	9,100	—	14,600	—

M Powdered high-speed steel

D	SR−PMHD	SRA−PMHD	SR−PHDD SR−PHDR SR−PHDE SR−PHDG	SRA−PHDD SRA−PHDR SRA−PHDE SRA−PHDG
6	3,180	3,380	8,280	8,480
8	2,920	3,120	7,880	8,080
10	2,920	3,120	7,880	8,080
13	2,880	3,080	8,600	8,800
16	3,080	3,280	9,600	9,800
20	3,390	—	10,530	—
25	4,440	—	11,190	—

PRESS ADD.SPEC. Printed in Red

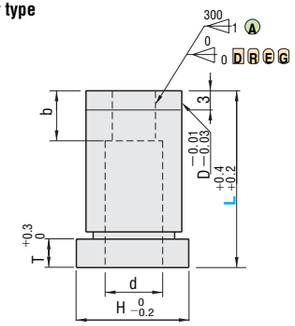
SCRAP RETENTION BUTTON DIES
—HEADED TYPE (ECONOMY)—

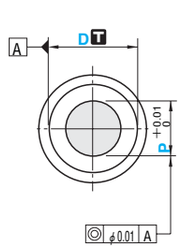
PRODUCTS DATA P.1229

SCRAP RETENTION DIES

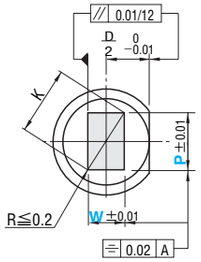
Price Cut : Reduced Price

The volume discount rate is also applicable to alteration cost. P.39

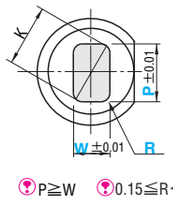
Headed type	Shank dia. D T	M / H	Shank dia.	Catalog No.	For shape, select from Ⓐ D R E G shown below.
RoHS Shank Dia.Tolerance D T m5 $^{+0.005}_{0}$ Selection	D_{m5}	SKD11 or equivalent 60~63HRC	D6~56	SR−EMHD	Economy type 
				SR−EHD□	
		Powdered high-speed steel 64~67HRC	D6~25	SR−EPMHD	
				SR−EPHD□	
	$D^{+0.005}_{0}$	SKD11 or equivalent 60~63HRC	D6~16	SRA−EMHD	
				SRA−EHD□	
		Powdered high-speed steel 64~67HRC	D6~16	SRA−EPMHD	
				SRA−EPHD□	

Shape A 

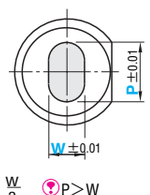
Ⓐ P−0.4≧1.5(Dimension P straight part 1.5mm or more)
Ⓐ P≧W K=$\sqrt{P^2+W^2}$

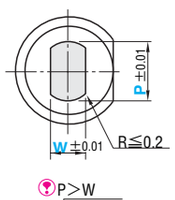
Shape D 

Ⓓ P−2R≧1.5(Dimension P straight part 1.5mm or more)
Ⓓ K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape R 

Ⓡ P≧W Ⓡ 0.15≦R< $\frac{W}{2}$ Ⓡ P>W

Shape E 

Shape G 

Ⓖ P>W
Ⓖ $\sqrt{P^2-W^2}$ ≧1.5
(Dimension P straight part 1.5mm or more)

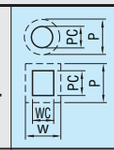
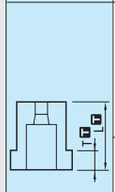
D	D T m5	D T $^{+0.005}_{0}$	Catalog No. Type	Catalog No. D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments Ⓐ P・Kmax.	0.01mm increments Ⓐ P・Wmin.	0.01mm increments R	MT (Material thickness)	0.005mm increments C (Clearance)	b	d	H	T
6	$^{+0.009}_{+0.004}$	+ 0.005 0	(SKD11 or equivalent) (Dm5) (D $^{+0.005}_{0}$)	6	16 20 22 25 28 30 32 35	1.00~ 3.00	3.00	1.00	W/2 (Ⓡ only) 0.15≦R<	MT≧0.15 Specifiable with material thickness 0.15mm or more.	C≧0.010 Specifiable with clearance 0.010 mm or more.	3	3.4	9	5
8	+0.012			8	16 20 22 25 28 30 32 35 40	1.00~ 4.00	4.00	1.00				4	4.4	11	
10	+0.006		Ⓐ SR−EMHD SRA−EMHD	10	16 20 22 25 28 30 32 35 40 (45)	2.00~ 6.00	6.00	1.20				6	6.4	13	
13	+0.015		Ⓓ SR−EHDD SRA−EHDD	13	16 20 22 25 28 30 32 35 40 (45)	3.00~ 8.00	8.00	1.50				8	8.4	16	
16	+0.007		Ⓡ SR−EHDR SRA−EHDR	16	16 20 22 25 28 30 32 35 40 (45)	5.00~10.00	10.00	2.00					10.6	19	
20	+0.017	—	Ⓔ SR−EHDE SRA−EHDE	(20)	16 20 22 25 28 30 32 35 40 (45)	7.00~12.00	12.00	3.00					12.6	23	
22	+0.008		Ⓖ SR−EHDG SRA−EHDG	(22)	16 20 22 25 28 30 32 35 40 (45)	8.00~14.00	14.00	3.00					14.6	25	
25				(25)	16 20 22 25 28 30 32 35 40 (45)	10.00~16.00	16.00	3.00					16.6	28	
32	+0.020			(32)	16 20 22 25 28 30 32 35	15.00~20.00	20.00	4.00					20.6	35	
38	+0.009			(38)	16 20 22 25 30 35	19.00~26.00	26.00	5.00					26.6	41	
45				(45)	20 22 25 30 35	25.00~35.00	35.00	6.00					36.0	48	
50				(50)	20 22 25 30 35	33.00~40.00	40.00	7.00					41.0	53	
56	$^{+0.024}_{+0.011}$			(56)	20 22 25 30 35	38.00~45.00	45.00	8.00					46.0	59	
6	$^{+0.009}_{+0.004}$	+ 0.005 0	(Powdered high-speed steel) (Dm5) (D $^{+0.005}_{0}$)	6	16 20 22 25 30 35	1.00~ 3.00	3.00	1.00				3	3.4	9	5
8	+0.012			8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00				4	4.4	11	
10	+0.006		Ⓐ SR−EPMHD SRA−EPMHD	10	16 20 22 25 30 35	2.00~ 6.00	6.00	1.20				6	6.4	13	
13	+0.015		Ⓓ SR−EPHDD SRA−EPHDD	13	16 20 22 25 30 35	3.00~ 8.00	8.00	1.50				8	8.4	16	
16	+0.007		Ⓡ SR−EPHDR SRA−EPHDR	16	16 20 22 25 30 35	5.00~10.00	10.00	2.00					10.6	19	
20	+0.017	—	Ⓔ SR−EPHDE SRA−EPHDE	(20)	16 20 22 25 30 35	7.00~12.00	12.00	3.00					12.6	23	
25	+0.008		Ⓖ SR−EPHDG SRA−EPHDG	(25)	16 20 22 25 30 35	10.00~16.00	16.00	3.00					16.6	28	

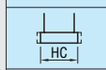
Ⓟ Applied only to the material which has the tensile strength up to 1177N/mm^2(120kgf/mm^2)
Ⓟ Worked material thickness and clearance are used as scrap retention working data.Specify the point with the finishing dimension (P・W・R) as the button dies at present.
Ⓟ D=(20) (22) (25) (32) (38) (45) (50) (56) is available for shank dia. tolerance of Dm5 only.
Ⓟ L=(45) is available for shank dia. tolerance of Dm5 only.

Order: Catalog No. — L — P — W — R(Ⓡ only) — MT — C
SR−EMHD 13 — 30 — P7.00 — MT1.50 — C0.105

Delivery: 3 Days | Express A 800/1Pc. P.38
Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration: Catalog No. — L(LC) — P(PC) — W(WC) — R — MT — C — (HC・TC・CKC・MKC…etc.)
SR−EMHD 13 — 30 — P7.00 — MT1.50 — C0.105 — TC3

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole		PC WC	Changes shaped hole dimension P・W min.: $\frac{P}{W} > \frac{PC}{WC} \geqq \frac{P \cdot Wmin}{2} \geqq 1.00$ 0.01mm increments Ⓟ Ⓐ: When PC is 1.00~1.99, b is 4mm. max.: $\frac{P}{W} < \frac{PC}{WC} \leqq P \cdot Kmax + 0.2$ 0.01mm increments		200
Full length		LC	Changes full length (Cutting from the shaped hole side) 10≦L−(b−1)≦LC<L 0.1mm incr. (combination with LKC・LKZ・CKC・MKC→0.01mm incr.) Ⓟ b and lead are shortened by (L−LC).		200
		LKC	Changes full length tolerance L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance L $^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗L(LC)<16 : Not available ⊗D>25 : Not available		600
		CKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code. ⊗L(LC)<16 : Not available TKC + LKC T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		500
		MKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code. ⊗L(LC)<16 : Not available TKM + LKC T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		500

Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		KC	Adds key flat	270° 180° 0° 90° Changes key flat position 1° incr.	200
		WKC	Adds key flats in parallel For changing angle, add KC		200 (Ⓐ only 400)
		KFC	270° 180° 0° 90° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC : Not available ⊗L(LC)<16, D>25:Not available	270° 180° 0° 90° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC : Not available ⊗L(LC)<16, D>25:Not available	200 (Ⓐ only 400)
		HC	Changes head diameter H D≦HC<H 0.1mm increments		200
		TC	Changes head thickness 2≦TC<T 0.1mm incr. (Comb. with TKC・TKM・CKC・MKC→0.01mm incr.) Ⓟ L is shortened by (T−TC), When LC is applied, L is equal to LC.		200
		TKC	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗L<16 : Not available		200
		TKM	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗L<16 : Not available		200
		RC	0 −0.04 Reduces head thickness by −0.04~0 from retainer surface ⊗L(LC)<30 : Not available		200
Others		SKC	Adds key flat on shank Ⓟ Applicable to D≧8, L(LC)≧20 ⊗Combination with KC・WKC・KFC : Not available		600

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

M SKD11 or equivalent

D	SR−EMHD	SRA−EMHD	SR−EHDD SR−EHDR SR−EHDE SR−EHDG	SRA−EHDD SRA−EHDR SRA−EHDE SRA−EHDG
6	1,870	2,070	4,860	5,060
8	1,640	1,840	4,460	4,660
10	1,640	1,840	4,460	4,660
13	1,570	1,770	4,610	4,810
16	1,770	1,970	5,230	5,430
20	1,860	—	5,450	—
22	2,110	—	5,620	—
25	2,290	—	5,750	—
32	2,680	—	5,970	—
38	3,470	—	6,340	—
45	6,410	—	11,670	—
50	7,620	—	12,980	—
56	8,980	—	14,220	—

M Powdered high-speed steel

D	SR−EPMHD	SRA−EPMHD	SR−EPHDD SR−EPHDR SR−EPHDE SR−EPHDG	SRA−EPHDD SRA−EPHDR SRA−EPHDE SRA−EPHDG
6	2,880	3,080	7,870	8,070
8	2,620	2,820	7,470	7,670
10	2,620	2,820	7,470	7,670
13	2,560	2,760	8,160	8,360
16	2,760	2,960	9,020	9,220
20	3,050	—	9,920	—
25	4,110	—	10,580	—

PRESS ADD.SPEC. Printed in Red

SCRAP RETENTION BUTTON DIES
—STRAIGHT TYPE (REGULAR)—

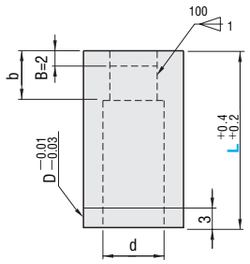
PRODUCTS DATA P.1229

Price Cut : Reduced Price

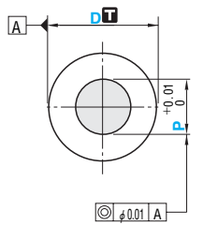
The volume discount rate is also applicable to alteration cost. P.39

Straight type	Shank dia. D T	M H	Shank dia.	Catalog No.
RoHS Shank Dia.Tolerance D T n5· $^{+0.005}_{0}$ Selection	D_{n5}	SKH51 61~64HRC	D4·5	SR—MSD
		SKD11 or equivalent 60~63HRC	D6~56	
		SKD11 or equivalent 60~63HRC	D8~56	SR—SD□
		Powdered high speed steel 64~67HRC	D6~25	SR—PMSD
			D8~25	SR—PSD□
	$D^{+0.005}_{0}$	SKH51 61~64HRC	D4·5	SRA—MSD
		SKD11 or equivalent 60~63HRC	D6~16	
		SKD11 or equivalent 60~63HRC	D8~16	SRA—SD□
		Powdered high speed steel 64~67HRC	D6~16	SRA—PMSD
			D8~16	SRA—PSD□

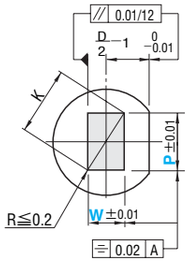
Regular type



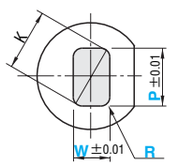
Shape A



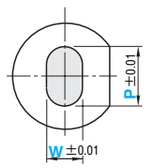
Shape D



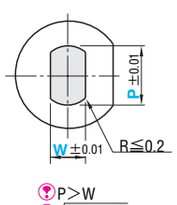
Shape R



Shape E



Shape G



Ⓐ P−0.4≧1.5 (Dimension P straight part 1.5mm or more)
Ⓐ P≧W K= $\sqrt{P^2+W^2}$

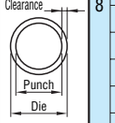
Ⓓ P≧W Ⓓ 0.15≦R< $\frac{W}{2}$ Ⓓ P>W
Ⓓ P−2R≧1.5 (Dimension P straight part 1.5mm or more)
Ⓓ K= $\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Ⓖ P>W
Ⓖ $\sqrt{P^2-W^2}$ ≧1.5 (Dimension P straight part 1.5mm or more)

D T D	n5	+0.005 0	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P·Kmax.	Ⓓ Ⓡ Ⓔ Ⓖ P·Wmin.	Ⓡ R	MT (Material thickness)	0.005mm increments C (Clearance)	b	d
4			(SKH51)	(4)	16 20 22 25 28 30	1.00~ 2.00	—	—				2	2.4
5	+0.013 +0.008		(Dn5) (D +0.005 0) Ⓐ SR—MSD SRA—MSD	(5)	16 20 22 25 28 30	1.00~ 2.50	—	—	—				2.9
6				(6)	16 20 22 25 28 30 32 35	1.00~ 3.00	—	—				3	3.4
8	+0.016	+0.005 0		8	16 20 22 25 28 30 32 35	1.00~ 4.00	4.00	1.00				4	4.4
10	+0.010		(SKD11 or equivalent)	10	16 20 22 25 28 30 32 35 (40)	2.00~ 6.00	6.00	1.20				6	6.4
13	+0.020		(Dn5) (D +0.005 0)	13	16 20 22 25 28 30 32 35 (40)	3.00~ 8.00	8.00	1.50				8	8.4
16	+0.012		Ⓐ SR—MSD SRA—MSD	16	16 20 22 25 28 30 32 35 (40)	5.00~10.00	10.00	2.00					10.6
20			Ⓓ SR—SDD SRA—SDD	(20)	16 20 22 25 28 30 32 35 (40)	7.00~12.00	12.00	3.00					12.6
22	+0.024 +0.015		Ⓡ SR—SDR SRA—SDR	(22)	16 20 22 25 28 30 32 35 (40)	8.00~14.00	14.00	3.00					14.6
25			Ⓔ SR—SDE SRA—SDE	(25)	16 20 22 25 28 30 32 35 (40)	10.00~16.00	16.00	3.00					16.6
32		—	Ⓖ SR—SDG SRA—SDG	(32)	16 20 22 25 28 30 32 35	15.00~20.00	20.00	4.00					20.6
38	+0.028			(38)	16 20 22 25 30 35	19.00~26.00	26.00	5.00					26.6
45	+0.017			(45)	20 22 25 30 35	25.00~35.00	35.00	6.00	W/2 (Ⓐ only)				36.0
50				(50)	20 22 25 30 35	33.00~40.00	40.00	7.00	0.15≦R<				41.0
56	+0.033 +0.020			(56)	20 22 25 30 35	38.00~45.00	45.00	8.00					46.0
6	+0.013 +0.008		(Powdered high-speed steel)	(6)	16 20 22 25 30 35	1.00~ 3.00	—	—				3	3.4
8	+0.016	+0.005 0	(Dn5) (D +0.005 0) Ⓐ SR—PMSD SRA—PMSD	8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00				4	4.4
10	+0.010		Ⓓ SR—PSDD SRA—PSDD	10	16 20 22 25 30 35	2.00~ 6.00	6.00	1.20				6	6.4
13	+0.020		Ⓡ SR—PSDR SRA—PSDR	13	16 20 22 25 30 35	3.00~ 8.00	8.00	1.50				8	8.4
16	+0.012		Ⓔ SR—PSDE SRA—PSDE	16	16 20 22 25 30 35	5.00~10.00	10.00	2.00					10.6
20	+0.024	—	Ⓖ SR—PSDG SRA—PSDG	(20)	16 20 22 25 30 35	7.00~12.00	12.00	3.00					12.6
25	+0.015			(25)	16 20 22 25 30 35	10.00~16.00	16.00	3.00					16.6

MT≧0.15 Specifiable with material thickness 0.15mm or more.

C≧0.010 Specifiable with clearance 0.010mm or more.



Ⓐ(4)(5)(6)is available for shape Ⓐ(round) only. Shapes Ⓓ Ⓡ Ⓔ Ⓖ are not available. Applied only to the material which has the tensile strength up to 1177N/mm²(120kgf/mm²)
D=(20)(22)(25)(32)(38)(45)(50)(56) is available for shank dia. tolerance of Dn5 only.
L=(40) is available for shank dia. tolerance of Dn5 only.
Workpiece material thickness and clearance are used as scrap retention machining data.Specify the shaped hole with the finishing dimension (P · W · R) as the button dies at present.

Order

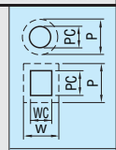
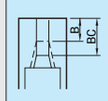
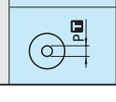
Catalog No.	L	P	W	R(Ⓡ only)	MT	C
SR—SDR 13	35	P5.25	W2.82	R0.40	MT1.50	C0.105

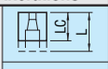
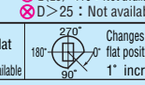
Delivery 3 Days | Express A 800/1Pc. P.38

Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration

Catalog No.	L(LC · SLC)	P(PC)	W(WC)	R	MT	C	(BC · KC · LKC···etc.)
SR—SDD 13	35	P5.58	W2.25		MT1.50	C0.105	LKC

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Shaped hole		PC WC	Changes shaped hole dimension P·W min : $\frac{P}{W} > \frac{PC}{WC} \geqq \frac{P \cdot Wmin.}{2} \geqq 1.00$ 0.01mm increments Ⓟ Ⓐ : When PC is 1.00~1.99, b is 4mm. max : $\frac{P}{W} < \frac{PC}{WC} \leqq P \cdot Kmax + 0.2$ 0.01mm increments		200
		BC	Changes shaped hole depth B P: 1.00~1.99 → Bmax. 3; 2.00~3.99 → 5; 4.00~ → 6 1≦BC≦Bmax. 1≦BC≦b 0.1mm increments	Changes shaped hole depth B 1≦BC<2 0.1mm increments	200
		PKC	Changes shaped hole tolerance P $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	Changes shaped hole tolerance P·W $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	400

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Full length		LC	Changes full length 10≦LC<L 0.1mm incr. (combination with LKC · LKZ→0.01mm incr.) Ⓟ Press-in lead is (L—LC) shorter.		200
		SLC	Changes full length and its tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code. LC + LKC $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$ Ⓟ 0.01mm increments		500
		LKC	Changes full length tolerance $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.01}_{0}$ ⊗ L(LC)<16 : Not available ⊗ D>25 : Not available		600
Others		KC	Adds key flat ⊗ D4~6 : Not available	 Changes key flat position 1° incr.	200
		WKC	Adds key flats in parallel ⊗ D4~6 : Not available		200 (Ⓐ only) 400

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

M SKH51 · SKD11 or equivalent

D	SR—MSD	SRA—MSD	SR—SDD SR—SDR SR—SDE SR—SDG	SRA—SDD SRA—SDR SRA—SDE SRA—SDG
4	2,510	2,710	—	—
5	2,510	2,710	—	—
6	1,870	2,070	—	—
8	1,630	1,830	4,670	4,870
10	1,630	1,830	4,670	4,870
13	1,550	1,750	4,820	5,020
16	1,750	1,950	5,510	5,710
20	1,830	—	5,730	—
22	1,990	—	5,910	—
25	2,110	—	6,030	—
32	2,420	—	6,330	—
38	3,050	—	6,690	—
45	5,940	—	12,120	—
50	6,940	—	13,380	—
56	8,320	—	14,600	—

M Powdered high-speed steel

D	SR—PMSD	SRA—PMSD	SR—PSDD SR—PSDR SR—PSDE SR—PSDG	SRA—PSDD SRA—PSDR SRA—PSDE SRA—PSDG
6	2,880	3,080	—	—
8	2,600	2,800	7,880	8,080
10	2,600	2,800	7,880	8,080
13	2,500	2,700	8,600	8,800
16	2,700	2,900	9,600	9,800
20	3,010	—	10,530	—
25	3,650	—	11,190	—

PRESS ADD.SPEC. Printed in Red

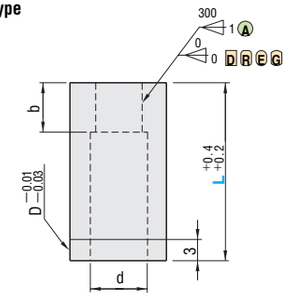
SCRAP RETENTION BUTTON DIES
—STRAIGHT TYPE (ECONOMY)—

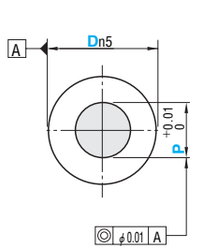
PRODUCTS DATA P.1229

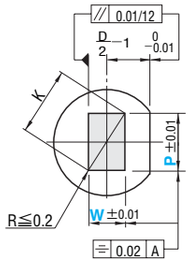
SCRAP RETENTION DIES

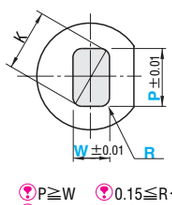
Price Cut : Reduced Price

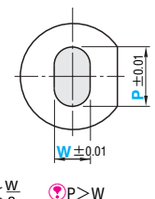
The volume discount rate is also applicable to alteration cost. P.39

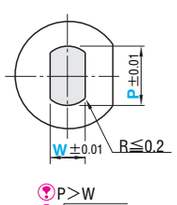
Straight type	Shank dia. D T	M H	Shank dia.	Catalog No.	For shape, select from Ⓐ D R E G shown below.
RoHS Shank Dia.Tolerance D T n5 $^{+0.005}_{0}$ Selection	D_{n5}	SKD11 or equivalent 60~63HRC	D6~56	SR—EMSD	Economy type 
			D8~56	SR—ESD□	
		Powdered high speed steel 64~67HRC	D6~25	SR—EPMSD	
			D8~25	SR—EPSD□	
	$D^{+0.005}_{0}$	SKD11 or equivalent 60~63HRC	D6~16	SRA—EMSD	
			D8~16	SRA—ESD□	
		Powdered high speed steel 64~67HRC	D6~16	SRA—EPMSD	
			D8~16	SRA—EPSD□	

Shape Ⓐ 

Shape D 

Shape R 

Shape E 

Shape G 

Ⓐ P−0.4≧1.5 (Dimension P straight part 1.5mm or more) Ⓐ P≧W K= $\sqrt{P^2+W^2}$

D P≧W Ⓓ 0.15≦R< $\frac{W}{2}$ (Ⓐ only) P>W

R P−2R≧1.5 (Dimension P straight part 1.5mm or more) R K= $\sqrt{(P-2R)^2+(W-2R)^2}+2R$

E P>W G $\sqrt{P^2-W^2}$ ≧1.5 (Dimension P straight part 1.5mm or more)

D T D	n5	$^{+0.005}_{0}$	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ R E G P・Kmax.	Ⓓ R E G P・Wmin.	R R	MT (Material thickness)	0.005mm increments C (Clearance)	b	d
6	$^{+0.008}_{+0.004}$	$^{+0.005}_{0}$	(SKD11 or equivalent) (D_{n5}) ($D^{+0.005}_{0}$)	(6)	16 20 22 25 28 30 32 35	1.00~ 3.00	—	—	—	MT≧0.15 Specifiable with material thickness 0.15mm or more.	C≧0.010 Specifiable with clearance 0.010mm or more. Clearance Punch Die	3	3.4
8	+0.016		Ⓐ SR—EMSD SRA—EMSD	8	16 20 22 25 28 30 32 35	1.00~ 4.00	4.00	1.00				4	4.4
10	+0.010		Ⓓ SR—ESDD SRA—ESDD	10	16 20 22 25 28 30 32 35(40)	2.00~ 6.00	6.00	1.20				6	6.4
13	+0.020		Ⓡ SR—ESDR SRA—ESDR	13	16 20 22 25 28 30 32 35(40)	3.00~ 8.00	8.00	1.50				8	8.4
16	+0.012		Ⓔ SR—ESDE SRA—ESDE	16	16 20 22 25 28 30 32 35(40)	5.00~10.00	10.00	2.00					10.6
20			Ⓖ SR—ESDG SRA—ESDG	(20)	16 20 22 25 28 30 32 35(40)	7.00~12.00	12.00	3.00					12.6
22	+0.024 +0.015			(22)	16 20 22 25 28 30 32 35(40)	8.00~14.00	14.00	3.00					14.6
25				(25)	16 20 22 25 28 30 32 35(40)	10.00~16.00	16.00	3.00					16.6
32		—		(32)	16 20 22 25 28 30 32 35	15.00~20.00	20.00	4.00					20.6
38	+0.028			(38)	16 20 22 25 30 35	19.00~26.00	26.00	5.00					26.6
45	+0.017			(45)	20 22 25 30 35	25.00~35.00	35.00	6.00					36.0
50				(50)	20 22 25 30 35	33.00~40.00	40.00	7.00					41.0
56	$^{+0.033}_{+0.020}$			(56)	20 22 25 30 35	38.00~45.00	45.00	8.00					46.0
6	$^{+0.013}_{+0.008}$	$^{+0.005}_{0}$	(Powdered high-speed steel) (D_{n5}) ($D^{+0.005}_{0}$)	(6)	16 20 22 25 30 35	1.00~ 3.00	—	—	0.15≦R< $\frac{W}{2}$ (Ⓐ only)			3	3.4
8	+0.016		Ⓐ SR—EPMSD SRA—EPMSD	8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00				4	4.4
10	+0.010		Ⓓ SR—EPSDD SRA—EPSDD	10	16 20 22 25 30 35	2.00~ 6.00	6.00	1.20				6	6.4
13	+0.020		Ⓡ SR—EPSDR SRA—EPSDR	13	16 20 22 25 30 35	3.00~ 8.00	8.00	1.50				8	8.4
16	+0.012		Ⓔ SR—EPSDE SRA—EPSDE	16	16 20 22 25 30 35	5.00~10.00	10.00	2.00					10.6
20	+0.024	—	Ⓖ SR—EPSDG SRA—EPSDG	(20)	16 20 22 25 30 35	7.00~12.00	12.00	3.00					12.6
25	+0.015			(25)	16 20 22 25 30 35	10.00~16.00	16.00	3.00					16.6

Ⓓ D(6)is available for shape Ⓐ(round) only. Dimensions D R E G are not available.
Ⓓ D=(20)(22)(25)(32)(38)(45)(50)(56) is available for shank dia. tolerance of Dn5 only.
Ⓓ L=(40) is available for shank dia. tolerance of Dn5 only.
Ⓓ Workpiece material thickness and clearance are used as scrap retention machining data.Specify the shaped hole with the finishing dimension (P・W・R) as the button dies at present.
Ⓓ Applied only to the material which has the tensile strength up to 1177N/mm² (120kgf/mm²)

Order

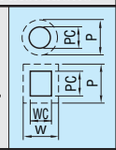
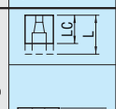
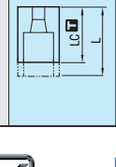
Catalog No.	L	P	W	R(Ⓡ only)	MT	C
SR—ESDR 13	35	P5.25	W2.82	R0.40	MT1.50	C0.105

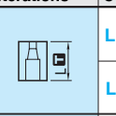
Delivery 3 Days | Express A 800/1Pc. P.38

Ⓓ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration

Catalog No.	L(LC・SLC)	P(PC)	W(WC)	R	MT	C	(KC・LKC…etc.)
SR—ESDD 13	35	P5.58	W2.25		MT1.50	C0.105	LKC

Alterations		Code	Ⓐ / Ⓓ R E G	¥/1Code
Shaped hole		PC WC	Changes shaped hole dimension P・W min: $\frac{P}{W} > \frac{PC}{WC} \geqq \frac{P-Wmin}{2} \geqq 1.00$ 0.01mm increments Ⓐ: When PC is 1.00~1.99, b is 4mm. max: $\frac{P}{W} < \frac{PC}{WC} \leqq P \cdot Kmax + 0.2$ 0.01mm increments	200
Full length		LC	Changes full length 10≦LC<L 0.1mm incr. (combination with LKC・LKZ→0.01mm incr.) Ⓓ Press-in lead is (L—LC) shorter.	200
		SLC	Changes full length and its tolerance in one code. Specifiable range, unit, and remarks (Ⓓ) are the same as that of each combined alteration code. LC + LKC $L^{+0.4}_{+0.2} \Rightarrow ^{+0.05}_{0}$ Ⓓ 0.01mm increments	500

Alterations		Code	Ⓐ / Ⓓ R E G	¥/1Code
Full length		LKC	Changes full length tolerance $L^{+0.4}_{+0.2} \Rightarrow ^{+0.05}_{0}$	400
		LKZ	Changes full length tolerance $L^{+0.4}_{+0.2} \Rightarrow ^{+0.01}_{0}$ ⊗L(LC)<16 : Not available ⊗D>25 : Not available	600
Others		KC	Adds key flat ⊗ D6 : Not available 270° 180° 0° 90° Changes key flat position 1° incr.	200
		WKC	Adds key flats in parallel ⊗ D6 : Not available	200 (Ⓐ only 400)

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓓ To be quoted on price & lead time above Max. Q'ty.

M SKD11 or equivalent

D	SR—EMSD	SRA—EMSD	SR—ESDD SR—ESDR SR—ESDE SR—ESDG	SRA—ESDD SRA—ESDR SRA—ESDE SRA—ESDG
6	1,720	1,920	—	—
8	1,490	1,690	4,460	4,660
10	1,490	1,690	4,460	4,660
13	1,410	1,610	4,510	4,710
16	1,610	1,810	5,230	5,430
20	1,690	—	5,450	—
22	1,850	—	5,620	—
25	1,960	—	5,750	—
32	2,290	—	5,970	—
38	2,910	—	6,340	—
45	5,810	—	11,670	—
50	6,810	—	12,980	—
56	8,190	—	14,220	—

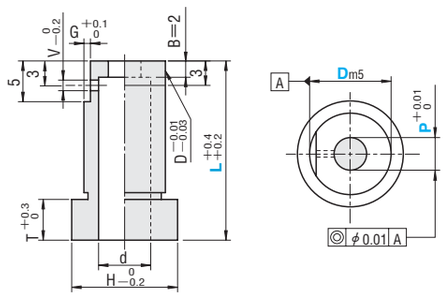
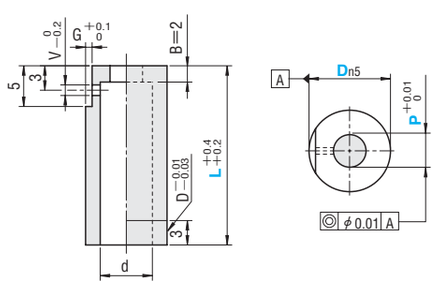
M Powdered high-speed steel

D	SR—EPMSD	SRA—EPMSD	SR—EPSDD SR—EPSDR SR—EPSDE SR—EPSDG	SRA—EPSDD SRA—EPSDR SRA—EPSDE SRA—EPSDG
6	2,560	2,760	—	—
8	2,310	2,510	7,470	7,670
10	2,310	2,510	7,470	7,670
13	2,200	2,400	8,160	8,360
16	2,380	2,580	9,020	9,220
20	2,660	—	9,920	—
25	3,330	—	10,580	—

BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP
—HEADED TYPE , STRAIGHT TYPE—

PRODUCTS DATA P.1231 NON-CLOGGING DIE
RELATED PRODUCTS P.297 SCRAP VACUUM UNIT

The volume discount rate is also applicable to alteration cost. P.39

Type		Shank dia.	Catalog No.	View
—Headed type— RoHS	SKH51 61～64HRC	D3～5	SV—MHD	
	SKD11 or equivalent 60～63HRC	D6～10		
	Powdered high speed steel 64～67HRC	D6～10	SV—PMHD	
—Straight type— RoHS	SKH51 61～64HRC	D3～5	SV—MSD	
	SKD11 or equivalent 60～63HRC	D6～10		
	Powdered high speed steel 64～67HRC	D6～10	SV—PMSD	

D T			Catalog No.		L	0.01mm increments	V	G	d	H	T
D	m5	n5	Type	D		min. P max.					
3	+0.006 +0.002	+0.008 +0.004	(SKH51)	3	16	0.50～1.00	0.4	0.2	2.0	4	3
4	+0.009 +0.004	+0.013 +0.008	Headed type (Dm5) SV—MHD / Straight type (Dn5) SV—MSD	4		0.50～2.00			2.4	5	
5				5		0.50～2.50			2.9	6	
6			(SKD11 or equivalent)	6	20	1.00～3.00	0.8	0.3	3.4	9	5
8	+0.012 +0.006	+0.016 +0.010	Headed type (Dm5) SV—MHD / Straight type (Dn5) SV—MSD	8	(22)	1.00～4.00			4.4	11	
10				10		2.00～6.00			6.4	13	
6	+0.009 +0.004	+0.013 +0.008	(Powdered high-speed steel)	6	(25)	1.00～3.00	0.8	0.3	3.4	9	5
8	+0.012 +0.006	+0.016 +0.010	Headed type (Dm5) SV—PMHD / Straight type (Dn5) SV—PMSD	8		1.00～4.00			4.4	11	
10				10		2.00～6.00			6.4	13	

(?) The die wall around head undercut part of D(3) is thin, pay attention when installing.
(?) L(22) and (25) ···▸ D4~10: Total length (22) and (25) are covered by standards from D4~10.

Order Catalog No. — L — P
SV-PMHD10 — 25 — P4.50

Delivery 3 Days

Price

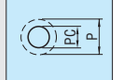
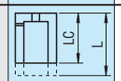
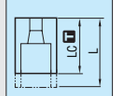
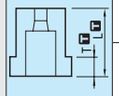
■Volume discount rate P.37

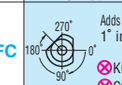
Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

(?) To be quoted on price & lead time above Max. Q'ty.

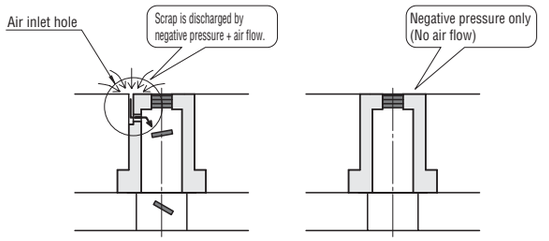
D	SV—MHD	SV—PMHD	SV—MSD	SV—PMSD
3	3,820	—	3,660	—
4	3,140	—	2,970	—
5	3,140	—	2,970	—
6	2,390	3,500	2,220	3,180
8	2,350	3,430	2,180	3,100
10	2,350	3,430	2,180	3,100

Alteration Catalog No. — L(LC・SLC) — P(PC) — (HC・TC・CKC・MKC···etc.)
SV-MSD8 — LC18 — PC4.20 — LKC

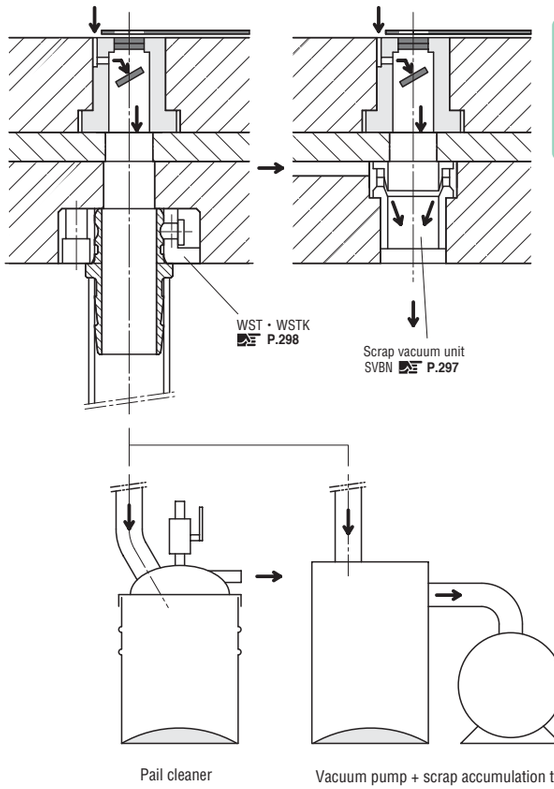
Alterations		Code	Spec.	¥/1Code
Shaped hole		PC	Changes shaped hole dimension P・W min: P > PC ≧ Pmin/2 ≧0.50 0.01mm increments max: P < PC ≦Pmax+0.2 0.01mm increments	200
		PKC	Changes shaped hole tolerance P P +0.01 0 ⇨ +0.005 0 ⊗P<1.00：Not available	400
Full length		LC	Changes full length 10≦LC<L 0.1mm incr. (Combination with LKC→0.01mm increments) (?)Press-in lead is (L—LC) shorter. ⊗Head type：Not available	200
		SLC	Changes full length and its tolerance in one code. Specifiable range, unit, and remarks ((?)) are the same as that of each combined alteration code. LC + LKC L +0.4 +0.2 ⇨ +0.05 0 (?)0.01mm increments ⊗Head type：Not available	500
		LKC	Changes full length tolerance L +0.4 +0.2 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance L +0.4 +0.2 ⇨ +0.01 0 ⊗L(LC)<16：Not available	600
		CKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks ((?)) are the same as that of each combined alteration code. ⊗Straight type：Not available TKC + LKC T +0.3 0 ⇨ +0.02 0 L +0.4 +0.2 ⇨ +0.05 0	500
		MKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks ((?)) are the same as that of each combined alteration code. ⊗Straight type：Not available TKM + LKC T +0.3 0 ⇨ 0 −0.02 L +0.4 +0.2 ⇨ +0.05 0	500

Alterations		Code	Spec.	¥/1Code
Head		KC	Adds key flat	200
			Adds key flat ⊗D3～6：Not available	
		WKC	Adds key flats in parallel ⊗Combination with KC：Not available ⊗Straight type：Not available	400
		KFC	 Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC：Not available ⊗Straight type：Not available	400
		HC	Changes head diameter H D≦HC<H 0.1mm increments	200
		TC	Changes head thickness 2≦TC<T. 0.1mm incr.(Comb. with TKC・TKM・CKC・MKC →0.01mm incr.) (?)L is shortened by(T—TC). When LC is applied, L is equal to LC.	200
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0 ⊗L(LC)<16：Not available	200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02 ⊗L(LC)<16：Not available	200

■Features
- These Non-clogging button dies are intended to be used in combination with a vacuum device such as a vacuum pump.
- There is an air inlet hole near the tip, so when scrap is sucked out by the vacuum device, an air flow is created inside the button die. As a result, the scrap discharge effectiveness is higher than that of a button die without an air inlet hole. [Fig.1]
- For the vacuum device, it is also possible to use a scrap vacuum unit (P.297) or a commercially available pail-mounted type cleaner, for example, instead of a vacuum pump. In such a case, compressed air from a compressor, for example, is used as the drive source. [Fig.2]
- Button dies for preventing clogging of scrap [Products Data] P.1231



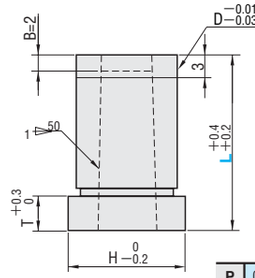
[Fig.1] Effectiveness of air inlet hole



[Fig.2] Examples of use in combination with different vacuum devices

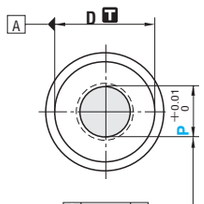
PRESS ADD.SPEC. Printed in Red

ANGULAR BUTTON DIES
—HEADED TYPE—

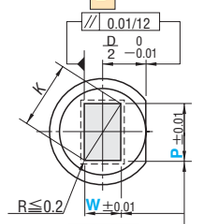
Headed type	Shank dia. D T	M H	Shank dia.	Catalog No.	For shape, select from Ⓐ D R E G shown below.
RoHS Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selection	D_{m5}	SKH51 61～64HRC	D3～5	AHD	
		SKD11 or equivalent 60～63HRC	D6～25	AHD□	
		SKD11 or equivalent 60～63HRC	D6～25	PAHD	
		Powdered high speed steel 64～67HRC	D3～25	PAHD□	
			D6～25		
	$D^{+0.005}_{0}$	SKH51 61～64HRC	D3～5	A—AHD	
		SKD11 or equivalent 60～63HRC	D6～16	A—AHD□	
		Powdered high speed steel 64～67HRC	D3～16	A—PAHD	
			D6～16	A—PAHD□	

P	0.30～0.49	0.50～
B	1	2

Shape A

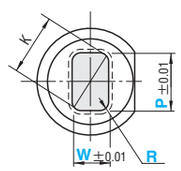


Shape D



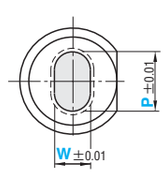
Ⓟ P≧W

Shape R



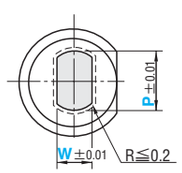
Ⓟ P≧W
Ⓟ 0.15≦R< $\frac{W}{2}$
Ⓟ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



Ⓟ P>W

Shape G



Ⓟ P>W

D T D	m5	+0.005 0	Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P · Kmax.	D R E G P · Wmin.	R R	H	T
3	+0.006 +0.002	+0.005 0	(D_{m5}) (SKH51) (Powdered high-speed steel) A AHD PAHD; ($D^{+0.005}_{0}$) (SKH51) (Powdered high-speed steel) A A—AHD A—PAHD	(3)	8 13	0.30～0.70	—	—	—	4	3
4				(4)	8 13 16 20 22 25 30	0.50～1.50	—	—		5	
5	+0.009 +0.004			(5)	16 20 22 25 30	0.50～2.50	—	—		6	
6			(D_{m5}) (SKD11 or equivalent) (Powdered high-speed steel) A AHD PAHD; ($D^{+0.005}_{0}$) (SKD11 or equivalent) (Powdered high-speed steel) A A—AHD A—PAHD	6	16 20 22 25 30 35	1.00～3.00	3.00	1.00	0.15≦R< $\frac{W}{2}$ (Ⓡonly)	9	5
8	+0.012			8	16 20 22 25 30 35	1.00～4.00	4.00	1.00		11	
10	+0.006		D AHDD PAHDD A—AHDD A—PAHDD	10	16 20 22 25 30 35(40)	2.00～6.00	6.00	1.20		13	
13	+0.015		R AHDR PAHDR A—AHDR A—PAHDR	13	16 20 22 25 30 35(40)	3.00～8.00	8.00	1.50		16	
16	+0.007		E AHDE PAHDE A—AHDE A—PAHDE	16	16 20 22 25 30 35(40)	5.00～10.00	10.00	2.00		19	
20	+0.017	—	G AHDG PAHDG A—AHDG A—PAHDG	(20)	16 20 22 25 30 35	7.00～12.00	12.00	3.00		23	
25	+0.008			(25)	16 20 22 25 30 35	10.00～16.00	16.00	3.00		28	

Ⓟ D=(3)(4)(5) is available for shape Ⓐ (round) only. Shapes D R E G are not available.
Ⓟ D=(20)(25) is available for shank dia. tolerance of Dm5 only.
Ⓟ L=(40) is available for AHD, AHDD, AHDR, AHDE, AHDG.

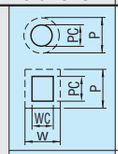
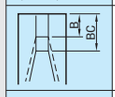
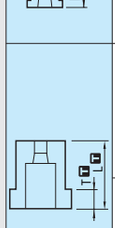
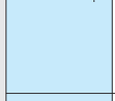
Order

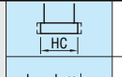
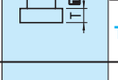
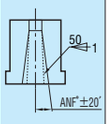
Catalog No.	L	P	W	R (Ⓡonly)
AHDR 13	25	P6.20	W2.00	R0.50

Delivery 3 Days | Express A 800/1Pc. P.38
Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

The volume discount rate is also applicable to alteration cost. P.39

Alteration Catalog No. — L(LC · LCT · LMT) — P(PC) — W(WC) — R — (BC · HC · TC · CKC · MKC···etc.)
AHD 6 — 16 — P2.47 — HC8.0—ANF1.8—KFC135

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole		PC WC	Changes shaped hole diameter P min: P>PC≧ Pmin/2 ≧0.50 0.01mm increments Ⓟ When PC1.00～1.99, b is 4mm. max: P/W < PC/WC ≦ P·Kmax+0.2 0.01mm increments	Changes shaped hole dimension P·W min: P/W > PC/WC ≧ P·Wmin/2 ≧1.00 0.01mm increments	200
		BC	Changes shaped hole depth B 1≦BC≦4 0.1mm increments ⊗ P<1.0 : Not available		200
		PKC	Changes shaped hole tolerance P $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ P<1.00 : Not available	Changes shaped hole tolerance P·W P·W±0.01 ⇨ $^{+0.01}_{0}$	400
Full length		LC	Changes full length 10≦LC<L 0.1mm incr. (Combination with LKC·LKZ·CKC·MKC→0.01mm increments) Ⓟ Press-in lead is (L—LC) shorter.		200
		LKC	Changes full length tolerance L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗ L(LC)<10 : Not available		400
		LKZ	Changes full length tolerance L $^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ L(LC)<16 : Not available		600
		CKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code. ⊗ L(LC)<16 : Not available TKC + LKC T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		500
		MKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code. ⊗ L(LC)<16 : Not available TKM + LKC T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		500
		LCT	Changes head thickness tolerance, full length and its tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code. TKC + LC + LKC Ⓟ 0.01mm increments ⊗ L<16 : Not available		600
		LMT	TKM + LC + LKC Ⓟ 0.01mm increments ⊗ L<16 : Not available		600

Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		HC	Changes head diameter H D≦HC<H 0.1mm increments		200
		TC	Changes head thickness 2≦TC<T 0.1mm incr.(Comb. with TKC·TKM·CKC·MKC·LCT·LMT →0.01mm incr.) Ⓟ L is shortened by(T—TC). When LC, LCT and LMT are used together, L is the same as the specified dimension.		200
		KC	Adds key flat ⊗ L(LC)<16 : Not available	270° 180° 90° 0° Changes key flat position 1° incr.	200
		WKC	Adds key flats in parallel For changing angle, add KC ⊗ L(LC)<16 : Not available		200 (Ⓐonly 400)
		KFC	270° 180° 90° 0° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗ KC·WKC : Not available ⊗ L(LC)<16:Not available	270° 180° 90° 0° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗ KC·WKC : Not available ⊗ L(LC)<16:Not available	200 (Ⓐonly 400)
		TKC	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗ L(LC)<16 : Not available		200
		TKM	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗ L(LC)<16 : Not available		200
Others		SKC	Adds key flat on shank Ⓟ Applicable to D≧8, L(LC)≧20 ⊗ Combination with KC·WKC·KFC·ANF : Not available		600
		ANF	Changes back relief angle 0.6≦ANF≦1.2 0.2° increments Ⓟ d≦dmax Ⓟ d=P+2((L—B)tan(ANF°)) Ⓟ P—Btan(ANF°)≧0.6 W—Btan(ANF°)≧0.6 ⊗ P·W<1.0 : Not available ⊗ D=3 : Not available Taper 1/50 Angle 0.573°	D / d max: 4/2.4, 5/2.9, 6/3.4, 8/4.4, 10/6.4, 13/8.4, 16/10.6, 20/12.6, 25/16.6	200

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

M SKH51 · SKD11 or equivalent

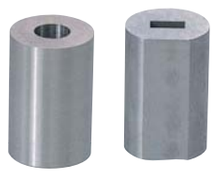
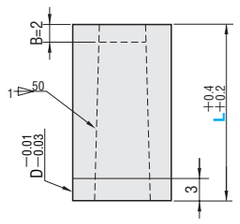
D	AHD	A—AHD	AHDD AHDR AHDE AHDG	A—AHDD A—AHDR A—AHDE A—AHDG
3	2,730	2,930	—	—
4	2,140	2,340	—	—
5	1,990	2,190	—	—
6	1,770	1,970	4,780	4,980
8	1,770	1,970	5,030	5,230
10	1,770	1,970	5,310	5,510
13	2,160	2,360	6,310	6,510
16	2,360	2,560	7,470	7,670
20	2,680	—	8,380	—
25	2,950	—	9,480	—

M Powdered high-speed steel

D	PAHD	A—PAHD	PAHDD PAHDR PAHDE PAHDG	A—PAHDD A—PAHDR A—PAHDE A—PAHDG
3	4,210	4,410	—	—
4	3,320	3,520	—	—
5	3,070	3,270	—	—
6	2,740	2,940	6,990	7,190
8	2,740	2,940	7,320	7,520
10	2,740	2,940	7,660	7,860
13	3,870	4,070	9,770	9,970
16	4,110	4,310	11,230	11,430
20	4,530	—	12,450	—
25	4,930	—	13,990	—

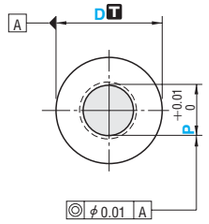
ANGULAR BUTTON DIES
—STRAIGHT TYPE—

The volume discount rate is also applicable to alteration cost. P.39

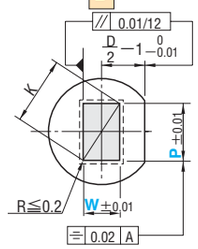
Straight type	Shank dia. D T	M H	Shank dia.	Catalog No.	For shape, select from Ⓐ D R E G shown below.
 RoHS Shank Dia.Tolerance D T n5 · $^{+0.005}_{0}$ Selection	D_{n5}	SKH51 61～64HRC	D3～ 5	ASD	
		SKD11 or equivalent 60～63HRC	D6～25		
		SKD11 or equivalent 60～63HRC	D8～25	ASD□	
		Powdered high speed steel 64～67HRC	D3～25	PASD	
			D8～25	PASD□	
	$D^{+0.005}_{0}$	SKH51 61～64HRC	D3～ 5	A—ASD	
		SKD11 or equivalent 60～63HRC	D6～16		
		SKD11 or equivalent 60～63HRC	D8～16	A—ASD□	
		Powdered high speed steel 64～67HRC	D3～16	A—PASD	
			D8～16	A—PASD□	

P	0.30～0.49	0.50～
B	1	2

Shape Ⓐ

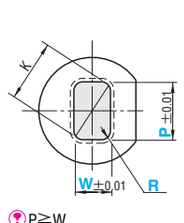


Shape D



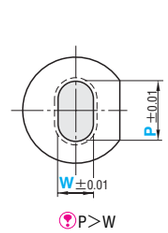
Ⓟ P≧W
Ⓟ $K=\sqrt{P^2+W^2}$

Shape R



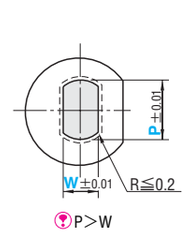
Ⓟ P≧W
Ⓟ 0.15≦R< W/2
Ⓟ $K=\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Shape E



Ⓟ P>W

Shape G



Ⓟ P>W

D T D	n5	+0.005 0	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P · Kmax.	D R E G P · Wmin.	Ⓡ R
3	+0.008 +0.004	+0.005 0	(Dn5) (SKH51) (Powdered high-speed steel) A ASD PASD; (D+0.005 0) (SKH51) (Powdered high-speed steel) A—ASD A—PASD	(3)	8 13	0.30～0.70	—	—	—
4	+0.013 +0.008			(4)	8 13 16 20 22 25 30	0.50～1.50	—	—	
5				(5)	8 13 16 20 22 25 30	0.50～2.50	—	—	
6			(Dn5) (SKD11 or equivalent) (Powdered high-speed steel) A ASD PASD; (D+0.005 0) (SKD11 or equivalent) (Powdered high-speed steel) A—ASD A—PASD	(6)	16 20 22 25 30 35	1.00～3.00	—	—	
8	+0.016 +0.010			8	16 20 22 25 30 35	1.00～4.00	4.00	1.00	0.15≦R< W/2 (Ⓡ only)
10			D ASDD PASDD A—ASDD A—PASDD	10	16 20 22 25 30 35	2.00～6.00	6.00	1.20	
13	+0.020			13	16 20 22 25 30 35	3.00～8.00	8.00	1.50	
16	+0.012		R ASDR PASDR A—ASDR A—PASDR	16	16 20 22 25 30 35	5.00～10.00	10.00	2.00	
20	+0.024	—	E ASDE PASDE A—ASDE A—PASDE	(20)	16 20 22 25 30 35	7.00～12.00	12.00	3.00	
25	+0.015		G ASDG PASDG A—ASDG A—PASDG	(25)	16 20 22 25 30 35	10.00～16.00	16.00	3.00	

Ⓟ D=(3)(4)(5)(6) is available for shape Ⓐ(round) only. Shapes D R E G are not available.
Ⓟ D=(20)(25) is available for shank dia. tolerance of Dn5 only.

Order Catalog No. — L — P — W — R(Ⓡ only)
ASDE 8 — 20 — P3.80 — W2.00

Delivery 3 Days | Express A 800/1Pc. P.38
Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC · SLC) — P(PC) — W(WC) — R — (BC · KC…etc.)
ASD 6 — 16 — P2.47 — — ANF1.2

Alterations	Code	Ⓐ	D R E G	¥/1Code
Shaped hole	PC WC	Changes shaped hole diameter P min : P>PC≧ Pmin/2 ≧0.50; 0.01mm increments; Ⓟ When PC1.00～1.99, b is 4mm. max : P/W<PC/WC≦P·Kmax+0.2 0.01mm increments	Changes shaped hole dimension P·W min : P/W>PC/WC≦P·Wmin/2 ≧1.00; 0.01mm increments	200
	BC	Changes shaped hole depth B 1≦BC≦4; 0.1mm increments; ⊗ P<1.0 : Not available		200
	PKC	Changes shaped hole tolerance P $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$; ⊗ P<1.00 : Not available	Changes shaped hole tolerance P·W P·W±0.01 ⇨ $^{+0.01}_{0}$	400
Full length	LC	Changes full length 10≦LC<L; 0.1mm incr. (Combination with LKC · LKZ→0.01mm increments); Ⓟ Press-in lead is (L—LC) shorter.		200
	LKC	Changes full length tolerance $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗ L(LC)<10 : Not available		400
	LKZ	Changes full length tolerance $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ L(LC)<16 : Not available		600
	SLC	Changes full length and its tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code. LC + LKC $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ Ⓟ 0.01mm increments ⊗ L(LC)<10 : Not available		500

Alterations	Code	Ⓐ	D R E G	¥/1Code
Others	KC	Adds key flat ⊗ D3～6 : Not available	270° 180° 0° 90° Changes key flat position 1° incr.	200
	WKC	Adds key flats in parallel For changing angle, add KC ⊗ L(LC)<16 : Not available ⊗ D3～6 : Not available		200 (Ⓐ only 400)
	KM	Adds key flat ⊗ D<6 : Not available ⊗ Comb. With WKC · ANF : Not available When D=6, applicable to shape Ⓐ only. D 6 8 10 13 16 20 25; h 1 1.5 2; ℓ 5≦ℓ<L Specified in 0.1 mm increments. Ⓟ Added to the symmetrical position of the original key flat		400
	ANF	Changes back relief angle 0.6≦ANF≦1.2; 0.2° increments; Ⓟ d≦dmax; Ⓟ d=P+2(L−B)tan(ANF°); Ⓟ P−Btan(ANF°)≧0.6; W−Btan(ANF°)≧0.6; ⊗ P·W<1.0 : Not available; ⊗ D=3 : Not available. Taper 1/50 Angle 0.573	D: 4 5 6 8 10 13 16 20 25; d max: 2.4 2.9 3.4 4.4 6.4 8.4 10.6 12.6 16.6	200

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

M SKH51 · SKD11 or equivalent

D	ASD	A—ASD	ASDD ASDR ASDE ASDG	A—ASDD A—ASDR A—ASDE A—ASDG
3	2,580	2,780	—	—
4	1,990	2,190	—	—
5	1,850	2,050	—	—
6	1,550	1,750	—	—
8	1,550	1,750	4,820	5,020
10	1,550	1,750	5,100	5,300
13	2,130	2,330	6,040	6,240
16	2,340	2,540	7,150	7,350
20	2,640	—	8,120	—
25	2,930	—	9,090	—

M Powdered high-speed steel

D	PASD	A—PASD	PASDD PASDR PASDE PASDG	A—PASDD A—PASDR A—PASDE A—PASDG
3	3,980	4,180	—	—
4	3,070	3,270	—	—
5	2,850	3,050	—	—
6	2,380	2,580	—	—
8	2,380	2,580	6,920	7,120
10	2,380	2,580	7,320	7,520
13	3,700	3,900	9,220	9,420
16	3,950	4,150	10,760	10,960
20	4,370	—	12,000	—
25	4,770	—	13,460	—

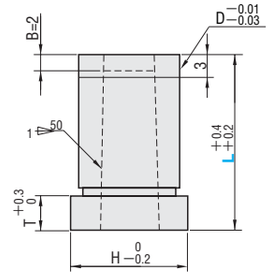
PRESS ADD.SPEC. Printed in Red

SCRAP RETENTION ANGULAR BUTTON DIES
—HEADED TYPE—

PRODUCTS DATA P.1229

SCRAP RETENTION DIES

The volume discount rate is also applicable to alteration cost. P.39

Headed type	Shank dia. D T	M H	Shank dia.	Catalog No.	For shape, select from Ⓐ D R E G shown below.
RoHS Shank Dia.Tolerance D T m5, $^{+0.005}_{0}$ Selection	D_{m5}	SKH51 61~64HRC	D4~ 5	SR—AHD	
		SKD11 or equivalent 60~63HRC	D6~25	SR—AHD□	
		SKD11 or equivalent 60~63HRC	D6~25	SR—PAHD	
		Powdered high-speed steel 64~67HRC	D4~25	SR—PAHD□	
	$D^{+0.005}_{0}$	SKH51 61~64HRC	D4~ 5	SRA—AHD	
		SKD11 or equivalent 60~63HRC	D6~16	SRA—AHD□	
		Powdered high-speed steel 64~67HRC	D6~16	SRA—PAHD	

Shape A: P $^{+0.01}_{0}$; ◎ ϕ0.01 A

Shape D: // 0.01/12; D $^{0}_{-0.01}$ / 2; K; P±0.01; R≦0.2; W±0.01; = 0.02 A
- P≧W
- P−0.4≧1.5 (Dimension P straight part 1.5mm or more)
- K=$\sqrt{P^2+W^2}$

Shape R: K; P±0.01; W±0.01; R
- P≧W
- P−2R≧1.5 (Dimension P straight part 1.5mm or more)
- 0.15≦R<$\frac{W}{2}$
- K=$\sqrt{(P-2R)^2+(W-2R)^2}$ +2R

Shape E: P±0.01; W±0.01
- P>W

Shape G: P±0.01; W±0.01; R≦0.2
- P>W
- $\sqrt{P^2-W^2}$≧1.5 (Dimension P straight part 1.5mm or more)

D T D	m5	$^{+0.005}_{0}$	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.01mm increments R R	MT (Material thickness)	0.005mm increments C (Clearance)	H	T
4	+0.009 +0.004	+0.005 0	(D_{m5}) ($D^{+0.005}_{0}$) (SKH51) Ⓐ SR—AHD SRA—AHD (Powdered high-speed steel) Ⓐ SR—PAHD SRA—PAHD	(4)	8 13 16 20 22 25 30	1.00~ 1.50	—	—	—	MT≧0.15 Specifiable with material thickness 0.15 mm or more.	C≧0.010 Specifiable with clearance 0.010mm or more. Clearance, Punch, Die	5	3
5				(5)	8 13 16 20 22 25 30	1.00~ 2.50	—	—				6	
6			(D_{m5}) ($D^{+0.005}_{0}$) (SKD11 or equivalent) Ⓐ SR—AHD SRA—AHD Ⓓ SR—AHDD SRA—AHDD Ⓡ SR—AHDR SRA—AHDR Ⓔ SR—AHDE SRA—AHDE Ⓖ SR—AHDG SRA—AHDG (Powdered high-speed steel) Ⓐ SR—PAHD SRA—PAHD Ⓓ SR—PAHDD SRA—PAHDD Ⓡ SR—PAHDR SRA—PAHDR Ⓔ SR—PAHDE SRA—PAHDE Ⓖ SR—PAHDG SRA—PAHDG	6	16 20 22 25 30 35	1.00~ 3.00	3.00	1.00	0.15≦R<$\frac{W}{2}$ (Ⓡ only)			9	5
8	+0.012 +0.006			8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00				11	
10				10	16 20 22 25 30 35 (40)	2.00~ 6.00	6.00	1.20				13	
13	+0.015 +0.007			13	16 20 22 25 30 35 (40)	3.00~ 8.00	8.00	1.50				16	
16				16	16 20 22 25 30 35 (40)	5.00~10.00	10.00	2.00				19	
20	+0.017 +0.008	—		(20)	16 20 22 25 30 35	7.00~12.00	12.00	3.00				23	
25				(25)	16 20 22 25 30 35	10.00~16.00	16.00	3.00				28	

- D(4)(5) is available for shape Ⓐ (round) only. Shapes D R E G are not available.
- D=(20)(25) is available for shank dia. tolerance of Dm5 only.
- L=(40) is available for SR-AHD, SR-AHDD, SR-AHDR, SR-AHDE, SR-AHDG.
- Applied only to the material which has the tensile strength up to 1177N/mm^2(120kgf/mm^2).
- Workpiece material thickness and clearance are used as scrap retention machining data. Specify the shaped hole with the finishing dimension (P・W・R) as the button dies at present.

Order Catalog No. — L — P — W — R(Ⓡ only) — MT — C

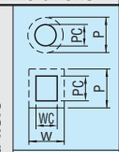
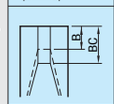
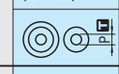
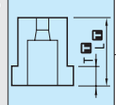
SR—AHDR 13 — 25 — P6.20 — W2.00 — R0.20 — MT1.50 — C0.105

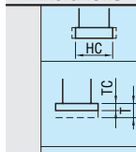
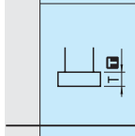
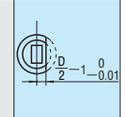
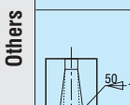
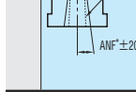
Delivery 3 Days | Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC・LCT・LMT) — P(PC) — W(WC) — R — MT — C — (BC・HC・TC…etc.)

SR—AHD 6 — 16 — P2.47 — MT1.50 — C0.105 — HC8

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole		PC WC	Changes shaped hole dimension P・W min: $\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\cdot Wmin}{2}\geqq1.00$ 0.01mm increments / max: $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax+0.2$ 0.01mm increments		200
		BC	Changes shaped hole depth B: P 1.00~1.99 Bmax 3; 2.00~ 4; 1≦BC≦Bmax 0.1mm increments	Changes shaped hole depth B 1≦BC≦2 0.1mm increments	200
		PKC	Changes shaped hole tolerance P $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Changes shaped hole tolerance P・W $P\cdot W\pm0.01$ ⇨ $^{+0.01}_{0}$	400
Full length		LC	Changes full length 10≦LC<L 0.1mm incr. (Combination with LKC・LKZ・CKC・MKC→0.01mm increments) Ⓟ Press-in lead is (L—LC) shorter.		200
		LKC	Changes full length tolerance $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗L(LC)<10 : Not available		400
		LKZ	Changes full length tolerance $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗L(LC)<16 : Not available		600
		CKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code. ⊗L(LC)<16 : Not available TKC + LKC $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		500
		MKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code. ⊗L(LC)<16 : Not available TKM + LKC $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		500
		LCT	Changes head thickness tolerance, full length and its tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code. TKC + LC + LKC Ⓟ 0.01mm increments ⊗L<16 : Not available		600
		LMT	TKM + LC + LKC Ⓟ 0.01mm increments ⊗L<16 : Not available		600

Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		HC	Changes head diameter H D≦HC<H 0.1mm increments		200
		TC	Changes head thickness 2≦TC<T 0.1mm incr.(Comb. with TKC・TKM・CKC・MKC・LCT・LMT →0.01mm incr.) Ⓟ L is shortened by(T—TC). When LC, LCT and LMT are used together, L is the same as the specified dimension.		200
		KC	Adds key flat ⊗L<16 : Not available	270° 180° 0° 90° Changes key flat position 1° incr.	200
		WKC	Adds key flats in parallel For changing angle, add KC ⊗L(LC)<16 : Not available		200 (Ⓐ only 400)
		KFC	270° 180° 0° 90° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC : Not available ⊗L(LC)<16 : Not available	270° 180° 0° 90° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC : Not available ⊗L(LC)<16 : Not available	200 (Ⓐ only 400)
		TKC	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗L(LC)<16 : Not available		200
		TKM	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗L(LC)<16 : Not available		200
Others		SKC	Adds key flat on shank Ⓟ Applicable to D≧8, L(LC)≧20 ⊗Combination with KC・WKC・KFC・ANF : Not available		600
		ANF	Changes back relief angle 0.6≦ANF≦1.2 0.2° increments Ⓟ d≦dmax Ⓟ d=P+2((L—B)tan(ANF°)) Ⓟ P—Btan(ANF°)≧0.6 W—Btan(ANF°)≧0.6 ⊗P・W<1.0 : Not available	D: 4 5 6 8 10 13 16 20 25; d max: 2.4 2.9 3.4 4.4 6.4 8.4 10.6 12.6 16.6; Taper 1/50; Angle 0.573°	200

Price P.37

Volume discount rate

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

M SKH51・SKD11 or equivalent

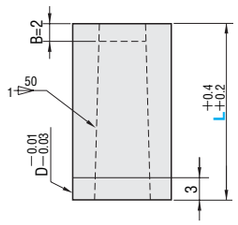
D	SR—AHD	SRA—AHD	SR—AHDD SR—AHDR SR—AHDE SR—AHDG	SRA—AHDD SRA—AHDR SRA—AHDE SRA—AHDG
4	3,150	3,350	—	—
5	3,000	3,200	—	—
6	2,770	2,970	6,400	6,600
8	2,570	2,770	6,260	6,460
10	2,570	2,770	6,530	6,730
13	2,970	3,170	7,540	7,740
16	3,370	3,570	9,110	9,310
20	3,680	—	10,020	—
25	3,960	—	11,130	—

M Powdered high-speed steel

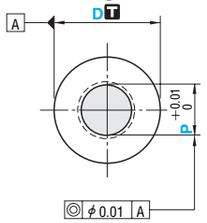
D	SR—PAHD	SRA—PAHD	SR—PAHDD SR—PAHDR SR—PAHDE SR—PAHDG	SRA—PAHDD SRA—PAHDR SRA—PAHDE SRA—PAHDG
4	4,280	4,480	—	—
5	4,070	4,270	—	—
6	3,730	3,930	8,590	8,790
8	3,530	3,730	8,530	8,730
10	3,530	3,730	8,860	9,060
13	4,670	4,870	10,960	11,160
16	5,110	5,310	12,830	13,030
20	5,520	—	14,060	—
25	5,930	—	15,600	—

SCRAP RETENTION ANGULAR BUTTON DIES
—STRAIGHT TYPE—

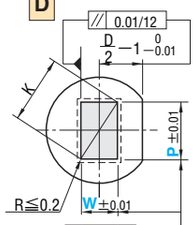
PRODUCTS DATA P.1229

Straight type	Shank dia. D T	M H	Shank dia.	Catalog No.	For shape, select from Ⓐ D R E G shown below.
RoHS Shank Dia.Tolerance D T n5· $^{+0.005}_{0}$ Selection	D_{n5}	SKH51 61～64HRC	D4～ 5	SR—ASD	
		SKD11 or equivalent 60～63HRC	D6～25		
		SKD11 or equivalent 60～63HRC	D8～25	SR—ASD□	
		Powdered high-speed steel 64～67HRC	D4～25	SR—PASD	
			D8～25	SR—PASD□	
	$D^{+0.005}_{0}$	SKH51 61～64HRC	D4～ 5	SRA—ASD	
		SKD11 or equivalent 60～63HRC	D6～16		
		SKD11 or equivalent 60～63HRC	D8～16	SRA—ASD□	
		Powdered high-speed steel 64～67HRC	D4～16	SRA—PASD	
			D8～16	SRA—PASD□	

Shape Ⓐ

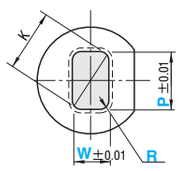


Shape Ⓓ



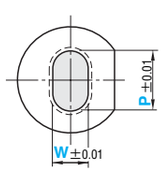
Ⓟ P≧W
Ⓟ P−0.4≧1.5
(Dimension P straight part 1.5mm or more)
Ⓟ K=$\sqrt{P^2+W^2}$

Shape Ⓡ



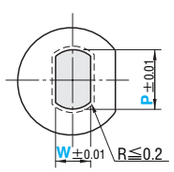
Ⓟ P≧W
Ⓟ P−2R≧1.5
(Dimension P straight part 1.5mm or more)
Ⓟ 0.15≦R<$\frac{W}{2}$
Ⓟ K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape Ⓔ



Ⓟ P>W

Shape Ⓖ



Ⓟ P>W
Ⓟ $\sqrt{P^2-W^2}$≧1.5
(Dimension P straight part 1.5mm or more)

D T D	D T n5	D T $^{+0.005}_{0}$	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ R Ⓔ Ⓖ P·Kmax.	Ⓓ R Ⓔ Ⓖ P·Wmin.	Ⓡ R	MT (Material thickness)	0.005mm increments C (Clearance)
4	+0.013 +0.008	+0.005 0	(Dn5) (SKH51) (D$^{+0.005}_{0}$) Ⓐ SR—ASD SRA—ASD (Powdered high-speed steel) Ⓐ SR—PASD SRA—PASD	(4)	8 13 16 20 22 25 30	1.00～ 1.50	—	—	—	MT≧0.15 Specifiable with material thickness 0.15 mm or more.	C≧0.010 Specifiable with clearance 0.010mm or more.
5				(5)	8 13 16 20 22 25 30	1.00～ 2.50	—	—			
6			(Dn5) (SKD11 or equivalent) (D$^{+0.005}_{0}$) Ⓐ SR—ASD SRA—ASD Ⓓ SR—ASDD SRA—ASDD Ⓡ SR—ASDR SRA—ASDR Ⓔ SR—ASDE SRA—ASDE Ⓖ SR—ASDG SRA—ASDG (Powdered high-speed steel) Ⓐ SR—PASD SRA—PASD Ⓓ SR—PASDD SRA—PASDD Ⓡ SR—PASDR SRA—PASDR Ⓔ SR—PASDE SRA—PASDE Ⓖ SR—PASDG SRA—PASDG	(6)	16 20 22 25 30 35	1.00～ 3.00	—	—	0.15≦R<$\frac{W}{2}$ (Ⓡonly)		
8	+0.016 +0.010			8	16 20 22 25 30 35	1.00～ 4.00	4.00	1.00			
10				10	16 20 22 25 30 35	2.00～ 6.00	6.00	1.20			
13	+0.020 +0.012			13	16 20 22 25 30 35	3.00～ 8.00	8.00	1.50			
16				16	16 20 22 25 30 35	5.00～ 10.00	10.00	2.00			
20	+0.024 +0.015	—		(20)	16 20 22 25 30 35	7.00～ 12.00	12.00	3.00			
25				(25)	16 20 22 25 30 35	10.00～ 16.00	16.00	3.00			

Ⓟ D(4)(5)(6) is available for shape Ⓐ(round) only. Shapes Ⓓ R Ⓔ Ⓖ are not available.
Ⓟ D=(20)(25) is available for shank dia. tolerance of D_{n5} only.
Ⓟ Applied only to the material which has the tensile strength up to 1177N/mm²(120kgf/mm²).
Ⓟ Workpiece material thickness and clearance are used as scrap retention machining data.Specify the shaped hole with the finishing dimension (P・W・R) as the button dies at present.

Order

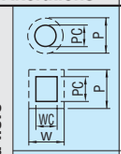
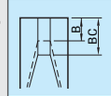
Catalog No.	L	P	W	R(Ⓡonly)	MT	C
SR—ASDE 8	20	P3.80	W2.00		MT1.50	C0.105

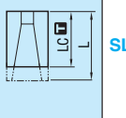
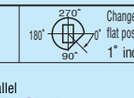
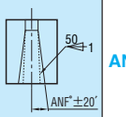
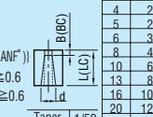
Delivery 3 Days | Express A 800/1Pc. P.38

Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

The volume discount rate is also applicable to alteration cost. P.39

Alteration Catalog No. — L(LC・SLC) — P(PC) — W(WC) — R — MT — C — (BC・KC…etc.)
SR—ASD 6 — 16 — P2.47 — MT1.50 — C0.105 — LKZ

Alterations		Code	Ⓐ	Ⓓ R Ⓔ Ⓖ	¥/1Code
Shaped hole		PC WC	Changes shaped hole dimension P・W min : $\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\cdot Wmin}{2}\geqq1.00$ 0.01mm increments max: $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax+0.2$ 0.01mm increments		200
		BC	Changes shaped hole depth B (P 1.00～1.99 Bmax 3; 2.00～ 4) 1≦BC≦Bmax 0.1mm increments	Changes shaped hole depth B 1≦BC≦2 0.1mm increments	200
		PKC	Changes shaped hole tolerance P $P^{+0.01}_{0}\Rightarrow{}^{+0.005}_{0}$	Changes shaped hole tolerance P・W $P\cdot W\pm0.01\Rightarrow{}^{+0.01}_{0}$	400
Full length		LC	Changes full length 10≦LC<L 0.1mm incr. (combination with LKC・LKZ→0.01mm incr.) Ⓟ Press-in lead is (L—LC) shorter.		200
		LKC	Changes full length tolerance $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$ ⊗ L(LC)<10 : Not available		400
		LKZ	Changes full length tolerance $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.01}_{0}$ ⊗ L(LC)<16 : Not available		600

Alterations		Code	Ⓐ	Ⓓ R Ⓔ Ⓖ	¥/1Code
Full length		SLC	Changes full length and its tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code. LC + LKC $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$ Ⓟ 0.01mm increments ⊗ L(LC)<10 : Not available		500
Others		KC	Adds key flat ⊗ D4～6 : Not available	 270° 180° 90° 0° Changes key flat position 1° incr.	200
		WKC	Adds key flats in parallel For changing angle, add KC ⊗ D4～6 : Not available ⊗ L(LC)<16 : Not available		200 (Ⓐ only 400)
		ANF	Changes back relief angle 0.6≦ANF≦1.2 0.2° increments Ⓟ d≦dmax Ⓟ d=P+2((L−B)tan(ANF°)) Ⓟ P−Btan(ANF°)≧0.6 W−Btan(ANF°)≧0.6 ⊗ P・W<1.0 : Not available	 D: 4 5 6 8 10 13 16 20 25; d max: 2.4 2.9 3.4 4.4 6.4 8.4 10.6 12.6 16.6; Taper 1/50; Angle 0.573°	200

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

M SKH51・SKD11 or equivalent

D	SR—ASD	SRA—ASD	SR—ASDD SR—ASDR SR—ASDE SR—ASDG	SRA—ASDD SRA—ASDR SRA—ASDE SRA—ASDG
4	3,000	3,200	—	—
5	2,860	3,060	—	—
6	2,560	2,760	—	—
8	2,360	2,560	6,040	6,240
10	2,360	2,560	6,320	6,520
13	2,940	3,140	7,270	7,470
16	3,340	3,540	8,790	8,990
20	3,650	—	9,760	—
25	3,940	—	10,740	—

M Powdered high-speed steel

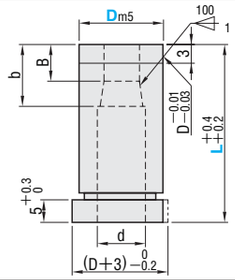
D	SR—PASD	SRA—PASD	SR—PASDD SR—PASDR SR—PASDE SR—PASDG	SRA—PASDD SRA—PASDR SRA—PASDE SRA—PASDG
4	4,070	4,270	—	—
5	3,850	4,050	—	—
6	3,380	3,580	—	—
8	3,180	3,380	8,110	8,310
10	3,180	3,380	8,530	8,730
13	4,500	4,700	10,430	10,630
16	4,950	5,150	12,360	12,560
20	5,370	—	13,600	—
25	5,770	—	15,070	—

LONG POINT BUTTON DIES

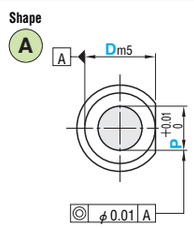
The volume discount rate is also applicable to alteration cost. P.39

—Headed type— RoHS

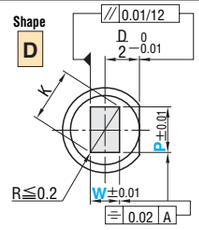
M / H	Shank dia.	Catalog No.
SKD11 or equivalent 60～63HRC	D10～56	Ⓐ MHDS Ⓓ HDDS Ⓡ HDRS Ⓔ HDES Ⓖ HDGS



Shape Ⓐ

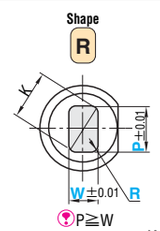


Shape Ⓓ



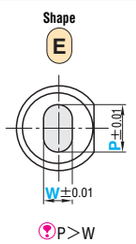
P≧W
K=$\sqrt{P^2+W^2}$

Shape Ⓡ



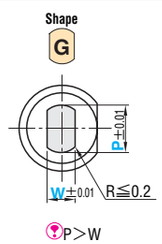
P≧W
0.15≦ R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape Ⓔ



P>W

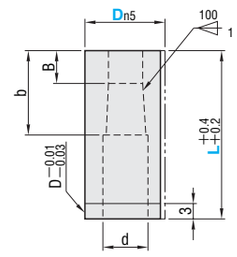
Shape Ⓖ



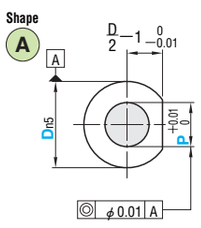
P>W

—Straight type— RoHS

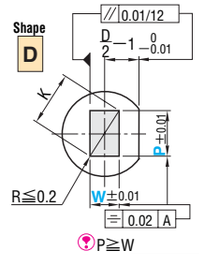
M / H	Shank dia.	Catalog No.
SKD11 or equivalent 60～63HRC	D10～56	Ⓐ MSDS Ⓓ SDDS Ⓡ SDRS Ⓔ SDES Ⓖ SDGS



Shape Ⓐ

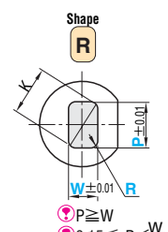


Shape Ⓓ



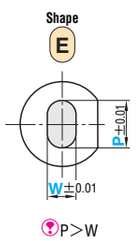
P≧W
K=$\sqrt{P^2+W^2}$

Shape Ⓡ



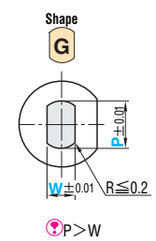
P≧W
0.15≦ R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape Ⓔ



P>W

Shape Ⓖ



P>W

D T			Catalog No. Type	Catalog No. D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments Ⓓ Ⓡ Ⓔ Ⓖ P・Kmax.	0.01mm increments Ⓔ P・Wmin.	0.01mm increments Ⓡ R	B	b	d
Dm5	10	+0.012 +0.006	Headed type Ⓐ MHDS Ⓓ HDDS Ⓡ HDRS Ⓔ HDES Ⓖ HDGS	10	40	2.00～ 6.00	6.00	1.20	0.15≦R< W/2 (Ⓡ only)	6	10	6.4
	13	+0.015 +0.007		13		3.00～ 8.00	8.00	1.50				8.4
	16			16		5.00～10.00	10.00	2.00				10.6
	20	+0.017 +0.008		20		7.00～12.00	12.00	3.00		8	12	12.6
	25			25		10.00～16.00	16.00	3.00				16.6
	32	+0.020 +0.009		32		15.00～20.00	20.00	4.00		10	15	20.6
	38			38		19.00～26.00	26.00	5.00				26.6
	45			45		25.00～35.00	35.00	6.00		14	20	36.0
	50			50		33.00～40.00	40.00	7.00				41.0
	56	+0.024 +0.011		56		38.00～45.00	45.00	8.00				46.0
Dn5	10	+0.016 +0.010	Straight type Ⓐ MSDS Ⓓ SDDS Ⓡ SDRS Ⓔ SDES Ⓖ SDGS	10	16 20 22 25 30 35 40	2.00～ 6.00	6.00	1.20	0.15≦R< W/2 (Ⓡ only)	6	10	6.4
	13	+0.020 +0.012		13	16 20 22 25 30 35 40	3.00～ 8.00	8.00	1.50				8.4
	16			16	16 20 22 25 30 35 40	5.00～10.00	10.00	2.00				10.6
	20	+0.024 +0.015		20	16 20 22 25 30 35 40	7.00～12.00	12.00	3.00		8	12	12.6
	25			25	16 20 22 25 30 35 40	10.00～16.00	16.00	3.00				16.6
	32	+0.028 +0.017		32	16 20 22 25 30 35 40	15.00～20.00	20.00	4.00		10	15	20.6
	38			38	16 20 22 25 30 35 40	19.00～26.00	26.00	5.00				26.6
	45			45	20 22 25 30 35 40	25.00～35.00	35.00	6.00		14	20	36.0
	50			50	20 22 25 30 35 40	33.00～40.00	40.00	7.00				41.0
	56	+0.033 +0.020		56	20 22 25 30 35 40	38.00～45.00	45.00	8.00				46.0

Order

Catalog No.	L	P	W	R (Ⓡ only)
SDDS 25	35	P10.00	W8.00	

Delivery 3 Days

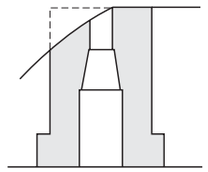
Express	T	1,600/1Pc.
Express	A	800/1Pc.

⊗Express T is not available for D45・50・56

Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

P.38

Example



Price

D	MHDS	HD□S	MSDS	SD□S
10	1,210	3,980	1,030	3,980
13	1,100	4,140	950	4,140
16	1,100	4,450	950	4,450
20	1,210	4,680	1,030	4,680
25	1,670	5,010	1,330	5,010
32	2,170	5,310	1,660	5,310
38	2,960	5,700	2,320	5,700
45	5,910	13,490	5,910	13,490
50	7,150	14,870	7,150	14,870
56	8,600	16,790	8,600	16,790

Volume discount rate P.37

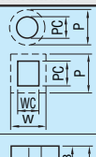
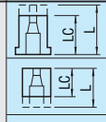
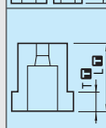
Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

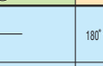
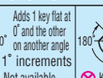
Ⓟ To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. — L(LC・SLC) — P(PC) — W(WC) — R — (BC・HC・TC・CKC・MKC…etc.)

HDRS 45 — 40 — P25.2 — W10.2 — R1.50 — BC20

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Shaped hole		PC WC	Changes shaped hole dimension P・W min : $\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\cdot Wmin}{2}\geqq1.00$ 0.01mm increments Ⓟ Ⓐ : When PC is 1.00～1.99, b is 4mm. max : $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax+0.2$ 0.01mm increments		200
		BC	Changes shaped hole depth B 1≦BC≦b 0.1mm increments		200
		PKC	Changes shaped hole tolerance P $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Changes shaped hole tolerance P・W $P\cdot W^{\pm0.01}$ ⇨ $^{+0.01}_{0}$	400
Full length		LC	Changes full length 10≦L−(b−1)≦LC<L 0.1mm incr. Combination with LKC→0.01mm incr. Ⓟ b and lead are shortened by (L−LC). Changes full length 10≦LC<L 0.1mm incr. Combination with LKC→0.01mm incr. Ⓟ Press-in lead is (L−LC) shorter.		200
		LKC	Changes full length tolerance $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		400
		LKZ	Changes full length tolerance $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗L<16, D>25: Not available		600
		CKC	Changes head thickness tolerance and full length tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code.	TKC + LKC Ⓟ Available to D≧16 of headed type only.	500
		MKC		TKM + LKC Ⓟ Available to D≧16 of headed type only.	500
		SLC	Changes full length and its tolerance in one code. Specifiable range, unit, and remarks (Ⓟ) are the same as that of each combined alteration code.	LC + LKC Ⓟ 0.01mm increments ⊗Headed type : Not available	500

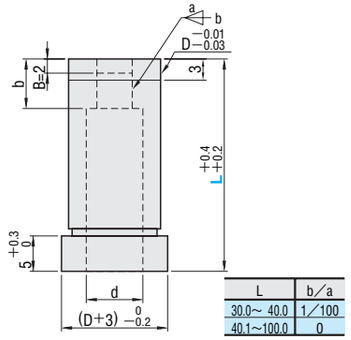
Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Head		KC	—	 Changes key flat position 1° incr.	200
			—	Changes key flat position 1° incr.	
		WKC	Adds key flats in parallel Ⓟ For changing angle, add KC		200 (Ⓐ only 400)
		KFC	Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC : Not available ⊗L<16, D>25:Not available ⊗Straight type : Not available	 Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC : Not available ⊗L<16, D>25:Not available ⊗Straight type : Not available	200 (Ⓐ only 400)
		NKC	No key flat. Ⓟ Available only for the straight type.	—	0
		HC	Changes head diameter H D≦HC<(D+3) 0.1mm increments		200
		TC	Changes head thickness 2≦TC<T 0.1mm incr. (Comb. with TKC・TKM・CKC・MKC→0.01mm incr.) Ⓟ L is shortened by (T−TC) When LC is applied, L is equal to LC.		200
		TKC	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗L(LC)<16 : Not available		200
		TKM	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗L(LC)<16 : Not available		200
		RC	Reduces head thickness by −0.04～0 from retainer surface ⊗L(LC)<30 : Not available		200
Others		SKC	Adds key flat on shank Ⓟ Applicable only to the headed type Ⓟ Applicable to L(LC)≧20 ⊗ Combination with KC・WKC・KFC : Not available		600

FREE LENGTH BUTTON DIES

The volume discount rate is also applicable to alteration cost. P.39

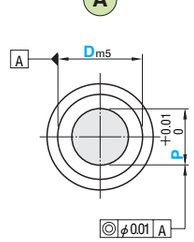
—Headed type— RoHS

M / H	Shank dia.	Catalog No.
SKD11 or equivalent 60～63HRC	D6～56	Ⓐ S—MHD
		D S—HDD
		R S—HDR
		E S—HDE
		G S—HDG
	D10～56	Ⓐ S—MHDS
		D S—HDDS
		R S—HDRS
		E S—HDES
		G S—HDGS

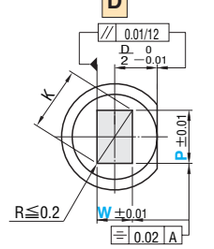


L	b/a
30.0～ 40.0	1/100
40.1～100.0	0

Shape Ⓐ



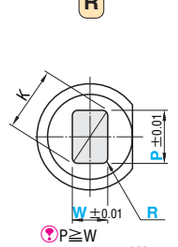
Shape D



P≧W

K=$\sqrt{P^2+W^2}$

Shape R

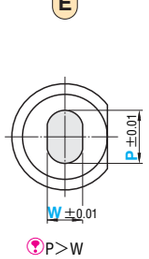


P≧W

0.15≦ R<$\frac{W}{2}$

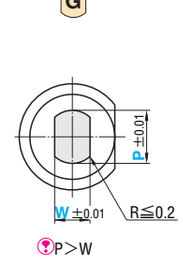
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

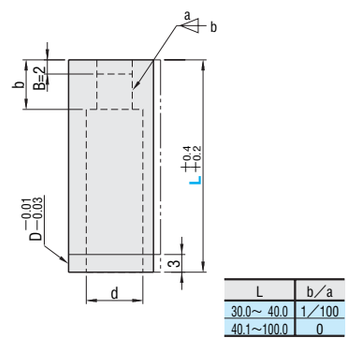
Shape G



P>W

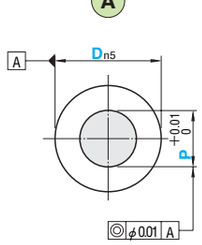
—Straight type— RoHS

M / H	Shank dia.	Catalog No.
SKD11 or equivalent 60～63HRC	D6～56	Ⓐ S—MSD
	D8～56	D S—SDD
		R S—SDR
		E S—SDE
		G S—SDG
	D10～56	Ⓐ S—MSDS
		D S—SDDS
		R S—SDRS
		E S—SDES
		G S—SDGS

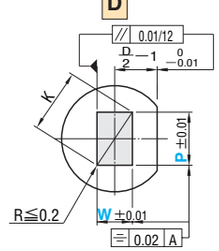


L	b/a
30.0～ 40.0	1/100
40.1～100.0	0

Shape Ⓐ



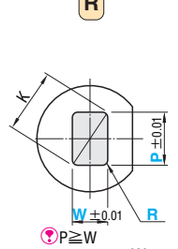
Shape D



P≧W

K=$\sqrt{P^2+W^2}$

Shape R

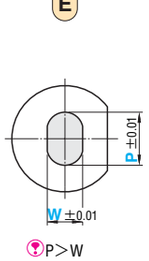


P≧W

0.15≦ R<$\frac{W}{2}$

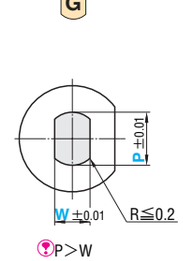
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

D T			Catalog No.		0.1mm increments	0.01mm increments				b	d
D	m5	n5	Type	D	L	Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R		
6	+0.009 +0.004	+0.013 +0.006	Headed type Straight type	(6)	30.0～40.0	1.00～ 3.00	3.00	1.00	0.15≦R< W/2 (R only)	3	3.4
8	+0.012	+0.016	Ⓐ S—MHD S—MSD	8		1.00～ 4.00	4.00	1.00		4	4.4
10	+0.006	+0.010		10		2.00～ 6.00	6.00	1.20		6	6.4
13	+0.015	+0.020		13		3.00～ 8.00	8.00	1.50		8	8.4
16	+0.007	+0.012	D S—HDD S—SDD	16		5.00～10.00	10.00	2.00			10.6
20	+0.017	+0.024		20		7.00～12.00	12.00	3.00			12.6
25	+0.008	+0.015	R S—HDR S—SDR	25		10.00～16.00	16.00	3.00			16.6
32				32		15.00～20.00	20.00	4.00			20.6
38	+0.020	+0.028	E S—HDE S—SDE	38		19.00～26.00	26.00	5.00			26.6
45	+0.009	+0.017		45		25.00～35.00	35.00	6.00			36.0
50			G S—HDG S—SDG	50		33.00～40.00	40.00	7.00			41.0
56	+0.024 +0.011	+0.033 +0.020		56		38.00～45.00	45.00	8.00			46.0
10	+0.012 +0.006	+0.016 +0.010	Headed type Straight type	10	40.1～80.0 (40.01)	2.00～ 6.00	6.00	1.20		6	6.4
13	+0.015	+0.020	Ⓐ S—MHDS S—MSDS	13		3.00～ 8.00	8.00	1.50		8	8.4
16	+0.007	+0.012		16	40.1～100.0 (40.01)	5.00～10.00	10.00	2.00			10.6
20	+0.017	+0.024		20		7.00～12.00	12.00	3.00			12.6
25	+0.008	+0.015	D S—HDDS S—SDDS	25		10.00～16.00	16.00	3.00			16.6
32			R S—HDRS S—SDRS	32		15.00～20.00	20.00	4.00			20.6
38	+0.020	+0.028		38		19.00～26.00	26.00	5.00			26.6
45	+0.009	+0.017	E S—HDES S—SDES	45		25.00～35.00	35.00	6.00			36.0
50			G S—HDGS S—SDGS	50		33.00～40.00	40.00	7.00			41.0
56	+0.024 +0.011	+0.033 +0.020		56		38.00～45.00	45.00	8.00			46.0

? D(6) ⋯▸ D=6 Ⓐ Straight type of D=6 is available for shape Ⓐ (round) only. Shapes D R E G are not available.

? L (40.01) ⋯▸ When specifying LKC or LKZ, it is possible to specify the L dimension from 40.01.

Order

Catalog No.	L	P	W	R(R only)
S—MHD 10	35.1	P5.00		
S—SDRS 20	65	P8.00	W8.00	R0.40

Delivery 5 Days

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

? To be quoted on price & lead time above Max. Q'ty.

Price

■Headed type

D	S—MHD	S—HDD・S—HDR S—HDE・S—HDG	S—MHDS	S—HDDS・S—HDRS S—HDES・S—HDGS
6	2,110	4,420	—	—
8	2,100	4,500	—	—
10	2,100	4,500	3,020	7,080
13	2,060	4,690	3,020	7,630
16	2,060	5,000	3,020	8,500
20	2,100	5,180	3,020	8,960
25	2,780	5,740	4,050	10,100
32	3,460	6,350	5,010	11,220
38	4,720	7,270	6,700	13,040
45	7,980	12,470	10,250	16,830
50	9,210	13,700	11,490	18,320
56	10,870	15,270	13,420	20,520

■Straight type

D	S—MSD	S—SDD・S—SDR S—SDE・S—SDG	S—MSDS	S—SDDS・S—SDRS S—SDES・S—SDGS
6	2,050	—	—	—
8	2,020	4,500	—	—
10	2,020	4,500	3,020	7,080
13	1,980	4,690	3,020	7,630
16	1,980	5,000	3,020	8,500
20	2,020	5,180	3,020	8,960
25	2,610	5,740	4,050	10,100
32	3,250	6,350	5,010	11,220
38	4,440	7,270	6,700	13,040
45	7,630	12,470	10,250	16,830
50	8,800	13,700	11,490	18,320
56	10,450	15,270	13,420	20,520

Alteration Catalog No. — L — P(PC) — W(WC) — R —(BC・HC・TC⋯etc.)

S—MHD 13 — 35 — PC8.02 — TC4.0

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole	PC / WC	PC WC	Changes shaped hole diameter P min: P>PC≧ Pmin/2 ≧0.50 0.01mm increments ? When PC is 1.00～1.99, b is 4mm. max: P/W < PC/WC ≦P·Kmax+0.2	Changes shaped hole dimension P·W min: P/W > PC/WC ≧ P·Wmin/2 ≧1.00 0.01mm increments 0.01mm increments	200
	B / BC	BC	Changes shaped hole depth B 1≦BC≦b 0.1mm increments ⊗ L>40 : Not available	⊗ P<1.00 : Not available	200
	P	PKC	Changes shaped hole tolerance P P +0.01 0 ⇨ +0.005 0 ⊗ P<1.00 : Not available	Changes shaped hole tolerance P·W P·W±0.01 ⇨ +0.01 0	400
Full length	L	LKC	Changes full length tolerance L +0.4 +0.2 ⇨ +0.05 0	? (Combination with LKC →0.01mm increments)	400
		LKZ	Changes full length tolerance L +0.4 +0.2 ⇨ +0.01 0	? (Combination with LKZ→0.01mm increments) ⊗ D>25 : Not available	600
Head		KC	Adds key flat	Changes key flat position 1° incr.	200
			Adds key flat ⊗ D6 : Not available	Changes key flat position 1° incr.	

Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		WKC	Adds key flats in parallel For changing angle, add KC ⊗ Straight type D6 : Not available		200 (Ⓐ only 400)
		KFC	180° 270° 90° 0° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗ KC・WKC : Not available ⊗ L<16, D>25:Not available ⊗ Straight type : Not available	180° 270° 90° 0° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗ KC・WKC : Not available ⊗ L<16, D>25:Not available ⊗ Straight type : Not available	200 (Ⓐ only 400)
	HC	HC	Changes head diameter H D≦HC<(D+3) 0.1mm increments		200
	TC	TC	Changes head thickness 2≦TC<5 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) ? Overall length does not change.		200
	T	TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0		200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02		200
		RC	0 −0.04 Reduces head thickness by −0.04～0 from retainer surface		200
Others	D	SKC	Adds key flat on shank ? Applicable only to headed type ? Applicable to D≧8 ⊗ Combination with KC・WKC・KFC : Not available ⊗ Straight type : Not available		600

SCRAP RETENTION FREE LENGTH BUTTON DIES
—CONFIGURABLE LENGTH—

PRODUCTS DATA P.1229

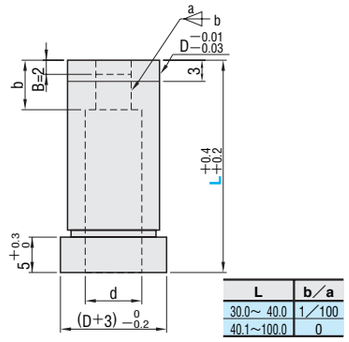
SCRAP RETENTION DIES

Price Cut : Reduced Price

The volume discount rate is also applicable to alteration cost. P.39

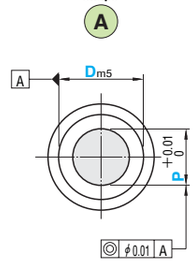
—Headed type— RoHS

M H	Shank dia.	Catalog No.
SKD11 or equivalent 60～63HRC	D6～56	(A) SRS—MHD
		(D) SRS—HDD
		(R) SRS—HDR
		(E) SRS—HDE
		(G) SRS—HDG
	D10～56	(A) SRS—MHDS
		(D) SRS—HDDS
		(R) SRS—HDRS
		(E) SRS—HDES
		(G) SRS—HDGS

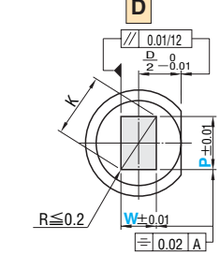


L	b/a
30.0～ 40.0	1/100
40.1～100.0	0

Shape (A)

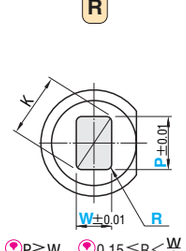


Shape (D)



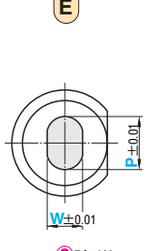
(P) P−0.4≧1.5 (Dimension P straight part 1.5mm or more)
(P) P≧W (P) K=√(P²+W²)

Shape (R)



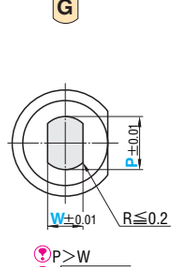
(P) P≧W (P) 0.15≦R<W/2
(P) P−2R≧1.5 (Dimension P straight part 1.5mm or more)
(P) K=√((P−2R)²+(W−2R)²+2R

Shape (E)



(P) P>W

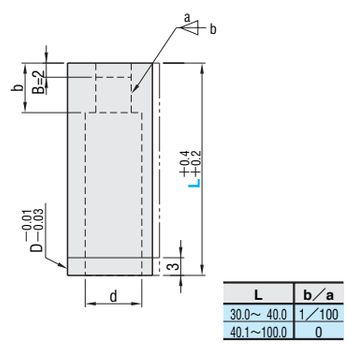
Shape (G)



(P) P>W
(P) √(P²−W²)≧1.5 (Dimension P straight part 1.5mm or more)

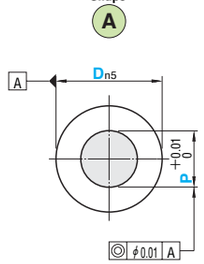
—Straight type— RoHS

M H	Shank dia.	Catalog No.
SKD11 or equivalent 60～63HRC	D6～56	(A) SRS—MSD
	D8～56	(D) SRS—SDD
		(R) SRS—SDR
		(E) SRS—SDE
		(G) SRS—SDG
	D10～56	(A) SRS—MSDS
		(D) SRS—SDDS
		(R) SRS—SDRS
		(E) SRS—SDES
		(G) SRS—SDGS

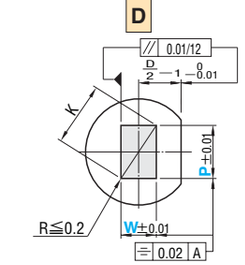


L	b/a
30.0～ 40.0	1/100
40.1～100.0	0

Shape (A)

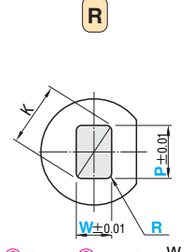


Shape (D)



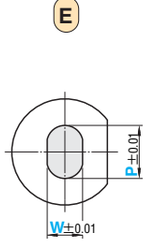
(P) P−0.4≧1.5 (Dimension P straight part 1.5mm or more)
(P) P≧W (P) K=√(P²+W²)

Shape (R)



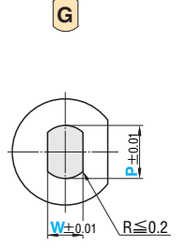
(P) P≧W (P) 0.15≦R<W/2
(P) P−2R≧1.5 (Dimension P straight part 1.5mm or more)
(P) K=√((P−2R)²+(W−2R)²+2R

Shape (E)



(P) P>W

Shape (G)



(P) P>W
(P) √(P²−W²)≧1.5 (Dimension P straight part 1.5mm or more)

D T			Catalog No.		0.1mm increments	0.01mm increments				0.005mm increments		
D	m5	n5	Type	D	L	(A) min. P max.	(D)(R)(E)(G) P·Kmax.	(D)(R)(E)(G) P·Wmin.	(R) R	MT (Material thickness)	C (Clearance)	b	d
6	+0.009 +0.004	+0.013 +0.008		(6)	30.0～40.0	1.00～ 3.00	3.00	1.00	R≦W/2 (R only)	MT≧0.15 Specifiable with material thickness 0.15mm or more.	C≧0.010 Specifiable with clearance 0.010mm or more.	3	3.4
8	+0.012	+0.016	Headed type Straight type	8		1.00～ 4.00	4.00	1.00				4	4.4
10	+0.006	+0.010	(A) SRS—MHD SRS—MSD	10		2.00～ 6.00	6.00	1.20				6	6.4
13	+0.015	+0.020		13		3.00～ 8.00	8.00	1.50					8.4
16	+0.007	+0.012	(D) SRS—HDD SRS—SDD	16		5.00～10.00	10.00	2.00					10.6
20	+0.017	+0.024	(R) SRS—HDR SRS—SDR	20		7.00～12.00	12.00	3.00					12.6
25	+0.008	+0.015		25		10.00～16.00	16.00	3.00					16.6
32			(E) SRS—HDE SRS—SDE	32		15.00～20.00	20.00	4.00				8	20.6
38	+0.020	+0.028	(G) SRS—HDG SRS—SDG	38		19.00～26.00	26.00	5.00					26.6
45	+0.009	+0.017		45		25.00～35.00	35.00	6.00					36.0
50				50		33.00～40.00	40.00	7.00					41.0
56	+0.024 +0.011	+0.033 +0.020		56		38.00～45.00	45.00	8.00					46.0
10	+0.012 +0.006	+0.016 +0.010		10	40.1～ 80.0 (40.01)	2.00～ 6.00	6.00	1.20				6	6.4
13	+0.015	+0.020	Headed type Straight type	13		3.00～ 8.00	8.00	1.50					8.4
16	+0.007	+0.012	(A) SRS—MHDS SRS—MSDS	16		5.00～10.00	10.00	2.00					10.6
20	+0.017	+0.024		20		7.00～12.00	12.00	3.00					12.6
25	+0.008	+0.015	(D) SRS—HDDS SRS—SDDS	25		10.00～16.00	16.00	3.00					16.6
32			(R) SRS—HDRS SRS—SDRS	32	40.1～100.0 (40.01)	15.00～20.00	20.00	4.00				8	20.6
38	+0.020	+0.028	(E) SRS—HDES SRS—SDES	38		19.00～26.00	26.00	5.00					26.6
45	+0.009	+0.017		45		25.00～35.00	35.00	6.00					36.0
50			(G) SRS—HDGS SRS—SDGS	50		33.00～40.00	40.00	7.00					41.0
56	+0.024 +0.011	+0.033 +0.020		56		38.00～45.00	45.00	8.00					46.0

(P) D(6)···D=6 (A) Straight type of D=6 is available for shape (A) (round) only. Shapes (D)(R)(E)(G) are not available. (P) L (40.01)···When specifying LKC or LKZ, it is possible to specify the L dimension from 40.01.

(P) Table of effective recession length. Regrinding should be done in the range of effective recession length−1mm.

L	L≦40.0	L≧40.1		
		P1.00～1.99	P2.00～3.99	P4.00～
Effective recession width	B(BC)	3	5	6

(P) Applied only to the material which has the tensile strength up to 1177N/mm² (120kgf/mm²).

(P) Workpiece material thickness and clearance are used as scrap retention machining data. Specify the shaped hole with the finishing dimension (P・W・R) as the button dies at present.

Order

Catalog No.	L	P	W	R((R) only)	MT	C
SRS—MHD 10	35.1	P5.00			MT1.5	C0.105
SRS—HDRS 20	65	P8.00	W8.00	R0.40	MT1.5	C0.105

Delivery 5 Days

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

(P) To be quoted on price & lead time above Max. Q'ty.

Price

■Headed type

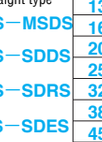
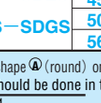
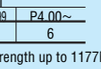
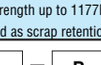
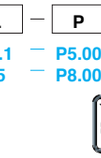
D	SRS—MHD	SRS—HDD・SRS—HDR SRS—HDE・SRS—HDG	SRS—MHDS	SRS—HDDS・SRS—HDRS SRS—HDES・SRS—HDGS
6	3,110	6,040	—	—
8	2,900	5,730	—	—
10	2,900	5,730	3,830	8,320
13	2,870	5,920	3,830	8,870
16	3,070	6,620	4,030	10,140
20	3,100	6,800	4,030	10,610
25	3,790	7,370	5,070	11,750
32	4,470	7,980	6,030	12,880
38	5,740	8,900	7,730	14,910
45	9,220	14,330	11,500	18,720
50	10,470	15,580	12,760	20,220
56	12,130	17,160	14,690	22,440

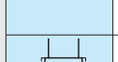
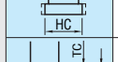
■Straight type

D	SRS—MSD	SRS—SDD・SRS—SDR SRS—SDE・SRS—SDG	SRS—MSDS	SRS—SDDS・SRS—SDRS SRS—SDES・SRS—SDGS
6	3,060	—	—	—
8	2,830	5,730	—	—
10	2,830	5,730	3,830	8,320
13	2,790	5,920	3,830	8,870
16	2,990	6,620	4,030	10,140
20	3,030	6,800	4,030	10,610
25	3,620	7,370	5,070	11,750
32	4,270	7,980	6,030	12,880
38	5,460	8,900	7,730	14,710
45	8,870	14,330	11,500	18,720
50	10,050	15,580	12,760	20,220
56	11,710	17,160	14,690	22,440

Alteration

Catalog No.	L	P(PC)	W(WC)	R	MT	C	(BC・HC・TC···etc.)
SRS—MHD 13	35	PC8.02			MT1.5	C0.105	TC4.0

Alterations		Code	(A)	(D)(R)(E)(G)	¥/1Code
Shaped hole		PC WC	Changes shaped hole dimension P・W min: P/W > PC/WC ≧ P・Wmin/2 ≧1.00 0.01mm increments (P) (A): When PC is 1.00～1.99, b is 4mm. max: P/W < PC/WC ≦P・Kmax+0.2 0.01mm increments		200
		BC	Changes shaped hole depth B: P 1.00～1.99 Bmax 3; 2.00～3.99 5; 4.00～ 6. 1≦BC<Bmax 1≦BC≦b 0.1mm increments (X) L>40: Not available	Changes shaped hole depth B 1≦BC<2 0.1mm increments (X) L>40: Not available	200
		PKC	Changes shaped hole tolerance P P +0.01 0 ⇨ +0.005 0	Changes shaped hole tolerance P・W P・W±0.01 ⇨ +0.01 0	400
Full length		LKC	Changes full length tolerance L +0.4 +0.2 ⇨ +0.05 0	(P) (Combination with LKC →0.01mm increments)	400
		LKZ	Changes full length tolerance L +0.4 +0.2 ⇨ +0.01 0	(P) (Combination with LKZ →0.01mm increments) (X) D>25: Not available	600
Head		KC	Adds key flat	Changes key 0° flat position 1° incr.	200
			Adds key flat (X) D6: Not available	Changes key 0° flat position 1° incr.	200

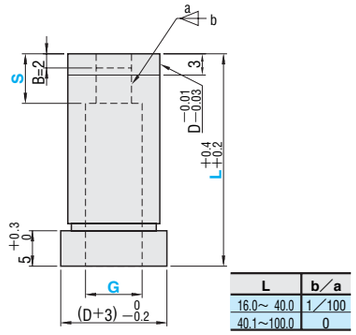
Alterations		Code	(A)	(D)(R)(E)(G)	¥/1Code
Head		WKC	Adds key flats in parallel For changing angle, add KC (X) Straight type D6: Not available		200 (A only 400)
		KFC	Adds 1 key flat at 0° and the other on another angle 1° increments (X) KC・WKC: Not available (X) L(LC)<16, D>25: Not available (X) Straight type: Not available	Adds 1 key flat at 0° and the other on another angle 1° increments (X) KC・WKC: Not available (X) L(LC)<16, D>25: Not available (X) Straight type: Not available	200 (A only 400)
		HC	Changes head diameter H D≦HC<(D+3) 0.1mm increments		200
		TC	Changes head thickness 2≦TC<5 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) (P) Overall length does not change.		200
		TKC	Changes head thickness tolerance	T +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness tolerance	T +0.3 0 ⇨ 0 −0.02	200
		RC	Reduces head thickness by −0.04～0 from retainer surface		200
Others		SKC	Adds key flat on shank (P) Applicable only to headed type (P) D≧8 (X) Combination with KC・WKC・KFC: Not available (X) Straight type: Not available		600

FREE SIZE BUTTON DIES
—CONFIGURABLE TYPE—

The volume discount rate is also applicable to alteration cost. P.39

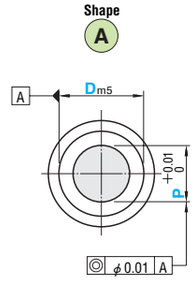
—Headed type— RoHS

M / H	Shank dia.	Catalog No.
SKD11 or equivalent 60～63HRC	D6～56	Ⓐ FMHD
	D8～56	Ⓓ FHDD
		Ⓡ FHDR
		Ⓔ FHDE
		Ⓖ FHDG
	D10～56	Ⓐ FMHDS
		Ⓓ FHDDS
		Ⓡ FHDRS
		Ⓔ FHDES
		Ⓖ FHDGS

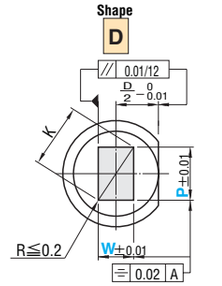


L	b／a
16.0～ 40.0	1／100
40.1～100.0	0

Shape Ⓐ

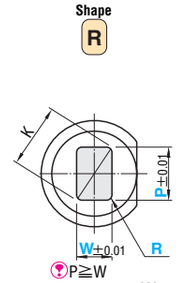


Shape Ⓓ



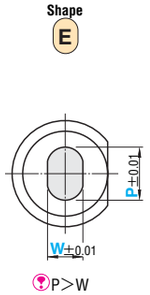
Ⓟ P≧W
Ⓟ K=√(P²+W²)

Shape Ⓡ



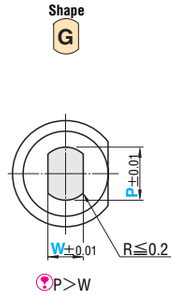
Ⓟ P≧W
Ⓟ 0.15≦ R<W/2
Ⓟ K=√((P−2R)²+(W−2R)²+2R

Shape Ⓔ



Ⓟ P>W

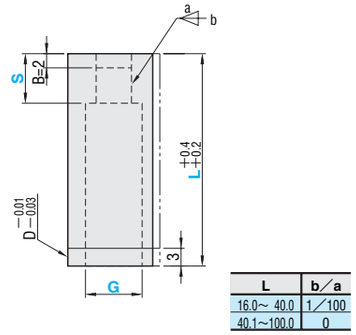
Shape Ⓖ



Ⓟ P>W

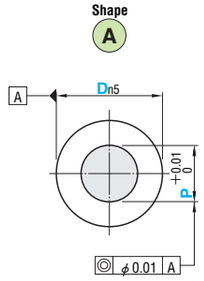
—Straight type— RoHS

M / H	Shank dia.	Catalog No.
SKD11 or equivalent 60～63HRC	D6～56	Ⓐ FMSD
	D8～56	Ⓓ FSDD
		Ⓡ FSDR
		Ⓔ FSDE
		Ⓖ FSDG
	D10～56	Ⓐ FMSDS
		Ⓓ FSDDS
		Ⓡ FSDRS
		Ⓔ FSDES
		Ⓖ FSDGS

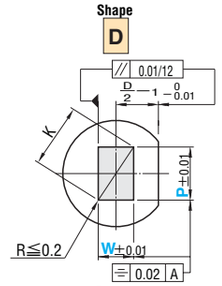


L	b／a
16.0～ 40.0	1／100
40.1～100.0	0

Shape Ⓐ

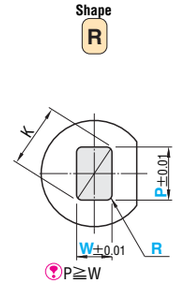


Shape Ⓓ



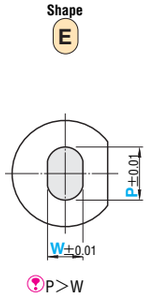
Ⓟ P≧W
Ⓟ K=√(P²+W²)

Shape Ⓡ



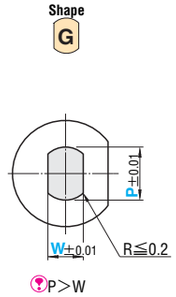
Ⓟ P≧W
Ⓟ 0.15≦ R<W/2
Ⓟ K=√((P−2R)²+(W−2R)²+2R

Shape Ⓔ



Ⓟ P>W

Shape Ⓖ



Ⓟ P>W

D T		Catalog No.		L	0.01mm increments			1mm increments	G
D	m5	n5	Type	D	0.1mm increments	Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P·Kmax.	Ⓡ P·Wmin. R	S	Ⓟ L≦40.0 G≧P・K+0.4 L≧40.1 G≧P・K+0.5
6	+0.009 +0.004	+0.013 +0.006		(6)	16.0～40.0	0.50～ 3.20	—	—	3～4	3.0～ 3.6
8	+0.012	+0.016		8		0.50～ 4.40	4.40	1.00		3.0～ 4.8
10	+0.006	+0.010	Headed type Straight type	10		1.00～ 6.40	6.40	1.00	3～6	3.0～ 6.8
13	+0.015	+0.020	Ⓐ FMHD FMSD	13		1.50～ 8.50	8.50	1.00	3～8	3.0～ 9.0
16	+0.007	+0.012		16		2.50～10.50	10.50	1.00		3.0～11.0
20	+0.017	+0.024	Ⓓ FHDD FSDD	20		3.50～12.50	12.50	1.50		4.0～13.0
25	+0.008	+0.015	Ⓡ FHDR FSDR	25		5.00～16.50	16.50	1.50		5.5～17.0
32			Ⓔ FHDE FSDE	32		7.50～21.00	21.00	2.00		8.0～21.5
38	+0.020	+0.028	Ⓖ FHDG FSDG	38		9.50～27.00	27.00	2.50		9.5～27.5
45	+0.009	+0.017		45		12.50～36.00	36.00	3.00		13.0～36.5
50				50		16.50～41.00	41.00	3.50		17.0～41.5
56	+0.024 +0.011	+0.033 +0.020		56		19.00～46.00	46.00	4.00		19.5～46.5
10	+0.012 +0.006	+0.016 +0.010		10	40.1～80.0 (40.01)	1.00～ 6.00	6.00	1.00	3～10	5.0～ 6.5
13	+0.015	+0.020	Headed type Straight type	13		1.50～ 8.50	8.50	1.00		5.0～ 9.0
16	+0.007	+0.012		16		2.50～10.50	10.50	1.00		5.0～11.0
20	+0.017	+0.024	Ⓐ FMHDS FMSDS	20		3.50～12.50	12.50	1.50	3～12	5.0～13.0
25	+0.008	+0.015		25		5.00～16.50	16.50	1.50		6.0～17.0
32			Ⓓ FHDDS FSDDS	32	40.1～100.0 (40.01)	7.50～21.00	21.00	2.00	3～15	9.0～21.5
38	+0.020	+0.028	Ⓡ FHDRS FSDRS	38		9.50～27.00	27.00	2.50		11.0～27.5
45	+0.009	+0.017	Ⓔ FHDES FSDES	45		12.50～36.00	36.00	3.00		14.0～36.5
50			Ⓖ FHDGS FSDGS	50		16.50～41.00	41.00	3.50	3～20	18.0～41.5
56	+0.024 +0.011	+0.033 +0.020		56		19.00～46.00	46.00	4.00		20.0～46.5

Ⓟ D(6) is available for shape Ⓐ (round) only. Shapes Ⓓ Ⓡ Ⓔ Ⓖ are not available.
Ⓟ When dimension P is from 1.00mm to 1.99mm, dimension S is max.4mm. Ⓟ L (40.01)···When specifying LKC or LKZ, it is possible to specify the L dimension from 40.01.

Order

Catalog No.	L	P	W	R(Ⓡonly)	S	G
FMHD 10	35.1	P5.00			S6	G5.4
FSDRS 20	65.5	P10.00	W8.00	R2.25	S10	G12.5

Delivery 5 Days

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

Price

■Headed type

D	FMHD	FHDD・FHDR FHDE・FHDG	FMHDS	FHDDS・FHDRS FHDES・FHDGS
6	3,210	—	—	—
8	3,190	5,760	—	—
10	3,190	5,800	4,210	8,940
13	3,150	5,960	4,210	9,600
16	3,150	6,300	4,210	10,740
20	3,200	6,430	4,210	11,300
25	3,940	7,060	5,350	12,410
32	4,700	7,740	6,410	13,520
38	6,100	8,750	8,290	15,440
45	10,390	15,950	13,170	20,980
50	11,910	17,530	14,670	22,790
56	13,900	19,450	16,970	25,390

■Straight type

D	FMSD	FSDD・FSDR FSDE・FSDG	FMSDS	FSDDS・FSDRS FSDES・FSDGS
6	3,140	—	—	—
8	3,110	5,760	—	—
10	3,110	5,800	4,260	8,940
13	3,070	5,960	4,260	9,600
16	3,070	6,300	4,260	10,740
20	3,110	6,430	4,260	11,300
25	3,760	7,060	5,410	12,410
32	4,480	7,740	6,490	13,520
38	5,770	8,750	8,390	15,440
45	10,030	15,950	12,360	20,980
50	11,410	17,530	13,760	22,790
56	13,410	19,450	15,910	25,390

Alteration

Catalog No. — L — P — W — R — S — G — (BC・HC・TC···etc.)
FMHD 10 — 35.1 — P5.00 — S6 — G5.4 — TC4—KC

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Shaped hole		BC	Changes shaped hole depth B 1≦BC≦S 0.1mm increments ⊗ L>40：Not available ⊗ P<1.00：Not available		200
		PKC	Changes shaped hole tolerance P P +0.01 0 ⇨ +0.005 0 ⊗ P<1.00：Not available	Changes shaped hole tolerance P・W P・W±0.01 ⇨ +0.01 0	400
Full length		LKC	Changes full length tolerance Ⓟ (Combination with LKC→0.01mm increments) L +0.4 +0.2 ⇨ +0.05 0		400
		LKZ	Changes full length tolerance Ⓟ (Combination with LKZ→0.01mm increments) L +0.4 +0.2 ⇨ +0.01 0 ⊗ D>25：Not available		600
Head		KC	Adds key flat	Changes key flat position 1° incr.	200
			Adds key flat ⊗ D6：Not available	Changes key flat position 1° incr.	
		WKC	Adds key flats in parallel For changing angle, add KC ⊗ Straight type D6：Not available		200 (Ⓐ only 400)
		KFC	Adds 1 key flat at 0° and the other on another angle 1° increments ⊗ KC・WKC：Not available ⊗ L (LC)<16, D>25:Not available ⊗ Straight type：Not available	Adds 1 key flat at 0° and the other on another angle 1° increments ⊗ KC・WKC：Not available ⊗ L (LC)<16, D>25:Not available ⊗ Straight type：Not available	200 (Ⓐ only 400)

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Head		HC	Changes head diameter H D≦HC<(D+3) 0.1mm increments		200
		TC	Changes head thickness 2≦TC<5 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) Ⓟ Overall length does not change.		200
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0		200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02		200
		RC	Reduces head thickness by −0.04~0 from retainer surface ⊗ L<30：Not available		200
Others		SKC	Adds key flat on shank Ⓟ Applicable only to headed type Ⓟ Applicable to D≧8, L≧8 ⊗ Combination with KC・WKC・KFC：Not available ⊗ Straight type：Not available		600

SCRAP RETENTION FREE SIZE BUTTON DIES
—CONFIGURABLE TYPE—

PRODUCTS DATA P.1229

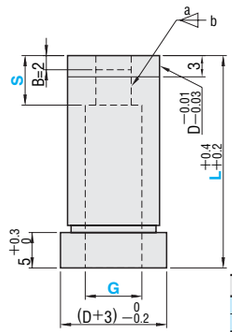
SCRAP RETENTION DIES

Price Cut : Reduced Price

The volume discount rate is also applicable to alteration cost. P.39

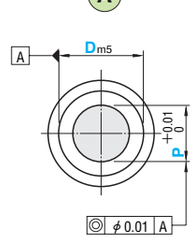
—Headed type— RoHS

M H	Shank dia.	Catalog No.
SKD11 or equivalent 60～63HRC	D6～56	A SR—FMHD
	D8～56	D SR—FHDD
		R SR—FHDR
		E SR—FHDE
		G SR—FHDG
	D10～56	A SR—FMHDS
		D SR—FHDDS
		R SR—FHDRS
		E SR—FHDES
		G SR—FHDGS

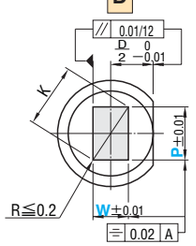


L	b／a
16.0～ 40.0	1／100
40.1～100.0	0

Shape A

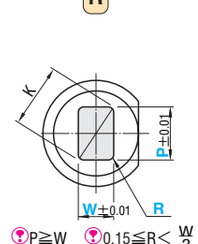


Shape D



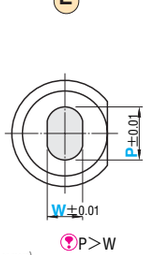
P−0.4≧1.5 (Dimension P straight part 1.5mm or more)
P≧W K=√(P²+W²)

Shape R



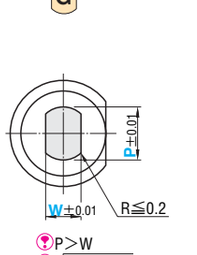
P≧W 0.15≦R< W/2
P−2R≧1.5 (Dimension P straight part 1.5mm or more)
K=√((P−2R)²+(W−2R)²+2R

Shape E



P>W

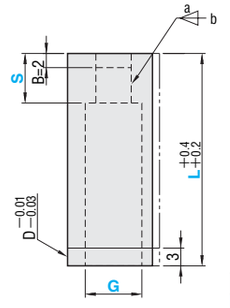
Shape G



P>W
√(P²−W²)≧1.5
(Dimension P straight part 1.5mm or more)

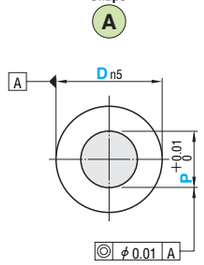
—Straight type— RoHS

M H	Shank dia.	Catalog No.
SKD11 or equivalent 60～63HRC	D6～56	A SR—FMSD
	D8～56	D SR—FSDD
		R SR—FSDR
		E SR—FSDE
		G SR—FSDG
	D10～56	A SR—FMSDS
		D SR—FSDDS
		R SR—FSDRS
		E SR—FSDES
		G SR—FSDGS

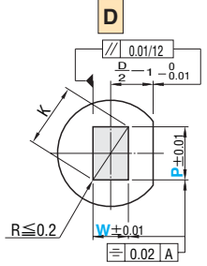


L	b／a
16.0～ 40.0	1／100
40.1～100.0	0

Shape A

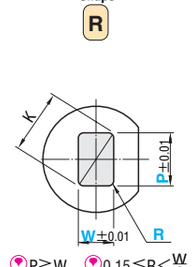


Shape D



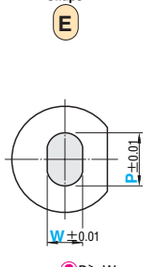
P−0.4≧1.5 (Dimension P straight part 1.5mm or more)
P≧W K=√(P²+W²)

Shape R



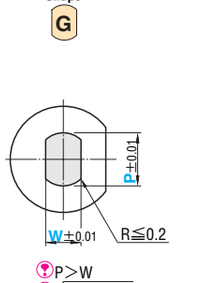
P≧W 0.15≦R< W/2
P−2R≧1.5 (Dimension P straight part 1.5mm or more)
K=√((P−2R)²+(W−2R)²+2R

Shape E



P>W

Shape G

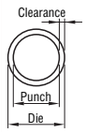


P>W
√(P²−W²)≧1.5
(Dimension P straight part 1.5mm or more)

D T			Catalog No.	L	0.01mm increments			1mm increments	G		0.01mm increments	0.005mm increments
D	m5	n5	Type	D	0.1mm increments	Ⓐ min. P max.	D R E G P·Kmax.	R R	S	Ⓟ L≦40.0 G≧P・K+0.4 L≧40.1 G≧P・K+0.5		MT (Material thickness)	C (Clearance)
6	+0.009 +0.004	+0.013 +0.008	Headed type Straight type	(6)	16.0～40.0	1.00～ 3.20	—	—	3～4	3.0～ 3.6	0.2mm increments		
8	+0.012	+0.016		8		1.00～ 4.40	4.40	1.00		3.0～ 4.8			
10	+0.006	+0.010	A SR—FMHD SR—FMSD	10		1.00～ 6.40	6.40	1.00	3～6	3.0～ 6.8			
13	+0.015	+0.020		13		1.50～ 8.50	8.50	1.00	3～8	3.0～ 9.0	0.5mm increments		
16	+0.007	+0.012	D SR—FHDD SR—FSDD	16		2.50～10.50	10.50	1.00		3.0～11.0			
20	+0.017	+0.024	R SR—FHDR SR—FSDR	20		3.50～12.50	12.50	1.50		4.0～13.0			
25	+0.008	+0.015	E SR—FHDE SR—FSDE	25		5.00～16.50	16.50	1.50		5.5～17.0			
32				32		7.50～21.00	21.00	2.00		8.0～21.5			
38	+0.020	+0.028	G SR—FHDG SR—FSDG	38		9.50～27.00	27.00	2.50		9.5～27.5			
45	+0.009	+0.017		45		12.50～36.00	36.00	3.00		13.0～36.5			
50				50		16.50～41.00	41.00	3.50		17.0～41.5			
56	+0.024 +0.011	+0.033 +0.020		56		19.00～46.00	46.00	4.00		19.5～46.5			
10	+0.012 +0.006	+0.016 +0.010		10	40.1～80.0 (40.01)	1.00～ 6.00	6.00	1.00	3～10	5.0～ 6.5	0.5mm increments		
13	+0.015	+0.020	Headed type Straight type	13		1.50～ 8.50	8.50	1.00		5.0～ 9.0			
16	+0.007	+0.012	A SR—FMHDS SR—FMSDS	16		2.50～10.50	10.50	1.00		5.0～11.0			
20	+0.017	+0.024	D SR—FHDDS SR—FSDDS	20		3.50～12.50	12.50	1.50	3～12	5.0～13.0			
25	+0.008	+0.015	R SR—FHDRS SR—FSDRS	25		5.00～16.50	16.50	1.50		6.0～17.0			
32				32	40.1～100.0 (40.01)	7.50～21.00	21.00	2.00	3～15	9.0～21.5			
38	+0.020	+0.028	E SR—FHDES SR—FSDES	38		9.50～27.00	27.00	2.50		11.5～27.5			
45	+0.009	+0.017	G SR—FHDGS SR—FSDGS	45		12.50～36.00	36.00	3.00		14.0～36.5			
50				50		16.50～41.00	41.00	3.50	3～20	18.0～41.5			
56	+0.024 +0.011	+0.033 +0.020		56		19.00～46.00	46.00	4.00		20.0～46.5			

MT≧0.15 Specifiable with material thickness 0.15mm or more.

C≧0.010 Specifiable with clearance 0.010mm or more.



Ⓟ When dimension P is from 1.00mm to 1.99mm, dimension S is max.4mm.
Ⓟ D(6) ⋯▸D=6 Ⓐ Straight type of D=6 is available for shape Ⓐ (round) only. Shapes D R E G are not available.
Ⓟ Table of effective recession length. Regrinding should be done in the range of effective recession length−1mm.

L	L≦40.0	L≧40.1		
		P1.00～1.99	P2.00～3.99	P4.00～
Effective recession length B(BC)	3	5	6	

Ⓟ L (40.01)⋯▸When specifying LKC or LKZ, it is possible to specify the L dimension from 40.01.
Ⓟ Straight type of D=6 is available for shape Ⓐ (round) only.
Ⓟ Applied only to the material which has the tensile strength up to 1177N/mm² (120kgf/mm²).
Ⓟ Workpiece material thickness and clearance are used as scrap retention machining data. Specify the shaped hole with the finishing dimension (P・W・R) as the button dies at present.

Order

Catalog No. — L — P — W — R(R only) — S — G — MT — C

SR—FMHD 10 — 35.1 — P5.00 — — S6 — G5.4 — MT1.5 — C0.105
SR—FSDRS 25 — 65.5 — P10.00 — W8.00 — R2.25 — S10 — G14.5 — MT1.5 — C0.105

Delivery 5 Days

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

Price

■Headed type

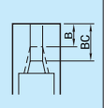
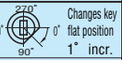
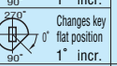
D	SR—FMHD	SR—FHDD・SR—FHDR SR—FHDE・SR—FHDG	SR—FMHDS	SR—FHDDS・SR—FHDRS SR—FHDES・SR—FHDGS
6	4,220	—	—	—
8	4,010	6,990	—	—
10	4,010	7,040	5,030	10,190
13	3,970	7,190	5,030	10,860
16	4,170	7,930	5,230	12,410
20	4,220	8,060	5,230	12,960
25	4,970	8,700	6,380	14,080
32	5,730	9,380	7,450	15,200
38	7,130	10,390	9,330	17,130
45	11,650	17,840	13,630	22,890
50	13,170	19,430	15,040	24,720
56	15,180	21,360	17,200	27,330

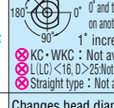
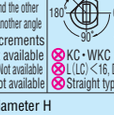
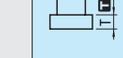
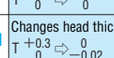
■Straight type

D	SR—FMSD	SR—FSDD・SR—FSDR SR—FSDE・SR—FSDG	SR—FMSDS	SR—FSDDS・SR—FSDRS SR—FSDES・SR—FSDGS
6	4,150	—	—	—
8	3,920	6,900	—	—
10	3,920	7,040	5,030	10,190
13	3,880	7,190	5,030	10,860
16	4,080	7,930	5,230	12,410
20	4,120	8,060	5,230	12,960
25	4,790	8,700	6,380	14,080
32	5,500	9,380	7,450	15,200
38	6,800	10,390	9,330	17,130
45	11,280	17,840	13,630	22,890
50	12,670	19,430	15,040	24,720
56	14,680	21,360	17,200	27,330

Alteration

Catalog No. — L — P — W — R — S — G — MT — C —(B・HC・TC⋯etc.)
SR—FMHD 10 — 35.1 — P5.00 — S6 — G5.4 — MT1.50 — C0.105 — TC4—KC

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole		BC	Changes shaped hole depth B P: 1.00～1.99 → Bmax 3; 2.00～3.99 → 5; 4.00～ → 6 1≦BC≦Bmax 1≦BC≦S 0.1mm increments ⊗L>40：Not available	Changes shaped hole depth B 1≦BC<2 0.1mm increments ⊗L>40：Not available	200
		PKC	Changes shaped hole tolerance P $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Changes shaped hole tolerance P・W $P \cdot W^{\pm 0.01}$ ⇨ $^{+0.01}_{0}$	400
Full length		LKC	Changes full length tolerance $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ Ⓟ(Combination with LKC →0.01mm increments)		400
		LKZ	Changes full length tolerance Ⓟ(Combination with LKZ→0.01mm increments) $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗D>25：Not available		600
Head		KC	Adds key flat  Changes key flat position 1° incr.		200
			Adds key flat  ⊗D6：Not available Changes key flat position 1° incr.		
		WKC	Adds key flats in parallel For changing angle, add KC ⊗Straight type D6：Not available		200 (Ⓐ only 400)

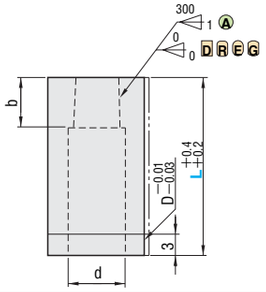
Alterations		Code	Ⓐ	D R E G	¥/1Code
Head		KFC	 Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC：Not available ⊗L(LC)<16, D>25:Not available ⊗Straight type：Not available	 Adds 1 key flat at 0° and the other on another angle 1° increments ⊗KC・WKC：Not available ⊗L(LC)<16, D>25:Not available ⊗Straight type：Not available	200 (Ⓐ only 400)
		HC	Changes head diameter H D≦HC<(D+3) 0.1mm increments		200
		TC	Changes head thickness 2≦TC<5 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) ⓅOverall length does not change.		200
		TKC	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		200
		TKM	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		200
		RC	 Reduces head thickness by −0.04～0 from retainer surface ⊗L<30：Not available		200
Others		SKC	Adds key flat on shank ⓅApplicable only to headed type ⓅApplicable to D≧8, L≧20 ⊗Combination with KC・WKC・KFC：Not available ⊗Straight type：Not available		600

BUTTON DIES
—DOWEL SLOT TYPE—

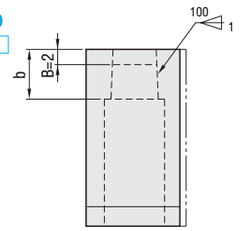
The volume discount rate is also applicable to alteration cost. P.39

M SKD11 or equivalent
H 60～63HRC
A MS4—15

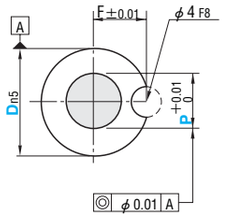
Economy type
EKSD
EKD□



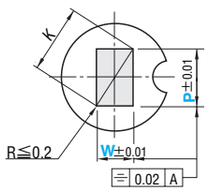
Regular type
KSD
KD□



Shape A

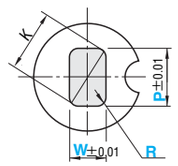


Shape D



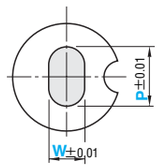
P≧W
K=$\sqrt{P^2+W^2}$

Shape R



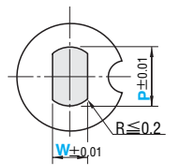
P≧W
0.15≦ R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Dn5	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.01mm increments R	b	d	F	U/Price Q'ty：1～9 EKSD	KSD	EKD□	KD□
10 +0.016 +0.010	Economy type Ⓐ EKSD / Regular type KSD	10	16 20 22 25 28 30 32 35	2.00～ 6.00	6.00	1.20	0.15≦R<W/2 (R only)	6	6.4	6	1,120	1,270	3,830	4,050
13 +0.020 +0.012	Ⓐ EKSD / KSD	13	16 20 22 25 28 30 32 35	3.00～ 8.00	8.00	1.50		8	8.4	7.5	1,030	1,180	3,990	4,200
16	Ⓐ EKSD / KSD	16	16 20 22 25 28 30 32 35	5.00～10.00	10.00	2.00			10.6	8	1,030	1,180	4,210	4,500
20 +0.024 +0.015	Ⓓ EKDD / KDD	20	16 20 22 25 28 30 32 35	7.00～12.00	12.00	3.00			12.6	10	1,120	1,270	4,450	4,740
22	Ⓓ EKDD / KDD	22	16 20 22 25 28 30 32 35	8.00～14.00	14.00	3.00			14.6	11	1,310	1,450	4,620	4,920
25	Ⓡ EKDR / KDR	25	16 20 22 25 28 30 32 35	10.00～16.00	16.00	3.00			16.6	12.5	1,410	1,560	4,760	5,050
32	Ⓡ EKDR / KDR	32	16 20 22 25 28 30 32 35	15.00～20.00	20.00	4.00			20.6	16	1,750	1,890	5,010	5,360
38 +0.028 45 +0.017	Ⓔ EKDE / KDE	38	16 20 22 25 30 35	19.00～26.00	26.00	5.00			26.6	19	2,400	2,560	5,380	5,740
45	Ⓔ EKDE / KDE	45	20 22 25 30 35	25.00～35.00	35.00	6.00			36.0	22.5	5,230	5,390	10,800	11,280
50	Ⓖ EKDG / KDG	50	20 22 25 30 35	33.00～40.00	40.00	7.00			41.0	25	6,300	6,450	12,110	12,590
56 +0.033 +0.020	Ⓖ EKDG / KDG	56	20 22 25 30 35	38.00～45.00	45.00	8.00			46.0	28	7,700	7,910	13,490	13,900

Order

Catalog No.	L	P	W	R(Ⓡonly)
EKDR 13	20	P6.00	W2.40	R1.00

Delivery

3 Days	Express T	1,600/1Pc.
	Express A	800/1Pc.

⊗Express T is not available for D45・50・56

P.38

Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size（excluding Express T）.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC…etc.)
EKDD 13 — 20 — P6.00 — WC1.00 — KC90

Alterations	Code	Ⓐ	D R E G	¥/1Code
Shaped hole	PC WC	Changes shaped hole dimension P・W min：$\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\cdot Wmin}{2}\geqq1.00$ 0.01mm increments Ⓟ Ⓐ：When PC is 1.00～1.99, b is 4mm. max：$\frac{P}{W}<\frac{PC}{WC}\leqq$P・Kmax+0.2 0.01mm increments		200
	BC	Changes shaped hole depth B 1≦BC≦b 0.1mm increments ⊗Economy type is not available.		200

Alterations	Code	Ⓐ	D R E G	¥/1Code
Shaped hole	PKC	Changes shaped hole tolerance P $P^{+0.01}_{0}\Rightarrow^{+0.005}_{0}$ ⊗Economy type is not available.	Changes shaped hole tolerance P・W P・W±0.01⇨±0.01 ⊗Economy type is not available.	400
Full length	LC	Changes full length 10≦LC＜L 0.1mm incr.（combination with LKC・LKZ→0.01mm incr.） Ⓟ Press-in lead is（L—LC）shorter.		200
	LKC	Changes full length tolerance $L^{+0.4}_{+0.2}\Rightarrow^{+0.05}_{0}$		400
	LKZ	Changes full length tolerance $L^{+0.4}_{+0.2}\Rightarrow^{+0.01}_{0}$ ⊗L<16, D>25：Not available		600
Others	KC	——	270° 180° 90° 0° Changes dowel slot position 1° incr.	200

SCRAP RETENTION BUTTON DIES
—DOWEL SLOT TYPE—

PRODUCTS DATA P.1229

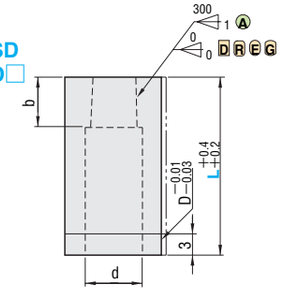
SCRAP RETENTION DIES

Price Cut : Reduced Price

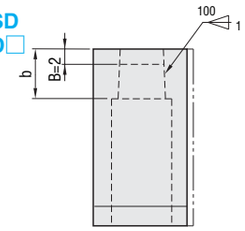
The volume discount rate is also applicable to alteration cost. P.39

M SKD11 or equivalent
H 60～63HRC
A MS4—15

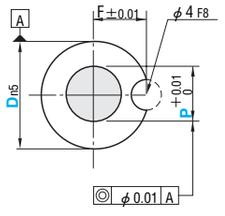
Economy type
SR—EKSD
SR—EKD□



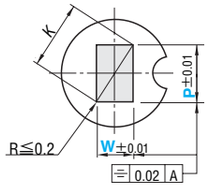
Regular type
SR—KSD
SR—KD□



Shape A

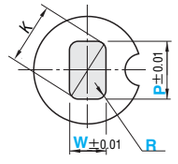


Shape D



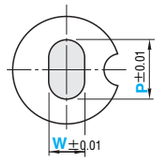
P≧W Ⓟ K=$\sqrt{P^2+W^2}$
P−0.4≧1.5
(Dimension P straight part 1.5mm or more)

Shape R

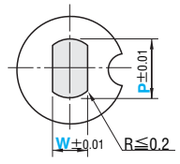


P≧W Ⓟ 0.15≦ R<$\frac{W}{2}$ Ⓟ P>W
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$
P−2R≧1.5
(Dimension P straight part 1.5mm or more)

Shape E



Shape G



P>W
Ⓟ $\sqrt{P^2-W^2}\geqq1.5$
(Dimension P straight part 1.5mm or more)

Dn5	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.01mm increments R	0.01mm increments MT (Material thickness)	0.005mm increments C (Clearance)	b	d	F	U/Price Q'ty：1～9 SR—EKSD	SR—KSD	SR—EKD□	SR—KD□
10 +0.016 +0.010	Economy type Ⓐ SR—EKSD / Regular type SR—KSD	10	16 20 22 25 28 30 32 35	2.00～ 6.00	6.00	1.20	0.15≦R<W/2 (R only)	MT≧0.15 Specifiable with material thickness 0.15mm or more.	C≧0.010 Specifiable with clearance 0.010mm or more. Clearance Punch Die	6	6.4	6	1,930	2,080	5,050	5,270
13 +0.020 +0.012	Ⓐ SR—EKSD / SR—KSD	13	16 20 22 25 28 30 32 35	3.00～ 8.00	8.00	1.50				8	8.4	7.5	1,830	1,980	5,200	5,420
16	Ⓐ SR—EKSD / SR—KSD	16	16 20 22 25 28 30 32 35	5.00～10.00	10.00	2.00					10.6	8	2,030	2,180	5,820	6,130
20 +0.024 +0.015	Ⓓ SR—EKDD / SR—KDD	20	16 20 22 25 28 30 32 35	7.00～12.00	12.00	3.00					12.6	10	2,130	2,280	6,080	6,360
22	Ⓓ SR—EKDD / SR—KDD	22	16 20 22 25 28 30 32 35	8.00～14.00	14.00	3.00					14.6	11	2,320	2,460	6,250	6,540
25	Ⓡ SR—EKDR / SR—KDR	25	16 20 22 25 28 30 32 35	10.00～16.00	16.00	3.00					16.6	12.5	2,410	2,570	6,380	6,680
32	Ⓡ SR—EKDR / SR—KDR	32	16 20 22 25 28 30 32 35	15.00～20.00	20.00	4.00					20.6	16	2,750	2,900	6,630	6,990
38 +0.028 45 +0.017	Ⓔ SR—EKDE / SR—KDE	38	16 20 22 25 30 35	19.00～26.00	26.00	5.00					26.6	19	3,420	3,570	7,010	7,370
45	Ⓔ SR—EKDE / SR—KDE	45	20 22 25 30 35	25.00～35.00	35.00	6.00					36.0	22.5	6,460	6,620	12,660	13,140
50	Ⓖ SR—EKDG / SR—KDG	50	20 22 25 30 35	33.00～40.00	40.00	7.00					41.0	25	7,530	7,680	13,970	14,460
56 +0.033 +0.020	Ⓖ SR—EKDG / SR—KDG	56	20 22 25 30 35	38.00～45.00	45.00	8.00					46.0	28	8,940	9,160	15,360	15,770

Ⓟ Applied only to the material which has the tensile strength up to 1177N/mm² (120kgf/mm²) .
Ⓟ Workpiece material thickness and clearance are used as scrap retention machining data. Specify the shaped hole with the finishing dimension（P・W・R）as the button dies at present.

Order

Catalog No.	L	P	W	R(Ⓡonly)	MT	C
SR—EKDR 13	20	P6.00	W2.40	R1.00	MT1.50	C0.105

Price

Delivery

3 Days	Express A	800/1Pc.

P.38

Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration

Catalog No. — L(LC) — P(PC) — W(WC) — R — MT — C — (BC・KC…etc.)
SR—EKDD 13 — 20 — P6.00 — WC1.00 — MT1.50 — C0.105 — KC90

■Volume discount rate P.37

Quantity	Rate
1～9	—
10～29	5%
30～99	10%
100～200	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

Alterations	Code	Ⓐ	D R E G	¥/1Code
Shaped hole	PC WC	Changes shaped hole dimension P・W min：$\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\cdot Wmin}{2}\geqq1.00$ 0.01mm increments Ⓟ Ⓐ：When PC is 1.00～1.99, b is 4mm. max：$\frac{P}{W}<\frac{PC}{WC}\leqq$P・Kmax+0.2 0.01mm increments		200
	BC	Changes shaped hole depth B P: 1.00～1.99 Bmax 3; 2.00～3.99 5; 4.00～ 6 1≦BC≦Bmax 0.1mm increments ⊗Economy type is not available.	Changes shaped hole depth B 1≦BC＜2 0.1mm increments	200

Alterations	Code	Ⓐ	D R E G	¥/1Code
Shaped hole	PKC	Changes shaped hole tolerance P $P^{+0.01}_{0}\Rightarrow^{+0.005}_{0}$ ⊗Economy type is not available.	Changes shaped hole tolerance P・W P・W±0.01⇨±0.01 ⊗Economy type is not available.	400
Full length	LC	Changes full length 10≦LC＜L 0.1mm incr.（combination with LKC・LKZ→0.01mm incr.） Ⓟ Press-in lead is（L—LC）shorter.		200
	LKC	Changes full length tolerance $L^{+0.4}_{+0.2}\Rightarrow^{+0.05}_{0}$		400
	LKZ	Changes full length tolerance $L^{+0.4}_{+0.2}\Rightarrow^{+0.01}_{0}$ ⊗L<16, D>25：Not available		600
Others	KC	——	270° 180° 90° 0° Changes dowel slot position 1° incr.	200

TILTING BUTTON DIES
—DOWEL SLOT TYPE—

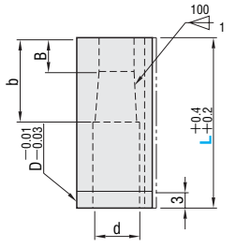
The head type and the straight type of tilting button die are renamed as long point button die. (P.283)

The volume discount rate is also applicable to alteration cost. P.39

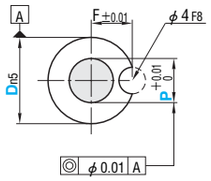
RoHS

M SKD11 or equivalent
H 60～63HRC
A MS4—15

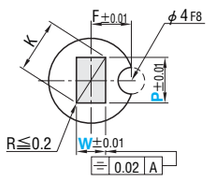
KSDS
KD□S



Shape A

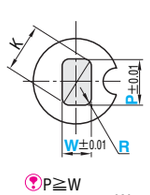


Shape D



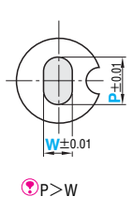
P≧W
K=√(P²+W²)

Shape R



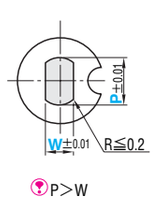
P≧W
0.15≦ R<W/2
K=√((P−2R)²+(W−2R)²)+2R

Shape E



P>W

Shape G



P>W

D n5			Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	R R	B	b	d	F	U/Price Q'ty : 1～9 KSDS	U/Price Q'ty : 1～9 KD□S
Dn5	10	+0.016 +0.010	A KSDS	10	16 20 22 25 30 35 40	2.00～ 6.00	6.00	1.20	0.15≦R<W/2 (R only)	6	10	6.4	6	1,430	4,360
	13	+0.020 +0.012		13	16 20 22 25 30 35 40	3.00～ 8.00	8.00	1.50				8.4	7.5	1,340	4,530
	16			16	16 20 22 25 30 35 40	5.00～10.00	10.00	2.00				10.6	8	1,340	4,840
	20	+0.024 +0.015	D KDDS	20	16 20 22 25 30 35 40	7.00～12.00	12.00	3.00		8	12	12.6	10	1,430	5,080
	25		R KDRS	25	16 20 22 25 30 35 40	10.00～16.00	16.00	3.00				16.6	12.5	1,720	5,390
	32			32	16 20 22 25 30 35 40	15.00～20.00	20.00	4.00		10	15	20.6	16	2,060	5,700
	38	+0.028 +0.017	E KDES	38	16 20 22 25 30 35 40	19.00～26.00	26.00	5.00				26.6	19	2,710	6,090
	45		G KDGS	45	20 22 25 30 35 40	25.00～35.00	35.00	6.00		14	20	36.0	22.5	6,310	13,900
	50			50	20 22 25 30 35 40	33.00～40.00	40.00	7.00				41.0	25	7,500	15,210
	56	+0.033 +0.020		56	20 22 25 30 35 40	38.00～45.00	45.00	8.00				46.0	28	9,010	17,200

Order: Catalog No. — L — P — W — R(R only)
KDDS 25 — 35 — P10.00 — W8.00

Delivery: 3 Days

Express	T	1,600/1Pc.
Express	A	800/1Pc.

⊗Express T is not available for D45・50・56

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC…etc.)
KDRS 45 — 40 — P25.2 — W10.2 — R1.50 — BC20

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole		PC WC	Changes shaped hole dimension P・W min : P/W > PC/WC ≧ (P・Wmin)/2 ≧1.00 0.01mm increments Ⓐ : When PC is 1.00～1.99, B・b is 4.		200
			max : P/W < PC/WC ≦P・Kmax+0.2 0.01mm increments		
		BC	Changes shaped hole depth B 1≦BC≦b 0.1mm increments		200
Shaped hole		PKC	Changes shaped hole tolerance P P +0.01 0 ⇨ +0.005 0	Changes shaped hole tolerance P・W P・W±0.01 ⇨ +0.01 0	400
Full length		LC	Changes full length 10≦LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) Press-in lead is (L—LC) shorter.		200
		LKC	Changes full length tolerance L +0.4 +0.2 ⇨ +0.05 0		400
Others		KC	——	270° 180° 90° 0° Changes dowel slot position 1° incr.	200

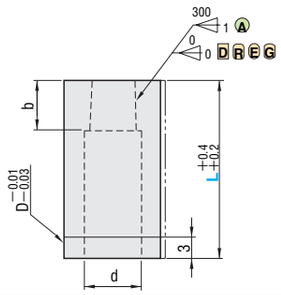
UNHARDENED BUTTON DIES
—DOWEL SLOT TYPE—

The volume discount rate is also applicable to alteration cost. P.39

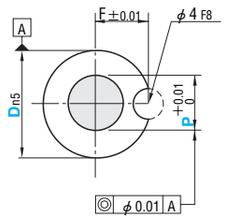
RoHS

M SX105V
H No quenching
A MS4—15

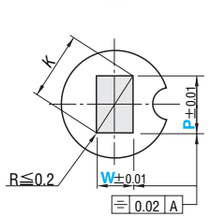
HKSDS
HKD□S



Shape A

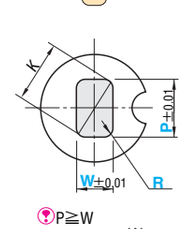


Shape D



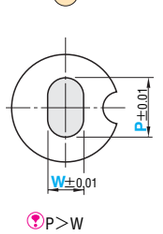
P≧W
K=√(P²+W²)

Shape R



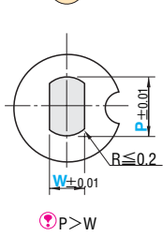
P≧W
0.15≦ R<W/2
K=√((P−2R)²+(W−2R)²)+2R

Shape E



P>W

Shape G



P>W

Dn5			Catalog No. Type	D	L	Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	b	d	F	U/Price Q'ty : 1～9 HKDS	U/Price Q'ty : 1～9 HKD□S
20	+0.024 +0.015	A	HKSDS	20	25	6.00 ～ 12.20	12.20	3.00	0.15≦R<W/2 (R only)	8	12.6	10	1,670	5,960
25		D	HKDDS	25		10.00 ～ 16.20	16.20	3.00			16.6	12.5	2,010	6,320
32	+0.028 +0.017	R	HKDRS	32		15.00 ～ 20.20	20.20	4.00		10	20.6	16	2,400	6,690
38		E	HKDES	38		19.00 ～ 26.20	26.20	5.00			26.6	19	3,170	7,150
		G	HKDGS											

Order: Catalog No. — L — P — W — R(R only) — Delivery: 5 Days

HKDRS 20 — 25 — P10.00 — W8.00 — R2.25

Express B 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

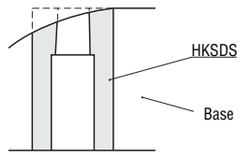
Catalog No. — L(LC) — P(PC) — W(WC) — R — (KC・LKC・TYC…etc.)
HKDDS 20 — 25 — P8.00 — WC2.00 — KC90

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole		PC WC	Changes shaped hole dimension P・W P/W > PC/WC ≧ (P・Wmin)/2 ≧1.50 0.01mm increments		200
		TYC	Grinds down the shank of the shaped hole side		200
Full length		LC	Changes full length 10≦LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) Press-in lead is (L—LC) shorter.		200
		LKC	Changes full length tolerance L +0.4 +0.2 ⇨ +0.05 0		400
Others		KC	——	270° 180° 90° 0° Changes dowel slot position 1° incr.	200

■About Unhardened Button Dies

Since no heat treatment has been performed on these button dies, they can easily be modified. For example, you can preassemble the button dies into the casting base, and then configure them all together into the required form.
By means of flame hardening, you can make the die's surface highly resistant to wear with a hardness level of 63 to 64HRC.
The listed point dimensions are measurements before flame hardening. Note that flame hardening may cause slight changes in these dimensions.

Example

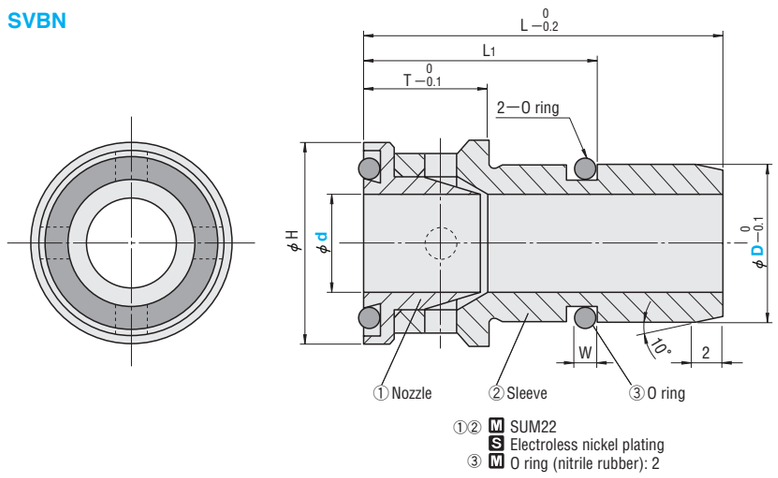


SCRAP VACUUM UNITS

PATENT PENDING

RoHS

SVBN



①② M SUM22
S Electroless nickel plating
③ M O ring (nitrile rubber): 2

H	L	L1	T	Accessory O ring W	Accessory O ring No.	Catalog No. Type	Catalog No. D	d	U/Price Q'ty 1～9
8	18	13	8	1	5	SVBN	6	3	2,400
11	25	15	8	1.5	6	SVBN	8	4	2,200
13	25	15	8	1.5	8	SVBN	10	6	2,400
16	30	15	8	1.5	10	SVBN	13	9	2,800
19	35	15	8	1.5	14	SVBN	16	12	3,400
23	40	15	8	1.5	18	SVBN	20	16	3,900

Order — Catalog No. SVBN 10 — d 6

Delivery — 3 Days — Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

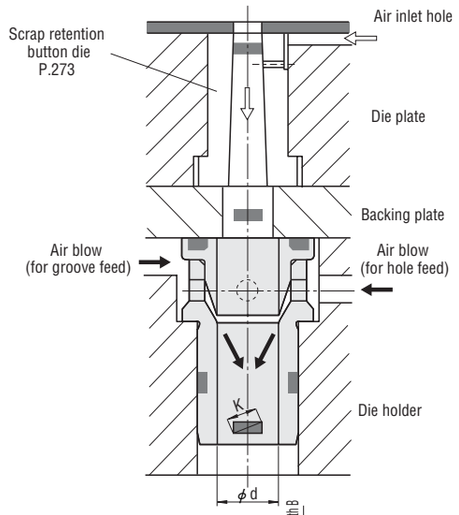
To be quoted on price & lead time above Max. Q'ty.

■Features

- The scrap vacuum unit uses an air blow (compressed air) to create a vacuum inside the die and draw the blanking scrap (product) downward, thus preventing clogging or rising of scrap.
- A greater degree of effectiveness can be obtained by using a non-clogging button die that has an air inlet hole (P.273). (For details, refer to Product Data on P.1231.)
- One of two air supply methods, groove feed and hole feed, can be selected.
- The unit is intended to be recessed in the die holder, enabling it to be installed later as a countermeasure against scrap rising and scrap clogging.

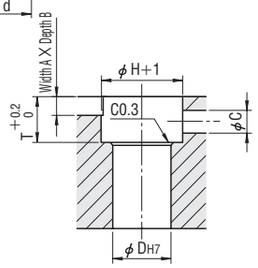
■Precautions

- When using two or more scrap vacuum units, take steps to ensure that the flow of air through each air flow path is the same. In this case, the flow velocity will fall, causing the vacuum to fall as well. The vacuum is proportional to the pressure of the compressed air and the cross-sectional area of the flow path, and inversely proportional to the blow unit diameter D and the length of the flow path.
- Use a vacuum unit of dimensions such that the size K of the scrap is K ≦d −3.
- This unit can be used to help prevent scrap from rising and clogging, however it is not effective under all conditions.
- In order to prevent damage to the O ring when inserting the scrap vacuum unit, chamfer the die holder.
- Use a hose that has an O.D. φ 6 and an I.D. of at least φ 4.



■Example of recommended machined dimensions of flow path

Catalog No. Type	D	Machined groove A	Machined groove B	Transverse hole φ C
SVBN	6	4	3	4
	8			
	10			
	13			
	16			
	20			

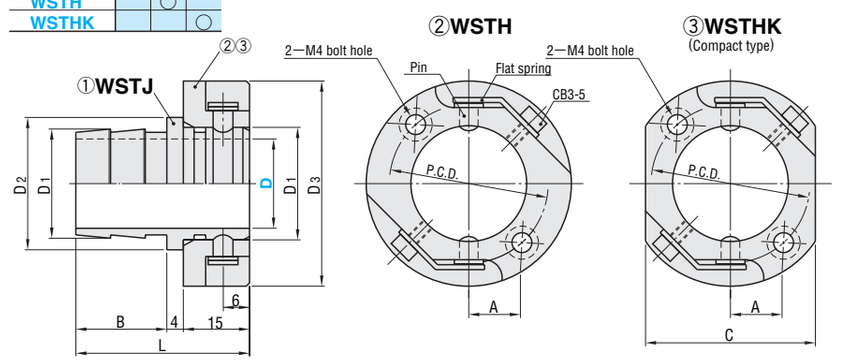


SHOOTING UNIT

Catalog No.	Components ①	②	③
WST	○	○	
WSTK	○		○
WSTJ	○		
WSTH		○	
WSTHK			○

Joint①WSTJ
M Brass
S Hard chrome plating

Holder②WSTH ・③WSTHK
M S45C
S Nickel plating
A CB4×15 2pcs.



Adaptable hose int. dia. D1	D2	D3	P.C.D.	A	B	L	C	Catalog No. Type	Catalog No. D	U/Price Q'ty：1～9 WST	WSTK	WSTJ	WSTH	WSTHK
19	24	39	29	10	21	40	30	WST (Sets①and②)	15	2,300	3,000	750	1,600	2,300
25	30	45	35					WSTK (Sets①and③)	20	2,700	3,400	850	1,900	2,600
32	37	52	42	12			37	WSTJ (① only)	27	3,000	3,750	1,050	2,000	2,750
38	43	58	48				43	WSTH (② only)	33	3,300	4,050	1,250	2,100	2,850
45	50	65	55	14	26	45	50	WSTHK (③ only)	40	3,800	4,600	1,550	2,300	3,100
50	55	70	60				55		45	4,200	5,000	1,850	2,400	3,200

Order — Catalog No. WST 20

Delivery — 3 Days — Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Features

(1) This product is useful for sorting out slugs to be sold as a product from other slugs.

(2) Combining air suction makes it also effective against scrap pulling and clogging.

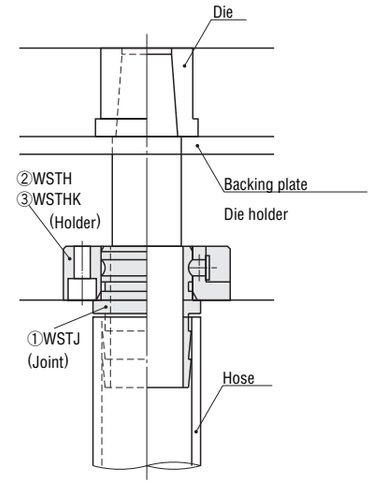
(3) Its one-touch attachment/detachment makes die replacement work easier than ever.

(4) Extremely compact due to its special structure.

■Notes

- Check the attachment of the joint before starting press jobs.
- Use a commercially available hose and hose band.

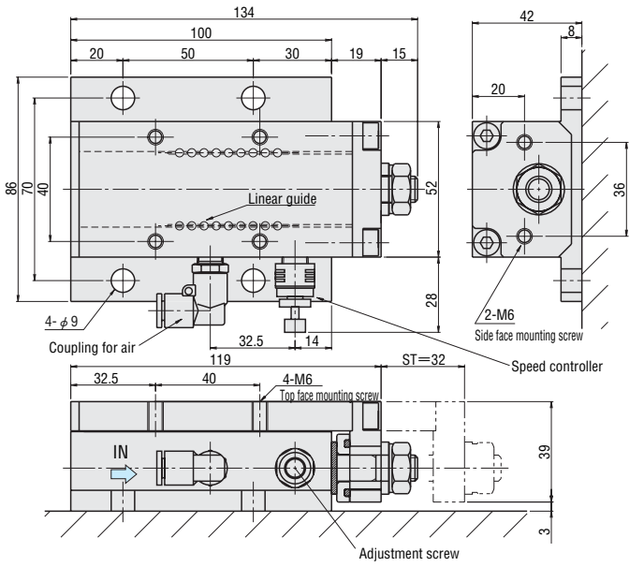
Example



SCRAP REMOVER

RoHS

MREE15



- Working pressure：0.3～0.6MPa (3.1～6.1kgf/cm²)
- Maximum stroke ST：32mm
- Maximum conveying load：150N (15.3kgf)
- Working temperature：0～60℃
- Tubing diameter：φ6
- Maximum inclination angle：8°

Catalog No.		U/Price
Type	No.	Q'ty:1～9
MREE	15	52,000

Order — Catalog No. MREE15

Delivery — 1 Day

Price

■Volume discount rate P.37

Quantity	1～9	10～19
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

■Features

- By simply connecting the air tubing, scrap is conveyed by means of vibration.
- There are no concerns of failure of the AC power supply or the belt as in the case of a belt conveyor.
- There is no need to carry out wiring for a solenoid valve of an air cylinder, for example.
- A ball type linear guide is used, enabling the shooter to withstand eccentric loads and also realizing smooth motion.

■Air consumption (Load 150 N)

MPa	L/min
0.3	15
0.4	22
0.5	26
0.6	39

※When speed controller is fully open

It is also possible to differentiate between the product and scrap by forming holes in the shooter.

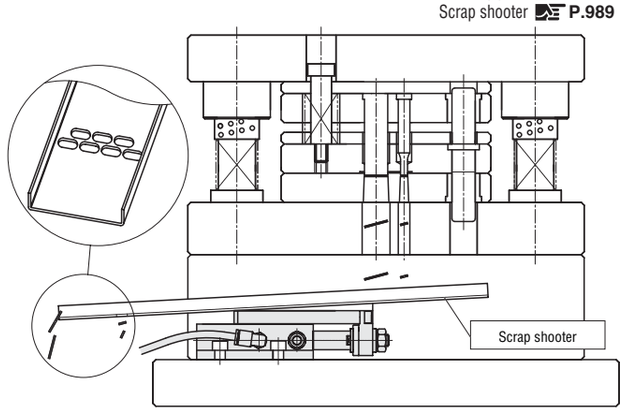
■Use Method

- When the compressed air (0.3～0.6 MPa) is connected to the air connector of the scrap remover, the table starts to vibrate. Use tubing that has an O.D. of 6 mm and an I.D. of 4mm.
- Adjust the screw of the speed controller, and fix the nut at the point corresponding to the correct speed.
- To facilitate conveyance of scrap, either change the inclination of the scrap shooter, or insert a plate or a washer between the scrap remover and the fixing base to tilt the scrap remover.
- Install the scrap shooter either by inserting countersunk bolts into the top surface, or by installing L-shaped angle brackets over the tap holes on the side face and welding the scrap shooter to it.
- If a lot of oil drips onto the scrap shooter, apply an embossed shooting plate (P.988).
- If the weight of the scrap is heavy, take steps to ensure that the scrap is distributed evenly on the scrap shooter.
- Pass the air to be used through the lubricator.
- For details of the scrap shooter, refer to P.989.

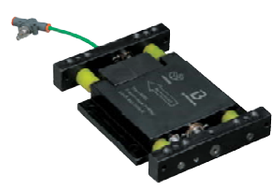
■Notes

- If the scrap shooter is installed longer in one direction rather than symmetrically in the left and right directions, a high moment of inertia will be applied, which may cause the vibration to be reduced. In such a case, install a roller on the scrap shooter, for example.

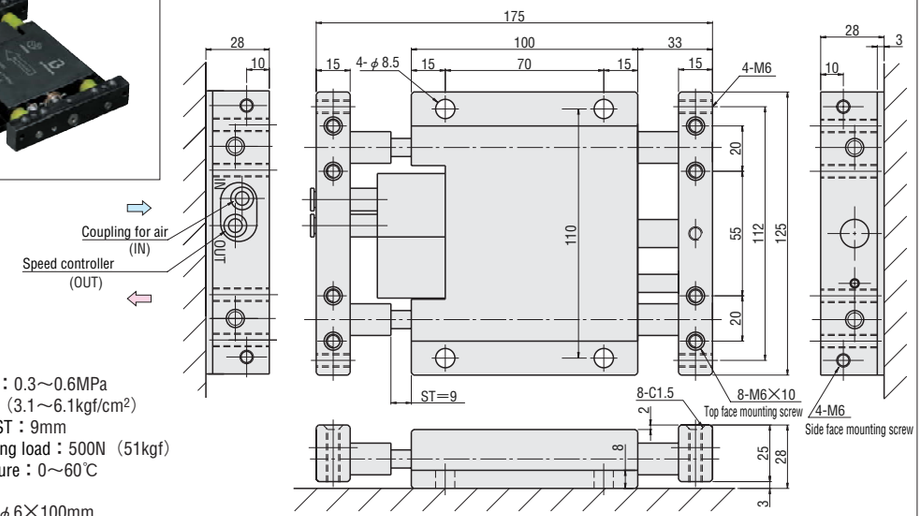
Embossed shooting plate P.988
Scrap shooter P.989



RoHS



MRE50



- Working pressure：0.3～0.6MPa (3.1～6.1kgf/cm²)
- Maximum stroke ST：9mm
- Maximum conveying load：500N (51kgf)
- Working temperature：0～60℃

A Speed controller
Tube for piping：φ6×100mm

Catalog No.		U/Price
Type	No.	Q'ty:1～9
MRE	50	85,000

Order — Catalog No. MRE50

Delivery — 1 Day

Price

■Volume discount rate P.37

Quantity	1～9	10～19
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

■Features

- The MRE50 is designed in such a way that material is conveyed as a result of the change in velocity between the forward and return motions. Consequently, it can also convey material to the high side (max 2℃).
- The air consumption is less than 1/2 of that of MREE.
- The speed controller can be installed on the outside, permitting the speed to be adjusted even in a confined space.
- There are no concerns of failure of the AC power supply or the belt as in the case of a belt conveyor.
- There is no need to carry out wiring for a solenoid valve of an air cylinder, for example.
- A guide type linear bushing is used, enabling to withstand eccentric loads and also realizing smooth motion.

■Air consumption (Load 250 N)

MPa	L/min
0.3	7
0.4	9
0.5	11
0.6	13

※When speed controller is fully open

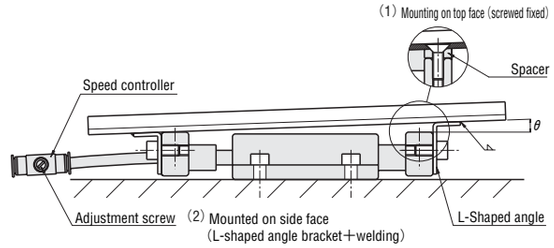
■Use Method

- When the compressed air (0.3～0.6 MPa) is connected to the air connector of the scrap remover, the table starts to vibrate. Use tubing that has an O.D. of 6 mm and an I.D. of 4mm.
- Adjust the screw of the speed controller, and fix the nut at the point corresponding to the correct speed.
- To facilitate conveyance of scrap, either change the inclination of the scrap shooter, or insert a plate or a washer between the scrap remover and the fixing base to tilt the scrap remover.
- Install the scrap shooter either by inserting countersunk bolts into the top surface, or by installing L-shaped angle brackets over the tap holes on the side face and welding the scrap shooter to it.
- If a lot of oil drips onto the scrap shooter, apply an embossed shooting plate (P.988).
- If the weight of the scrap is heavy, take steps to ensure that the scrap is distributed evenly on the scrap shooter.
- For details of the scrap shooter, refer to P.989.

■Notes

- If the scrap shooter is installed longer in one direction rather than symmetrically in the left and right directions, a high moment of inertia will be applied, which may cause the vibration to be reduced. In such a case, install a roller on the scrap shooter, for example.

■Attachment Example of Scrap Shooter



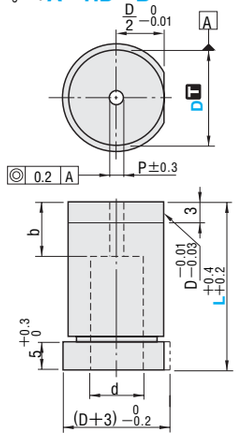
BUTTON DIE BLANKS

PRESS ADD.SPEC. Printed in Red

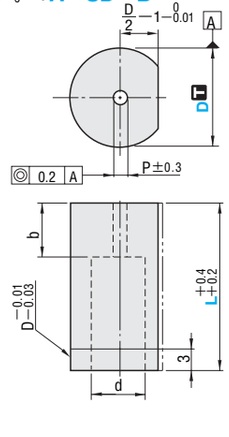
The volume discount rate is also applicable to alteration cost. P.39

RoHS

(Dm5) HD—B
(D+0.005 0) A—HD—B



(Dn5) SD—B
(D+0.005 0) A—SD—B



M SKD11 or equivalent
H 60～63HRC

D	Shank dia. tolerance Dm5	Dn5	+0.005 0	Catalog No. Type	D	L	P	b	d	U/Price Q'ty：1～9 HD—B	A—HD—B	SD—B	A—SD—B
6	+0.009 +0.004	——		(Dm5) HD—B (D+0.005 0) A—HD—B	6	16 20 22 25 28 30 32 35		3	3.4	850	1,050	—	—
8	+0.012 +0.006	+0.016 +0.010			8	16 20 22 25 28 30 32 35 (40)		4	4.4	830	1,030	700	900
10					10	16 20 22 25 28 30 32 35 (40) (45)	0.8	6	6.4	830	1,030	700	900
13	+0.015 +0.007	+0.020 +0.012			13	16 20 22 25 28 30 32 35 (40) (45)			8.4	760	960	640	840
16					16	16 20 22 25 28 30 32 35 (40) (45)			10.6	760	960	640	840
20	+0.017 +0.008	+0.024 +0.015		(Dm5) HD—B (D+0.005 0) A—HD—B	(20)	16 20 22 25 28 30 32 35 (40) (45)	1.0	8	12.6	850	—	700	—
22					(22)	16 20 22 25 28 30 32 35 (40) (45)			14.6	1,030	—	840	—
25					(25)	16 20 22 25 28 30 32 35 (40) (45)			16.6	1,200	—	940	—
32			——	(Dn5) SD—B (D+0.005 0) A—SD—B	(32)	16 20 22 25 28 30 32 35			20.6	1,530	—	1,200	—
38	+0.020 +0.009	+0.028 +0.017			(38)	16 20 22 25 30 35			26.6	2,200	—	1,740	—
45					(45)	20 22 25 30 35	2.8		36.0	4,480	—	3,970	—
50					(50)	20 22 25 30 35			41.0	5,480	—	4,810	—
56	+0.024 +0.011	+0.023 +0.020			(56)	20 22 25 30 35			46.0	6,600	—	5,930	—

(40) is available for HD—B, A—HD—B, SD—B.
(45) is available for HD—B only.
D(20)～D(56) are available for shank dia. tolerance of Dm5 and Dn5 only.

Order Catalog No. — L
SD—B 20 — 25

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery 3 Days

Express	T	1,600/1Pc.
Express	A	800/1Pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration Catalog No. — L(LC) — (HC・TC…etc.)
SD—B 25 — LC27 — WKC

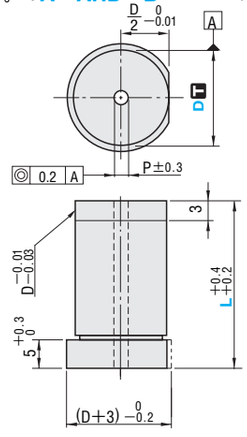
Alterations		Code	Spec.	¥/1Code
Head		HC	Changes head diameter H D≦HC<H 0.1mm increments	200
		TC	Changes head thickness 2≦TC<5 0.1mm increments L is shortened according to (5—TC). If LC is applied, L is equal to LC.	200
		WKC	Adds key flats in parallel L(LC)<16：Not available	200
		NKC	Eliminates key flat D>16：Not available	0
		RC	 Reduces head thickness by −0.04～0 from retainer surface L<30：Not available	200

Alterations		Code	Spec.	¥/1Code
Full length		LC	• HD—B Changes full length 10≦L—(b—1)≦LC<L 0.1mm increments Press-in lead is (L—LC) shorter. • SD—B Changes full length 10≦LC<L 0.1mm increments Press-in lead is (L—LC) shorter.	200
Others		NHC	Eliminates start hole D>16：Not available	−100

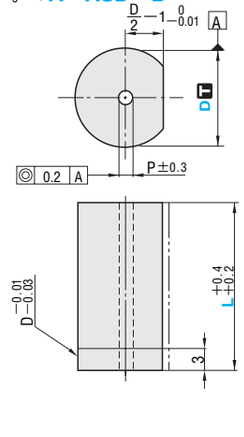
—For angular button die—

RoHS

(Dm5) AHD—B
(D+0.005 0) A—AHD—B



(Dn5) ASD—B
(D+0.005 0) A—ASD—B



M SKD11 or equivalent
H 60～63HRC

D	Shank dia. tolerance Dm5	Dn5	+0.005 0	Catalog No. Type	D	L	P	U/Price Q'ty：1～9 AHD—B	A—AHD—B	ASD—B	A—ASD—B
6	+0.009 +0.004	——		(Dm5) AHD—B (D+0.005 0) A—AHD—B	6	16 20 22 25 30 35		1,010	1,210	—	—
8	+0.012 +0.006	+0.016 +0.010			8	16 20 22 25 30 35		980	1,180	850	1,050
10					10	16 20 22 25 30 35 (40)		980	1,180	850	1,050
13	+0.015 +0.007	+0.020 +0.012			13	16 20 22 25 30 35 (40)	0.8	930	1,130	790	990
16					16	16 20 22 25 30 35 (40)		930	1,130	790	990
20	+0.017 +0.008	+0.024 +0.015	——	(Dm5) AHD—B (D+0.005 0) A—AHD—B (Dn5) ASD—B (D+0.005 0) A—ASD—B	(20)	16 20 22 25 30 35		1,000	—	850	—
25					(25)	16 20 22 25 30 35		1,360	—	1,090	—

(40) is available for AHD—B only.
D(20)・D(25) are available for shank dia. tolerance of Dm5 and Dn5 only.

Order Catalog No. — L
AHD—B 20 — 25

Delivery 3 Days

Express	T	1,600/1Pc.
Express	A	800/1Pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC) — (HC・TC・WKC…etc.)
AHD—B 20 — 25 — TC3

Alterations		Code	Spec.	¥/1Code
Head		HC	Changes head diameter H D≦HC<H 0.1mm increments	200
		TC	Changes head thickness 2≦TC<5 0.1mm increments L is shortened according to (5—TC). If LC is applied, L is equal to LC.	200
		WKC	Adds key flats in parallel L(LC)<16：Not available	200
		NKC	Eliminates key flat D>16：Not available	0

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length 10≦LC<L 0.1mm increments Press-in lead is (L—LC) shorter.	200
Others		NHC	Eliminates start hole D>16：Not available	−100

SPACERS FOR BUTTON DIE
—FOR ANGULAR BUTTON DIES AND BACK RELIEF HOLE OF STRAIGHT BUTTON DIE TYPE—

The volume discount rate is also applicable to alteration cost. P.39

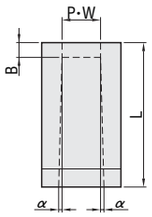
—For angular button die—

RoHS

M SK5
H 45HRC～

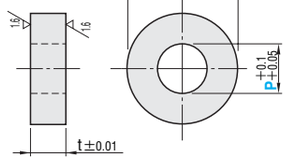
■Dimension L of button dies and extent width of dimension P and W

Partial dimension : Extent width of P and W (when B=2)
Values of table below are those of (α×2)

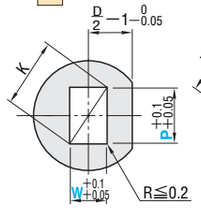


L \ Taper	1/50	1/100	1/150
16	0.28	0.14	0.09
20	0.36	0.18	0.12
22	0.40	0.20	0.13
25	0.46	0.23	0.15
30	0.56	0.28	0.19
35	0.66	0.33	0.22
40	0.76	0.38	0.25

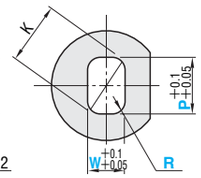
Shape A SSD



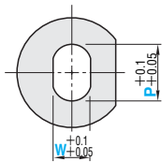
Shape D SSDD



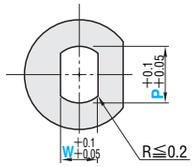
Shape R SSDR



Shape E SSDE



Shape G SSDG



(?)P≧W
(?)K=√(P²+W²)

(?)P≧W
(?)0.15≦R<W/2
(?)K=√((P−2R)²+(W−2R)²+2R

(?)P>W

(?)P>W

Catalog No. Type	D	0.01mm increments Ⓐ min.	Ⓐ P max.	DREG P·Kmax.	DREG P·Wmin.	Ⓡ R	t	U/Price (1set : 8spacers) Q'ty : 1～4 sets
Ⓐ SSD	6	1.00～	4.00	—	—	—	0.05	2,220
Ⓓ SSDD	8	1.00～	5.00	5.00	1.00	0.15≦R<W/2 (Ⓡonly)	0.1	2,560
Ⓡ SSDR	10	2.00～	7.00	7.00	1.20		0.2	2,920
Ⓔ SSDE	13	3.00～	9.00	9.00	1.50		0.3	3,320
Ⓖ SSDG	16	5.00～	12.00	12.00	2.00		0.5	3,480
	20	7.00～	16.00	16.00	3.00		1.0	4,210
	25	10.00～	20.00	20.00	3.00		1.5 2.0	4,370

(?)1 set consists of 8 spacers(1 piece for each t size).

Order — Catalog No. — P — W — R (Ⓡonly)
SSDG 10 — P5.65 — W3.25

Delivery — 3 Days
Express A 800/1Pc. P.38
(?)A flat charge of 2,160 yen for 3 sets or more.

Alteration — Catalog No. — P — W — R — (KC)
SSDD 8 — P3.60 — W2.85 — KC90

Alteration	Code	Ⓐ	DREG	¥/1Code
Head	KC	Key flat on one side	Change angle 1° increments (270° 180° 90° 0°)	200

Price

■Volume discount rate P.37

Quantity	1～4 sets	5～9	10～29	30～50
Rate	—	5%	10%	15%

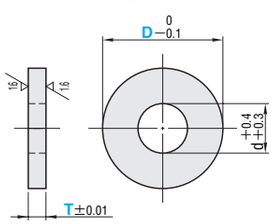
(?)To be quoted on price & lead time above Max. Q'ty.

—For back relief hole of straight button die—

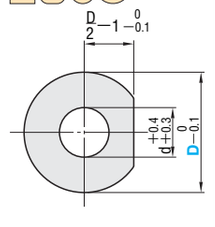
RoHS

M SK5
H 45HRC～

Shape A SSDN



Shape D R E G SSDHN



d	Catalog No. Type	D	T	U/Price (1set : 5spacers) Q'ty : 1～9 sets T0.05	T0.1	T0.2	T0.5	T1.0
3.4	SSDN (Round D6～25)	6	0.05	330	340	350	360	370
4.4		8	0.1	390	400	410	410	420
6.4		10	0.2	450	460	470	480	490
8.4		13	0.5	510	520	530	540	550
10.6	SSDHN (Shaped D8～25)	16	1.0	570	580	590	590	600
12.6		20		690	700	710	720	730
16.6		25		810	820	830	840	850

(?)5 spacers of an identical T dimension make up a set.
When T0.1, for example, the set consists of 5 spacers of 0.1 thickness.

Order — Catalog No. — T
SSDN 6 — 0.1

Delivery — 1 Day

Price

■Volume discount rate P.37

Quantity	1～9 sets	10～29	30～99	100～200
Rate	—	5%	10%	15%

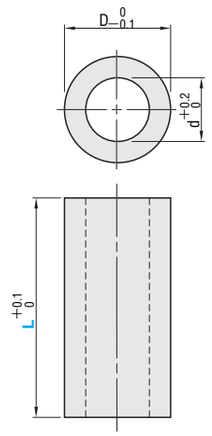
(?)To be quoted on price & lead time above Max. Q'ty.

COLLARS FOR BUTTON DIES

The volume discount rate is also applicable to alteration cost. P.39

RoHS

HBDC



M SKS3
H 58～60HRC

D 0 −0.1	d +0.2 0	Catalog No. Type	No.	L 0.1mm increments	U/Price Q'ty : 1～9
11	5.4	HBDC	8	10.0 ～ 60.0	320
13	7.8		10		360
16	10		13		520
19	12.4		16		560
23	14.6		20		610
25	16.8		22		650
28	18.8		25		720
35	23		32		880

Order — Catalog No. — L
HBDC 8 — 40.5

Delivery — 3 Days

Price

■Volume discount rate P.37

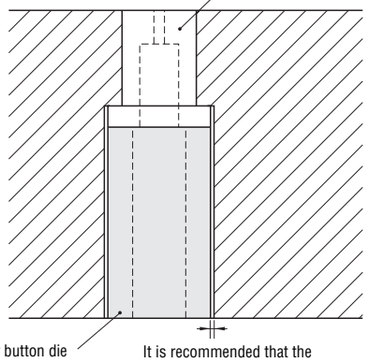
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

(?)To be quoted on price & lead time above Max. Q'ty.

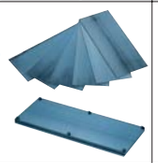
Alteration — Catalog No. — L — (LKC)
HBDC 8 — 40.5 — LKC

Alteration	Code	Spec.	¥/1Code
Full length (L)	LKC	Changes full length tolerance L +0.1 0 ⇨ +0.05 0	300

Example



■Products related to shim and spacer

Multilayer plates for spacer	Precision multipurpose plates	Hardened plates	Shim tapes
LHP LHP—H LHP—SET	UTPB UTPL	HPSH HPHE	FGSM FGSMW FGSML
			
P.751	P.753	P.1181	P.752

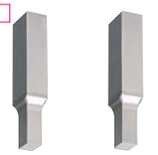
BLOCK PUNCHES

BLOCK PUNCHES

Name	BLOCK PUNCHES	BLOCK PUNCHES —Tapped—	JECTOR BLOCK PUNCHES —Tapped—	BLOCK PUNCHES —With key groove—	JECTOR BLOCK PUNCHES —With key groove—
Catalog No.					
Delivery	③Ⓣ Ⓐ·③	③Ⓐ·③	③Ⓐ·⑧	③Ⓐ·③	③Ⓐ·⑧
Page	311	313	315	317	319

BLOCK PUNCHES —Single flanged—	JECTOR BLOCK PUNCHES —Single flanged—	BLOCK PUNCHES —Double flanged—	JECTOR BLOCK PUNCHES —Double flanged—	BLOCK PUNCHES FOR HEAVY LOAD—Flange thickness 10mm— —Single flanged—	—Double flanged—
③Ⓐ·③·⑧	③Ⓐ·⑧	③Ⓐ·③·⑧	③Ⓐ·⑧	③Ⓐ·③	③Ⓐ·③
321	323	325	327	329	331

BLOCK PUNCHES —Flange fixing type—	BLOCK PUNCHES—Configurable type— —Standard type—	—Tapped—	—With key groove—	—Single flanged—	—Double flanged—
③Ⓐ·③	⑧	⑧	⑧	⑧	⑧
333	335	335	335	335	335



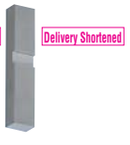
BLOCK PUNCHES—WPC® type— —Standard type—	—Tapped—	—With key groove—	—Single flanged—	—Double flanged—	BLOCK PUNCHES—TiCN coating type— —Standard type—	—Tapped—	—With key groove—
⑤	⑤	⑤	⑤·⑧	⑤·⑧	⑤	⑤	⑤
339	339	339	339	339	343	343	343

BLOCK PUNCHES—TiCN coating type— —Single flanged—	—Double flanged—	BLOCK PUNCHES—HW coating type— —Standard type—	—Tapped—	—With key groove—	—Single flanged—	—Double flanged—
⑤·⑧	⑤·⑧	⑤	⑤	⑤	⑤·⑩	⑤·⑩
343	343	347	347	347	347	347

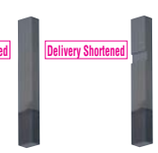
JECTOR BLOCK PUNCHES—WPC® type— —Tapped—	—With key groove—	—Single flanged—	—Double flanged—	JECTOR BLOCK PUNCHES—TiCN coating type— —Tapped—	—With key groove—	—Single flanged—	—Double flanged—
⑤·⑧	⑤·⑧	⑤·⑧	⑤·⑧	⑧	⑧	⑧	⑧
351	351	351	351	355	355	355	355

JECTOR BLOCK PUNCHES—HW coating type— —Tapped—	—With key groove—	—Single flanged—	—Double flanged—	BLOCK PUNCHES—Flange thickness 10mm,TiCN coating type— —Single flanged—	—Double flanged—	BLOCK PUNCHES—Flange thickness 10mm,WPC® type— —Single flanged—	—Double flanged—
⑩	⑩	⑩	⑩	⑤	⑤	⑤	⑤
359	359	359	359	363	363	365	365

BLOCK PUNCHES—Flange thickness 10mm,HW coating type— —Single flanged—	—Double flanged—	BLOCK PUNCHES—Configurable type / TiCN coating type— —Standard type—	—Tapped—	—With key groove—	—Single flanged—	—Double flanged—
⑤	⑤	⑧	⑧	⑧	⑧	⑧
365	365	369	369	369	369	369



STRAIGHT PUNCHES —Straight—	—Tapped—	—With key groove—	—Single flanged—	—Double flanged—	JECTOR STRAIGHT PUNCHES —Tapped—	—With key groove—	—Single flanged—	—Double flanged—
③Ⓐ·③	③Ⓐ·③	③Ⓐ·③	⑤Ⓑ·⑤·⑧	⑤Ⓑ·⑤·⑧	③Ⓐ·⑧	③Ⓐ·⑧	⑤Ⓑ·⑧	⑤Ⓑ·⑧·⑧
373	373	373	373	373	377	377	377	377



STRAIGHT PUNCHES—TiCN coating type— —Straight—	—Tapped—	—With key groove—	JECTOR STRAIGHT PUNCHES—TiCN coating type— —Tapped—	—With key groove—	SHORT STRAIGHT PUNCHES —Tapped—	—Single flanged—	—Double flanged—
⑤	⑤	⑤	⑧	⑧	③	③	③
381	381	381	383	383	385	385	385

BLOCK PUNCH BLANKS	JECTOR BLOCK PUNCH BLANKS
③Ⓐ	③Ⓐ
387	389

BLOCK PUNCH BLANKS—Short type—	FLANGE HOLDERS HFW	FIXED KEYS／SLOTTED KEYS PSK□ PSKBH	—Long type— PSKW
③Ⓐ	③Ⓐ	①	③Ⓐ
391	393	394	394

BLOCK PUNCHES LIST
—GUIDE 1—

Printed in red are New Products / Delivery Shortened.

	Type		Material	Standard Type	Product Time	Page	TiCN coating type Type	Product Time	Page	WPC® coating type Type	Product Time	Page	HW coating type Type	Product Time	Page
Fixed size type	Standard		SKD11 or equivalent	HP□□	3TA	P.311			P.343	W—HP□□	5	P.339			P.347
			SKH51	HSP□□	3		H—HSP□□	5		W—HSP□□			HW—HSP□□	5	
			Powdered high-speed steel	PHP□□	3TA		H—PHP□□	5		W—PHP□□			HW—PHP□□		
	Tapped		SKD11 or equivalent	HM□□	3A	P.313			P.343	W—HM□□	5	P.339			P.347
			SKH51	HSM□□	3		H—HSM□□	5		W—HSM□□			HW—HSM□□	5	
			Powdered high-speed steel	PHM□□	3A		H—PHM□□	5		W—PHM□□			HW—PHM□□		
	Jector Tapped		SKD11 or equivalent	HJM□□	3A	P.315			P.355	W—HJM□□	5	P.351			P.359
			SKH51	HSJM□□	8		H—HSJM□□	8		W—HSJM□□	8		HW—HSJM□□	10	
			Powdered high-speed steel	PHJM□□	8		H—PHJM□□	8		W—PHJM□□			HW—PHJM□□		
	With key groove		SKD11 or equivalent	HK□□	3A	P.317			P.343	W—HK□□	5	P.339			P.347
			SKH51	HSK□□	3		H—HSK□□	5		W—HSK□□			HW—HSK□□	5	
			Powdered high-speed steel	PHK□□	3A		H—PHK□□	5		W—PHK□□			HW—PHK□□		
	Jector With key groove		SKD11 or equivalent	HJK□□	3A	P.319			P.355	W—HJK□□	5	P.351			P.359
			SKH51	HSJK□□	8		H—HSJK□□	8		W—HSJK□□	8		HW—HSJK□□	10	
			Powdered high-speed steel	PHJK□□	8		H—PHJK□□	8		W—PHJK□□			HW—PHJK□□		
	Single flanged		SKD11 or equivalent	HF□□	3A	P.321			P.343	W—HF□□	5	P.339			P.347
			SKH51	HSF□□	3・8		H—HSF□□	5・8		W—HSF□□	5・8		HW—HSF□□	5・10	
			Powdered high-speed steel	PHF□□	3A		H—PHF□□	5		W—PHF□□	5		HW—PHF□□	5・10	
	Jector Single flanged		SKD11 or equivalent	HJF□□	3A	P.323			P.355	W—HJF□□	5	P.351			P.359
			SKH51	HSJF□□	8		H—HSJF□□	8		W—HSJF□□	8		HW—HSJF□□	10	
			Powdered high-speed steel	PHJF□□	8		H—PHJF□□	8		W—PHJF□□			HW—PHJF□□		
	Double flanged		SKD11 or equivalent	HW□□	3A	P.325			P.343	W—HW□□	5	P.339			P.347
			SKH51	HSW□□	3・8		H—HSW□□	5・8		W—HSW□□	5・8		HW—HSW□□	5・10	
			Powdered high-speed steel	PHW□□	3A		H—PHW□□	5		W—PHW□□	5		HW—PHW□□	8C	
	Jector Double flanged		SKD11 or equivalent	HJW□□	3A	P.327			P.355	W—HJW□□	5	P.351			P.359
			SKH51	HSJW□□	8		H—HSJW□□	8		W—HSJW□□	8		HW—HSJW□□	10	
			Powdered high-speed steel	PHJW□□	8		H—PHJW□□	8		W—PHJW□□			HW—PHJW□□		
	Flange thickness 10mm Single flanged		SKD11 or equivalent	AHF□□	3A	P.329			P.363	W—AHF□□	5	P.365			P.365
			SKH51	AHSF□□	3		H—AHSF□□	5		W—AHSF□□			HW—AHSF□□	5	
			Powdered high-speed steel	APHF□□	3A		H—APHF□□	5		W—APHF□□			HW—APHF□□		
	Flange thickness 10mm Double flanged		SKD11 or equivalent	AHW□□	3A	P.331			P.363	W—AHW□□	5	P.365			P.365
			SKH51	AHSW□□	3		H—AHSW□□	5		W—AHSW□□			HW—AHSW□□	5	
			Powdered high-speed steel	APHW□□	3A		H—APHW□□	5		W—APHW□□			HW—APHW□□		
	Flange fixing type		SKD11 or equivalent	HT□□	3A	P.333									
			SKH51	HST□□	3										
			Powdered high-speed steel	PHT□□	3A										
Configurable type	Standard		SKD11 or equivalent	FHP□	8	P.335			P.369						
			SKH51	FHSP□			H—FHSP□	8							
			Powdered high-speed steel	FPHP□			H—FPHP□								
	Tapped		SKD11 or equivalent	FHM□		P.335			P.369						
			SKH51	FHSM□			H—FHSM□	8							
			Powdered high-speed steel	FPHM□			H—FPHM□								
	With key groove		SKD11 or equivalent	FHK□		P.335			P.369						
			SKH51	FHSK□			H—FHSK□	8							
			Powdered high-speed steel	FPHK□			H—FPHK□								
	Single flanged		SKD11 or equivalent	FHF□		P.335			P.369						
			SKH51	FHSF□			H—FHSF□	8							
			Powdered high-speed steel	FPHF□			H—FPHF□								
	Double flanged		SKD11 or equivalent	FHW□		P.335			P.369						
			SKH51	FHSW□			H—FHSW□	8							
			Powdered high-speed steel	FPHW□			H—FPHW□								
Straight type	Straight		SKD11 or equivalent	HPC□	3A	P.373			P.381						
			SKH51	HSPC□	3		H—HSPC□	5							
			Powdered high-speed steel	PHPC□	3A		H—PHPC□	5							
	Straight Tapped		SKD11 or equivalent	HMC□	3A	P.373			P.381						
			SKH51	HSMC□	3		H—HSMC□	5							
			Powdered high-speed steel	PHMC□	3A		H—PHMC□	5							
	Jector Straight Tapped		SKD11 or equivalent	HJMC□	3A	P.377			P.383						
			SKH51	HSJMC□	8		H—HSJMC□	8							
			Powdered high-speed steel	PHJMC□			H—PHJMC□								
	Straight With key groove		SKD11 or equivalent	HKC□	3A	P.373			P.381						
			SKH51	HSKC□	3		H—HSKC□	5							
			Powdered high-speed steel	PHKC□	3A		H—PHKC□	5							
	Jector Straight With key groove		SKD11 or equivalent	HJKC□	3A	P.377			P.383						
			SKH51	HSJKC□	8		H—HSJKC□	8							
			Powdered high-speed steel	PHJKC□			H—PHJKC□								

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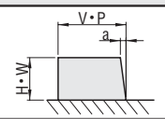
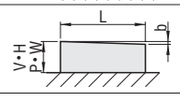
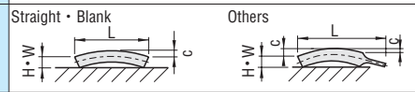
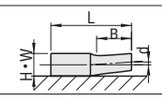
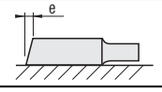
	Type		Material	Standard Type	Product Time	Page	TiCN coating type Type	Product Time	Page	WPC® coating type Type	Product Time	Page	HW coating type Type	Product Time	Page
Straight type	Straight Single flanged		SKD11 or equivalent	HFC□	5B	P.373									
			SKH51	HSFC□	5・8										
			Powdered high-speed steel	PHFC□	5B										
	Jector Straight Single flanged		SKD11 or equivalent	HJFC□	5B	P.377									
			SKH51	HSJFC□	8										
			Powdered high-speed steel	PHJFC□											
	Straight Double flanged		SKD11 or equivalent	HWC□	5B	P.373									
			SKH51	HSWC□	5・8										
			Powdered high-speed steel	PHWC□	5B										
	Jector Straight Double flanged		SKD11 or equivalent	HJWC□	5B	P.377									
			SKH51	HSJWC□	8										
			Powdered high-speed steel	PHJWC□											
	Short Straight Tapped		SKD11 or equivalent	HMCDS	3	P.385									
			Powdered high-speed steel	PHMCDS											
	Short Straight with Single Flanged		SKD11 or equivalent	HFCDS	3	P.385									
			Powdered high-speed steel	PHFCDS											
	Short Straight with Double Flanged		SKD11 or equivalent	HWCDS	3	P.385									
			Powdered high-speed steel	PHWCDS											
Blanks	Standard		SKD11 or equivalent	HPB (H6~30)	3A	P.387									
			SKH51	HPB (H3~5)											
			Powdered high-speed steel	PHPB											
	Tapped		SKD11 or equivalent	HMB (H6~30)	3A	P.387									
			SKH51	HMB (H5)											
			Powdered high-speed steel	PHMB											
	Jector Tapped		SKD11 or equivalent	HJMB	3A	P.389									
	With key groove		SKD11 or equivalent	HKB (H6~30)	3A	P.387									
			SKH51	HKB (H3~5)											
			Powdered high-speed steel	PHKB											
	Jector With key groove		SKD11 or equivalent	HJKB	3A	P.389									
	Single flanged		SKD11 or equivalent	HFB (H6~30)	3A	P.387									
			SKH51	HFB (H3~5)											
			Powdered high-speed steel	PHFB											
	Jector Single flanged		SKD11 or equivalent	HJFB	3A	P.389									
	Double flanged		SKD11 or equivalent	HWB (H6~30)	3A	P.387									
			SKH51	HWB (H3~5)											
			Powdered high-speed steel	PHWB											
	Jector Double flanged		SKD11 or equivalent	HJWB	3A	P.389									
	Short Tapped		SKD11 or equivalent	HMBS	3A	P.391									
			Powdered high-speed steel	PHMBS											
	Short with Single Flanged		SKD11 or equivalent	HFBS	3A	P.391									
			Powdered high-speed steel	PHFBS											
	Short with Double Flanged		SKD11 or equivalent	HWBS	3A	P.391									
			Powdered high-speed steel	PHWBS											

BLOCK PUNCHES
—GUIDE 2—

■Improved contour precision of Block punch

The contour precision of Block punch is improved in order to meet the demand for die precision.
This Block punch reduces the numbers of die assembling process which were caused by the lack of precision of Block punch.

■Contour precision standard

BASIS OF TOLERANCE		Standard	
		Old standard	New standard
Perpendicularity		H≦10 a≦0.005 10＜H≦30 a≦0.01	a≦0.005
Parallelism		b≦0.01	b≦0.005
Warpage		c≦0.01	c≦0.005
Bends at the blade		d≦0.01	d≦0.01
Perpendicularity of the head		e≦0.01	e≦0.005

■Price reduction on shank tolerance alteration

Shank tolerance alteration price is reduced greatly.
Due to the difference on hole tolerance of EDM machining and shank tolerance, it required additional alteration, however, this alteration reduces such additional processes.

			Former price	New price
Standard	V・H±0.01	⇨		
Alteration	VKC	V・H $^{+0.005}_{0}$	600 Yen	⇨ 300 Yen
Alteration	VKM	V・H $^{0}_{-0.005}$	600 Yen	⇨ 300 Yen
Alteration	VHM	V・H $^{0}_{-0.01}$	400 Yen	⇨ 200 Yen
Alteration	VHZ	V・H ±0.005	400 Yen	⇨ 100 Yen

■Shorter delivery time for High-speed steel（SKH51）Block punch

Along with the increase of hard machinability materials such as stainless steel, high tensile steel or hardened steed, delivery time of high-speed steel（SKH51）Block punch, which is superior in wear resistance and toughness than die steel（SKD11）, is greatly shortened and accessible.

Previous delivery time

8 Days ⇨

Delivery time after shortening

3 Days （**Without surface treatment**）
5 Days （**With surface treatment**）

※Excludes some of the types with flange, Jector punch and HW coating products.

■Expansion of coating type availability

Well received surface treatment, WPC® and HW coating of round shank punch is now available for Block punch. These are recommended for severe conditions when existing TiCN coating products were used.

How to order

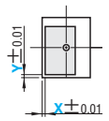
■The blade tip position is selectable freely within the range of shank V and H.

(1) The blade is in the center of shank.

Catalog No.	V	H	–	L	–	P.W.R
HMDS	20	10	–	60	–	P16.00 – W8.00

(2) The blade is not in the center of shank.

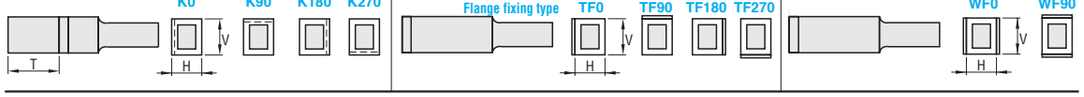
Specify X and Y. 0.01mm increment. Tolerance ±0.01. But specify 0, or 0.02 or over.



Catalog No.	V	H	–	L	–	P.W.R.X.Y
HMDL	20	10	–	60	–	P16.00 – W8.00 – X0.10 – Y0.10

■The position of key groove and flange is selectable freely.(Flange thickness 10mm type is fixed)

With key groove					Single flanged type/Flange fixing type.					Double flanged type	
K0	K90	K180	K270		Single flanged type Flange fixing type	F0 TF0	F90 TF90	F180 TF180	F270 TF270	WF0	WF90



The position of key groove and flanges are at the standard position (0) as default. The position is specifiable at free of charge.

Catalog No.	V	H	–	L	–	P.W.R	–	WF
HWES	13	10	–	70	–	P10.0	– W7.3	– WF90

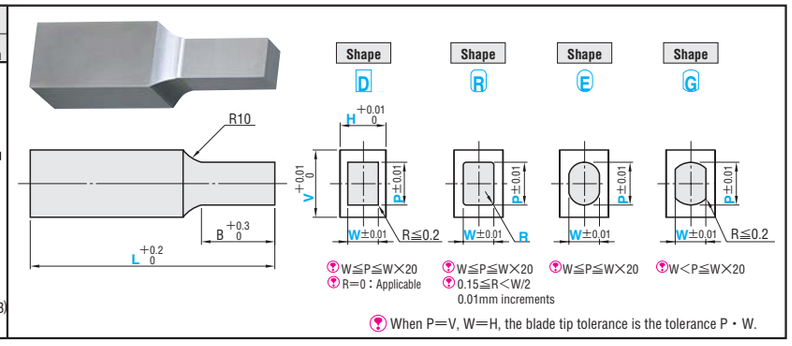
■The corner R of square type D

The corners have less than 0.2 R as default.
When R 0 is needed, specify R 0.

Catalog No.	V	H	–	L	–	P.W
HPDS	10	08	–	60	–	P8.00 – W6.5 – R0

■Example of selecting Catalog No.

M H	Catalog No. Type	Shape	B Blade length
(H3～5) SKH51 61～64HRC (H6～30) SKD11 or equivalent 60～63HRC	HP	D R E G	S
SKH51 61～64HRC	HSP (H6～30)		L
Powdered high speed steel 64～67HRC	PHP		Blade length(B) L＞S



(Example)

①Select powdered high-speed steel. ⇨ Type **PHP**
②Select shape：D ⇨ Shape **D**
③Select blade length：S（short type） ⇨ Blade length **S**

※Catalog No. is **PHPDS**

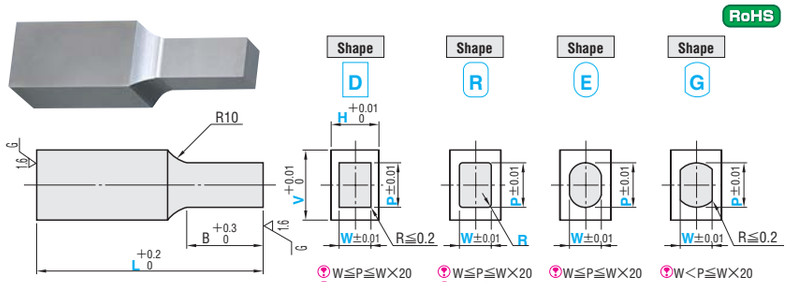
BLOCK PUNCHES

DELIVERY SHORTENED
HSP(SKH51)
Delivery time
8 Days→3 Days

The volume discount rate is also applicable to alteration cost. P.39

M / H	Catalog No. Type	Shape	B Blade length
(H3～5) SKH51 61～64HRC (H6～30) SKD11 or equivalent 60～63HRC	HP	D R E G	S
SKH51 61～64HRC	HSP (H6～30)		L
Powdered high-speed steel 64～67HRC	PHP		Blade length(B) L>S

RoHS



- W≦P≦W×20 (R=0 : Applicable)
- W≦P≦W×20 (0.15≦R<W/2, 0.01 mm increments)
- W≦P≦W×20
- W<P≦W×20

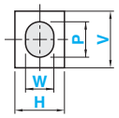
When P=V, W=H, the blade tip tolerance is the tolerance of P・W.

Catalog No. Type	Shape	B Blade length	H	W	Rmin.	V	3	4	5	6	8	10	13	16	20	22	25	28	30	(40)	(50)	L	B S	B L
							1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0	16.0	20.0			
			(3)	1.0			○	○	○	○	○	○	○	○	○	○							6	8
			(4)	1.0				○	○	○	○	○	○	○	○	○								
			5	1.2					○	○	○	○	○	○	○	○	○	○	○			(40)	8	13
		S	6	1.5						○	○	○	○	○	○	○	○	○	○			(50)		
HP	D		8	2.0							○	○	○	○	○	○	○	○	○	○		60		
HSP (H6～30)	R		10	2.5								○	○	○	○	○	○	○	○	○	○	70	13	19
PHP	E		13	3.0									○	○	○	○	○	○	○	○	○	80		
	G		16	4.0										○	○	○	○	○	○	○	○	90		
		L	20	5.0											○	○	○	○	○	○	○	100		
			22	6.0												○	○	○	○	○	○		19	25
			25	6.5													○	○	○	○	○			
			28	7.0														○	○	○	○			
			30	7.5															○	○	○			

- L(40)・H10～30 B=13 When the full length is (40) and dimension H is 10～30, the blade length is fixed to 13mm.
- L(50)・H16～30 B=19 When the full length is (50) and dimension H is 16～30, the blade length is fixed to 19mm.
- When H(3), (4), the length (L) is HP type : L40～80, PHP type : L40～70.
- V=(40)・(50) are standards for HP type only.

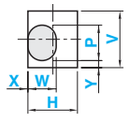
Order

(1)The blade is in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R(Ⓡ only)
PHPES	08	06	60	P7.62	W3.81	

(2)The blade is not in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R(Ⓡ only)	X−Y
PHPES	20	10	60	P14.05	W6.05		X0.00 − Y0.50

(Ⓨ X, Y specification is 0.02 over, or 0. Tolerance ±0.01)

Delivery 3 Days

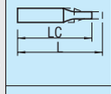
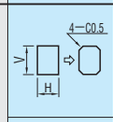
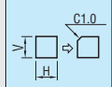
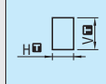
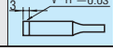
Express	T	1,600/1Pc.
Express	A	800/1Pc.

P.38

Ⓨ A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).
⊗ Express T and A are not available for HSP.

Alteration

Catalog No. V H − L(LC) − P(PC)−W(WC)−R−X−Y − (BC・PKC…etc.)
PHPES 20 10 − LC65.5 − P16.00 − W8.00 − BC15.5 − VHZ

	Alterations	Code	Spec.	¥/1Code
Blade		PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01 mm increments W(WC) / Bmax: 0.50～0.99 / 4; 1.00～1.19 / 8; 1.20～1.99 / 13; 2.00～2.99 / 20; 3.00～4.99 / 30; 5.00～ / 35	200
		BC	Changes blade length B 2≦BC≦Bmax 0.1 mm increments Ⓨ Full length L(LC) requires BC+30mm or more.	400
		SC	Finishes blade with lapping Ⓨ W≧2.00 Ⓨ Dimension P tolerance and the specification unit remain the same. Ⓨ Pay attention to delivery time. 5 Days ⊗ Express is not available. ⊗ D shape : R=0 Not applicable	1,200
		PKC	Changes blade tolerance P・W P・W±0.01 ⇨ $^{+0.01}_{0}$	400
		PKV	Changes blade tolerance P・W P・W±0.01 ⇨ ±0.005	400
Full length		LC	Changes full length 30+B(BC)≦LC<L 0.1 mm increments (Combination with LKC・LKZ→0.01mm increments) Ⓨ When LC−B is 30mm or less, blade length is full length−30mm.	200
		LKC	Changes full length tolerance L $^{+0.2}_{0}$ ⇨ $^{+0.05}_{0}$	400
		LKZ	Changes full length tolerance L $^{+0.2}_{0}$ ⇨ $^{+0.01}_{0}$	600
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	200
		CCP	Adds chamfering (C1.0) to a corner of shank. (Error prevention) Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270	200
		VKC	Changes shank tolerance (V・H) V・H $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	300
		VKM	Changes shank tolerance (V・H) V・H $^{+0.01}_{0}$ ⇨ $^{0}_{-0.005}$	300
		VHM	Changes shank tolerance (V・H) V・H $^{+0.01}_{0}$ ⇨ $^{0}_{-0.01}$	200
		VHZ	Changes shank tolerance (V・H) V・H $^{+0.01}_{0}$ ⇨ ±0.005	100
		DC	Adds press-in lead Adds 3mm (V・H $^{-0.01}_{-0.03}$) press-in lead	200

Price ■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

Catalog No.	H \ V	3・4・5	6・8・10	13・16	20・22・25	28・30	40	50
HPDS HPDL HPES HPEL	3・4	1,850	1,980	2,150	2,320			
	5・6	1,850	2,020	2,320	2,600	2,900		
	8・10		2,150	2,430	2,670	2,900	3,130	3,480
	13・16			2,730	2,900	3,130	3,480	3,830
	20・22				3,020	3,370	3,950	4,180
	25・28				3,600	3,830	4,060	4,410
	30					3,950	4,180	4,530
HPRS HPRL	3・4	4,300	4,300	4,650	4,870			
	5・6	4,300	4,410	4,760	5,000	5,220		
	8・10		4,530	4,870	5,220	5,450	6,160	6,380
	13・16			5,340	5,930	6,160	6,740	6,960
	20・22				6,610	6,860	7,310	7,550
	25・28				7,200	7,440	7,780	8,020
	30					7,550	8,250	8,480
HPGS HPGL	3・4	2,200	2,200	2,690	2,810			
	5・6	2,200	2,440	2,690	2,930	3,290		
	8・10		2,440	2,810	3,050	3,420	3,660	4,160
	13・16			3,180	3,420	3,660	3,900	4,270
	20・22				3,790	4,030	4,270	4,530
	25・28				4,160	4,270	4,640	4,890
	30					4,530	5,010	5,260

Catalog No.	H \ V	6・8・10	13・16	20・22	25・28	30
HSPDS HSPDL HSPES HSPEL	6	2,640	3,130	3,820	4,040	4,370
	8・10	2,990	3,590	4,040	4,660	5,240
	13・16		4,360	4,870	5,500	6,490
	20・22			5,600	6,840	7,870
	25・28				8,320	9,400
	30					9,610
HSPRS HSPRL	6	5,080	5,640	6,060	6,360	6,740
	8・10	5,440	6,120	6,740	7,270	7,850
	13・16		7,020	8,000	8,630	9,360
	20・22			9,310	10,440	11,520
	25・28				11,990	13,060
	30					13,340
HSPGS HSPGL	6	3,060	3,530	3,950	4,430	4,790
	8・10	3,310	4,010	4,540	5,200	5,840
	13・16		4,850	5,490	6,140	6,900
	20・22			6,510	7,680	8,810
	25・28				8,950	10,050
	30					10,450

Catalog No.	H \ V	3・4・5	6・8・10	13・16	20・22	25・28	30
PHPDS PHPDL PHPES PHPEL	3・4	2,640	2,930	3,320	3,740		
	5・6	2,690	3,040	3,680	4,620	4,890	5,350
	8・10		3,550	4,350	4,940	5,910	6,800
	13・16			5,440	6,180	7,150	8,270
	20・22				7,320	9,260	11,010
	25・28					11,390	13,100
	30						13,390
PHPRS PHPRL	3・4	5,200	5,360	5,950	6,420		
	5・6	5,230	5,520	6,230	6,760	7,180	7,740
	8・10		6,050	6,930	7,740	8,540	9,430
	13・16			8,140	9,380	10,350	11,490
	20・22				11,110	12,910	14,620
	25・28					15,100	16,810
	30						17,190
PHPGS PHPGL	3・4	2,980	3,250	3,890	4,260		
	5・6	3,030	3,470	4,080	4,620	5,310	5,780
	8・10		3,880	4,800	5,530	6,500	7,450
	13・16			5,950	6,860	7,870	9,060
	20・22				8,310	10,190	11,990
	25・28					12,090	13,890
	30						14,390

BLOCK PUNCHES
—TAPPED—

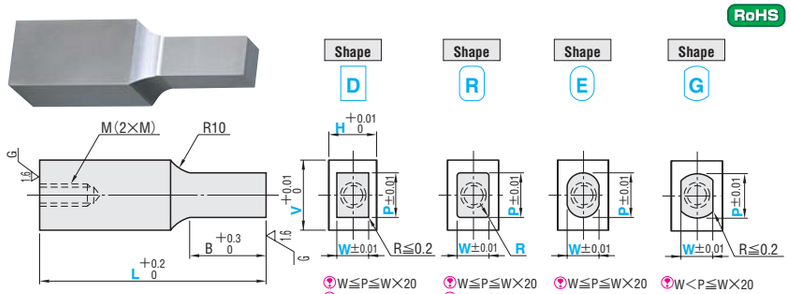
DELIVERY SHORTENED
HSM(SKH51) Delivery time 8 Days→3 Days

¥ The volume discount rate is also applicable to alteration cost. P.39

M H	Catalog No. Type	Shape	B Blade length
(H5) SKH51 61~64HRC (H6~30) SKD11 or equivalent 60~63HRC	HM	D R E G	S
SKH51 61~64HRC	HSM (H6~30)	D R E G	L
Powdered high-speed steel 64~67HRC	PHM	D R E G	L

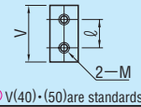
Blade length(B) L>S

RoHS



Catalog No. Type	Shape	B Blade length	H \ V	5	6	8	10	13	16	20	22	25	28	30	(40)	(50)	L	B S	B L	M
HM HSM (H6~30) PHM	D R E G	S	5 (W min. 1.2)	○	○	○	○	○	○	○	○	○	○	○			(40)	8	13	3
			6 (1.5)		○	○	○	○	○	○	○	○	○	○						4
			8 (2.0)			○	○	○	○	○	○	○	○	○	○					5
			10 (2.5)				○	○	○	○	○	○	○	○	○	○	(50)	13	19	6
			13 (3.0)					○	○	○	○	○	○	○	○	○	60			8
			16 (4.0)						○	○	○	○	○	○	○	○	70			
			20 (5.0)							○	○	○	○	○	○	○	80			
		L	22 (6.0)								○	○	○	○	○	○	90	19	25	
			25 (6.5)									○	○	○	○	○	100			
			28 (7.0)										○	○	○	○				
			30 (7.5)											○	○	○				

L(40)・H10~30 ···▸B=10 When the full length is (40) and dimension H is 10~30, the blade length is fixed to 10mm.
L(50)・H16~30 ···▸B=19 When the full length is (50) and dimension H is 16~30, the blade length is fixed to 19mm.

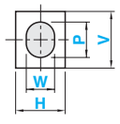


V40 ···▸2—M・ℓ=20 When V40, 2 taps and pitch 20mm.
V50 ···▸2—M・ℓ=24 When V50, 2 taps and pitch 24mm.

V(40)・(50) are standards for HM type only.

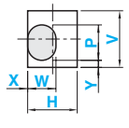
Order

(1)The blade is in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R(Ⓡonly)
HMES	08	06	60	P5.00	W2.50	

(2)The blade is not in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R(Ⓡonly)	X—Y
HMEL	08	06	60	P5.00	W2.50		X0.00 — Y0.50

(Ⓟ X, Y specification is 0.02 over, or 0. Tolerance ±0.01)

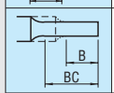
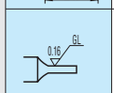
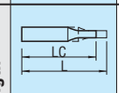
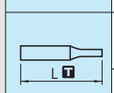
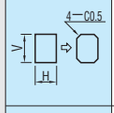
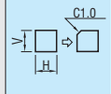
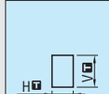
Delivery

3	Days	Express	A	800/1Pc.	P.38

Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.
⊗ Express A are not available for HSP.

Alteration

Catalog No.	V	H	—	L(LC)	—	P(PC)—W(WC)—R	—(BC・PKC・etc.)
HMES	20	10	—	LC65.5	—	P16.00—W8.00	—BC15.5

Alterations		Code	Spec.	¥/1Code
Blade		PC WC	Changes blade dimension PC≧V×0.3≧1.50 WC≧H×0.15≧0.75 0.01 mm increments W(WC) 0.75~0.99 / 1.00~1.19 / 1.20~1.99 / 2.00~2.99 / 3.00~4.99 / 5.00~ → Bmax 4 / 8 / 13 / 20 / 30 / 35	200
		BC	Changes blade length B 2≦BC≦Bmax 0.1 mm increments Ⓟ Full length L(LC) requires BC+30mm or more.	400
		SC	Finishes blade with lapping Ⓟ W≧2.00 Ⓟ Dimension P tolerance and the specification unit remain the same. Ⓟ Pay attention to delivery time. 5 Days ⊗ Express is not available. ⊗ D shape : R=0 Not applicable	1,200
		PKC	Changes blade tolerance P・W P・W±0.01 ⇨ +0.01 0	400
		PKV	Changes blade tolerance P・W P・W±0.01 ⇨ ±0.005	400
Full length		LC	Changes full length 30+B(BC)≦LC<L 0.1 mm increments (Combination with LKC・LKZ→0.01mm increments) Ⓟ When LC—B is 30mm or less, blade length is full length—30mm.	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance L +0.2 0 ⇨ +0.01 0	600
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. 0.5mm or longer.	200
		CCP	Adds chamfering (C1.0) to a corner of shank. (Error prevention) Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 Blade corner Blade corner ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270	200
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100
		MC (ⓅMMC)	Changes tap size. □SKD11 or equivalent H \ V: 6 → M4→M3; 8 → M5→M4; 10 → (M6→M4 Ⓟ / M6→M5) M6→M5; 13 → (M8→M5 Ⓟ / M8→M6) M8→M6 Ⓟ When changing M6→M4 M8→M5 Specify MMC. □SKH51/Powdered high-speed steel H \ V: 6 → M4→M3; 8 → M5→M4; 10 → M6→M5; 13 → M8→M6	0
		DC	Adds press-in lead Adds 3mm (V・H −0.01 −0.03) press-in lead	200

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~49	50~100
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

Catalog No. \ H \ V	5	6・8・10	13・16	20・22・25	28・30	40	50
HMDS HMDL HMES HMEL	5・6	1,910	2,080	2,370	2,660	2,950		
	8・10		2,200	2,490	2,730	2,950	3,240	3,590
	13・16			2,780	2,950	3,240	3,590	3,940
	20・22				3,130	3,480	4,060	4,280
	25・28				3,700	3,940	4,170	4,520
	30					4,060	4,280	4,640
HMRS HMRL	5・6	4,350	4,460	4,820	5,050	5,280		
	8・10		4,570	4,930	5,280	5,510	6,270	6,500
	13・16			5,400	5,980	6,270	6,840	7,080
	20・22				6,730	6,960	7,420	7,670
	25・28				7,310	7,540	7,890	8,120
	30					7,670	8,350	8,590
HMGS HMGL	5・6	2,260	2,500	2,740	2,980	3,350		
	8・10		2,500	2,870	3,110	3,480	3,780	4,270
	13・16			3,240	3,480	3,780	4,020	4,390
	20・22				3,900	4,150	4,390	4,640
	25・28				4,270	4,390	4,760	5,010
	30					4,640	5,120	5,380

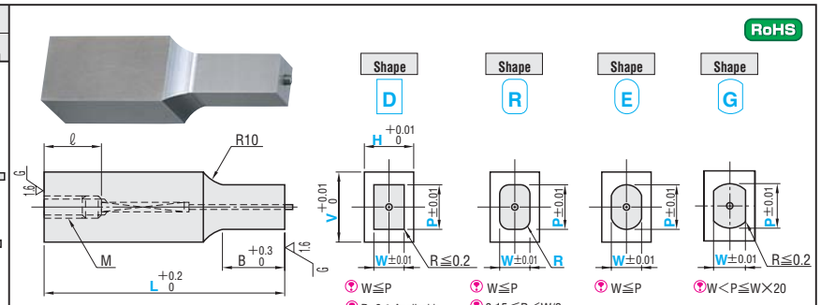
Catalog No. \ H \ V	6・8・10	13・16	20・22	25・28	30
HSMDS HSMDL HSMES HSMEL	6	2,730	3,230	3,900	4,130	4,460
	8・10	3,090	3,680	4,120	4,750	5,340
	13・16		4,460	4,970	5,600	6,340
	20・22			5,750	6,980	8,060
	25・28				8,480	9,560
	30					9,780
HSMRS HSMRL	6	5,170	5,740	6,160	6,510	6,820
	8・10	5,530	6,200	6,820	7,350	7,960
	13・16		7,120	8,090	8,780	9,460
	20・22			9,470	10,600	11,680
	25・28				12,150	13,210
	30					13,440
HSMGS HSMGL	6	3,160	3,610	4,030	4,520	4,880
	8・10	3,410	4,100	4,640	5,300	5,870
	13・16		4,950	5,580	6,250	7,020
	20・22			6,660	7,850	8,920
	25・28				9,110	10,150
	30					10,610

Catalog No. \ H \ V	5	6・8・10	13・16	20・22	25・28	30
PHMDS PHMDL PHMES PHMEL	5・6	2,800	3,150	3,800	4,720	5,010	5,450
	8・10		3,670	4,460	5,050	6,010	6,930
	13・16			5,560	6,300	7,260	8,390
	20・22				7,490	9,420	11,110
	25・28					11,580	13,290
	30						13,580
PHMRS PHMRL	5・6	5,360	5,630	6,350	6,890	7,400	7,850
	8・10		6,170	7,040	7,850	8,640	9,590
	13・16			8,260	9,490	10,540	11,580
	20・22				11,300	13,100	14,810
	25・28					15,290	17,000
	30						17,280
PHMGS PHMGL	5・6	3,160	3,590	4,190	4,730	5,420	5,890
	8・10		4,010	4,920	5,650	6,620	7,450
	13・16			6,080	6,970	7,990	9,170
	20・22				8,490	10,390	12,090
	25・28					12,290	13,990
	30						14,590

JECTOR BLOCK PUNCHES
—TAPPED—

M / H	Catalog No. Type	Shape	B Blade length
SKD11 or equivalent 60～63HRC	HJM	D R E G	S
SKH51 61～64HRC	HSJM		L
Powdered high-speed steel 64～67HRC	PHJM		Blade length(B) L>S

RoHS



W≦P　W≦P　W≦P　W<P≦W×20
R=0：Applicable　0.15≦R<W/2 0.01 mm increments

Detail of jector hole P.389

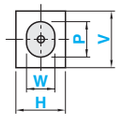
When P=V, W=H, the blade tip tolerance is the tolerance of P・W.

Catalog No. Type	Shape	B Blade length	H	Rmin. Wmin.	V 6 (3.0)	8 (3.0)	10 (4.0)	13 (5.0)	16 (7.0)	20 (8.0)	22 (9.0)	25 (10.0)	28 (12.0)	30 (12.0)	L	B S	B L	M	ℓ
HJM HSJM PHJM	D R E G	S	6	2.0	○	○	○	○	○	○	○	○	○	○	(40)	8	13	4	12
			8	2.5		○	○	○	○	○	○	○	○	○				5	
			10	3.0			○	○	○	○	○	○	○	○	(50)	13	19	6	
			13	4.0				○	○	○	○	○	○	○	60			8	
		L	16	5.0					○	○	○	○	○	○	70	19	25		
			20	6.0						○	○	○	○	○					
			22	6.0							○	○	○	○	80				
			25	6.0								○	○	○					

L(40) ····▸ B= 6 When the full length is (40), the blade length is fixed to 6mm.
L(50)・H10～25 ····▸ B=13 When the full length is (50) and dimension H is 10～25, the blade length is fixed to 13mm.

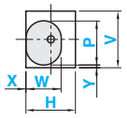
Order

(1)The blade is in the center of shank.



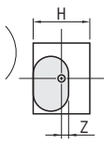
Catalog No.	V	H	L	0.01 mm increments P	W	R(Ronly)
HJMES	08	06	60	P8.00	W5.00	

(2)The blade is not in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R(Ronly)	X—Y
HJMEL	20	16	60	P14.00	W10.00		X0.00 — Y2.50

X, Y specification is 0.02 over, or 0. Tolerance ±0.01



H	Zmin.
6・8	1.0
10・13	1.5
16～25	2.0

When changing blade position, jector hole must be Zmin apart from the blade side. Jector hole position is not changeable.

Delivery

●HJM type: 3 Days — Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

●HSJM type・PHJM type: 8 Days

Alteration

Catalog No. V H – L(LC) – P–W–R–X–Y – (BC・PKC…etc.)
HJMES 10 10 – 59.5 – P8.00 – W7.80 – BC10.5 – VKM

Alterations		Code	Spec.	¥/1Code
Blade		BC	Changes blade length B (shorter than standard) 2≦BC<B 0.1 mm increments	400
		SC	Finishes blade with lapping ・W≧2.00 ・Dimension P tolerance and the specification unit remain the same. ・Pay attention to delivery time. ● HJM type 5 Days ● HSJM・PHJM type 10 Days ⊗ Express is not available. ⊗ D shape : R=0 Not applicable	1,200
		PKC	Changes blade tolerance P・W P・W±0.01 ⇨ +0.01 0	400
		PKV	Changes blade tolerance P・W P・W±0.01 ⇨ ±0.005	400
Full length		LC	Changes full length LC<L 0.1 mm increments (Combination with LKC・LKZ→0.01mm increments) ・B is shortened by (L—LC)	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance L +0.2 0 ⇨ +0.01 0	600
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. (0.5mm or more)	200
		CCP	Adds chamfering (C1.0) to a corner of shank. (Error prevention) Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 (Blade corner) ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270	200
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	—100
		NC	Removes jector pin ⊗ AC : Not applicable.	—200
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 —0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 —0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100
		DC	Adds press-in lead Adds 3mm (V・H —0.01 —0.03) press-in lead	200

The volume discount rate is also applicable to alteration cost. P.39

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No. H \ V	6・8・10	13・16	20・22・25	28・30
HJMDS HJMDL HJMES HJMEL 6	3,480	3,950	4,180	4,530
8・10	3,700	4,060	4,300	4,650
13・16		4,300	4,410	4,760
20・22			4,650	5,000
25			5,220	5,450
HJMRS HJMRL 6	5,800	6,160	6,380	6,740
8・10	6,030	6,280	6,610	6,960
13・16		6,740	7,440	7,670
20・22			8,130	8,360
25			8,710	8,940
HJMGS HJMGL 6	4,030	4,270	4,530	4,890
8・10	4,030	4,400	4,640	5,010
13・16		4,890	5,130	5,380
20・22			5,500	5,620
25			5,870	6,110

Catalog No. H \ V	6・8・10	13・16	20・22・25	28・30
HSJMDS HSJMDL HSJMES HSJMEL 6	5,440	5,950	6,850	7,170
8・10	5,800	6,390	7,470	8,060
13・16		7,170	8,310	9,050
20・22			9,700	10,770
25			11,200	12,270
HSJMRS HSJMRL 6	7,880	8,450	9,220	9,540
8・10	8,250	8,920	10,070	10,680
13・16		9,830	11,490	12,180
20・22			13,320	14,390
25			14,870	15,930
HSJMGS HSJMGL 6	6,020	6,470	7,380	7,740
8・10	6,270	6,960	8,160	8,730
13・16		7,810	9,110	9,880
20・22			10,710	11,780
25			11,970	13,010

Catalog No. H \ V	6・8・10	13・16	20・22・25	28・30
PHJMDS PHJMDL PHJMES PHJMEL 6	6,070	6,750	8,040	8,510
8・10	6,610	7,460	9,110	10,080
13・16		8,630	10,430	11,630
20・22			12,730	14,520
25			15,020	16,840
PHJMRS PHJMRL 6	8,700	9,460	10,580	11,060
8・10	9,270	10,190	11,900	12,900
13・16		11,490	13,910	15,020
20・22			16,630	18,460
25			18,960	20,780
PHJMGS PHJMGL 6	6,670	7,310	8,620	9,120
8・10	7,120	8,090	9,890	10,780
13・16		9,320	11,350	12,600
20・22			13,900	15,710
25			15,920	17,730

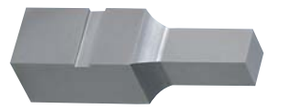
BLOCK PUNCHES
—WITH KEY GROOVE—

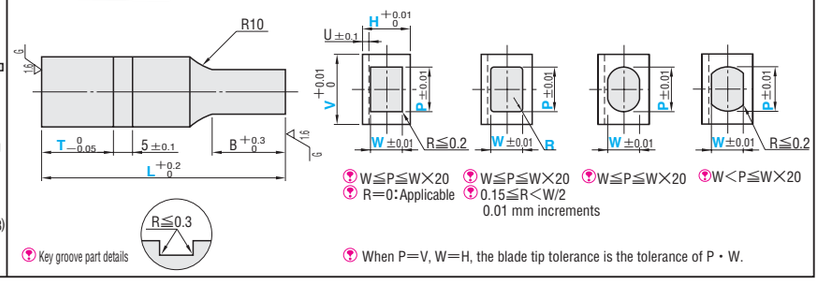
DELIVERY SHORTENED
HSK(SKH51)
Delivery time
8 Days→3 Days

The volume discount rate is also applicable to alteration cost. P.39

M / H	Catalog No. Type	Shape	B Blade length
(H3～5) SKH51 61～64HRC (H6～30) SKD11 or equivalent 60～63HRC	HK	D R E G	S
SKH51 61～64HRC	HSK (H6～30)	D R E G	L
Powdered high-speed steel 64～67HRC	PHK	D R E G	Blade length(B) L>S

RoHS





Key groove part details

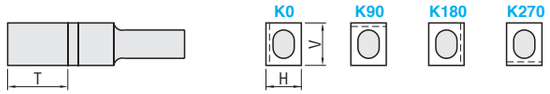
When P=V, W=H, the blade tip tolerance is the tolerance of P・W.

Catalog No. Type	Shape	B Blade length	H \ V	Pmin.	Wmin.	3	4	5	6	8	10	13	16	20	22	25	28	30	(40)	(50)	L	0.1mm T	B S	B L	U
HK HSK (H6～30) PHK	D R E G	S	(3)	1.0		○	○	○	○	○	○	○	○	○	○										
			(4)	1.0			○	○	○	○	○	○	○	○	○								6	8	1.0
			5	1.2				○	○	○	○	○	○	○	○	○	○	○			(40)				
			6	1.5					○	○	○	○	○	○	○	○	○	○			(50)		8	13	
			8	2.0						○	○	○	○	○	○	○	○	○	○		60				
			10	2.5							○	○	○	○	○	○	○	○	○	○	70	T≧2	13	19	
			13	3.0								○	○	○	○	○	○	○	○	○	80				
		L	16	4.0									○	○	○	○	○	○	○	○	90				1.5
			20	5.0										○	○	○	○	○	○	○	100				
			22	6.0											○	○	○	○	○	○			19	25	
			25	6.5												○	○	○	○	○					
			28	7.0													○	○	○	○					
			30	7.5														○	○	○					

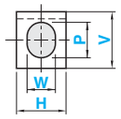
- L(40)・H10～30 ⋯▸ B=13 — When the full length is (40) and dimension H is 10～30, the blade length is fixed to 13mm.
- L(50)・H16～30 ⋯▸ B=19 — When the full length is (50) and dimension H is 16～30, the blade length is fixed to 19mm.
- H(3)(4) ⋯▸ L40～70 — When H (3), (4), the length (L) is HP type : L40～80, PHP type : L40～70.
- V= (40)・(50) are standards for HK type only.

Order

■Key position

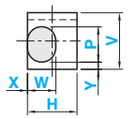


(1)The blade is in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R(Ⓡonly)	0.1 mm increments T≧2	K
PHKES	08	06	60	P7.00	W5.20		T20.5	K90

(2)The blade is not in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R(Ⓡonly)	0.1 mm increments T≧2	K	0.01 mm increments X−Y
PHKEL	20	10	70	P16.00	W8.00		T20.5	K90	X0.00 − Y0.50

(Ⓨ X, Y specification is 0.02 over, or 0. Tolerance ±0.01)

Delivery

3 Days

Express A 800/1Pc. P.38

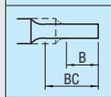
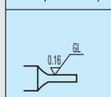
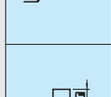
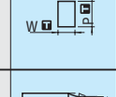
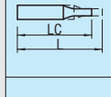
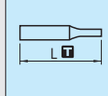
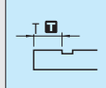
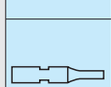
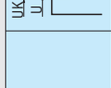
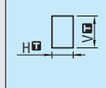
Ⓨ A flat charge of 2,160 yen for 3 pieces or more of the same size.

⊗Express A are not available for HSK.

■Keys P.394

Alteration

Catalog No. V H − L/LC − P/PC/−W/WC/−R − T−K − X−Y − (BC・PKC・etc.)
HKES 20 10 − LC55.5 − P16.00 − W8.00 − T20.5 − K90 − BC15.5

Alterations		Code	Spec.	¥/1Code
Blade		PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01 mm increments W(WC) / Bmax: 0.50～0.99 / 4; 1.00～1.19 / 8; 1.20～1.99 / 13; 2.00～2.99 / 20; 3.00～4.99 / 30; 5.00～ / 35	200
		BC	Changes blade length B 2≦BC≦Bmax 0.1 mm increments Ⓨ Full length L (LC) requires BC +30mm or more.	400
		SC	Finishes blade with lapping Ⓨ W≧2.00 Ⓨ Dimension P tolerance and the specification unit remain the same. Ⓨ Pay attention to delivery time. 5 Days ⊗Express is not available. ⊗Ⓡshape : R=0 Not applicable	1,200
		PKC	Changes blade tolerance P・W±0.01 ⇨ +0.01 0 P・W	400
		PKV	Changes blade tolerance P・W±0.01 ⇨ ±0.005 P・W	400
Full length		LC	Changes full length 30+B(BC)≦LC<L 0.1 mm increments (Combination with LKC・LKZ→0.01mm increments) Ⓨ When LC−B is 30mm or less, blade length is full length−30mm.	200
		LKC	Changes full length tolerance +0.2 L 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance +0.2 L 0 ⇨ +0.01 0	600
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. 0.5mm or more	200
		TKC	Changes tolerance on key groove position T. T 0 −0.05 ⇨ 0 −0.02	200
		RTC	Changes tolerance on key groove position T. T 0 −0.05 ⇨ +0.05 0	0
		WK	Adds key groove at symmetrical position K0・180 K90・270 H−|2×U(UK)|≧2.0 (K0.K180) V−|2×U(UK)|≧2.0 (K90.K270) Additional key groove is on the symmetrical position of the specified key groove. Ⓨ Combination with UK is applicable	400
		UK	Changes key groove depth. 0.5≦UK≦U+0.2 0.1mm increments H(V)−UK≧2.0 Ⓨ Combination with WK is applicable	200
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100
		DC	Adds press-in lead Adds 3mm (V・H −0.01 −0.03) press-in lead	200

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

Catalog No. H \ V	3・4・5	6・8・10	13・16	20・22・25	28・30	40	50
HKDS HKDL HKES HKEL 3・4	2,230	2,360	2,530	2,710			
5・6	2,230	2,410	2,710	2,990	3,290		
8・10		2,530	2,810	3,050	3,290	3,510	3,870
13・16			3,110	3,290	3,510	3,870	4,210
20・22				3,400	3,750	4,330	4,560
25・28				3,980	4,210	4,440	4,790
30					4,330	4,560	4,910
HKRS HKRL 3・4	4,680	4,680	5,030	5,260			
5・6	4,680	4,790	5,140	5,380	5,610		
8・10		4,910	5,260	5,610	5,840	6,540	6,760
13・16			5,720	6,310	6,540	7,120	7,340
20・22				7,000	7,240	7,690	7,930
25・28				7,590	7,820	8,170	8,400
30					7,930	8,630	8,860
HKGS HKGL 3・4	2,600	2,600	3,090	3,210			
5・6	2,600	2,850	3,090	3,330	3,700		
8・10		2,850	3,210	3,460	3,820	4,070	4,560
13・16			3,580	3,820	4,070	4,310	4,670
20・22				4,190	4,430	4,670	4,930
25・28				4,560	4,670	5,040	5,300
30					4,930	5,410	5,660

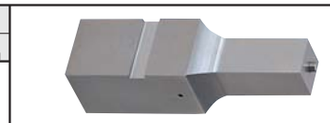
Catalog No. H \ V	6・8・10	13・16	20・22	25・28	30
HSKDS HSKDL HSKES HSKEL 6	3,060	3,560	4,240	4,470	4,800
8・10	3,410	4,010	4,460	5,080	5,670
13・16		4,780	5,300	5,900	6,640
20・22			6,020	7,310	8,340
25・28				8,760	9,830
30					10,050
HSKRS HSKRL 6	5,500	6,070	6,490	6,850	7,160
8・10	5,870	6,540	7,160	7,690	8,260
13・16		7,450	8,450	9,060	9,790
20・22			9,760	10,890	11,960
25・28				12,430	13,500
30					13,720
HSKGS HSKGL 6	3,510	3,970	4,390	4,880	5,230
8・10	3,760	4,450	4,990	5,640	6,280
13・16		5,290	5,930	6,590	7,350
20・22			6,950	8,140	9,210
25・28				9,410	10,510
30					10,910

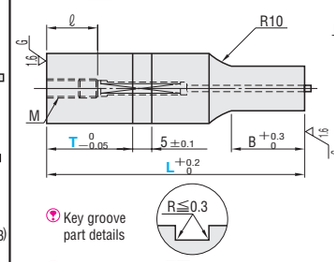
Catalog No. H \ V	3・4・5	6・8・10	13・16	20・22	25・28	30
PHKDS PHKDL PHKES PHKEL 3・4	3,090	3,380	3,780	4,190		
5・6	3,140	3,490	4,130	5,060	5,350	5,790
8・10		4,000	4,800	5,400	6,360	7,250
13・16			5,890	6,640	7,550	8,720
20・22				7,770	9,780	11,390
25・28					11,870	13,580
30						13,860
PHKRS PHKRL 3・4	5,640	5,800	6,390	6,980		
5・6	5,690	5,970	6,680	7,220	7,740	8,190
8・10		6,510	7,380	8,190	8,990	9,870
13・16			8,590	9,870	10,820	11,960
20・22				11,580	13,390	15,100
25・28					15,570	17,280
30						17,570
PHKGS PHKGL 3・4	3,460	3,720	4,380	4,730		
5・6	3,500	3,950	4,550	5,090	5,780	6,250
8・10		4,360	5,270	6,010	6,970	7,920
13・16			6,430	7,330	8,340	9,530
20・22				8,780	10,690	12,390
25・28					12,590	14,390
30						14,890

JECTOR BLOCK PUNCHES
—WITH KEY GROOVE—

The volume discount rate is also applicable to alteration cost. P.39

M / H	Catalog No. Type	Shape	B Blade length
SKD11 or equivalent 60～63HRC	HJK	D R E G	S
SKH51 61～64HRC	HSJK	D R E G	L
Powdered high-speed steel 64～67HRC	PHJK	D R E G	Blade length(B) L>S

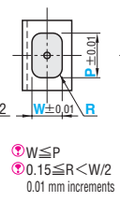




Shape D

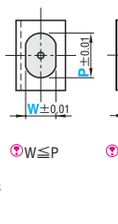
W≦P
R=0 : Applicable

Shape R



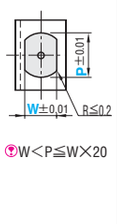
W≦P
0.15≦R<W/2
0.01 mm increments

Shape E



W≦P

Shape G



W<P≦W×20

Key groove part details

When P=V, W=H, the blade tip tolerance is the tolerance of P・W.

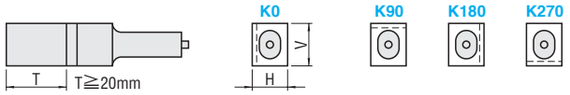
Detail of jector hole P.389

Catalog No. Type	Shape	B Blade length	H \ V	P min. / W min.	6	8	10	13	16	20	22	25	28	30	L	0.1mm T	B S1	B L1	M	ℓ	U
					3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0							
HJK HSJK PHJK	D R E G	S	6	2.0	○	○	○	○	○	○	○	○	○	○	(40)	T≧20	8	13	4	12	1.0
			8	2.5		○	○	○	○	○	○	○	○	○	(50)				5		
			10	3.0			○	○	○	○	○	○	○	○	60		13	19	6		
		L	13	4.0				○	○	○	○	○	○	○	70				8		1.5
			16	5.0					○	○	○	○	○	○	80		19	25			
			20	6.0						○	○	○	○	○							
			22	6.0							○	○	○	○							
			25	6.0								○	○	○							

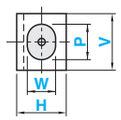
L(40) ···› B= 6 — When the full length is (40), the blade length is fixed to 6mm.
L(50)・H10～25 ···› B= 10 — When the full length is (50) and dimension H is 10～25, the blade length is fixed to 10mm.

Order

■Key position



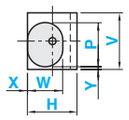
(1)The blade is in the center of shank.



Catalog No. | V | H | – | L | – | 0.01 mm increments: P – W – R(Ⓡonly) | – | 0.1 mm increments: T≧20 | – | K

HJKES 08 06 – 60 – P8.00 – W5.20 – T22.5 – K0

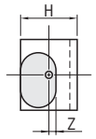
(2)The blade is not in the center of shank.



Catalog No. | V | H | – | L | – | 0.01 mm increments: P – W – R(Ⓡonly) | – | 0.1 mm increments: T≧20 | – | K | – | 0.01 mm increments: X – Y

HJKEL 20 16 – 60 – P14.00 – W10.00 – T25.5 – K180 – X0.00 – Y2.50

X, Y specification is 0.02 over, or 0. Tolerance ±0.01



H	Zmin
6・8	1.0
10・13	1.5
16～25	2.0

When changing blade position, jector hole must be Zmin apart from the blade side. Jector hole position is not changeable.

Delivery

●HJK type: 3 Days | Express A 800/1Pc. P.38

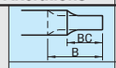
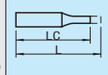
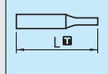
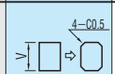
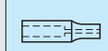
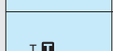
●HSJK type/PHJK type: 8 Days

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration

Catalog No. | V | H | – | L(LC) | – | P–W–R | – | T–K | – | X–Y | – (BC-PKC-etc.)

HJKDL 20 16 – LC55.5 – P14.00 – W10.00 – T25 – K0 – BC22.5

Alterations		Code	Spec.	¥/1Code
Blade		BC	Changes blade length B (shorter than standard) 2≦BC<B 0.1 mm increments	400
		SC	Finishes blade with lapping ⓟW≧2.00 ⓟDimension P tolerance and the specification unit remain the same. ⓟPay attention to delivery time. ● HJK type: 5 Days ● HSJK・PHJK type: 10 Days ⊗Express is not available. ⊗D shape : R=0 Not applicable	1,200
		PKC	Changes blade tolerance P・W P・W±0.01 ⇨ +0.01 0	400
		PKV	Changes blade tolerance P・W P・W±0.01 ⇨ ±0.005	400
Full length		LC	Changes full length LC<L 0.1 mm increments (Combination with LKC・LKZ→0.01mm increments) ⓟB is shortened by (L−LC)	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance L +0.2 0 ⇨ +0.01 0	600
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	200
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	—100
		NC	Removes jector pin ⊗ AC : Not applicable	—200
		TKC	Changes tolerance on key groove position T. T 0 −0.05 ⇨ 0 −0.02	200
		RTC	Changes tolerance on key groove position T. T 0 −0.05 ⇨ +0.05 0	0
		UK	Changes key groove depth. 0.5≦UK≦U+0.2 0.1mm increments ⓟH≧10 (K0,K180) V≧10 (K90,K270) : Applicable	200
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100
		DC	Adds press-in lead Adds 3mm (V・H −0.01 −0.03) press-in lead	200

■Keys P.394

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

ⓟTo be quoted on price & lead time above Max. Q'ty.

Catalog No.	H \ V	6・8・10	13・16	20・22・25	28・30
HJKDS HJKDL HJKES HJKEL	6	3,870	4,330	4,560	4,910
	8・10	4,090	4,440	4,680	5,030
	13・16		4,680	4,790	5,140
	20・22			5,030	5,380
	25			5,610	5,840
HJKRS HJKRL	6	6,180	6,540	6,760	7,120
	8・10	6,420	6,660	7,000	7,340
	13・16		7,120	7,820	8,050
	20・22			8,510	8,750
	25			9,090	9,330
HJKGS HJKGL	6	4,430	4,670	4,930	5,300
	8・10	4,430	4,800	5,040	5,410
	13・16		5,300	5,540	5,780
	20・22			5,910	6,020
	25			6,270	6,510

Catalog No.	H \ V	6・8・10	13・16	20・22・25	28・30
HSJKDS HSJKDL HSJKES HSJKEL	6	5,780	6,280	7,190	7,510
	8・10	6,130	6,730	7,800	8,390
	13・16		7,500	8,620	9,360
	20・22			10,020	11,060
	25			11,480	12,550
HSJKRS HSJKRL	6	8,220	8,790	9,570	9,880
	8・10	8,590	9,250	10,400	10,980
	13・16		10,160	11,780	12,510
	20・22			13,600	14,680
	25			15,140	16,220
HSJKGS HSJKGL	6	6,370	6,830	7,740	8,090
	8・10	6,620	7,310	8,500	9,140
	13・16		8,150	9,450	10,210
	20・22			11,000	12,070
	25			12,270	13,370

Catalog No.	H \ V	6・8・10	13・16	20・22・25	28・30
PHJKDS PHJKDL PHJKES PHJKEL	6	6,420	7,110	8,400	8,870
	8・10	6,960	7,820	9,470	10,420
	13・16		8,980	10,740	11,980
	20・22			13,100	14,820
	25			15,320	17,150
PHJKRS PHJKRL	6	9,050	9,810	10,940	11,420
	8・10	9,630	10,560	12,260	13,200
	13・16		11,850	14,210	15,430
	20・22			16,940	18,760
	25			19,270	21,080
PHJKGS PHJKGL	6	7,060	7,690	9,000	9,500
	8・10	7,490	8,460	10,270	11,280
	13・16		9,690	11,720	12,990
	20・22			14,220	16,030
	25			16,240	18,150

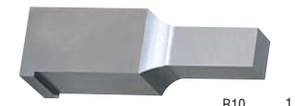
BLOCK PUNCHES
—WITH SINGLE FLANGED—

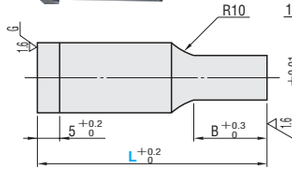
DELIVERY SHORTENED
HSF(SKH51) Delivery time 8 Days → 3 Days (F90 and F270 are excluded)

¥ The volume discount rate is also applicable to alteration cost. P.39

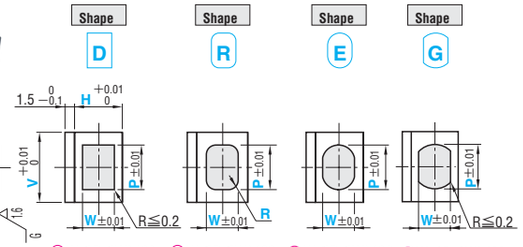
M / H	Catalog No. Type	Shape	B Blade length
(H2~5) SKH51 61~64HRC (H6~30) SKD11 or equivalent 60~63HRC	HF	D R E G	S
SKH51 61~64HRC	HSF (H6~30)		L
Powdered high-speed steel 64~67HRC	PHF		Blade length(B) L>S

RoHS





Shape D / Shape R / Shape E / Shape G



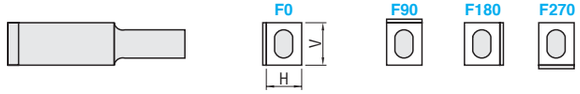
Ⓨ W≦P≦W×20 Ⓨ R=0 : Applicable
Ⓨ W≦P≦W×20 Ⓨ 0.15≦R<W/2 0.01 mm increments
Ⓨ W≦P≦W×20
Ⓨ W<P≦W×20
Ⓨ Flange part details
Ⓨ When P=V, W=H, the blade tip tolerance is the tolerance of P・W.

Catalog No. Type	Shape	B Blade length	H \ V	2	3	4	5	6	8	10	13	16	20	22	25	28	30	(40)	(50)	L	B S	B L
				P min. 1.0	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0	16.0	20.0			
			W min. (2)	○	○	○	○	○	○	○	○											
			(3)		○	○	○	○	○	○	○	○	○	○							6	8
			(4)			○	○	○	○	○	○	○	○	○						(40)		
HF	D	S	5				○	○	○	○	○	○	○	○	○	○	○			(50)	8	13
HSF (H6~30)	R		6					○	○	○	○	○	○	○	○	○	○			60		
	E		8						○	○	○	○	○	○	○	○	○	○	○	70	13	19
PHF	G	L	10							○	○	○	○	○	○	○	○	○	○	80		
			13								○	○	○	○	○	○	○	○	○	90		
			16									○	○	○	○	○	○	○	○	100		
			20										○	○	○	○	○	○	○		19	25
			22											○	○	○	○	○	○			
			25												○	○	○	○	○			
			28													○	○	○	○			
			30														○	○	○			

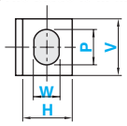
Ⓨ L(40)・H10~30 ···▸B=13 When the full length is (40) and dimension H is 10~30, the blade length is fixed to 13mm.
Ⓨ L(50)・H16~30 ···▸B=19 When the full length is (50) and dimension H is 16~30, the blade length is fixed to 19mm.
Ⓨ H(2)(3)(4) ···▸ L40~70 When H (2), (3) or (4), the length (L) is 40~70.
Ⓨ V=(40)・(50) are standards for HF type only.

Order

■Flange position : F selectable Ⓨ The delivery time is 8 days for F90 and F270 of HSF type.

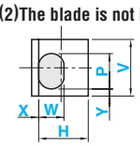


(1)The blade is in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R(Ⓡonly)	F
PHFES	08	08	60	P6.00	W4.00		F0

(2)The blade is not in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R(Ⓡonly)	F	0.01 mm increments X−Y
PHFEL	10	10	60	P6.00	W5.00		F0	X0.00 − Y0.50

Ⓨ X, Y specification is 0.02 over, or 0. Tolerance ±0.01

Delivery

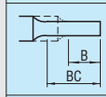
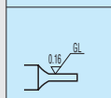
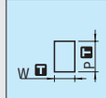
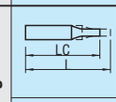
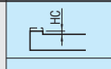
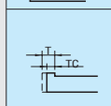
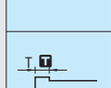
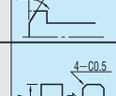
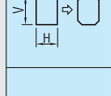
● HF type/PHF type/HSF type (F0, F180) 3 Days | Express A 800/1Pc. P.38

● HSF type (F90, F270) 8 Days

Ⓨ A flat charge of 2,160 yen for 3 pieces or more of the same size.
⊗ Express A are not available for HSF.

Alteration

Catalog No. − V − H − L(LC) − P(PC)−W(WC)−R − F − X−Y − (BC・PKC・・etc)
PHFES 10 − 10 − LC58.5 − P8.00 − W6.00 − F90 − HC1.0

Alterations		Code	Spec.	¥/1Code
Blade		PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01 mm increments	200
		BC	Changes blade length B 2≦BC≦Bmax 0.1 mm increments	400
		SC	Finishes blade with lapping Ⓨ W≧2.00 Ⓨ Dimension P tolerance and the specification unit remain the same. Ⓨ Pay attention to delivery time. ●HF・PHF・HSF(F0, F180) type 5 Days ●HSF(F90, F270) type 10 Days ⊗ Express is not available ⊗ D shape : R=0 Not applicable	1,200
		PKC	Changes blade tolerance P・W P・W±0.01 ⇨ +0.01 0	400
		PKV	Changes blade tolerance P・W P・W±0.01 ⇨ ±0.005	400
Full length		LC	Changes full length 30+B(BC)≦LC<L 0.1 mm increments (Combination with LKC・LKZ→0.01mm increments) Ⓨ When LC−B is 30mm or less, blade length is full length−30mm.	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance L +0.2 0 ⇨ +0.01 0	600
Flange		HC	Changes flange width. 0≦HC<1.5 0.1 mm increments	200
		TC	Changes flange thickness. 2≦TC<5 0.1 mm increments (Combination with TKC→0.01mm increments) Ⓨ L is shortened by (5−TC). When LC, L=LC.	200
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.02	200
		FK	Adds relief chamfering to flange. For breakage prevention.	200
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	400
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~49	50~100
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

Catalog No. H \ V	2	3・4・5	6・8・10	13・16	20・22・25	28・30	40	50
2	2,490	2,490	2,630	2,840				
3・4		2,070	2,190	2,370	2,540			
HFDS 5・6		2,070	2,240	2,540	2,820	3,120		
HFDL 8・10			2,370	2,650	2,890	3,120	3,340	3,700
HFES 13・16				2,940	3,120	3,340	3,700	4,050
HFEL 20・22					3,240	3,590	4,170	4,400
25・28					3,820	4,050	4,270	4,630
30						4,170	4,400	4,750
2	5,420	5,420	5,420	5,840				
3・4		4,520	4,520	4,860	5,090			
5・6		4,520	4,630	4,980	5,220	5,440		
HFRS 8・10			4,750	5,090	5,440	5,670	6,370	6,600
HFRL 13・16				5,560	6,150	6,370	6,950	7,180
20・22					6,830	7,080	7,530	7,770
25・28					7,420	7,660	8,000	8,240
30						7,770	8,460	8,700
2	2,920	2,920	2,920	3,510				
3・4		2,430	2,430	2,920	3,040			
5・6		2,430	2,670	2,920	3,160	3,520		
HFGS 8・10			2,670	3,040	3,280	3,650	3,890	4,390
HFGL 13・16				3,410	3,650	3,890	4,130	4,500
20・22					4,020	4,260	4,500	4,760
25・28					4,390	4,500	4,870	5,120
30						4,760	5,240	5,490

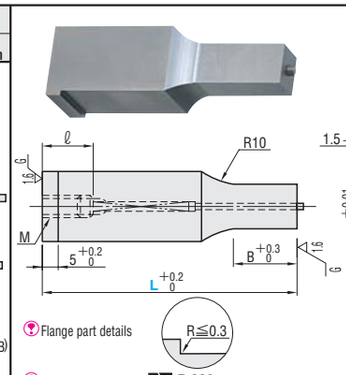
Catalog No. H \ V	6・8・10	13・16	20・22	25・28	30
6	3,680	4,320	4,980	5,570	5,980
HSFDS 8・10	4,110	4,900	5,670	6,240	6,560
HSFDL 13・16		5,870	6,460	7,280	7,670
HSFES 20・22			7,390	8,490	8,960
HSFEL 25・28				9,830	10,960
30					11,520
6	6,190	6,980	7,510	8,060	8,450
HSFRS 8・10	6,640	7,490	8,370	8,950	9,280
HSFRL 13・16		8,660	9,700	10,480	10,870
20・22			11,220	12,190	12,690
25・28				13,610	14,800
30					15,360
6	4,200	4,890	5,430	6,100	6,540
HSFGS 8・10	4,530	5,420	6,220	6,930	7,300
HSFGL 13・16		6,500	7,220	8,050	8,450
20・22			8,450	9,450	9,980
25・28				10,600	11,820
30					12,520

Catalog No. H \ V	2	3・4・5	6・8・10	13・16	20・22	25・28	30
2	4,780	4,780	5,480	6,330			
3・4		3,980	4,570	5,270	5,860		
PHFDS 5・6		3,980	4,630	5,500	6,400	7,300	7,880
PHFDL 8・10			5,270	6,390	7,510	8,400	8,850
PHFES 13・16				7,810	8,680	9,970	10,540
PHFEL 20・22					10,160	11,870	12,530
25・28						13,770	15,570
30							16,430
2	8,010	8,010	8,540	9,630			
3・4		6,670	7,120	8,030	8,680		
PHFRS 5・6		6,670	7,240	8,310	9,040	9,870	10,440
PHFRL 8・10			7,890	9,070	10,320	11,200	11,680
13・16				10,730	12,060	13,290	13,860
20・22					14,150	15,670	16,430
25・28						17,660	19,560
30							20,420
2	5,350	5,350	5,930	7,210			
3・4		4,460	4,940	6,010	6,570		
PHFGS 5・6		4,460	5,220	6,190	6,940	7,940	8,550
PHFGL 8・10			5,760	7,000	8,170	9,230	9,720
13・16				8,550	9,600	10,890	11,490
20・22					11,390	12,990	13,790
25・28						14,690	16,690
30							17,690

JECTOR BLOCK PUNCHES
—WITH SINGLE FLANGED—

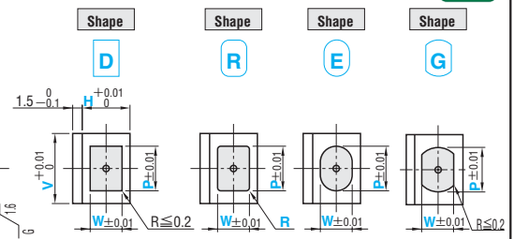
M / H	Catalog No. Type	Shape	B Blade length
SKD11 or equivalent 60～63HRC	HJF	D R E G	S
SKH51 61～64HRC	HSJF	D R E G	L
Powdered high-speed steel 64～67HRC	PHJF	D R E G	Blade length(B) L>S

RoHS



Flange part details

Detail of jector hole P.389



W≦P
R=0 : Applicable

W≦P
0.15≦R<W/2
0.01 mm increments

W≦P

W<P≦W×20

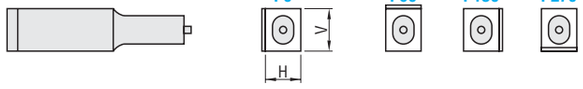
When P=V, W=H, the blade tip tolerance is the tolerance of P・W.

Catalog No. Type	Shape	B Blade length	H	Rmin. Wmin.	V 6	8	10	13	16	20	22	25	28	30	L	B S	B L	M	ℓ
					3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0					
HJF HSJF PHJF	D R E G	S	6	2.0	○	○	○	○	○	○	○	○	○	○		8	13	4	12
			8	2.5		○	○	○	○	○	○	○	○	○	(40)			5	
			10	3.0			○	○	○	○	○	○	○	○	(50)	13	19	6	
			13	4.0				○	○	○	○	○	○	○	60				
			16	5.0					○	○	○	○	○	○	70			8	
		L	20	6.0						○	○	○	○	○	80	19	25		
			22	6.0							○	○	○	○					
			25	6.0								○	○	○					

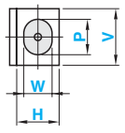
L(40) ⋯▸ B= 6 When the full length is (40), the blade length is fixed to 6mm.
L(50)・H10～25 ⋯▸ B=13 When the full length is (50) and dimension H is 10～25, the blade length is fixed to 13mm.

Order

■Flange position : F selectable

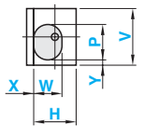


(1) The blade is in the center of shank.



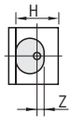
Catalog No.	V	H	L	0.01 mm increments P	W	R (R only)	F
HJFES	08	06	60	P6.00	W4.00		F0

(2) The blade is not in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R (R only)	F	0.01 mm increments X−Y
HJFES	13	10	60	P9.00	W7.00		F0	X0.00 −Y0.10

(X, Y specification is 0.02 over, or 0. Tolerance ±0.01)



H	Zmin
6・8	1.0
10・13	1.5
16～25	2.0

When changing blade position, jector hole must be Zmin apart from the blade side. Jector hole position is not changeable.

Delivery

● HJF type: 3 Days | Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

● HSJF type/PHJF type: 8 Days

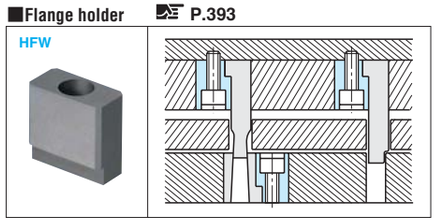
Alteration

Catalog No. | V | H | L/LC | P-W-R | F | X-Y | (BC・PKC⋯etc.)
HJFES 10 10 − 60 − P8.00 − W7.80 − F0 − BC10.5

Alterations		Code	Spec.	¥/1Code
Blade		BC	Changes blade length B (shorter than standard) 2≦BC<B 0.1 mm increments	400
		SC	Finishes blade with lapping W≧2.00 Dimension P tolerance and the specification unit remain the same. Pay attention to delivery time. ●HJF type 5 Days ●HSJF・PHJF type 10 Days Express is not available. shape : R=0 Not applicable	1,200
		PKC	Changes blade tolerance P・W P・W±0.01 ⇨ +0.01 0	400
		PKV	Changes blade tolerance P・W P・W±0.01 ⇨ ±0.005	400
Full length		LC	Changes full length LC<L 0.1 mm increments (Combination with LKC・LKZ→0.01mm increments) B is shortened by (L−LC)	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance L +0.2 0 ⇨ +0.01 0	600
Flange		HC	Changes flange width. 0≦HC<1.5 0.1 mm increments	200
		TC	Changes flange thickness. 3.5≦TC<5 0.1mm increments (Combination with TKC→0.01mm increments) L is shortened by (5−TC). When LC, L=LC.	200
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.02	200
		FK	Adds relief chamfering to flange. For breakage prevention.	200
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	400
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	−100
		NC	Removes jector pin AC : Not applicable	−200
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100

■Flange holder P.393

HFW



The volume discount rate is also applicable to alteration cost. P.39

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No.	H \ V	6・8・10	13・16	20・22・25	28・30
HJFDS HJFDL HJFES HJFEL	6	3,720	4,200	4,430	4,780
	8・10	3,950	4,300	4,550	4,890
	13・16		4,550	4,650	5,010
	20・22			4,890	5,240
	25			5,470	5,700
HJFRS HJFRL	6	6,050	6,400	6,630	6,980
	8・10	6,280	6,530	6,860	7,210
	13・16		6,980	7,690	7,910
	20・22			8,380	8,610
	25			8,960	9,190
HJFGS HJFGL	6	4,290	4,530	4,790	5,150
	8・10	4,290	4,660	4,900	5,270
	13・16		5,150	5,390	5,640
	20・22			5,760	5,880
	25			6,130	6,370

Catalog No.	H \ V	6・8・10	13・16	20・22・25	28・30
HSJFDS HSJFDL HSJFES HSJFEL	6	6,390	7,040	8,280	8,690
	8・10	6,830	7,620	8,960	9,280
	13・16		8,590	9,990	10,380
	20・22			11,210	11,680
	25			12,550	13,680
HSJFRS HSJFRL	6	8,910	9,700	10,770	11,160
	8・10	9,360	10,200	11,670	12,000
	13・16		11,380	13,200	13,580
	20・22			14,910	15,410
	25			16,330	17,520
HSJFGS HSJFGL	6	7,060	7,750	8,960	9,400
	8・10	7,390	8,280	9,790	10,160
	13・16		9,360	10,910	11,310
	20・22			12,310	12,840
	25			13,460	14,680

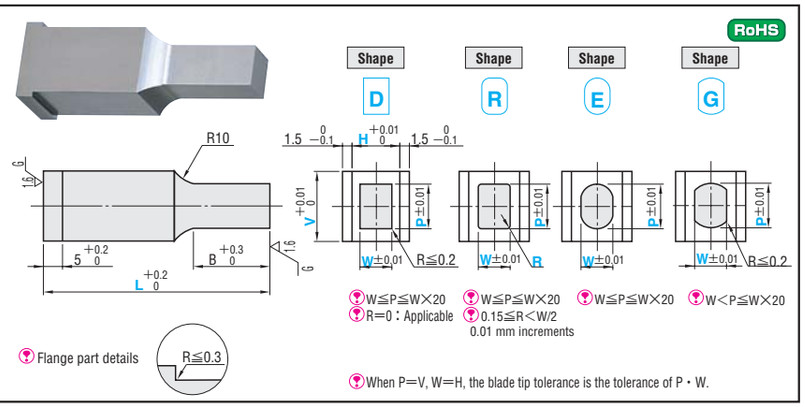
Catalog No.	H \ V	6・8・10	13・16	20・22・25	28・30
PHJFDS PHJFDL PHJFES PHJFEL	6	7,630	8,560	10,470	11,090
	8・10	8,320	9,510	11,640	12,120
	13・16		11,010	13,310	13,910
	20・22			15,320	16,040
	25			17,350	19,270
PHJFRS PHJFRL	6	10,410	11,550	13,200	13,810
	8・10	11,110	12,360	14,620	15,120
	13・16		14,120	16,840	17,440
	20・22			19,360	20,170
	25			21,490	23,500
PHJFGS PHJFGL	6	8,410	9,440	11,300	11,950
	8・10	8,980	10,300	12,670	13,190
	13・16		11,950	14,430	15,070
	20・22			16,660	17,510
	25			18,470	20,600

BLOCK PUNCHES
—WITH DOUBLE FLANGED—

DELIVERY SHORTENED
HSW(SKH51)
Delivery time
8 Days → 3 Days
(WF90 is excluded)

¥ The volume discount rate is also applicable to alteration cost. P.39

M / H	Catalog No. Type	Shape	B Blade length
(H2～5) SKH51 61～64HRC (H6～30) SKD11 or equivalent 60～63HRC	HW	D R E G	S
SKH51 61～64HRC	HSW (H6～30)	D R E G	L
Powdered high speed steel 64～67HRC	PHW	D R E G	Blade length(B) L>S

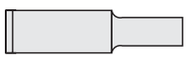


Catalog No. Type	Shape	B Blade length	H \ V	2	3	4	5	6	8	10	13	16	20	22	25	28	30	(40)	(50)	L	B S	B L
			W min. / P min.	1.0	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0	16.0	20.0			
			(2) 1.0	○	○	○	○	○	○	○	○											
			(3) 1.0		○	○	○	○	○	○	○	○	○	○								
			(4) 1.0			○	○	○	○	○	○	○	○	○						(40)	6	8
			5 1.2				○	○	○	○	○	○	○	○	○	○	○					
HW	D	S	6 1.5					○	○	○	○	○	○	○	○	○	○			(50)	8	13
HSW (H6～30)	R		8 2.0						○	○	○	○	○	○	○	○	○	○		60		
	E	L	10 2.5							○	○	○	○	○	○	○	○	○	○	70	13	19
PHW	G		13 3.0								○	○	○	○	○	○	○	○	○	80		
			16 4.0									○	○	○	○	○	○	○	○	90		
			20 5.0										○	○	○	○	○	○	○	100		
			22 6.0											○	○	○	○	○	○		19	25
			25 6.5												○	○	○	○	○			
			28 7.0													○	○	○	○			
			30 7.5														○	○	○			

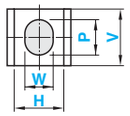
- L(40)・H10～30 ⋯› B=13 When the full length is (40) and dimension H is 10～30, the blade length is fixed to 13mm.
- L(50)・H16～30 ⋯› B=19 When the full length is (50) and dimension H is 16～30, the blade length is fixed to 19mm.
- H(2)(3)(4) ⋯› L40～70 When H(2), (3) or (4), the length (L) is 40～70.
- V=(40)・(50) are standards for HW type only.

Order

■Flange position: WF selectable The delivery time is 8 days for WF90 of HSF type.

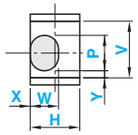


(1)The blade is in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R (R only)	WF
PHWES	08	08	60	P7.00	W6.00		WF0

(2)The blade is not in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R (R only)	WF	0.01 mm increments X−Y
PHWEL	10	10	60	P6.00	W5.00		WF90	X0.00−Y0.10

(X, Y specification is 0.02 over, or 0. Tolerance ±0.01)

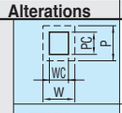
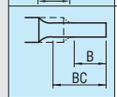
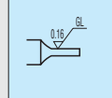
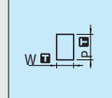
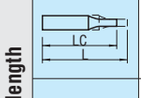
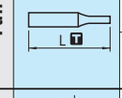
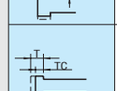
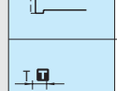
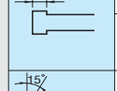
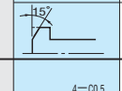
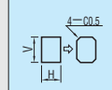
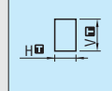
Delivery

- HW type/PHW type/HSW type (WF0): 3 Days / Express A 800/1Pc. P.38
- HSW type (WF90): 8 Days

A flat charge of 2,160 yen for 3 pieces or more of the same size.
⊗Express A are not available for HSW.

Alteration

Catalog No. | V | H | L/LC | P/PC−W/WC | R | WF | X−Y | (BC・PKC−etc.)
PHWES 10 10 − LC57.5 − P8.00 − W6.00 − WF90 − TC4.0

Alterations		Code	Spec.	¥/1Code
Blade		PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01 mm increments W(WC) / Bmax: 0.50～0.99 / 4; 1.00～1.19 / 8; 1.20～1.99 / 13; 2.00～2.99 / 20; 3.00～4.99 / 30; 5.00～ / 35	200
		BC	Changes blade length B 2≦BC≦Bmax 0.1 mm increments ¥ Full length L (LC) requires BC+30mm or more.	400
		SC	Finishes blade with lapping ¥ W≧2.00 ¥ Dimension P tolerance and the specification unit remain the same. ¥ Pay attention to delivery time. ● HW・PHW・HSW(WF0) type 5 Days ● HSW(WF90) type 10 Days ⊗ Express is not available ⊗R shape : R=0 Not applicable	1,200
		PKC	Changes blade tolerance P・W P・W±0.01 ⇨ +0.01 0	400
		PKV	Changes blade tolerance P・W P・W±0.01 ⇨ ±0.005	400
Full length		LC	Changes full length 0.1 mm increments (Combination with LKC・LKZ→0.01mm increments) ¥ When LC−B is 30mm or less, blade length is full length−30mm. 30+B(BC)≦LC＜L	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance L +0.2 0 ⇨ +0.01 0	600
Flange		HC	Changes flange width. 0≦HC＜1.5 0.1 mm increments	200
		TC	Changes flange thickness. 2≦TC＜5 0.1 mm increments (Combination with TKC→0.01mm increments) ¥ L is shortened by (5−TC). When LC, L=LC.	200
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.02	200
		FK	Adds relief chamfering to flange. For breakage prevention.	400
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	400
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

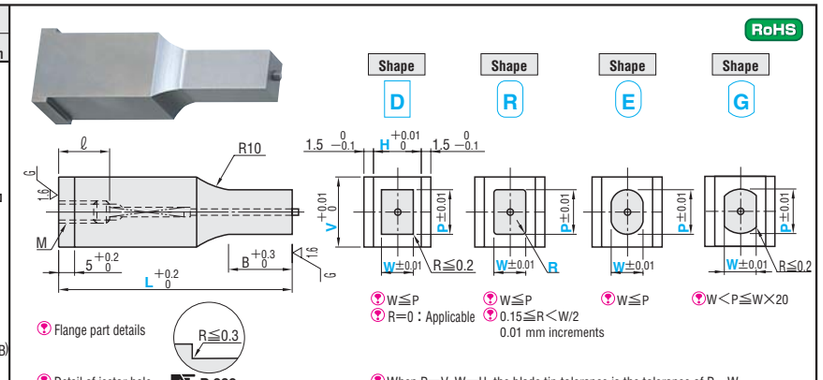
Catalog No.	H \ V	2	3・4・5	6・8・10	13・16	20・22・25	28・30	40	50
HWDS HWDL HWES HWEL	2	2,680	2,680	2,830	3,030				
	3・4		2,230	2,360	2,530	2,710			
	5・6		2,230	2,410	2,710	2,990	3,290		
	8・10			2,530	2,810	3,050	3,290	3,510	3,870
	13・16				3,110	3,290	3,510	3,870	4,210
	20・22					3,400	3,750	4,330	4,560
	25・28					3,980	4,210	4,440	4,790
	30						4,330	4,560	4,910
HWRS HWRL	2	5,620	5,620	5,620	6,040				
	3・4		4,680	4,680	5,030	5,260			
	5・6		4,680	4,790	5,140	5,380	5,610		
	8・10			4,910	5,260	5,610	5,840	6,540	6,760
	13・16				5,720	6,310	6,540	7,120	7,340
	20・22					7,000	7,240	7,690	7,930
	25・28					7,590	7,820	8,170	8,400
	30						7,930	8,630	8,860
HWGS HWGL	2	3,120	3,120	3,120	3,710				
	3・4		2,600	2,600	3,090	3,210			
	5・6		2,600	2,850	3,090	3,330	3,700		
	8・10			2,850	3,210	3,460	3,820	4,070	4,560
	13・16				3,580	3,820	4,070	4,310	4,670
	20・22					4,190	4,430	4,670	4,930
	25・28					4,560	4,670	5,040	5,300
	30						4,930	5,410	5,660

Catalog No.	H \ V	6・8・10	13・16	20・22	25・28	30
HSWDS HSWDL HSWES HSWEL	6	3,950	4,600	5,240	5,840	6,250
	8・10	4,390	5,170	5,940	6,510	6,840
	13・16		6,130	6,740	7,570	7,960
	20・22			7,690	8,790	9,250
	25・28				10,130	11,260
	30					11,820
HSWRS HSWRL	6	6,470	7,250	7,780	8,350	8,740
	8・10	6,920	7,760	8,680	9,240	9,580
	13・16		8,960	9,980	10,770	11,160
	20・22			11,470	12,480	12,930
	25・28				13,910	15,100
	30					15,600
HSWGS HSWGL	6	4,490	5,180	5,720	6,400	6,840
	8・10	4,820	5,710	6,510	7,220	7,590
	13・16		6,790	7,510	8,360	8,770
	20・22			8,690	9,760	10,230
	25・28				10,910	12,130
	30					12,830

Catalog No.	H \ V	2	3・4・5	6・8・10	13・16	20・22	25・28	30
PHWDS PHWDL PHWES PHWEL	2	5,190	5,190	5,900	6,750			
	3・4		4,320	4,910	5,620	6,210		
	5・6		4,320	4,980	5,850	6,740	7,640	8,220
	8・10			5,620	6,740	7,860	8,730	9,210
	13・16				8,140	9,020	10,350	10,920
	20・22					10,540	12,250	12,910
	25・28						14,150	15,950
	30							16,810
PHWRS PHWRL	2	8,430	8,430	8,960	10,030			
	3・4		7,020	7,470	8,360	9,020		
	5・6		7,020	7,590	8,650	9,380	10,250	10,820
	8・10			8,250	9,420	10,730	11,580	12,060
	13・16				11,110	12,440	13,670	14,240
	20・22					14,430	16,050	16,710
	25・28						18,040	19,940
	30							20,700
PHWGS PHWGL	2	5,790	5,790	6,370	7,660			
	3・4		4,820	5,310	6,380	6,940		
	5・6		4,820	5,570	6,560	7,300	8,310	8,920
	8・10			6,120	7,370	8,540	9,600	10,090
	13・16				8,920	9,960	11,290	11,890
	20・22					11,690	13,390	14,090
	25・28						15,090	17,090
	30							18,090

JECTOR BLOCK PUNCHES
—WITH DOUBLE FLANGED—

M / H	Catalog No. Type	Shape	B Blade length
SKD11 or equivalent 60～63HRC	HJW	D R E G	S
SKH51 61～64HRC	HSJW	D R E G	L
Powdered high speed steel 64～67HRC	PHJW	D R E G	Blade length(B) L>S

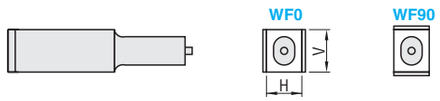


Catalog No. Type	Shape	B Blade length	H	W min.	P min.	V 6 (3.0)	8 (3.0)	10 (4.0)	13 (5.0)	16 (7.0)	20 (8.0)	22 (9.0)	25 (10.0)	28 (12.0)	30 (12.0)	L	B S	B L	M	ℓ
HJW HSJW PHJW	D R E G	S	6	2.0		○	○	○	○	○	○	○	○	○	○	(40)	8	13	4	12
			8	2.5			○	○	○	○	○	○	○	○	○				5	
			10	3.0				○	○	○	○	○	○	○	○	(50)	13	19	6	
			13	4.0					○	○	○	○	○	○	○	60				
		L	16	5.0						○	○	○	○	○	○	70	19	25	8	
			20	6.0							○	○	○	○	○					
			22	6.0								○	○	○	○	80				
			25	6.0									○	○	○					

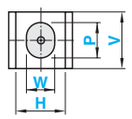
L(40) ···▸ B= 6 When the full length is(40), the blade length is fixed to 6mm.
L(50)・H10～25 ···▸ B=13 When the full length is(50)and dimension H is 10～25, the blade length is fixed to 13mm.

Order

■**Flange position : WF selectable**

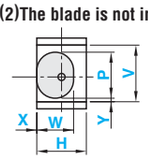


(1)The blade is in the center of shank.



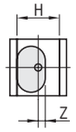
Catalog No.	V	H	L	0.01 mm increments P	W	R(Ⓡ only)	WF
HJWES	08	06	60	P6.00	W5.00		WF0

(2)The blade is not in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R(Ⓡ only)	WF	0.01 mm increments X–Y
HJWES	13	10	60	P10.00	W8.00		WF90	X0.00 – Y0.10

(X, Y specification is 0.02 over, or 0. Tolerance ±0.01)



H	Zmin.
6・8	1.0
10・13	1.5
16～25	2.0

When changing blade position, jector hole must be Zmin apart from the blade side. Jector hole position is not changeable.

Delivery

● HJW type: 3 Days | Express A 800/1Pc. P.38

● HSJW type/PHJW type: 8 Days

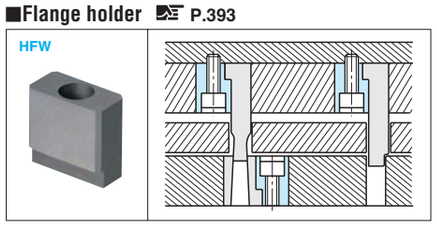
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration

Catalog No. | V | H | L(LC) | P–W–R | WF | X–Y | (BC・PKC・etc.)
HJWES 10 10 – 60 – P8.00 – W7.80 – WF0 – BC10.5

Alterations		Code	Spec.	¥/1Code
Blade		BC	Changes blade length B(shorter than standard) 2≦BC<B 0.1 mm increments	400
		SC	Finishes blade with lapping ⓥ W≧2.00 ⓥ Dimension P tolerance and the specification unit remain the same. ⓥ Pay attention to delivery time. ● HJW type 5 Days ● HSJW・PHJW type 10 Days ⊗ Express is not available. ⊗ Ⓓ shape : R=0 Not applicable	1,200
		PKC	Changes blade tolerance P・W P・W±0.01 ⇨ +0.01 0	400
		PKV	Changes blade tolerance P・W P・W±0.01 ⇨ ±0.005	400
Full length		LC	Changes full length LC<L 0.1 mm increments (Combination with LKC・LKZ→0.01mm increments) ⓥ B is shortened by(L–LC).	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance L +0.2 0 ⇨ +0.01 0	600
Flange		HC	Changes flange width. 0≦HC<1.5 0.1 mm increments	200
		TC	Changes flange thickness. 3.5≦TC<5 0.1 mm increments (Combination with TKC→0.01mm increments) ⓥ L is shortened by(5–TC). When LC, L=LC.	200
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.02	200
		FK	Adds relief chamfering to flange. For breakage prevention.	400
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	400
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	–100
		NC	Removes jector pin ⊗ AC : Not applicable	–200
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100

■**Flange holder** P.393



The volume discount rate is also applicable to alteration cost. P.39

Price

■**Volume discount rate** P.37

Quantity	1～9	10～29	30～49	50～100
Rate	–	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No.	H \ V	6・8・10	13・16	20・22・25	28・30
HJWDS HJWDL HJWES HJWEL	6	3,910	4,390	4,610	4,970
	8・10	4,130	4,480	4,740	5,070
	13・16		4,740	4,840	5,200
	20・22			5,070	5,430
	25			5,650	5,890
HJWRS HJWRL	6	6,240	6,590	6,810	7,170
	8・10	6,460	6,710	7,050	7,390
	13・16		7,170	7,870	8,100
	20・22			8,560	8,800
	25			9,140	9,380
HJWGS HJWGL	6	4,490	4,730	4,980	5,350
	8・10	4,480	4,850	5,100	5,460
	13・16		5,350	5,580	5,840
	20・22			5,950	6,080
	25			6,320	6,570

Catalog No.	H \ V	6・8・10	13・16	20・22・25	28・30
HSJWDS HSJWDL HSJWES HSJWEL	6	6,670	7,310	8,560	8,970
	8・10	7,110	7,880	9,220	9,560
	13・16		8,840	10,290	10,680
	20・22			11,500	11,970
	25			12,840	13,970
HSJWRS HSJWRL	6	9,190	9,970	11,070	11,460
	8・10	9,630	10,480	11,960	12,290
	13・16		11,680	13,490	13,880
	20・22			15,200	15,650
	25			16,620	17,810
HSJWGS HSJWGL	6	7,350	8,040	9,260	9,700
	8・10	7,680	8,570	10,080	10,450
	13・16		9,650	11,220	11,630
	20・22			12,620	13,090
	25			13,770	14,990

Catalog No.	H \ V	6・8・10	13・16	20・22・25	28・30
PHJWDS PHJWDL PHJWES PHJWEL	6	8,010	8,930	10,830	11,450
	8・10	8,690	9,870	12,000	12,500
	13・16		11,370	13,710	14,320
	20・22			15,730	16,430
	25			17,750	19,660
PHJWRS PHJWRL	6	10,780	11,910	13,610	14,210
	8・10	11,480	12,730	15,020	15,530
	13・16		14,520	17,240	17,850
	20・22			19,770	20,470
	25			21,890	23,910
PHJWGS PHJWGL	6	8,780	9,830	11,690	12,340
	8・10	9,360	10,690	13,060	13,580
	13・16		12,340	14,860	15,500
	20・22			17,090	17,830
	25			18,900	21,020

BLOCK PUNCHES FOR HEAVY LOAD
—FLANGE THICKNESS 10mm, SINGLE FLANGED TYPE—

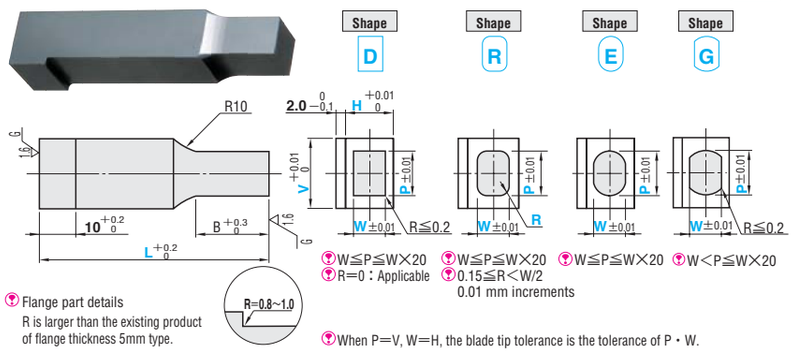
DELIVERY SHORTENED
AHSF(SKH51)
Delivery time
8 Days → 3 Days

The volume discount rate is also applicable to alteration cost. P.39

M / H	Catalog No. Type	Shape	B Blade length
(H2~5) SKH51 61~64HRC (H6~13) SKD11 or equivalent 60~63HRC	AHF	D R E G	S
SKH51 61~64HRC	AHSF (H6~13)	D R E G	L
Powdered high-speed steel 64~67HRC	APHF	D R E G	Blade length(B) L>S

RoHS

Shape D R E G



Flange part details
R is larger than the existing product of flange thickness 5mm type.

W≦P≦W×20 W≦P≦W×20 W≦P≦W×20 W<P≦W×20
R=0 : Applicable 0.15≦R<W/2 0.01 mm increments

When P=V, W=H, the blade tip tolerance is the tolerance of P・W.

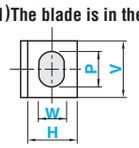
Catalog No. Type	Shape	B Blade length	H	W min.	P min.	V 3	4	5	6	8	10	13	16	20	22	25	28	30	L	B S	B L
						1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0			
AHF	D	S	(2)	1.0		○	○	○	○	○	○	○								6	8
			(3)	1.0		○	○	○	○	○	○	○	○	○	○				50		
AHSF (H6~13)	R		(4)	1.0			○	○	○	○	○	○	○	○	○						
			5	1.2				○	○	○	○	○	○	○	○	○	○	○	60	8	13
APHF	E	L	6	1.5					○	○	○	○	○	○	○	○	○	○	70		
			8	2.0						○	○	○	○	○	○	○	○	○	80		
	G		10	2.5							○	○	○	○	○	○	○	○		13	19
			13	3.0								○	○	○	○	○	○	○			

H(2)(3)(4) ••• L50~70 When H(2),(3)or (4), the length(L)is 50~70.

Order

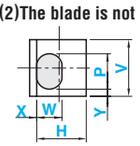
■The flange position is fixed. (F specification unnecessary)

(1)The blade is in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R(Ⓡonly)
APHFES	08	08	60	P8.00	W6.00	

(2)The blade is not in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R(Ⓡonly)	0.01 mm increments X−Y
APHFEL	10	10	60	P6.00	W5.00		X0.00 − Y0.50

(X, Y specification is 0.02 over, or 0. Tolerance ±0.01)

Delivery: 3 Days | Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.
Express A are not available for AHSF.

■Features

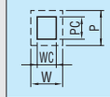
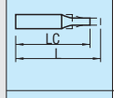
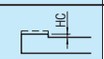
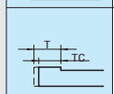
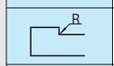
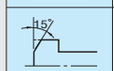
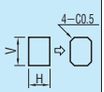
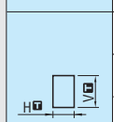
This block punch has stronger flange than general products. It is suitable for situations like flange breakage cause problems when punching thick plates or high-tensile steel plates.

Comparison of flange size Unit:mm

Type	Thickness	Width	R
Standard	5	1.5	0.3 or less
Flange thickness 10mm	10	2.0	0.8~1.0

Alteration

Catalog No. | V | H | L(LC) | P(PC)-W(WC)-R | X-Y | (BC・PKC・etc.)
APHFES 10 10 − LC58.5 − P8.00 − W6.00 − HC1.5

Alterations		Code	Spec.	¥/1Code
Blade		PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01 mm increments	200
		BC	Changes blade length B 2≦BC≦Bmax 0.1 mm increments Full length L (LC) requires BC+36mm or more.	400
		SC	Finishes blade with lapping W≧2.00 Dimension P tolerance and the specification unit remain the same. Pay attention to delivery time. 5 Days Express is not available. D shape : R=0 Not applicable	1,200
		PKC	Changes blade tolerance P・W P・W±0.01 ⇨ +0.01 0	400
		PKV	Changes blade tolerance P・W P・W±0.01 ⇨ ±0.005	400
Full length		LC	Changes full length 36+B(BC)≦LC<L 0.1 mm increments (Combination with LKC・LKZ→0.01mm increments) When LC−B is 36mm or less, blade length is full length−36mm.	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance L +0.2 0 ⇨ +0.01 0	600
Flange		HC	Changes flange width. 1.0≦HC<2.0 0.1 mm increments	200
		TC	Changes flange thickness. 5≦TC<10 0.1 mm increments (Combination with TKC→0.01mm increments) L is shortened by (10−TC). When LC, L=LC.	200
		RE	Changes R on flange. R=0.8~1.0 ⇨ R≦0.3	300
		FK	Adds relief chamfering to flange. For breakage prevention.	200
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.02	200
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. No chamfering on R of flange foot.	400
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~49
Rate	—	5%	10%

To be quoted on price & lead time above Max. Q'ty.

Catalog No.	H \ V	3・4・5	6・8・10	13・16	20・22・25	28・30
AHFDS AHFDL	2	2,620	2,770	2,990		
	3・4	2,180	2,310	2,490	2,670	
	5・6	2,180	2,360	2,670	2,970	3,280
	8・10		2,490	2,790	3,040	3,280
	13			3,100	3,280	3,520
AHFRS AHFRL	2	5,710	5,710	6,150		
	3・4	4,760	4,760	5,120	5,360	
	5・6	4,760	4,870	5,240	5,490	5,730
	8・10		5,000	5,360	5,730	5,970
	13			5,850	6,470	6,710
AHFES AHFEL AHFGS AHFGL	2	2,920	2,920	3,510		
	3・4	2,430	2,430	2,920	3,040	
	5・6	2,430	2,670	2,920	3,160	3,520
	8・10		2,670	3,040	3,280	3,650
	13			3,410	3,650	3,890

Catalog No.	H \ V	6・8・10	13・16	20・22	25・28	30
AHSFDS AHSFDL	6	3,870	4,550	5,240	5,860	6,290
	8・10	4,330	5,160	5,970	6,570	6,910
	13		6,180	6,800	7,660	8,070
AHSFRS AHSFRL	6	6,520	7,350	7,910	8,480	8,890
	8・10	6,990	7,880	8,810	9,420	9,770
	13		9,120	10,210	11,030	11,440
AHSFES AHSFEL AHSFGS AHSFGL	6	4,200	4,890	5,430	6,100	6,540
	8・10	4,530	5,420	6,220	6,930	7,300
	13		6,500	7,220	8,050	8,450

Catalog No.	H \ V	3・4・5	6・8・10	13・16	20・22	25・28	30
APHFDS APHFDL	2	5,030	5,770	6,660			
	3・4	4,190	4,810	5,550	6,170		
	5・6	4,190	4,870	5,790	6,740	7,680	8,290
	8・10		5,550	6,730	7,910	8,840	9,320
	13			8,220	9,140	10,490	11,090
APHFRS APHFRL	2	8,430	8,990	10,140			
	3・4	7,020	7,490	8,450	9,140		
	5・6	7,020	7,620	8,750	9,520	10,390	10,990
	8・10		8,310	9,550	10,860	11,790	12,290
	13			11,290	12,690	13,990	14,590
APHFES APHFEL APHFGS APHFGL	2	5,350	5,930	7,210			
	3・4	4,460	4,940	6,010	6,570		
	5・6	4,460	5,220	6,190	6,940	7,940	8,550
	8・10		5,760	7,000	8,170	9,230	9,720
	13			8,550	9,600	10,890	11,490

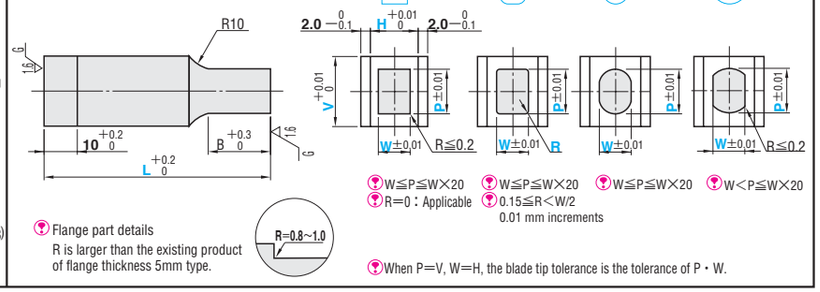
BLOCK PUNCHES FOR HEAVY LOAD
—FLANGE THICKNESS 10mm, DOUBLE FLANGED TYPE—

DELIVERY SHORTENED
AHSW (SKH51)
Delivery time
8 Days→3 Days

The volume discount rate is also applicable to alteration cost. P.39

M / H	Catalog No. Type	Shape	B Blade length
(H2～5) SKH51 61～64HRC (H6～13) SKD11 or equivalent 60～63HRC	AHW	D R E G	S
SKH51 61～64HRC	AHSW (H6～13)	D R E G	L
Powdered high speed steel 64～67HRC	APHW	D R E G	Blade length(B) L>S

RoHS



Shape D: W≦P≦W×20 ; R=0 : Applicable
Shape R: W≦P≦W×20 ; 0.15≦R<W/2, 0.01 mm increments
Shape E: W≦P≦W×20
Shape G: W<P≦W×20

Flange part details
R is larger than the existing product of flange thickness 5mm type.

When P=V, W=H, the blade tip tolerance is the tolerance of P・W.

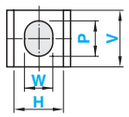
Catalog No. Type	Shape	B Blade length	H	V / W min.	P min.	3	4	5	6	8	10	13	16	20	22	25	28	30	L	B S	B L
						1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0			
AHW	D	S	(2)	1.0		○	○	○	○	○	○	○							50	6	8
			(3)	1.0		○	○	○	○	○	○	○	○	○	○						
AHSW (H6～13)	R		(4)	1.0			○	○	○	○	○	○	○	○	○				60		
			5	1.2				○	○	○	○	○	○	○	○	○	○	○	70	8	13
	E	L	6	1.5					○	○	○	○	○	○	○	○	○	○	80		
APHW	G		8	2.0						○	○	○	○	○	○	○	○	○			
			10	2.5							○	○	○	○	○	○	○	○		13	19
			13	3.0								○	○	○	○	○	○	○			

H(2)(3)(4) ···▸ L50～70 When H(2), (3) or (4), the length (L) is 50～70.

Order

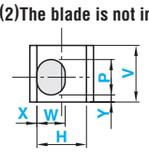
■The flange position is fixed. (WF specification unnecessary.)

(1)The blade is in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R (R only)
APHWES	08	08	60	P6.00	W4.00	

(2)The blade is not in the center of shank.



Catalog No.	V	H	L	0.01 mm increments P	W	R (R only)	0.01 mm increments X−Y
APHWEL	10	10	60	P6.00	W5.00		X0.00−Y0.10

(X, Y specification is 0.02 over, or 0. Tolerance ±0.01)

Delivery

3 Days | Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.
Express A are not available for AHSW.

■Features

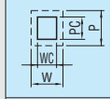
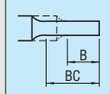
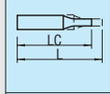
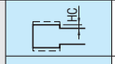
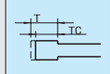
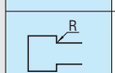
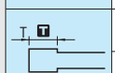
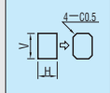
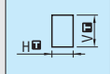
This block punch has stronger flange than general products. It is suitable for situations like flange breakage cause problems when punching thick plates or high-tensile steel plates.

Comparison of flange size Unit:mm

Type	Thickness	Width	R
Standard	5	1.5	0.3 or less
Flange thickness 10mm	10	2.0	0.8～1.0

Alteration

Catalog No. | V | H | − L(LC) − P(PC)−W(WC)−R − X−Y − (BC・PKC・etc.)
APHWES 10 10 − LC57.5 − P8.00 − W6.00 − TC8.0

Alterations		Code	Spec.	¥/1Code
Blade		PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01 mm increments W(WC) / Bmax: 0.50～0.99 / 4; 1.00～1.19 / 8; 1.20～1.99 / 13; 2.00～2.99 / 20; 3.00～4.99 / 30; 5.00～ / 35	200
		BC	Changes blade length B 2≦BC≦Bmax 0.1 mm increments Full length L (LC) requires BC+36mm or more.	400
		SC	Finishes blade with lapping W≧2.00 Dimension P tolerance and the specification unit remain the same. Pay attention to delivery time. 5 Days Express is not available. D shape : R=0 Not applicable	1,200
		PKC	Changes blade tolerance P・W P・W±0.01 ⇨ $^{+0.01}_{0}$	400
		PKV	Changes blade tolerance P・W P・W±0.01 ⇨ ±0.005	400
Full length		LC	Changes full length 36+B(BC)≦LC<L 0.1 mm increments (Combination with LKC・LKZ→0.01mm increments) When LC−B is 36mm or less, blade length is full length−36mm.	200
		LKC	Changes full length tolerance L $^{+0.2}_{0}$ ⇨ $^{+0.05}_{0}$	400
		LKZ	Changes full length tolerance L $^{+0.2}_{0}$ ⇨ $^{+0.01}_{0}$	600
Flange		HC	Changes flange width. 1.0≦HC<2.0 0.1 mm increments	200
		TC	Changes flange thickness. 5≦TC<10 0.1 mm increments (Combination with TKC→0.01mm increments) L is shortened by (10−TC). When LC, L=LC.	200
		RE	Changes R on flange. R=0.8～1.0 ⇨ R≦0.3	600
		FK	Adds relief chamfering to flange. For breakage prevention.	400
		TKC	Changes flange thickness tolerance. T $^{+0.2}_{0}$ ⇨ $^{+0.02}_{0}$	200
		TKM	Changes flange thickness tolerance. T $^{+0.2}_{0}$ ⇨ $^{0}_{-0.02}$	200
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. No chamfering on R of flange foot.	400
		VKC	Changes shank tolerance (V・H) V・H $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	300
		VKM	Changes shank tolerance (V・H) V・H $^{+0.01}_{0}$ ⇨ $^{0}_{-0.005}$	300
		VHM	Changes shank tolerance (V・H) V・H $^{+0.01}_{0}$ ⇨ $^{0}_{-0.01}$	200
		VHZ	Changes shank tolerance (V・H) V・H $^{+0.01}_{0}$ ⇨ ±0.005	100

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～49
Rate	—	5%	10%

To be quoted on price & lead time above Max. Q'ty.

Catalog No.	H \ V	3・4・5	6・8・10	13・16	20・22・25	28・30
AHWDS AHWDL	2	2,820	2,980	3,190		
	3・4	2,350	2,480	2,660	2,850	
	5・6	2,350	2,540	2,850	3,150	3,460
	8・10		2,660	2,960	3,210	3,460
	13			3,270	3,460	3,700
AHWRS AHWRL	2	5,920	5,920	6,360		
	3・4	4,930	4,930	5,300	5,540	
	5・6	4,930	5,040	5,410	5,660	5,910
	8・10		5,170	5,540	5,910	6,150
	13			6,020	6,640	6,880
AHWES AHWEL AHWGS AHWGL	2	3,120	3,120	3,710		
	3・4	2,600	2,600	3,090	3,210	
	5・6	2,600	2,850	3,090	3,330	3,700
	8・10		2,850	3,210	3,460	3,820
	13			3,580	3,820	4,070

Catalog No.	H \ V	6・8・10	13・16	20・22	25・28	30
AHSWDS AHSWDL	6	4,160	4,840	5,520	6,150	6,580
	8・10	4,620	5,440	6,250	6,850	7,200
	13		6,450	7,090	7,970	8,380
AHSWRS AHSWRL	6	6,810	7,630	8,190	8,790	9,200
	8・10	7,280	8,170	9,140	9,730	10,080
	13		9,430	10,510	11,340	11,750
AHSWES AHSWEL AHSWGS AHSWGL	6	4,490	5,180	5,720	6,400	6,840
	8・10	4,820	5,710	6,510	7,220	7,590
	13		6,790	7,510	8,360	8,770

Catalog No.	H \ V	3・4・5	6・8・10	13・16	20・22	25・28	30
APHWDS APHWDL	2	5,460	6,210	7,110			
	3・4	4,550	5,170	5,920	6,540		
	5・6	4,550	5,240	6,160	7,100	8,040	8,650
	8・10		5,920	7,090	8,270	9,190	9,690
	13			8,570	9,500	10,890	11,490
APHWRS APHWRL	2	8,870	9,430	10,560			
	3・4	7,390	7,860	8,800	9,500		
	5・6	7,390	7,990	9,110	9,870	10,790	11,390
	8・10		8,680	9,920	11,290	12,190	12,690
	13			11,690	13,090	14,390	14,990
APHWES APHWEL APHWGS APHWGL	2	5,790	6,370	7,660			
	3・4	4,820	5,310	6,380	6,940		
	5・6	4,820	5,570	6,560	7,300	8,310	8,920
	8・10		6,120	7,370	8,540	9,600	10,090
	13			8,920	9,960	11,290	11,890

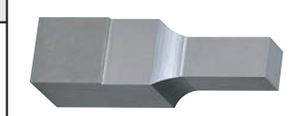
BLOCK PUNCHES
—FLANGED TYPE—

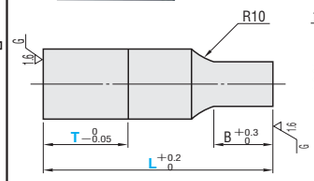
DELIVERY SHORTENED
HST(SKH51)
Delivery time
8 Days→3 Days

¥ The volume discount rate is also applicable to alteration cost. P.39

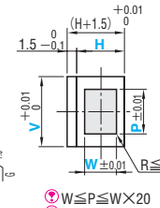
M / H	Catalog No. Type	Shape	B Blade length
(H3～5) SKH51 61～64HRC (H6～30) SKD11 or equivalent 60～63HRC	HT	D R E G	S
SKH51 61～64HRC	HST (H6～28)	D R E G	L
Powdered high-speed steel 64～67HRC	PHT	D R E G	Blade length(B) L>S

RoHS

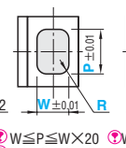




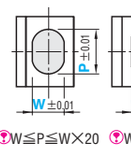
Shape D



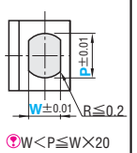
Shape R



Shape E



Shape G

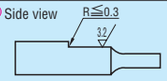


When W≦P≦W×20 / R=0 : Applicable
When W≦P≦W×20 / 0.15≦R<W/2 0.01mm increments
When W≦P≦W×20
When W<P≦W×20
When P=V, W=H, the blade tip tolerance is the tolerance of P・W.

Catalog No. Type	Shape	B Blade length	H \ V	3	4	5	6	8	10	13	16	20	22	25	28	(30)	L	T	B S	B L
			W min. \ P min.	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0				
HT HST (H6～28) PHT	D R E G	S	(3)	1.0	○	○	○	○	○	○	○	○	○	○						
			(4)	1.0		○	○	○	○	○	○	○	○	○						
			5	1.2			○	○	○	○	○	○	○	○	○	○	○	(40)			
			6	1.5				○	○	○	○	○	○	○	○	○	○	(50)	13	8	13
			8	2.0					○	○	○	○	○	○	○	○	○	60	16		
			10	2.5						○	○	○	○	○	○	○	○	70	20	13	19
			13	3.0							○	○	○	○	○	○	○	80	22		
			16	4.0								○	○	○	○	○	○	90	25		
			20	5.0									○	○	○	○	○	100			
			22	6.0										○	○	○	○				
			25	6.5											○	○	○			19	25
			28	7.0												○	○				
			(30)	7.5													○				

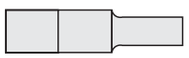
B≦L−(T+15)
L(40)・H10～30 ･･･▸ B=13 When the full length is(40)and dimension H is 10～30, the blade length is fixed to 13mm.
L(50)・H16～30 ･･･▸ B=19 When the full length is(50)and dimension H is 16～30, the blade length is fixed to 19mm.
H(3)(4) ･･･▸ L40～70 When H(3),(4), the length (L)is 40～70.
H(30)V(30) ･･･▸ H・V=30 is a standard only of HT□□ and PHT□□. (HST□□3030 is subject to be discontinued)

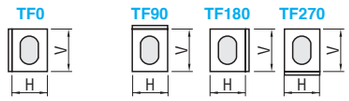
Side view



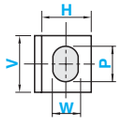
Order

■Flange position : TF selectable.



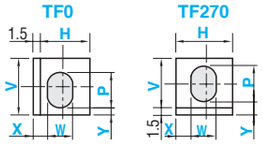


(1)When the blade is in the center of V and H.



Catalog No.	V	H	L	0.01mm increments P	W	R(Ronly)	T	TF
PHTES	08	08	60	P6.00	W4.00		T20	TF0

(2)When the blade is not in the center of V and H.



Dimension X,Y includes the flange.

Catalog No.	V	H	L	0.01mm increments P	W	R(Ronly)	T	TF	0.01mm increments X	Y
PHTEL	10	10	60	P6.00	W5.00		T16	TF0	X2.00	Y0.50

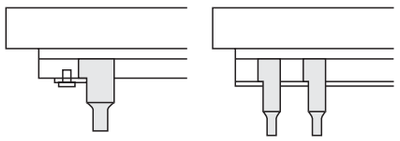
Specify X, when TF0 is 1.5 or more, when TF90, TF180 and TF270 is 0.02 or more, and when 0.
Specify Y, when TF270 is 1.5 or more, when TF0, TF90, and TF180 is 0.02 or more, and when 0.
Tolerance ±0.01

Delivery 3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.
⊗Express A are not available for HST.

Example



Alteration

Catalog No. | V | H | − (L/LC) − P(PC)−W(WC)−R − T/TC − TF − X−Y − (BC・PKC・etc.)
PHTES 10 10 − LC58.5 − P8.00 − W6.00 − T20 − TF90 − HC1.0

Alterations		Code	Spec.	¥/1Code
Blade		WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments. W(WC): 0.50～0.99 Bmax 4; 1.00～1.19 8; 1.20～1.99 13; 2.00～2.99 20; 3.00～4.99 30; 5.00～ 35	200
		BC	Changes blade length B 2≦BC≦Bmax 0.1mm increments. Full length L(LC) requires BC+30mm or more.	400
		SC	Finishes blade with lapping. W≧2.00. Dimension P tolerance and the specification unit remain the same. Pay attention to delivery time. 5 Days. ⊗Express is not available. ⊗D shape : R=0 Not applicable	1,200
		PKC	Changes blade tolerance P・W P・W±0.01 ⇨ +0.01 0	400
		PKV	Changes blade tolerance P・W P・W±0.01 ⇨ ±0.005	400
Full length		LC	Changes full length 30+B(BC)≦LC<L 0.1mm increments (Combination with LKC・LKZ→0.01mm increments). When LC−B is 30mm or less, blade length is full length−30mm.	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance L +0.2 0 ⇨ +0.01 0	600
Flange		HC	Changes flange width. 0≦HC<1.5 0.1mm increments	200
		TC	Changes flange thickness. 2≦TC<25 0.1mm increments (Combination with TKC→0.01mm increments)	200
		TKC	Changes flange thickness tolerance. T 0 −0.05 ⇨ 0 −0.02	200
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	400
		VKC	Changes shank tolerance (V・H) V・(H+1.5) +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・(H+1.5) +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・(H+1.5) +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・(H+1.5) +0.01 0 ⇨ ±0.005	100
		DC	Adds press-in lead. Adds 3mm (V・H+1.5 −0.01 −0.03) press-in lead	200

Price

■Volume discount rate P.37 ⓟ To be quoted on price & lead time above Max. Q'ty.

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

Catalog No.	H \ V	3・4・5	6・8・10	13・16	20・22・25	28・30
HTDS HTDL HTES HTEL	3・4	2,070	2,190	2,370	2,540	
	5・6	2,070	2,240	2,540	2,820	3,120
	8・10		2,370	2,650	2,890	3,120
	13・16			2,940	3,120	3,340
	20・22				3,240	3,590
	25・28				3,820	4,050
	30					4,170
HTRS HTRL	3・4	4,520	4,520	4,860	5,090	
	5・6	4,520	4,630	4,980	5,220	5,440
	8・10		4,750	5,090	5,440	5,670
	13・16			5,560	6,150	6,370
	20・22				6,830	7,080
	25・28				7,420	7,660
	30					7,770
HTGS HTGL	3・4	2,430	2,430	2,920	3,040	
	5・6	2,430	2,670	2,920	3,160	3,520
	8・10		2,670	3,040	3,280	3,650
	13・16			3,410	3,650	3,890
	20・22				4,020	4,260
	25・28				4,390	4,500
	30					4,760

Catalog No.	H \ V	6・8・10	13・16	20・22	25・28	30
HSTDS HSTDL HSTES HSTEL	6	3,680	4,320	4,980	5,570	5,980
	8・10	4,110	4,900	5,670	6,240	6,560
	13・16		5,870	6,460	7,280	7,670
	20・22			7,390	8,490	8,960
	25・28				9,830	10,960
HSTRS HSTRL	6	6,190	6,980	7,510	8,060	8,450
	8・10	6,640	7,490	8,370	8,950	9,280
	13・16		8,660	9,700	10,480	10,870
	20・22			11,220	12,190	12,690
	25・28				13,610	14,800
HSTGS HSTGL	6	4,200	4,890	5,430	6,100	6,540
	8・10	4,530	5,420	6,220	6,930	7,300
	13・16		6,500	7,220	8,050	8,450
	20・22			8,450	9,450	9,980
	25・28				10,600	11,820

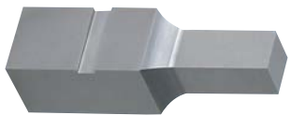
Catalog No.	H \ V	3・4・5	6・8・10	13・16	20・22	25・28	30
PHTDS PHTDL PHTES PHTEL	3・4	3,980	4,570	5,270	5,860		
	5・6	3,980	4,630	5,500	6,400	7,300	7,880
	8・10		5,270	6,390	7,510	8,400	8,850
	13・16			7,810	8,680	9,970	10,540
	20・22				10,160	11,870	12,530
	25・28					13,770	15,570
	30						16,430
PHTRS PHTRL	3・4	6,670	7,120	8,030	8,680		
	5・6	6,670	7,240	8,310	9,040	9,870	10,440
	8・10		7,890	9,070	10,320	11,200	11,680
	13・16			10,730	12,060	13,290	13,860
	20・22				14,150	15,670	16,430
	25・28					17,660	19,560
	30						20,420
PHTGS PHTGL	3・4	4,460	4,940	6,010	6,570		
	5・6	4,460	5,220	6,190	6,940	7,940	8,550
	8・10		5,760	7,000	8,170	9,230	9,720
	13・16			8,550	9,600	10,890	11,490
	20・22				11,390	12,990	13,790
	25・28					14,690	16,690
	30						17,690

PRESS ADD.SPEC. Printed in Red

BLOCK PUNCHES —CONFIGURABLE TYPE—

Price P.337

FHS□□type (SKH51) added.



● Machining limit

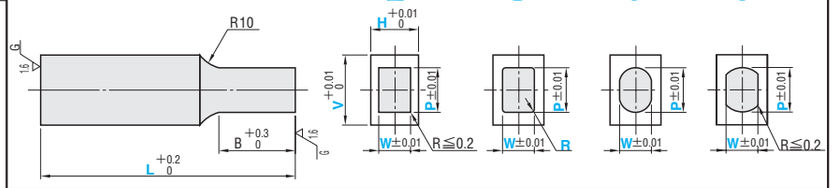
RoHS

Shape D	Shape R	Shape E	Shape G
W≦P≦W×20	W≦P≦W×20	W≦P≦W×20	W<P≦W×20
R=0 : Applicable	0.15≦R<W/2		
	0.01mm increments		

When P=V, W=H, the blade tip tolerance is the tolerance of P・W.

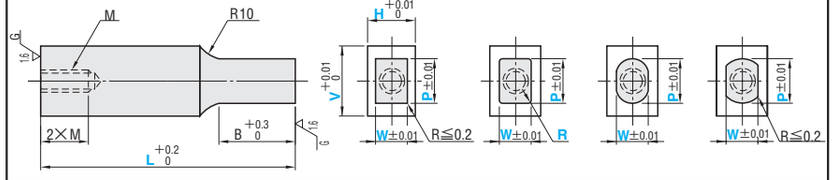
M / H	Shank dimension V·H	Catalog No. Type	Shape
(H3.0~5.0) SKH51 61~64HRC (H5.1~30.0) SKD11 or equivalent 60~63HRC	V3.0~50 H3.0~30	FHP	D R E G
SKH51 61~64HRC	V5.1~30 H5.1~30	FHSP	
Powdered high -speed steel 64~67HRC	V3.0~30 H3.0~30	FPHP	

Standard



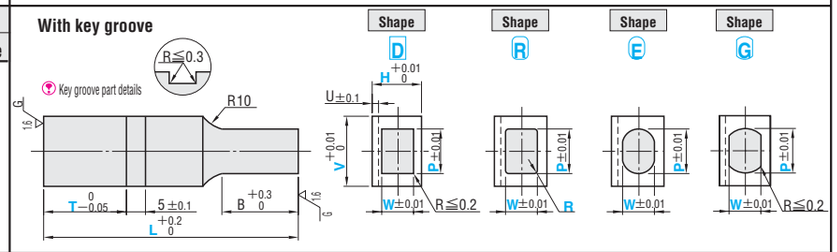
M / H	Shank dimension V·H	Catalog No. Type	Shape
SKD11 or equivalent 60~63HRC	V5.1~50 H5.1~30	FHM	D R E G
SKH51 61~64HRC	V5.1~30 H5.1~30	FHSM	
Powdered high -speed steel 64~67HRC	V5.1~30 H5.1~30	FPHM	

Tapped



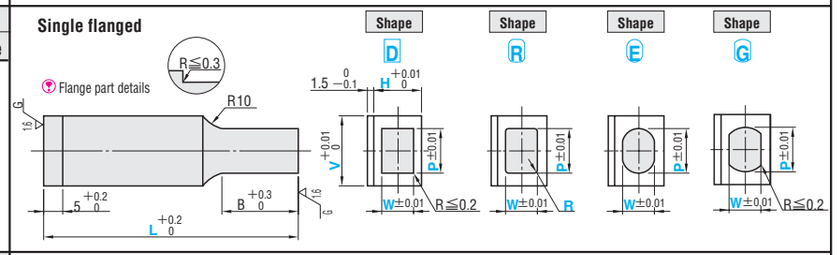
M / H	Shank dimension V·H	Catalog No. Type	Shape
(H3.0~5.0) SKH51 61~64HRC (H5.1~30.0) SKD11 or equivalent 60~63HRC	V3.0~50 H3.0~30	FHK	D R E G
SKH51 61~64HRC	V5.1~30 H5.1~30	FHSK	
Powdered high -speed steel 64~67HRC	V3.0~30 H3.0~30	FPHK	

With key groove



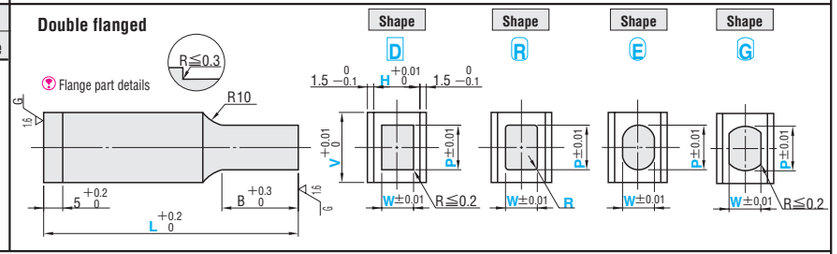
M / H	Shank dimension V·H	Catalog No. Type	Shape
(H3.0~5.0) SKH51 61~64HRC (H5.1~30.0) SKD11 or equivalent 60~63HRC	V3.0~50 H3.0~30	FHF	D R E G
SKH51 61~64HRC	V5.1~30 H5.1~30	FHSF	
Powdered high -speed steel 64~67HRC	V3.0~30 H3.0~30	FPHF	

Single flanged



M / H	Shank dimension V·H	Catalog No. Type	Shape
(H3.0~5.0) SKH51 61~64HRC (H5.1~30.0) SKD11 or equivalent 60~63HRC	V3.0~50 H3.0~30	FHW	D R E G
SKH51 61~64HRC	V5.1~30 H5.1~30	FHSW	
Powdered high -speed steel 64~67HRC	V3.0~30 H3.0~30	FPHW	

Double flanged



■Key groove position change
Flange position change

● With key groove K0 K90 K180 K270

● Single flanged F0 F90 F180 F270

● Double flanged WF0 WF90

The volume discount rate is also applicable to alteration cost. P.39

Catalog No. Type			Shape	H \ V	V	3.0~4.0	4.1~5.0	5.1~6.0	6.1~8.0	8.1~10.0	10.1~13.0	13.1~16.0	16.1~20.0	20.1~25.0	25.1~30.0	30.1~40.0	40.1~50.0
					P min	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	10.0	12.0	16.0	20.0
Standard	FHP	FHSP	D	(3.0~4.0)	1.0	○	○	○	○	○	○	○	○				
	FPHP			4.1~5.0	1.2		○	○	○	○	○	○	○				
Tapped	FHM	FHSM	R	5.1~6.0	1.5			○	○	○	○	○	○	○	○		
	FPHM			6.1~8.0	2.0				○	○	○	○	○	○	○	○	
With key groove	FHK	FHSK	E	8.1~10.0	2.5					○	○	○	○	○	○	○	○
	FPHK			10.1~13.0	3.0						○	○	○	○	○	○	○
Single flanged	FHF	FHSF	G	13.1~16.0	4.0							○	○	○	○	○	○
	FPHF			16.1~20.0	5.0								○	○	○	○	○
Double flanged	FHW	FHSW		20.1~25.0	6.5									○	○	○	○
	FPHW			25.1~30.0	7.5										○	○	○

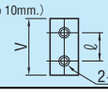
L	0.1mm T	B	M	U
(40)	T≧2.0	8	–	1.0
(50)		13	–	
60			3	1.5
70			4	
80		19	5	
90			6	
100		25	8	

L(40)・H8.1~30・・・▸ B=13 When the full length is (40) and dimension H is 8.1~30, the blade length is fixed to 13mm. (Tapped type, it is fixed to 10mm.)

L(50)・H13.1~30・・・▸ B=19 When the full length is (50) and dimension H is 13.1~30, the blade length is fixed to 19mm.

H(3.0~4.0) ・・・▸ L40~70 When H (3.0~4.0), the length (L) is 40~70.

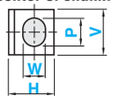
V30.1~50.0 ・・・▸ When V30.1~50.0, 2 taps and pitch is shown at right.



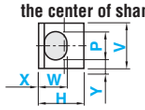
V	ℓ
30.1~40.0	20
40.1~50.0	24

Order

(1)The blade is in the center of shank.



(2)The blade is not in the center of shank.



Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R (R only)	0.1mm incr. T≧2	K F WF	
FHPD	V23.5	H12.0	60	P18.00	W 4.00				
FHMD	V17.0	H10.0	100	P16.00	W 9.00				
FPHKD	V 9.0	H 5.5	60	P 8.00	W 5.00		T25.5	K	0
FPHFD	V17.0	H14.0	60	P15.00	W12.00			F	0
FPHWD	V 9.5	H 6.0	40	P 8.00	W 5.00			WF	90

Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R (R only)	0.1mm incr. T≧2	K F WF	0.01mm increments X	Y
FHFE	V16.5	H14.0	50	P15.00	W12.00			F	X0.00	Y0.50

X, Y specification is 0.02 over, or 0. Tolerance ±0.01

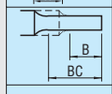
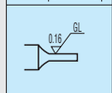
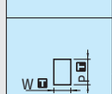
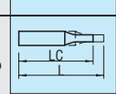
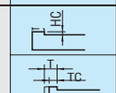
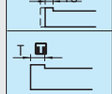
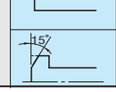
Delivery 8 Days

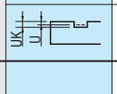
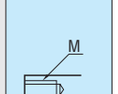
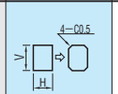
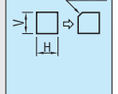
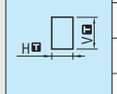
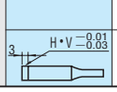
Price P.337

Alteration

Catalog No. – V – H – L(LC) – P(PC)・W(WC) – T – K-F-WF – (BC-HC-TC···etc.)

FHMD – V19.0 – H7.9 – 60.0 – P18.00 – WC1.50 – T25.5 – VKC – MC3

Alterations		Code	Spec.	¥/1Code
Blade		PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments	W(WC) 0.50~0.99 / 1.00~1.19 / 1.20~1.99 / 2.00~2.99 / 3.00~4.99 / 5.00~ ; Bmax 4 / 8 / 13 / 20 / 30 / 35 — 200
		BC	Changes blade length B 2≦BC≦Bmax 0.1mm increments Full length L(LC) requires BC+30mm or more.	400
		SC	Finishes blade with lapping W≧2.00 Dimension P tolerance and the specification unit remain the same. Pay attention to delivery time. 10 Days ⊗ D shape : R=0 Not applicable	1,200
		PKC	Changes blade tolerance P・W P・W±0.01 ⇨ +0.01 0	400
		PKV	Changes blade tolerance P・W P・W±0.01 ⇨ ±0.005	400
Full length		LC	Changes full length 30+B(BC)≦LC<L 0.1mm increments (Combination with LKC・LKZ→0.01mm increments) When LC−B is 30mm or less, blade length is full length−30mm.	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance L +0.2 0 ⇨ +0.01 0	600
Flange		HC	Changes flange width. 0≦HC<1.5 0.1mm increments	200
		TC	Changes flange thickness. 2≦TC<5 0.1mm increments (Combination with TKC→0.01mm increments) L is shortened by (5−TC). When LC, L=LC.	200
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.02	200
		FK	Adds relief chamfering to flange. For breakage prevention.	Single flange 200 Double flange 400

Alterations		Code	Spec.	¥/1Code
Key groove		TKC	Changes tolerance on key groove position T. T 0 −0.05 ⇨ 0 −0.02	200
		RTC	Changes tolerance on key groove position T. T 0 −0.05 ⇨ +0.05 0	0
		WK	Adds key groove at symmetrical position H– (2×U(UK)) ≧2.0 (K0,K180) V– (2×U(UK)) ≧2.0 (K90,K270) Additional key groove is on the symmetrical position of the specified key groove. Available to key groove type only. Combination with UK is applicable	400
		UK	Changes key groove depth. 0.5≦UK≦U+0.2 0.1mm increments H(V)−UK≧2.0 Applicable to key groove type only. Combination with WK is applicable	200
Tap		MC	Changes tap size. H dimension: 6.1~8.0 M4 M3 / 8.1~10.0 M5 M4・M6 / 10.1~13.0 M6 M4 (V10.1~16.0) M5・M8 / 13.1~16.0 M8 M5 (V13.1~20.0) M6・M10 / 16.1~30.0 M8 M6・M10 Specify the tap size after MC upon ordering. (Refer to order example). Pay attention to delivery time of FHSM. 10 Days	200
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	Standard With tapping With key groove 200 Single flange Double flange 400
		CCP	Adds chamfering (C1.0) to a corner of shank. (Error prevention) Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 Specifiable position of chamfering CCP0 CCP90 CCP180 CCP270 Applicable to standard and Tapped type only.	200
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100
		DC	Adds press-in lead Applicable to standard, tap, key groove type only. Adds 3mm (V・H −0.01 −0.03) press-in lead	200

BLOCK PUNCHES
—CONFIGURABLE TYPE—PRICE

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Standard type SKD11 or equivalent

Catalog No.	H \ V	3.0 ~ 5.0	5.1 ~ 10.0	10.1 ~ 16.0	16.1 ~ 25.0	25.1 ~ 30.0	30.1 ~ 40.0	40.1 ~ 50.0
FHPD FHPE	3.0~ 4.0	2,350	2,500	2,720	2,930			
	4.1~ 6.0	2,350	2,560	2,930	3,290	3,660		
	6.1~10.0		2,720	3,080	3,370	3,660	3,950	4,390
	10.1~16.0			3,450	3,660	3,950	4,390	4,840
	16.1~22.0				3,820	4,270	5,000	5,280
	22.1~28.0				3,990	4,840	5,130	5,570
	28.1~30.0					5,000	5,280	5,730
FHPR	3.0~ 4.0	5,430	5,430	5,870	6,160			
	4.1~ 6.0	5,430	5,570	6,010	6,320	6,600		
	6.1~10.0		5,730	6,160	6,600	6,890	7,780	8,070
	10.1~16.0			6,740	7,490	7,780	8,510	8,800
	16.1~22.0				8,350	8,660	9,240	9,540
	22.1~28.0				9,310	9,400	9,830	10,130
	28.1~30.0					9,540	10,170	10,720
FHPG	3.0~ 4.0	2,780	2,780	3,400	3,550			
	4.1~ 6.0	2,780	3,080	3,400	3,700	4,160		
	6.1~10.0		3,080	3,550	3,850	4,320	4,620	5,260
	10.1~16.0			4,020	4,320	4,620	4,930	5,400
	16.1~22.0				4,790	5,090	5,400	5,720
	22.1~28.0				5,090	5,400	5,860	6,180
	28.1~30.0					5,720	6,330	6,650

■With key groove type SKD11 or equivalent

Catalog No.	H \ V	3.0 ~ 5.0	5.1 ~ 10.0	10.1 ~ 16.0	16.1 ~ 25.0	25.1 ~ 30.0	30.1 ~ 40.0	40.1 ~ 50.0
FHKD FHKE	3.0~ 4.0	2,820	2,970	3,190	3,420			
	4.1~ 6.0	2,820	3,050	3,420	3,780	4,150		
	6.1~10.0		3,190	3,550	3,860	4,150	4,450	4,880
	10.1~16.0			3,920	4,150	4,450	4,880	5,320
	16.1~22.0				4,290	4,740	5,470	5,760
	22.1~28.0				4,450	5,320	5,600	6,050
	28.1~30.0					5,470	5,760	6,200
FHKR	3.0~ 4.0	5,920	5,920	6,360	6,650			
	4.1~ 6.0	5,920	6,050	6,490	6,790	7,100		
	6.1~10.0		6,200	6,650	7,100	7,380	8,260	8,540
	10.1~16.0			7,230	7,970	8,260	8,990	9,270
	16.1~22.0				8,840	9,150	9,720	10,020
	22.1~28.0				9,810	9,880	10,320	10,610
	28.1~30.0					10,020	10,900	11,200
FHKG	3.0~ 4.0	3,290	3,290	3,900	4,060			
	4.1~ 6.0	3,290	3,600	3,900	4,210	4,680		
	6.1~10.0		3,600	4,060	4,370	4,830	5,140	5,760
	10.1~16.0			4,520	4,830	5,140	5,450	5,900
	16.1~22.0				5,290	5,600	5,900	6,230
	22.1~28.0				5,800	5,900	6,370	6,700
	28.1~30.0					6,230	6,830	7,150

■Double flanged type SKD11 or equivalent

Catalog No.	H \ V	3.0 ~ 5.0	5.1 ~ 10.0	10.1 ~ 16.0	16.1 ~ 25.0	25.1 ~ 30.0	30.1 ~ 40.0	40.1 ~ 50.0
FHWD FHWE	3.0~ 4.0	2,820	2,970	3,190	3,420			
	4.1~ 6.0	2,820	3,050	3,420	3,780	4,150		
	6.1~10.0		3,190	3,550	3,860	4,150	4,450	4,880
	10.1~16.0			3,920	4,150	4,450	4,880	5,320
	16.1~22.0				4,290	4,740	5,470	5,760
	22.1~28.0				4,450	5,320	5,600	6,050
	28.1~30.0					5,470	5,760	6,200
FHWR	3.0~ 4.0	5,920	5,920	6,360	6,650			
	4.1~ 6.0	5,920	6,050	6,490	6,790	7,100		
	6.1~10.0		6,200	6,650	7,100	7,380	8,260	8,540
	10.1~16.0			7,230	7,970	8,260	8,990	9,270
	16.1~22.0				8,840	9,150	9,720	10,020
	22.1~28.0				9,810	9,880	10,320	10,610
	28.1~30.0					10,020	10,900	11,200
FHWG	3.0~ 4.0	3,290	3,290	3,900	4,060			
	4.1~ 6.0	3,290	3,600	3,900	4,210	4,680		
	6.1~10.0		3,600	4,060	4,370	4,830	5,140	5,760
	10.1~16.0			4,520	4,830	5,140	5,450	5,900
	16.1~22.0				5,290	5,600	5,900	6,230
	22.1~28.0				5,800	5,900	6,370	6,700
	28.1~30.0					6,230	6,830	7,430

■Tapped type SKH51

Catalog No.	H \ V	5.1 ~ 10.0	10.1 ~ 16.0	16.1 ~ 22.0	22.1 ~ 28.0	28.1 ~ 30.0
FHSMD FHSME	5.1~ 6.0	3,360	3,940	4,400	5,010	5,430
	6.1~10.0	3,360	3,940	4,400	5,010	5,430
	10.1~16.0		4,670	5,140	5,800	6,320
	16.1~22.0			5,820	6,970	7,750
	22.1~28.0			6,600	8,320	9,110
	28.1~30.0				9,290	9,330
FHSMR	5.1~ 6.0	6,310	6,980	7,610	8,160	8,590
	6.1~10.0	6,310	6,980	7,610	8,160	8,590
	10.1~16.0		7,900	8,900	9,600	10,090
	16.1~22.0			10,300	11,320	12,100
	22.1~28.0			11,920	12,760	13,550
	28.1~30.0				13,670	13,770
FHSMG	5.1~ 6.0	3,930	4,610	5,150	5,860	6,350
	6.1~10.0	3,930	4,610	5,150	5,860	6,350
	10.1~16.0		5,460	6,010	6,790	7,390
	16.1~22.0			6,810	8,150	9,070
	22.1~28.0			7,720	9,730	10,660
	28.1~30.0				10,870	10,920

■Tapped type SKD11 or equivalent

Catalog No.	H \ V	5.1 ~ 10.0	10.1 ~ 16.0	16.1 ~ 25.0	25.1 ~ 30.0	30.1 ~ 40.0	40.1 ~ 50.0
FHMD FHME	5.1~ 6.0	2,630	3,000	3,360	3,730		
	6.1~10.0	2,780	3,140	3,450	3,730	4,090	4,540
	10.1~16.0		3,510	3,730	4,090	4,540	4,980
	16.1~22.0			3,950	4,390	5,130	5,410
	22.1~28.0			4,180	4,980	5,270	5,710
	28.1~30.0				5,130	5,410	5,860
FHMR	5.1~ 6.0	5,640	6,090	6,380	6,670		
	6.1~10.0	5,780	6,230	6,670	6,960	7,920	8,210
	10.1~16.0		6,820	7,560	7,920	8,640	8,940
	16.1~22.0			8,490	8,800	9,380	9,680
	22.1~28.0			9,540	9,530	9,970	10,260
	28.1~30.0				9,680	10,540	10,850
FHMG	5.1~ 6.0	3,160	3,460	3,770	4,230		
	6.1~10.0	3,160	3,630	3,930	4,400	4,780	5,400
	10.1~16.0		4,090	4,400	4,780	5,080	5,550
	16.1~22.0			4,930	5,240	5,550	5,860
	22.1~28.0			5,520	5,550	6,010	6,330
	28.1~30.0				5,860	6,470	6,800

■Single flanged type SKD11 or equivalent

Catalog No.	H \ V	3.0 ~ 5.0	5.1 ~ 10.0	10.1 ~ 16.0	16.1 ~ 25.0	25.1 ~ 30.0	30.1 ~ 40.0	40.1 ~ 50.0
FHFD FHFE	3.0~ 4.0	2,620	2,770	2,990	3,200			
	4.1~ 6.0	2,620	2,830	3,200	3,560	3,930		
	6.1~10.0		2,990	3,350	3,650	3,930	4,230	4,700
	10.1~16.0			3,720	3,930	4,230	4,670	5,110
	16.1~22.0				4,090	4,540	5,270	5,560
	22.1~28.0				4,270	5,110	5,410	5,840
	28.1~30.0					5,270	5,560	6,000
FHFR	3.0~ 4.0	5,710	5,710	6,150	6,430			
	4.1~ 6.0	5,710	5,840	6,290	6,590	6,880		
	6.1~10.0		6,000	6,430	6,880	7,160	8,060	8,340
	10.1~16.0			7,020	7,760	8,060	8,790	9,070
	16.1~22.0				8,630	8,940	9,520	9,810
	22.1~28.0				9,590	9,670	10,110	10,400
	28.1~30.0					9,810	10,690	10,990
FHFG	3.0~ 4.0	3,070	3,070	3,690	3,840			
	4.1~ 6.0	3,070	3,370	3,690	3,990	4,450		
	6.1~10.0		3,370	3,840	4,140	4,610	4,920	5,550
	10.1~16.0			4,310	4,610	4,920	5,220	5,690
	16.1~22.0				5,080	5,380	5,690	6,010
	22.1~28.0				5,600	5,690	6,150	6,470
	28.1~30.0					6,010	6,620	6,940

■Standard type SKH51

Catalog No.	H \ V	5.1 ~ 10.0	10.1 ~ 16.0	16.1 ~ 22.0	22.1 ~ 28.0	28.1 ~ 30.0
FHSPD FHSPE	5.1~ 6.0	3,270	3,860	4,300	4,920	5,330
	6.1~10.0	3,270	3,860	4,300	4,920	5,330
	10.1~16.0		4,580	5,040	5,670	6,390
	16.1~22.0			5,670	6,830	7,550
	22.1~28.0			6,390	8,150	8,940
	28.1~30.0				9,140	9,170
FHSPR	5.1~ 6.0	6,230	6,890	7,530	8,070	8,480
	6.1~10.0	6,230	6,890	7,530	8,070	8,480
	10.1~16.0		7,800	8,810	9,430	9,960
	16.1~22.0			10,130	11,140	11,930
	22.1~28.0			11,640	12,590	13,380
	28.1~30.0				13,510	13,640
FHSPG	5.1~ 6.0	3,830	4,520	5,030	5,760	6,240
	6.1~10.0	3,830	4,520	5,030	5,760	6,240
	10.1~16.0		5,360	5,900	6,630	7,480
	16.1~22.0			6,630	7,990	8,830
	22.1~28.0			7,480	9,540	10,460
	28.1~30.0				10,690	10,730

■With key groove type SKH51

Catalog No.	H \ V	5.1 ~ 10.0	10.1 ~ 16.0	16.1 ~ 22.0	22.1 ~ 28.0	28.1 ~ 30.0
FHSKD FHSKE	5.1~ 6.0	3,760	4,340	4,800	5,410	5,830
	6.1~10.0	3,760	4,340	4,800	5,410	5,830
	10.1~16.0		5,060	5,550	6,150	6,690
	16.1~22.0			6,150	7,350	8,090
	22.1~28.0			6,860	8,660	9,450
	28.1~30.0				9,590	9,670
FHSKR	5.1~ 6.0	6,720	7,390	8,030	8,570	8,970
	6.1~10.0	6,720	7,390	8,030	8,570	8,970
	10.1~16.0		8,290	9,330	9,940	10,460
	16.1~22.0			10,640	11,660	12,440
	22.1~28.0			12,150	13,100	13,890
	28.1~30.0				13,990	14,100
FHSKG	5.1~ 6.0	4,400	5,080	5,620	6,330	6,820
	6.1~10.0	4,400	5,080	5,620	6,330	6,820
	10.1~16.0		5,920	6,490	7,200	7,830
	16.1~22.0			7,200	8,600	9,470
	22.1~28.0			8,030	10,130	11,060
	28.1~30.0				11,220	11,310

■Single flanged type SKH51

Catalog No.	H \ V	5.1 ~ 10.0	10.1 ~ 16.0	16.1 ~ 22.0	22.1 ~ 28.0	28.1 ~ 30.0
FHSFD FHSFE	5.1~ 6.0	4,220	4,950	5,650	6,230	6,430
	6.1~10.0	4,220	4,950	5,650	6,230	6,430
	10.1~16.0		5,830	6,360	7,130	7,390
	16.1~22.0			7,130	8,190	8,500
	22.1~28.0			8,030	9,410	10,240
	28.1~30.0				10,390	10,730
FHSFR	5.1~ 6.0	7,240	8,040	8,880	9,460	9,670
	6.1~10.0	7,240	8,040	8,880	9,460	9,670
	10.1~16.0		9,150	10,210	10,960	11,220
	16.1~22.0			11,690	12,580	12,930
	22.1~28.0			13,400	13,940	14,810
	28.1~30.0				15,060	15,290
FHSFG	5.1~ 6.0	4,940	5,790	6,610	7,290	7,520
	6.1~10.0	4,940	5,790	6,610	7,290	7,520
	10.1~16.0		6,820	7,440	8,340	8,650
	16.1~22.0			8,340	9,580	9,950
	22.1~28.0			9,400	11,010	11,980
	28.1~30.0				12,160	12,550

■Standard type Powdered high-speed steel

Catalog No.	H \ V	3.0 ~ 5.0	5.1 ~ 10.0	10.1 ~ 16.0	16.1 ~ 22.0	22.1 ~ 28.0	28.1 ~ 30.0
FHPHD FHPHE	3.0~ 4.0	3,040	3,370	3,830	4,310		
	4.1~ 6.0	3,100	3,510	4,240	5,320	5,630	6,160
	6.1~10.0		4,090	5,020	5,690	6,800	7,840
	10.1~16.0			6,270	7,120	8,240	10,040
	16.1~22.0				8,440	10,670	12,480
	22.1~28.0				9,980	13,120	15,100
	28.1~30.0					15,350	15,420
FHPHR	3.0~ 4.0	5,980	6,170	6,850	7,400		
	4.1~ 6.0	6,030	6,360	7,170	7,790	8,270	8,920
	6.1~10.0		6,970	7,990	8,920	9,830	10,870
	10.1~16.0			9,380	10,800	11,910	13,220
	16.1~22.0				12,790	14,870	16,830
	22.1~28.0				15,130	17,380	19,350
	28.1~30.0					19,460	19,790
FHPHG	3.0~ 4.0	3,430	3,740	4,480	4,910		
	4.1~ 6.0	3,490	4,000	4,700	5,320	6,120	6,660
	6.1~10.0		4,470	5,530	6,370	7,490	8,580
	10.1~16.0			6,850	7,900	9,060	10,430
	16.1~22.0				9,570	11,730	13,810
	22.1~28.0				11,590	13,920	15,990
	28.1~30.0					16,520	16,570

■With key groove type Powdered high-speed steel

Catalog No.	H \ V	3.0 ~ 5.0	5.1 ~ 10.0	10.1 ~ 16.0	16.1 ~ 22.0	22.1 ~ 28.0	28.1 ~ 30.0
FPHKD FPHKE	3.0~ 4.0	3,550	3,890	4,350	4,830		
	4.1~ 6.0	3,620	4,020	4,760	5,830	6,160	6,680
	6.1~10.0		4,610	5,530	6,210	7,310	8,350
	10.1~16.0			6,780	7,650	8,700	10,040
	16.1~22.0				8,950	11,260	13,120
	22.1~28.0				10,470	13,660	15,640
	28.1~30.0					15,760	15,960
FPHKR	3.0~ 4.0	6,500	6,690	7,360	8,040		
	4.1~ 6.0	6,550	6,870	7,690	8,310	8,920	9,430
	6.1~10.0		7,500	8,500	9,430	10,350	11,360
	10.1~16.0			9,890	11,360	12,460	13,770
	16.1~22.0				13,340	15,420	17,380
	22.1~28.0				15,660	17,930	19,900
	28.1~30.0					19,940	20,230
FPHKG	3.0~ 4.0	3,990	4,280	5,040	5,450		
	4.1~ 6.0	4,030	4,550	5,240	5,860	6,660	7,200
	6.1~10.0		5,020	6,070	6,920	8,030	9,120
	10.1~16.0			7,410	8,440	9,600	10,970
	16.1~22.0				10,110	12,310	14,270
	22.1~28.0				12,110	14,500	16,570
	28.1~30.0					17,080	17,150

■Double flanged type Powdered high-speed steel

Catalog No.	H \ V	3.0 ~ 5.0	5.1 ~ 10.0	10.1 ~ 16.0	16.1 ~ 22.0	22.1 ~ 28.0	28.1 ~ 30.0
FPHWD FPHWE	3.0~ 4.0	4,980	5,650	6,480	7,150		
	4.1~ 6.0	4,980	5,740	6,740	7,770	8,800	9,460
	6.1~10.0		6,480	7,760	9,040	10,050	10,600
	10.1~16.0			9,380	10,390	11,910	12,570
	16.1~22.0				12,130	14,100	14,870
	22.1~28.0				14,150	16,290	18,360
	28.1~30.0					18,510	19,350
FPHWR	3.0~ 4.0	8,080	8,600	9,620	10,390		
	4.1~ 6.0	8,080	8,740	9,970	10,800	11,810	12,460
	6.1~10.0		9,500	10,850	12,350	13,340	13,880
	10.1~16.0			12,790	14,320	15,740	16,400
	16.1~22.0				16,620	18,480	19,250
	22.1~28.0				19,280	20,780	22,960
	28.1~30.0					23,360	23,840
FPHWG	3.0~ 4.0	5,550	6,120	7,350	7,990		
	4.1~ 6.0	5,550	6,410	7,550	8,410	9,570	10,270
	6.1~10.0		7,050	8,490	9,830	11,060	11,620
	10.1~16.0			10,270	11,470	13,000	13,690
	16.1~22.0				13,460	15,420	16,230
	22.1~28.0				15,790	17,380	19,680
	28.1~30.0					19,590	20,830

■Tapped type Powdered high-speed steel

Catalog No.	H \ V	5.1 ~ 10.0	10.1 ~ 16.0	16.1 ~ 22.0	22.1 ~ 28.0	28.1 ~ 30.0
FPHMD FPHME	5.1~ 6.0	3,630	4,380	5,430	5,770	6,280
	6.1~10.0	4,230	5,140	5,820	6,930	7,980
	10.1~16.0		6,400	7,260	8,360	9,660
	16.1~22.0			8,620	10,850	12,790
	22.1~28.0			10,230	13,340	15,300
	28.1~30.0				15,600	15,640
FPHMR	5.1~ 6.0	6,490	7,310	7,930	8,520	9,030
	6.1~10.0	7,100	8,100	9,030	9,960	11,040
	10.1~16.0		9,510	10,920	12,130	13,340
	16.1~22.0			13,010	15,090	17,050
	22.1~28.0			15,480	17,600	19,570
	28.1~30.0				19,660	19,900
FPHMG	5.1~ 6.0	4,140	4,830	5,450	6,240	6,780
	6.1~10.0	4,620	5,670	6,510	7,620	8,580
	10.1~16.0		7,000	8,030	9,200	10,560
	16.1~22.0			9,780	11,960	13,920
	22.1~28.0			11,910	14,150	16,110
	28.1~30.0				16,740	16,800

■Single flanged type Powdered high-speed steel

Catalog No.	H \ V	3.0 ~ 5.0	5.1 ~ 10.0	10.1 ~ 16.0	16.1 ~ 22.0	22.1 ~ 28.0	28.1 ~ 30.0
FPHFD FPHFE	3.0~ 4.0	4,590	5,260	6,070	6,750		
	4.1~ 6.0	4,590	5,330	6,340	7,370	8,400	9,070
	6.1~10.0		6,070	7,360	8,650	9,670	10,190
	10.1~16.0			9,000	10,000	11,480	12,130
	16.1~22.0				11,690	13,660	14,430
	22.1~28.0				13,670	15,860	17,930
	28.1~30.0					18,080	18,910
FPHFR	3.0~ 4.0	7,680	8,200	9,240	10,000		
	4.1~ 6.0	7,680	8,340	9,580	10,410	11,360	12,030
	6.1~10.0		9,090	10,450	11,880	12,900	13,440
	10.1~16.0			12,350	13,880	15,300	15,960
	16.1~22.0				16,290	18,040	18,910
	22.1~28.0				19,120	20,340	22,520
	28.1~30.0					22,930	23,510
FPHFG	3.0~ 4.0	5,140	5,690	6,920	7,570		
	4.1~ 6.0	5,140	6,010	7,130	7,990	9,140	9,850
	6.1~10.0		6,630	8,060	9,410	10,630	11,190
	10.1~16.0			9,850	11,060	12,540	13,230
	16.1~22.0				13,120	14,960	15,880
	22.1~28.0				15,560	16,920	19,220
	28.1~30.0					19,140	20,370

PRESS NEW

BLOCK PUNCHES
—WPC® COATING TYPE—

PRODUCTS DATA P.1221

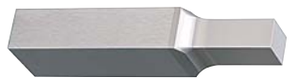
COATING PUNCHES
— WPC® —

Price P.341

The volume discount rate is also applicable to alteration cost. P.39

RoHS

—WPC® coating—



S WPC®
H 1000～1100HV
B is valid treatment range but shank may have coated layer of 10mm.

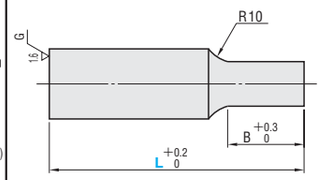
● Machining limit

Shape D	Shape R	Shape E	Shape G
W≦P≦W×20	W≦P≦W×20	W≦P≦W×20	W<P≦W×20
R=0：Applicable	0.15≦R<W/2 0.01 mm increments		

When P=V, W=H, the blade tip tolerance is the tolerance of P・W.
The tip edge is very slightly rounded.

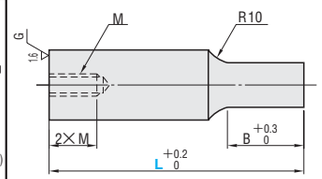
Standard

M H	Type	Shape	B Blade length
(H3～5) SKH51 61～64HRC (H6～30) SKD11 or equivalent 60～63HRC	W—HP	D R E G	S L Blade length(B) L>S
SKH51 61～64HRC	W—HSP (H6～30)		
Powdered high-speed steel 64～67HRC	W—PHP		



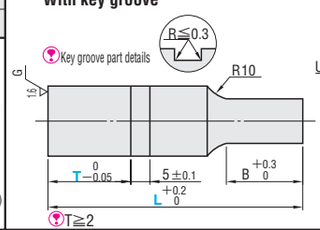
Tapped

M H	Type	Shape	B Blade length
(H5) SKH51 61～64HRC (H6～30) SKD11 or equivalent 60～63HRC	W—HM	D R E G	S L Blade length(B) L>S
SKH51 61～64HRC	W—HSM (H6～30)		
Powdered high-speed steel 64～67HRC	W—PHM		



With key groove

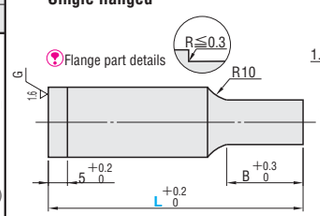
M H	Type	Shape	B Blade length
(H3～5) SKH51 61～64HRC (H6～30) SKD11 or equivalent 60～63HRC	W—HK	D R E G	S L Blade length(B) L>S
SKH51 61～64HRC	W—HSK (H6～30)		
Powdered high-speed steel 64～67HRC	W—PHK		



T≧2

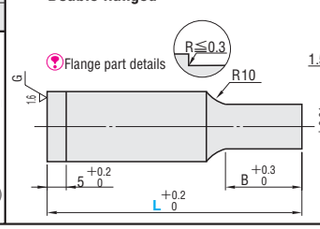
Single flanged

M H	Type	Shape	B Blade length
(H3～5) SKH51 61～64HRC (H6～30) SKD11 or equivalent 60～63HRC	W—HF	D R E G	S L Blade length(B) L>S
SKH51 61～64HRC	W—HSF (H6～30)		
Powdered high-speed steel 64～67HRC	W—PHF		

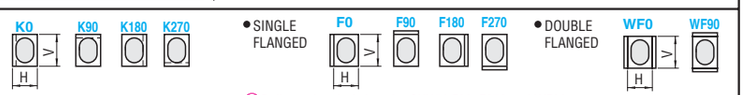


Double flanged

M H	Type	Shape	B Blade length
(H3～5) SKH51 61～64HRC (H6～30) SKD11 or equivalent 60～63HRC	W—HW	D R E G	S L Blade length(B) L>S
SKH51 61～64HRC	W—HSW (H6～30)		
Powdered high-speed steel 64～67HRC	W—PHW		



■Key groove position change
Flange position change



Delivery time is 8 days for SKH51 F90, F270 and WF90.

Catalog No. Type	Shape	B Blade length	H	W min.	V 3	4	5	6	8	10	13	16	20	22	25	28	30	L	0.1mm T	B S	B L	M	U
Standard W—HP W—HSP W—PHP	D R E G	S L	(3)	1.0	○	○	○	○	○	○	○	○	○	○				(40)	T≧2	6	8	—	1.0
Tapped W—HM W—HSM W—PHM			(4)	1.0		○	○	○	○	○	○	○	○	○				(50)		8	13	3 4 5	
With key groove W—HK W—HSK W—PHK			5	1.2			○	○	○	○	○	○	○	○	○	○	○	60		13	19	6	
Single flanged W—HF W—HSF W—PHF			6	1.5				○	○	○	○	○	○	○	○	○	○	70		19	25	8	1.5
Double flanged W—HW W—HSW W—PHW			8	2.0					○	○	○	○	○	○	○	○	○	80					
			10	2.5						○	○	○	○	○	○	○	○	90					
			13	3.0							○	○	○	○	○	○	○	100					
			16	4.0								○	○	○	○	○	○						
			20	5.0									○	○	○	○	○						
			22	6.0										○	○	○	○						
			25	6.5											○	○	○						
			28	7.0												○	○						
			30	7.5													○						

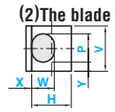
L(40)・H10～30 ･･･▶ B=13 When the full length is (40) and dimension H is 10～30, the blade length is fixed to 13mm.(Tapped type, it is fixed to 10mm.)
L(50)・H16～30 ･･･▶ B=19 When the full length is (50) and dimension H is 16～30, the blade length is fixed to 19mm.
H(3)(4) ･･･▶ L40～70 When H(3)、(4), the length(L) is 40～70.

Order

(1)The blade is in the center of shank.

Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm incr. T≧2	K・F・WF
W—HSMRL	20	10	70	P16.00	W 9.00	R0.20		
W—PHKES	10	06	60	P 8.00	W 5.00		T25.5	K0

(2)The blade is not in the center of shank. (X, Y specification is 0.02 over, or 0. Tolerance ±0.01)



Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm incr. T≧2	K・F・WF	0.01mm incr. X — Y
W—HSFDL	16	13	50	P15.00	W12.00			F90	X0.00—Y0.55

Delivery

(SKD11 or equivalent) W—H□□□
(SKH51) W—HS□□□ (F90・F270 of Single flange / WF90 of double flange are excluded)
(Powdered high-speed steel) W—PH□□□

5 Days

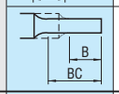
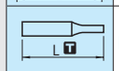
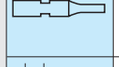
(SKH51) W—HSF□□ (F90,F270)
W—HSW□□ (WF90)

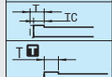
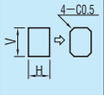
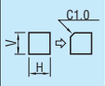
8 Days

Price P.341

Alteration

Catalog No. V H — L(LC) — P(PC)・W(WC)・R — T≧2 — K・F・WF — X — Y — (BC・HC・TC･･･etc.)
W—HSKDS 20 08 — 60 — P18.00—WC1.50 — T25.5 — LKC

Alterations		Code	Spec.	¥/1Code
Blade		PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments	200
		BC	Changes blade length B 2≦BC≦Bmax 0.1mm increments Full length L (LC) requires BC+30mm or more.	400
Full length		LC	Changes full length 30+B(BC)≦LC<L 0.1mm increments (Combination with LKC→0.01mm increments) When LC−B is 30mm or less, blade length is full length−30mm.	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
Tap		MC (MMC)	Changes tap size. □SKD11 or equivalent: H 6 8 10 13 16 20 22 25 28・30; V 6: M4→M3; V 8: —, M5→M4; V 10: M6→M4, M6→M5, M6→M5; V 13: M8→M5, M8→M6, M8→M6. When changing M6→M4 M8→M5 Specify MMC. □SKH51・Powered high-speed steel: H 6 8 10 13 16 20 22; V 6: M4→M3; V 8: —, M5→M4; V 10: —, —, M6→M5; V 13: —, —, —, M8→M6	0
Key groove		TKC	Changes tolerance on key groove position T. T 0 −0.05 ⇨ 0 −0.02	200
		RTC	Changes tolerance on key groove position T. T 0 −0.05 ⇨ 0 +0.05	0
		WK	Adds key groove at symmetrical position H− 2×U(UK)≧2.0(K0,K180) V− 2×U(UK)≧2.0(K90,K270) K0・180 K90・270 Additional key groove is on the symmetrical position of the specified key groove. Applicable to key groove type only. Combination with UK is applicable	400
		UK	Changes key groove depth. 0.5≦UK≦U+0.2 0.1mm increments H(V) −UK≧2.0 Applicable to key groove type only. Combination with WK is applicable	200

Alterations		Code	Spec.	¥/1Code
Flange		HC	Changes flange width. 0≦HC<1.5 0.1mm increments	200
		TC	Changes flange thickness. 2≦TC<5 0.1mm increments (Combination with TKC→0.01mm increments) L is shortened by (5−TC). When LC, L=LC.	200
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.02	200
		FK	Adds relief chamfering to flange. For breakage prevention.	Single flange 200 Double flange 400
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. 0.5mmor longer	Standard Tapped With key groove 200 Single flanged Double flanged 400
		CCP	Adds chamfering (C1.0) to a corner of shank. (Error prevention) Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 Blade corner Blade corner ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270 Applicable to standard, tap type only.	200
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100
		DC	Adds press-in lead Applicable to standard, tap, key groove type only. Adds 3mm (V・H −0.01 −0.03) press-in lead	200

BLOCK PUNCHES
—WPC® COATING TYPE— PRICE

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Standard type SKD11 or equivalent 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22·25	28·30
W—HPDS W—HPDL W—HPES W—HPEL	3· 4	3,100	3,230	3,400	3,570	
	5· 6	3,100	3,270	3,570	3,850	4,150
	8· 10		3,400	3,680	3,920	4,150
	13· 16			3,980	4,150	4,380
	20· 22				4,270	4,620
	25· 28				4,850	5,080
	30					5,200
W—HPRS W—HPRL	3· 4	5,550	5,550	5,900	6,120	
	5· 6	5,550	5,660	6,010	6,250	6,470
	8· 10		5,780	6,120	6,470	6,700
	13· 16			6,590	7,180	7,410
	20· 22				7,860	8,110
	25· 28				8,450	8,690
	30					8,800
W—HPGS W—HPGL	3· 4	3,450	3,450	3,940	4,060	
	5· 6	3,450	3,690	3,940	4,180	4,540
	8· 10		3,690	4,060	4,300	4,670
	13· 16			4,430	4,670	4,910
	20· 22				5,040	5,280
	25· 28				5,410	5,520
	30					5,780

■With key groove type SKD11 or equivalent 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22·25	28·30
W—HKDS W—HKDL W—HKES W—HKEL	3· 4	3,480	3,610	3,780	3,960	
	5· 6	3,480	3,660	3,960	4,240	4,540
	8· 10		3,780	4,060	4,300	4,540
	13· 16			4,360	4,540	4,760
	20· 22				4,650	5,000
	25· 28				5,230	5,460
	30					5,580
W—HKRS W—HKRL	3· 4	5,930	5,930	6,280	6,510	
	5· 6	5,930	6,040	6,390	6,630	6,860
	8· 10		6,160	6,510	6,860	7,090
	13· 16			6,970	7,560	7,790
	20· 22				8,250	8,490
	25· 28				8,840	9,070
	30					9,180
W—HKGS W—HKGL	3· 4	3,850	3,850	4,340	4,460	
	5· 6	3,850	4,100	4,340	4,580	4,950
	8· 10		4,100	4,460	4,710	5,070
	13· 16			4,830	5,070	5,320
	20· 22				5,440	5,680
	25· 28				5,810	5,920
	30					6,180

■Double flanged type SKD11 or equivalent 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22·25	28·30
W—HWDS W—HWDL W—HWES W—HWEL	3· 4	3,480	3,610	3,780	3,960	
	5· 6	3,480	3,660	3,960	4,240	4,540
	8· 10		3,780	4,060	4,300	4,540
	13· 16			4,360	4,540	4,760
	20· 22				4,650	5,000
	25· 28				5,230	5,460
	30					5,580
W—HWRS W—HWRL	3· 4	5,930	5,930	6,280	6,510	
	5· 6	5,930	6,040	6,390	6,630	6,860
	8· 10		6,160	6,510	6,860	7,090
	13· 16			6,970	7,560	7,790
	20· 22				8,250	8,490
	25· 28				8,840	9,070
	30					9,180
W—HWGS W—HWGL	3· 4	3,850	3,850	4,340	4,460	
	5· 6	3,850	4,100	4,340	4,580	4,950
	8· 10		4,100	4,460	4,710	5,070
	13· 16			4,830	5,070	5,320
	20· 22				5,440	5,680
	25· 28				5,810	5,920
	30					6,180

■Tapped type SKH51 5 Days

Catalog No.	H \ V	6·8·10	13·16	20·22	25·28	30
W—HSMDS W—HSMDL W—HSMES W—HSMEL	6	3,980	4,480	5,150	5,380	5,710
	8· 10	4,340	4,930	5,370	6,000	6,590
	13· 16		5,710	6,220	6,850	7,590
	20· 22			7,000	8,230	9,310
	25· 28				9,730	10,810
	30					11,030
W—HSMRS W—HSMRL	6	6,420	6,990	7,410	7,760	8,070
	8· 10	6,780	7,450	8,070	8,600	9,210
	13· 16		8,370	9,340	10,030	10,710
	20· 22			10,720	11,850	12,930
	25· 28				13,400	14,460
	30					14,690
W—HSMGS W—HSMGL	6	4,410	4,860	5,280	5,770	6,130
	8· 10	4,660	5,350	5,890	6,550	7,120
	13· 16		6,200	6,830	7,500	8,270
	20· 22			7,910	9,100	10,170
	25· 28				10,360	11,400
	30					11,860

■Tapped type SKD11 or equivalent 5 Days

Catalog No.	H \ V	5	6·8·10	13·16	20·22·25	28·30
W—HMDS W—HMDL W—HMES W—HMEL	5· 6	3,160	3,330	3,620	3,910	4,200
	8· 10		3,450	3,740	3,980	4,200
	13· 16			4,030	4,200	4,490
	20· 22				4,380	4,730
	25· 28				4,950	5,190
	30					5,310
W—HMRS W—HMRL	5· 6	5,600	5,710	6,070	6,300	6,530
	8· 10		5,820	6,180	6,530	6,760
	13· 16			6,650	7,230	7,520
	20· 22				7,980	8,210
	25· 28				8,560	8,790
	30					8,920
W—HMGS W—HMGL	5· 6	3,510	3,750	3,990	4,230	4,600
	8· 10		3,750	4,120	4,360	4,730
	13· 16			4,490	4,730	5,030
	20· 22				5,150	5,400
	25· 28				5,520	5,640
	30					5,890

■Single flanged type SKD11 or equivalent 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22·25	28·30
W—HFDS W—HFDL W—HFES W—HFEL	3· 4	3,320	3,440	3,620	3,790	
	5· 6	3,320	3,490	3,790	4,070	4,370
	8· 10		3,620	3,900	4,140	4,370
	13· 16			4,190	4,370	4,590
	20· 22				4,490	4,840
	25· 28				5,070	5,300
	30					5,420
W—HFRS W—HFRL	3· 4	5,770	5,770	6,110	6,340	
	5· 6	5,770	5,880	6,230	6,470	6,690
	8· 10		6,000	6,340	6,690	6,920
	13· 16			6,810	7,400	7,620
	20· 22				8,080	8,330
	25· 28				8,670	8,910
	30					9,020
W—HFGS W—HFGL	3· 4	3,680	3,680	4,170	4,290	
	5· 6	3,680	3,920	4,170	4,410	4,770
	8· 10		3,920	4,290	4,530	4,900
	13· 16			4,660	4,900	5,140
	20· 22				5,270	5,510
	25· 28				5,640	5,750
	30					6,010

■Standard type SKH51 5 Days

Catalog No.	H \ V	6·8·10	13·16	20·22	25·28	30
W—HSPDS W—HSPDL W—HSPES W—HSPEL	6	3,890	4,380	5,070	5,290	5,620
	8· 10	4,240	4,840	5,290	5,910	6,490
	13· 16		5,610	6,120	6,750	7,740
	20· 22			6,850	8,090	9,120
	25· 28				9,570	10,650
	30					10,860
W—HSPRS W—HSPRL	6	6,330	6,890	7,310	7,610	7,990
	8· 10	6,690	7,370	7,990	8,520	9,100
	13· 16		8,270	9,250	9,880	10,610
	20· 22			10,560	11,690	12,770
	25· 28				13,240	14,310
	30					14,590
W—HSPGS W—HSPGL	6	4,310	4,780	5,200	5,680	6,040
	8· 10	4,560	5,260	5,790	6,450	7,090
	13· 16		6,100	6,740	7,390	8,150
	20· 22			7,760	8,930	10,060
	25· 28				10,200	11,300
	30					11,700

■With key groove type SKH51 5 Days

Catalog No.	H \ V	6·8·10	13·16	20·22	25·28	30
W—HSKDS W—HSKDL W—HSKES W—HSKEL	6	4,310	4,810	5,490	5,720	6,050
	8· 10	4,660	5,260	5,710	6,330	6,920
	13· 16		6,030	6,550	7,150	7,890
	20· 22			7,270	8,560	9,590
	25· 28				10,010	11,080
	30					11,300
W—HSKRS W—HSKRL	6	6,750	7,320	7,740	8,100	8,410
	8· 10	7,120	7,790	8,410	8,940	9,510
	13· 16		8,700	9,700	10,310	11,040
	20· 22			11,010	12,140	13,210
	25· 28				13,680	14,750
	30					14,970
W—HSKGS W—HSKGL	6	4,760	5,220	5,640	6,130	6,480
	8· 10	5,010	5,700	6,240	6,890	7,530
	13· 16		6,540	7,180	7,840	8,600
	20· 22			8,200	9,390	10,460
	25· 28				10,660	11,760
	30					12,160

■Single flanged type SKH51 5 Days (F0,F180) / 8 Days (F90,F270)

Catalog No.	H \ V	6·8·10	13·16	20·22	25·28	30
W—HSFDS W—HSFDL W—HSFES W—HSFEL	6	4,930	5,570	6,230	6,820	7,230
	8· 10	5,360	6,150	6,920	7,490	7,810
	13· 16		7,120	7,710	8,530	8,920
	20· 22			8,640	9,740	10,210
	25· 28				11,080	12,210
	30					12,770
W—HSFRS W—HSFRL	6	7,440	8,230	8,760	9,310	9,700
	8· 10	7,890	8,740	9,620	10,200	10,530
	13· 16		9,910	10,950	11,730	12,120
	20· 22			12,470	13,440	13,940
	25· 28				14,860	16,050
	30					16,610
W—HSFGS W—HSFGL	6	5,450	6,140	6,680	7,350	7,790
	8· 10	5,780	6,670	7,470	8,180	8,550
	13· 16		7,750	8,470	9,300	9,700
	20· 22			9,700	10,700	11,230
	25· 28				11,850	13,070
	30					13,770

■Standard type Powdered high-speed steel 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
W—PHPDS W—PHPDL W—PHPES W—PHPEL	3· 4	3,890	4,180	4,570	4,990		
	5· 6	3,940	4,290	4,930	5,870	6,140	6,600
	8· 10		4,800	5,600	6,190	7,160	8,050
	13· 16			6,690	7,430	8,400	9,520
	20· 22				8,570	10,510	12,260
	25· 28					12,640	14,350
	30						14,640
W—PHPRS W—PHPRL	3· 4	6,450	6,610	7,200	7,670		
	5· 6	6,480	6,770	7,480	8,010	8,430	8,990
	8· 10		7,300	8,180	8,990	9,790	10,680
	13· 16			9,390	10,630	11,600	12,740
	20· 22				12,360	14,160	15,870
	25· 28					16,350	18,060
	30						18,440
W—PHPGS W—PHPGL	3· 4	4,230	4,500	5,140	5,510		
	5· 6	4,280	4,720	5,330	5,870	6,560	7,030
	8· 10		5,130	6,050	6,780	7,750	8,700
	13· 16			7,200	8,110	9,120	10,310
	20· 22				9,560	11,440	13,240
	25· 28					13,340	15,140
	30						15,640

■With key groove type Powdered high-speed steel 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
W—PHKDS W—PHKDL W—PHKES W—PHKEL	3· 4	4,340	4,630	5,030	5,440		
	5· 6	4,390	4,740	5,380	6,310	6,600	7,040
	8· 10		5,250	6,050	6,650	7,610	8,500
	13· 16			7,140	7,890	8,800	9,970
	20· 22				9,020	11,030	12,640
	25· 28					13,120	14,830
	30						15,110
W—PHKRS W—PHKRL	3· 4	6,890	7,050	7,640	8,230		
	5· 6	6,940	7,220	7,930	8,470	8,990	9,440
	8· 10		7,760	8,630	9,440	10,240	11,120
	13· 16			9,840	11,120	12,070	13,210
	20· 22				12,830	14,640	16,350
	25· 28					16,820	18,530
	30						18,820
W—PHKGS W—PHKGL	3· 4	4,710	4,970	5,630	5,980		
	5· 6	4,750	5,200	5,800	6,340	7,030	7,500
	8· 10		5,610	6,520	7,260	8,220	9,170
	13· 16			7,680	8,580	9,590	10,780
	20· 22				10,030	11,940	13,640
	25· 28					13,840	15,640
	30						16,140

■Double flanged type Powdered high-speed steel 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
W—PHWDS W—PHWDL W—PHWES W—PHWEL	3· 4	5,570	6,160	6,870	7,460		
	5· 6	5,570	6,230	7,100	7,990	8,890	9,470
	8· 10		6,870	7,990	9,110	9,980	10,460
	13· 16			9,390	10,270	11,600	12,170
	20· 22				11,790	13,500	14,160
	25· 28					15,400	17,200
	30						18,060
W—PHWRS W—PHWRL	3· 4	8,270	8,720	9,610	10,270		
	5· 6	8,270	8,840	9,900	10,630	11,500	12,070
	8· 10		9,500	10,670	11,980	12,830	13,310
	13· 16			12,360	13,690	14,920	15,490
	20· 22				15,680	17,300	17,960
	25· 28					19,290	21,190
	30						21,950
W—PHWGS W—PHWGL	3· 4	6,070	6,560	7,630	8,190		
	5· 6	6,070	6,820	7,810	8,550	9,560	10,170
	8· 10		7,370	8,620	9,790	10,850	11,340
	13· 16			10,170	11,210	12,540	13,140
	20· 22				12,940	14,640	15,340
	25· 28					16,340	18,340
	30						19,340

■Double flanged type SKH51 5 Days (WF0) / 8 Days (W90)

Catalog No.	H \ V	6·8·10	13·16	20·22	25·28	30
W—HSWDS W—HSWDL W—HSWES W—HSWEL	6	5,200	5,850	6,490	7,090	7,500
	8· 10	5,640	6,420	7,190	7,760	8,090
	13· 16		7,380	7,990	8,820	9,210
	20· 22			8,940	10,040	10,500
	25· 28				11,380	12,510
	30					13,070
W—HSWRS W—HSWRL	6	7,720	8,500	9,030	9,600	9,990
	8· 10	8,170	9,010	9,930	10,490	10,830
	13· 16		10,210	11,230	12,020	12,410
	20· 22			12,720	13,730	14,180
	25· 28				15,160	16,350
	30					16,850
W—HSWGS W—HSWGL	6	5,740	6,430	6,970	7,650	8,090
	8· 10	6,070	6,960	7,760	8,470	8,840
	13· 16		8,040	8,760	9,610	10,020
	20· 22			9,940	11,010	11,480
	25· 28				12,160	13,380
	30					14,080

■Tapped type Powdered high-speed steel 5 Days

Catalog No.	H \ V	5	6·8·10	13·16	20·22	25·28	30
W—PHMDS W—PHMDL W—PHMES W—PHMEL	5· 6	4,050	4,400	5,050	5,970	6,260	6,700
	8· 10		4,920	5,710	6,300	7,260	8,180
	13· 16			6,810	7,550	8,510	9,640
	20· 22				8,740	10,670	12,360
	25· 28					12,830	14,540
	30						14,830
W—PHMRS W—PHMRL	5· 6	6,610	6,880	7,600	8,140	8,650	9,100
	8· 10		7,420	8,290	9,100	9,890	10,840
	13· 16			9,510	10,740	11,790	12,830
	20· 22				12,550	14,350	16,060
	25· 28					16,540	18,250
	30						18,530
W—PHMGS W—PHMGL	5· 6	4,410	4,840	5,440	5,980	6,670	7,140
	8· 10		5,260	6,170	6,900	7,870	8,700
	13· 16			7,330	8,220	9,240	10,420
	20· 22				9,740	11,640	13,340
	25· 28					13,540	15,240
	30						15,840

■Single flanged type Powdered high-speed steel 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
W—PHFDS W—PHFDL W—PHFES W—PHFEL	3· 4	5,230	5,820	6,520	7,110		
	5· 6	5,230	5,880	6,750	7,650	8,550	9,130
	8· 10		6,520	7,640	8,760	9,650	10,100
	13· 16			9,060	9,930	11,220	11,790
	20· 22				11,410	13,120	13,780
	25· 28					15,020	16,820
	30						17,680
W—PHFRS W—PHFRL	3· 4	7,920	8,370	9,280	9,930		
	5· 6	7,920	8,490	9,560	10,290	11,120	11,690
	8· 10		9,140	10,320	11,570	12,450	12,930
	13· 16			11,980	13,310	14,540	15,110
	20· 22				15,400	16,920	17,680
	25· 28					18,910	20,810
	30						21,670
W—PHFGS W—PHFGL	3· 4	5,710	6,190	7,260	7,820		
	5· 6	5,710	6,470	7,440	8,190	9,190	9,800
	8· 10		7,010	8,250	9,420	10,480	10,970
	13· 16			9,800	10,850	12,140	12,740
	20· 22				12,640	14,240	15,040
	25· 28					15,940	17,940
	30						18,940

BLOCK PUNCHES
—TiCN COATING TYPE—

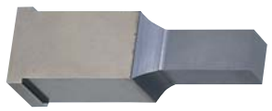
PRODUCTS DATA P.1220

COATING PUNCHES
— TiCN —

DELIVERY SHORTENED
H—HS(SKH51)
8 Days → 5 Days
(F90・F270 of Single flanged / WF90 of double flanged are excluded)
Price P.345

The volume discount rate is also applicable to alteration cost. P.39

—TiCN coating type—



S TiCN
H 3000HV
B is valid treatment range but shank may have coated layer of 10mm.

● Machining limit

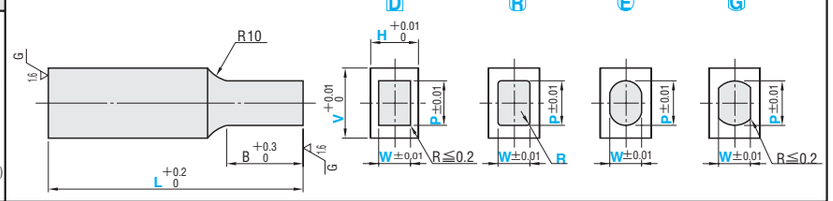
Shape D	Shape R	Shape E	Shape G
W≦P≦W×20	W≦P≦W×20	W≦P≦W×20	W<P≦W×20
R=0：Applicable	0.15≦R<W/2		
	0.01 mm increments		

When P=V, W=H, the blade tip tolerance is the tolerance of P・W.
The tip edge is very slightly rounded.

RoHS

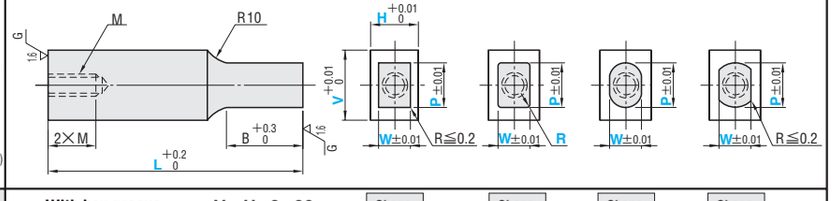
M / H	Catalog No. Type	Shape	B Blade length
SKH51 61～64HRC	H—HSP	D R E G	S
Powdered high-speed steel 64～67HRC	H—PHP		L
			Blade length(B) L>S

Standard V・H=3～30



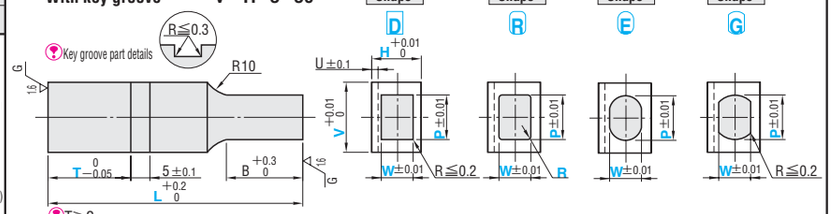
M / H	Catalog No. Type	Shape	B Blade length
SKH51 61～64HRC	H—HSM	D R E G	S
Powdered high-speed steel 64～67HRC	H—PHM		L
			Blade length(B) L>S

Tapped V・H=5～30



M / H	Catalog No. Type	Shape	B Blade length
SKH51 61～64HRC	H—HSK	D R E G	S
Powdered high-speed steel 64～67HRC	H—PHK		L
			Blade length(B) L>S

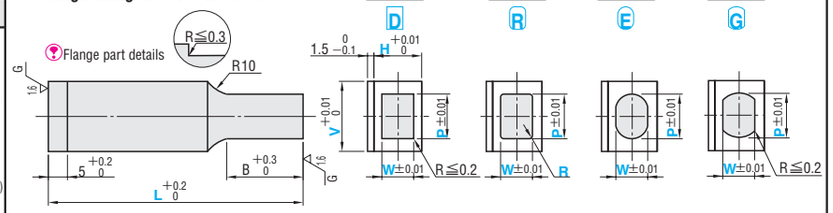
With key groove V・H=3～30



T≧2

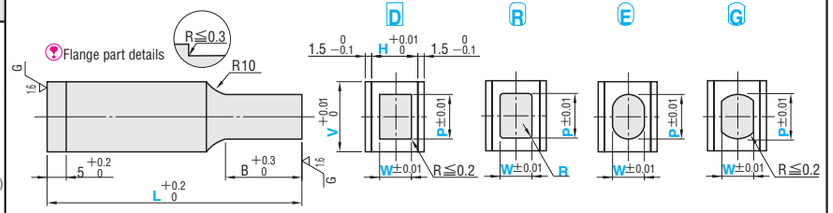
M / H	Catalog No. Type	Shape	B Blade length
SKH51 61～64HRC	H—HSF	D R E G	S
Powdered high-speed steel 64～67HRC	H—PHF		L
			Blade length(B) L>S

Single flanged V・H=3～30



M / H	Catalog No. Type	Shape	B Blade length
SKH51 61～64HRC	H—HSW	D R E G	S
Powdered high-speed steel 64～67HRC	H—PHW		L
			Blade length(B) L>S

Double flanged V・H=3～30



■Key groove position change
Flange position change

●WITH KEY GROOVE K0 K90 K180 K270
●SINGLE FLANGED F0 F90 F180 F270
●DOUBLE FLANGED WF0 WF90

Delivery time is 8 days for SKH51 F90, F270 and WF90.

Catalog No. Type	Shape	B Blade length	H \ V	3	4	5	6	8	10	13	16	20	22	25	28	30	L	0.1mm T	B S	B L	M	U
			W min. \ R min.	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0						
Standard H—HSP	D R E G	S	(3)	1.0	○	○	○	○	○	○	○	○	○									
H—PHP			(4)	1.0		○	○	○	○	○	○	○	○				(40)		6	8	—	1.0
With tapping H—HSM			5	1.2			○	○	○	○	○	○	○	○	○	○					3	
H—PHM			6	1.5				○	○	○	○	○	○	○	○	○	(50)		8	13	4	
With key groove H—HSK		L	8	2.0					○	○	○	○	○	○	○	○	60				5	
H—PHK			10	2.5						○	○	○	○	○	○	○	70	T≧2	13	19	6	
Single flange H—HSF			13	3.0							○	○	○	○	○	○	80				8	1.5
H—PHF			16	4.0								○	○	○	○	○	90		19	25		
Double flange H—HSW			20	5.0									○	○	○	○	100					
H—PHW			22	6.0										○	○	○						
			25	6.5											○	○						
			28	7.0												○						
			30	7.5												○						

L(40)・H10～30 ···▸ B=13 When the full length is (40) and dimension H is 10～30, the blade length is fixed to 13mm. (Tapped type, it is fixed to 10mm.)
L(50)・H16～30 ···▸ B=19 When the full length is (50) and dimension H is 16～30, the blade length is fixed to 19mm.
H(3)(4) ···▸ L40～70 When H(3), (4), the length (L) is 40～70.

Order

(1)The blade is in the center of shank.

Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm incr. T≧2	K·F·WF
H—HSPDS	08	08	60	P 6.00	W 4.00			
H—HSMRL	20	10	70	P16.00	W 9.00	R0.20		
H—PHKES	10	06	60	P 8.00	W 5.00		T25.5	K0
H—HSFDL	16	13	60	P15.00	W12.00			F90
H—HSWEL	13	10	40	P 8.00	W 5.00			WF90

(2)The blade is not in the center of shank. (Specify X・Y≧0.02 or 0. Tolerance ±0.01. When X・Y is 0, coating layer of 3～5 μ is added.)

Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm incr. T≧2	K·F·WF	0.01mm incr. X — Y
H—HSFDL	16	13	50	P15.00	W12.00			F90	X0.00 — Y0.55

Delivery

(SKH51)H—HS□□□ (F90・F270 of Single flange / WF90 of double flange are excluded)
(Powdered high-speed steel)H—PH□□□
5 Days

(SKH51)H—HSF□□(F90,F270),
H—HSW(WF90)
8 Days

Price P.345

Alteration

Catalog No. V H — L(LC) — P(PC)・W(WC)・R — T≧2 — K・F・WF — X — Y — (BC・HC・TC…etc.)
H—HSKDS 20 08 — 60 — P18.00—WC1.50 — T25.5 — LKC

Alterations		Code	Spec.	¥/1Code
Blade		PC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments	200
		WC		
		BC	Changes blade length B 2≦BC≦Bmax 0.1mm increments (Full length L (LC) requires BC+30mm or more.)	400
Full length		LC	Changes full length 30+B(BC)≦LC<L 0.1mm increments (Combination with LKC→0.01mm increments) When LC−B is 30mm or less, blade length is full length−30mm.	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
Tap		MC	Changes tap size. (V 6: M4→M3; V 8: M5→M4; V 10: M6→M5; V 13: M8→M6)	0
Key groove		TKC	Changes tolerance on key groove position T. T 0 −0.05 ⇨ 0 −0.02	200
		RTC	Changes tolerance on key groove position T. T 0 −0.05 ⇨ +0.05 0	0
		WK	Adds key groove at symmetrical position H− (2×U(UK)≧2.0 (K0,K180) V− (2×U(UK)≧2.0 (K90,K270) K0・180 K90・270 Additional key groove is on the symmetrical position of the specified key groove. Applicable to key groove type only. Combination with UK is applicable	400
		UK	Changes key groove depth. 0.5≦UK≦U+0.2 0.1mm increments H(V) −UK≧2.0 Applicable to key groove type only. Combination with WK is applicable	200

Alterations		Code	Spec.	¥/1Code
Flange		HC	Changes flange width. 0≦HC<1.5 0.1mm increments	200
		TC	Changes flange thickness. 2≦TC<5 0.1mm increments (Combination with TKC→0.01mm increments) L is shortened by (5−TC). When LC, L=LC.	200
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.02	200
		FK	Adds relief chamfering to flange. For breakage prevention.	Single flanged 200 Double flanged 400
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. 0.5mmor longer	Standard Tapped With key groove 200 Single flange Double flange 400
		CCP	Adds chamfering (C1.0) to a corner of shank. (Error prevention) Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 Blade corner Blade corner ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270 Applicable to standard tap type only.	200
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100
		DC	Adds press-in lead Applicable to standard, tap, key groove type only. Adds 3mm (V・H −0.01 −0.03) press-in lead	200

BLOCK PUNCHES
—TiCN COATING TYPE— PRICE

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Standard type SKH51 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
H—HSPDS H—HSPDL H—HSPES H—HSPEL	3· 4	2,760	3,190	4,060	5,310		
	5· 6	2,930	3,930	5,040	7,090	7,850	8,740
	8·10		4,500	5,830	7,310	8,400	9,440
	13·16			7,500	8,350	9,400	9,870
	20·22				8,540	9,680	10,920
	25·28					10,920	11,870
	30						11,960
H—HSPRS H—HSPRL	3· 4	5,030	5,260	6,170	7,270		
	5· 6	5,150	6,110	7,160	8,670	9,400	10,210
	8·10		6,720	7,900	9,350	10,310	11,320
	13·16			9,490	10,830	11,890	12,770
	20·22				11,960	12,820	13,960
	25·28					14,150	15,290
	30						15,670
H—HSPGS H—HSPGL	3· 4	3,160	3,480	4,700	5,960		
	5· 6	3,330	4,420	5,540	7,390	8,440	9,390
	8·10		4,940	6,370	7,980	9,040	10,140
	13·16			8,090	9,190	10,190	10,390
	20·22				9,490	10,490	11,490
	25·28					11,590	12,690
	30						13,090

■Standard type Powdered high-speed steel 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
H—PHPDS H—PHPDL H—PHPES H—PHPEL	3· 4	3,490	4,070	5,110	6,550		
	5· 6	3,690	4,250	5,460	7,020	8,460	9,430
	8·10		5,040	6,460	8,010	9,480	10,890
	13·16			8,150	9,510	10,990	12,360
	20·22				11,070	13,480	15,610
	25·28					15,990	17,780
	30						18,320
H—PHPRS H—PHPRL	3· 4	6,040	6,500	7,730	9,230		
	5· 6	6,230	6,730	8,020	9,830	10,750	11,830
	8·10		7,540	9,040	10,810	12,110	13,520
	13·16			10,820	12,540	14,180	15,570
	20·22				14,610	17,130	19,220
	25·28					19,690	21,660
	30						22,120
H—PHPGS H—PHPGL	3· 4	3,870	4,450	5,770	7,220		
	5· 6	4,080	4,740	5,960	7,850	9,070	10,080
	8·10		5,450	7,020	8,760	10,260	11,750
	13·16			9,000	10,360	11,910	13,360
	20·22				12,250	14,630	16,830
	25·28					16,930	19,000
	30						19,770

■Tapped type SKH51 5 Days

Catalog No.	H \ V	5	6·8·10	13·16	20·22	25·28	30
H—HSMDS H—HSMDL H—HSMES H—HSMEL	5· 6	2,980	4,020	5,140	7,170	7,940	8,830
	8·10		4,600	5,920	7,390	8,490	9,540
	13·16			7,590	8,540	9,490	9,970
	20·22				9,490	10,540	11,200
	25·28					11,010	11,200
	30						12,060
H—HSMRS H—HSMRL	5· 6	5,200	6,190	7,260	8,770	9,550	10,300
	8·10		6,800	7,990	9,430	10,390	11,440
	13·16			9,160	10,920	12,050	12,860
	20·22				12,820	13,770	14,150
	25·28					14,240	15,380
	30						15,860
H—HSMGS H—HSMGL	5· 6	3,390	4,520	5,620	7,470	8,530	9,480
	8·10		4,940	6,460	7,940	9,140	10,340
	13·16			8,090	9,190	10,290	10,490
	20·22				10,490	11,390	11,690
	25·28					11,590	12,790
	30						13,090

■Tapped type Powdered high-speed steel 5 Days

Catalog No.	H \ V	5	6·8·10	13·16	20·22	25·28	30
H—PHMDS H—PHMDL H—PHMES H—PHMEL	5· 6	3,800	4,360	5,590	7,790	8,580	9,540
	8·10		5,160	6,570	8,120	9,590	11,010
	13·16			8,450	9,620	11,100	12,470
	20·22				11,230	13,640	15,700
	25·28					16,180	18,140
	30						18,510
H—PHMRS H—PHMRL	5· 6	6,360	6,840	8,130	9,960	10,970	11,930
	8·10		7,660	9,150	10,920	12,220	13,670
	13·16			11,050	12,820	14,370	15,670
	20·22				15,040	17,320	19,410
	25·28					19,880	21,850
	30						22,210
H—PHMGS H—PHMGL	5· 6	4,210	4,860	6,070	7,960	9,180	10,190
	8·10		5,580	7,140	8,880	10,380	11,750
	13·16			9,130	10,470	12,030	13,470
	20·22				12,430	14,830	16,930
	25·28					17,130	19,100
	30						19,780

■With key groove type SKH51 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
H—HSKDS H—HSKDL H—HSKES H—HSKEL	3· 4	3,140	3,570	4,440	5,700		
	5· 6	3,310	4,350	5,470	7,500	8,280	9,170
	8·10		5,010	6,250	7,730	8,890	9,820
	13·16			7,880	8,830	9,870	10,250
	20·22				9,020	9,970	11,490
	25·28					11,390	12,250
	30						12,440
H—HSKRS H—HSKRL	3· 4	5,410	5,640	6,550	7,660		
	5· 6	5,530	6,530	7,590	9,100	9,890	10,640
	8·10		7,070	8,320	9,780	10,730	11,740
	13·16			9,920	11,280	12,330	13,050
	20·22				12,250	13,290	14,430
	25·28					14,530	15,570
	30						16,240
H—HSKGS H—HSKGL	3· 4	3,560	3,880	5,100	6,360		
	5· 6	3,730	4,870	5,980	7,830	8,890	9,830
	8·10		5,240	6,810	8,340	9,540	10,540
	13·16			8,590	9,490	10,590	10,890
	20·22				9,890	10,890	11,990
	25·28					11,890	13,090
	30						13,390

■With key groove type Powdered high-speed steel 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
H—PHKDS H—PHKDL H—PHKES H—PHKEL	3· 4	3,930	4,520	5,570	7,000		
	5· 6	4,140	4,690	5,920	8,130	8,920	9,880
	8·10		5,490	6,910	8,460	9,930	11,330
	13·16			8,790	9,970	11,390	12,810
	20·22				11,510	13,990	15,990
	25·28					16,460	18,430
	30						18,790
H—PHKRS H—PHKRL	3· 4	6,490	6,940	8,180	9,790		
	5· 6	6,690	7,170	8,460	10,290	11,310	12,270
	8·10		8,000	9,490	11,260	12,560	13,960
	13·16			11,490	13,200	14,660	16,050
	20·22				15,320	17,600	19,690
	25·28					20,170	22,130
	30						22,500
H—PHKGS H—PHKGL	3· 4	4,350	4,920	6,260	7,690		
	5· 6	4,550	5,220	6,430	8,320	9,540	10,550
	8·10		5,930	7,490	9,240	10,730	12,220
	13·16			9,480	10,830	12,380	13,830
	20·22				12,720	15,130	17,230
	25·28					17,430	19,500
	30						20,080

■Single flanged type SKH51 5 Days (F0,F180) / 8 Days (F90,F270)

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
H—HSFDS H—HSFDL H—HSFES H—HSFEL	3· 4	3,080	3,520	4,490	5,870		
	5· 6	3,250	5,100	6,210	8,350	9,440	10,390
	8·10		5,310	7,310	8,350	9,490	10,440
	13·16			8,450	9,590	10,630	10,920
	20·22				10,540	11,770	12,630
	25·28					12,340	13,200
	30						13,200
H—HSFRS H—HSFRL	3· 4	5,320	5,590	6,550	7,750		
	5· 6	5,460	7,320	8,590	10,410	11,430	12,310
	8·10		7,590	8,640	10,820	11,960	13,100
	13·16			10,920	12,530	13,580	14,050
	20·22				13,960	15,190	15,760
	25·28					15,480	16,520
	30						16,710
H—HSFGS H—HSFGL	3· 4	3,490	3,830	5,160	6,550		
	5· 6	4,290	5,590	6,790	8,790	10,090	11,190
	8·10		5,590	7,790	8,990	10,390	11,190
	13·16			9,190	10,290	11,390	11,590
	20·22				11,590	12,690	13,090
	25·28					12,690	13,990
	30						14,090

■Single flanged type Powdered high-speed steel 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
H—PHFDS H—PHFDL H—PHFES H—PHFEL	3· 4	4,920	5,820	6,670	8,980		
	5· 6	5,080	5,960	7,020	9,810	11,270	12,420
	8·10		6,930	7,720	10,920	12,370	13,390
	13·16			8,970	12,520	14,220	15,080
	20·22				14,320	16,550	17,640
	25·28					18,880	20,960
	30						21,900
H—PHFRS H—PHFRL	3· 4	7,610	8,370	9,350	11,800		
	5· 6	7,770	8,570	9,700	12,450	13,840	14,980
	8·10		9,550	10,400	13,730	15,170	16,220
	13·16			11,660	15,890	17,550	18,400
	20·22				18,310	20,350	21,540
	25·28					22,770	24,950
	30						25,890
H—PHFGS H—PHFGL	3· 4	5,450	6,260	8,100	9,850		
	5· 6	5,620	6,620	8,280	10,530	12,120	13,330
	8·10		7,500	9,460	11,760	13,410	14,500
	13·16			11,930	13,640	15,370	16,270
	20·22				15,770	17,920	19,170
	25·28					20,070	22,360
	30						23,450

■Double flanged type SKH51 5 Days (WF0) / 8 Days (WF90)

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
H—HSWDS H—HSWDL H—HSWES H—HSWEL	3· 4	3,240	3,690	4,650	6,040		
	5· 6	3,410	5,260	6,590	8,590	9,820	10,580
	8·10		5,410	7,690	8,830	9,870	10,630
	13·16			8,640	9,870	11,010	11,110
	20·22				10,730	11,960	12,720
	25·28					12,530	13,290
	30						13,290
H—HSWRS H—HSWRL	3· 4	5,480	5,750	6,730	7,920		
	5· 6	5,620	7,600	8,940	10,680	11,720	12,610
	8·10		7,880	9,970	11,110	12,060	13,480
	13·16			11,110	12,910	14,050	14,150
	20·22				14,240	15,290	15,950
	25·28					15,950	16,810
	30						16,900
H—HSWGS H—HSWGL	3· 4	3,660	4,000	5,330	6,720		
	5· 6	4,490	5,890	7,090	9,090	10,490	11,290
	8·10		5,890	8,090	9,290	10,490	11,290
	13·16			9,290	10,690	11,790	11,790
	20·22				11,790	12,890	13,390
	25·28					13,190	14,190
	30						14,290

■Double flanged type Powdered high-speed steel 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
H—PHWDS H—PHWDL H—PHWES H—PHWEL	3· 4	5,260	6,170	7,430	9,330		
	5· 6	5,420	6,310	7,840	10,160	11,610	12,760
	8·10		7,280	8,490	11,270	12,700	13,750
	13·16			9,680	12,860	14,600	15,460
	20·22				14,700	16,930	18,020
	25·28					19,260	21,340
	30						22,280
H—PHWRS H—PHWRL	3· 4	7,960	8,720	10,110	12,140		
	5· 6	8,120	8,920	10,460	12,790	14,220	15,360
	8·10		9,900	11,160	14,140	15,550	16,600
	13·16			12,420	16,270	17,930	18,780
	20·22				18,590	20,730	21,820
	25·28					23,150	25,330
	30						26,170
H—PHWGS H—PHWGL	3· 4	5,810	6,630	8,470	10,220		
	5· 6	5,980	6,970	8,650	10,890	12,490	13,700
	8·10		7,860	9,830	12,130	13,780	14,870
	13·16			12,300	14,000	15,770	16,670
	20·22				16,070	18,320	19,470
	25·28					20,470	22,760
	30						23,850

Express service system P.38

MISUMI Press 2007 http://misumi.jp/press/

For inquiry, ordering and other information, refer to P.1269

PRESS NEW

BLOCK PUNCHES
—HW COATING TYPE—

PRODUCTS DATA P.1221

COATING PUNCHES
— HW —

Price P.349

The volume discount rate is also applicable to alteration cost. P.39

—HW coating type—

S HW
H 3000HV
B is valid treatment range but shank may have coated layer of 10mm.

RoHS

● Machining limit

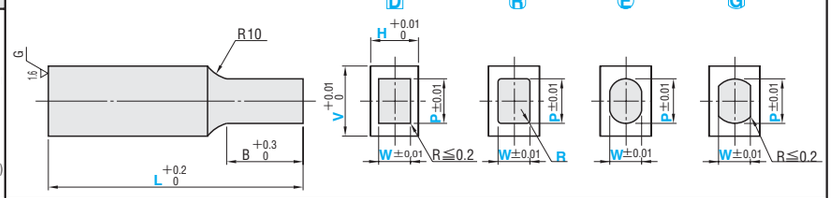
Shape D	Shape R	Shape E	Shape G
W≦P≦W×20	W≦P≦W×20	W≦P≦W×20	W<P≦W×20
R=0 : Applicable	0.15≦R<W/2		
	0.01 mm increments		

When P=V, W=H, the blade tip tolerance is the tolerance of P・W.
The tip edge is very slightly rounded.

Standard V・H=3~30

M / H	Type	Shape	B Blade length
SKH51 61~64HRC	HW-HSP	D R E G	S L
Powdered high-speed steel 64~67HRC	HW-PHP	D R E G	S L

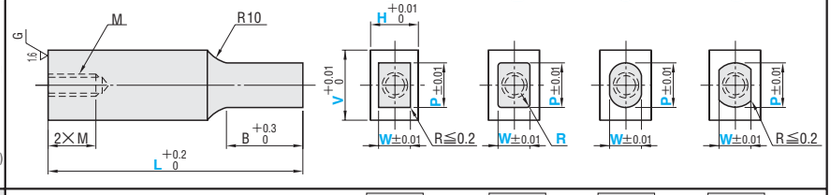
Blade length(B) L≧S



Tapped V・H=5~30

M / H	Type	Shape	B Blade length
SKH51 61~64HRC	HW-HSM	D R E G	S L
Powdered high-speed steel 64~67HRC	HW-PHM	D R E G	S L

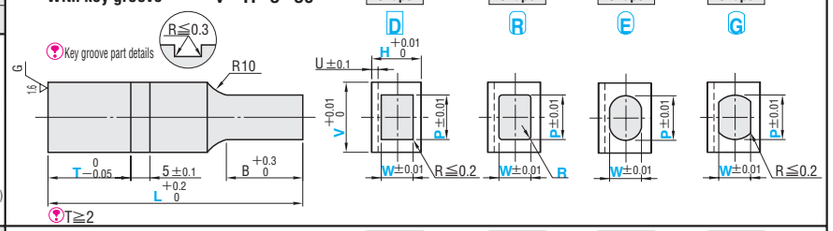
Blade length(B) L≧S



With key groove V・H=3~30

M / H	Type	Shape	B Blade length
SKH51 61~64HRC	HW-HSK	D R E G	S L
Powdered high-speed steel 64~67HRC	HW-PHK	D R E G	S L

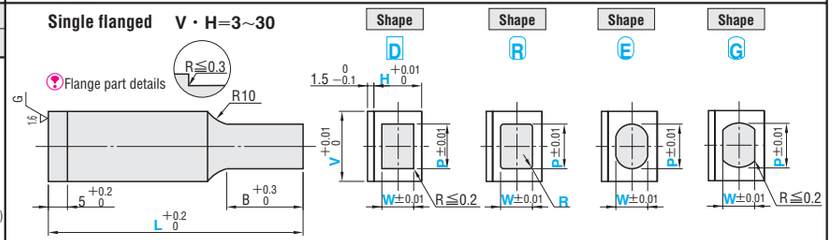
Blade length(B) L≧S



Single flanged V・H=3~30

M / H	Type	Shape	B Blade length
SKH51 61~64HRC	HW-HSF	D R E G	S L
Powdered high-speed steel 64~67HRC	HW-PHF	D R E G	S L

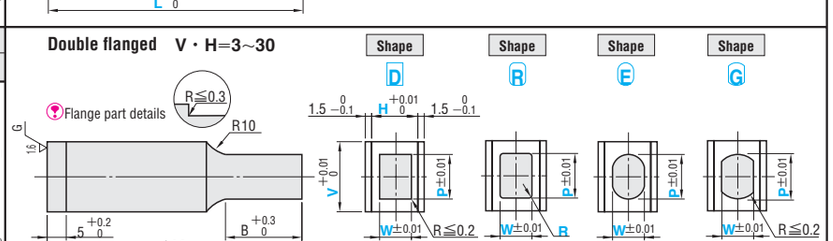
Blade length(B) L≧S



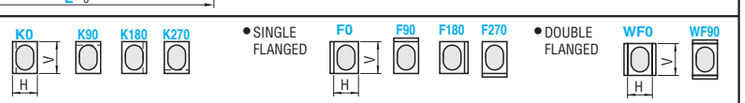
Double flanged V・H=3~30

M / H	Type	Shape	B Blade length
SKH51 61~64HRC	HW-HSW	D R E G	S L
Powdered high-speed steel 64~67HRC	HW-PHW	D R E G	S L

Blade length(B) L≧S



■Key groove position change
Flange position change



Catalog No. Type	Shape	B Blade length	H	W min.	V R min.	3 1.5	4 2.0	5 2.5	6 3.0	8 3.0	10 4.0	13 5.0	16 7.0	20 8.0	22 9.0	25 10.0	28 12.0	30 12.0	L	0.1mm T	B S	B L	M	U
Standard HW-HSP HW-PHP	D R E G	S	(3)	1.0		○	○	○	○	○	○	○	○	○	○				(40)	T≧2	6	8	—	1.0
			(4)	1.0			○	○	○	○	○	○	○	○	○								3	
With tapping HW-HSM HW-PHM			5	1.2				○	○	○	○	○	○	○	○	○	○	○			8	13	4	
			6	1.5					○	○	○	○	○	○	○	○	○	○	(50)				5	
With key groove HW-HSK HW-PHK		L	8	2.0						○	○	○	○	○	○	○	○	○	60				6	
			10	2.5							○	○	○	○	○	○	○	○	70		13	19		
			13	3.0								○	○	○	○	○	○	○	80					
Single flange HW-HSF HW-PHF			16	4.0									○	○	○	○	○	○	90					
			20	5.0										○	○	○	○	○	100		19	25	8	1.5
			22	6.0											○	○	○	○						
Double flange HW-HSW HW-PHW			25	6.5												○	○	○						
			28	7.0													○	○						
			30	7.5														○						

? L(40)・H10~30 ···▸ B=13 When the full length is (40) and dimension H is 10~30, the blade length is fixed to 13mm.(Tapped type, it is fixed to 10mm.)
? L(50)・H16~30 ···▸ B=19 When the full length is (50) and dimension H is 16~30, the blade length is fixed to 19mm.
? H(3)(4) ···▸ L40~70 When H(3), (4), the length(L) is 40~70.

Order

(1)The blade is in the center of shank.

Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm incr. T≧2	K・F・WF
HW-HSPDS 08	08	—	60	P 6.00	W 4.00			
HW-HSMRL 20	10	—	70	P16.00	W 9.00	R0.20		
HW-PHKES 10	06	—	60	P 8.00	W 5.00		T25.5	K0
HW-HSFDL 16	13	—	60	P15.00	W12.00			F90
HW-HSWEL 13	10	—	40	P 8.00	W 5.00			WF90

(2)The blade is not in the center of shank. (? Specify X・Y≧0.02 or 0. Tolerance ±0.01. When X・Y is 0, coating layer of 3~5 μ is added.)

Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm incr. T≧2	K・F・WF	0.01mm incr. X — Y
HW-HSFDL 16	13	—	50	P15.00	W12.00			F90	X0.00 — Y0.55

(SKH51)HW—HS□□□[F90・F270 of Single flange / WF90 of double flange are excluded]
(Powdered high-speed steel)HW—PH□□□

Delivery 5 Days

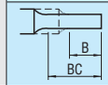
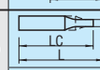
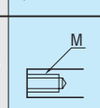
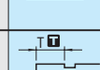
(SKH51)HW—HSF□□(F90,F270)
HW—HSW□□(WF90)

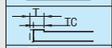
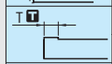
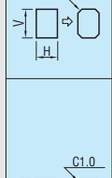
10 Days

Price P.349

Alteration

Catalog No.	V	H	L(LC)	P(PC)・W(WC)・R	T≧2	K・F・WF	X — Y	(BC・HC・TC…etc.)
HW-HSKDS 20	08	—	60	P18.00—WC1.50	T25.5			LKC

Alterations		Code	Spec.	¥/1Code
Blade		PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments	200
		BC	Changes blade length B 2≦BC≦Bmax 0.1mm increments ? Full length L (LC) requires BC+30mm or more.	400
Full length		LC	Changes full length 30+B(BC)≦LC<L 0.1mm increments (Combination with LKC→0.01mm increments) ? When LC−B is 30mm or less, blade length is full length−30mm.	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
Tap		MC	Changes tap size. V: 6 8 10 13 16 20 22 / H 6: M4→M3 — / 8: — M5→M4 / 10: — — M6→M5 / 13: — — — M8→M6	0
Key groove		TKC	Changes tolerance on key groove position T. T 0 −0.05 ⇨ 0 −0.02	200
		RTC	Changes tolerance on key groove position T. T 0 −0.05 ⇨ 0 +0.05 0	0
		WK	Adds key groove at symmetrical position H− |2×U(UK)|≧2.0(K0,K180) V− |2×U(UK)|≧2.0(K90,K270) K0・180 K90・270 Additional key groove is on the symmetrical position of the specified key groove. ? Applicable to key groove type only. ? Combination with UK is applicable	400
		UK	Changes key groove depth. 0.5≦UK≦U+0.2 0.1mm increments H(V) −UK≧2.0 ? Applicable to key groove type only. ? Combination with WK is applicable	200

Alterations		Code	Spec.	¥/1Code
Flange		HC	Changes flange width. 0≦HC<1.5 0.1mm increments	200
		TC	Changes flange thickness. 2≦TC<5 0.1mm increments (Combination with TKC→0.01mm increments) ? L is shortened by (5−TC). When LC, L=LC.	200
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.02	200
		FK	Adds relief chamfering to flange. For breakage prevention.	Single flanged 200 Double flanged 400
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	Standard Tapped With key groove 200 Single flanged Double flanged 400
		CCP	Adds chamfering (C1.0) to a corner of shank. (Error prevention) Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 Blade corner Blade corner ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270 ? Applicable to standard tap type only.	200
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100
		DC	Adds press-in lead ? Applicable to standard, tap, key groove type only. Adds 3mm (V・H −0.01 −0.03) press-in lead	200

BLOCK PUNCHES
—HW COATING TYPE— PRICE

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Standard type SKH51 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
HW—HSPDS HW—HSPDL HW—HSPES HW—HSPEL	3· 4	3,660	4,090	4,960	6,210		
	5· 6	3,830	4,830	5,940	7,990	8,750	9,640
	8·10		5,400	6,730	8,210	9,300	10,340
	13·16			8,400	9,250	10,300	10,770
	20·22				9,440	10,580	11,820
	25·28					11,820	12,770
	30						12,860
HW—HSPRS HW—HSPRL	3· 4	5,930	6,160	7,070	8,170		
	5· 6	6,050	7,010	8,060	9,570	10,300	11,110
	8·10		7,620	8,800	10,250	11,210	12,220
	13·16			10,390	11,730	12,790	13,670
	20·22				12,860	13,720	14,860
	25·28					15,050	16,190
	30						16,570
HW—HSPGS HW—HSPGL	3· 4	4,060	4,380	5,600	6,860		
	5· 6	4,230	5,320	6,440	8,290	9,340	10,290
	8·10		5,840	7,270	8,880	9,940	11,040
	13·16			8,990	10,090	11,090	11,290
	20·22				10,390	11,390	12,390
	25·28					12,490	13,590
	30						13,990

■Tapped type SKH51 5 Days

Catalog No.	H \ V	5	6·8·10	13·16	20·22	25·28	30
HW—HSMDS HW—HSMDL HW—HSMES HW—HSMEL	5· 6	3,880	4,920	6,040	8,070	8,840	9,730
	8·10		5,500	6,820	8,290	9,390	10,440
	13·16			8,490	9,440	10,390	10,870
	20·22				10,390	11,440	12,100
	25·28					11,910	12,100
	30						12,960
HW—HSMRS HW—HSMRL	5· 6	6,100	7,090	8,160	9,670	10,450	11,200
	8·10		7,700	8,890	10,330	11,290	12,340
	13·16			10,060	11,820	12,950	13,760
	20·22				13,720	14,670	15,050
	25·28					15,140	16,280
	30						16,760
HW—HSMGS HW—HSMGL	5· 6	4,290	5,420	6,520	8,370	9,430	10,380
	8·10		5,840	7,360	8,840	10,040	11,240
	13·16			8,990	10,090	11,190	11,390
	20·22				11,390	12,290	12,590
	25·28					12,490	13,690
	30						13,990

■With key groove type SKH51 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
HW—HSKDS HW—HSKDL HW—HSKES HW—HSKEL	3· 4	4,040	4,470	5,340	6,600		
	5· 6	4,210	5,250	6,370	8,400	9,180	10,070
	8·10		5,910	7,150	8,630	9,790	10,720
	13·16			8,780	9,730	10,770	11,150
	20·22				9,920	10,870	12,390
	25·28					12,290	13,150
	30						13,340
HW—HSKRS HW—HSKRL	3· 4	6,310	6,540	7,450	8,560		
	5· 6	6,430	7,430	8,490	10,000	10,790	11,540
	8·10		7,970	9,220	10,680	11,630	12,640
	13·16			10,820	12,180	13,230	13,950
	20·22				13,150	14,190	15,330
	25·28					15,430	16,470
	30						17,140
HW—HSKGS HW—HSKGL	3· 4	4,460	4,780	6,000	7,260		
	5· 6	4,630	5,770	6,880	8,730	9,790	10,730
	8·10		6,140	7,710	9,240	10,440	11,440
	13·16			9,490	10,390	11,490	11,790
	20·22				10,790	11,790	12,890
	25·28					12,790	13,990
	30						14,290

■Standard type Powdered high-speed steel 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
HW—PHPDS HW—PHPDL HW—PHPES HW—PHPEL	3· 4	4,390	4,970	6,010	7,450		
	5· 6	4,590	5,150	6,360	7,920	9,360	10,330
	8·10		5,940	7,360	8,910	10,380	11,790
	13·16			9,050	10,410	11,890	13,260
	20·22				11,970	14,380	16,510
	25·28					16,890	18,680
	30						19,220
HW—PHPRS HW—PHPRL	3· 4	6,940	7,400	8,630	10,130		
	5· 6	7,130	7,630	8,920	10,730	11,650	12,730
	8·10		8,440	9,940	11,710	13,010	14,420
	13·16			11,720	13,440	15,080	16,470
	20·22				15,510	18,030	20,120
	25·28					20,590	22,560
	30						23,020
HW—PHPGS HW—PHPGL	3· 4	4,770	5,350	6,670	8,120		
	5· 6	4,980	5,640	6,860	8,750	9,970	10,980
	8·10		6,350	7,920	9,660	11,160	12,650
	13·16			9,900	11,260	12,810	14,260
	20·22				13,150	15,530	17,730
	25·28					17,830	19,900
	30						20,670

■Tapped type Powdered high-speed steel 5 Days

Catalog No.	H \ V	5	6·8·10	13·16	20·22	25·28	30
HW—PHMDS HW—PHMDL HW—PHMES HW—PHMEL	5· 6	4,700	5,260	6,490	8,690	9,480	10,440
	8·10		6,060	7,470	9,020	10,490	11,910
	13·16			9,350	10,520	12,000	13,370
	20·22				12,130	14,540	16,600
	25·28					17,080	19,040
	30						19,410
HW—PHMRS HW—PHMRL	5· 6	7,260	7,740	9,030	10,860	11,870	12,830
	8·10		8,560	10,050	11,820	13,120	14,570
	13·16			11,950	13,720	15,270	16,570
	20·22				15,940	18,220	20,310
	25·28					20,780	22,750
	30						23,110
HW—PHMGS HW—PHMGL	5· 6	5,110	5,760	6,970	8,860	10,080	11,090
	8·10		6,480	8,040	9,780	11,280	12,650
	13·16			10,030	11,370	12,930	14,370
	20·22				13,330	15,730	17,830
	25·28					18,030	20,000
	30						20,680

■With key groove type Powdered high-speed steel 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
HW—PHKDS HW—PHKDL HW—PHKES HW—PHKEL	3· 4	4,830	5,420	6,470	7,900		
	5· 6	5,040	5,590	6,820	9,030	9,820	10,780
	8·10		6,390	7,810	9,360	10,830	12,230
	13·16			9,690	10,870	12,290	13,710
	20·22				12,410	14,890	16,890
	25·28					17,360	19,330
	30						19,690
HW—PHKRS HW—PHKRL	3· 4	7,390	7,840	9,080	10,690		
	5· 6	7,590	8,070	9,360	11,190	12,210	13,170
	8·10		8,900	10,390	12,160	13,460	14,860
	13·16			12,390	14,100	15,560	16,950
	20·22				16,220	18,500	20,590
	25·28					21,070	23,030
	30						23,400
HW—PHKGS HW—PHKGL	3· 4	5,250	5,820	7,160	8,590		
	5· 6	5,450	6,120	7,330	9,220	10,440	11,450
	8·10		6,830	8,390	10,140	11,630	13,120
	13·16			10,380	11,730	13,280	14,730
	20·22				13,620	16,030	18,130
	25·28					18,330	20,400
	30						20,980

■Single flanged type SKH51 5 Days (F0,F180) / 10 Days (F90,F270)

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
HW—HSFDS HW—HSFDL HW—HSFES HW—HSFEL	3· 4	3,980	4,420	5,390	6,770		
	5· 6	4,150	6,000	7,110	9,250	10,340	11,290
	8·10		6,210	8,210	9,250	10,390	11,340
	13·16			9,350	10,490	11,530	11,820
	20·22				11,440	12,670	13,530
	25·28					13,240	14,100
	30						14,100
HW—HSFRS HW—HSFRL	3· 4	6,220	6,490	7,450	8,650		
	5· 6	6,360	8,220	9,490	11,310	12,330	13,210
	8·10		8,490	9,540	11,720	12,860	14,000
	13·16			11,820	13,430	14,480	14,950
	20·22				14,860	16,090	16,660
	25·28					16,380	17,420
	30						17,610
HW—HSFGS HW—HSFGL	3· 4	4,390	4,730	6,060	7,450		
	5· 6	5,190	6,490	7,690	9,690	10,990	12,090
	8·10		6,490	8,690	9,890	11,290	12,090
	13·16			10,090	11,190	12,290	12,490
	20·22				12,490	13,590	13,990
	25·28					13,590	14,890
	30						14,990

■Single flanged type Powdered high-speed steel 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
HW—PHFDS HW—PHFDL HW—PHFES HW—PHFEL	3· 4	5,820	6,720	7,570	9,880		
	5· 6	5,980	6,860	7,920	10,710	12,170	13,320
	8·10		7,830	8,620	11,820	13,270	14,290
	13·16			9,870	13,420	15,120	15,980
	20·22				15,220	17,450	18,540
	25·28					19,780	21,860
	30						22,800
HW—PHFRS HW—PHFRL	3· 4	8,510	9,270	10,250	12,700		
	5· 6	8,670	9,470	10,600	13,350	14,740	15,880
	8·10		10,450	11,300	14,630	16,070	17,120
	13·16			12,560	16,790	18,450	19,300
	20·22				19,210	21,250	22,440
	25·28					23,670	25,850
	30						26,790
HW—PHFGS HW—PHFGL	3· 4	6,350	7,160	9,000	10,750		
	5· 6	6,520	7,520	9,180	11,430	13,020	14,230
	8·10		8,400	10,360	12,660	14,310	15,400
	13·16			12,830	14,540	16,270	17,170
	20·22				16,670	18,820	20,070
	25·28					20,970	23,260
	30						24,350

■Double flanged type SKH51 5 Days (WF0) / 10 Days (WF90)

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
HW—HSWDS HW—HSWDL HW—HSWES HW—HSWEL	3· 4	4,140	4,590	5,550	6,940		
	5· 6	4,310	6,160	7,490	9,490	10,720	11,480
	8·10		6,310	8,590	9,730	10,770	11,530
	13·16			9,540	10,770	11,910	12,010
	20·22				11,630	12,860	13,620
	25·28					13,430	14,190
	30						14,190
HW—HSWRS HW—HSWRL	3· 4	6,380	6,650	7,630	8,820		
	5· 6	6,520	8,500	9,840	11,580	12,620	13,510
	8·10		8,780	10,870	12,010	12,960	14,380
	13·16			12,010	13,810	14,950	15,050
	20·22				15,140	16,190	16,850
	25·28					16,850	17,710
	30						17,800
HW—HSWGS HW—HSWGL	3· 4	4,560	4,900	6,230	7,620		
	5· 6	5,390	6,790	7,990	9,990	11,390	12,190
	8·10		6,790	8,990	10,190	11,390	12,190
	13·16			10,190	11,590	12,690	12,690
	20·22				12,690	13,790	14,290
	25·28					14,090	15,090
	30						15,190

■Double flanged type Powdered high-speed steel 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
HW—PHWDS HW—PHWDL HW—PHWES HW—PHWEL	3· 4	6,160	7,070	8,330	10,230		
	5· 6	6,320	7,210	8,740	11,060	12,510	13,660
	8·10		8,180	9,390	12,170	13,600	14,650
	13·16			10,580	13,760	15,500	16,360
	20·22				15,600	17,830	18,920
	25·28					20,160	22,240
	30						23,180
HW—PHWRS HW—PHWRL	3· 4	8,860	9,620	11,010	13,040		
	5· 6	9,020	9,820	11,360	13,690	15,120	16,260
	8·10		10,800	12,060	15,040	16,450	17,500
	13·16			13,320	17,170	18,830	19,680
	20·22				19,490	21,630	22,720
	25·28					24,050	26,230
	30						27,070
HW—PHWGS HW—PHWGL	3· 4	6,710	7,530	9,370	11,120		
	5· 6	6,880	7,870	9,550	11,790	13,390	14,600
	8·10		8,760	10,730	13,030	14,680	15,770
	13·16			13,200	14,900	16,670	17,570
	20·22				16,970	19,220	20,370
	25·28					21,370	23,660
	30						24,750

Express service system P.38

MISUMI Press 2007 http://misumi.jp/press/

For inquiry, ordering and other information, refer to P.1269

PRESS NEW

JECTOR BLOCK PUNCHES
—WPC® COATING TYPE—

PRODUCTS DATA P.1221

COATING PUNCHES — WPC® —

Price P.353

¥ The volume discount rate is also applicable to alteration cost. P.39

—WPC® coating type—

RoHS

S WPC® coating
H 1000～1100HV
B is valid treatment range but shank may have coated layer of 10mm.
Detail of jector hole P.389

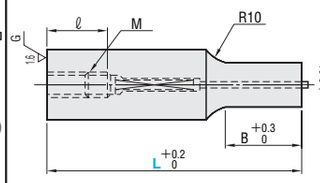
● Machining limit

Shape D	Shape R	Shape E	Shape G
W≦P	W≦P 0.15≦R＜W/2 0.01mm increments	W≦P	W＜P
R=0：Applicable			

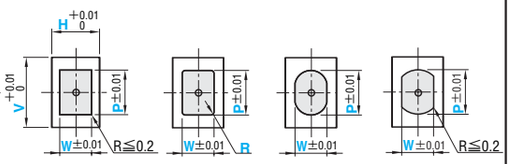
When P=V, W=H, the blade tip tolerance is the tolerance of P・W.
The tip edge is very slightly rounded.

M H	Catalog No. Type	Shape	B Blade length
SKD11 or equivalent 60～63HRC	W—HJM	D R E G	S L
SKH51 61～64HRC	W—HSJM		
Powdered high speed steel 64～67HRC	W—PHJM		Blade length(B) L>S

Tapped



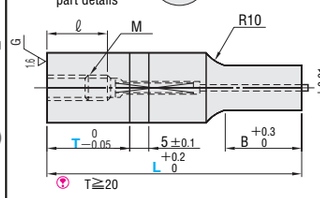
Shape D / R / E / G



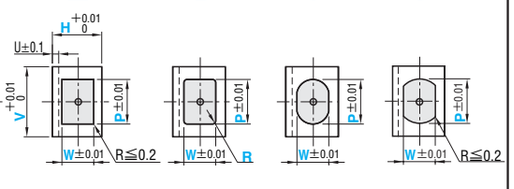
M H	Catalog No. Type	Shape	B Blade length
SKD11 or equivalent 60～63HRC	W—HJK	D R E G	S L
SKH51 61～64HRC	W—HSJK		
Powdered high speed steel 64～67HRC	W—PHJK		Blade length(B) L>S

With key groove

Key groove part details



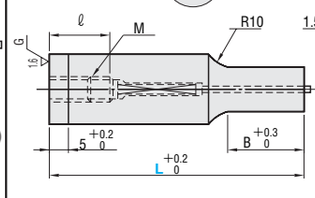
Shape D / R / E / G



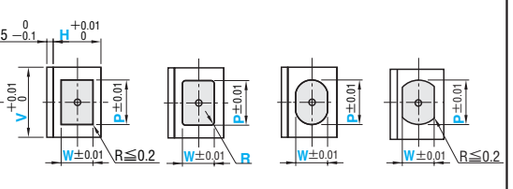
M H	Catalog No. Type	Shape	B Blade length
SKD11 or equivalent 60～63HRC	W—HJF	D R E G	S L
SKH51 61～64HRC	W—HSJF		
Powdered high speed steel 64～67HRC	W—PHJF		Blade length(B) L>S

Single flanged

Flange part details R≦0.3



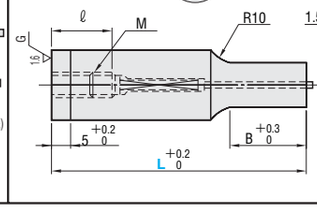
Shape D / R / E / G



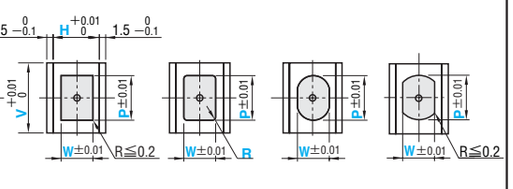
M H	Catalog No. Type	Shape	B Blade length
SKD11 or equivalent 60～63HRC	W—HJW	D R E G	S L
SKH51 61～64HRC	W—HSJW		
Powdered high speed steel 64～67HRC	W—PHJW		Blade length(B) L>S

Double flanged

Flange part details R≦0.3



Shape D / R / E / G



Catalog No. Type	Shape	B Blade length	V	6	8	10	13	16	20	22	25	28	30	L	0.1mm T	B S	B	M	ℓ	U
			H \ W / Pmin.	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0							
Tapping W—HJM W—HSJM W—PHJM	D	S	6	2.0	○	○	○	○	○	○	○	○	○	○	(40)	T≧20	8	13	4	12	1.0
			8	2.5		○	○	○	○	○	○	○	○	○	(50)				5		
With key groove W—HJK W—HSJK W—PHJK	R		10	3.0			○	○	○	○	○	○	○	○	60		13	19	6		
			13	4.0				○	○	○	○	○	○	○	70				8		1.5
Single flanged W—HJF W—HSJF W—PHJF	E	L	16	5.0					○	○	○	○	○	○	80		19	25			
			20	6.0						○	○	○	○	○							
Double flanged W—HJW W—HSJW W—PHJW	G		22	6.0							○	○	○	○							
			25	6.0								○	○	○							

L(40) ⋯▸ B= 6 When the full length is (40), the blade length is fixed to 6mm.
L(50)・H10～25 ⋯▸ B= 13 (10) When the full length is (50) and dimension H is 10～25, the blade length is fixed to 13mm. (It is fixed to 10mm. for the key groove type.)

Order

■Key position/Flange position change

With key groove	K0	K90	K180	K270	Single flanged	F0	F90	F180	F270	Double flanged	WF0	WF90
	H					H					H	

(1) The blade is in the center of shank.

Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧20	K·F·WF
W—HSJMRL	20	10	70	P16.00	W 9.00	R0.15		
W—PHJKES	08	06	60	P 7.00	W 5.00		T25.5	K0
W—HSJFDL	16	13	60	P15.00	W 12.00			F90
W—HSJWEL	13	10	40	P 8.00	W 5.00			WF90

(2) The blade is not in the center of shank.

Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1 mm increments T≧20	K·F·WF	0.01mm increments X	Y
W—HSJFDL	16	13	50	P15.00	W12.00			F90	X0.00	Y0.55

(X, Y specification is 0.02 over, or 0. Tolerance ±0.01)

H	Zmin
6・8	1.0
10・13	1.5
16～25	2.0

When changing blade position, jector hole must be Zmin apart from the blade side. Jector hole position is not changeable.

Delivery

(SKD11 or equivalent) W—HJ□□□ 5 Days

(SKH51) W—HSJ□□□ (Powdered high speed steel) W—PHJ□□□ 8 Days

Price P.353

Alteration

Catalog No.	V	H	L(LC)	P・W・R	T	K·F·WF	X — Y	(BC・HC・TC…etc.)
W—HSJMDS	20	08	60	P18.00	W3.50	T25.5		LKC

Alterations		Code	Spec.	¥/1Code
Blade	BC	BC	Changes blade length B (shorter than standard) 2≦BC≦B 0.1mm increments	400
Full length	LC	LC	Changes full length LC＜L 0.1mm increments (Combination with LKC→0.01mm increments) B is shortened by (L—LC)	200
	LKC	LKC	Changes full length tolerance $L^{+0.2}_{0} \Rightarrow {}^{+0.05}_{0}$	400
Key groove	TKC	TKC	Changes tolerance on key groove position T. $T^{0}_{-0.05} \Rightarrow {}^{0}_{-0.02}$	200
	RTC	RTC	Changes tolerance on key groove position T. $T^{0}_{-0.05} \Rightarrow {}^{+0.05}_{0}$	0
	UK	UK	Changes key groove depth. Applicable to key groove type only. 0.5≦UK≦U+0.2 0.1mm increments H≧10 (K0,K180) V≧10 (K90,K270)：Applicable	200
Flange	HC	HC	Changes flange width. 0≦HC＜1.5 0.1mm increments	200
	TC	TC	Changes flange thickness. 3.5≦TC＜5 0.1mm increments (Combination with TKC→0.01mm increments) L is shortened by (5—TC). When LC, L=LC.	200
	TKC	TKC	Changes flange thickness tolerance. $T^{+0.2}_{0} \Rightarrow {}^{+0.02}_{0}$	200
	TKM	TKM	Changes flange thickness tolerance. $T^{+0.2}_{0} \Rightarrow {}^{0}_{-0.02}$	200
	FK	FK	Adds relief chamfering to flange. For breakage prevention.	Single flanged 200 Double flanged 400

Alterations		Code	Spec.	¥/1Code
Contour	CC	CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	Tapped With key groove 200; Single flanged Double flanged 400
	AC	AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	—100
	NC	NC	Removes jector pin ⊗AC：Not applicable	—200
	CCP	CCP	Adds chamfering (C1.0) to a corner of shank. (Error prevention) Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 Blade corner ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270 Only tap type is applicable.	200
	VKC	VKC	Changes shank tolerance (V・H) $V \cdot H^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	300
	VKM	VKM	Changes shank tolerance (V・H) $V \cdot H^{+0.01}_{0} \Rightarrow {}^{0}_{-0.005}$	300
	VHM	VHM	Changes shank tolerance (V・H) $V \cdot H^{+0.01}_{0} \Rightarrow {}^{0}_{-0.01}$	200
	VHZ	VHZ	Changes shank tolerance (V・H) $V \cdot H^{+0.01}_{0} \Rightarrow \pm 0.005$	100
	DC	DC	Adds press-in lead Applicable to tap, key groove type only. Adds 3mm ($V \cdot H^{-0.01}_{-0.03}$) press-in lead	200

JECTOR BLOCK PUNCHES
—WPC® COATING TYPE— PRICE

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Tapped type SKD11 or equivalent — 5 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
W—HJMDS W—HJMDL W—HJMES W—HJMEL	6	4,730	5,200	5,430	5,780
	8·10	4,950	5,310	5,550	5,900
	13·16		5,550	5,660	6,010
	20·22			5,900	6,250
	25			6,470	6,700
W—HJMRS W—HJMRL	6	7,050	7,410	7,630	7,990
	8·10	7,280	7,530	7,860	8,210
	13·16		7,990	8,690	8,920
	20·22			9,380	9,610
	25			9,960	10,190
W—HJMGS W—HJMGL	6	5,280	5,520	5,780	6,140
	8·10	5,280	5,650	5,890	6,260
	13·16		6,140	6,380	6,630
	20·22			6,750	6,870
	25			7,120	7,360

■With key groove type SKD11 or equivalent — 5 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
W—HJKDS W—HJKDL W—HJKES W—HJKEL	6	5,120	5,580	5,810	6,160
	8·10	5,340	5,690	5,930	6,280
	13·16		5,930	6,040	6,390
	20·22			6,280	6,630
	25			6,860	7,090
W—HJKRS W—HJKRL	6	7,430	7,790	8,010	8,370
	8·10	7,670	7,910	8,250	8,590
	13·16		8,370	9,070	9,300
	20·22			9,760	10,000
	25			10,340	10,580
W—HJKGS W—HJKGL	6	5,680	5,920	6,180	6,550
	8·10	5,680	6,050	6,290	6,660
	13·16		6,550	6,790	7,030
	20·22			7,160	7,270
	25			7,520	7,760

■With single flanged type SKD11 or equivalent — 5 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
W—HJFDS W—HJFDL W—HJFES W—HJFEL	6	4,970	5,450	5,680	6,030
	8·10	5,200	5,550	5,800	6,140
	13·16		5,800	5,900	6,260
	20·22			6,140	6,490
	25			6,720	6,950
W—HJFRS W—HJFRL	6	7,300	7,650	7,880	8,230
	8·10	7,530	7,780	8,110	8,460
	13·16		8,230	8,940	9,160
	20·22			9,630	9,860
	25			10,210	10,440
W—HJFGS W—HJFGL	6	5,540	5,780	6,040	6,400
	8·10	5,540	5,910	6,150	6,520
	13·16		6,400	6,640	6,890
	20·22			7,010	7,130
	25			7,380	7,620

■With double flanged type SKD11 or equivalent — 5 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
W—HJWDS W—HJWDL W—HJWES W—HJWEL	6	5,160	5,640	5,860	6,220
	8·10	5,380	5,730	5,990	6,320
	13·16		5,990	6,090	6,450
	20·22			6,320	6,680
	25			6,900	7,140
W—HJWRS W—HJWRL	6	7,490	7,840	8,060	8,420
	8·10	7,710	7,960	8,300	8,640
	13·16		8,420	9,120	9,350
	20·22			9,810	10,050
	25			10,390	10,630
W—HJWGS W—HJWGL	6	5,740	5,980	6,230	6,600
	8·10	5,730	6,100	6,350	6,710
	13·16		6,600	6,830	7,090
	20·22			7,200	7,330
	25			7,570	7,820

■Tapped SKH51 — 8 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
W—HSJMDS W—HSJMDL W—HSJMES W—HSJMEL	6	6,690	7,200	8,100	8,420
	8·10	7,050	7,640	8,720	9,310
	13·16		8,420	9,560	10,300
	20·22			10,950	12,020
	25			12,450	13,520
W—HSJMRS W—HSJMRL	6	9,130	9,700	10,470	10,790
	8·10	9,500	10,170	11,320	11,930
	13·16		11,080	12,740	13,430
	20·22			14,570	15,640
	25			16,120	17,180
W—HSJMGS W—HSJMGL	6	7,270	7,720	8,630	8,990
	8·10	7,520	8,210	9,410	9,980
	13·16		9,060	10,360	11,130
	20·22			11,960	13,030
	25			13,220	14,260

■With key groove type SKH51 — 8 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
W—HSJKDS W—HSJKDL W—HSJKES W—HSJKEL	6	7,030	7,530	8,440	8,760
	8·10	7,380	7,980	9,050	9,640
	13·16		8,750	9,870	10,610
	20·22			11,270	12,310
	25			12,730	13,800
W—HSJKRS W—HSJKRL	6	9,470	10,040	10,820	11,130
	8·10	9,840	10,500	11,650	12,230
	13·16		11,410	13,030	13,760
	20·22			14,850	15,930
	25			16,390	17,470
W—HSJKGS W—HSJKGL	6	7,620	8,080	8,990	9,340
	8·10	7,870	8,560	9,750	10,390
	13·16		9,400	10,700	11,460
	20·22			12,250	13,320
	25			13,520	14,620

■Single flanged type SKH51 — 8 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
W—HSJFDS W—HSJFDL W—HSJFES W—HSJFEL	6	7,640	8,290	9,530	9,940
	8·10	8,080	8,870	10,210	10,530
	13·16		9,840	11,240	11,630
	20·22			12,460	12,930
	25			13,800	14,930
W—HSJFRS W—HSJFRL	6	7,640	8,290	9,530	9,940
	8·10	8,080	8,870	10,210	10,530
	13·16		9,840	11,240	11,630
	20·22			12,460	12,930
	25			13,800	14,930
W—HSJFGS W—HSJFGL	6	7,640	8,290	9,530	9,940
	8·10	8,080	8,870	10,210	10,530
	13·16		9,840	11,240	11,630
	20·22			12,460	12,930
	25			13,800	14,930

■Double flanged type SKH51 — 8 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
W—HSJWDS W—HSJWDL W—HSJWES W—HSJWEL	6	7,920	8,560	9,810	10,220
	8·10	8,360	9,130	10,470	10,810
	13·16		10,090	11,540	11,930
	20·22			12,750	13,220
	25			14,090	15,220
W—HSJWRS W—HSJWRL	6	10,440	11,220	12,320	12,710
	8·10	10,880	11,730	13,210	13,540
	13·16		12,930	14,740	15,130
	20·22			16,450	16,900
	25			17,870	19,060
W—HSJWGS W—HSJWGL	6	8,600	9,290	10,510	10,950
	8·10	8,930	9,820	11,330	11,700
	13·16		10,900	12,470	12,880
	20·22			13,870	14,340
	25			15,020	16,240

■Tapped type Powdered high-speed steel — 8 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
W—PHJMDS W—PHJMDL W—PHJMES W—PHJMEL	6	7,320	8,000	9,290	9,760
	8·10	7,860	8,710	10,360	11,330
	13·16		9,880	11,680	12,880
	20·22			13,980	15,770
	25			16,270	18,090
W—PHJMRS W—PHJMRL	6	9,950	10,710	11,830	12,310
	8·10	10,520	11,440	13,150	14,150
	13·16		12,740	15,160	16,270
	20·22			17,880	19,710
	25			20,210	22,030
W—PHJMGS W—PHJMGL	6	7,920	8,560	9,870	10,370
	8·10	8,370	9,340	11,140	12,030
	13·16		10,570	12,600	13,850
	20·22			15,150	16,960
	25			17,170	18,980

■With key groove type Powdered high-speed steel — 8 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
W—PHJKDS W—PHJKDL W—PHJKES W—PHJKEL	6	7,670	8,360	9,650	10,120
	8·10	8,210	9,070	10,720	11,670
	13·16		10,230	11,990	13,230
	20·22			14,350	16,070
	25			16,570	18,400
W—PHJKRS W—PHJKRL	6	10,300	11,060	12,190	12,670
	8·10	10,880	11,810	13,510	14,450
	13·16		13,100	15,460	16,680
	20·22			18,190	20,010
	25			20,520	22,330
W—PHJKGS W—PHJKGL	6	8,310	8,940	10,250	10,750
	8·10	8,740	9,710	11,520	12,530
	13·16		10,940	12,970	14,240
	20·22			15,470	17,280
	25			17,490	19,400

■Single flanged type Powdered high-speed steel — 8 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
W—PHJFDS W—PHJFDL W—PHJFES W—PHJFEL	6	8,880	9,810	11,720	12,340
	8·10	9,570	10,760	12,890	13,370
	13·16		12,260	14,560	15,160
	20·22			16,570	17,290
	25			18,600	20,520
W—PHJFRS W—PHJFRL	6	11,660	12,800	14,450	15,060
	8·10	12,360	13,610	15,870	16,370
	13·16		15,370	18,090	18,690
	20·22			20,610	21,420
	25			22,740	24,750
W—PHJFGS W—PHJFGL	6	9,660	10,690	12,550	13,200
	8·10	10,230	11,550	13,920	14,440
	13·16		13,200	15,680	16,320
	20·22			17,910	18,760
	25			19,720	21,850

■Double flanged type Powdered high-speed steel — 8 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
W—PHJWDS W—PHJWDL W—PHJWES W—PHJWEL	6	9,260	10,180	12,080	12,700
	8·10	9,940	11,120	13,250	13,750
	13·16		12,620	14,960	15,570
	20·22			16,980	17,680
	25			19,000	20,910
W—PHJWRS W—PHJWRL	6	12,030	13,160	14,860	15,460
	8·10	12,730	13,980	16,270	16,780
	13·16		15,770	18,490	19,100
	20·22			21,020	21,720
	25			23,140	25,160
W—PHJWGS W—PHJWGL	6	10,030	11,080	12,940	13,590
	8·10	10,610	11,940	14,310	14,830
	13·16		13,590	16,110	16,750
	20·22			18,340	19,080
	25			20,150	22,270

Express service system P.38

MISUMI Press 2007 http://misumi.jp/press/

For inquiry, ordering and other information, refer to P.1269

JECTOR BLOCK PUNCHES
—TiCN COATING TYPE—

PRODUCTS DATA P.1220

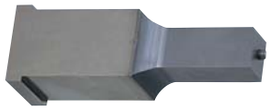
COATING PUNCHES
— TiCN —

Price P.357

The volume discount rate is also applicable to alteration cost. P.39

—TiCN coating type—

RoHS



S TiCN
H 3000HV
B is valid treatment range but shank may have coated layer of 10mm.
Detail of jector hole P.389

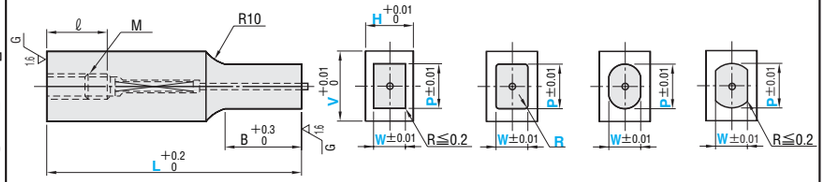
● Machining limit

Shape D	Shape R	Shape E	Shape G
W≦P	W≦P	W≦P	W<P
R=0 : Applicable	0.15≦R<W/2 0.01mm increments		

When P=V, W=H, the blade tip tolerance is the tolerance of P・W.
The tip edge is very slightly rounded.

Tapped

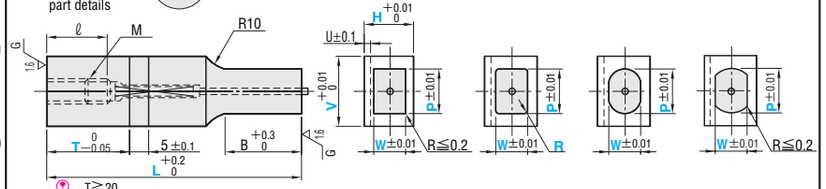
M H	Catalog No. Type	Shape	B Blade length
SKH51 61~64HRC	H—HSJM	D R E G	S L
Powdered high speed steel 64~67HRC	H—PHJM		Blade length(B) L>S



With key groove

M H	Catalog No. Type	Shape	B Blade length
SKH51 61~64HRC	H—HSJK	D R E G	S L
Powdered high speed steel 64~67HRC	H—PHJK		Blade length(B) L>S

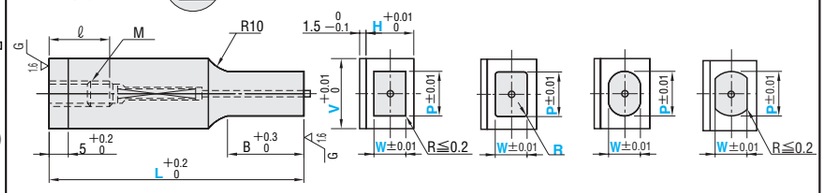
Key groove part details R≦0.3



Single flanged

M H	Catalog No. Type	Shape	B Blade length
SKH51 61~64HRC	H—HSJF	D R E G	S L
Powdered high speed steel 64~67HRC	H—PHJF		Blade length(B) L>S

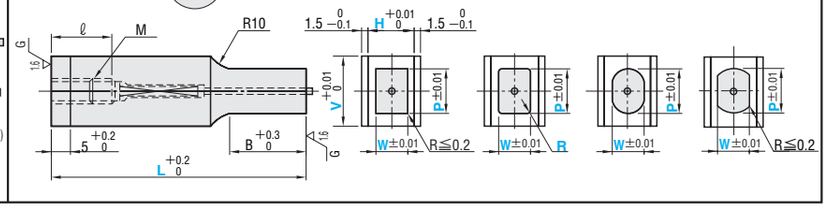
Flange part details R≦0.3



Double flanged

M H	Catalog No. Type	Shape	B Blade length
SKH51 61~64HRC	H—HSJW	D R E G	S L
Powdered high speed steel 64~67HRC	H—PHJW		Blade length(B) L>S

Flange part details R≦0.3



Catalog No. Type	Shape	B Point length	H	W min.	P min.	V	6	8	10	13	16	20	22	25	28	30	L	0.1mm T	B S	B L	M	ℓ	U
							3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0							
With tapping H—HSJM	D	S	6	2.0			○	○	○	○	○	○	○	○	○	○	(40)	T≧20	8	13	4	12	1.0
H—PHJM			8	2.5				○	○	○	○	○	○	○	○	○					5		
With key groove H—HSJK	R		10	3.0					○	○	○	○	○	○	○	○	(50)		13	19	6		
H—PHJK			13	4.0						○	○	○	○	○	○	○	60						
Single flange H—HSJF	E	L	16	5.0							○	○	○	○	○	○	70		19	25	8		1.5
H—PHJF			20	6.0								○	○	○	○	○	80						
Double flange H—HSJW	G		22	6.0									○	○	○	○							
H—PHJW			25	6.0										○	○	○							

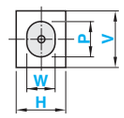
L(40) ⋯▸ B= 6 When the full length is (40), the blade length is fixed to 6mm.
L(50)・H10~25 ⋯▸ B= 13 (10) When the full length is (50) and dimension H is 10~25, the blade length is fixed to 13mm. (It is fixed to 10mm. for the key groove type.)

Order

■Key position/Flange position change

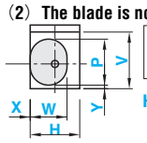
With key groove				Single flanged				Double flanged	
K0	K90	K180	K270	F0	F90	F180	F270	WF0	WF90

(1) The blade is in the center of shank.



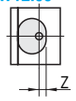
Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧20	K·F·WF
H—HSJMRL	20	10	70	P16.00	W 9.00	R0.15		
H—PHJKES	08	06	60	P 7.00	W 5.00		T25.5	K0
H—HSJFDL	16	13	60	P15.00	W 12.00			F90
H—HSJWEL	13	10	40	P 8.00	W 5.00			WF90

(2) The blade is not in the center of shank.



Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1 mm increments T≧20	K·F·WF	0.01mm increments X	Y
H—HSJFDL	16	13	50	P15.00	W12.00			F90	X0.00	Y0.55

Specify X・Y≧0.02 or 0. Tolerance ±0.01.
When X・Y is 0, coating layer of 3~5 μ is added.



H	Zmin
6・8	1.0
10・13	1.5
16~25	2.0

When changing blade position, jector hole must be Zmin apart from the blade side. Jector hole position is not changeable.

Delivery 8 Days

Price P.357

Alteration

Catalog No. | V | H | L(LC) | P・W・R | T | K・F・WF | X — Y | (BC・HC・TC⋯etc.)
H—HSJMDS | 20 | 08 | 60 | P18.00 | W3.50 | T25.5 | LKC

Alterations		Code	Spec.	¥/1Code
Blade		BC	Changes blade length B (shorter than standard) 2≦BC≦B 0.1mm increments	400
Full length		LC	Changes full length LC<L 0.1mm increments (Combination with LKC→0.01mm increments) B is shortened by (L—LC)	200
		LKC	Changes full length tolerance $L^{+0.2}_{0} \Rightarrow {}^{+0.05}_{0}$	400
Key groove		TKC	Changes tolerance on key groove position T. $T^{0}_{-0.05} \Rightarrow {}^{0}_{-0.02}$	200
		RTC	Changes tolerance on key groove position T. $T^{0}_{-0.05} \Rightarrow {}^{+0.05}_{0}$	0
		UK	Changes key groove depth. 0.5≦UK≦U+0.2 0.1mm increments Applicable to key groove type only. H≧10 (K0,K180) V≧10 (K90,K270) : Applicable	200
Flange		HC	Changes flange width. 0≦HC<1.5 0.1mm increments	200
		TC	Changes flange thickness. 3.5≦TC<5 0.1mm increments (Combination with TKC→0.01mm increments) L is shortened by (5—TC). When LC, L=LC.	200
		TKC	Changes flange thickness tolerance. $T^{+0.2}_{0} \Rightarrow {}^{+0.02}_{0}$	200
		TKM	Changes flange thickness tolerance. $T^{+0.2}_{0} \Rightarrow {}^{0}_{-0.02}$	200
		FK	Adds relief chamfering to flange. For breakage prevention.	Single flanged 200 Double flanged 400

Alterations		Code	Spec.	¥/1Code
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. 0.5mm or more	Tapped With key groove 200 Single flanged Double flanged 400
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	—100
		NC	Removes jector pin AC : Not applicable	—200
		CCP	Adds chamfering (C1.0) to a corner of shank. (Error prevention) Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 Blade corner Blade corner ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270 Only tap type is applicable.	200
		VKC	Changes shank tolerance (V・H) $V \cdot H^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	300
		VKM	Changes shank tolerance (V・H) $V \cdot H^{+0.01}_{0} \Rightarrow {}^{0}_{-0.005}$	300
		VHM	Changes shank tolerance (V・H) $V \cdot H^{+0.01}_{0} \Rightarrow {}^{0}_{-0.01}$	200
		VHZ	Changes shank tolerance (V・H) $V \cdot H^{+0.01}_{0} \Rightarrow \pm 0.005$	100
		DC	Adds press-in lead Applicable to tap, key groove type only. Adds 3mm ($V \cdot H^{-0.01}_{-0.03}$) press-in lead	200

Express service system P.38

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For inquiry, ordering and other information, refer to P.1269

JECTOR BLOCK PUNCHES
—TiCN COATING TYPE— PRICE

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Tapped SKH51

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
H—HSJMDS H—HSJMDL H—HSJMES H—HSJMEL	6	6,740	7,860	10,310	11,270
	8·10	7,400	8,300	10,920	12,150
	13·16		10,260	12,040	13,270
	20·22			13,900	15,470
	25			16,110	17,460
H—HSJMRS H—HSJMRL	6	8,910	9,970	11,970	12,810
	8·10	9,520	10,440	12,820	13,950
	13·16		12,300	14,470	15,540
	20·22			16,660	18,140
	25			18,780	20,050
H—HSJMGS H—HSJMGL	6	7,380	8,480	11,020	12,050
	8·10	7,950	8,970	11,800	13,040
	13·16		11,060	13,030	14,320
	20·22			15,130	16,720
	25			17,140	18,470

■Tapped type Powdered high-speed steel

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
H—PHJMDS H—PHJMDL H—PHJMES H—PHJMEL	6	7,440	8,790	11,720	12,880
	8·10	8,310	9,490	12,800	14,450
	13·16		11,920	14,400	16,140
	20·22			17,200	19,530
	25			20,250	22,370
H—PHJMRS H—PHJMRL	6	10,070	11,490	14,270	15,430
	8·10	10,970	12,230	15,590	17,270
	13·16		14,780	17,880	19,530
	20·22			21,110	23,470
	25			24,200	26,310
H—PHJMGS H—PHJMGL	6	8,110	9,450	12,500	13,720
	8·10	8,910	10,230	13,770	15,380
	13·16		12,790	15,530	17,350
	20·22			18,610	20,990
	25			21,430	23,550

■With key groove type SKH51

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
H—HSJKDS H—HSJKDL H—HSJKES H—HSJKEL	6	7,070	8,190	10,650	11,610
	8·10	7,720	8,640	11,260	12,480
	13·16		10,580	12,340	13,580
	20·22			14,220	15,750
	25			16,390	17,740
H—HSJKRS H—HSJKRL	6	9,240	10,310	12,310	13,150
	8·10	9,860	10,770	13,150	14,250
	13·16		12,630	14,750	15,870
	20·22			16,950	18,420
	25			19,060	20,340
H—HSJKGS H—HSJKGL	6	7,730	8,840	11,380	12,400
	8·10	8,300	9,320	12,140	13,450
	13·16		11,400	13,370	14,650
	20·22			15,420	17,010
	25			17,440	18,830

■With key groove type Powdered high-speed steel

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
H—PHJKDS H—PHJKDL H—PHJKES H—PHJKEL	6	7,790	9,140	12,080	13,240
	8·10	8,660	9,850	13,160	14,790
	13·16		12,270	14,720	16,490
	20·22			17,570	19,840
	25			20,560	22,680
H—PHJKRS H—PHJKRL	6	10,420	11,850	14,630	15,790
	8·10	11,330	12,600	15,950	17,570
	13·16		15,140	18,180	19,940
	20·22			21,410	23,780
	25			24,500	26,610
H—PHJKGS H—PHJKGL	6	8,500	9,830	12,880	14,100
	8·10	9,280	10,600	14,150	15,880
	13·16		13,160	15,900	17,740
	20·22			18,930	21,310
	25			21,750	23,970

■Single flanged type SKH51

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
H—HSJFDS H—HSJFDL H—HSJFES H—HSJFEL	6	7,820	9,170	12,120	13,230
	8·10	8,600	10,120	12,800	13,820
	13·16		12,020	14,240	15,080
	20·22			15,860	16,900
	25			18,000	19,130
H—HSJFRS H—HSJFRL	6	10,040	11,390	13,830	14,780
	8·10	10,760	12,190	14,720	15,620
	13·16		14,120	16,580	17,330
	20·22			18,630	19,580
	25			20,680	21,870
H—HSJFGS H—HSJFGL	6	8,560	9,990	13,000	14,180
	8·10	9,250	10,910	13,830	14,940
	13·16		12,970	15,380	16,250
	20·22			17,210	18,340
	25			19,200	20,420

■Single flanged type Powdered high-speed steel

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
H—PHJFDS H—PHJFDL H—PHJFES H—PHJFEL	6	9,150	10,820	14,560	15,930
	8·10	10,210	12,180	15,730	16,970
	13·16		14,670	17,830	18,900
	20·22			20,300	21,600
	25			23,170	25,090
H—PHJFRS H—PHJFRL	6	11,930	13,810	17,300	18,660
	8·10	13,000	15,030	18,710	19,970
	13·16		17,770	21,370	22,440
	20·22			24,340	25,740
	25			27,310	29,330
H—PHJFGS H—PHJFGL	6	10,010	11,820	15,610	17,050
	8·10	10,970	13,110	16,980	18,290
	13·16		15,800	19,190	20,330
	20·22			21,900	23,370
	25			24,600	26,730

■Double flanged type SKH51

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
H—HSJWDS H—HSJWDL H—HSJWES H—HSJWEL	6	8,090	9,440	12,400	13,510
	8·10	8,870	10,380	13,060	14,100
	13·16		12,270	14,530	15,370
	20·22			16,160	17,190
	25			18,300	19,430
H—HSJWRS H—HSJWRL	6	10,320	11,660	14,130	15,080
	8·10	11,040	12,460	15,020	15,910
	13·16		14,410	16,870	17,620
	20·22			18,920	19,820
	25			20,980	22,160
H—HSJWGS H—HSJWGL	6	8,850	10,280	13,300	14,480
	8·10	9,540	11,200	14,120	15,230
	13·16		13,260	15,690	16,570
	20·22			17,520	18,590
	25			19,510	20,730

■Double flanged type Powdered high-speed steel

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
H—PHJWDS H—PHJWDL H—PHJWES H—PHJWEL	6	9,530	11,190	14,920	16,290
	8·10	10,580	12,540	16,090	17,350
	13·16		15,030	18,230	19,310
	20·22			20,710	22,000
	25			23,570	25,490
H—PHJWRS H—PHJWRL	6	12,300	14,170	17,710	19,060
	8·10	13,370	15,400	19,110	20,380
	13·16		18,170	21,760	22,850
	20·22			24,750	26,040
	25			27,710	29,730
H—PHJWGS H—PHJWGL	6	10,380	12,210	16,000	17,440
	8·10	11,350	13,500	17,370	18,680
	13·16		16,190	19,620	20,760
	20·22			22,330	23,690
	25			25,030	27,150

Express service system P.38

MISUMI Press 2007 http://misumi.jp/press/

For inquiry, ordering and other information, refer to P.1269

PRESS NEW

JECTOR BLOCK PUNCHES
—HW COATING TYPE—

PRODUCTS DATA P.1221

COATING PUNCHES
— HW —

Price P.361

¥ The volume discount rate is also applicable to alteration cost. P.39

—HW coating—

RoHS

S HW
H 3000HV
B is valid treatment range but shank may have coated layer of 10mm.
Detail of jector hole P.389

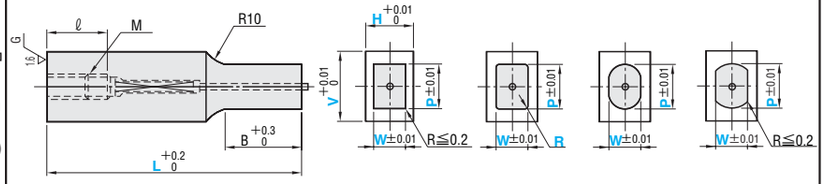
● Machining limit

Shape D	Shape R	Shape E	Shape G
W≦P	W≦P	W≦P	W<P
R=0 : Applicable	0.15≦R<W/2 0.01mm increments		

When P=V, W=H, the blade tip tolerance is the tolerance of P・W.
The tip edge is very slightly rounded.

M H	Catalog No. Type	Shape	B Blade length
SKH51 61~64HRC	HW—HSJM	D R E G	S
Powdered high speed steel 64~67HRC	HW—PHJM		L
			Blade length(B) L>S

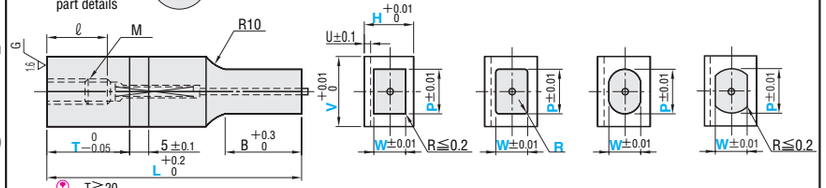
With tapping



M H	Catalog No. Type	Shape	B Blade length
SKH51 61~64HRC	HW—HSJK	D R E G	S
Powdered high speed steel 64~67HRC	HW—PHJK		L
			Blade length(B) L>S

With key groove

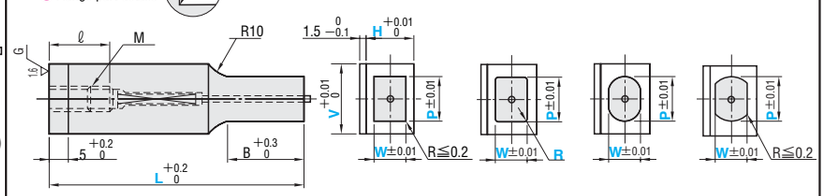
Key groove part details



M H	Catalog No. Type	Shape	B Blade length
SKH51 61~64HRC	HW—HSJF	D R E G	S
Powdered high speed steel 64~67HRC	HW—PHJF		L
			Blade length(B) L>S

Single flanged

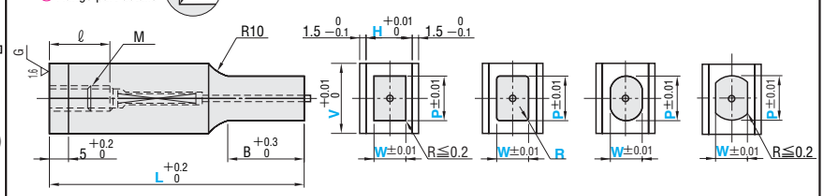
Flange part details



M H	Catalog No. Type	Shape	B Blade length
SKH51 61~64HRC	HW—HSJW	D R E G	S
Powdered high speed steel 64~67HRC	HW—PHJW		L
			Blade length(B) L>S

Double flanged

Flange part details



Catalog No. Type	Shape	B Blade length	H	W	V P min.	6 3.0	8 3.0	10 4.0	13 5.0	16 7.0	20 8.0	22 9.0	25 10.0	28 12.0	30 12.0	L	0.1mm T	B S	B L	M	ℓ	U
Tapped HW—HSJM	D	S	6	2.0		○	○	○	○	○	○	○	○	○	○	(40)	T≧20	8	13	4	12	1.0
HW—PHJM	R		8	2.5			○	○	○	○	○	○	○	○	○	(50)				5		
With key groove HW—HSJK	E	L	10	3.0				○	○	○	○	○	○	○	○	60		13	19	6		
HW—PHJK	G		13	4.0					○	○	○	○	○	○	○	70						1.5
Single flanged HW—HSJF		Blade length(B) L>S	16	5.0						○	○	○	○	○	○	80		19	25	8		
HW—PHJF			20	6.0							○	○	○	○	○							
Double flanged HW—HSJW			22	6.0								○	○	○	○							
HW—PHJW			25	6.0									○	○	○							

ℓ(40) ⋯▸ B= 6 When the full length is (40), the blade length is fixed to 6mm.
ℓ(50)・H10~25 ⋯▸ B= 13(10) When the full length is (50) and dimension H is 10~25, the blade length is fixed to 13mm. (It is fixed to 10mm. for the key groove type.)

Order

■Key position/Flange position change

With key groove	K0	K90	K180	K270	Single flanged	F0	F90	F180	F270	Double flanged	WF0	WF90

(1) The blade is in the center of shank.

Catalog No.	V	H	L	P	W	R (R only)	T≧20	K・F・WF
HW—HSJMRL	20	10	70	P16.00	W 9.00	R0.15	T25.5	K0
HW—HSJKES	08	06	60	P 7.00	W 5.00			
HW—HSJFDL	16	13	60	P15.00	W 12.00			F90
HW—HSJWEL	13	10	40	P 8.00	W 5.00			WF90

(2) The blade is not in the center of shank.

Catalog No.	V	H	L	P	W	R (R only)	T≧20	K・F・WF	X	Y
HW—HSJFDL	16	13	50	P15.00	W12.00			F90	X0.00	Y0.55

(Specify X・Y≧0.02 or 0. Tolerance ±0.01 When X・Y is 0, coating layer of 3~5 μ is added.)

H	Zmin
6・8	1.0
10・13	1.5
16~25	2.0

When changing blade position, jector hole must be Zmin apart from the blade side. Jector hole position is not changeable.

Delivery 10 Days

Price P.361

Alteration

Catalog No.	V	H	L(LC)	P・W・R	T	K・F・WF	X — Y	(BC・HC・TC…etc.)
HW—HSJMDS	20	08	60	P18.00 W3.50	T25.5			LKC

Alterations		Code	Spec.	¥/1Code
Blade		BC	Changes blade length B (shorter than standard) 2≦BC≦B 0.1mm increments	400
Full length		LC	Changes full length LC<L 0.1mm increments (Combination with LKC→0.01mm increments) B is shortened by (L—LC)	200
		LKC	Changes full length tolerance $L^{+0.2}_{0} \Rightarrow {}^{+0.05}_{0}$	400
Key groove		TKC	Changes tolerance on key groove position T. $T^{0}_{-0.05} \Rightarrow {}^{0}_{-0.02}$	200
		RTC	Changes tolerance on key groove position T. $T^{0}_{-0.05} \Rightarrow {}^{+0.05}_{0}$	0
		UK	Changes key groove depth. Applicable to key groove type only. 0.5≦UK≦U+0.2 0.1mm increments H≧10(K0,K180) V≧10(K90,K270) : Applicable	200
Flange		HC	Changes flange width. 0≦HC<1.5 0.1mm increments	200
		TC	Changes flange thickness. 3.5≦TC<5 0.1mm increments (Combination with TKC→0.01mm increments) L is shortened by (5—TC). When LC, L=LC.	200
		TKC	Changes flange thickness tolerance. $T^{+0.2}_{0} \Rightarrow {}^{+0.02}_{0}$	200
		TKM	Changes flange thickness tolerance. $T^{+0.2}_{0} \Rightarrow {}^{0}_{-0.02}$	200
		FK	Adds relief chamfering to flange. For breakage prevention.	Single flanged 200 Double flanged 400

Alterations		Code	Spec.	¥/1Code
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	Tapped With key groove 200 Single flanged Double flanged 400
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	—100
		NC	Removes jector pin AC : Not applicable	—200
		CCP	Adds chamfering (C1.0) to a corner of shank. (Error prevention) Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270 Only tap type is applicable.	200
		VKC	Changes shank tolerance (V・H) $V \cdot H^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	300
		VKM	Changes shank tolerance (V・H) $V \cdot H^{+0.01}_{0} \Rightarrow {}^{0}_{-0.005}$	300
		VHM	Changes shank tolerance (V・H) $V \cdot H^{+0.01}_{0} \Rightarrow {}^{0}_{-0.01}$	200
		VHZ	Changes shank tolerance (V・H) $V \cdot H^{+0.01}_{0} \Rightarrow \pm 0.005$	100
		DC	Adds press-in lead Applicable to tap, key groove type only. Adds 3mm ($V \cdot H^{-0.01}_{-0.03}$) press-in lead	200

JECTOR BLOCK PUNCHES
—HW COATING TYPE— PRICE

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Tapped SKH51 10 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
HW—HSJMDS HW—HSJMDL HW—HSJMES HW—HSJMEL	6	7,640	8,760	11,210	12,170
	8·10	8,300	9,200	11,820	13,050
	13·16		11,160	12,940	14,170
	20·22			14,800	16,370
	25			17,010	18,360
HW—HSJMRS HW—HSJMRL	6	9,810	10,870	12,870	13,710
	8·10	10,420	11,340	13,720	14,850
	13·16		13,200	15,370	16,440
	20·22			17,560	19,040
	25			19,680	20,950
HW—HSJMGS HW—HSJMGL	6	8,280	9,380	11,920	12,950
	8·10	8,850	9,870	12,700	13,940
	13·16		11,960	13,930	15,220
	20·22			16,030	17,620
	25			18,040	19,370

■Tapped type Powdered high-speed steel 10 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
HW—PHJMDS HW—PHJMDL HW—PHJMES HW—PHJMEL	6	8,340	9,690	12,620	13,780
	8·10	9,210	10,390	13,700	15,350
	13·16		12,820	15,300	17,040
	20·22			18,100	20,430
	25			21,150	23,270
HW—PHJMRS HW—PHJMRL	6	10,970	12,390	15,170	16,330
	8·10	11,870	13,130	16,490	18,170
	13·16		15,680	18,780	20,430
	20·22			22,010	24,370
	25			25,100	27,210
HW—PHJMGS HW—PHJMGL	6	9,010	10,350	13,400	14,620
	8·10	9,810	11,130	14,670	16,280
	13·16		13,690	16,430	18,250
	20·22			19,510	21,890
	25			22,330	24,450

■With key groove type SKH51 10 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
HW—HSJKDS HW—HSJKDL HW—HSJKES HW—HSJKEL	6	7,970	9,090	11,550	12,510
	8·10	8,620	9,540	12,160	13,380
	13·16		11,480	13,240	14,480
	20·22			15,120	16,650
	25			17,290	18,640
HW—HSJKRS HW—HSJKRL	6	10,140	11,210	13,210	14,050
	8·10	10,760	11,670	14,050	15,150
	13·16		13,530	15,650	16,770
	20·22			17,850	19,320
	25			19,960	21,240
HW—HSJKGS HW—HSJKGL	6	8,630	9,740	12,280	13,300
	8·10	9,200	10,220	13,040	14,350
	13·16		12,300	14,270	15,550
	20·22			16,320	17,910
	25			18,340	19,730

■With key groove type Powdered high-speed steel 10 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
HW—PHJKDS HW—PHJKDL HW—PHJKES HW—PHJKEL	6	8,690	10,040	12,980	14,140
	8·10	9,560	10,750	14,060	15,690
	13·16		13,170	15,620	17,390
	20·22			18,470	20,740
	25			21,460	23,580
HW—PHJKRS HW—PHJKRL	6	11,320	12,750	15,530	16,690
	8·10	12,230	13,500	16,850	18,470
	13·16		16,040	19,080	20,840
	20·22			22,310	24,680
	25			25,400	27,510
HW—PHJKGS HW—PHJKGL	6	9,400	10,730	13,780	15,000
	8·10	10,180	11,500	15,050	16,780
	13·16		14,060	16,800	18,640
	20·22			19,830	22,210
	25			22,650	24,870

■Single flanged type SKH51 10 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
HW—HSJFDS HW—HSJFDL HW—HSJFES HW—HSJFEL	6	8,720	10,070	13,020	14,130
	8·10	9,500	11,020	13,700	14,720
	13·16		12,920	15,140	15,980
	20·22			16,760	17,800
	25			18,900	20,030
HW—HSJFRS HW—HSJFRL	6	10,940	12,290	14,730	15,680
	8·10	11,660	13,090	15,620	16,520
	13·16		15,020	17,480	18,230
	20·22			19,530	20,480
	25			21,580	22,770
HW—HSJFGS HW—HSJFGL	6	9,460	10,890	13,900	15,080
	8·10	10,150	11,810	14,730	15,840
	13·16		13,870	16,280	17,150
	20·22			18,110	19,240
	25			20,100	21,320

■Single flanged type Powdered high-speed steel 10 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
HW—PHJFDS HW—PHJFDL HW—PHJFES HW—PHJFEL	6	10,050	11,720	15,460	16,830
	8·10	11,110	13,080	16,630	17,870
	13·16		15,570	18,730	19,800
	20·22			21,200	22,500
	25			24,070	25,990
HW—PHJFRS HW—PHJFRL	6	12,830	14,710	18,200	19,560
	8·10	13,900	15,930	19,610	20,870
	13·16		18,670	22,270	23,340
	20·22			25,240	26,640
	25			28,210	30,230
HW—PHJFGS HW—PHJFGL	6	10,910	12,720	16,510	17,950
	8·10	11,870	14,010	17,880	19,190
	13·16		16,700	20,090	21,230
	20·22			22,800	24,270
	25			25,500	27,630

■Double flanged type SKH51 10 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
HW—HSJWDS HW—HSJWDL HW—HSJWES HW—HSJWEL	6	8,990	10,340	13,300	14,410
	8·10	9,770	11,280	13,960	15,000
	13·16		13,170	15,430	16,270
	20·22			17,060	18,090
	25			19,200	20,330
HW—HSJWRS HW—HSJWRL	6	11,220	12,560	15,030	15,980
	8·10	11,940	13,360	15,920	16,810
	13·16		15,310	17,770	18,520
	20·22			19,820	20,720
	25			21,880	23,060
HW—HSJWGS HW—HSJWGL	6	9,750	11,180	14,200	15,380
	8·10	10,440	12,100	15,020	16,130
	13·16		14,160	16,590	17,470
	20·22			18,420	19,490
	25			20,410	21,630

■Double flanged type Powdered high-speed steel 10 Days

Catalog No.	H \ V	6·8·10	13·16	20·22·25	28·30
HW—PHJWDS HW—PHJWDL HW—PHJWES HW—PHJWEL	6	10,430	12,090	15,820	17,190
	8·10	11,480	13,440	16,990	18,250
	13·16		15,930	19,130	20,210
	20·22			21,610	22,900
	25			24,470	26,390
HW—PHJWRS HW—PHJWRL	6	13,200	15,070	18,610	19,960
	8·10	14,270	16,300	20,010	21,280
	13·16		19,070	22,660	23,750
	20·22			25,650	26,940
	25			28,610	30,630
HW—PHJWGS HW—PHJWGL	6	11,280	13,110	16,900	18,340
	8·10	12,250	14,400	18,270	19,580
	13·16		17,090	20,520	21,660
	20·22			23,230	24,590
	25			25,930	28,050

Express service system P.38

MISUMI Press 2007 http://misumi.jp/press/

For inquiry, ordering and other information, refer to P.1269

BLOCK PUNCHES FOR HEAVY LOAD
—FLANGE THICKNESS 10mm, TiCN COATING TYPE—

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

DELIVERY SHORTENED

H—AHS(SKH51) Delivery Time 8 Days→5 Days

The volume discount rate is also applicable to alteration cost. P.39

—TiCN coating type—

S TiCN
H 3000HV
B is valid treatment range but shank may have coated layer of 10mm.

● Machining limit

RoHS

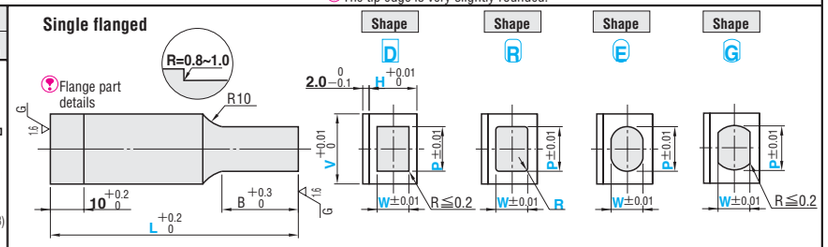
Shape D	Shape R	Shape E	Shape G
W≦P≦W×20	W≦P≦W×20	W≦P≦W×20	W<P≦W×20
R=0 : Applicable	0.15≦R<W/2		
	0.01 mm increments		

When P=V, W=H, the blade tip tolerance is the tolerance of P・W.
The tip edge is very slightly rounded.

M H	Catalog No. Type	Shape	B Blade length
SKH51 61～64HRC	H-AHSF	D R E G	S
Powdered high-speed steel 64～67HRC	H-APHF	D R E G	L

Blade length(B) L>S

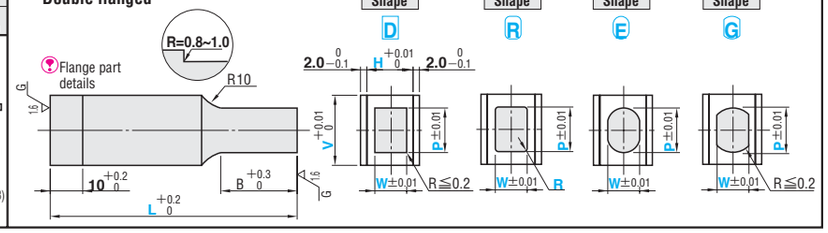
Single flanged



M H	Catalog No. Type	Shape	B Blade length
SKH51 61～64HRC	H-AHSW	D R E G	S
Powdered high-speed steel 64～67HRC	H-APHW	D R E G	L

Blade length(B) L>S

Double flanged



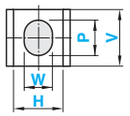
Catalog No. Type	Shape	B Blade length	H	W	V Pmin.	3	4	5	6	8	10	13	16	20	22	25	28	30	L	B S	B L
						1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0			
Single flanged H-AHSF H-APHF	D R E G	S	(2)	1.0		○	○	○	○	○	○	○								6	8
			(3)	1.0		○	○	○	○	○	○	○	○	○	○				50		
			(4)	1.0			○	○	○	○	○	○	○	○	○				50		
			5	1.2				○	○	○	○	○	○	○	○	○	○	○	60	8	13
Double flanged H-AHSW H-APHW		L	6	1.5					○	○	○	○	○	○	○	○	○	○	70		
			8	2.0						○	○	○	○	○	○	○	○	○	80		
			10	2.5							○	○	○	○	○	○	○	○		13	19
			13	3.0								○	○	○	○	○	○	○			

H(2)(3)(4) ···· L50～70 When H (2), (3) or (4), the length (L) is 50～70.

Order

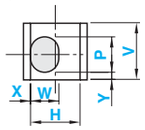
■The frange position is fixed.

(1) The blade is in the center of shank.



Catalog No.	V	H	—	L	—	0.01 mm increments P	—	W	—	R (R only)
H-APHWES	08	08	—	60	—	P7.00	—	W6.00		

(2) The blade is not in the center of shank.



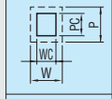
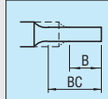
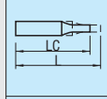
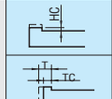
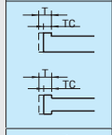
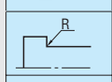
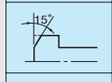
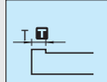
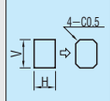
Catalog No.	V	H	—	L	—	0.01 mm increments P	—	W	—	R (R only)	—	0.01 mm increments X—Y
H-APHWEL	10	10	—	60	—	P6.00	—	W5.00			—	X0.00—Y0.10

(X, Y specification is 0.02 over, or 0. Tolerance ±0.01)

Delivery 5 Days

Alteration

Catalog No. V H—L(LC)—P(PC)—W(WC)—R—X—Y—(BC・PKC・etc.)
H-APHFES10 10—LC58.5—P8.00—W6.00—HC1.5

Alterations		Code	Spec.	¥/1Code
Blade		PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01 mm increments	200
		BC	Changes blade length B 2≦BC≦Bmax 0.1 mm increments Full length L (LC) requires BC+36mm or more.	400
Full length		LC	Changes full length 36+B(BC)≦LC<L 0.1 mm increments (Combination with LKC→0.01mm increments) When LC—B is 36mm or less, blade length is full length—36mm.	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
Flange		HC	Changes flange width. 1.0≦HC<2.0 0.1 mm increments	200
		TC	Changes flange thickness. 5≦TC<10 0.1 mm increments (Combination with TKC→0.01mm increments) L is shortened by (10—TC). When LC, L=LC.	200
		RE	Changes R on flange. R=0.8～1.0 ⇨ R≦0.3	Single flanged 300 Double flanged 600
		FK	Adds relief chamfering to flange. For breakage prevention.	Single flanged 200 Double flanged 400
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.02	200
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. No chamfering on R of flange foot.	400
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100

■Features

This block punch has stronger flange than general products. It is suitable for situations like flange breakage cause problems when punching thick plates or high-tensile steel plates.

Comparison of flange size Unit : mm

Type	Thickness	Width	R
Standard	5	1.5	0.3 or less
Flange thickness 10mm	10	2.0	0.8～1.0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49
Rate	—	5%	10%

To be quoted on price & lead time above Max. Q'ty.

■Single flanged type SKH51

Catalog No. H \ V	3・4・5	6・8・10	13・16	20・22	25・28	30
H—AHSFDS 2	4,110	4,630	5,730			
H—AHSFDS 3・4	3,240	3,710	4,730	6,180		
H—AHSFDS 5・6	3,420	5,370	6,540	8,790	9,940	10,940
H—AHSFDL 8・10		5,590	7,690	8,790	9,990	10,990
H—AHSFDL 13			8,890	10,090	11,190	11,490
H—AHSFRS 2	6,790	6,910	8,440			
H—AHSFRS 3・4	5,600	5,880	6,900	8,160		
H—AHSFRL 5・6	5,750	7,710	9,040	10,960	12,030	12,960
H—AHSFRL 8・10		7,990	9,090	11,390	12,590	13,790
H—AHSFRL 13			11,490	13,190	14,290	14,790
H—AHSFES 2	4,400	4,770	6,240			
H—AHSFEL 3・4	3,490	3,830	5,160	6,550		
H—AHSFGS 5・6	4,290	5,590	6,790	8,790	10,090	11,190
H—AHSFGL 8・10		5,590	7,790	8,990	10,390	11,190
H—AHSFGL 13			9,190	10,290	11,390	11,590

■Single flanged type Powdered high-speed steel

Catalog No. H \ V	3・4・5	6・8・10	13・16	20・22	25・28	30
H—APHFDS 2	6,150	7,220	8,950			
H—APHFDS 3・4	5,180	6,130	7,020	9,450		
H—APHFDS 5・6	5,350	6,270	7,390	10,330	11,860	13,070
H—APHFDL 8・10		7,290	8,130	11,500	13,020	14,100
H—APHFDL 13			9,440	13,180	14,970	15,870
H—APHFRS 2	9,190	10,090	12,060			
H—APHFRS 3・4	8,010	8,810	9,840	12,420		
H—APHFRL 5・6	8,180	9,020	10,210	13,110	14,570	15,770
H—APHFRL 8・10		10,050	10,950	14,450	15,970	17,070
H—APHFRL 13			12,270	16,730	18,470	19,370
H—APHFES 2	6,440	7,370	9,460			
H—APHFEL 3・4	5,450	6,260	8,100	9,850		
H—APHFGS 5・6	5,620	6,620	8,280	10,530	12,120	13,330
H—APHFGL 8・10		7,500	9,460	11,760	13,410	14,500
H—APHFGL 13			11,930	13,640	15,370	16,270

■Double flanged type SKH51

Catalog No. H \ V	3・4・5	6・8・10	13・16	20・22	25・28	30
H—AHSWDS 2	4,300	4,830	5,930			
H—AHSWDS 3・4	3,410	3,880	4,900	6,360		
H—AHSWDS 5・6	3,590	5,540	6,940	9,040	10,340	11,140
H—AHSWDL 8・10		5,690	8,090	9,290	10,390	11,190
H—AHSWDL 13			9,090	10,390	11,590	11,690
H—AHSWRS 2	7,220	7,580	8,840			
H—AHSWRS 3・4	5,770	6,050	7,080	8,340		
H—AHSWRS 5・6	5,920	8,000	9,410	11,240	12,340	13,270
H—AHSWRL 8・10		8,290	10,490	11,690	12,690	14,190
H—AHSWRL 13			11,690	13,590	14,790	14,890
H—AHSWES 2	4,590	4,960	6,430			
H—AHSWEL 3・4	3,660	4,000	5,330	6,720		
H—AHSWGS 5・6	4,490	5,890	7,090	9,090	10,490	11,290
H—AHSWGL 8・10		5,890	8,090	9,290	10,490	11,290
H—AHSWGL 13			9,290	10,690	11,790	11,790

■Double flanged type Powdered high-speed steel

Catalog No. H \ V	3・4・5	6・8・10	13・16	20・22	25・28	30
H—APHWDS 2	6,540	7,610	9,350			
H—APHWDS 3・4	5,540	6,490	7,820	9,820		
H—APHWDS 5・6	5,710	6,640	8,250	10,690	12,220	13,430
H—APHWDL 8・10		7,660	8,940	11,860	13,370	14,470
H—APHWDL 13			10,190	13,540	15,370	16,270
H—APHWRS 2	9,320	10,490	12,440			
H—APHWRS 3・4	8,380	9,180	10,640	12,780		
H—APHWRS 5・6	8,550	9,390	11,010	13,460	14,970	16,170
H—APHWRL 8・10		10,420	11,750	14,880	16,370	17,470
H—APHWRL 13			13,070	17,130	18,870	19,770
H—APHWES 2	6,830	7,750	9,850			
H—APHWEL 3・4	5,810	6,630	8,470	10,220		
H—APHWGS 5・6	5,980	6,970	8,650	10,890	12,490	13,700
H—APHWGL 8・10		7,860	9,830	12,130	13,780	14,870
H—APHWGL 13			12,300	14,000	15,770	16,670

PRESS NEW

BLOCK PUNCHES FOR HEAVY LOAD
—FLANGE THICKNESS 10mm, WPC®/HW COATING TYPE—

PRODUCTS DATA P.1221

COATING PUNCHES
— WPC® coating —
— HW coating —

Price P.367

The volume discount rate is also applicable to alteration cost. P.39

—WPC®/HW coating type—

S WPC® coating　　HW coating
H 1000～1100HV　　3000HV
B is valid treatment range but shank may have coated layer of 10mm.

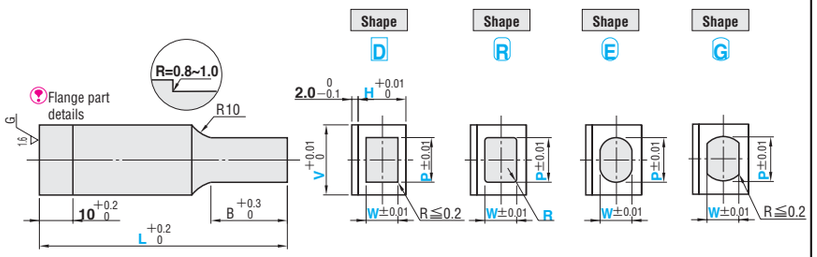
● Machining limit　RoHS

Shape D	Shape R	Shape E	Shape G
W≦P≦W×20	W≦P≦W×20	W≦P≦W×20	W<P≦W×20
R=0：Applicable	0.15≦R<W/2 0.01 mm increments		

When P=V, W=H, the blade tip tolerance is the tolerance of P・W.
The tip edge is very slightly rounded.

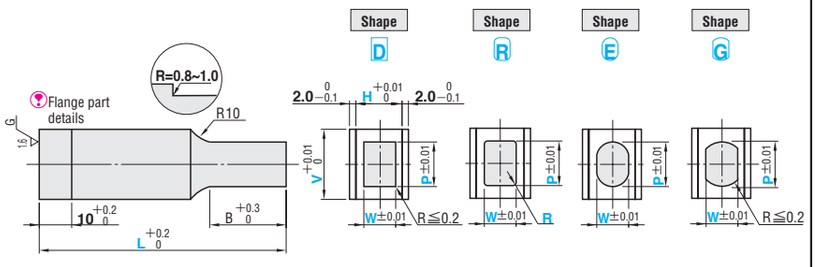
Single flanged

M H	Catalog No. Type	Shape	B Blade length
(H2～5) SKH51 61～64HRC H1000～1100HV	WPC® coating W—AHF	D R E G	S L Blade length(B) L>S
(H6～13) SKD11 or equivalent 60～63HRC H1000～1100HV			
SKH51 61～64HRC H1000～1100HV	WPC® coating W—AHSF (H6～13)		
SKH51 61～64HRC H1000～1100HV	HW coating HW—AHSF		
Powdered high-speed steel 64～67HRC H3000HV	WPC® coating W—APHF		
Powdered high-speed steel 64～67HRC H3000HV	HW coating HW—APHF		



Double flanged

M H	Catalog No. Type	Shape	B Blade length
(H2～5) SKH51 61～64HRC H1000～1100HV	WPC® coating W—AHW	D R E G	S L Blade length(B) L>S
(H6～13) SKD11 or equivalent 60～63HRC H1000～1100HV			
SKH51 61～64HRC H1000～1100HV	WPC® coating W—AHSW (H6～13)		
SKH51 61～64HRC H1000～1100HV	HW coating HW—AHSW		
Powdered high-speed steel 64～67HRC H3000HV	WPC® coating W—APHW		
Powdered high-speed steel 64～67HRC H3000HV	HW coating HW—APHW		



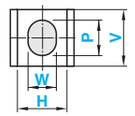
Catalog No. Type	Shape	B Blade length	H	W min.	V P min.	3 1.5	4 2.0	5 2.5	6 3.0	8 3.0	10 4.0	13 5.0	16 7.0	20 8.0	22 9.0	25 10.0	28 12.0	30 12.0	L	B S	B L
Single flanged WPC® coating HW coating W-AHF W-AHSF HW-AHSF W-APHF HW-APHF	D R E G	S L	(2)	1.0		○	○	○	○	○	○	○							50	6	8
			(3)	1.0		○	○	○	○	○	○	○	○	○	○						
			(4)	1.0			○	○	○	○	○	○	○	○	○						
Double flanged WPC® coating HW coating W-AHW W-AHSW HW-AHSW W-APHW HW-APHW			5	1.2				○	○	○	○	○	○	○	○	○	○	○	60 70 80	8	13
			6	1.5					○	○	○	○	○	○	○	○	○	○			
			8	2.0						○	○	○	○	○	○	○	○	○			
			10	2.5							○	○	○	○	○	○	○	○		13	19
			13	3.0								○	○	○	○	○	○	○			

H(2)(3)(4) ⋯▸ L50～70　　When H (2), (3) or (4), the length (L) is 50～70.

Order

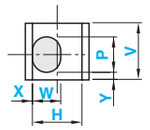
■The frange position is fixed.

(1) The blade is in the center of shank.



Catalog No.	V	H	—	L	—	0.01 mm increments P	—	W	—	R (R only)
W-AHWES	08	08	—	60	—	P7.00	—	W6.00		

(2) The blade is not in the center of shank.



Catalog No.	V	H	—	L	—	0.01 mm increments P	—	W	—	R (R only)	—	0.01 mm increments X—Y
HW-APHWEL	10	10	—	60	—	P6.00	—	W5.00			—	X0.00—Y0.10

(X, Y specification is 0.02 over, or 0. Tolerance ±0.01)

Delivery　WPC® coating・HW coating　5 Days

Price P.367

Alteration　Catalog No. V H—L(LC)—P(PC)—W(WC)—R — X—Y —(BC・PKC⋯etc.)
W-APHFES10 10—LC58.5 — P8.00— W6.00 —HC1.5

Alterations		Code	Spec.	¥/1Code
Blade		PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01 mm increments	200
		BC	Changes blade length B 2≦BC≦Bmax 0.1 mm increments (W(WC) 0.50～0.99 Bmax 4; 1.00～1.19 8; 1.20～1.99 13; 2.00～2.99 20; 3.00～4.99 30; 5.00～ 35) Full length L (LC) requires BC+36mm or more.	400
Full length		LC	Changes full length 36+B(BC)≦LC<L 0.1 mm increments (Combination with LKC→0.01mm increments) When LC—B is 36mm or less, blade length is full length—36mm.	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
Flange		HC	Changes flange width. 1.0≦HC<2.0 0.1 mm increments	200
		TC	Changes flange thickness. 5≦TC<10 0.1 mm increments (Combination with TKC→0.01mm increments) L is shortened by (10—TC). When LC, L=LC.	200
		RE	Changes R on flange. R=0.8～1.0 ⇨ R≦0.3	Single flanged 300 Double flanged 600
		FK	Adds relief chamfering to flange. For breakage prevention.	Single flanged 200 Double flanged 400
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.02	200

Alterations		Code	Spec.	¥/1Code
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. No chamfering on R of flange foot.	400
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100

■Features

This block punch has stronger flange than general products. It is suitable for situations like flange breakage cause problems when punching thick plates or high-tensile steel plates.

Comparison of flange size　Unit : mm

Type	Thickness	Width	R
Standard	5	1.5	0.3 or less
Flange thickness 10mm	10	2.0	0.8～1.0

BLOCK PUNCHES FOR HEAVY LOAD
—FLANGE THICKNESS 10mm, WPC®/HW COATING TYPE— PRICE

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49
Rate	—	5%	10%

To be quoted on price & lead time above Max. Q'ty.

■Single flanged type SKD11 or equivalent · WPC®coating 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22·25	28·30
W—AHFDS	2	3,870	4,020	4,240		
	3・4	3,430	3,560	3,740	3,920	
W—AHFDL	5・6	3,430	3,610	3,920	4,220	4,530
	8・10		3,740	4,040	4,290	4,530
	13			4,350	4,530	4,770
W—AHFRS	2	6,960	6,960	7,400		
	3・4	6,010	6,010	6,370	6,610	
W—AHFRL	5・6	6,010	6,120	6,490	6,740	6,980
	8・10		6,250	6,610	6,980	7,220
	13			7,100	7,720	7,960
W—AHFES	2	4,170	4,170	4,760		
W—AHFEL	3・4	3,680	3,680	4,170	4,290	
W—AHFGS	5・6	3,680	3,920	4,170	4,410	4,770
W—AHFGL	8・10		3,920	4,290	4,530	4,900
	13			4,660	4,900	5,140

■Double flanged type SKD11 or equivalent · WPC®coating 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22·25	28·30
W—AHWDS	2	4,070	4,230	4,440		
	3・4	3,600	3,730	3,910	4,100	
W—AHWDL	5・6	3,600	3,790	4,100	4,400	4,710
	8・10		3,910	4,210	4,460	4,710
	13			4,520	4,710	4,950
W—AHWRS	2	7,170	7,170	7,610		
	3・4	6,180	6,180	6,550	6,790	
W—AHWRL	5・6	6,180	6,290	6,660	6,910	7,160
	8・10		6,420	6,790	7,160	7,400
	13			7,270	7,890	8,130
W—AHWES	2	4,370	4,370	4,960		
W—AHWEL	3・4	3,850	3,850	4,340	4,460	
W—AHWGS	5・6	3,850	4,100	4,340	4,580	4,950
W—AHWGL	8・10		4,100	4,460	4,710	5,070
	13			4,830	5,070	5,320

■Single flanged type SKH51 · WPC®coating 5 Days

Catalog No.	H \ V	6·8·10	13·16	20·22	25·28	30
W—AHSFDS	6	5,120	5,800	6,490	7,110	7,540
	8・10	5,580	6,410	7,220	7,820	8,160
W—AHSFDL	13		7,430	8,050	8,910	9,320
W—AHSFRS	6	7,770	8,600	9,160	9,730	10,140
	8・10	8,240	9,130	10,060	10,670	11,020
W—AHSFRL	13		10,370	11,460	12,280	12,690
W—AHSFES	6	5,450	6,140	6,680	7,350	7,790
W—AHSFEL	8・10	5,780	6,670	7,470	8,180	8,550
W—AHSFGS	13		7,750	8,470	9,300	9,700
W—AHSFGL						

■Single flanged type SKH51 · HW coating 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
HW—AHSFDS	2	5,010	5,530	6,630			
	3・4	4,140	4,610	5,630	7,080		
HW—AHSFDL	5・6	4,320	6,270	7,440	9,690	10,840	11,840
	8・10		6,490	8,590	9,690	10,890	11,890
	13			9,790	10,990	12,090	12,390
HW—AHSFRS	2	7,690	7,810	9,340			
	3・4	6,500	6,780	7,800	9,060		
HW—AHSFRL	5・6	6,650	8,610	9,940	11,860	12,930	13,860
	8・10		8,890	9,990	12,290	13,490	14,690
	13			12,390	14,090	15,190	15,690
HW—AHSFES	2	5,300	5,670	7,140			
HW—AHSFEL	3・4	4,390	4,730	6,060	7,450		
HW—AHSFGS	5・6	5,190	6,490	7,690	9,690	10,990	12,090
HW—AHSFGL	8・10		6,490	8,690	9,890	11,290	12,090
	13			10,090	11,190	12,290	12,490

■Double flanged type SKH51 · WPC®coating 5 Days

Catalog No.	H \ V	6·8·10	13·16	20·22	25·28	30
W—AHSWDS	6	5,410	6,090	6,770	7,400	7,830
	8・10	5,870	6,690	7,500	8,100	8,450
W—AHSWDL	13		7,700	8,340	9,220	9,630
W—AHSWRS	6	8,060	8,880	9,440	10,040	10,450
	8・10	8,530	9,420	10,390	10,980	11,330
W—AHSWRL	13		10,680	11,760	12,590	13,000
W—AHSWES	6	5,740	6,430	6,970	7,650	8,090
W—AHSWEL	8・10	6,070	6,960	7,760	8,470	8,840
W—AHSWGS	13		8,040	8,760	9,610	10,020
W—AHSWGL						

■Double flanged type SKH51 · HW coating 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
HW—AHSWDS	2	7,050	8,120	9,850			
	3・4	6,080	7,030	7,920	10,350		
HW—AHSWDL	5・6	6,250	7,170	8,290	11,230	12,760	13,970
	8・10		8,190	9,030	12,400	13,920	15,000
	13			10,340	14,080	15,870	16,770
HW—AHSWRS	2	10,090	10,990	12,960			
	3・4	8,910	9,710	10,740	13,320		
HW—AHSWRL	5・6	9,080	9,920	11,110	14,010	15,470	16,670
	8・10		10,950	11,850	15,350	16,870	17,970
	13			13,170	17,630	19,370	20,270
HW—AHSWES	2	7,340	8,270	10,360			
HW—AHSWEL	3・4	6,350	7,160	9,000	10,750		
HW—AHSWGS	5・6	6,520	7,520	9,180	11,430	13,020	14,230
HW—AHSWGL	8・10		8,400	10,360	12,660	14,310	15,400
	13			12,830	14,540	16,270	17,170

■Single flanged type Powdered high-speed steel · WPC®coating 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
W—APHFDS	2	6,280	7,020	7,910			
	3・4	5,440	6,060	6,800	7,420		
W—APHFDL	5・6	5,440	6,120	7,040	7,990	8,930	9,540
	8・10		6,800	7,980	9,160	10,090	10,570
	13			9,470	10,390	11,740	12,340
W—APHFRS	2	9,680	10,240	11,390			
	3・4	8,270	8,740	9,700	10,390		
W—APHFRL	5・6	8,270	8,870	10,000	10,770	11,640	12,240
	8・10		9,560	10,800	12,110	13,040	13,540
	13			12,540	13,940	15,240	15,840
W—APHFES	2	6,600	7,180	8,460			
W—APHFEL	3・4	5,710	6,190	7,260	7,820		
W—APHFGS	5・6	5,710	6,470	7,440	8,190	9,190	9,800
W—APHFGL	8・10		7,010	8,250	9,420	10,480	10,970
	13			9,800	10,850	12,140	12,740

■Single flanged type Powdered high-speed steel · HW coating 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
HW—APHFDS	2	5,200	5,730	6,830			
	3・4	4,310	4,780	5,800	7,260		
HW—APHFDL	5・6	4,490	6,440	7,840	9,940	11,240	12,040
	8・10		6,590	8,990	10,190	11,290	12,090
	13			9,990	11,290	12,490	12,590
HW—APHFRS	2	8,120	8,480	9,740			
	3・4	6,670	6,950	7,980	9,240		
HW—APHFRL	5・6	6,820	8,900	10,310	12,140	13,240	14,170
	8・10		9,190	11,390	12,590	13,590	15,090
	13			12,590	14,490	15,690	15,790
HW—APHFES	2	5,490	5,860	7,330			
HW—APHFEL	3・4	4,560	4,900	6,230	7,620		
HW—APHFGS	5・6	5,390	6,790	7,990	9,990	11,390	12,190
HW—APHFGL	8・10		6,790	8,990	10,190	11,390	12,190
	13			10,190	11,590	12,690	12,690

■Double flanged type Powdered high-speed steel · WPC®coating 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
W—APHWDS	2	6,710	7,460	8,360			
	3・4	5,800	6,420	7,170	7,790		
W—APHWDL	5・6	5,800	6,490	7,410	8,350	9,290	9,900
	8・10		7,170	8,340	9,520	10,440	10,940
	13			9,820	10,750	12,140	12,740
W—APHWRS	2	10,120	10,680	11,810			
	3・4	8,640	9,110	10,050	10,750		
W—APHWRL	5・6	8,640	9,240	10,360	11,120	12,040	12,640
	8・10		9,930	11,170	12,540	13,440	13,940
	13			12,940	14,340	15,640	16,240
W—APHWES	2	7,040	7,620	8,910			
W—APHWEL	3・4	6,070	6,560	7,630	8,190		
W—APHWGS	5・6	6,070	6,820	7,810	8,550	9,560	10,170
W—APHWGL	8・10		7,370	8,620	9,790	10,850	11,340
	13			10,170	11,210	12,540	13,140

■Double flanged type Powdered high-speed steel · HW coating 5 Days

Catalog No.	H \ V	3·4·5	6·8·10	13·16	20·22	25·28	30
HW—APHWDS	2	7,440	8,510	10,250			
	3・4	6,440	7,390	8,720	10,720		
HW—APHWDL	5・6	6,610	7,540	9,150	11,590	13,120	14,330
	8・10		8,560	9,840	12,760	14,270	15,370
	13			11,090	14,440	16,270	17,170
HW—APHWRS	2	10,220	11,390	13,340			
	3・4	9,280	10,080	11,540	13,680		
HW—APHWRL	5・6	9,450	10,290	11,910	14,360	15,870	17,070
	8・10		11,320	12,650	15,780	17,270	18,370
	13			13,970	18,030	19,770	20,670
HW—APHWES	2	7,730	8,650	10,750			
HW—APHWEL	3・4	6,710	7,530	9,370	11,120		
HW—APHWGS	5・6	6,880	7,870	9,550	11,790	13,390	14,600
HW—APHWGL	8・10		8,760	10,730	13,030	14,680	15,770
	13			13,200	14,900	16,670	17,570

Express service system P.38

MISUMI Press 2007

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For inquiry, ordering and other information, refer to P.1269

PRESS NEW

BLOCK PUNCHES
—CONFIGURABLE, TiCN COATING TYPE—

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

Price P.371

The volume discount rate is also applicable to alteration cost. P.39

—TiCN coating type—

S TiCN
H 3000HV
B is valid treatment range but shank may have coated layer of 10mm.

● Machining limit

RoHS

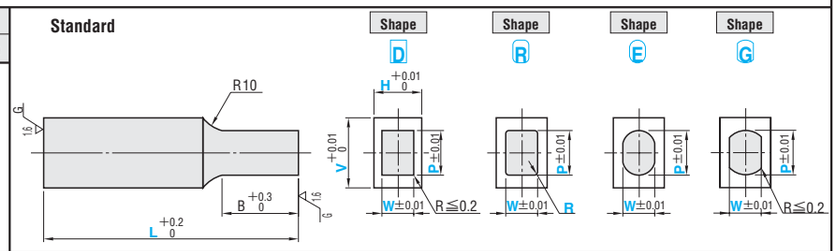
Shape D	Shape R	Shape E	Shape G
W≦P≦W×20	W≦P≦W×20	W≦P≦W×20	W<P≦W×20
R=0 : Applicable	0.15≦R<W/2		

0.01 mm increments

When P=V, W=H, the blade tip tolerance is the tolerance of P・W.
The tip edge is very slightly rounded.

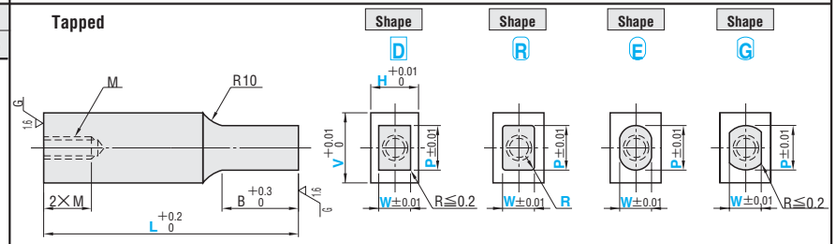
M H	Shank diameter V·H	Catalog No. Type	Shape
SKH51 61~64HRC	V3.0~30 H3.0~30	H—FHSP	D R E G
Powdered high-speed steel 64~67HRC	V3.0~30 H3.0~30	H—FPHP	D R E G

Standard



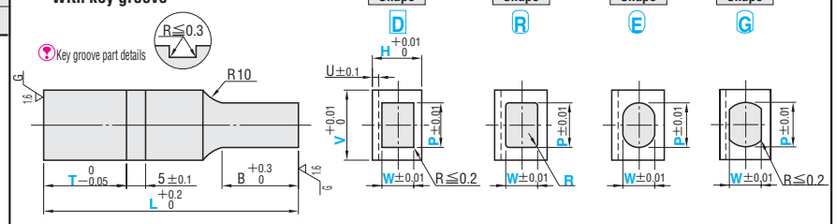
M H	Shank diameter V·H	Catalog No. Type	Shape
SKH51 61~64HRC	V5.1~30 H5.1~30	H—FHSM	D R E G
Powdered high-speed steel 64~67HRC	V5.1~30 H5.1~30	H—FPHM	D R E G

Tapped



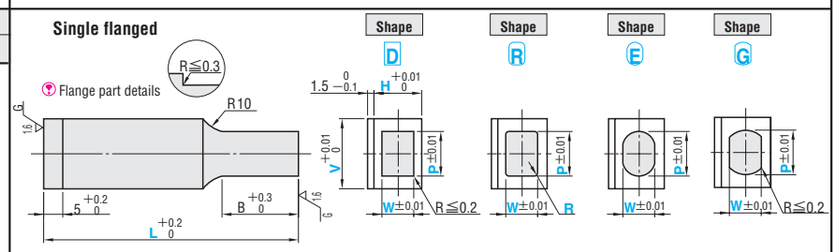
M H	Shank diameter V·H	Catalog No. Type	Shape
SKH51 61~64HRC	V3.0~30 H3.0~30	H—FHSK	D R E G
Powdered high-speed steel 64~67HRC	V3.0~30 H3.0~30	H—FPHK	D R E G

With key groove



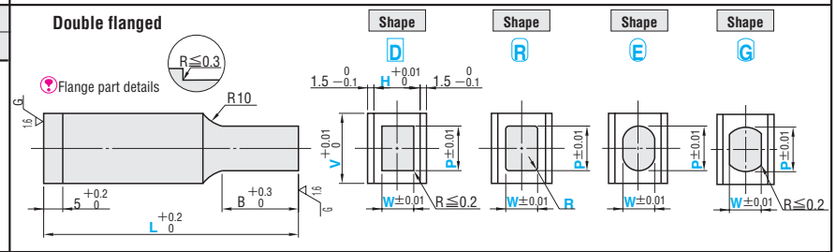
M H	Shank diameter V·H	Catalog No. Type	Shape
SKH51 61~64HRC	V3.0~30 H3.0~30	H—FHSF	D R E G
Powdered high-speed steel 64~67HRC	V3.0~30 H3.0~30	H—FPHF	D R E G

Single flanged



M H	Shank diameter V·H	Catalog No. Type	Shape
SKH51 61~64HRC	V3.0~30 H3.0~30	H—FHSW	D R E G
Powdered high-speed steel 64~67HRC	V3.0~25 H3.0~25	H—FPHW	D R E G

Double flanged



■Key groove position change
Flange position change

●WITH KEY GROOVE K0 K90 K180 K270

●SINGLE FLANGED F0 F90 F180 F270

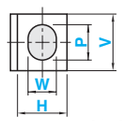
●DOUBLE FLANGED WF0 WF90

Catalog No. Type	Shape	H \ V	V 3.0~4.0	4.1~5.0	5.1~6.0	6.1~8.0	8.1~10.0	10.1~13.0	13.1~16.0	16.1~20.0	20.1~25.0	25.1~30.0	L	0.1mm T	B	M	U
		Wmin \ Pmin	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	10.0	12.0					
Standard H—FHSP	D	(3.0~4.0) 1.0	○	○	○	○	○	○	○	○			(40) (50) 60 70 80 90 100	T≧2.0	8	–	1.0
Tapped H—FHSM	D	4.1~5.0 1.2		○	○	○	○	○	○	○	○	○			13	–	
	D	5.1~6.0 1.5			○	○	○	○	○	○	○	○				3	
With key groove H—FPHM	D	6.1~8.0 2.0				○	○	○	○	○	○	○				4	1.5
H—FHSK	R	8.1~10.0 2.5					○	○	○	○	○	○			19	5	
H—FPHK	E	10.1~13.0 3.0						○	○	○	○	○				6	
Single flanged H—FHSF	E	13.1~16.0 4.0							○	○	○	○			25	8	
H—FPHF	G	16.1~20.0 5.0								○	○	○					
Double flanged H—FHSW	G	20.1~25.0 6.5									○	○					
H—FPHW	G	(25.1~30.0) 7.5										○					

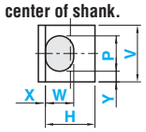
L(40)・H8.1~30 ▸▸▸ B=13 When the full length is (40) and dimension H is 8.1~30, the blade length is fixed to 13mm (With tapping type, it is fixed to 10mm.)
L(50)・H13.1~30 ▸▸▸ B=19 When the full length is (50) and dimension H is 13.1~30, the blade length is fixed to 19mm
H(3)(4) ▸▸▸ L40~70 When H (3.0~4.0), the length (L) is 40~70.
Not applicable on H(25.1~30.0) of double flanged type.

Order

(1)The blade is in the center of shank.



(2)The blade is not in the center of shank.



Catalog No. – 0.1mm incr. V – H – L – 0.01mm increments P – W – R(R only) – 0.1mm incr. T≧2 – K F WF

H—FHSPD – V23.5 – H12.0 – 60 – P18.00 – W 4.00
H—FHSMD – V17.0 – H10.0 – 100 – P16.00 – W 9.00
H—FPHKD – V 9.0 – H 5.5 – 60 – P 8.00 – W 5.00 – T25.5 – K0
H—FPHFD – V17.0 – H14.0 – 60 – P15.00 – W12.00 – F0
H—FPHWD – V 9.5 – H 6.0 – 40 – P 8.00 – W 5.00 – WF90

Catalog No. – 0.1mm incr. V – H – L – 0.01mm increments P – W – R(R only) – 0.1mm incr. T≧2 – K F WF – 0.01mm incr. X – Y

H—FHSFE – V16.5 – H14.0 – 50 – P15.00 – W12.00 – F0 – X0.00 – Y0.50

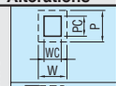
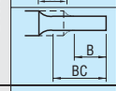
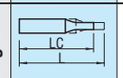
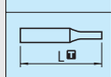
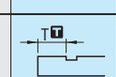
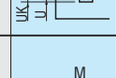
(X, Y specification is 0.02 over, or 0. Tolerance ±0.01)

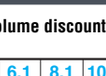
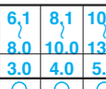
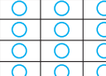
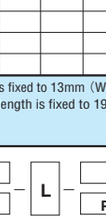
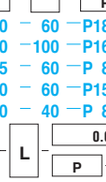
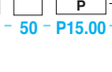
Delivery 8 Days

Price P.371

Alteration

Catalog No. – V – H – L(LC) – P(PC)・W(WC) – T – K・F・WF – (BC・HC・TC・etc.)
H—FHSMD – V19.0~H7.9 – 60.0 – P18.00 – WC1.50 – T25.5 – VKC – MC3

Alterations		Code	Spec.	¥/1Code
Blade		PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧1.00 0.01mm increments	200
		BC	Changes blade length B 2≦BC≦Bmax 0.1mm increments Full length L(LC) requires BC+30mm or more.	400
Full length		LC	Changes full length 30+B(BC)≦LC<L 0.1mm increments (Combination with LKC→0.01mm increments) When LC−B is 30mm or less, blade length is full length−30mm.	200
		LKC	Changes full length tolerance L +0.2 0 ⇨ +0.05 0	400
Key groove		TKC	Changes tolerance on key groove position T. T 0 −0.05 ⇨ 0 −0.02	200
		RTC	Changes tolerance on key groove position T. T 0 −0.05 ⇨ +0.05 0	0
		WK	Adds key groove at symmetrical position H−(2×U(UK))≧2.0(K0,K180) V−(2×U(UK))≧2.0(K90,K270) K0・180 K90・270 Additional key groove is on the symmetrical position of the specified key groove. Applicable to key groove type only. Combination with UK is applicable	400
		UK	Changes key groove depth. 0.5≦UK≦U+0.2 0.1mm increments H(V)−UK≧2.0 Applicable to key groove type only. Combination with WK is applicable	200
Tap		MC	Changes tap size. H diameter / Standard / Option: 6.1~8.0 M4 M3; 8.1~10.0 M5 M4・M6; 10.1~13.0 M6 M4(V10.1~16.0)M5・M8; 13.1~16.0 M8 M5(V13.1~20.0)M6・M10; 16.1~30.0 M8 M6・M10 Specify the tap size after MC upon ordering. (Refer to order example). 10 Days	200

Alterations		Code	Spec.	¥/1Code
Flange		HC	Changes flange width. 0≦HC<1.5 0.1mm increments	200
		TC	Changes flange thickness. 2≦TC<5 0.1mm increments (Combination with TKC→0.01mm increments) L is shortened by (5−TC). When LC, L=LC.	200
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.02	200
		FK	Adds relief chamfering to flange. For breakage prevention.	Single flanged 200 Double flanged 400
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. 0.5mmor longer	Standard Tapped With key groove 200 Single flanged Double flanged 400
		CCP	Adds chamfering (C1.0) to a corner of shank. (Error prevention) Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 Blade corner Blade corner ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270 Applicable to standard tap type only.	200
		VKC	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ +0.005 0	300
		VKM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.005	300
		VHM	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ 0 −0.01	200
		VHZ	Changes shank tolerance (V・H) V・H +0.01 0 ⇨ ±0.005	100
		DC	Adds press-in lead Adds 3mm (V・H −0.01 −0.03) press-in lead Applicable to standard, tapped, key groove type only.	200

Express service system P.38

MISUMI Press 2007 http://misumi.jp/press/

For inquiry, ordering and other information, refer to P.1269

BLOCK PUNCHES
—CONFIGURABLE, TiCN COATING TYPE— PRICE

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~49
Rate	—	5%	10%

To be quoted on price & lead time above Max. Q'ty.

■Standard type SKH51

Catalog No.	H \ V	3.0~5.0	5.1~10.0	10.1~16.0	16.1~22.0	22.1~28.0	28.1~30.0
H—FHSPD H—FHSPE	3.0~ 4.0	3,220	3,650	4,590	5,740		
	4.1~ 6.0	3,360	3,900	5,030	6,880	7,160	7,520
	6.1~10.0		4,680	6,330	7,310	8,470	9,400
	10.1~16.0			7,250	8,390	9,540	10,740
	16.1~22.0				9,140	10,840	12,020
	22.1~28.0				10,860	12,620	13,610
	28.1~30.0					14,090	14,120
H—FHSPR	3.0~ 4.0	6,300	6,580	7,740	8,970		
	4.1~ 6.0	6,430	6,830	8,020	9,350	9,920	10,400
	6.1~10.0		7,640	9,360	10,540	11,620	12,550
	10.1~16.0			10,470	12,160	13,300	14,310
	16.1~22.0				13,600	15,150	16,400
	22.1~28.0				16,110	17,060	18,050
	28.1~30.0					18,460	18,590
H—FHSPG	3.0~ 4.0	3,650	3,930	5,270	6,360		
	4.1~ 6.0	3,790	4,570	5,640	6,930	7,800	8,190
	6.1~10.0		5,240	6,990	8,040	9,310	10,310
	10.1~16.0			8,030	9,250	10,500	11,830
	16.1~22.0				10,100	12,000	13,300
	22.1~28.0				11,950	14,010	15,130
	28.1~30.0					15,640	15,680

■Standard type Powdered high-speed steel

Catalog No.	H \ V	3.0~5.0	5.1~10.0	10.1~16.0	16.1~22.0	22.1~28.0	28.1~30.0
H—FPHPD H—FPHPE	3.0~ 4.0	3,910	4,520	5,700	7,120		
	4.1~ 6.0	4,050	4,720	6,190	8,270	9,040	10,030
	6.1~10.0		5,500	7,490	8,700	10,350	11,910
	10.1~16.0			8,940	10,470	12,110	14,390
	16.1~22.0				11,910	14,680	16,950
	22.1~28.0				14,450	17,590	19,770
	28.1~30.0					20,300	20,370
H—FPHPR	3.0~ 4.0	6,850	7,320	8,720	10,210		
	4.1~ 6.0	6,980	7,570	9,120	10,740	11,680	12,790
	6.1~10.0		8,380	10,460	11,930	13,380	14,940
	10.1~16.0			12,050	14,150	15,780	17,570
	16.1~22.0				16,260	18,880	21,300
	22.1~28.0				19,600	21,850	24,020
	28.1~30.0					24,410	24,740
H—FPHPG	3.0~ 4.0	4,300	4,890	6,350	7,720		
	4.1~ 6.0	4,440	5,210	6,650	8,270	9,530	10,530
	6.1~10.0		5,880	8,000	9,380	11,040	12,650
	10.1~16.0			9,520	11,250	12,930	14,780
	16.1~22.0				13,040	15,740	18,280
	22.1~28.0				16,060	18,390	20,660
	28.1~30.0					21,470	21,520

■Tapped type SKH51

Catalog No.	H \ V	5.1~10.0	10.1~16.0	16.1~22.0	22.1~28.0	28.1~30.0
H—FHSMD H—FHSME	5.1~ 6.0	4,770	6,410	7,410	8,560	9,500
	6.1~10.0	4,770	6,410	7,410	8,560	9,500
	10.1~16.0		7,340	8,490	9,670	10,670
	16.1~22.0			9,290	10,980	12,220
	22.1~28.0			11,070	12,790	13,780
	28.1~30.0				14,270	14,280
H—FHSMR	5.1~ 6.0	7,720	9,450	10,620	11,710	12,660
	6.1~10.0	7,720	9,450	10,620	11,710	12,660
	10.1~16.0		10,570	12,250	13,470	14,440
	16.1~22.0			13,770	15,330	16,570
	22.1~28.0			16,390	17,230	18,220
	28.1~30.0				18,620	18,720
H—FHSMG	5.1~ 6.0	5,340	7,080	8,160	9,410	10,420
	6.1~10.0	5,340	7,080	8,160	9,410	10,420
	10.1~16.0		8,130	9,360	10,660	11,740
	16.1~22.0			10,280	12,160	13,540
	22.1~28.0			12,190	14,200	15,330
	28.1~30.0				15,850	15,870

■Tapped type Powdered high-speed steel

Catalog No.	H \ V	5.1~10.0	10.1~16.0	16.1~22.0	22.1~28.0	28.1~30.0
H—FPHMD H—FPHME	5.1~ 6.0	4,840	6,330	8,380	9,180	10,150
	6.1~10.0	5,640	7,610	8,830	10,480	12,050
	10.1~16.0		9,070	10,610	12,230	14,010
	16.1~22.0			12,090	14,860	17,260
	22.1~28.0			14,700	17,810	19,970
	28.1~30.0				20,550	20,590
H—FPHMR	5.1~ 6.0	7,700	9,260	10,880	11,930	12,900
	6.1~10.0	8,510	10,570	12,040	13,510	15,110
	10.1~16.0		12,180	14,270	16,000	17,690
	16.1~22.0			16,480	19,100	21,520
	22.1~28.0			19,950	22,070	22,240
	28.1~30.0				24,610	24,850
H—FPHMG	5.1~ 6.0	5,350	6,780	8,400	9,650	10,650
	6.1~10.0	6,030	8,140	9,520	11,170	12,650
	10.1~16.0		9,670	11,380	13,070	14,910
	16.1~22.0			13,250	15,970	18,390
	22.1~28.0			16,380	18,620	20,780
	28.1~30.0				21,690	21,750

■With key groove type SKH51

Catalog No.	H \ V	3.0~5.0	5.1~10.0	10.1~16.0	16.1~22.0	22.1~28.0	28.1~30.0
H—FHSKD H—FHSKE	3.0~ 4.0	3,690	4,120	5,060	6,230		
	4.1~ 6.0	3,840	4,380	5,520	7,370	7,670	8,030
	6.1~10.0		5,170	6,810	7,810	8,960	9,900
	10.1~16.0			7,730	8,900	10,020	11,040
	16.1~22.0				9,620	11,360	12,560
	22.1~28.0				11,330	13,130	14,120
	28.1~30.0					14,540	14,620
H—FHSKR	3.0~ 4.0	6,790	7,070	8,230	9,460		
	4.1~ 6.0	6,920	7,300	8,530	9,860	10,550	10,910
	6.1~10.0		8,130	9,860	11,040	12,120	13,040
	10.1~16.0			10,960	12,680	13,810	14,810
	16.1~22.0				14,110	15,670	16,910
	22.1~28.0				16,620	17,570	18,560
	28.1~30.0					18,940	19,050
H—FHSKG	3.0~ 4.0	4,160	4,440	5,770	6,870		
	4.1~ 6.0	4,280	5,140	6,200	7,510	8,370	8,770
	6.1~10.0		5,810	7,550	8,630	9,880	10,890
	10.1~16.0			8,590	9,840	11,070	12,180
	16.1~22.0				10,670	12,610	13,940
	22.1~28.0				12,500	14,600	15,730
	28.1~30.0					16,170	16,260

■With key groove type Powdered high-speed steel

Catalog No.	H \ V	3.0~5.0	5.1~10.0	10.1~16.0	16.1~22.0	22.1~28.0	28.1~30.0
H—FPHKD H—FPHKE	3.0~ 4.0	4,420	5,040	6,220	7,640		
	4.1~ 6.0	4,570	5,230	6,710	8,780	9,570	10,550
	6.1~10.0		6,020	8,000	9,220	10,860	12,420
	10.1~16.0			9,450	11,000	12,570	14,390
	16.1~22.0				12,420	12,570	17,590
	22.1~28.0				14,940	18,130	20,310
	28.1~30.0					20,710	20,910
H—FPHKR	3.0~ 4.0	7,370	7,840	9,230	10,850		
	4.1~ 6.0	7,500	8,080	9,640	11,260	12,330	13,300
	6.1~10.0		8,910	10,970	12,440	13,900	15,430
	10.1~16.0			12,560	14,710	16,330	18,120
	16.1~22.0				16,810	19,430	21,850
	22.1~28.0				20,130	22,400	24,570
	28.1~30.0					24,890	25,180
H—FPHKG	3.0~ 4.0	4,860	5,430	6,910	8,260		
	4.1~ 6.0	4,980	5,760	7,190	8,810	10,070	11,070
	6.1~10.0		6,430	8,540	9,930	11,580	13,190
	10.1~16.0			10,080	11,790	13,470	15,320
	16.1~22.0				13,580	13,620	18,740
	22.1~28.0				16,580	18,970	21,240
	28.1~30.0					22,030	22,100

■Single flanged type SKH51

Catalog No.	H \ V	3.0~5.0	5.1~10.0	10.1~16.0	16.1~22.0	22.1~28.0	28.1~30.0
H—FHSFD H—FHSFE	3.0~ 4.0	3,490	3,920	4,860	6,010		
	4.1~ 6.0	3,570	4,690	5,880	7,320	8,370	9,180
	6.1~10.0		5,630	7,420	8,660	9,780	10,500
	10.1~16.0			8,500	9,710	11,000	11,740
	16.1~22.0				10,600	12,200	12,970
	22.1~28.0				12,500	13,880	14,910
	28.1~30.0					15,340	15,680
H—FHSFR	3.0~ 4.0	6,580	6,860	8,020	9,240		
	4.1~ 6.0	6,660	7,700	9,120	10,360	11,330	12,130
	6.1~10.0		8,650	10,510	11,890	13,010	13,740
	10.1~16.0			11,820	13,560	14,830	15,570
	16.1~22.0				15,160	16,590	17,400
	22.1~28.0				17,870	18,410	19,480
	28.1~30.0					20,010	20,240
H—FHSFG	3.0~ 4.0	3,940	4,220	5,560	6,650		
	4.1~ 6.0	4,020	5,530	6,810	8,140	9,210	10,050
	6.1~10.0		6,350	8,260	9,620	10,840	11,590
	10.1~16.0			9,490	10,790	12,210	13,000
	16.1~22.0				11,810	13,590	14,420
	22.1~28.0				13,870	15,480	16,650
	28.1~30.0					17,110	17,500

■Single flanged type Powdered high-speed steel

Catalog No.	H \ V	3.0~5.0	5.1~10.0	10.1~16.0	16.1~22.0	22.1~28.0	28.1~30.0
H—FPHFD H—FPHFE	3.0~ 4.0	5,460	6,410	7,940	9,560		
	4.1~ 6.0	5,540	6,540	8,290	10,320	11,810	12,940
	6.1~10.0		7,480	9,830	11,660	13,220	14,260
	10.1~16.0			11,670	13,350	15,350	16,480
	16.1~22.0				15,160	17,670	18,900
	22.1~28.0				18,140	20,330	22,600
	28.1~30.0					23,030	23,860
H—FPHFR	3.0~ 4.0	8,550	9,350	11,110	12,810		
	4.1~ 6.0	8,630	9,550	11,530	13,360	14,770	15,900
	6.1~10.0		10,500	12,920	14,890	16,450	17,510
	10.1~16.0			15,020	17,230	19,170	20,310
	16.1~22.0				19,760	22,050	23,380
	22.1~28.0				23,590	24,810	27,190
	28.1~30.0					27,880	28,460
H—FPHFG	3.0~ 4.0	6,010	6,840	8,790	10,380		
	4.1~ 6.0	6,090	7,220	9,080	10,940	12,550	13,720
	6.1~10.0		8,040	10,530	12,420	14,180	15,260
	10.1~16.0			12,520	14,410	16,410	17,580
	16.1~22.0				16,590	18,970	20,350
	22.1~28.0				20,030	21,390	23,890
	28.1~30.0					24,090	25,320

■Double flanged type SKH51

Catalog No.	H \ V	3.0~5.0	5.1~10.0	10.1~16.0	16.1~22.0	22.1~28.0	28.1~30.0
H—FHSWD H—FHSWE	3.0~ 4.0	3,690	4,120	5,060	6,230		
	4.1~ 6.0	3,770	4,980	6,160	7,610	8,670	9,460
	6.1~10.0		5,920	7,700	8,940	10,060	10,800
	10.1~16.0			8,770	10,000	11,300	12,050
	16.1~22.0				10,900	12,490	13,260
	22.1~25.0				12,800	14,180	15,210
H—FHSWR	3.0~ 4.0	6,790	7,070	8,230	9,460		
	4.1~ 6.0	6,870	7,970	9,400	10,600	11,640	12,430
	6.1~10.0		8,930	10,800	12,210	13,310	14,050
	10.1~16.0			12,120	13,860	15,120	15,870
	16.1~22.0				15,420	16,890	17,660
	22.1~25.0				18,070	18,710	19,780
H—FHSWG	3.0~ 4.0	4,160	4,440	5,770	6,870		
	4.1~ 6.0	4,240	5,800	7,080	8,420	9,490	10,340
	6.1~10.0		6,640	8,540	9,900	11,120	11,890
	10.1~16.0			9,760	11,080	12,510	13,310
	16.1~22.0				12,110	13,880	14,710
	22.1~25.0				14,170	15,780	16,950

■Double flanged type Powdered high-speed steel

Catalog No.	H \ V	3.0~5.0	5.1~10.0	10.1~16.0	16.1~22.0	22.1~28.0	28.1~30.0
H—FPHWD H—FPHWE	3.0~ 4.0	5,850	6,800	8,350	9,960		
	4.1~ 6.0	5,930	6,950	8,690	10,720	12,210	13,330
	6.1~10.0		7,890	10,230	12,050	13,600	14,670
	10.1~16.0			12,050	13,740	15,780	16,920
	16.1~22.0				15,600	18,110	19,340
	22.1~25.0				18,620	20,760	23,030
H—FPHWR	3.0~ 4.0	8,950	9,750	11,490	13,200		
	4.1~ 6.0	9,030	9,950	11,920	13,750	15,220	16,330
	6.1~10.0		10,910	13,320	15,360	16,890	17,950
	10.1~16.0			15,460	17,670	19,610	20,750
	16.1~22.0				20,090	22,490	23,720
	22.1~25.0				23,750	25,250	27,630
H—FPHWG	3.0~ 4.0	6,420	7,270	9,220	10,800		
	4.1~ 6.0	6,500	7,620	9,500	11,360	12,980	14,140
	6.1~10.0		8,460	10,960	12,840	14,610	15,690
	10.1~16.0			12,940	14,820	16,870	18,040
	16.1~22.0				16,930	19,430	20,700
	22.1~25.0				20,260	21,850	24,350

Express service system P.38

MISUMI Press 2007 http://misumi.jp/press/

For inquiry, ordering and other information, refer to P.1269

STRAIGHT PUNCHES

DELIVERY SHORTENED

HS□C (SKH51)
Delivery Time
8 Days → 3 Days (Straight・Tapped・With key groove type)
8 Days → 5 Days (Single flanged・Double flanged type, F90, F270, WF90 are excluded)

Price P.375

The volume discount rate is also applicable to alteration cost. P.39

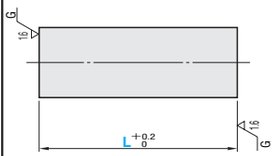
RoHS

• Machining limit

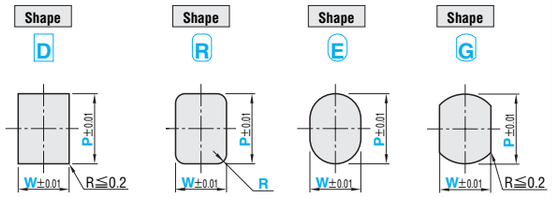
Shape D	Shape R	Shape E	Shape G
W≦P R=0：Applicable	W≦P 0.15≦R<W/2 W−2R≧1 0.01mm increments	W<P P≦10 P−W≧1 10<P≦20 P−W≧2 20<P≦30 P−W≧3	W<P P≦10 P−W≧1 10<P≦20 P−W≧2 20<P≦30 P−W≧3

M / H	P・W	Catalog No. Type	Shape
W2.00～5.00 SKH51 61～64HRC W5.01～30.00 SXD11 or equivalent 60～63HRC	P2.00～50.00	HPC	D
	W2.00～30.00		
SKH51 61～64HRC	P5.01～30.00	HSPC	R
	W5.01～30.00		E
Powdered high-speed steel 64～67HRC	P2.00～30.00	PHPC	G
	W2.00～30.00		

Straight

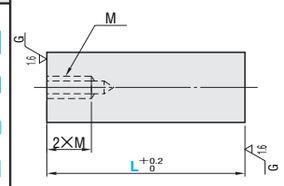


Shape D / R / E / G

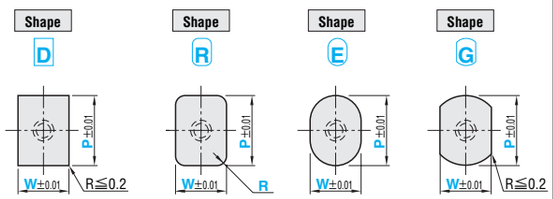


M / H	P・W	Catalog No. Type	Shape
W4.01～5.00 SKH51 61～64HRC W5.01～30.00 SXD11 or equivalent 60～63HRC	P4.01～50.00	HMC	D
	W4.01～30.00		
SKH51 61～64HRC	P5.01～30.00	HSMC	R
	W5.01～30.00		E
Powdered high-speed steel 64～67HRC	P4.01～30.00	PHMC	G
	W4.01～30.00		

Tapped



Shape D / R / E / G

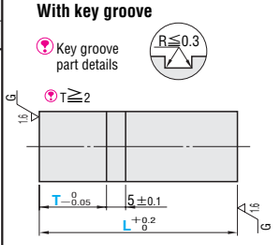


P.W≧4.01mm

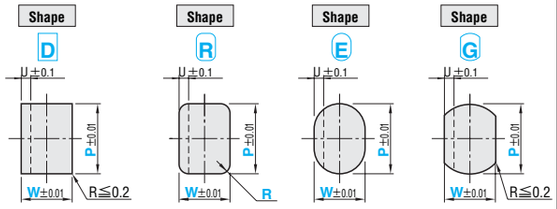
M / H	P・W	Catalog No. Type	Shape
W2.00～5.00 SKH51 61～64HRC W5.01～30.00 SXD11 or equivalent 60～63HRC	P2.00～50.00	HKC	D
	W2.00～30.00		
SKH51 61～64HRC	P5.01～30.00	HSKC	R
	W5.01～30.00		E
Powdered high-speed steel 64～67HRC	P2.00～30.00	PHKC	G
	W2.00～30.00		

With key groove

Key groove part details R≦0.3



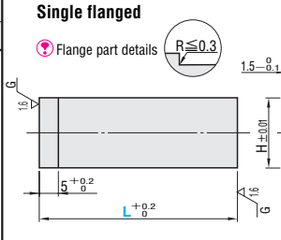
Shape D / R / E / G



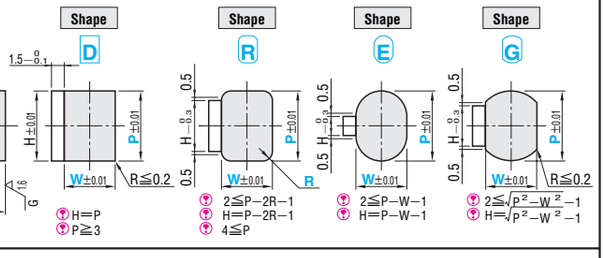
M / H	P・W	Catalog No. Type	Shape
W2.00～5.00 SKH51 61～64HRC W5.01～30.00 SXD11 or equivalent 60～63HRC	P3.00～50.00	HFC	D
	W2.00～30.00		
SKH51 61～64HRC	P5.01～30.00	HSFC	R
	W5.01～30.00		E
Powdered high-speed steel 64～67HRC	P3.00～50.00	PHFC	G
	W2.00～30.00		

Single flanged

Flange part details R≦0.3



Shape D / R / E / G

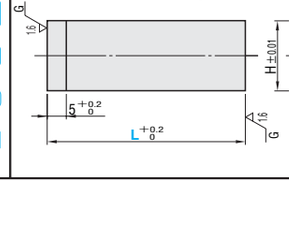


H=P
P≧3
2≦P−2R−1
H=P−2R−1
4≦P
2≦P−W−1
H=P−W−1
2≦√(P²−W²)−1
H=√(P²−W²)−1

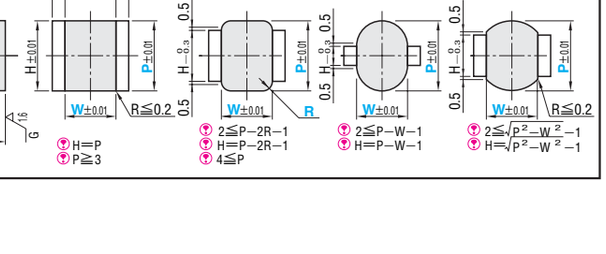
M / H	P・W	Catalog No. Type	Shape
W2.00～5.00 SKH51 61～64HRC W5.01～30.00 SXD11 or equivalent 60～63HRC	P3.00～50.00	HWC	D
	W2.00～30.00		
SKH51 61～64HRC	P5.01～30.00	HSWC	R
	W5.01～30.00		E
Powdered high-speed steel 64～67HRC	P3.00～50.00	PHWC	G
	W2.00～30.00		

Double flanged

Flange part details R≦0.3



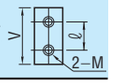
Shape D / R / E / G



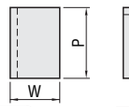
H=P
P≧3
2≦P−2R−1
H=P−2R−1
4≦P
2≦P−W−1
H=P−W−1
2≦√(P²−W²)−1
H=√(P²−W²)−1

Catalog No. Type	Shape	L	P / W	(2.00)～(2.99)	3.00～5.00	5.01～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00	(30.01)～(40.00)	(40.01)～(50.00)	0.1mm T	M	U
Straight Single flanged HPC HFC HSPC HSFC PHPC PHFC	D	13 16 20 25 P.385	2.00～2.99	○	○	○	○						T≧2	–	1.0
			3.00～4.00		○	○	○	○						3	
			4.01～5.00		○	○	○	○	○	○				4	
Tapped Double flanged HMC HWC HSMC HSWC PHMC PHWC	R	40	5.01～6.00			○	○	○	○	○				5	1.5
		50	6.01～8.00			○	○	○	○	○	○			6	
	E	60	8.01～10.00			○	○	○	○	○	○	○		8	
With key groove HKC HSKC PHKC	G	70	10.01～15.00				○	○	○	○	○	○			
		(80)	15.01～20.00					○	○	○	○	○			
		(90)	20.01～25.00						○	○	○	○			
		(100)	25.01～30.00							○	○	○			

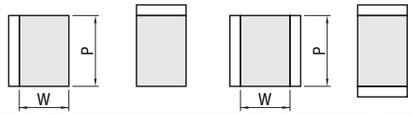
L(80)(90)(100)･･･▶W4.01～30.00
When L（80）, L（90）, or L（100）, W is within the range of 4.01～30.00.
See the short straight punch for L13～25. However, they have only Shape D（tapped/flanged）. P.385
HS□C□（SKH51） is applicable for the size W>5.
For a flange type, when W2.00～2.99, P is≦13.00 and L is≦60.
The flange type R shape is P≧4.
P2.00～2.99 is the standard only for key groove types with a straight tap.
P（30.01～40.00）and（40.01～50.00）are the standard only for the H□CD（SKD11 D type）.
When P30.01～40.00, two taps and the pitch is 20 mm.（Right figure）
When P40.01～50.00, two taps and the pitch is 24 mm.（Right figure）



■Key position specified



■Flange position specified



Shape E G：Applicable for F0・WF0 only.
When F90 or WF90, dimension H is as follows.
Shape D：H=W
Shape R：2≦W−2R−1
H=W−2R−1

Order

Catalog No. – L – 0.01mm increments: P – W – R (R only) – 0.1mm increments: T≧2 – K・F・WF

PHPCD – 60 – P14.28 – W9.28
HMCD – 80 – P 5.80 – W5.20
PHKCR – 60 – P14.28 – W9.28 – R0.50 – T25.5 – K0

Delivery

(SKD11 or equivalent) (SKH51) (Powdered high-speed steel)	HPC□ HSPC□ PHPC□	HMC□ HSMC□ PHMC□	HKC□ HSKC□ PHKC□	3 Days — Express A 800/1Pc. P.38
(SKD11 or equivalent) (SKH51) (Powdered high-speed steel)	HFC□ HSFC□ (F0) PHFC□	HWC□ HSWC□ (WF0) PHWC□		5 Days — Express B 800/1Pc. P.38
(SKH51)	HSFC□ (F90)	HSWC□ (WF90)		8 Days

A flat charge of 2,160 yen for 3 pieces or more of the same size.
⊗ Express A not available for HS□C□ type.
A flat charge of 2,160 yen for 3 pieces or more of the same size.
⊗ Express B not available for HSFC□ / HSWC□ type.
See the price list（P.375）for the delivery details.

Price P.375

Alteration

Catalog No. – L(LC) – P – W – R – T – K – (MC・PKC･･･etc.)
PHPCD – LC65.5 – P5.80 – W5.20 – PKC

Alterations		Code	Spec.	¥/1Code
Blade		PKC	Changes blade tolerance P・W: P・W±0.01 ⇨ +0.01 0	400
		PKV	Changes blade tolerance P・W: P・W±0.01 ⇨ ±0.005	400
Full length		LC	Changes full length 20≦LC<L（For tapped type, 30≦LC<L） 0.1mm increments（Combination with LKC・LKZ→0.01mm increments）	200
		LKC	Changes full length tolerance: L +0.2 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance: L +0.2 0 ⇨ +0.01 0	600
Tap		MC (MMC)	Changes tap size. MMC: Applicable to SKD 11 or equivalent. When changing M6→M4 M8→M5 Specify MMC.	0

W \ P	5.01～20.00
5.01～ 6.00	M4 →M3
6.01～ 8.00	M5 →M4
8.01～10.00	M6 →M5・M4
10.01～13.00	M8 →M6・M5

Alterations		Code	Spec.	¥/1Code
Key groove		TKC	Changes tolerance on key groove position T: 0 −0.05 ⇨ 0 −0.02	200
		RTC	Changes tolerance on key groove position T: 0 −0.05 ⇨ +0.05 0	0
		WK	Adds key groove at symmetrical position W−（2×U（UK））≧2.0（K0） P−（2×U（UK））≧2.0（K90） Additional key groove is on the symmetrical position of the specified key groove. Combination with Applicable to key groove type only.	400
		UK	Changes key groove depth. 0.5≦UK≦U+0.2 0.1mm increments P（W）−UK≧2.0 Combination with WK is applicable Applicable to key groove type only.	200
Flange		HC	Changes flange width. 0≦HC<1.5 0.1mm increments	200
		TC	Changes flange thickness. 2≦TC<5 0.1mm increments（Combination with TKC→0.01mm increments） L is shortened by（5−TC）. When LC, L=LC.	200
		TKC	Changes flange thickness tolerance: T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance: T +0.2 0 ⇨ 0 −0.02	200
		FK	Adds relief chamfering to flange. For breakage prevention.	Single flanged 200 Double flanged 400
Contour		CCN	Adds chamfering at 4 corners of shank. 5≦CCN<L 1mm increments Applicable to shape D only. ⊗ Tap type P・W−M<2:Not applicable For flanged type, chamfered length of the flanged sides：CCN−T(TC).	400

STRAIGHT PUNCHES
—PRICE—

DELIVERY SHORTENED

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Express A·B 800/1Pc.

A flat charge of 2,160 yen for 3 pieces or more of the same size.

■Straight type SKD11 or equivalent — 3 Days — Express A 800/1Pc.

Catalog No.	P \ W	2.00~5.00	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00	30.01~40.00	40.01~50.00
HPCD	2.00~ 4.00	1,170	1,170	1,420	1,560				
	4.01~ 6.00	1,170	1,170	1,420	1,560	1,680	1,950		
	6.01~ 8.00		1,170	1,420	1,560	1,810	1,950	4,510	
	8.01~10.00		1,170	1,420	1,560	1,810	1,950	4,510	4,640
	10.01~15.00			1,810	1,950	2,070	2,200	4,830	5,010
	15.01~20.00				2,070	2,200	2,340	5,140	5,390
	20.01~25.00					2,400	2,460	5,390	5,650
	25.01~30.00						2,590	5,510	5,770
HPCR HPCE HPCG	2.00~ 4.00	3,500	3,640	4,030	4,280				
	4.01~ 6.00	3,500	3,640	4,030	4,280	4,540	4,810		
	6.01~ 8.00		3,500	3,890	4,150	4,280	4,540		
	8.01~10.00		3,500	3,890	4,150	4,280	4,540		
	10.01~15.00			4,420	4,540	4,930	5,060		
	15.01~20.00				4,670	5,060	5,200		
	20.01~25.00					5,200	5,450		
	25.01~30.00						5,590		

■With key groove type SKD11 or equivalent — 3 Days — Express A 800/1Pc.

Catalog No.	P \ W	2.00~5.00	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00	30.01~40.00	40.01~50.00
HKCD	2.00~ 4.00	1,600	1,600	1,850	1,990				
	4.01~ 6.00	1,600	1,600	1,850	1,990	2,110	2,370		
	6.01~ 8.00		1,600	1,850	1,990	2,240	2,370	5,120	
	8.01~10.00		1,600	1,850	1,990	2,240	2,370	5,120	5,240
	10.01~15.00			2,240	2,370	2,500	2,630	5,430	5,620
	15.01~20.00				2,500	2,630	2,760	5,750	5,990
	20.01~25.00					2,830	2,890	5,990	6,250
	25.01~30.00						3,020	6,130	6,370
HKCR HKCE HKCG	2.00~ 4.00	3,920	4,070	4,460	4,710				
	4.01~ 6.00	3,920	4,070	4,460	4,710	4,970	5,230		
	6.01~ 8.00		3,920	4,320	4,580	4,710	4,970		
	8.01~10.00		3,920	4,320	4,580	4,710	4,970		
	10.01~15.00			4,840	4,970	5,360	5,490		
	15.01~20.00				5,100	5,490	5,620		
	20.01~25.00					5,620	5,880		
	25.01~30.00						6,010		

■Double flanged type SKD11 or equivalent — 5 Days — Express B 800/1Pc.

Catalog No.	P \ W	3.00~5.00	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00	30.01~40.00	40.01~50.00
HWCD	2.00~ 2.99	3,520	3,680	4,080					
	3.00~ 4.00	2,690	2,840	3,250	3,530				
	4.01~ 6.00	2,690	2,840	3,250	3,530	3,810	4,230		
	6.01~ 8.00		2,840	3,250	3,530	3,940	4,230	8,300	
	8.01~10.00		2,840	3,250	3,530	3,940	4,230	8,300	8,910
	10.01~15.00			3,640	3,920	4,200	4,480	8,620	9,290
	15.01~20.00				4,050	4,330	4,620	8,910	9,660
	20.01~25.00					4,530	4,740	9,190	9,910
	25.01~30.00						4,870	9,310	10,040
HWCR HWCE HWCG	2.00~ 2.99	5,850	6,150	6,690					
	3.00~ 4.00	5,020	5,310	5,850	6,260				
	4.01~ 6.00	5,020	5,310	5,850	6,260	6,670	7,090		
	6.01~ 8.00		5,170	5,720	6,130	6,410	6,820		
	8.01~10.00		5,170	5,720	6,130	6,410	6,820		
	10.01~15.00			6,240	6,520	7,060	7,340		
	15.01~20.00				6,650	7,190	7,480		
	20.01~25.00					7,320	7,730		
	25.01~30.00						7,870		

■Tapped SKH51 — 3 Days

Catalog No.	P \ W	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
HSMCD	5.01~ 6.00	2,070	2,640	3,030	3,540	4,100
	6.01~10.00	2,420	3,140	3,690	4,610	5,400
	10.01~15.00		3,910	4,530	5,370	6,250
	15.01~20.00			5,030	6,310	7,480
	20.01~25.00				6,820	7,660
	25.01~30.00					7,910
HSMCR HSMCE HSMCG	5.01~ 6.00	4,680	5,400	5,900	6,580	7,120
	6.01~10.00	4,890	5,750	6,420	7,220	8,130
	10.01~15.00		6,640	7,250	8,410	9,240
	15.01~20.00			7,790	9,310	10,450
	20.01~25.00				9,740	10,760
	25.01~30.00					11,020

■Tapped type SKD11 or equivalent — 3 Days — Express A 800/1Pc.

Catalog No.	P \ W	4.01~5.00	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00	30.01~40.00	40.01~50.00
HMCD	4.01~ 6.00	1,230	1,230	1,480	1,610	1,610	2,010		
	6.01~ 8.00		1,230	1,480	1,610	1,870	2,010	5,120	
	8.01~10.00		1,230	1,480	1,610	1,870	2,010	5,120	5,240
	10.01~15.00			1,870	2,010	2,130	2,270	5,430	5,620
	15.01~20.00				2,190	2,330	2,460	5,750	5,990
	20.01~25.00					2,530	2,580	5,990	6,250
	25.01~30.00						2,720	6,130	6,370
HMCR HMCE HMCG	4.01~ 6.00	3,560	3,700	4,080	4,340	4,600	4,870		
	6.01~ 8.00		3,560	3,950	4,210	4,340	4,600		
	8.01~10.00		3,560	3,950	4,210	4,340	4,600		
	10.01~15.00			4,470	4,600	4,990	5,110		
	15.01~20.00				4,800	5,190	5,320		
	20.01~25.00					5,320	5,580		
	25.01~30.00						5,710		

■Single flanged type SKD11 or equivalent — 5 Days — Express B 800/1Pc.

Catalog No.	P \ W	3.00~5.00	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00	30.01~40.00	40.01~50.00
HFCD	2.00~ 2.99	2,760	2,840	3,170					
	3.00~ 4.00	1,930	2,000	2,340	2,550				
	4.01~ 6.00	1,930	2,000	2,340	2,550	2,750	3,090		
	6.01~10.00		2,000	2,340	2,550	2,880	3,090	8,110	
	8.01~10.00		2,000	2,340	2,550	2,880	3,090	8,110	8,720
	10.01~15.00			2,730	2,940	3,130	3,340	8,430	9,100
	15.01~20.00				3,060	3,270	3,480	8,740	9,480
	20.01~25.00					3,470	3,600	9,000	9,720
	25.01~30.00						3,730	9,120	9,850
HFCR HFCE HFCG	2.00~ 2.99	5,090	5,310	5,780					
	3.00~ 4.00	4,260	4,470	4,940	5,270				
	4.01~ 6.00	4,260	4,470	4,940	5,270	5,600	5,950		
	6.01~ 8.00		4,330	4,810	5,140	5,350	5,680		
	8.01~10.00		4,330	4,810	5,140	5,350	5,680		
	10.01~15.00			5,330	5,530	5,990	6,200		
	15.01~20.00				5,660	6,130	6,340		
	20.01~25.00					6,260	6,590		
	25.01~30.00						6,730		

■Straight type SKH51 — 3 Days

Catalog No.	P \ W	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
HSPCD	5.01~ 6.00	1,970	2,530	2,920	3,460	3,980
	6.01~10.00	2,320	3,030	3,570	4,500	5,290
	10.01~15.00		3,810	4,420	5,260	6,150
	15.01~20.00			4,870	6,150	7,310
	20.01~25.00				6,660	7,500
	25.01~30.00					7,750
HSPCR HSPCE HSPCG	5.01~ 6.00	4,570	5,280	5,790	6,480	7,010
	6.01~10.00	4,780	5,640	6,320	7,110	8,020
	10.01~15.00		6,540	7,140	8,260	9,170
	15.01~20.00			7,630	9,150	10,290
	20.01~25.00				9,580	10,610
	25.01~30.00					10,870

■With key groove type SKH51 — 3 Days

Catalog No.	P \ W	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
HSKCD	5.01~ 6.00	2,400	2,950	3,350	3,890	4,420
	6.01~10.00	2,750	3,470	4,000	4,940	5,730
	10.01~15.00		4,250	4,850	5,690	6,580
	15.01~20.00			5,310	6,580	7,770
	20.01~25.00				7,070	7,900
	25.01~30.00					8,210
HSKCR HSKCE HSKCG	5.01~ 6.00	5,020	5,720	6,230	6,910	7,440
	6.01~10.00	5,220	6,070	6,750	7,540	8,450
	10.01~15.00		6,970	7,590	8,720	9,620
	15.01~20.00			8,030	9,600	10,740
	20.01~25.00				10,030	11,010
	25.01~30.00					11,310

■Single flanged type SKH51 F0 — 5 Days — F90 — 8 Days

Catalog No.	P \ W	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
HSFCD	5.01~ 6.00	2,800	3,440	3,900	4,520	5,120
	6.01~10.00	3,150	3,940	4,560	5,570	6,430
	10.01~15.00		4,720	5,410	6,330	7,290
	15.01~20.00			5,860	7,210	8,450
	20.01~25.00				7,720	8,640
	25.01~30.00					8,890
HSFCR HSFCE HSFCG	5.01~ 6.00	5,410	6,190	6,780	7,540	8,150
	6.01~10.00	5,610	6,550	7,310	8,170	9,160
	10.01~15.00		7,450	8,130	9,320	10,310
	15.01~20.00			8,620	10,210	11,430
	20.01~25.00				10,640	11,750
	25.01~30.00					12,010

■Double flanged type SKH51 WF0 — 5 Days — WF90 — 8 Days

Catalog No.	P \ W	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
HSWCD	5.01~ 6.00	3,640	4,350	4,890	5,590	6,260
	6.01~10.00	3,990	4,850	5,550	6,630	7,570
	10.01~15.00		5,630	6,390	7,390	8,430
	15.01~20.00			6,850	8,270	9,590
	20.01~25.00				8,790	9,780
	25.01~30.00					10,030
HSWCR HSWCE HSWCG	5.01~ 6.00	6,240	7,110	7,770	8,610	9,290
	6.01~10.00	6,450	7,470	8,290	9,230	10,300
	10.01~15.00		8,360	9,120	10,380	11,450
	15.01~20.00			9,600	11,280	12,570
	20.01~25.00				11,700	12,890
	25.01~30.00					13,150

■Straight type Powdered high-speed steel — 3 Days — Express A 800/1Pc.

Catalog No.	P \ W	2.00~5.00	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
PHPCD	2.00~ 4.00	1,990	2,110	2,620	3,160		
	4.01~ 6.00	1,990	2,160	2,790	3,250	3,890	4,480
	6.01~10.00		2,600	3,430	4,070	5,170	6,120
	10.01~15.00			4,660	5,470	6,620	7,830
	15.01~20.00				6,740	8,770	10,630
	20.01~25.00					10,920	12,530
	25.01~30.00						12,910
PHPCR PHPCE PHPCG	2.00~ 4.00	4,420	4,740	5,400	6,080		
	4.01~ 6.00	4,460	4,800	5,600	6,170	6,950	7,550
	6.01~10.00		5,090	6,070	6,850	7,810	8,880
	10.01~15.00			7,440	8,260	9,680	10,920
	15.01~20.00				9,590	11,870	13,670
	20.01~25.00					13,960	15,760
	25.01~30.00						16,140

■With key groove type Powdered high-speed steel — 3 Days — Express A 800/1Pc.

Catalog No.	P \ W	2.00~5.00	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
PHKCD	2.00~ 4.00	2,430	2,550	3,060	3,600		
	4.01~ 6.00	2,430	2,600	3,230	3,690	4,330	4,920
	6.01~10.00		3,040	3,870	4,500	5,600	6,560
	10.01~15.00			5,100	5,910	7,060	8,270
	15.01~20.00				7,170	9,210	11,110
	20.01~25.00					11,300	12,910
	25.01~30.00						13,390
PHKCR PHKCE PHKCG	2.00~ 4.00	4,860	5,180	5,840	6,530		
	4.01~ 6.00	4,910	5,240	6,030	6,610	7,390	7,990
	6.01~10.00		5,530	6,510	7,300	8,250	9,320
	10.01~15.00			7,880	8,700	10,160	11,390
	15.01~20.00				9,970	12,340	14,150
	20.01~25.00					14,430	16,140
	25.01~30.00						16,620

■Double flanged type Powdered high-speed steel — 5 Days — Express B 800/1Pc.

Catalog No.	P \ W	3.00~5.00	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
PHWCD	2.00~ 2.99	4,320	4,340	5,260			
	3.00~ 4.00	3,510	3,780	4,450	5,140		
	4.01~ 6.00	3,510	3,830	4,620	5,220	6,020	6,760
	6.01~10.00		4,270	5,250	6,040	7,300	8,400
	10.01~15.00			6,490	7,450	8,750	10,110
	15.01~20.00				8,710	10,900	12,910
	20.01~25.00					13,040	14,810
	25.01~30.00						15,190
PHWCR PHWCE PHWCG	2.00~ 2.99	6,750	7,230	8,040			
	3.00~ 4.00	5,940	6,410	7,220	8,060		
	4.01~ 6.00	5,980	6,470	7,420	8,140	9,080	9,830
	6.01~10.00		6,760	7,890	8,830	9,940	11,160
	10.01~15.00			9,260	10,230	11,810	13,200
	15.01~20.00				11,560	13,990	15,950
	20.01~25.00					16,080	18,040
	25.01~30.00						18,420

■Tapped type Powdered high-speed steel — 3 Days — Express A 800/1Pc.

Catalog No.	P \ W	4.01~5.00	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
PHMCD	4.01~ 6.00	2,110	2,280	2,930	3,380	4,020	4,620
	6.01~10.00		2,720	3,550	4,200	5,290	6,240
	10.01~15.00			4,790	5,600	6,740	7,950
	15.01~20.00				6,930	8,960	10,820
	20.01~25.00					11,110	12,720
	25.01~30.00						13,100
PHMCR PHMCE PHMCG	4.01~ 6.00	4,590	4,920	5,720	6,290	7,080	7,680
	6.01~10.00		5,220	6,190	6,970	7,930	9,010
	10.01~15.00			7,560	8,380	9,870	11,010
	15.01~20.00				9,780	12,060	13,860
	20.01~25.00					14,150	15,950
	25.01~30.00						16,330

■Single flanged type Powdered high-speed steel — 5 Days — Express B 800/1Pc.

Catalog No.	P \ W	3.00~5.00	5.01~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
PHFCD	2.00~ 2.99	3,760	3,960	4,550			
	3.00~ 4.00	2,750	2,940	3,530	4,150		
	4.01~ 6.00	2,750	2,990	3,700	4,240	4,960	5,620
	6.01~10.00		3,440	4,340	5,050	6,230	7,260
	10.01~15.00			5,580	6,460	7,690	8,970
	15.01~20.00				7,720	9,830	11,770
	20.01~25.00					11,980	13,670
	25.01~30.00						14,050
PHFCR PHFCE PHFCG	2.00~ 2.99	5,990	6,390	7,120			
	3.00~ 4.00	5,180	5,580	6,310	7,070		
	4.01~ 6.00	5,220	5,630	6,510	7,150	8,020	8,690
	6.01~10.00		5,930	6,980	7,840	8,870	10,020
	10.01~15.00			8,350	9,240	10,740	12,060
	15.01~20.00				10,570	12,930	14,810
	20.01~25.00					15,020	16,900
	25.01~30.00						17,280

Express service system P.38

MISUMI Press 2007 http://misumi.jp/press/

For inquiry, ordering and other information, refer to P.1269

JECTOR STRAIGHT PUNCHES

Price P.379

The volume discount rate is also applicable to alteration cost. P.39

Detail of jector hole P.389

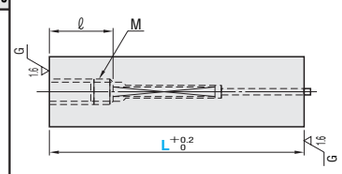
RoHS

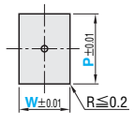
• Machining limit

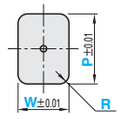
Shape D	Shape R	Shape E	Shape G
W≦P R=0：Applicable	W≦P 0.15≦R<W/2 W−2R≧1 0.01mm increments	W<P P≦10 P−W≧1 10<P≦20 P−W≧2 20<P≦30 P−W≧3	W<P P≦10 P−W≧1 10<P≦20 P−W≧2 20<P≦30 P−W≧3

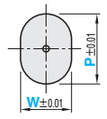
M H	Catalog No. Type	Shape
SKD11 or equivalent 60～63HRC	HJMC	D
SKH51 61～64HRC	HSJMC	R
Powdered high-speed steel 64～67HRC	PHJMC	E G

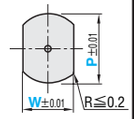
Tapped



Shape D: 

Shape R: 

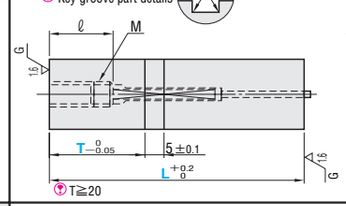
Shape E: 

Shape G: 

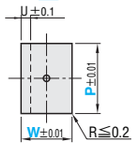
M H	Catalog No. Type	Shape
SKD11 or equivalent 60～63HRC	HJKC	D
SKH51 61～64HRC	HSJKC	R
Powdered high-speed steel 64～67HRC	PHJKC	E G

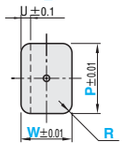
With key groove

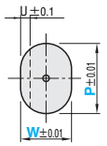
Key groove part details R≦0.3

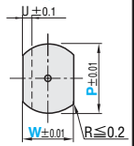


T≧20

Shape D: 

Shape R: 

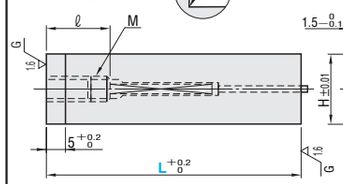
Shape E: 

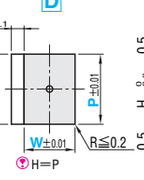
Shape G: 

M H	Catalog No. Type	Shape
SKD11 or equivalent 60～63HRC	HJFC	D
SKH51 61～64HRC	HSJFC	R
Powdered high-speed steel 64～67HRC	PHJFC	E G

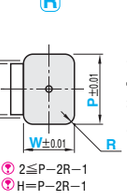
Single flanged

Flange part details R≦0.3

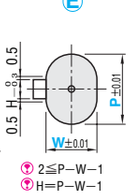


Shape D: 

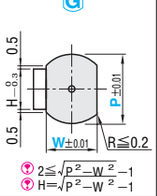
H=P

Shape R: 

2≦P−2R−1
H=P−2R−1

Shape E: 

2≦P−W−1
H=P−W−1

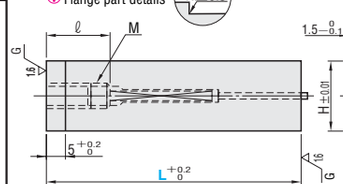
Shape G: 

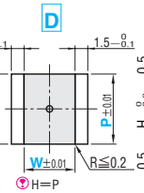
2≦$\sqrt{P^2-W^2}$−1
H=$\sqrt{P^2-W^2}$−1

M H	Catalog No. Type	Shape
SKD11 or equivalent 60～63HRC	HJWC	D
SKH51 61～64HRC	HSJWC	R
Powdered high-speed steel 64～67HRC	PHJWC	E G

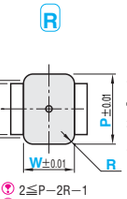
Double flanged

Flange part details R≦0.3

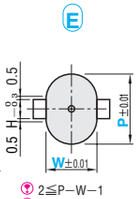


Shape D: 

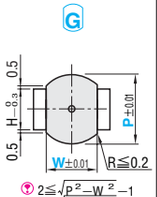
H=P

Shape R: 

2≦P−2R−1
H=P−2R−1

Shape E: 

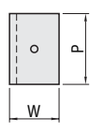
2≦P−W−1
H=P−W−1

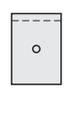
Shape G: 

2≦$\sqrt{P^2-W^2}$−1
H=$\sqrt{P^2-W^2}$−1

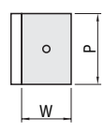
Catalog No. Type	Shape	L	W \ P	5.00～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00	0.1mm increments T	M	ℓ	U
Tapped HJMC / With key groove HJKC	D	40	5.00～6.00	○	○	○	○	○	T≧20	4	12	1.0
Tapped HSJMC / With key groove HSJKC	R	50	6.01～8.00	○	○	○	○	○		5		
Tapped PHJMC / With key groove PHJKC	E	60	8.01～10.00	○	○	○	○	○		6		1.5
Single flanged HJFC / Double flanged HJWC	G	70	10.01～15.00		○	○	○	○		8		
Single flanged HSJFC / Double flanged HSJWC		80	15.01～20.00			○	○	○				
Single flanged PHJFC / Double flanged PHJWC			20.01～25.00				○	○				

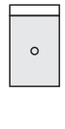
■Key position

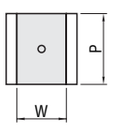
K0: 

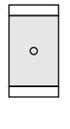
K90: 

■Flange position

F0: 

F90: 

WF0: 

WF90: 

Shape EG：Applicable for F0・WF0 only.

When F90 or WF90, dimension H is as follows.

Shape D：H=W

Shape R：2≦W−2R−1
H=W−2R−1

Order

Catalog No. − L − 0.01mm increments P − W − R(R only) − 0.1mm increments T≧20 − K・F・WF

HJKCD − 80 − P15.00 − W7.25 − T28.5 − K0

Delivery

●HJMC□ (SKD11 or equivalent) ●HJKC□ (SKD11 or equivalent)	3 Days	Express A 800/1Pc.	P.38
●HJFC□ (SKD11 or equivalent) ●HJWC□ (SKD11 or equivalent)	5 Days	Express B 800/1Pc.	P.38
●HSJ□C□ (SKH51) ●PHJ□C□ (Powdered high-speed steel)	8 Days	See the price list (P.379) for the delivery details.	

A flat charge of 2,160 yen for 3 pieces or more of the same size.

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price P.379

Alteration

Catalog No. − L(LC) − P − W − R − T − K − (PKC…etc.)

HJKCE − LC65.5 − P6.00 − W5.00 − T28.5−K0 − PKC

Alterations		Code	Spec.	¥/1Code
Blade		PKC	Changes blade tolerance P・W	P・W±0.01 ⇨ +0.01 0	400
		PKV	Changes blade tolerance P・W	P・W±0.01 ⇨ ±0.005	400
Full length		LC	Changes full length 30≦LC<L 0.1mm increments (Combination with LKC・LKZ→0.01mm increments)	200
		LKC	Changes full length tolerance	L +0.3 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance	L +0.2 0 ⇨ +0.01 0	600
Key groove		TKC	Changes tolerance on key groove position T.	T 0 −0.05 ⇨ 0 −0.02	200
		RTC	Changes tolerance on key groove position T.	T 0 −0.05 ⇨ +0.05 0	0
		UK	Changes key groove depth. Applicable to key groove type only. 0.5≦UK≦U+0.2 0.1mm increments W−UK≧10(K0) P−UK≧10(K90)：Applicable	200

Alterations		Code	Spec.	¥/1Code
Flange		HC	Changes flange width. 0≦HC<1.5 0.1mm increments	200
		TC	Changes flange thickness. 3.5≦TC<5 0.1mm increments (Combination with TKC→0.01mm increments) L is shortened by (5−TC). When LC, L=LC.	200
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.01	200
		FK	Adds relief chamfering to flange. For breakage prevention.	Single flanged 200 Double flanged 400
Contour		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	−100
		NC	Removes jector pin AC：Not applicable	−200
		CCN	Adds chamfering at 4 corners of shank. 5≦CCN<L 1mm increments Applicable to point shape D only. Tap type P・W−M<2:Not applicable For flanged type, chamfered length of the flanged sides：CCN−T(TC).	400

JECTOR STRAIGHT PUNCHES
—PRICE—

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Express A・B 800/1Pc.

A flat charge of 2,160 yen for 3 pieces or more of the same size.

■Tapped type SKD11 or equivalent — 3 Days — Express A 800/1Pc.

Catalog No.	W \ P	5.00~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
HJMCD	5.00~ 6.00	2,880	3,130	3,270	3,400	3,520
	6.01~ 8.00	3,010	3,270	3,400	3,670	3,920
	8.01~10.00	3,010	3,270	3,400	3,670	3,920
	10.01~15.00		3,520	3,670	3,920	4,180
	15.01~20.00			3,920	4,060	4,310
	20.01~25.00				4,310	4,460
HJMCR HJMCE HJMCG	5.00~ 6.00	5,500	5,890	6,290	6,550	6,800
	6.01~ 8.00	5,230	5,760	6,010	6,290	6,550
	8.01~10.00	5,230	5,760	6,010	6,290	6,550
	10.01~15.00		6,290	6,550	6,800	7,080
	15.01~20.00			6,680	7,080	7,200
	20.01~25.00				7,200	7,590

■With key groove type SKD11 or equivalent — 3 Days — Express A 800/1Pc.

Catalog No.	W \ P	5.00~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
HJKCD	5.00~ 6.00	3,310	3,560	3,700	3,840	3,960
	6.01~ 8.00	3,440	3,700	3,840	4,090	4,350
	8.01~10.00	3,440	3,700	3,840	4,090	4,350
	10.01~15.00		3,960	4,090	4,350	4,610
	15.01~20.00			4,350	4,480	4,750
	20.01~25.00				4,750	4,880
HJKCR HJKCE HJKCG	5.00~ 6.00	5,930	6,330	6,720	6,970	7,230
	6.01~ 8.00	5,670	6,180	6,450	6,720	6,970
	8.01~10.00	5,670	6,180	6,450	6,720	6,970
	10.01~15.00		6,720	6,970	7,230	7,500
	15.01~20.00			7,110	7,500	7,660
	20.01~25.00				7,630	8,020

■Tapped type SKH51 — 8 Days

Catalog No.	W \ P	5.00~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
HSJMCD	5.00~ 6.00	5,100	5,560	5,770	6,240	6,720
	6.01~ 8.00	5,620	6,140	6,610	7,090	7,530
	8.01~10.00	5,620	6,140	6,610	7,090	7,530
	10.01~15.00		6,880	7,620	8,170	8,740
	15.01~20.00			8,480	8,880	9,430
	20.01~25.00				9,410	10,140
HSJMCR HSJMCE HSJMCG	5.00~ 6.00	8,740	9,390	9,970	10,610	11,280
	6.01~ 8.00	8,710	9,330	9,850	10,580	11,180
	8.01~10.00	8,710	9,330	9,850	10,580	11,180
	10.01~15.00		10,720	11,620	12,170	12,760
	15.01~20.00			12,310	13,080	13,450
	20.01~25.00				13,420	14,490

■With key groove type SKH51 — 8 Days

Catalog No.	W \ P	5.00~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
HSJKCD	5.00~ 6.00	5,990	6,480	6,810	7,110	7,380
	6.01~ 8.00	6,230	6,780	7,290	7,730	8,190
	8.01~10.00	6,230	6,780	7,290	7,730	8,190
	10.01~15.00		7,530	8,260	8,790	9,310
	15.01~20.00			9,110	9,480	10,020
	20.01~25.00				10,040	10,710
HSJKCR HSJKCE HSJKCG	5.00~ 6.00	9,630	10,330	11,010	11,460	11,920
	6.01~ 8.00	9,490	10,240	10,920	11,380	11,830
	8.01~10.00	9,490	10,240	10,920	11,380	11,830
	10.01~15.00		11,360	12,260	12,790	13,330
	15.01~20.00			12,940	13,670	14,060
	20.01~25.00				14,040	15,060

■With tapping type Powdered high-speed steel — 8 Days

Catalog No.	W \ P	5.00~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
PHJMCD	5.00~ 6.00	5,440	5,730	6,300	7,190	7,880
	6.01~ 8.00	6,190	7,050	7,820	8,610	9,400
	8.01~10.00	6,360	7,410	8,290	9,220	10,090
	10.01~15.00		8,610	9,830	10,940	12,010
	15.01~20.00			11,300	12,240	13,320
	20.01~25.00				13,360	14,850
PHJMCR PHJMCE PHJMCG	5.00~ 6.00	9,090	10,020	10,840	11,750	12,680
	6.01~ 8.00	9,290	10,310	11,120	12,240	12,500
	8.01~10.00	9,590	10,680	11,570	12,780	13,840
	10.01~15.00		12,640	13,970	14,950	16,110
	15.01~20.00			15,150	16,370	17,320
	20.01~25.00				17,300	19,300

■With key groove type Powdered high-speed steel — 8 Days

Catalog No.	W \ P	5.00~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
PHJKCD	5.00~ 6.00	6,390	6,680	7,430	8,190	8,660
	6.01~ 8.00	6,850	7,790	8,610	9,390	10,200
	8.01~10.00	7,040	8,190	9,140	10,060	10,940
	10.01~15.00		9,420	10,680	11,770	12,790
	15.01~20.00			12,110	13,050	14,140
	20.01~25.00				14,250	15,670
PHJKCR PHJKCE PHJKCG	5.00~ 6.00	10,030	11,020	11,970	12,680	13,410
	6.01~ 8.00	10,130	11,310	12,340	13,160	13,220
	8.01~10.00	10,440	11,720	12,820	13,730	14,650
	10.01~15.00		13,410	14,750	15,720	16,820
	15.01~20.00			15,910	17,100	18,100
	20.01~25.00				18,100	20,060

■Single flanged type SKD11 or equivalent — 5 Days — Express B 800/1Pc.

Catalog No.	W \ P	5.00~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
HJFCD	5.00~ 6.00	3,710	4,050	4,260	4,460	4,660
	6.01~ 8.00	3,850	4,180	4,390	4,730	5,060
	8.01~10.00	3,850	4,180	4,390	4,730	5,060
	10.01~15.00		4,440	4,650	4,990	5,320
	15.01~20.00			4,910	5,120	5,450
	20.01~25.00				5,380	5,600
HJFCR HJFCE HJFCG	5.00~ 6.00	6,340	6,800	7,280	7,610	7,940
	6.01~ 8.00	6,070	6,670	7,000	7,350	7,690
	8.01~10.00	6,070	6,670	7,000	7,350	7,690
	10.01~15.00		7,200	7,530	7,870	8,220
	15.01~20.00			7,670	8,140	8,340
	20.01~25.00				8,260	8,730

■Double flanged type SKD11 or equivalent — 5 Days — Express B 800/1Pc.

Catalog No.	W \ P	5.00~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
HJWCD	5.00~ 6.00	4,980	5,390	5,670	5,970	6,240
	6.01~ 8.00	5,110	5,520	5,810	6,220	6,630
	8.01~10.00	5,110	5,520	5,810	6,220	6,630
	10.01~15.00		5,790	6,070	6,480	6,630
	15.01~20.00			6,330	6,610	7,030
	20.01~25.00				6,880	7,160
HJWCR HJWCE HJWCG	5.00~ 6.00	7,600	8,150	8,690	9,100	9,510
	6.01~ 8.00	7,340	8,010	8,430	8,840	9,250
	8.01~10.00	7,340	8,010	8,430	8,840	9,250
	10.01~15.00		8,540	8,950	9,360	9,780
	15.01~20.00			9,080	9,630	9,940
	20.01~25.00				9,760	10,300

■Single flanged type SKH51 — 8 Days

Catalog No.	W \ P	5.00~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
HSJFCD	5.00~ 6.00	5,630	6,160	6,530	6,810	7,090
	6.01~ 8.00	5,890	6,470	6,970	7,460	7,920
	8.01~10.00	5,890	6,470	6,970	7,460	7,920
	10.01~15.00		7,190	7,970	8,500	9,020
	15.01~20.00			8,770	9,160	9,730
	20.01~25.00				9,690	10,430
HSJFCR HSJFCE HSJFCG	5.00~ 6.00	9,280	9,970	10,720	11,080	11,640
	6.01~ 8.00	8,980	9,910	10,600	11,100	11,560
	8.01~10.00	8,980	9,910	10,600	11,100	11,560
	10.01~15.00		11,040	11,970	12,500	13,050
	15.01~20.00			12,590	13,360	13,740
	20.01~25.00				13,700	14,780

■Double flanged type SKH51 — 8 Days

Catalog No.	W \ P	5.00~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
HSJWCD	5.00~ 6.00	5,940	6,480	6,870	7,170	7,480
	6.01~ 8.00	6,170	6,780	7,320	7,690	8,290
	8.01~10.00	6,170	6,780	7,320	7,690	8,290
	10.01~15.00		7,520	8,310	8,850	9,410
	15.01~20.00			9,110	9,520	10,100
	20.01~25.00				10,030	10,810
HSJWCR HSJWCE HSJWCG	5.00~ 6.00	9,590	10,310	11,060	11,530	12,030
	6.01~ 8.00	9,260	10,240	10,950	11,460	11,930
	8.01~10.00	9,260	10,240	10,950	11,460	11,930
	10.01~15.00		11,360	12,310	12,850	13,430
	15.01~20.00			12,940	13,710	14,110
	20.01~25.00				14,040	15,160

■Single flanged type Powdered high-speed steel — 8 Days

Catalog No.	W \ P	5.00~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
PHJFCD	5.00~ 6.00	6,000	6,340	7,120	7,840	8,310
	6.01~ 8.00	6,480	7,430	8,240	9,050	9,870
	8.01~10.00	6,650	7,800	8,740	9,700	10,580
	10.01~15.00		9,010	10,300	11,380	12,410
	15.01~20.00			11,660	12,620	13,730
	20.01~25.00				13,760	15,270
PHJFCR PHJFCE PHJFCG	5.00~ 6.00	9,660	10,650	11,660	12,260	13,090
	6.01~ 8.00	9,570	10,940	11,970	12,820	12,920
	8.01~10.00	9,870	11,330	12,460	13,390	14,320
	10.01~15.00		13,020	14,400	15,360	16,480
	15.01~20.00			15,490	16,710	17,690
	20.01~25.00				17,660	19,690

■Double flanged type Powdered high-speed steel — 8 Days

Catalog No.	W \ P	5.00~10.00	10.01~15.00	15.01~20.00	20.01~25.00	25.01~30.00
PHJWCD	5.00~ 6.00	6,340	6,680	7,500	8,260	8,770
	6.01~ 8.00	6,800	7,790	8,660	9,320	10,340
	8.01~10.00	6,980	8,190	9,190	9,990	11,090
	10.01~15.00		9,410	10,740	11,870	12,940
	15.01~20.00			12,110	13,110	14,240
	20.01~25.00				14,230	15,830
PHJWCR PHJWCE PHJWCG	5.00~ 6.00	9,970	11,010	12,030	12,760	13,530
	6.01~ 8.00	9,890	11,310	12,380	13,230	13,350
	8.01~10.00	10,190	11,720	12,880	13,830	14,770
	10.01~15.00		13,410	14,810	15,800	16,960
	15.01~20.00			15,910	17,160	18,160
	20.01~25.00				18,100	20,210

STRAIGHT PUNCHES
—TiCN COATING TYPE—

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

DELIVERY SHORTENED

H—HS□C(SKH51) Delivery Time 8 Days → 5 Days

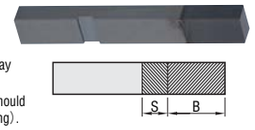
¥ The volume discount rate is also applicable to alteration cost. P.39

—TiCN coating—

S TiCN
H 3000HV

- B is valid treatment range but shank may have coated layer of 10mm.
- Dimensions P and W of non-coating part should be reduced in 6～10 μ (thickness of coating).
- The tip surface has been grinded before coating.

● Machining limit



Shape D: W≦P; R=0 : Applicable

Shape R: W≦P; 0.15≦R＜W/2; W−2R≧1; 0.01mm increments

Shape E: W＜P

P≦10	P−W≧1
10＜P≦20	P−W≧2
20＜P≦30	P−W≧3

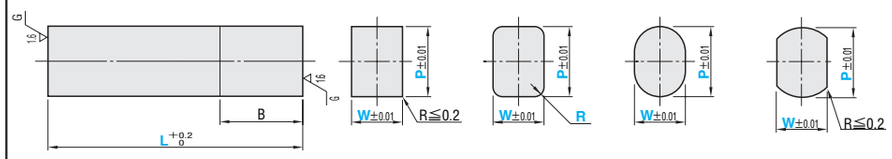
Shape G: W＜P

P≦10	P−W≧1
10＜P≦20	P−W≧2
20＜P≦30	P−W≧3

RoHS

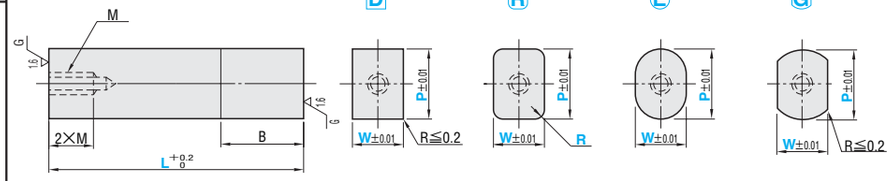
M H	Catalog No. Type	Shape
SKH51 61～64HRC	H—HSPC	D R E G
Powdered high-speed steel 64～67HRC	H—PHPC	D R E G

Straight



M H	Catalog No. Type	Shape
SKH51 61～64HRC	H—HSMC	D R E G
Powdered high-speed steel 64～67HRC	H—PHMC	D R E G

Tapped



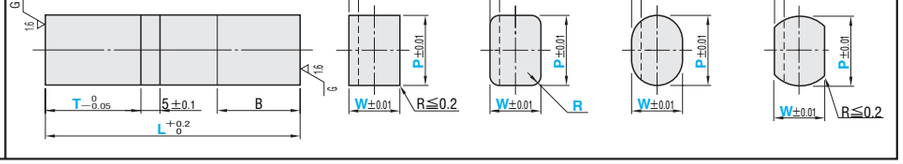
P·W≧4.01mm

M H	Catalog No. Type	Shape
SKH51 61～64HRC	H—HSKC	D R E G
Powdered high-speed steel 64～67HRC	H—PHKC	D R E G

With key groove

Key groove part details

T≧2



Catalog No. Type	Shape	L	W \ P	2.00～5.00	5.01～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00	0.1mm increments T	M	U	B
Straight H—HSPC H—PHPC	D R E G	40 50 60 70 (80) (90) (100)	2.00～ 3.00	○	○	○				T≧2.0	—	1.0	15
			3.01～ 4.00	○	○	○	○				3		
			4.01～ 5.00	○	○	○	○	○			4		
			5.01～ 6.00		○	○	○	○	○		5	1.5	
Tapped H—HSMC H—PHMC			6.01～ 8.00		○	○	○	○	○		6		
			8.01～10.00		○	○	○	○	○		8		
			10.01～15.00			○	○	○	○				
With key groove H—HSKC H—PHKC			15.01～20.00				○	○	○				
			20.01～25.00					○	○				
			25.01～30.00						○				

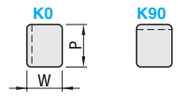
For Tapped type, P・W≧4.01 L(80)(90)(100) ···▸W4.01～30.00 When L(80), L(90), or L(100), W is within the range of 4.01～30.00.

Order

Catalog No.	—	L	—	P	—	W	—	R (R only)	—	T≧2	—	K
				0.01mm increments						0.1mm increments		
H—PHPCD	—	60	—	P14.28	—	W9.28						
H—HSMCD	—	80	—	P 5.80	—	W5.20						
H—PHKCR	—	60	—	P14.28	—	W9.28	—	R0.15	—	T25.5	—	K0

Delivery 5 Days

■Key position



Alteration

Catalog No. — L(LC) — P — W — R — T — K — (LKC・TKC・RTC…etc.)
H—PHPCD — LC65.5 — P5.80 — W5.20 — LKC

Alterations		Code	Spec.	¥/1Code
Full length	LC	LC	Changes full length 30≦LC＜L; 0.1mm increments (Combination with LKC→0.01mm increments)	200
	LT	LKC	Changes full length tolerance $L^{+0.2}_{0} \Rightarrow {}^{+0.05}_{0}$	400

Alterations		Code	Spec.	¥/1Code
Key groove	T	TKC	Changes tolerance on key groove position T. $T^{0}_{-0.05} \Rightarrow T^{0}_{-0.02}$	200
	T	RTC	Changes tolerance on key groove position T. $T^{0}_{-0.05} \Rightarrow {}^{+0.05}_{0}$	0
		WK	Adds key groove at symmetrical position; K0 K90; W−{2×U(UK)}≧2.0(K0) P−{2×U(UK)}≧2.0(K90); Additional key groove is on the symmetrical position of the specified key groove. Combination with UK is applicable. Applicable to key groove type only.	400
	UK	UK	Key groove depth alteration 0.5≦UK≦U+0.2 0.1mm increments P(W)−UK≧2.0 Combination with WK is applicable. Applicable to key groove type only.	200
Contour	4—C0.5 CCN	CCN	Adds chamfering at 4 corners of shank. 5≦CCN≦L 1mm increments; Applicable to point shape D only; ⊗Tap type P・W−M＜2:Not applicable	400

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Straight type SKH51

Catalog No. \ W \ P	2.00～5.00	5.01～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00
H—HSPCD 2.00～ 4.00	2,030	2,240	4,040	6,140		
4.01～ 6.00	2,180	3,080	4,040	6,140	6,570	7,600
6.01～10.00		3,550	4,270	6,290	7,380	8,430
10.01～15.00			5,610	7,480	8,380	8,710
15.01～20.00				7,780	8,730	9,680
20.01～25.00					9,680	10,540
25.01～30.00						10,730
H—HSPCR 2.00～ 4.00	4,360	4,570	6,790	8,120		
4.01～ 6.00	4,500	5,890	6,790	8,380	9,590	10,630
6.01～10.00		6,120	7,390	9,030	10,220	11,440
H—HSPCE 10.01～15.00			9,120	10,260	11,370	11,630
15.01～20.00				10,540	11,770	12,720
H—HSPCG 20.01～25.00					12,720	13,770
25.01～30.00						13,860

■Straight type Powdered high-speed steel

Catalog No. \ W \ P	2.00～5.00	5.01～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00
H—PHPCD 2.00～ 4.00	2,850	3,200	4,150	5,520		
4.01～ 6.00	3,010	3,290	4,300	5,860	7,040	8,140
6.01～10.00		4,060	5,200	6,810	8,310	9,780
10.01～15.00			7,280	8,620	9,770	11,760
15.01～20.00				10,230	12,430	14,700
20.01～25.00					15,100	17,120
25.01～30.00						17,620
H—PHPCR 2.00～ 4.00	5,280	5,830	6,930	8,440		
4.01～ 6.00	5,490	5,930	7,110	8,780	10,100	11,210
6.01～10.00		6,550	7,840	9,590	10,950	12,540
H—PHPCE 10.01～15.00			10,050	11,400	12,820	14,850
15.01～20.00				13,080	15,520	17,740
H—PHPCG 20.01～25.00					18,140	20,350
25.01～30.00						20,850

■Tapped type SKH51

Catalog No. \ W \ P	4.01～5.00	5.01～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00
H—HSMCD 4.01～ 6.00	2,230	3,180	4,140	5,610	6,660	7,720
6.01～10.00		3,650	4,890	6,400	7,480	8,430
10.01～15.00			6,500	7,650	8,480	8,710
15.01～20.00				8,640	9,590	9,780
20.01～25.00					9,780	10,730
25.01～30.00						10,920
H—HSMCR 4.01～ 6.00	5,220	5,790	6,900	8,480	9,700	10,730
6.01～10.00		6,210	7,500	9,140	10,340	11,440
H—HSMCE 10.01～15.00			9,220	10,360	11,520	11,820
15.01～20.00				11,390	12,720	12,820
H—HSMCG 20.01～25.00					12,820	13,860
25.01～30.00						14,050

■Tapped type Powdered high-speed steel

Catalog No. \ W \ P	4.01～5.00	5.01～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00
H—PHMCD 4.01～ 6.00	3,130	3,410	4,440	5,990	7,160	8,270
6.01～10.00		4,170	5,320	6,940	8,440	9,900
10.01～15.00			7,400	8,750	9,890	11,880
15.01～20.00				10,420	12,620	14,890
20.01～25.00					15,290	17,310
25.01～30.00						17,810
H—PHMCR 4.01～ 6.00	5,610	6,050	7,230	8,900	10,220	11,330
6.01～10.00		6,670	7,960	9,720	11,080	12,660
H—PHMCE 10.01～15.00			10,170	11,520	13,010	14,940
15.01～20.00				13,270	15,710	17,930
H—PHMCG 20.01～25.00					18,330	20,540
25.01～30.00						21,040

■With key groove type SKH51

Catalog No. \ W \ P	2.00～5.00	5.01～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00
H—HSKCD 2.00～ 4.00	2,460	2,670	3,360	4,310		
4.01～ 6.00	2,600	3,510	4,460	5,940	7,010	8,040
6.01～10.00		4,030	5,220	6,720	7,920	8,780
10.01～15.00			6,830	7,970	8,810	9,160
15.01～20.00				8,260	9,210	10,060
20.01～25.00					10,250	11,110
25.01～30.00						11,200
H—HSKCR 2.00～ 4.00	4,790	5,140	5,580	7,040		
4.01～ 6.00	4,930	6,130	7,220	8,820	10,020	11,060
6.01～10.00		6,590	7,820	9,470	10,660	11,910
H—HSKCE 10.01～15.00			9,560	10,710	11,840	12,100
15.01～20.00				11,110	12,150	13,200
H—HSKCG 20.01～25.00					13,200	14,340
25.01～30.00						14,340

■With key groove type Powdered high-speed steel

Catalog No. \ W \ P	2.00～5.00	5.01～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00
H—PHKCD 2.00～ 4.00	3,300	3,640	4,590	5,960		
4.01～ 6.00	3,460	3,730	4,740	6,300	7,480	8,580
6.01～10.00		4,490	5,630	7,250	8,750	10,220
10.01～15.00			7,710	9,050	10,200	12,210
15.01～20.00				10,670	12,870	15,170
20.01～25.00					15,480	17,500
25.01～30.00						18,100
H—PHKCR 2.00～ 4.00	5,730	6,270	7,370	8,880		
4.01～ 6.00	5,940	6,370	7,540	9,220	10,540	11,650
6.01～10.00		6,980	8,270	10,040	11,390	12,980
H—PHKCE 10.01～15.00			10,500	11,850	13,300	15,320
15.01～20.00				13,460	16,000	18,210
H—PHKCG 20.01～25.00					18,620	20,730
25.01～30.00						21,330

Express service system P.38 MISUMI Press 2007 http://misumi.jp/press/ For inquiry, ordering and other information, refer to P.1269

JECTOR STRAIGHT PUNCHES
—TiCN COATING TYPE—

PRODUCTS DATA P.1220

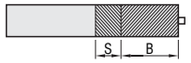
COATING PUNCHES — TiCN —

The volume discount rate is also applicable to alteration cost. P.39

—TiCN coating type—

RoHS

S TiCN
H 3000HV



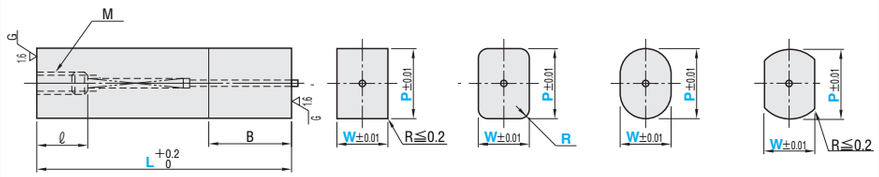
- B is valid treatment range but shank may have coated layer of 10mm.
- Dimensions P and W of non-coating part should be reduced in 6〜10 μ (thickness of coating).
  TiCN coating : Products information
- Detail of jector hole P.389

● Machining limit

Shape D	Shape R	Shape E	Shape G
W≦P	W≦P	W<P	W<P
R=0 : Applicable	0.15≦R<W/2	P≦10 P—W≧1	P≦10 P—W≧1
	W—2R≧1	10<P≦20 P—W≧2	10<P≦20 P—W≧2
	0.01mm increments	20<P≦30 P—W≧3	20<P≦30 P—W≧3

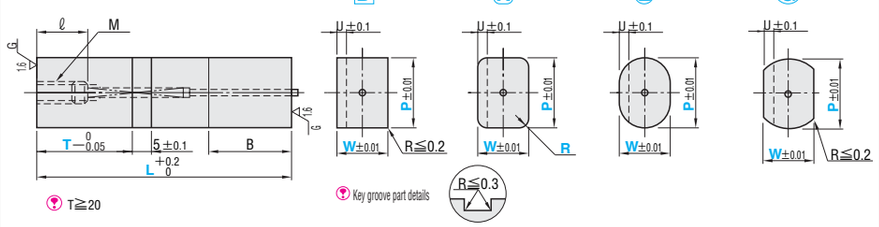
M / H	Catalog No. Type	Shape
SKH51 61〜64HRC	H—HSJMC	D R E G
Powdered high-speed steel 64〜67HRC	H—PHJMC	D R E G

Tapped



M / H	Catalog No. Type	Shape
SKH51 61〜64HRC	H—HSJKC	D R E G
Powdered high-speed steel 64〜67HRC	H—PHJKC	D R E G

With key groove



Catalog No. Type	Shape	L	W \ P	5.00〜10.00	10.01〜15.00	15.01〜20.00	20.01〜25.00	25.01〜30.00	0.1mm increments T	M	ℓ	U	B
Tapped H—HSJMC H—PHJMC	D	40	5.00〜 6.00	○	○	○	○	○	T≧20.0	4	12	1.0	15
	R	50	6.01〜 8.00	○	○	○	○	○		5			
With key groove H—HSJKC H—PHJKC	E	60	8.01〜10.00	○	○	○	○	○		6		1.5	
	G	70	10.01〜15.00		○	○	○	○		8			
		80	15.01〜20.00			○	○	○					
			20.01〜25.00				○	○					

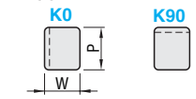
Order

Catalog No. — L — 0.01mm increments: P — W — R (R only) — 0.1mm increments: T≧20mm — K

H—HSJKCD — 80 — P15.00 — W7.25 — T28.5 — K0

Delivery 8 Days

■Key position



Alteration

Catalog No. — L(LC) — P — W — R — T — K — (LKC·TKC·RTC···etc.)
H—HSJKCE — LC65.5 — P5.80 — W5.00 — T28.5 — K0 — LKC

Alterations		Code	Spec.	¥/1Code
Full length	LC	LC	Changes full length 30≦LC<L (0.1mm increments (Combination with LKC→0.01mm increments)) B is shortened by (L—LC)	200
	L T	LKC	Changes full length tolerance +0.2 0 ⇨ +0.05 0	400
Key groove	T T	TKC	Changes tolerance on key groove position T. 0 −0.05 ⇨ 0 −0.02	200
		RTC	Changes tolerance on key groove position T. 0 −0.05 ⇨ +0.05 0	0
	UK U	UK	Changes key groove depth. 0.5≦UK≦U+0.2 0.1mm increments P≧10 (K0) W≧10 (K90) : Applicable Applicable to key groove type only.	200

Alterations		Code	Spec.	¥/1Code
Contour	4—C0.5 CCN	CCN	Adds chamfering at 4 corners of shank. 5≦CCN≦L 1mm increments Applicable to point shape D only. P·W—M<2:Not applicable	400
	AIR	AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	—100
	M	NC	Removes jector pin AC : Not applicable.	—200

Price

■Volume discount rate P.37

Quantity	1〜9	10〜29	30〜49	50〜100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Tapped type SKH51

Catalog No. W \ P	5.00〜10.00	10.01〜15.00	15.01〜20.00	20.01〜25.00	25.01〜30.00
H—HSJMCD 5.00〜 6.00	6,330	7,190	8,600	9,660	10,690
6.01〜 8.00	7,200	8,060	9,590	10,510	11,500
8.01〜10.00	7,200	8,060	9,590	10,510	11,500
10.01〜15.00		9,710	11,040	11,590	13,010
15.01〜20.00			12,260	12,850	13,830
20.01〜25.00				13,960	15,100
H—HSJMCR H—HSJMCE H—HSJMCG 5.00〜 6.00	9,970	11,020	12,800	14,000	15,150
6.01〜 8.00	10,290	11,250	12,830	14,030	15,250
8.01〜10.00	10,290	11,250	12,830	14,030	15,250
10.01〜15.00		13,550	15,040	15,590	17,020
15.01〜20.00			16,090	17,050	17,850
20.01〜25.00				17,960	19,460

■With key groove type SKH51

Catalog No. W \ P	5.00〜10.00	10.01〜15.00	15.01〜20.00	20.01〜25.00	25.01〜30.00
H—HSJKCD 5.00〜 6.00	7,220	8,110	9,640	10,530	11,350
6.01〜 8.00	7,810	8,700	10,270	11,150	12,160
8.01〜10.00	7,810	8,700	10,270	11,150	12,160
10.01〜15.00		10,360	11,680	12,210	13,580
15.01〜20.00			12,890	13,450	14,420
20.01〜25.00				14,580	15,670
H—HSJKCR H—HSJKCE H—HSJKCG 5.00〜 6.00	10,860	11,960	13,840	14,800	15,800
6.01〜 8.00	11,070	12,160	13,900	14,880	15,890
8.01〜10.00	11,070	12,160	13,900	14,880	15,890
10.01〜15.00		14,190	15,680	16,210	17,590
15.01〜20.00			16,720	17,640	18,460
20.01〜25.00				18,580	20,030

■Tapped type Powdered high-speed steel

Catalog No. W \ P	5.00〜10.00	10.01〜15.00	15.01〜20.00	20.01〜25.00	25.01〜30.00
H—PHJMCD 5.00〜 6.00	6,690	7,390	9,180	10,670	11,920
6.01〜 8.00	7,800	9,000	10,850	12,080	13,430
8.01〜10.00	7,970	9,360	11,320	12,700	14,130
10.01〜15.00		11,490	13,310	14,420	16,340
15.01〜20.00			15,140	16,270	17,780
20.01〜25.00				17,970	19,890
H—PHJMCR H—PHJMCE H—PHJMCG 5.00〜 6.00	9,980	11,050	12,840	14,060	15,220
6.01〜 8.00	10,320	11,280	12,880	14,090	15,310
8.01〜10.00	10,320	11,280	12,880	14,090	15,310
10.01〜15.00		13,590	15,100	15,650	17,090
15.01〜20.00			16,160	17,120	17,920
20.01〜25.00				18,040	19,530

■With key groove type Powdered high-speed steel

Catalog No. W \ P	5.00〜10.00	10.01〜15.00	15.01〜20.00	20.01〜25.00	25.01〜30.00
H—PHJKCD 5.00〜 6.00	7,640	8,340	10,310	11,670	12,700
6.01〜 8.00	8,450	9,740	11,640	12,860	14,240
8.01〜10.00	8,640	10,140	12,170	13,540	14,980
10.01〜15.00		12,300	14,150	15,250	17,120
15.01〜20.00			15,960	17,090	18,600
20.01〜25.00				18,870	20,720
H—PHJKCR H—PHJKCE H—PHJKCG 5.00〜 6.00	11,280	12,680	14,850	16,160	17,260
6.01〜 8.00	11,730	13,260	15,370	16,630	17,450
8.01〜10.00	12,050	13,670	15,860	17,200	18,690
10.01〜15.00		16,290	18,230	19,200	21,160
15.01〜20.00			19,760	21,140	22,560
20.01〜25.00				22,710	25,110

Express service system P.38 | MISUMI Press 2007 | http://misumi.jp/press/ | For inquiry, ordering and other information, refer to P.1269

SHORT STRAIGHT PUNCHES

M / H	Catalog No. Tapped	Single flanged	Double flanged
SKD11 or equivalent 60～63HRC	HMCDS	HFCDS	HWCDS
Powdered high-speed steel 64～67HRC	PHMCDS	PHFCDS	PHWCDS

RoHS

● Machining limit

Shape D

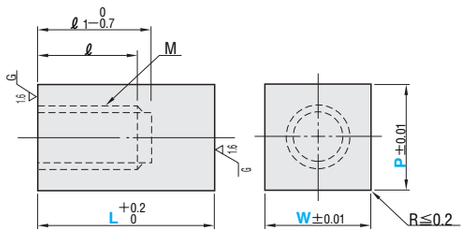
Ⓥ W≦P

Ⓥ R=0：Applicable

Tapped

HMCDS

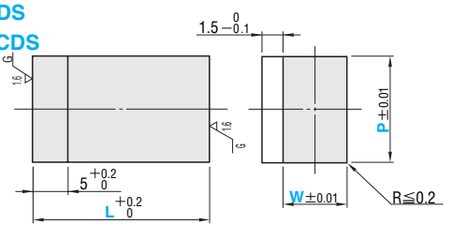
PHMCDS



Single flanged

HFCDS

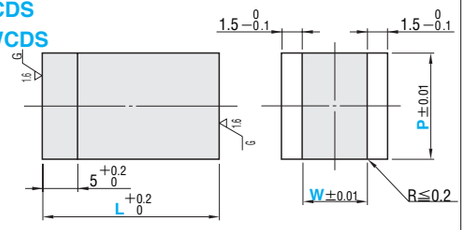
PHFCDS



Double flanged

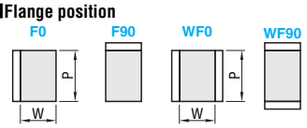
HWCDS

PHWCDS



Ⓥ Flange part details

■Flange position



Catalog No.		L	W \ P	5.01～8.00	6.01～8.00	8.01～10.00	10.01～13.00	13.01～16.00	16.01～20.00	M	ℓ	ℓ1
Tapped	HMCDS PHMCDS	(13)	5.01～6.00	○	○	○	○	○	○	4	6	8.5
			6.01～8.00		○	○	○	○	○	5	7.5	10.0
Single flanged	HFCDS PHFCDS	(16)	8.01～10.00			○	○	○	○	6	9	12.5
		20	10.01～13.00				○	○	○	8	12	15.5
Double flanged	HWCDS PHWCDS	25	13.01～16.00					○	○			
			16.01～20.00						○			

Ⓥ Tapped（HMCDS・PHMCDS）

- L(13)⋯▸ Only W5.01～W8.00 are available for L13.
- L(16)⋯▸ Only W5.01～W10.00 are available for L16.

Order: Catalog No. — L — 0.01mm increments P — W — F・WF

HMCDS — 16 — P9.51 — W6.22

Delivery: 3 Days

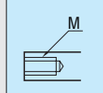
■Features

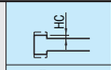
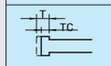
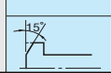
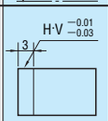
1. This is the short type of straight punch that can be mounted on the stripper plate.
2. Tapping type has shorter tap depth and pilot hole depth than existing products.

The volume discount rate is also applicable to alteration cost. P.39

Alteration: Catalog No. — L(LC) — P — W — F・WF — (HC・TC・TKC⋯etc.)

HFCDS — LC21.5 — P10.50 — W 8.50 — F0 — TC2.5

Alterations		Code	Spec.	¥/1Code
Blade		PKC	Changes blade tolerance P・W　P・W±0.01 ⇨ +0.01 0	400
		PKV	Changes blade tolerance P・W　P・W±0.01 ⇨±0.005	400
Full length		LC	Changes full length 0.1mm increments　Lmin.＜LC＜25 (Combination with LKC・LKZ→0.01mm increments) Ⓥ HMCDS・PHMCDS　20＜LC＜25	200
		LKC	Changes full length tolerance　L +0.2 0 ⇨ +0.05 0	400
		LKZ	Changes full length tolerance　L +0.2 0 ⇨ +0.01 0	600
Tap		MC	Changes tap size. (W \ P: 5.01～20.00) 5.01～6.00: M4→M3; 6.01～8.00: M5→M4; 8.01～10.00: M6→M5; 10.01～13.00: M8→M6	0

Alterations		Code	Spec.	¥/1Code
Flange		HC	Changes flange width. 0≦HC＜1.5　0.1mm increments	200
		TC	Changes flange thickness.　2≦TC＜5 0.1mm increments (Combination with TKC→0.01mm increments) Ⓥ L is shortened by (5－TC). When LC, L=LC.	200
		TKC	Changes flange thickness tolerance.　T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance.　T +0.2 0 ⇨ 0 -0.02	200
		FK	Adds relief chamfering to flange. For breakage prevention.	Single flanged 200 Double flanged 400
Contour		DC	Adds press-in lead Adds 3mm (V・H -0.01 -0.03) press-in lead ⊗Single, double flanged type are not applicable.	200

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

Ⓥ To be quoted on price & lead time above Max. Q'ty.

■SKD11 or equivalent

Catalog No.	W \ P	5.01～10.00	10.01～16.00	16.01～20.00
HMCDS (Tapped)	5.01～6.00	1,370	1,560	1,840
	6.01～10.00	1,470	1,650	1,930
	10.01～16.00		1,930	2,380
	16.01～20.00			2,660
HFCDS (Single flanged)	5.01～6.00	1,110	1,230	1,420
	6.01～10.00	1,170	1,300	1,480
	10.01～16.00		1,480	1,790
	16.01～20.00			1,920
HWCDS (Double flanged)	5.01～6.00	1,300	1,420	1,600
	6.01～10.00	1,350	1,480	1,670
	10.01～16.00		1,670	1,970
	16.01～20.00			2,100

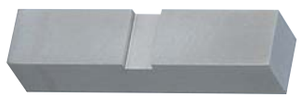
■Powdered high-speed steel

Catalog No.	W \ P	5.01～10.00	10.01～16.00	16.01～20.00
PHMCDS (Tapped)	5.01～6.00	2,630	3,330	4,010
	6.01～10.00	3,330	4,260	5,220
	10.01～16.00		5,980	7,350
	16.01～20.00			8,810
PHFCDS (Single flanged)	5.01～6.00	3,660	4,570	5,300
	6.01～10.00	4,310	5,350	6,540
	10.01～16.00		6,800	7,980
	16.01～20.00			9,610
PHWCDS (Double flanged)	5.01～6.00	4,060	4,960	5,680
	6.01～10.00	4,720	5,750	6,920
	10.01～16.00		7,190	8,380
	16.01～20.00			9,980

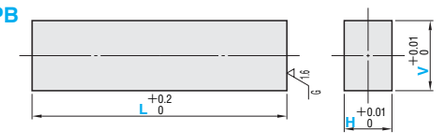
BLOCK PUNCH BLANKS

M / H		Standard	Tapped	With key groove	Single flanged	Double flanged	Flange fixing
H3～5	SKH51 61～64HRC	HPB	HMB	HKB	HFB	HWB	HTB
H6～30	SKD11 or equivalent 60～63HRC						
H3～30	Powdered high-speed steel 64～67HRC	PHPB	PHMB	PHKB	PHFB	PHWB	PHTB

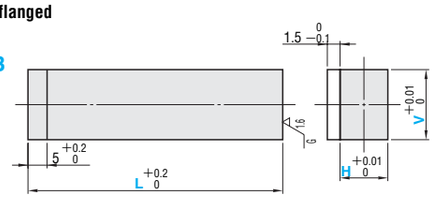
RoHS



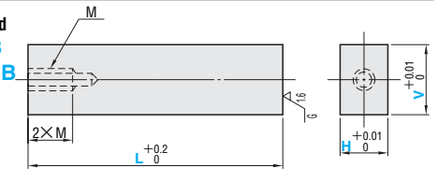
Standard
HPB
PHPB



Single flanged
HFB
PHFB

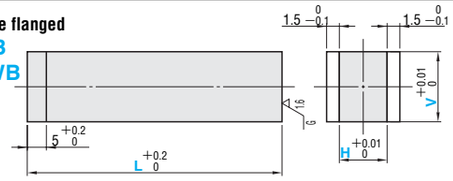


Tapped
HMB
PHMB

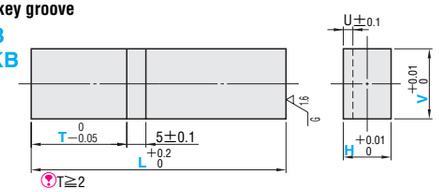


The length of the hole before threading=2×M+5±2.0

Double flanged
HWB
PHWB

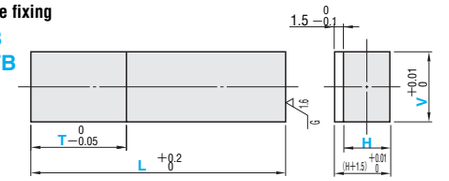


With key groove
HKB
PHKB



T≧2

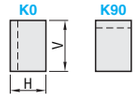
Flange fixing
HTB
PHTB



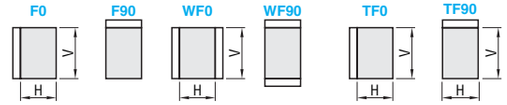
Key groove part details

Flange part and Collar part details

Key position



Flange position



Stopper flange position

Catalog No. H \ V	3	4	5	6	8	10	13	16	20	22	25	28	30	(40)	(50)	L	T With key groove	T Round	M	U
Standard HPB PHPB	(3)	○	○	○	○	○	○	○	○	○	○								–	
	(4)		○	○	○	○	○	○	○	○	○									
Tapped (H5～30) HMB PHMB	5			○	○	○	○	○	○	○	○	○	○						3	1.0
	6				○	○	○	○	○	○	○	○	○						4	
With key groove HKB PHKB	8					○	○	○	○	○	○	○	○	○					5	
	10						○	○	○	○	○	○	○	○	○				6	
Single flanged HFB PHFB	13							○	○	○	○	○	○	○	○					
	16								○	○	○	○	○	○	○					
Double flanged HWB PHWB	20									○	○	○	○	○	○					
	22										○	○	○	○	○					
Flange fixing HTB PHTB	25											○	○	○	○					
	28												○	○	○					
	30												○	○	○					

13 16 20 25 P.391

40 50 60 70 80 90 100

T≧2.0 0.1mm increments

Round: 13 16 20 22 25

8 | 1.5

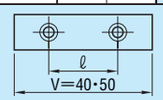
H(3)(4) ••• When H (3), (4), L is within the range from 40 to 70.(Only HPB applies L80)

V (40) and V (50) are applicable for **HPB**,**HMB**,**HKB**,**HFB** and **HWB**.

See the block punch blanks-short type-for L13～25.However, only tapped / flanged types are available. P.391

HMB:V=40・50 ••• Two taps.

V	40	50
ℓ	20	24



Order

Catalog No. | V | H | – | L | – | T | – | K・F・WF・TF

PHKB 16 13 – 50 – T20.5 – K90

Delivery

3 Days

Express A 800/1Pc. P.38

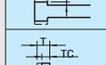
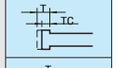
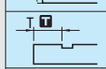
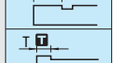
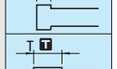
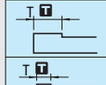
A flat charge of 2,160 yen for 3 pieces or more of the same size.

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No. | V | H | – | L(LC) | – | T | – | K・F・WF・TF | –(HC・TC・TKC…etc.)

PHKB 08 04 –LC58.5– T25.5 – K0 – TKC

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length 13≦LC＜L 0.1mm increments HMB・PHMB When H≦8 •••▸LC≧20 H=10 •••▸LC≧24 H≧13 •••▸LC≧28 Types with tapping are HMBS and PHMBS (P.391) and applicable for LC20.	200
Flange, Head and Key groove		HC	Changes flange width. 0≦HC＜1.5 0.1mm increments	200
		TC	Changes flange thickness. 2≦TC＜5 0.1mm increments (Combination with TKC→0.01mm increments) L is shortened by (5−TC). When LC, L=LC.	200
			Changes flange thickness. 2≦TC＜25 0.1mm increments (Combination with TKC→0.01mm increments) Applicable to the stopper flange type.	200
		TKC	Changes key groove tolerance. $T^{0}_{-0.05}$ ⇨ $^{0}_{-0.02}$	200
			Changes flange thickness tolerance. $T^{+0.2}_{0}$ ⇨ $^{+0.02}_{0}$	200
			Changes flange thickness tolerance. $T^{0}_{-0.05}$ ⇨ $^{0}_{-0.02}$	200
		TKM	Changes flange thickness tolerance. $T^{+0.2}_{0}$ ⇨ $^{0}_{-0.02}$	200
		RTC	Changes key groove tolerance. $T^{0}_{-0.05}$ ⇨ $^{+0.05}_{0}$	0

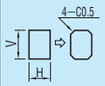
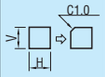
Price

Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	–	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No. H \ V	3・4・5	6・8・10	13・16	20・22・25	28・30	40	50
HPB 3・4	670	800	920	1,040			
HPB 5・6	730	850	980	1,170	1,350		
HPB 8・10		920	1,040	1,230	1,420	1,600	1,720
HPB 13・16			1,230	1,540	1,720	1,910	2,090
HPB 20・22				1,660	1,840	2,210	2,460
HPB 25・28				1,660	1,970	2,460	2,710
HPB 30					2,090	2,580	2,830
HMB 5・6	800	920	1,040	1,230	1,420		
HMB 8・10		980	1,100	1,290	1,470	1,720	1,840
HMB 13・16			1,290	1,600	1,840	2,030	2,210
HMB 20・22				1,790	1,970	2,340	2,580
HMB 25・28				1,790	2,090	2,580	2,830
HMB 30					2,210	2,710	2,950
HKB 3・4	1,100	1,230	1,350	1,470			
HKB 5・6	1,170	1,290	1,420	1,600	1,790		
HKB 8・10		1,350	1,470	1,660	1,840	2,030	2,160
HKB 13・16			1,660	1,970	2,160	2,340	2,530
HKB 20・22				2,090	2,280	2,650	2,900
HKB 25・28				2,090	2,400	2,900	3,140
HKB 30					2,530	3,020	3,270
HFB 3・4	920	1,040	1,170	1,290			
HFB 5・6	980	1,100	1,230	1,420	1,600		
HFB 8・10		1,170	1,290	1,470	1,660	1,840	1,970
HFB 13・16			1,470	1,790	1,970	2,160	2,340
HFB 20・22				1,910	2,090	2,460	2,710
HFB 25・28				1,910	2,210	2,710	2,950
HFB 30					2,340	2,830	3,080
HWB 3・4	1,100	1,230	1,350	1,470			
HWB 5・6	1,170	1,290	1,420	1,600	1,790		
HWB 8・10		1,350	1,470	1,660	1,840	2,030	2,160
HWB 13・16			1,660	1,970	2,160	2,340	2,530
HWB 20・22				2,090	2,280	2,650	2,900
HWB 25・28				2,090	2,400	2,900	3,140
HWB 30					2,530	3,020	3,270
HTB 3・4	920	1,040	1,170	1,290			
HTB 5・6	980	1,100	1,230	1,420	1,600		
HTB 8・10		1,170	1,290	1,470	1,660		
HTB 13・16			1,470	1,790	1,970		
HTB 20・22				1,910	2,090		
HTB 25・28				1,910	2,210		
HTB 30					2,340		

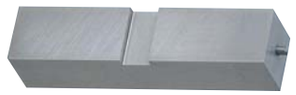
Alterations		Code	Spec.	¥/1Code
Tap		MC (MMC)	Changes tap size. SKD11 or equivalent H \ 6 8 10 13 16 20 22 25 28・30 6 M4 →M3 — — 8 — M5 →M4 — 10 — — M6→M4 M6→M5 M6 →M5 13 — — — M8→M5 M8→M6 M8 →M6 When changing M6→M4 M8→M5 Specify MMC. Tap diameter alteration Powdered high-speed steel H \ 6 8 10 13 16 20 22 6 M4 →M3 – 8 – M5 →M4 10 – – M6 →M5 13 – – – M8 →M6	0
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	Standard Tapped With key groove 200; Single flanged Double flanged Flange fixing 400
		CCP	Adds chamfering (C1.0) to a corner of shank. (Error prevention) Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 point corner point corner ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270 Applicable to standard tap type only.	200

Catalog No. H \ V	3・4・5	6・8・10	13・16	20・22	25・28	30
PHPB 3・4	1,390	1,710	2,090	2,480		
PHPB 5・6	1,530	1,830	2,340	2,850	3,360	3,880
PHPB 8・10		2,340	3,050	3,730	4,560	5,590
PHPB 13・16			4,310	5,330	6,350	7,370
PHPB 20・22				6,530	8,260	10,160
PHPB 25・28					10,160	12,060
PHPB 30						12,440
PHMB 5・6	1,650	1,960	2,480	2,980	3,490	4,000
PHMB 8・10		2,480	3,170	3,880	4,700	5,710
PHMB 13・16			4,440	5,450	6,480	7,550
PHMB 20・22				6,540	8,450	10,350
PHMB 25・28					10,350	12,250
PHMB 30						12,630
PHKB 3・4	1,900	2,210	2,600	2,980		
PHKB 5・6	2,030	2,340	2,850	3,360	3,880	4,380
PHKB 8・10		2,850	3,550	4,260	5,070	6,100
PHKB 13・16			4,830	5,830	6,850	7,880
PHKB 20・22				6,850	8,760	10,730
PHKB 25・28					10,730	12,630
PHKB 30						13,010
PHFB 3・4	2,940	3,590	4,300	4,880		
PHFB 5・6	2,990	3,650	4,560	5,280	6,140	6,780
PHFB 8・10		4,300	5,340	6,530	7,440	7,960
PHFB 13・16			6,780	7,960	9,270	9,970
PHFB 20・22				9,590	11,300	12,060
PHFB 25・28					13,010	15,000
PHFB 30						15,950
PHWB 3・4	3,320	3,970	4,700	5,280		
PHWB 5・6	3,390	4,050	4,960	5,670	6,530	7,170
PHWB 8・10		4,700	5,740	6,910	7,830	8,360
PHWB 13・16			7,170	8,360	9,680	10,350
PHWB 20・22				9,970	11,680	12,440
PHWB 25・28					13,390	15,480
PHWB 30						16,330
PHTB 3・4	2,940	3,590	4,300	4,880		
PHTB 5・6	2,990	3,650	4,560	5,280	6,140	6,780
PHTB 8・10		4,300	5,340	6,530	7,440	7,960
PHTB 13・16			6,780	7,960	9,270	9,970
PHTB 20・22				9,590	11,300	12,060
PHTB 25・28					13,010	15,000
PHTB 30						15,950

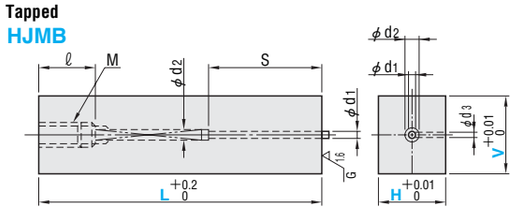
JECTOR BLOCK PUNCH BLANKS

M / H	Catalog No. Tapped	With key groove	Single flanged	Double flanged
SKD11 or equivalent 60〜63HRC	HJMB	HJKB	HJFB	HJWB

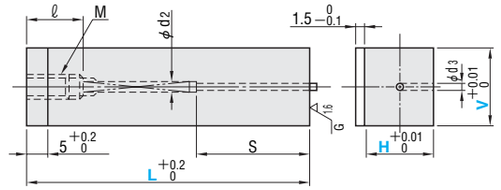
RoHS



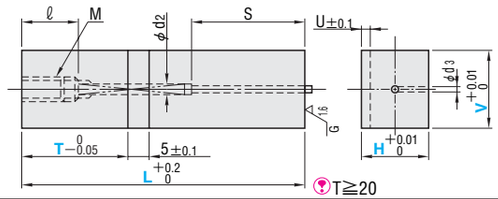
Tapped
HJMB



Single flanged
HJFB

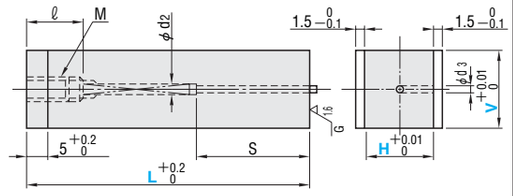


With key groove
HJKB



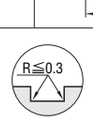
T≧20

Double flanged
HJWB

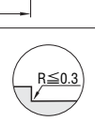


The hole of d3 may be punched on H side.

Key groove part details



Flange part details



Catalog No. / Type	V / H	6	8	10	13	16	20	22	25	28	30	L	0.1mm T	d1 × S L=40	d1 × S L=50	d1 × S L=60〜80	d2	d3	M	ℓ	U
Tapped HJMB	6	○	○	○	○	○	○	○	○	○	○	40	T≧20	0.7×15	0.7×20		2.6	1.0	4	12	1.0
	8		○	○	○	○	○	○	○	○	○	50		1.1×15	1.1×27		3.4	1.5	5		1.5
With key groove HJKB	10			○	○	○	○	○	○	○	○	60		1.5×15	1.5×28		4.4		6		
	13				○	○	○	○	○	○	○	70		1.8×15	1.8×28				8		
Single flanged HJFB	16					○	○	○	○	○	○	80		2.8×17	2.8×24	2.8×36					
	20						○	○	○	○	○										
Double flanged HJWB	22							○	○	○	○										
	25								○	○	○										

Order

Catalog No.	V	H	–	L	–	0.1 mm increments T≧20	–	K·F·WF
HJMB	08	06	–	70				
HJKB	25	20	–	80	–	T30.5	–	K0
HJFB	13	10	–	60			–	F90
HJWB	13	10	–	60			–	WF90

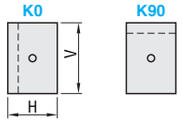
Delivery

3 Days

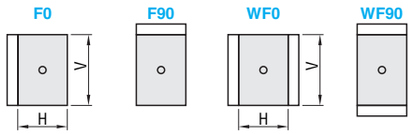
Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

■Key position



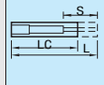
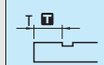
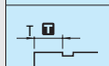
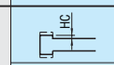
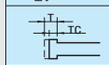
■Flange position

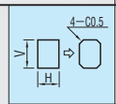
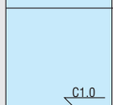


The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No.	V	H	–	L(LC)	–	T	–	K·F·WF	–	(HC·TC·TKC···etc.)
HJKB	28	20	–	LC65.5	–	T20.5	–	K0		

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length 30≦LC<L 0.1mm increments (?) S is shortened by (L−LC)	200
Key groove		TKC	Changes key groove tolerance. T 0 −0.05 ⇨ 0 −0.02	200
		RTC	Changes key groove tolerance. T 0 −0.05 ⇨ +0.05 0	0
Flange		HC	Changes flange width. 0≦HC<1.5 0.1mm increments	200
		TC	Changes flange thickness. 3.5≦TC<5 0.1mm increments (Combination with TKC→0.01mm increments) (?) L is shortened according to (5−TC). When LC is applied, L is equal to LC.	200
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.02	200

Alterations		Code	Spec.	¥/1Code
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	With tapping / With key groove 200; Single flange / Double flange 400
		CCP	Adds chamfering (C1.0) to a corner of shank. (Error prevention) Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 point corner point corner ■Specifiable position of chamfering. (?) Applicable only for tap type CCP0 CCP90 CCP180 CCP270	200
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	−100
		NC	Removes jector pin ⊗AC : Not applicable	−200

Price

■Volume discount rate P.37

Quantity	1〜9	10〜29	30〜49	50〜100
Rate	—	5%	10%	15%

(?) To be quoted on price & lead time above Max. Q'ty.

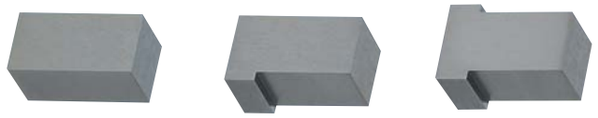
Catalog No. H \ V	6·8·10	13·16	20·22·25	28·30
HJMB (Tapped) 6	2,340	2,460	2,710	2,830
HJMB (Tapped) 8・10	2,460	2,580	2,770	2,950
HJMB (Tapped) 13・16		2,710	2,950	3,080
HJMB (Tapped) 20・22			3,080	3,200
HJMB (Tapped) 25			3,080	3,320
HJKB (With key groove type) 6	2,770	2,900	3,140	3,270
HJKB (With key groove type) 8・10	2,900	3,020	3,200	3,390
HJKB (With key groove type) 13・16		3,140	3,390	3,510
HJKB (With key groove type) 20・22			3,450	3,640
HJKB (With key groove type) 25			3,450	3,760

Catalog No. H \ V	6·8·10	13·16	20·22·25	28·30
HJFB (Single flanged) 6	2,580	2,710	2,950	3,080
HJFB (Single flanged) 8・10	2,710	2,830	3,020	3,200
HJFB (Single flanged) 13・16		2,950	3,200	3,320
HJFB (Single flanged) 20・22			3,320	3,450
HJFB (Single flanged) 25			3,320	3,570
HJWB (Double flanged) 6	2,770	2,900	3,130	3,270
HJWB (Double flanged) 8・10	2,890	3,010	3,210	3,380
HJWB (Double flanged) 13・16		3,140	3,380	3,510
HJWB (Double flanged) 20・22			3,510	3,640
HJWB (Double flanged) 25			3,510	3,760

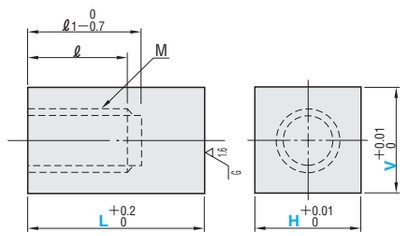
BLOCK PUNCH BLANKS
—SHORT TYPE—

M / H	Catalog No. Tapped	Single flanged	Double flanged
SKD11 or equivalent 60～63HRC	HMBS	HFBS	HWBS
Powdered high-speed steel 64～67HRC	PHMBS	PHFBS	PHWBS

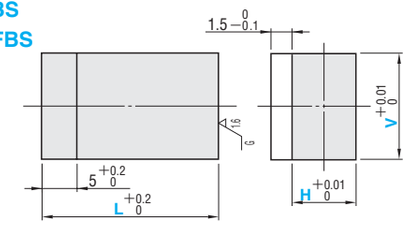
RoHS



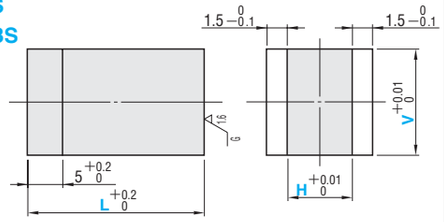
Tapped
HMBS
PHMBS



Single flanged
HFBS
PHFBS



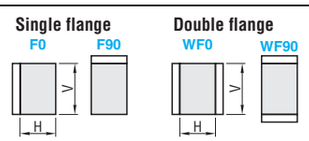
Double flanged
HWBS
PHWBS



Flange part details

■Flange position

Single flange F0 F90 / Double flange WF0 WF90



Catalog No.		V / H	6	8	10	13	16	20	L	M	ℓ	ℓ1
Tapped	HMBS PHMBS	6	○	○	○	○	○	○	(13) (16) 20 25	4	6	8.5
		8		○	○	○	○	○		5	7.5	10.0
Single flanged	HFBS PHFBS	10			○	○	○	○		6	9	12.5
		13				○	○	○		8	12	15.5
Double flanged	HWBS PHWBS	16					○	○				
		20						○				

Tapped type (HMBS・PHMBS)
- L (13) ···▸ Only H6 and H8 are available for L13.
- L (16) ···▸ Only H6～H10 are available for L16.

Order

Catalog No.	V	H	—	L	—	F・WF
HFBS	08	06	—	20	—	F90

Delivery 3 Days / Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

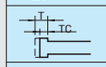
■Features

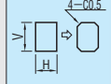
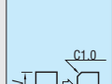
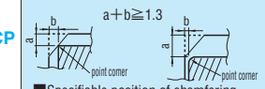
1. This is the short type of block punch blank that can be mounted on the stripper plate.
2. Tapping type has shorter tap depth and pilot hole depth than existing products.

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No.	V	H	—	L(LC)	—	F・WF	—(HC・TC・TKC…etc.)
PHFBS	20	10	—	LC15.5	—	F0	— TC2.5

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length 0.1mm increments Lmin.＜LC＜25 (HMBS・PHMBS 20＜LC＜25)	200
Tap		MC	Changes tap size. (H/V: 6: 6 M4→M3; 8: — M5→M4; 10: — — M6→M5; 13: — — — M8→M6) For M3, dimension ℓ1 is 7 −0.7.	0
Flange		HC	Changes flange width. 0≦HC＜1.5 0.1mm increments	200
		TC	Changes flange thickness. 2≦TC＜5 0.1mm increments (Combination with TKC→0.01mm increments) L is shortened by (5−TC). When LC, L=LC.	200
		TKC	Changes flange thickness tolerance. T +0.2 0 ⇨ +0.02 0	200
		TKM	Changes flange thickness tolerance. T +0.2 0 ⇨ 0 −0.02	200

Alterations		Code	Spec.	¥/1Code
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	Tapped 200 / Single flanged Double flanged 400
		CCP	Adds chamfering (C1.0) to a corner of shank. (Error prevention) Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3  ■Specifiable position of chamfering. CCP0 CCP90 (Applicable only for tap type)	200

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

(To be quoted on price & lead time above Max. Q'ty.)

■SKD11 or equivalent

Catalog No.	H \ V	6・8・10	13・16	20
HMBS (Tapped)	6	1,150	1,310	1,540
	8・10	1,230	1,380	1,620
	13・16		1,620	2,000
	20			2,230
HFBS (Single flanged)	6	930	1,030	1,190
	8・10	980	1,090	1,240
	13・16		1,240	1,500
	20			1,610
HWBS (Double flanged)	6	1,090	1,190	1,340
	8・10	1,130	1,240	1,400
	13・16		1,400	1,650
	20			1,760

■Powdered high-speed steel

Catalog No.	H \ V	6・8・10	13・16	20
PHMBS (Tapped)	6	2,210	2,800	3,370
	8・10	2,800	3,580	4,380
	13・16		5,020	6,170
	20			7,400
PHFBS (Single flanged)	6	3,070	3,840	4,450
	8・10	3,620	4,490	5,490
	13・16		5,710	6,700
	20			8,070
PHWBS (Double flanged)	6	3,410	4,170	4,770
	8・10	3,960	4,830	5,810
	13・16		6,040	7,040
	20			8,390

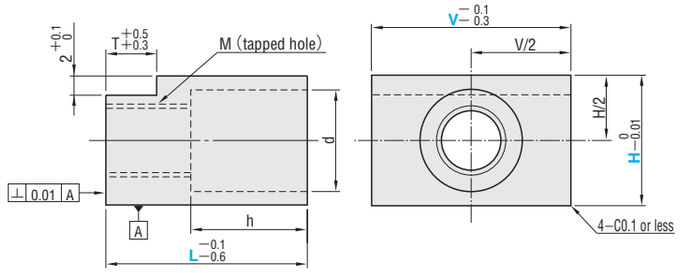
FLANGE HOLDERS

KEYS

The volume discount rate is also applicable to alteration cost. P.39

RoHS

HFW

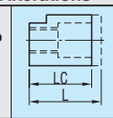
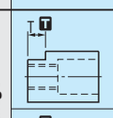
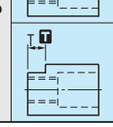


M SKS3
H 53～56HRC

Mounting bolt d	h	Size	Tapped hole M	T	Catalog No.	V	H	L	U/Price Q'ty : 1～19
8	6	M4	M5	3	HFW	13	10	13	450
	9.5			5				16	
								20	
								25	
9.5	7	M5	M6	3		16	13	13	480
	10.5			5				16	
						20		20	
								25	

Alteration

Catalog No. V H − L(LC) −(TKC)
HFW 13 13 − LC22 − TKC2

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length Applicable for L20 and L25 20＜LC＜25 1mm increments h is (L−LC) shorter.	200
Flange		TKC1	Changes T to negative tolerance. T +0.5 +0.3 ⇨ T −0.1 −0.3	0
		TKC2	Changes dimension T tolerance. T +0.5 +0.3 ⇨ T +0.05 +0.03	200

Order

Catalog No. V H − L
HFW 13 13 − 20

Delivery

3 Days | Express A | 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

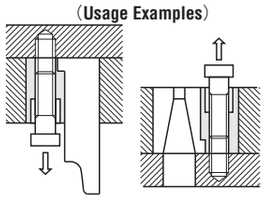
To be quoted on price & lead time above Max. Q'ty.

Example （Flange Holders Usage Examples）

■Features

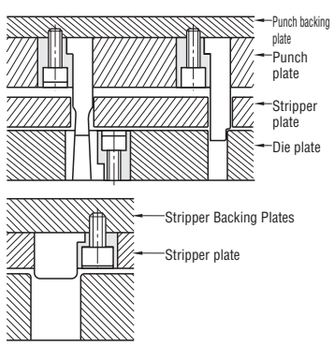
1.Offers easy maintenance of punch and die. （Example 1 Upper）
Able to do maintenance without disassembling dies.（Example 1 Lower）
2.Suitable for thin punch that cannot use key.（Example 2）
3.Counterbore machining of the stripper plate when using a key is unnecessary.
4.By setting the amount of regrinding at initial assembly, and assemble as shown in usage example 3, punch exchange time can be judged visually.

（Usage Examples）

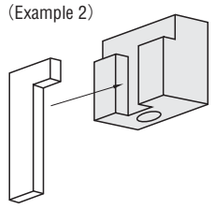


Pull the bolt to the punch tap out of the screw-in punch plate.

（Example 1）

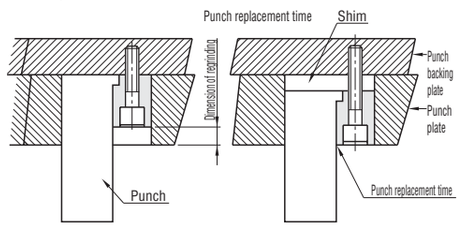


（Example 2）



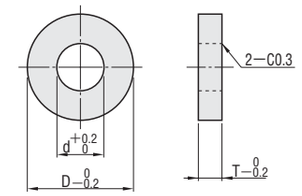
※The alteration that inserts a punch into a holder is necessary.
※For H13, the above alteration is available.

（Example 3）



RoHS

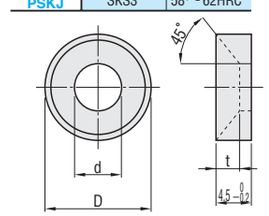
Catalog No.	M	H	S
PSKB	S45C	45～55HRC	—
PSKBH	SKS3	58～62HRC	Chromate plating



Bolt	D	d	T	Catalog No. Type	No.	U/Price Q'ty : 1～19	20～49	50～99	100～200
M4	10	4.2	3	PSKB	4	100	90	80	70
			4.5		4-4.5				
M5	12	5.2	3		5	110	100	90	80
			4.5		5-4.5				
M6	14	6.2	3		6	120	110	100	90
			4.5		6-4.5				
M4	10	4.2	3	PSKBH	4	120	110	100	90
			4.5		4-4.5				
M5	12	5.2	3		5	130	120	110	100
			4.5		5-4.5				
M6	14	6.2	3		6	140	130	120	110
			4.5		6-4.5				

RoHS

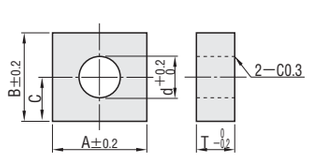
Catalog No.	M	H
PSKS	S45C	45～55HRC
PSKJ	SKS3	58～62HRC



Bolt	D	d	t	Catalog No. Type	No.	U/Price Q'ty : 1～19	20～49	50～99	100～200
M4	10	4.5	2.5	PSKS	4	130	120	110	100
M5	13	5.5	3		5	140	130	120	110
M4	12	4.2	2.5	PSKJ	4	150	140	130	120
M5	15	5.2	3		5	160	150	140	130

RoHS

Catalog No.	M	H	S
PSK	S45C	45～55HRC	—
PSKP			
PSKH	SKS3	58～62HRC	Chromate plating

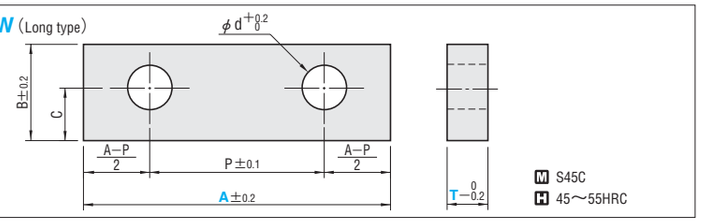


Bolt	A	B	C	d	T	Catalog No. Type	No.	U/Price Q'ty : 1～19	20～49	50～99	100～200
M4	10	11	6	4.2	3	PSK	4-3	140	130	120	110
					4.5		4				
M5				5.2	3		5-3				
					4.5		5				
M6	12	14	7	6.2	3		6-3	160	150	140	130
					4.5		6				
M4	11	11	5.5	4.2	3	PSKP	4-3	150	140	130	120
					4.5		4				
M5				5.2	3		5-3				
					4.5		5				
M6	14	14	7	6.2	3		6-3	170	160	150	140
					4.5		6				
M4	10	11	6	4.2	3	PSKH	4-3	160	150	140	130
					4.5		4				
M5				5.2	3		5-3				
					4.5		5				
M6	12	14	7	6.2	3		6-3	200	190	180	170
					4.5		6				

Because the PSKP has a hole at it's center, it can be mounted in any direction.
To be quoted on price & lead time above Max. Q'ty.

RoHS

PSKW (Long type)



Bolt	B	C	d	P A=21～30	P A=31～40	P A=41～50	P A=51～60	Catalog No. Type	No.	T (Selection)	A 1mm increments	U/Price Q'ty : 1～19 A21～30	A31～40	A41～50	A51～60
M4	11	6	4.2	10	20	30	—	PSKW	4	3	21～50	340	350	360	—
M5			5.2	—	20	30	40		5	4.5	31～60	—			370

Order

Catalog No. − T − A
PSKB 4
PSKS 5
PSKP 5
PSKW 4 − 3 − 40

Delivery

1 Day

●Long type PSKW only

3 Days | Express A | 300/1Pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size.

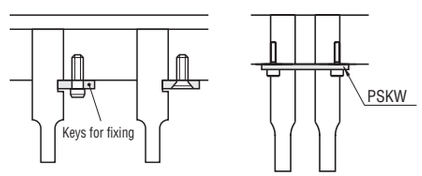
Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example



Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

BLOCK DIES

BLOCK DIES

Name / Catalog No.	BLOCK DIES —Straight type— —Single flanged type—	BLOCK DIES—Small type— —Straight type— —Single flanged type—	SCRAP RETENTION BLOCK DIES —Straight type— —Single flanged type—
Delivery	③Ⓐ	③Ⓐ	③Ⓐ
Page	397	399	401

BLOCK DIES —Configurable type—	SCRAP RETENTION BLOCK DIES —Configurable type—	BLOCK DIES —Bolt fixing type—	SCRAP RETENTION BLOCK DIES —Bolt fixing type—
③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ
403	405	407	409

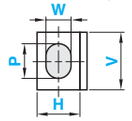
BLOCK DIE BLANKS —Straight type— —Single flanged type—	BLOCK DIE BLANKS —Bolt fixing type—	SPACERS FOR BLOCK DIE
③Ⓐ	③Ⓐ	③Ⓐ
411	412	413

How to order Block dies

■The position of the shaped hole can now be designated within the specified range.

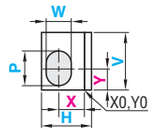
Order

(1) When the shaped hole is on the center of shank



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R(Ⓡonly)
BLDR	13	10	—	20	—	P6.34	—	W4.65	—	R1.50

(2) When the shaped hole is not on the center of shank

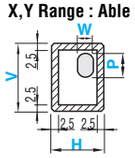


Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R(Ⓡonly)	—	X—Y
BLDR	13	10	—	20	—	P6.34	—	W4.65	—	R1.50	—	X2.85 — Y2.83

Determine the shaped hole center position by X and Y.
Unit : 0.01 increment
Tolerance : X,Y±0.005 (Shaped hole Ⓐ), X,Y±0.01 (Shaped hole D R E G)
Range : Refer to below.

Only shaped hole Ⓐ is available for Scrap retention block die.

X,Y Range : Able to specify X and Y unless the shaped hole is off the ▨.



Shaped hole Ⓐ: $2.5 + P/2 \leqq X \leqq H - (2.5 + P/2)$, $2.5 + P/2 \leqq Y \leqq V - (2.5 + P/2)$

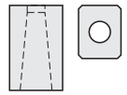
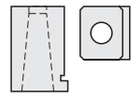
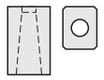
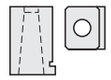
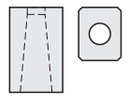
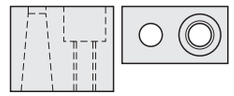
Shaped hole D R E G: $2.5 + W/2 \leqq X \leqq H - (2.5 + W/2)$, $2.5 + P/2 \leqq Y \leqq V - (2.5 + P/2)$

X and Y range is different for Bolt fixing type, see each page the product is listed.

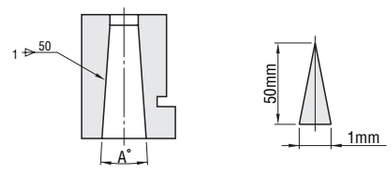
Please note that specifying method for shaped hole of block punch and determination of X and Y is different.

BLOCK DIES LIST

■Block dies list

Block die type		Material	type	Normal Round	Normal Shaped	Normal page	Scrap retention Round	Scrap retention Shaped	Scrap retention page
Block Straight type		SKD11 or equivalent.	Regular	BLD	BLD□	P.397	SR—BLD	SR—BLD□	P.401
		Powdered high-speed steel	Regular	PBLD	PBLD□		SR—PBLD	SR—PBLD□	
Block Single flanged type		SKD11 or equivalent.	Regular	BLDF	BLD□F	P.397	SR—BLDF	SR—BLD□F	P.401
		Powdered high-speed steel	Regular	PBLDF	PBLD□F		SR—PBLDF	SR—PBLD□F	
Block Small dia. Straight type		SKD11 or equivalent.	Regular	SBLD	SBLD□	P.399			
		Powdered high-speed steel	Regular	SPBLD	SPBLD□				
Block Small dia. Single flanged type		SKD11 or equivalent.	Regular	SBLDF	SBLD□F	P.399			
		Powdered high-speed steel	Regular	SPBLDF	SPBLD□F				
Block Size configurable type		SKD11 or equivalent.	Regular	FBLD	FBLD□	P.403	SR—FBLD	SR—FBLD□	P.405
		Powdered high-speed steel	Regular	FPBLD	FPBLD□		SR—FPBLD	SR—FPBLD□	
Block Bolt fixing type		SKD11 or equivalent.	Regular	BBD	BBD□	P.407	SR—BBD	SR—BBD□	P.409

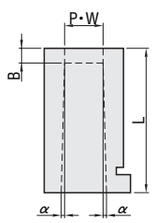
■Indication of Block dies relief angle dimension.



1→50 indicates a taper having a length of 50mm with 1mm extended width.

Taper	1/50
Angle(A°)	1.146°

■Dimension L of block dies and extent width of dimension P and W (When 1→50)



(α×2) dimension : Extent width of P and W (when B=2)

Below is the figures for both ends of α.

L \ Taper	2α
16	0.28
20	0.36
22	0.40
25	0.46
30	0.56
35	0.66

When LC is specified, $2\alpha = \frac{LC - B}{50}$

■Scrap retention block dies (For details, see P.1229)

Scrap retention block dies have 2 or more tilted grooves on the inside die wall. The scraps form small projection at the tilted grooves that fit there at the time of initial stamping. When the scraps are pushed lower by punching, the projected part is compressed from the die side increasing frictional force and prevents scrap retention.

●Applicable range
1. Hole diameter··· ϕ 1.0～ ϕ 16
2. Workpiece material···Tensile strength up to 1177N/mm² (120kgf/mm²)
3. Thickness of workpiece materials···0.15mm or larger
4. The scrap retention effect cannot be expected when the clearance (C) is larger than the workpiece thickness (MT) by 20%. Therefore, keep it to 20% or less.
   Clearance (C) < workpiece thickness (MT) ×20%

Since this product prevents scrap retention by forming small projections on scraps, this is not suitable for products which are pierced or punching precision holes.

PRESS ADD.SPEC. Printed in Red

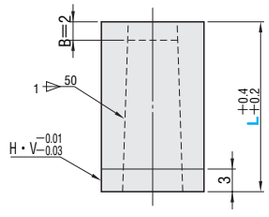
BLOCK DIES

The decentering of shaped hole is now specifiable.

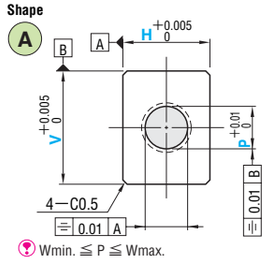
The volume discount rate is also applicable to alteration cost. P.39

—Straight type— RoHS

M / H	Catalog No. Ⓐ	Catalog No. D R E G
SKD11 or equivalent. 60～63HRC	BLD	BLDD BLDR BLDE BLDG
Powdered high-speed steel 64～67HRC	PBLD	PBLDD PBLDR PBLDE PBLDG

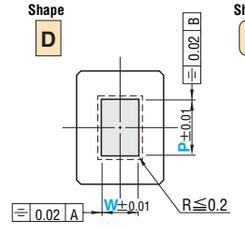


Shape Ⓐ



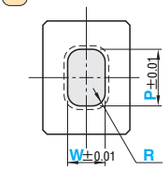
Wmin. ≦ P ≦ Wmax.
Dimension P should be specified within the range of dimension W.

Shape D



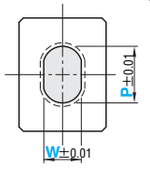
P≧W

Shape R



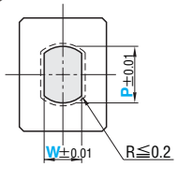
P≧W
0.15≦ R< W/2

Shape E



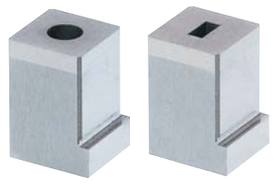
P>W

Shape G

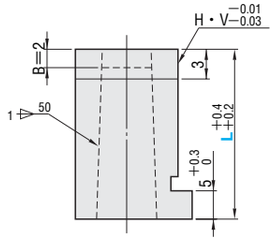


P>W

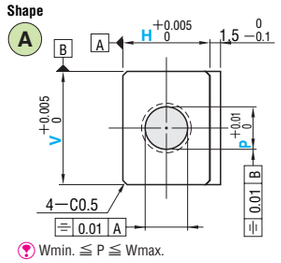
—Single flanged type— RoHS



M / H	Catalog No. Ⓐ	Catalog No. D R E G
SKD11 or equivalent. 60～63HRC	BLDF	BLDDF BLDRF BLDEF BLDGF
Powdered high-speed steel 64～67HRC	PBLDF	PBLDDF PBLDRF PBLDEF PBLDGF

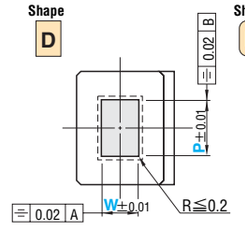


Shape Ⓐ



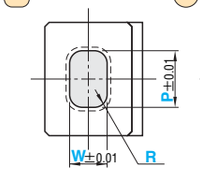
Wmin. ≦ P ≦ Wmax.
Dimension P should be specified within the range of dimension W.

Shape D



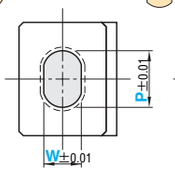
P≧W

Shape R



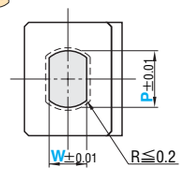
P≧W
0.15≦ R< W/2

Shape E



P>W

Shape G



P>W

Catalog No. H \ V	V 6 (1.00～3.00)	8 (1.00～4.00)	10 (1.00～6.00)	13 (1.00～8.00)	16 (1.00～10.00)	20 (1.50～12.00)	25 (1.50～16.00)	R: 0.15≦R< W/2 (R only)	L
6	○	○	○	○	○	○	○		16
8		○	○	○	○	○	○		20
10			○	○	○	○	○		22
13				○	○	○	○		25
16					○	○	○		30
20						○	○		35
25							○		

Straight type: A BLD PBLD · D BLDD PBLDD · R BLDR PBLDR · E BLDE PBLDE · G BLDG PBLDG

Single flanged type: BLDF PBLDF · BLDDF PBLDDF · BLDRF PBLDRF · BLDEF PBLDEF · BLDGF PBLDGF

P・W・R ⋯▸ 0.01mm increments

Delivery 3 Days — Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration

Catalog No.	V	H	L(LC)	P—W—R	(BC・HC⋯etc.)
BLDF	08	06	—LC21.5	P1.20	—PKC—ANF1.2

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole		BC	Changes the depth of shaped hole. 0≦BC≦4, 0.1mm increments		200
		PKC	Changes the tolerance of shaped hole depth. P +0.01 0 ⇨ +0.005 0	Changes the tolerance of shaped hole depth. P・W±0.01 ⇨ +0.01 0	400
		HVC	———	Reverses H and V. Machining P for H, and W for V. P≦W max. ⊗When the shaped hole is not in the center of shank: Not applicable.	0
Full length		LC	Changes the full length. 10≦LC<L. When LC≦12, no press-in lead for single flanged type. 0.1mm incr. (Comb. with LKC・LKZ→0.01mm incr.)		200
		LKC	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.05 0		400
		LKZ	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.01 0		600
Flange		HC	Changes the flange height. 0≦HC<1.5, 0.1mm increments		200
		TC	Changes the flange thickness. 2≦TC<5, 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) L is shortened by (5—TC). When LC, L=LC.		200
		TKC	Changes the flange thickness tolerance. T +0.3 0 ⇨ +0.02 0		200
		TKM	Changes the flange thickness tolerance. T +0.3 0 ⇨ 0 −0.02		200
Others		VHM	Changes H, V tolerance. H・V +0.005 0 ⇨ 0 −0.005		400
		NDC	H・V −0.01 −0.03 ⇨ No press-in lead		0
		ANF	Changes back relief angle. 0≦ANF≦1.2, 0.2° increments. d≦ dmax. d=P+2{(L—B)tan(ANF°)}. P—B tan(ANF°)≧0.6, W—B tan(ANF°)≧0.6. ⊗When the shaped hole is not in the center of shank: Not applicable.		200

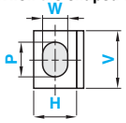
ANF° ±20′

V	d max.
6	3.4
8	4.4
10	6.4
13	8.4
16	10.6
20	12.6
25	14.6

Taper 1/50 (0.573°)

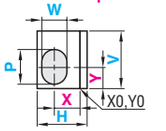
Order

(1) When the shaped hole is on the center of shank.



Catalog No.	V	H	—	L	—	0.01mm increments: P	—	W	—	R(Ⓡ only)
BLDR	13	10	—	20	—	P6.34	—	W3.65	—	R1.50

(2) When the shaped hole is not on the center of shank.



Catalog No.	V	H	—	L	—	0.01mm increments: P	—	W	—	R(Ⓡ only)	—	X—Y
BLDR	13	10	—	20	—	P6.34	—	W3.65	—	R1.50	—	X4.67 — Y6.02

Refer to P.395 for the upper and lower limit value for X and Y.
Tolerance : X,Y±0.005 (Shaped hole Ⓐ), X,Y±0.01 (Shaped hole D R E G)
Please note that specifying method for shaped hole of block punch and determination of X and Y is different.

Price P.37

■Volume discount rate

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Straight type

Catalog No. \ H \ V	6	8	10	13	16	20	25
BLD 6	4,860	5,030	5,290	6,400	7,600	8,800	9,570
BLD 8		5,030	5,380	6,490	7,690	8,800	9,650
BLD 10			5,380	6,490	7,690	8,800	9,650
BLD 13				6,660	7,860	9,140	9,820
BLD 16					7,860	9,140	9,820
BLD 20						9,140	9,990
BLD 25							9,990
BLDD 6	5,030	5,210	5,460	6,660	7,860	9,050	9,910
BLDD 8		5,210	5,550	6,740	7,940	9,050	9,990
BLDR 10			5,550	6,740	7,940	9,050	9,990
BLDE 13				6,830	8,110	9,400	10,160
BLDG 16					8,110	9,400	10,160
20						9,480	10,340
25							10,340
PBLD 6	5,720	5,900	6,250	7,750	8,990	10,310	11,630
PBLD 8		6,250	6,610	8,190	9,430	11,020	12,510
PBLD 10			6,610	8,190	9,430	11,020	12,510
PBLD 13				9,250	10,490	12,160	13,750
PBLD 16					10,490	12,160	13,750
PBLD 20						12,510	14,100
PBLD 25							14,100
PBLDD 6	5,900	6,080	6,430	8,020	9,250	10,660	11,990
PBLDD 8		6,520	6,780	8,460	9,780	11,370	12,870
PBLDR 10			6,780	8,460	9,780	11,370	12,870
PBLDE 13				9,520	10,750	12,600	14,280
PBLDG 16					10,750	12,600	14,280
20						12,870	14,370
25							14,370

■Single flanged type

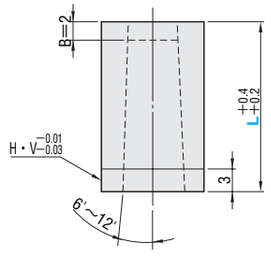
Catalog No. \ H \ V	6	8	10	13	16	20	25
BLDF 6	5,550	5,800	6,060	7,430	8,710	10,160	11,020
BLDF 8		5,800	6,230	7,510	8,880	10,160	11,110
BLDF 10			6,230	7,510	8,880	10,160	11,110
BLDF 13				7,600	9,050	10,510	11,360
BLDF 16					9,050	10,510	11,360
BLDF 20						10,590	11,450
BLDF 25							11,450
BLDDF 6	5,720	5,980	6,320	7,690	9,050	10,420	11,360
BLDDF 8		5,980	6,400	7,770	9,140	10,420	11,450
BLDRF 10			6,400	7,770	9,140	10,420	11,450
BLDEF 13				7,860	9,310	10,850	11,700
BLDGF 16					9,310	10,850	11,700
20						10,930	11,790
25							11,790
PBLDF 6	6,610	6,780	7,130	8,900	10,310	11,810	13,310
PBLDF 8		7,220	7,580	9,430	10,930	12,690	14,370
PBLDF 10			7,580	9,430	10,930	12,690	14,370
PBLDF 13				10,570	12,070	14,010	15,950
PBLDF 16					12,070	14,010	15,950
PBLDF 20						14,370	16,130
PBLDF 25							16,130
PBLDDF 6	6,780	7,050	7,400	9,160	10,660	12,160	13,750
PBLDDF 8		7,490	7,840	9,780	11,280	13,130	14,810
PBLDRF 10			7,840	9,780	11,280	13,130	14,810
PBLDEF 13				10,930	12,430	14,450	16,400
PBLDGF 16					12,430	14,450	16,400
20						14,810	16,480
25							16,480

BLOCK DIES
—SMALL TYPE—

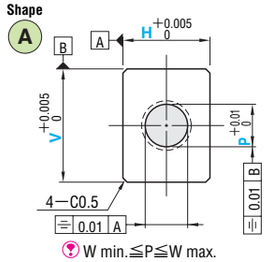
The volume discount rate is also applicable to alteration cost. P.39

—Straight type— RoHS

M / H	Catalog No. Ⓐ	Catalog No. D R E G
SKD11 or equivalent. 60～63HRC	SBLD	SBLDD SBLDR SBLDE SBLDG
Powdered high-speed steel 64～67HRC	SPBLD	SPBLDD SPBLDR SPBLDE SPBLDG

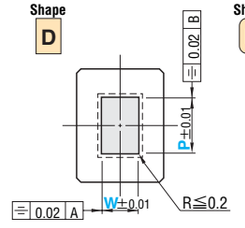


Shape A



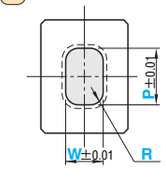
W min.≦P≦W max.
Dimension P should be specified within the range of dimension W.

Shape D



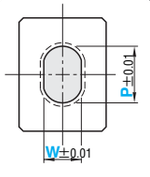
P≧W

Shape R



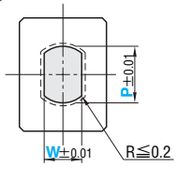
P≧W
0.15≦ R< W/2

Shape E



P>W

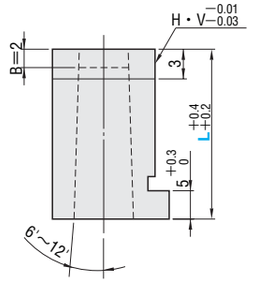
Shape G



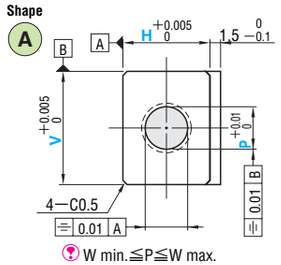
P>W

—Single flanged type— RoHS

M / H	Catalog No. Ⓐ	Catalog No. D R E G
SKD11 or equivalent. 60～63HRC	SBLDF	SBLDDF SBLDRF SBLDEF SBLDGF
Powdered high-speed steel 64～67HRC	SPBLDF	SPBLDDF SPBLDRF SPBLDEF SPBLDGF

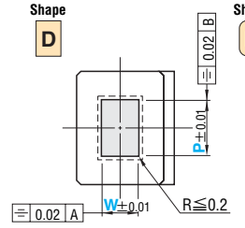


Shape A



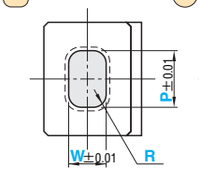
W min.≦P≦W max.
Dimension P should be specified within the range of dimension W.

Shape D



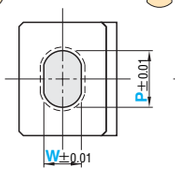
P≧W

Shape R



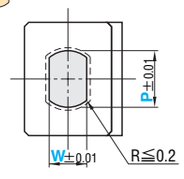
P≧W
0.15≦ R< W/2

Shape E



P>W

Shape G



P>W

Catalog No.	H \ V min. / P / W max.	3	4	5	R R	L
Straight type: Ⓐ SBLD SPBLD; Single flanged type: SBLDF SPBLDF	3	0.60～1.00	○	○	○	0.15≦R< W/2 (Ⓡ only)	10
							13
Ⓓ SBLDD SPBLDD; SBLDDF SPBLDDF	4	0.60～2.00		○	○		16
							20
Ⓡ SBLDR SPBLDR; SBLDRF SPBLDRF	5	0.60～3.00			○		22
Ⓔ SBLDE SPBLDE; SBLDEF SPBLDEF							25
Ⓖ SBLDG SPBLDG; SBLDGF SPBLDGF							

P・W・R ⋯▸ 0.01mm increments Single flanged type : When L =10, no press-in lead.

Delivery 3 Days — Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration Catalog No. | V | H | L(LC) | P—W—R | (BC・HC⋯etc.)

SBLDF 04 04 — LC15.5 — P1.85 — TKC

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole		BC	Changes the depth of shaped hole. 0≦BC≦2, 0.1mm increments		200
		PKC	Changes the tolerance of shaped hole depth. P +0.01 0 ⇨ +0.005 0	Changes the tolerance of shaped hole depth. P・W±0.01 ⇨ +0.01 0	400
		HVC	———	Reverses H and V. Machining P for H, and W for V. P≦W max.	0
Full length		LC	Changes the full length. 10≦LC<L. When LC≦12, no press-in lead for single flanged type. 0.1mm incr. (Comb. with LKC・LKZ→0.01mm incr.)		200
		LKC	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.05 0		400
		LKZ	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.01 0		600

Alterations		Code	Ⓐ	D R E G	¥/1Code
Flange		HC	Changes the flange height. 0≦HC<1.5, 0.1mm increments		200
		TC	Changes the flange thickness. 2≦TC<5, 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) L is shortened by (5—TC). When LC is applied, L=LC.		200
		TKC	Changes the flange thickness tolerance. T +0.3 0 ⇨ +0.02 0		200
		TKM	Changes the flange thickness tolerance. T +0.3 0 ⇨ 0 −0.02		200
Others		VHM	Changes H, V tolerance. H・V +0.005 0 ⇨ 0 −0.005		400
		NDC	H・V −0.01 −0.03 ⇨ No press-in lead		0

Order

Catalog No.	V	H	—	L	—	0.01mm increments: P	—	W	—	R(Ⓡ only)
SBLD	03	03	—	20	—	P0.60				

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Straight type

Catalog No.	H \ V	3	4	5
SBLD	3	7,330	6,870	6,930
	4		6,870	6,960
	5			6,960
SBLDD SBLDR SBLDE SBLDG	3	7,650	7,110	7,200
	4		7,110	7,240
	5			7,240
SPBLD	3	8,120	7,170	7,400
	4		7,170	7,530
	5			7,530
SPBLDD SPBLDR SPBLDE SPBLDG	3	8,440	7,410	7,640
	4		7,410	7,680
	5			7,680

■Single flanged type

Catalog No.	H \ V	3	4	5
SBLDF	3	8,150	7,600	7,600
	4		7,600	7,670
	5			7,670
SBLDDF SBLDRF SBLDEF SBLDGF	3	8,470	7,840	7,840
	4		7,840	7,910
	5			7,910
SPBLDF	3	9,000	7,930	8,160
	4		7,970	8,640
	5			8,640
SPBLDDF SPBLDRF SPBLDEF SPBLDGF	3	9,310	8,170	8,400
	4		8,170	8,880
	5			8,880

PRESS ADD.SPEC. Printed in Red

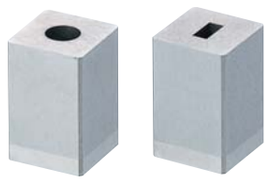
SCRAP RETENTION BLOCK DIES

The decentering of shaped hole is now specifiable.(Shaped hole Ⓐ only)

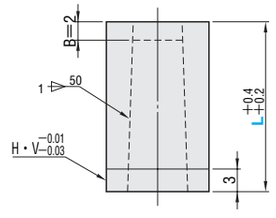
PRODUCTS DATA P.1229

The volume discount rate is also applicable to alteration cost. P.39

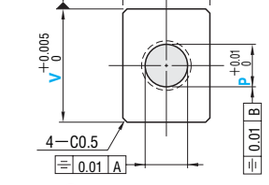
—Straight type— RoHS



M / H	Catalog No. Ⓐ	Catalog No. D R E G
SKD11 or equivalent. 60～63HRC	SR−BLD	SR−BLDD SR−BLDR SR−BLDE SR−BLDG
Powdered high-speed steel 64～67HRC	SR−PBLD	SR−PBLDD SR−PBLDR SR−PBLDE SR−PBLDG

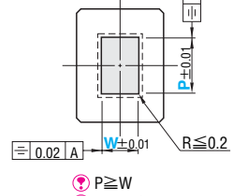


Shape A



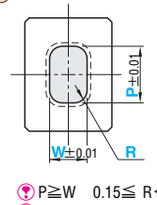
W min.≦P≦W max.
Dimension P should be specified within the range of dimension W.

Shape D



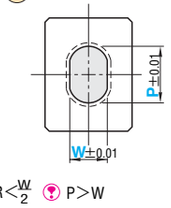
P≧W
P−0.4≧1.5
(Dimension P straight part 1.5mm or more)

Shape R



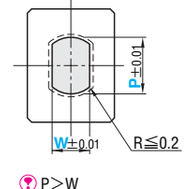
P≧W 0.15≦ R<W/2
P−2R≧1.5
(Dimension P straight part 1.5mm or more)

Shape E



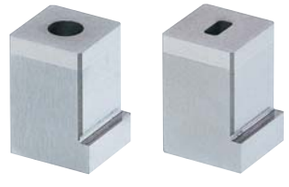
P>W
(Dimension P straight part 1.5mm or more)

Shape G

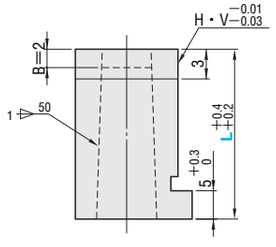


P>W
√(P²−W²)≧1.5
(Dimension P straight part 1.5mm or more)

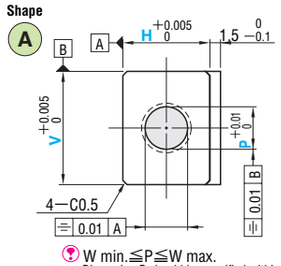
—Single flanged type— RoHS



M / H	Catalog No. Ⓐ	Catalog No. D R E G
SKD11 or equivalent. 60～63HRC	SR−BLDF	SR−BLDDF SR−BLDRF SR−BLDEF SR−BLDGF
Powdered high-speed steel 64～67HRC	SR−PBLDF	SR−PBLDDF SR−PBLDRF SR−PBLDEF SR−PBLDGF

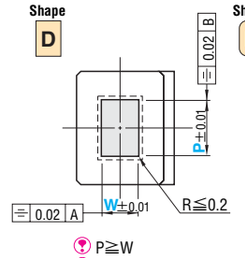


Shape A



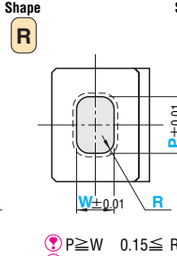
W min.≦P≦W max.
Dimension P should be specified within the range of dimension W.

Shape D



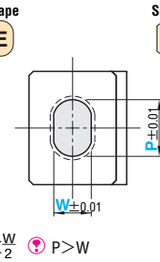
P≧W
P−0.4≧1.5
(Dimension P straight part 1.5mm or more)

Shape R



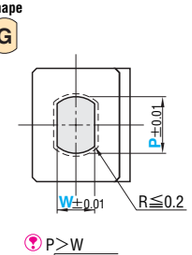
P≧W 0.15≦ R<W/2
P−2R≧1.5
(Dimension P straight part 1.5mm or more)

Shape E



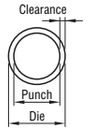
P>W
(Dimension P straight part 1.5mm or more)

Shape G



P>W
√(P²−W²)≧1.5
(Dimension P straight part 1.5mm or more)

Catalog No.	H	V min. W	V max. P	6	8	10	13	16	20	25	R	L	MT (Material thickness) 0.01mm increments	C (Clearance) 0.005mm increments
			min.	1.00	1.00	1.00	1.00	1.00	1.50	1.50				
			max.	3.00	4.00	6.00	8.00	10.00	12.00	16.00				
Straight type Ⓐ	SR−BLD	Single flanged type SR−BLDF	6	1.00～3.00	○	○	○	○	○	○	○	0.15≦R<W/2 (Ⓡ only)	16	MT≧0.15 Specifiable with material thickness 0.15mm or more.	C≧0.010 Specifiable with clearance 0.010mm or more.
D	SR−BLDD	SR−BLDDF	8	1.00～4.00		○	○	○	○	○	○		20		
R	SR−BLDR	SR−BLDRF	10	1.00～6.00			○	○	○	○	○		22		
E	SR−BLDE	SR−BLDEF	13	1.00～8.00				○	○	○	○		25		
G	SR−BLDG	SR−BLDGF	16	1.00～10.00					○	○	○		30		
Ⓐ	SR−PBLD	SR−PBLDF	20	1.50～12.00						○	○		35		
D	SR−PBLDD	SR−PBLDDF	25	1.50～16.00							○				
R	SR−PBLDR	SR−PBLDRF													
E	SR−PBLDE	SR−PBLDEF													
G	SR−PBLDG	SR−PBLDGF													



P・W・R ··· 0.01mm increments Applied only to the workpiece which has the tensile strength up to 1177N/mm² (120kgf/mm²)
The thickness of workpiece and the clearance are only used for scrap retention machining data. Specify the dimension of shaped hole (P, W, R) with the finished dimension of block die.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery 3 Days Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

■Straight type

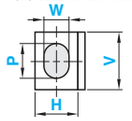
Catalog No.	H \ V	6	8	10	13	16	20	25
SR−BLD	6	6,020	6,200	6,470	7,640	8,900	10,160	10,970
	8		6,020	6,380	7,550	8,810	9,980	10,880
	10			6,380	7,550	8,810	9,980	10,880
	13				7,730	8,990	10,340	11,060
	16					9,170	10,520	11,240
	20						10,700	11,600
	25							11,600
SR−BLDD SR−BLDR SR−BLDE SR−BLDG	6	6,650	6,830	7,100	8,360	9,620	11,150	12,050
	8		6,560	6,920	8,180	9,440	10,880	11,870
	10			6,920	8,180	9,440	10,880	11,870
	13				8,270	9,620	11,240	12,050
	16					9,890	11,510	12,320
	20						11,600	12,500
	25							12,500
SR−PBLD	6	6,740	6,920	7,280	8,810	10,070	11,420	12,770
	8		7,100	7,460	9,080	10,340	11,960	13,490
	10			7,460	9,080	10,340	11,960	13,490
	13				10,160	11,420	13,130	14,750
	16					11,600	13,310	14,930
	20						13,850	15,470
	25							15,470
SR−PBLDD SR−PBLDR SR−PBLDE SR−PBLDG	6	7,370	7,550	7,910	9,530	10,790	12,500	13,850
	8		7,730	8,000	9,710	11,060	12,950	14,480
	10			8,000	9,710	11,060	12,950	14,480
	13				10,790	12,050	14,210	15,920
	16					12,320	14,480	16,190
	20						14,750	16,280
	25							16,280

■Single flanged type

Catalog No.	H \ V	6	8	10	13	16	20	25
SR−BLDF	6	6,740	7,010	7,280	8,720	10,070	11,600	12,500
	8		6,830	7,280	8,630	10,070	11,420	12,410
	10			7,280	8,630	10,070	11,420	12,410
	13				8,720	10,250	11,780	12,680
	16					10,430	11,960	12,860
	20						12,230	13,130
	25							13,130
SR−BLDDF SR−BLDRF SR−BLDEF SR−BLDGF	6	7,370	7,640	8,000	9,440	10,880	12,590	13,580
	8		7,370	7,820	9,260	10,700	12,320	13,400
	10			7,820	9,260	10,700	12,320	13,400
	13				9,350	10,880	12,770	13,670
	16					11,150	13,040	13,940
	20						13,130	14,030
	25							14,030
SR−PBLDF	6	7,640	7,820	8,180	9,980	11,420	12,950	14,480
	8		8,090	8,450	10,340	11,870	13,670	15,380
	10			8,450	10,340	11,870	13,670	15,380
	13				11,510	13,040	15,020	17,000
	16					13,220	15,200	17,180
	20						15,740	17,540
	25							17,540
SR−PBLDDF SR−PBLDRF SR−PBLDEF SR−PBLDGF	6	8,270	8,540	8,900	10,700	12,230	14,030	15,650
	8		8,720	9,080	11,060	12,590	14,750	16,460
	10			9,080	11,060	12,590	14,750	16,460
	13				12,230	13,760	16,100	18,080
	16					14,030	16,370	18,350
	20						16,730	18,440
	25							18,440

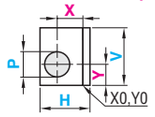
Order

(1) When the shaped hole is on the center of shank.



Catalog No.	V	H	L	0.01mm increments P	W	R(Ⓡ only)	MT	C
SR−PBLDRF	13	10	22	P7.65	W3.65	R0.50	MT1.50	C0.105

(2) When the shaped hole is not on the center of shank. (Shaped hole Ⓐ only)

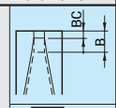
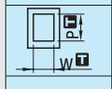
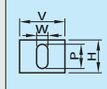
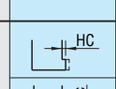
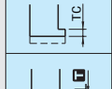


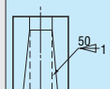
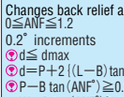
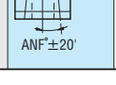
Catalog No.	V	H	L	0.01mm increments P	MT	C	0.01mm increments X−Y
SR−PBLDF	13	10	22	P4.35	MT1.50	C0.105	X4.85 − Y7.82

Refer to P.395 for the upper and lower limit value for X and Y.
Tolerance : X,Y±0.005 (Shaped hole Ⓐ), X,Y±0.01 (Shaped hole D R E G)
Please note that specifying method for shaped hole of block punch and determination of X and Y are different.

Alteration

Catalog No. V H − L(LC) − P−W−R − MT − C − (BC・HC···etc.)
SR−BLDF 08 06 − LC21 − P2.25 − MT1.50 − C0.105 − LKC − ANF1.2

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole		BC	Changes the depth of shaped hole. 1≦BC≦Bmax. 0.1mm increments P: 1.00～1.99 / 2.00～ ; Bmax.: 3 / 4	Changes the depth of shaped hole. 1≦BC＜2 0.1mm increments	200
		PKC	Changes the tolerance of shaped hole depth. P +0.01 0 ⇨ +0.005 0	Changes the tolerance of shaped hole depth. P・W±0.01 ⇨ +0.01 0	400
		HVC	———	Reverses H and V. Machining P for H, and W for V P≦W max. Dimension P should be specified within the range of dimension W. ⊗When the shaped hole is not in the center of shank : Not applicable.	0
Flange		HC	Changes the flange height. 0≦HC＜1.5 0.1mm increments		200
		TC	Changes the flange thickness. 2≦TC＜5 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) L is shortened by (5−TC). When LC is L=LC.		200
		TKC	Changes the flange thickness tolerance. T +0.3 0 ⇨ +0.02 0		200
		TKM	Changes the flange thickness tolerance. T +0.3 0 ⇨ 0 −0.02		200

Alterations		Code	Ⓐ	D R E G	¥/1Code
Full length		LC	Changes the full length. 10≦LC＜L 0.1mm incr. (Comb. with LKC・LKZ→0.01mm incr.) Single flanged type : When LC≦12, no press-in lead for single flanged type.		200
		LKC	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.05 0		400
		LKZ	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.01 0		600
Others		VHM	Changes H, V tolerance. H・V +0.005 0 ⇨ 0 −0.005		400
		NDC	 No press -in lead		0
		ANF	Changes back relief angle. 0≦ANF≦1.2 0.2° increments d≦ dmax d=P+2{(L−B)tan(ANF°)} P−B tan(ANF°)≧0.6 W−B tan(ANF°)≧0.6 ⊗When the shaped hole is not in the center of shank: Not applicable.	V / d max: 6 / 3.4; 8 / 4.4; 10 / 6.4; 13 / 8.4; 16 / 10.6; 20 / 12.6; 25 / 14.6 Taper 1/50 (Angle 0.573°)	200

PRESS ADD.SPEC. Printed in Red

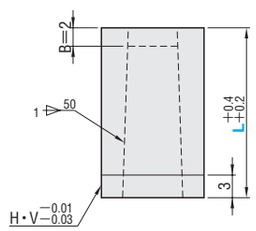
BLOCK DIES —CONFIGURABLE TYPE—

The decentering of shaped hole is now specifiable.

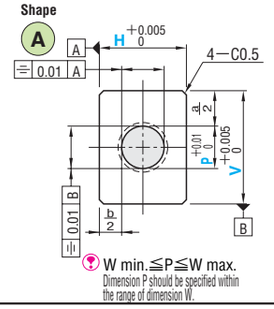
The volume discount rate is also applicable to alteration cost. P.39

—Straight type— RoHS

M H	Catalog No. Ⓐ	Catalog No. D R E G
SKD11 or equivalent. 60～63HRC	FBLD	FBLDD FBLDR FBLDE FBLDG
Powdered high-speed steel 64～67HRC	FPBLD	FPBLDD FPBLDR FPBLDE FPBLDG

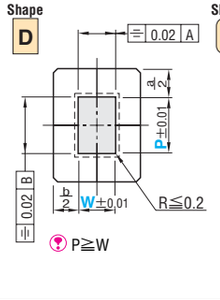


Shape Ⓐ



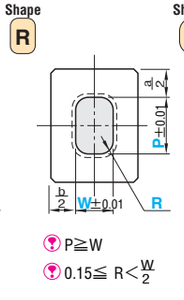
W min.≦P≦W max.
Dimension P should be specified within the range of dimension W.

Shape D



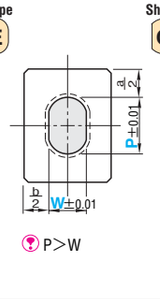
P≧W

Shape R



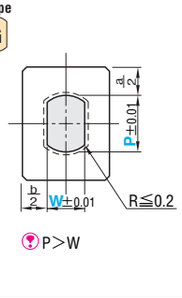
P≧W
0.15≦ R<W/2

Shape E



P>W

Shape G



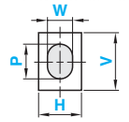
P>W

Catalog No. (SKD11 or equivalent.)	(Powdered high-speed steel)	H	V min. W max.	a min. b min.	V 6.0～8.0	V 8.1～10.0	V 10.1～13.0	V 13.1～16.0	V 16.1～20.0	V 20.1～25.0	R	L
			min. P max.		1.00～4.00	1.00～6.00	1.00～8.00	1.00～10.00	1.50～12.00	1.50～16.00	R	
					4	4	5	6	8	9		
Ⓐ FBLD	FPBLD	6.0～ 8.0	1.00～ 4.00	4	○	○	○	○	○	○	0.15≦R<W/2 (Ⓡonly)	16
Ⓐ FBLD	FPBLD	8.1～10.0	1.00～ 6.00	4		○	○	○	○	○		20
D FBLDD	FPBLDD	10.1～13.0	1.00～ 8.00	5			○	○	○	○		22
R FBLDR	FPBLDR	13.1～16.0	1.00～10.00	6				○	○	○		25
E FBLDE	FPBLDE	16.1～20.0	1.50～12.00	8					○	○		30
G FBLDG	FPBLDG	20.1～25.0	1.50～16.00	9						○		35

Ⓥ V—P=a H—W=b (However, Ⓐshape is H—P=b)
Ⓥ P・W・R···▸0.01mm increments V・H···▸0.1mm increments

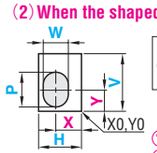
Order

(1) When the shaped hole is on the center of shank.



Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R (Ⓡonly)
FBLDE	V15.8	H12.8	L22	P7.25	W5.75	

(2) When the shaped hole is not on the center of shank.



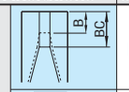
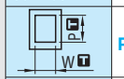
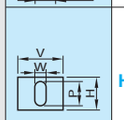
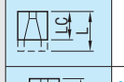
Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R (Ⓡonly)	0.01mm increments X—Y
FBLDE	V15.8	H12.8	L22	P7.25	W5.75		X5.80 — Y8.35

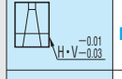
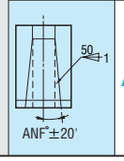
Ⓥ Refer to P.395 for the upper and lower limit value for X and Y.
Ⓥ Tolerance : X,Y±0.005 (Shaped hole Ⓐ), X,Y±0.01 (Shaped hole D R E G)
Ⓥ Please note that specifying method for shaped hole of block punch and determination of X and Y is different.

Delivery 3 Days | Express A 800/1Pc. P.38
Ⓥ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration

Catalog No. — V — H — L (LC) — P—W—R — (BC・LKC···etc.)
FBLDD — V12.5 — H9.5 — LC28.5 — P6.25 — W4.75 — LKC — ANF1.2

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole		BC	Changes the depth of shaped hole. 0≦BC≦4 0.1mm increments	———	200
		PKC	Changes the tolerance of shaped hole depth. P +0.01 0 ⇨ +0.005 0	Changes the tolerance of shaped hole depth. P・W±0.01 ⇨ +0.01 0	400
		HVC	———	Reverses H and V. Machining P for H, and W for V. Ⓥ P≦W max. Dimension P should be specified within the range of dimension W. Ⓧ When the shaped hole is not in the center of shank : Not applicable.	0
Full length		LC	Changes the full length. 10≦LC<L 0.1mm incr. (Comb. with LKC・LKZ→0.01mm incr.)		200
		LKC	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.05 0		400
		LKZ	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.01 0		600

Alterations		Code	Ⓐ	D R E G	¥/1Code
Others		VHM	Changes H, V tolerance. H・V +0.005 0 ⇨ 0 −0.005		400
		NDC	No press-in lead		0
		ANF	Changes back relief angle. 0≦ANF≦1.2 0.2° increments Ⓥ d≦ dmax Ⓥ d=P+2{(L−B)tan(ANF°)} Ⓥ P−B tan(ANF°)≧0.6 W−B tan(ANF°)≧0.6 Ⓧ When the shaped hole is not in the center of shank : Not applicable.		200

V	d max.
6.0～	3.4
8.0～	4.4
10.0～	6.4
13.0～	8.4
16.0～	10.6
20.0～	12.6
25.0	14.6
Taper Angle	1/50 0.573°

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

Ⓥ To be quoted on price & lead time above Max. Q'ty.

Catalog No.	H \ V	6.0～8.0	8.1～10.0	10.1～13.0	13.1～16.0	16.1～20.0	20.1～25.0
FBLD	6.0～ 8.0	5,550	5,980	7,000	8,370	9,480	10,340
	8.1～10.0		5,980	7,000	8,370	9,480	10,340
	10.1～13.0			7,170	8,450	9,740	10,590
	13.1～16.0				8,450	9,740	10,590
	16.1～20.0					9,820	10,680
	20.1～25.0						10,680
FBLDD FBLDR FBLDE FBLDG	6.0～ 8.0	5,720	6,150	7,260	8,630	9,740	10,680
	8.1～10.0		6,150	7,260	8,630	9,740	10,680
	10.1～13.0			7,430	8,710	9,990	10,930
	13.1～16.0				8,710	9,990	10,930
	16.1～20.0					10,080	11,020
	20.1～25.0						11,020
FPBLD	6.0～ 8.0	6,960	7,220	8,900	10,130	11,810	13,310
	8.1～10.0		7,220	8,900	10,130	11,810	13,310
	10.1～13.0			9,960	11,370	13,040	14,810
	13.1～16.0				11,370	13,040	14,810
	16.1～20.0					13,480	15,340
	20.1～25.0						15,340
FPBLDD FPBLDR FPBLDE FPBLDG	6.0～ 8.0	7,130	7,490	9,160	10,490	12,160	13,750
	8.1～10.0		7,490	9,160	10,490	12,160	13,750
	10.1～13.0			10,310	11,720	13,480	15,250
	13.1～16.0				11,720	13,480	15,250
	16.1～20.0					13,750	15,600
	20.1～25.0						15,600

PRESS ADD.SPEC. Printed in Red

SCRAP RETENTION BLOCK DIES
—CONFIGURABLE TYPE—

The decentering of shaped hole is now specifiable. (Shaped hole Ⓐ only)

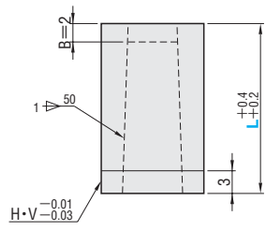
PRODUCTS DATA P.1229

SCRAP RETENTION DIES

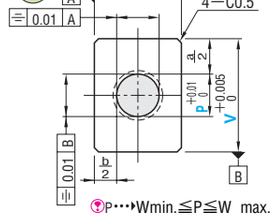
The volume discount rate is also applicable to alteration cost. P.39

—Straight type— RoHS

M / H	Catalog No. Ⓐ	Catalog No. D R E G
SKD11 or equivalent. 60～63HRC	SR—FBLD	SR—FBLDD SR—FBLDR SR—FBLDE SR—FBLDG
Powdered high-speed steel 64～67HRC	SR—FPBLD	SR—FPBLDD SR—FPBLDR SR—FPBLDE SR—FPBLDG

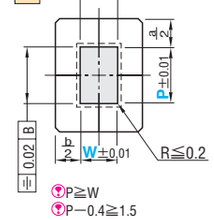


Shape Ⓐ



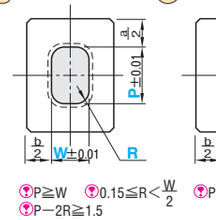
Ⓟ P⋯Wmin.≦P≦W max.
Dimension P should be specified within the range of dimension W.

Shape Ⓓ



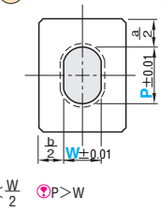
Ⓟ P≧W
Ⓟ P−0.4≧1.5
(Dimension P straight part 1.5mm or more)

Shape Ⓡ



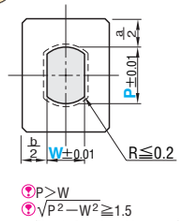
Ⓟ P≧W Ⓟ 0.15≦R<W/2
Ⓟ P−2R≧1.5
(Dimension P straight part 1.5mm or more)

Shape Ⓔ



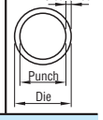
Ⓟ P>W

Shape Ⓖ



Ⓟ P>W
Ⓟ $\sqrt{P^2-W^2}$≧1.5
(Dimension P straight part 1.5mm or more)

Catalog No.	H	V min.	V max.	P min.	P max.	a min. / b min.	6.0〜8.0	8.1〜10.0	10.1〜13.0	13.1〜16.0	16.1〜20.0	20.1〜25.0	R	L	MT (Material thickness)	C (Clearance)
							1.00〜4.00	1.00〜6.00	1.00〜8.00	1.00〜10.00	1.50〜12.00	1.50〜16.00			0.01mm increments	0.005mm increments
(SKD11 or equivalent.) (Powdered high-speed steel)							4	4	5	6	8	9				
Ⓐ SR—FBLD SR—FPBLD	6.0〜8.0	1.00	4.00	1.00	4.00	4	○	○	○	○	○	○	0.15≦R<W/2 (Ⓡ only)	16	MT≧0.15 Specifiable with material thickness 0.15mm or more.	C≧0.010 Specifiable with clearance 0.010 mm or more.
Ⓓ SR—FBLDD SR—FPBLDD	8.1〜10.0	1.00	6.00	1.00	6.00	4		○	○	○	○	○		20		
Ⓡ SR—FBLDR SR—FPBLDR	10.1〜13.0	1.00	8.00	1.00	8.00	5			○	○	○	○		22		
Ⓔ SR—FBLDE SR—FPBLDE	13.1〜16.0	1.00	10.00	1.00	10.00	6				○	○	○		25		
Ⓖ SR—FBLDG SR—FPBLDG	16.1〜20.0	1.50	12.00	1.50	12.00	8					○	○		30		
	20.1〜25.0	1.50	16.00	1.50	16.00	9						○		35		



Ⓟ V−P≧a H−W≧b (However, Ⓐ shape is H−P=b)
Ⓟ P・W・R⋯▸0.01mm increments V・H⋯▸0.1mm increments
Ⓟ Applied only to the workpiece which has the tensile strength up to 1177N/mm² (120kgf/mm²)
Ⓟ The thickness of workpiece and the clearance are only used for scrap retention machining data. Specify the dimension of shaped hole (P, W, R) with the finished dimension of block die.

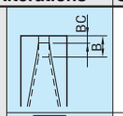
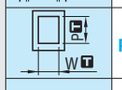
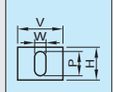
Order

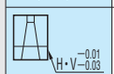
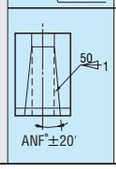
3 Days | Express A | 800/1Pc. P.38

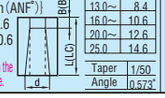
Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration

Catalog No. — V — H — L(LC) — P—W—R — MT — C —(BC・LKC⋯etc.)
SR—FBLDD — V12.5 — H9.5 — LC28 — P6.25 — W4.75 — MT1.50 — C0.105 — LKC — ANF1.2

Alterations		Code	Ⓐ	D R E G	¥/1Code
Shaped hole		BC	Changes the depth of shaped hole. 1≦BC≦Bmax. 0.1mm increments P: 1.00～1.99 / 2.00～ ; Bmax.: 3 / 4	Changes the depth of shaped hole. 1≦BC＜2 0.1mm increments	200
		PKC	Changes the tolerance of shaped hole depth. P +0.01 0 ⇨ +0.005 0	Changes the tolerance of shaped hole depth. P・W±0.01 ⇨ +0.01 0	400
		HVC	——	Reverses H and V. Machining P for H, and W for V. Ⓟ P≦W max. Dimension P should be specified within the range of dimension W. ⊗ When the shaped hole is not in the center of shank : Not applicable.	0
Full length		LC	Changes the full length. 10≦LC＜L 0.1mm incr. (Comb. with LKC・LKZ→0.01mm incr.)		200
		LKC	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.05 0		400
		LKZ	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.01 0		600

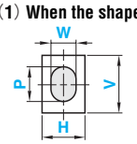
Alterations		Code	Ⓐ	D R E G	¥/1Code
Others		VHM	Changes H, V tolerance. H・V +0.005 0 ⇨ 0 −0.005		400
		NDC	No press-in lead		0
		ANF	Changes back relief angle. 0≦ANF≦1.2 0.2° increments Ⓟ d≦d max Ⓟ d=P+2{(L−B)tan(ANF°)} Ⓟ P−B tan(ANF°)≧0.6 W−B tan(ANF°)≧0.6 ⊗ When the shaped hole is not in the center of shank : Not applicable.		200



V	d max
6.0～	3.4
8.0～	4.4
10.0～	6.4
13.0～	8.4
16.0～	10.6
20.0～	12.6
25.0	14.6
Taper Angle	1/50 0.573°

Order

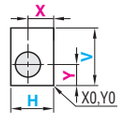
(1) When the shaped hole is on the center of shank.



Catalog No. — 0.1mm increments (V — H) — L — 0.01mm increments (P — W — R(Ⓡ only)) — MT — C

SR—FBLDE — V15.8 — H12.8 — L22 — P7.27 — W5.25 — MT1.50 — C0.105

(2) When the shaped hole is not on the center of shank. (Shaped hole Ⓐ only)



Catalog No. — 0.1mm increments (V — H) — L — 0.01mm increments (P) — MT — C — 0.01mm increments (X—Y)

SR—FBLD — V15.8 — H12.8 — L22 — P5.25 — MT1.50 — C0.105 — X5.80 — Y6.35

Ⓟ Refer to P.395 for the upper and lower limit value for X and Y.
Ⓟ Tolerance : X,Y±0.005 (Shaped hole Ⓐ), X,Y±0.01 (Shaped hole D R E G)
Ⓟ Please note that specifying method for shaped hole of block punch and determination of X and Y is different.

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

Catalog No.	H \ V	6.0～8.0	8.1～10.0	10.1～13.0	13.1～16.0	16.1～20.0	20.1～25.0
SR—FBLD	6.0～ 8.0	6,740	7,190	8,270	9,710	10,880	11,780
	8.1～10.0		7,010	8,090	9,530	10,700	11,600
	10.1～13.0			8,270	9,620	10,970	11,870
	13.1～16.0				9,620	10,970	11,870
	16.1～20.0					11,240	12,140
	20.1～25.0						12,320
SR—FBLDD SR—FBLDR SR—FBLDE SR—FBLDG	6.0～ 8.0	7,370	7,820	8,990	10,430	11,870	12,860
	8.1～10.0		7,550	8,720	10,160	11,600	12,590
	10.1～13.0			8,900	10,250	11,870	12,860
	13.1～16.0				10,250	11,870	12,860
	16.1～20.0					12,230	13,220
	20.1～25.0						13,220
SR—FPBLD	6.0～ 8.0	8,000	8,270	9,980	11,240	12,950	14,480
	8.1～10.0		8,090	9,800	11,060	12,770	14,300
	10.1～13.0			10,880	12,320	14,030	15,830
	13.1～16.0				12,320	14,030	15,830
	16.1～20.0					14,660	16,550
	20.1～25.0						16,730
SR—FPBLDD SR—FPBLDR SR—FPBLDE SR—FPBLDG	6.0～ 8.0	8,630	8,990	10,700	12,050	14,030	15,650
	8.1～10.0		8,720	10,430	11,780	13,760	15,380
	10.1～13.0			11,600	13,040	15,110	16,910
	13.1～16.0				13,040	15,110	16,910
	16.1～20.0					15,650	17,540
	20.1～25.0						17,540

PRESS ADD.SPEC. Printed in Red

BLOCK DIES
—BOLT FIXING TYPE—

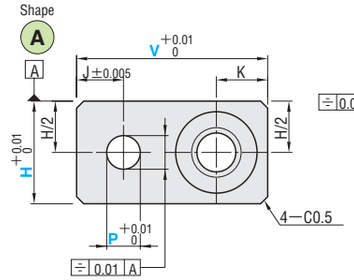
The decentering of shaped hole is now specifiable.

The volume discount rate is also applicable to alteration cost. P.39

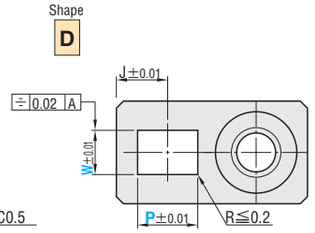
M H	Catalog No.
SKD11 or equivalent. 60～63HRC	(A) BBD (D) BBDD (R) BBDR (E) BBDE (G) BBDG

RoHS

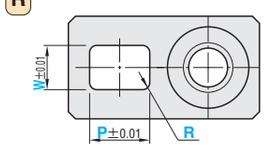
Shape (A)



Shape (D)

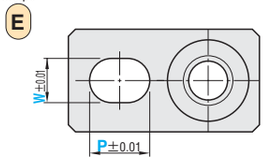


Shape (R)

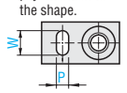


When P≧W
$0.15 \leqq R < \frac{W}{2}$
When P<W
$0.15 \leqq R < \frac{P}{2}$

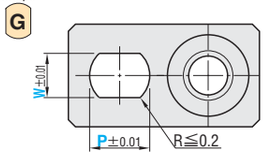
Shape (E)



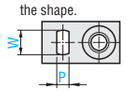
⊗P=W not applicable
When P<W, pay attention to the shape.

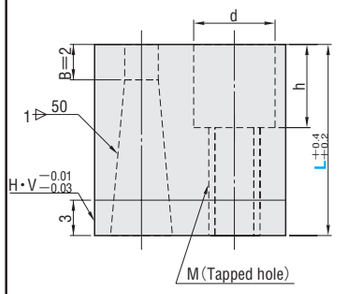


Shape (G)



⊗P=W not applicable
When P<W, pay attention to the shape.





Bolt for tapped hole is larger than mounting bolt by 1 size.

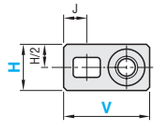
Mounting bolt	M (extraction tapping hole)
M3	M 4
M4	M 5
M6	M 8
M8	M10

K	Mounting bolt d	h	Size	J	Catalog No.	V	H	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ min. W max.	Ⓡ R	U/Price Q'ty：1～9 BBD	BBD□
4	6	7.5	M3	3	(A) BBD (D) BBDD (R) BBDR (E) BBDE (G) BBDG	13	8	16 20 22 25 30 35	1.00～ 3.00	1.00 ～ 3.00	1.00～ 4.00	0.15≦R＜W/2 (Ⓡ only)	3,480	3,690
				4		16			1.00～ 4.00	1.00 ～ 4.00			3,480	3,690
				5		18				1.00 ～ 6.00			3,600	4,090
				6.5		20				1.00 ～ 9.00			3,600	4,510
5	8	8.5	M4	4		18	10		1.00～ 4.00	1.00 ～ 4.00	1.00～ 6.00		3,600	4,090
				5		20			1.00～ 6.00	1.00 ～ 6.00			4,020	4,370
				6.5		22				1.00 ～ 9.00			4,210	4,980
				8		25				1.00 ～ 12.00			4,210	5,400
6.5	11	10.5	M6	5		22	13		1.00～ 6.00	1.00 ～ 6.00	1.00～ 9.00		4,210	4,980
				6.5		25			1.00～ 9.00	1.00 ～ 9.00			4,840	5,400
				8		28				1.00 ～ 12.00			5,020	6,000
				10		32				1.50 ～ 16.00			5,050	6,590
				6.5		25	16		1.00～ 9.00	1.00 ～ 9.00	1.00～12.00		5,050	6,030
				8		28			1.00～12.00	1.00 ～ 12.00			5,750	6,450
				10		32				1.50 ～ 16.00			5,880	7,140
				12.5		38				1.50 ～ 21.00			5,880	7,840
8	14	12.5	M8	8		32	20		1.00～12.00	1.00 ～ 12.00	1.50～16.00		5,880	7,140
				10		35			1.50～16.00	1.50 ～ 16.00			6,720	7,700
				12.5		40				1.50 ～ 21.00			6,900	8,580
				15		45				1.50 ～ 26.00			6,900	9,280
				10		35	25		1.50～16.00	1.50 ～ 16.00	1.50～21.00		6,900	8,580
				12.5		40			1.50～21.00	1.50 ～ 21.00			8,020	9,280
				15		45				1.50 ～ 26.00			8,200	10,160
				17.5		50				1.50 ～ 31.00			8,200	10,860

P・W・R 0.01mm increments

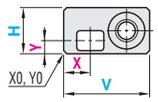
Order

(1) When the shaped hole is on the center of shank.



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (Ⓡ only)
BBDD	25	13	—	20	—	P6.34	—	W4.65		

(2) When the shaped hole is not on the center of shank.



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (Ⓡ only)	—	0.01mm increments X—Y
BBDD	25	13	—	20	—	P6.34	—	W4.65			—	X6.35 — Y9.5

Limit value of X and Y

Shape (A): $2.5+\frac{P}{2} \leqq X \leqq V-(2.5+\frac{P}{2})-(K+\frac{d}{2}),\quad 2.5+\frac{P}{2} \leqq Y \leqq H-(2.5+\frac{P}{2})$

Shape (D) (R) (E) (G): $2.5+\frac{P}{2} \leqq X \leqq V-(2.5+\frac{P}{2})-(K+\frac{d}{2}),\quad 2.5+\frac{W}{2} \leqq Y \leqq H-(2.5+\frac{W}{2})$

When P<W, pay attention to the shape.
Tolerance : X,Y±0.005 (Shaped hole (A)), X,Y±0.01 (Shaped hole (D) (R) (E) (G))
Please note that specifying method for shaped hole of block punch and determination of X and Y is different.

Delivery: 3 Days | Express A | 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

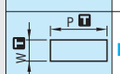
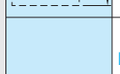
■Volume discount rate P.37

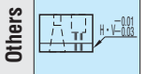
Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No.	V	H	—	L (LC)	—	P—W—R	—	(BC・LKC…etc.)
BBD	25	13	—	LC18	—	P1.50	—	BC3 — LKC — ANF1.2

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Shaped hole		BC	Changes the depth of shaped hole. 1≦BC≦4 0.1mm increments		200
		PKC	Changes the tolerance of shaped hole depth. P +0.01 0 ⇨ +0.005 0	Changes the tolerance of shaped hole depth. P・W±0.01 ⇨ +0.01 0	400
Full length		LC	Changes the full length. 16＜LC＜35 0.1mm incr. (Comb. with LKC・LKZ→0.01mm incr.)		200
		LKC	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.05 0		400
		LKZ	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.01 0		600

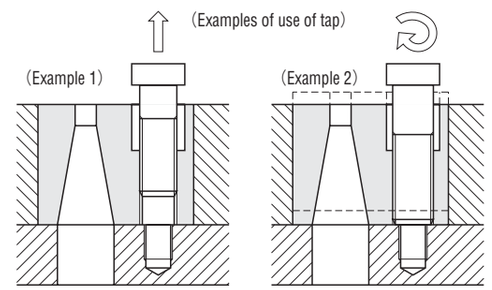
Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Others		VKC1	Changes V・H tolerance. V・H +0.01 0 ⇨ V・H +0.005 0		600
		VKC2	Changes V・H tolerance. V・H +0.01 0 ⇨ V・H 0 −0.005		600
		NDC	No press-in lead		0
		ANF	Changes back relief angle. 0≦ANF≦1.2 0.2° increments d≦ dmax d=P+2{(L−B) tan(ANF°)} P−B tan(ANF°)≧0.6 W−B tan(ANF°)≧0.6 ⊗When the shaped hole is not in the center of shank : Not applicable.		200

H	d max
8	4.4
10	6.4
13	8.4
16	10.6
20	12.6
25	14.6
Taper	1/50
Angle	0.573°

Example

■Features
1. Able to maintenance without disassembling dies.
2. Minor adjustment is possible after the die assembly by using shims etc.

(Examples of use of tap)



Screw a bolt into the die's tapping hole, and pull it out of the die plate.

Screw a bolt into the die's tapping hole, the die comes out of the die plate.

PRESS ADD.SPEC. Printed in Red

SCRAP RETENTION BLOCK DIES
—BOLT FIXING TYPE—

The decentering of shaped hole is now specifiable.(Shaped hole Ⓐ only)

PRODUCTS DATA P.1229

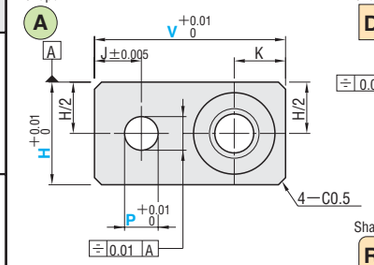
SCRAP RETENTION DIES

The volume discount rate is also applicable to alteration cost. P.39

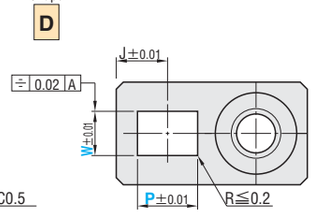
M / H	Catalog No.
SKD11 or equivalent. 60～63HRC	Ⓐ SR—BBD Ⓓ SR—BBDD Ⓡ SR—BBDR Ⓔ SR—BBDE Ⓖ SR—BBDG

RoHS

Shape Ⓐ

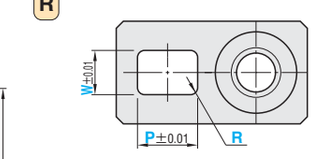


Shape Ⓓ



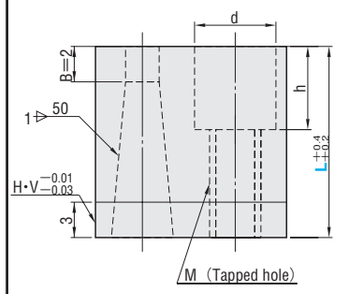
Ⓟ When P≧W
P−0.4≧1.5
(Dimension P straight part 1.5mm or more)
Ⓟ When P<W
W−0.4≧1.5
(Dimension W straight part 1.5mm or more)

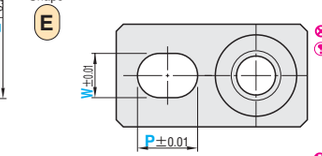
Shape Ⓡ



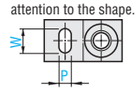
Ⓟ When P≧W
0.15≦R< W/2
P−2R≧1.5
(Dimension P straight part 1.5mm or more)
Ⓟ When P<W
0.15≦R< P/2
W−2R≧1.5
(Dimension W straight part 1.5mm or more)

Shape Ⓔ

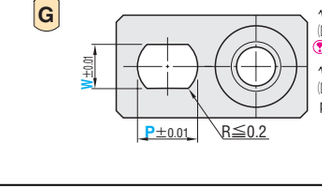




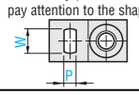
⊗P=W not applicable
Ⓟ When P<W, pay attention to the shape.



Shape Ⓖ



⊗P=W not applicable
Ⓟ When P>W
√(P²−W²)≧1.5
(Dimension P straight part 1.5mm or more)
Ⓟ When P<W
√(W²−P²)≧1.5
(Dimension W straight part 1.5mm or more)
pay attention to the shape.



Ⓟ Bolt for tapped hole is larger than mounting bolt by 1 size.

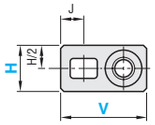
Mounting bolt	M (Tapped hole)
M3	M4
M4	M5
M6	M8
M8	M10

K	Mounting bolt d	h	Size	J	Catalog No.	V	H	L	0.01mm increments Ⓐ min. P max.	0.01mm increments Ⓓ Ⓡ Ⓔ Ⓖ min. P max.	0.01mm increments Ⓓ Ⓡ Ⓔ Ⓖ min. W max.	0.01mm increments R	0.01mm increments MT (Material thickness)	0.005mm increments C (Clearance)	U/Price Q'ty : 1～9 SR—BBD	U/Price Q'ty : 1～9 SR—BBD□
4	6	7.5	M3	3	Ⓐ SR—BBD Ⓓ SR—BBDD Ⓡ SR—BBDR Ⓔ SR—BBDE Ⓖ SR—BBDG	13	8	16	1.00 ～ 3.00	1.00 ～ 3.00	1.00 ～ 4.00	0.15≦R< W/2 (Ⓐ only)	MT≧0.15 Specifiable with material thickness 0.15mm or more.	C≧0.010 Specifiable with clearance 0.010mm or more. Clearance Punch Die	4,280	4,890
				4		16			1.00 ～ 4.00	1.00 ～ 4.00					4,280	4,890
				5		18				1.00 ～ 6.00					4,400	5,290
				6.5		20				1.00 ～ 9.00					4,400	5,710
5	8	8.5	M4	4		18	10	16	1.00 ～ 4.00	1.00 ～ 4.00	1.00 ～ 6.00				4,400	5,290
				5		20			1.00 ～ 6.00	1.00 ～ 6.00					4,820	5,570
				6.5		22				1.00 ～ 9.00					5,010	6,180
				8		25				1.00 ～ 12.00					5,010	6,600
6.5	11	10.5	M6	5		22	13	20	1.00 ～ 6.00	1.00 ～ 6.00	1.00 ～ 9.00				5,010	6,180
				6.5		25				1.00 ～ 9.00					5,640	6,600
				8		28		22	1.00 ～ 9.00	1.00 ～ 12.00					5,820	7,200
				10		32				1.50 ～ 16.00					5,850	8,090
				6.5		25	16	25	1.00 ～ 9.00	1.00 ～ 9.00	1.00 ～ 12.00				6,050	7,530
				8		28			1.00 ～12.00	1.00 ～ 12.00					6,750	7,950
				10		32				1.50 ～ 16.00					6,880	8,940
				12.5		38		30		1.50 ～ 21.00					6,880	9,640
8	14	12.5	M8	8		32	20	35	1.00 ～12.00	1.00 ～ 12.00	1.50 ～ 16.00				7,080	8,940
				10		35			1.50 ～16.00	1.50 ～ 16.00					7,920	9,500
				12.5		40				1.50 ～ 21.00					8,100	10,380
				15		45				1.50 ～ 26.00					8,100	11,080
				10		35	25		1.50 ～16.00	1.50 ～ 16.00	1.50 ～ 21.00				8,100	10,380
				12.5		40				1.50 ～ 21.00					9,220	11,080
				15		45			1.50 ～21.00	1.50 ～ 26.00					9,400	11,960
				17.5		50				1.50 ～ 31.00					9,400	12,660

Ⓟ P・W・R 0.01mm increments
Ⓟ Applied only to the workpiece which has the tensile strength up to 1177N/mm² (120kgf/mm²).
Ⓟ The thickness of workpiece and the clearance are only used for scrap retention machining data. Specify the dimension of shaped hole (P, W, R) with the finished dimension of block die.

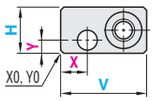
Order

(1) When the shaped hole is on the center of shank.



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (Ⓡ only)	—	MT	—	C
SR—BBDD	25	13	—	20	—	P6.34	—	W4.65			—	MT1.50	—	C0.105

(2) When the shaped hole is not on the center of shank. (Shaped hole Ⓐ only)



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (Ⓡ only)	—	MT	—	C	—	0.01mm increments X—Y
SR—BBDD	25	13	—	20	—	P6.34	—	W4.65			—	MT1.50	—	C0.105	—	X6.35— Y9.5

Ⓟ Limit value of X and Y

Shape Ⓐ $2.5+\frac{P}{2} \leqq X \leqq V-(2.5+\frac{P}{2})-(K+\frac{d}{2})$ $2.5+\frac{P}{2} \leqq Y \leqq H-(2.5+\frac{P}{2})$

Ⓟ Tolerance : X,Y±0.005
Ⓟ Please note that specifying method for shaped hole of block punch and determination of X and Y is different.

Delivery 3 Days — Express A 800/1Pc. P.38

Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

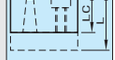
■Volume discount rate P.37

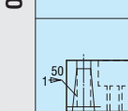
Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No.	V	H	—	L (LC)	—	P—W—R	—	MT	—	C	—	(BC・LKC…etc.)
SR—BBD	25	13	—	LC18	—	P1.5	—	0.5	—	0.04	—	BC3—LKC — ANF1.2

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Shaped hole		BC	Changes the depth of shaped hole. 1≦BC≦Bmax. 0.1mm increments P: 1.00～1.99 / 2.00～ — Bmax.: 3 / 4	Changes the depth of shaped hole. 1≦BC<2 0.1mm increments	200
		PKC	Changes the tolerance of shaped hole depth. P +0.01 0 ⇨ +0.005 0	Changes the tolerance of shaped hole depth. P・W±0.01 ⇨ +0.01 0	400
Full length		LC	Changes the full length. 16<LC<35 0.1mm incr. (Comb. with LKC・LKZ→0.01mm incr.)		200
		LKC	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.05 0		400
		LKZ	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.01 0		600

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Others		VKC1	Changes V・H tolerance. V・H +0.01 0 ⇨ +0.005 0		600
		VKC2	Changes V・H tolerance. V・H +0.01 0 ⇨ 0 −0.005		600
		NDC	No press-in lead		0
		ANF	Changes back relief angle. 0≦ANF≦1.2 0.2° increments Ⓟ d≦ dmax Ⓟ d=P+2{(L−B) tan(ANF°)} Ⓟ P−B tan(ANF°)≧0.6 W−B tan(ANF°)≧0.6 ⊗ When the shaped hole is not in the center of shank : Not applicable.		200

ANF° ±20'

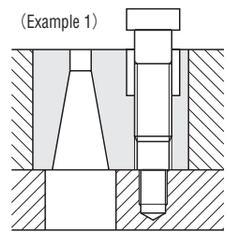
H	d max
8	4.4
10	6.4
13	8.4
16	10.6
20	12.6
25	14.6
Taper Angle	1/50 0.573°

Example

■Features
1. Able to maintenance without disassembling dies.
2. Minor adjustment is possible after the die assembly by using shims etc.

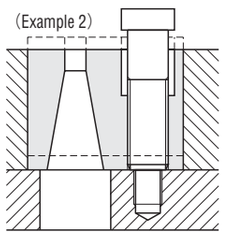
(Examples of use of tap)

(Example 1)



Screw a bolt into the die's tapping hole, and pull it out of the die plate.

(Example 2)



Screw a bolt into the die's tapping hole, the die comes out of the die plate.

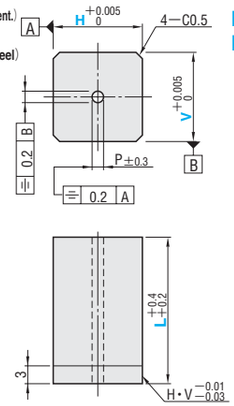
BLOCK DIE BLANKS

The volume discount rate is also applicable to alteration cost. P.39

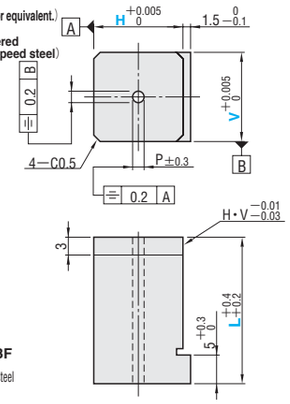
—Straight type— RoHS

—Single flanged type—

BLDB (SKD11 or equivalent.)
PBLDB (Powdered high-speed steel)



BLDBF (SKD11 or equivalent.)
PBLDBF (Powdered high-speed steel)



·BLDB ·BLDBF
M SKD11
H 60～63HRC

·PBLDB ·PBLDBF
M Powdered high-speed steel
H 64～67HRC

Catalog No.	H \ V	6	8	10	13	16	20	25	L	P
Straight type BLDB PBLDB / Single flanged type BLDBF PBLDBF	6	○	○	○	○	○	○	○	16	0.8
	8		○	○	○	○	○	○	20	
	10			○	○	○	○	○	22	
	13				○	○	○	○	25	
	16					○	○	○	30	
	20						○	○	35	
	25							○		

Order — Catalog No. V H — L
PBLDB 08 06 — 16

Delivery 3 Days

Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

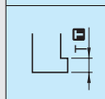
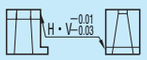
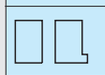
■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration — Catalog No. V H — L(LC) — (HC・TC・TKC…etc.)
BLDBF 13 10 — 20 — TC4

Catalog No.	H \ V	6	8	10	13	16	20	25
BLDB	6	1,790	1,790	1,790	2,730	3,070	3,500	3,670
	8		1,870	1,870	2,810	3,070	3,580	3,670
	10			1,870	2,810	3,070	3,580	3,670
	13				2,980	3,240	3,840	3,920
	16					3,240	3,840	3,920
	20						4,010	4,090
	25							4,090
PBLDB	6	2,810	2,810	2,810	3,960	4,400	4,660	4,930
	8		2,900	2,900	4,050	4,400	4,840	4,930
	10			2,900	4,050	4,400	4,840	4,930
	13				4,310	4,660	5,190	5,280
	16					4,660	5,190	5,280
	20						5,370	5,460
	25							5,460
BLDBF	6	2,130	2,130	2,130	3,240	3,670	4,180	4,440
	8		2,210	2,210	3,410	3,670	4,270	4,440
	10			2,210	3,410	3,670	4,270	4,440
	13				3,580	3,920	4,610	4,690
	16					3,920	4,610	4,690
	20						4,780	4,950
	25							4,950
PBLDBF	6	3,340	3,340	3,340	4,750	5,280	5,630	5,900
	8		3,520	3,520	4,840	5,280	5,810	5,900
	10			3,520	4,840	5,280	5,810	5,900
	13				5,190	5,630	6,250	6,340
	16					5,630	6,250	6,340
	20						6,430	6,520
	25							6,520

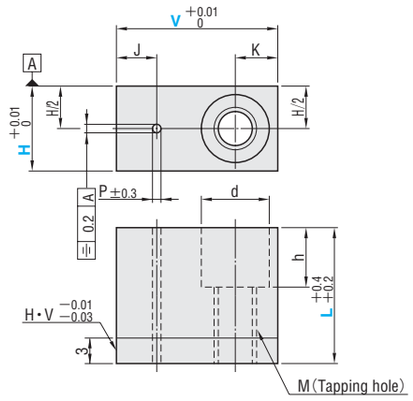
Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes the full length. 10≦LC＜L 0.1mm incr. (Comb. with LKC・LKZ→0.01mm incr.) In case of LC≦12 of flange type, H・V (press-in lead) is not adoptable.	200
		LKC	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.05 0	400
		LKZ	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.01 0	600
Flange		HC	Changes the flange height. 0≦HC＜1.5 0.1mm increments	200
		TC	Changes the flange thickness. 2≦TC＜5 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) L is shortened by (5−TC). When LC, L=LC.	200
		TKC	Changes the flange thickness tolerance. T +0.3 0 ⇨ +0.02 0	200
		TKM	Changes the flange thickness tolerance. T +0.3 0 ⇨ 0 −0.02	200
Others		VHM	Changes H, V tolerance. H・V +0.005 0 ⇨ 0 −0.005	400
		NDC	 ⇨No press-in lead	0
		NHC	No start hole (P)	−100

BLOCK DIE BLANKS
—BOLT FIXING TYPE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

BBDB



Bolt for tapped hole is larger than mounting bolt by 1 size.

Mounting bolt	M (Tapped hole)
M3	M4
M4	M5
M6	M8
M8	M10

M SKD11 or equivalent.
H 60～63HRC

K	Mounting bolt d	h	Size	J	Catalog No.	V	H	L	P	U/Price Q'ty：1～9
4	6	7.5	M3	3	BBDB	13	8	16	0.8	2,630
				4		16				
				5		18				2,750
				6.5		20				
5	8	8.5	M4	4		18	10			2,750
				5		20				
				6.5		22				2,940
				8		25		20		
6.5	11	10.5	M6	5		22	13			2,940
				6.5		25				
				8		28				3,110
				10		32				
				6.5		25	16	22		3,110
				8		28				
				10		32				3,230
				12.5		38				
8	14	12.5	M8	8		32	20	25		3,230
				10		35				
				12.5		40				3,420
				15		45				
				10		35	25	30		3,420
				12.5		40				
				15		45				3,600
				17.5		50		35		

Order — Catalog No. V H — L
BBDB 25 13 — 20

Delivery 3 Days

Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

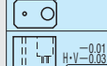
■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration — Catalog No. V H — L(LC) — (CC・LKC…etc.)
BBDB 25 13 — LC18.0 — LKC

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes the full length. 16＜LC＜L 0.1mm incr. (Comb. with LKC・LKZ→0.01mm incr.)	200
		LKC	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.05 0	400
		LKZ	Changes the full length tolerance. L +0.4 +0.2 ⇨ +0.01 0	600

Alterations		Code	Spec.	¥/1Code
Others		VKC1	Changes V・H tolerance. V・H +0.01 0 ⇨V・H +0.005 0	600
		VKC2	Changes V・H tolerance. V・H +0.01 0 ⇨V・H 0 −0.005	600
		CC	Adds C0.5 chamfering at 4 corners of V・H.	400
		NDC	No press-in lead	0
		NHC	No start hole (P)	−100

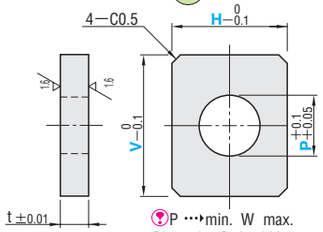
SPACERS FOR BLOCK DIE

The volume discount rate is also applicable to alteration cost. P.39

RoHS

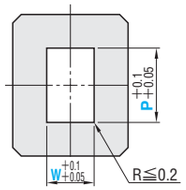
M SK5
H 45HRC～

Shape A



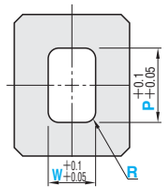
Ⓟ P ⋯▸min. W max.
Dimension P should be specified within the range of dimension W.

Shape D



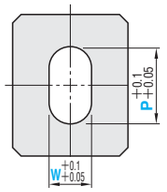
Ⓟ P≧W

Shape R



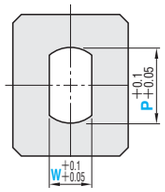
Ⓟ P≧W
Ⓟ 0.20≦ R<$\frac{W}{2}$

Shape E



Ⓟ P>W

Shape G



Ⓟ P>W

Catalog No.	H	V min. W max. / min. P max.	6 (1.00～4.00)	8 (1.00～6.00)	10 (1.00～8.00)	13 (1.00～10.00)	16 (1.00～12.00)	20 (1.50～16.00)	25 (1.50～20.00)	R Ⓡ	t
A SBD	6	1.00～ 4.00	○	○	○	○	○	○	○	0.20≦R<$\frac{W}{2}$ (Ⓡ only)	0.05
D SBDD	8	1.00～ 6.00		○	○	○	○	○	○		0.1
R SBDR	10	1.00～ 8.00			○	○	○	○	○		0.2
E SBDE	13	1.00～10.00				○	○	○	○		0.3
G SBDG	16	1.00～12.00					○	○	○		0.5
	20	1.50～16.00						○	○		1.0
	25	1.50～20.00							○		1.5
											2.0

Ⓟ 1 set consists of 8 spacers (1 piece for each t size).　Ⓟ P・W・R ⋯▸0.01mm increments

Order

Catalog No.	V	H	—	0.01mm increments P	—	W	—	R (Ⓡ only)
SBDE	13	10	—	P8.50	—	W6.50		

Delivery

3 Days　Express A 800/1Pc. P.38

Ⓟ A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～4 sets	5～9	10～29	30～50
Rate	—	5%	10%	15%

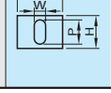
Ⓟ To be quoted on price & lead time above Max. Q'ty.

■U/Price (1set：8spacers)

H \ V	6	8	10	13	16	20	25
6	2,650	2,650	2,650	2,870	2,870	3,160	3,160
8		2,680	2,680	3,140	3,140	3,620	3,620
10			2,680	3,140	3,140	3,620	3,620
13				3,510	3,510	3,980	3,980
16					3,510	3,980	3,980
20						4,450	4,450
25							4,450

Alteration

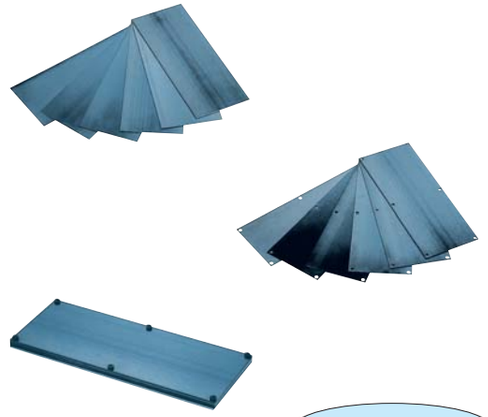
Catalog No. | V | H | — | P — W — R | —(HVC)
SBDR | 25 | 20 | — | P16.55 — W12.55 — R2.00 | — | HVC

Alteration		Code	Spec.	¥/1Code
Shaped hole		HVC	Reverses H and V. Machining P for H, and W for V Ⓟ P⋯▸min. W max. ⊗ Ⓐ SBD：Not available.	0

PRODUCTS RELATED TO SHIM AND SPACER

■Multilayer plates for spacer P.751

RoHS



Dimension T (thickness)：0.05mm～

LHP　：Sold in single units (without hole)
LHP—H　：Sold in single units (with hole)
LHP—SET：Multilayer set (variety of sets)

■Precision multipurpose plates P.753

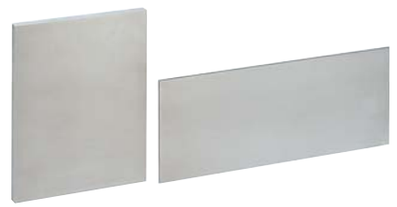
RoHS

Dimension T (thickness)：0.3mm～

UTPB：Dimension L standard length (150mm)
UTPL：Dimension L specified type (10～150mm)

■Harden plates P.1181

RoHS



Dimension T (thickness)：0.5mm～

※HPSH is available from thickness of 1.0mm.

HPSH：
HPHE：
SKH51
There are differences in thickness tolerance and precision standard.
(See each product's page for details)

■Shim tapes P.752

RoHS

Dimension T (thickness)：0.005mm～

FGSM　：Width 12.7mm, length 1m
FGSMW：Width 45.0mm, length 1m
FGSML：Width 12.7mm, length 5m (value pack)

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

PRECISION PUNCHES & DIES

PRECISION PUNCHES & DIES

Name / Catalog No.	PRECISION SHOULDER PUNCHES –Standard type–	–Lapping type–	PRECISION SHOULDER PUNCHES WITH AIR HOLE –Standard type–	–Lapping type–	PRECISION CARBIDE SHOULDER PUNCHES –Standard type–	–Lapping type–	PRECISION CARBIDE SHOULDER PUNCHES WITH AIR HOLE –Standard type–	–Lapping type–
Delivery	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤
Page	419	419	420	420	421	421	422	422

PRECISION CARBIDE SHOULDER QUILL PUNCHES –Standard type–	–Lapping type–	PRECISION PUNCHES WITH KEY GROOVE –Standard type–	–Lapping type–	PRECISION PUNCHES WITH KEY GROOVE AND AIR HOLE –Standard type–	–Lapping type–	PRECISION CARBIDE PUNCHES WITH KEY GROOVE –Standard type–	–Lapping type–	PRECISION CARBIDE PUNCHES WITH KEY GROOVE AND AIR HOLE –Standard type–	–Lapping type–
⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤
423	423	425	425	426	426	427	427	428	428

PRECISION ROUND PUNCHES –Standard type–	–Lapping type–	PRECISION CARBIDE ROUND PUNCHES –Standard type–	–Lapping type–	PRECISION CARBIDE BLOCK PUNCHES	PRECISION CARBIDE BLOCK PUNCHES WITH AIR HOLE	PRECISION CARBIDE STRAIGHT PUNCHES
⑤	⑤	⑤	⑤	⑩	⑩	⑩
429	429	430	430	431	433	435

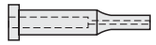
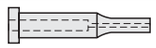
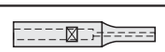
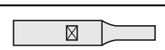
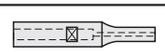
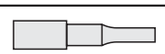
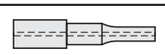
PRECISION CARBIDE STRAIGHT PUNCHES WITH AIR HOLE	PRECISION CARBIDE PILOT PUNCHES –Standard type–	–Lapping type–	PRECISION CARBIDE PILOT PUNCHES–Fixed in stripper plate– –Standard type–	–Lapping type–	PRECISION CARBIDE PILOT PUNCHES–Fixed in stripper plate– –Standard type–	–Lapping type–
⑩	⑤	⑤	⑤	⑤	⑤	⑤
437	441	441	442	442	442	442

Add.

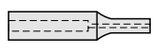
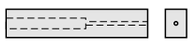
PRECISION ANGULAR BUTTON DIES –Fully tapered type–	PRECISION CARBIDE ANGULAR BUTTON DIES	PRECISION SCRAP RETENTION CARBIDE ANGULAR BUTTON DIES	PRECISION CARBIDE ANGULAR BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP
⑤	⑤	⑤	⑤
443	444	445	446

PRECISION PUNCHES AND DIES
—GUIDE—

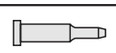
■List of precision punches

Shank profile		Material	Shank diameter tolerance	Standard		Lapped finish	
Precision shoulder punches		SKD11 or equivalent Powdered high-speed steel	D $^{+0.005}_{0}$	VSPA□ VPHA□	P.419	L—VSPA□ L—VPHA□	P.419
Precision shoulder punches with air hole		SKH51 Powdered high-speed steel	D $^{+0.005}_{0}$	VSJA□ VPJA□	P.420	L—VSJA□ L—VPJA□	P.420
Precision carbide shoulder punches		V30(HIP) Superfine particles(HIP)	D $^{+0.002}_{0}$	VPA□ VXPA□	P.421	L—VPA□ L—VXPA□	P.421
Precision carbide shoulder punches with air hole		V30(HIP) Superfine particles(HIP)	D $^{+0.002}_{0}$	VJA□ VXJA□	P.422	L—VJA□ L—VXJA□	P.422
Precision quill carbide shoulder punches		V30(HIP) Superfine particles(HIP)	L20~30 D $^{+0.002}_{0}$ L35~50 D $^{+0.003}_{0}$	VPA□ VXPA□	P.423	L—VPA□ L—VXPA□	P.423
Precision punches with key groove		SKD11 or equivalent Powdered high-speed steel	D $^{+0.005}_{0}$	VSKA□ VPKA□	P.425	L—VSKA□ L—VPKA□	P.425
Precision punches with key groove and air hole		SKH51 Powdered high-speed steel	D $^{+0.005}_{0}$	VSKJA□ VPKJA□	P.426	L—VSKJA□ L—VPKJA□	P.426
Precision carbide punches with key groove		V30(HIP) Superfine particles(HIP)	D $^{+0.002}_{0}$	VKA□ VXKA□	P.427	L—VKA□ L—VXKA□	P.427
Precision carbide punches with key groove and air hole		V30(HIP) Superfine particles(HIP)	D $^{+0.002}_{0}$	VJKA□ VXJKA□	P.428	L—VJKA□ L—VXJKA□	P.428
Precision round punches		SKD11 or equivalent Powdered high-speed steel	D $^{+0.005}_{0}$	VSPTAL VPHTAL	P.429	L—VSPTAL□ L—VPHTAL□	P.429
Precision carbide round punches		Superfine particles(HIP)	D $^{+0.002}_{0}$	VXPHAL	P.430	L—VXPHAL	P.430
Precision carbide round punches with air hole		Superfine particles(HIP)	D $^{+0.002}_{0}$	VXJHAL	P.430	L—VXJHAL	P.430

■List of precision carbide block punches

Shank profile		Material	type	Standard	
precision carbide block punches		V30(HIP)	Standard With tap With key groove Single flanged Double flanged	VZP□BL VZP□ML VZP□KL VZP□FL VZP□WL	P.431
Precision carbide block punches with air hole		V30(HIP)	Standard With key groove Single flanged Double flanged	VZJ□BL VZJ□KL VZJ□FL VZJ□WL	P.433
Precision carbide straight punches		V30(HIP)	Standard With tap With key groove Single flanged Double flanged	VZPC□ VZMC□ VZKC□ VZFC□ VZWC□	P.435
Precision carbide straight punches with air hole		V30(HIP)	Standard With key groove Single flanged Double flanged	VZJC□ VZJKC□ VZJFC□ VZJWC□	P.437

■List of precision carbide pilot punches

Shank profile		Material	Tip profile	Shank diameter tolerance	Standard		Lapped finish	
Precision carbide pilot punches		V30(HIP) Superfine particles(HIP)	Taper	D $^{+0.002}_{0}$	VTPA□ VXTPA□	P.441	L—VTPA□ L—VXTPA□	P.441
Precision carbide pilot punches Fixed in stripper plate		V30(HIP) Superfine particles(HIP)		D $^{+0.002}_{0}$	VTPTP VXTPTP	P.442	L—VTPTP L—VXTPTP	P.442
Precision carbide straight type pilot punches Fixed in stripper plate		V30(HIP) Superfine particles(HIP)		—	VTPT VXTPT	P.442	L—VTPT L—VXTPT	P.442

■List of precision angular button dies

Types of button dies		Material	O.D. tolerance	Scrap retention function: Without scrap retention function	Page	Scrap retention function: With scrap retention function	Page	Scrap clogging countermeasure	Page
Precision Angular Fully tapered With head		D3~5 SKH51 D6・8 SKD11 or equivalent Powdered high-speed steel V40(HIP)	D $^{+0.005}_{0}$	VSAHD VPAHD VWAHD	P.443				
Precision Angular Fully tapered Straight		D3~5 SKH51 D6・8 SKD11 or equivalent Powdered high-speed steel V40(HIP)	D $^{+0.005}_{0}$	VSASD VPASD VWASD	P.443				
Precision carbide Angular With head		V40(HIP) Superfine particles(HIP)	D $^{+0.002}_{0}$	VAHD VXAHD	P.444	SR—VAHD SR—VXAHD	P.445	SV—VAHD SV—VXAHD	P.446
Precision carbide Angular Straight		V40(HIP) Superfine particles(HIP)		VASD VXASD	P.444	SR—VASD SR—VXASD	P.445	SV—VASD SV—VXASD	P.446

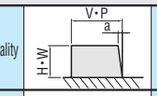
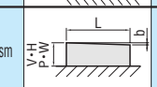
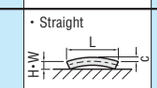
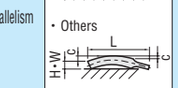
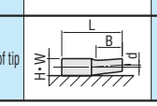
■Precision standard of carbide punches

Precision standard		
Roundness		D(shank) a≦0.0015 P(tip) P<1.000 a≦0.0020 P≧1.000 a≦0.0015
Eccentricity of shank and tip		b≦0.003

■Precision standard of carbide pilot punches

Precision standard		
Roundness		D(shank) a≦0.0015 P(tip) P<1.000 a≦0.0020 P≧1.000 a≦0.0015
Eccentricity of shank and tip		b≦0.003

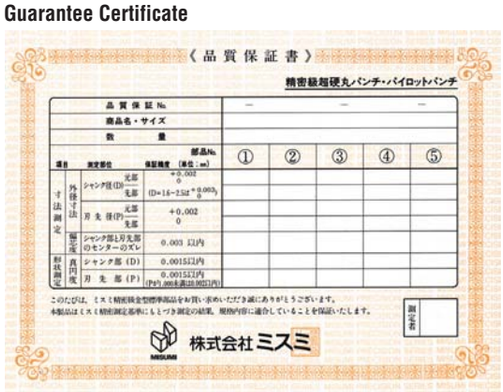
■Precision standard of carbide block punches

Precision standard		
Orthogonality		a≦0.003
Parallelism		b≦0.003
Parallelism	・Straight  ・Others 	c≦0.003
Bending of tip		d≦0.003

■Accuracy guarantee

To ensure that customers can use PRECISION carbide punches , each punch is measured both during manufacture and also after being left in a thermostatic chamber for a certain period subsequent to manufacture, and a "Quality Guarantee Certificate" indicating the measured values is attached to the product.

■Quality Guarantee Certificate


《品質保証書》

精密級超硬丸パンチ・パイロットパンチ

品質保証No. — — —

商品名・サイズ

数量

項目	測定部位	保証精度 (単位：mm)	部品No. ①	②	③	④	⑤
寸法測定 外径寸法	シャンク径(D) 先部	$^{+0.002}_{0}$					
	シャンク径(D) 元部	(D=16~25は $^{+0.003}_{0}$)					
	刃先径(P) 先部	$^{+0.002}_{0}$					
	刃先径(P) 元部						
偏芯度	シャンク部と刃先部のセンターのズレ	0.003 以内					
形状測定 真円度	シャンク部(D)	0.0015以内					
	刃先部(P)	0.0015以内 (P≦1.00も適用対応可)					

このたびは、ミスミ精密級全型標準部品をお買い求めいただき誠にありがとうございます。
本製品はミスミ精密測定基準にもとづき測定の結果、規格内容に適合していることを保証いたします。

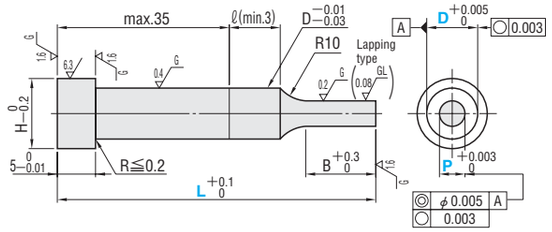
株式会社ミスミ

測定者

※A "Quality Guarantee Certificate" is attached only to a carbide product.
The accuracy standard for a steel product differs from the above.
Please refer to the relevant pages for details.

PRECISION SHOULDER PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS —Lapping type—	SKD11 or equivalent 60～63HRC	VSPAS VSPAL Lapping type L—VSPAS L—VSPAL	
	Powdered high-speed steel 64～67HRC	VPHAS VPHAL Lapping type L—VPHAS L—VPHAL	

Catalog No. Type	D	L	0.001 mm increments min. P max.	B	H
S VSPAS VPHAS Lapping type L—VSPAS L—VPHAS	3	40 45 50 55 60	1.000 ～ 2.990	8	5
	4	40 45 50 55 60 65 70	1.000 ～ 3.990		7
	5	40 45 50 55 60 65 70	2.000 ～ 4.990		8
	6	40 45 50 55 60 65 70	2.000 ～ 5.990		9
L VSPAL VPHAL Lapping type L—VSPAL L—VPHAL	3	50 55 60	1.000 ～ 2.990	13	5
	4	50 55 60 65 70	1.000 ～ 3.990		7
	5	50 55 60 65 70	2.000 ～ 4.990		8
	6	50 55 60 65 70	2.000 ～ 5.990		9

P>D−0.03 ···› ℓ=0 When P>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order Catalog No. — L — P
VSPAS 4 — 50 — P2.000

Delivery 5 Days

Price

Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	VSPAS VSPAL	VPHAS VPHAL	L—VSPAS L—VSPAL	L—VPHAS L—VPHAL
3	2,910	2,980	3,930	4,120
4	2,920	3,010	3,940	4,150
5	2,940	3,030	3,960	4,170
6	3,110	3,230	4,130	4,370

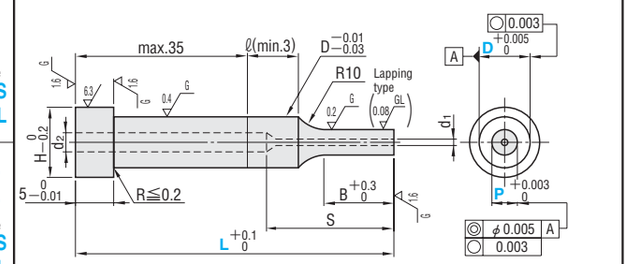
Alteration Catalog No. — L(LC) — P(PC) — (BC・HC・TC···etc.)
VSPAS 4 — 50 — P2.000 — TC4 — LKC — KFC150

Alterations		Code	Spec.	¥/1Code
Blade		PC	Changes blade diameter P PC≧Pmin./2 0.001 mm increments P: 0.500～0.799 Bmax. 6; 0.800～0.999 8; 1.000～1.999 13; 2.000～ 19	200
		BC	Changes blade length B. 2≦BC≦Bmax. 0.1 mm increments Full length L (LC) requires BC+25mm or more.	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 PCC・GC : Not applicable	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 PRC・GC : Not applicable	200
		GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B≧f+2 f=P/2×tan(90°−GC°) P≦1.000 : Not applicable LKC・PRC・PCC : Not applicable The edge of lapping type is rounded.	400
Full length		LC	Changes full length. 25+B(C)≦LC<L 0.1mm increments (Combination with LKC→0.01mm increments) When LC−B (or BC) is 25mm or less, B (or BC) is LC−25mm.	200
		LKT	Changes full length tolerance. L $^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	600

Alterations		Code	Spec.	¥/1Code
Head		KC	Adds single key flat at head.	200
		WKC	Adds double key flats in parallel.	400
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments KC・WKC : Not applicable	600
		HC	Changes head diameter. D≦HC<H 0.1 mm increments	200
		TC	Changes head thickness. 2≦TC<T 0.1 mm increments L is shortened by (T−TC). When LC, L=LC.	200
		TCC	Adds chamfering at head. Strengthen the punch head. P.1223 0.5≦TCC≦(H−D)/2 0.1mm increments H≦5 : TCC0.5	200
Shank		SKC	Adds key flat on shank. P≦D−1.2 (Machining width 0.5) KC・WKC・KFC : Not applicable	600
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	0

PRECISION SHOULDER PUNCHES WITH AIR HOLE

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS —Lapping type—	SKH51 61～64HRC	VSJAS VSJAL Lapping type L—VSJAS L—VSJAL	
	Powdered high-speed steel 64～67HRC	VPJAS VPJAL Lapping type L—VPJAS L—VPJAL	

Catalog No. Type	D	L	0.001mm increments min. P max.	B	d1	S	d2	H
S VSJAS VPJAS Lapping type L—VSJAS L—VPJAS	4	40 45 50 55 60	1.500 ～ 3.990	8	0.5	20	1.2	7
	5	(40) 45 50 55 60 65 70	2.000 ～ 4.990		0.8		2.1	8
	6	(40) 45 50 55 60 65 70	2.000 ～ 5.990				2.6	9
L VSJAL VPJAL Lapping type L—VSJAL L—VPJAL	4	50 55 60	1.500 ～ 3.990	13	0.5	20	1.2	7
	5	50 55 60 65 70	2.000 ～ 4.990		0.8		2.1	8
	6	50 55 60 65 70	2.000 ～ 5.990				2.6	9

L(40) ···› S=17 When L(40), dimension S is 17mm.

P>D−0.03 ···› ℓ=0 When P>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order Catalog No. — L — P
VSJAL 6 — 50 — P5.105

Delivery 5 Days

Price

Volume discount rate P.37

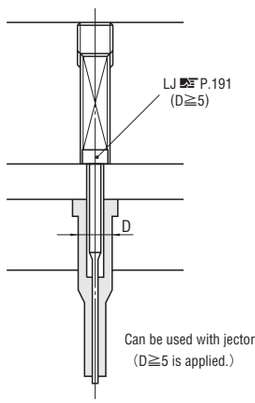
Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	VSJAS VSJAL	VPJAS VPJAL	L—VSJAS L—VSJAL	L—VPJAS L—VPJAL
4	3,120	3,210	4,140	4,350
5	3,190	3,280	4,210	4,420
6	3,390	3,510	4,410	4,650

Alteration Catalog No. — L(LC) — P(PC) — (BC・HC・TC···etc.)
VSJAL 6 — 50 — P5.105 — TC4 — LKC

Example



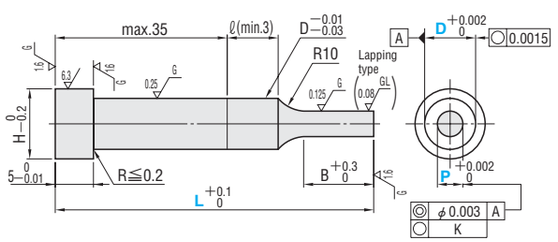
Alterations		Code	Spec.	¥/1Code
Blade		PC	Changes blade diameter P PC≧PCmin. 0.001mm increments D: 5 PCmin. 1.800; 6 1.800 D4 : Not applicable	200
		BC	Changes blade length B. 2≦BC<B 0.1mm increments	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 PCC : Not applicable	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 PRC : Not applicable	200
Full length		LC	Changes full length. LC<L 0.1mm increments (Combination with LKC→0.01mm increments) B and S are shortened by (L−LC).	200
		LKT	Changes full length tolerance. L $^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	600

Alterations		Code	Spec.	¥/1Code
Head		KC	Adds single key flat at head.	200
		WKC	Adds double key flats in parallel.	400
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments KC・WKC : Not available	600
		HC	Changes head diameter. D≦HC<H 0.1mm increments	200
		TC	Changes head thickness. 2≦TC<5 0.1mm increments L is shortened acording to (5−TC). When LC, L=LC.	200
		TCC	Adds chamfering at head. Strengthen the punch head. P.1223 0.5≦TCC≦(H−D)/2 0.1mm increments H≦5 : TCC0.5	200
Shank		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	0

PRECISION CARBIDE SHOULDER PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS —Lapping type—	V30(HIP) 88～89HRA	VPAS VPAL Lapping type L—VPAS L—VPAL	
	Super corpuscle (HIP) 90～92HRA	VXPAS VXPAL Lapping type L—VXPAS L—VXPAL	



P＜1.000 ⋯▸ K≦0.0020
P≧1.000 ⋯▸ K≦0.0015

Catalog No. Type	D	L	0.001 mm increments min. P max.	B	H
S Lapping type VPAS L—VPAS VXPAS L—VXPAS	3	40 45 50 55 60	1.000 ～ 2.990	8	5
	4	40 45 50 55 60 65 70	1.000 ～ 3.990		7
	5	40 45 50 55 60 65 70	2.000 ～ 4.990		8
	6	40 45 50 55 60 65 70	2.000 ～ 5.990		9
L Lapping type VPAL L—VPAL VXPAL L—VXPAL	3	50 55 60	1.000 ～ 2.990	13	5
	4	50 55 60 65 70	1.000 ～ 3.990		7
	5	50 55 60 65 70	2.000 ～ 4.990		8
	6	50 55 60 65 70	2.000 ～ 5.990		9

P＞D−0.03 ⋯▸ ℓ＝0 When P＞D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order Catalog No. — L — P
VPAS 4 — 50 — P2.000

Price

Delivery 5 Days

Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	VPAS VPAL	VXPAS VXPAL	L—VPAS L—VPAL	L—VXPAS L—VXPAL
3	9,830	10,700	10,590	11,460
4	10,030	10,900	10,790	11,660
5	10,100	10,960	10,860	11,720
6	10,160	11,030	10,920	11,790

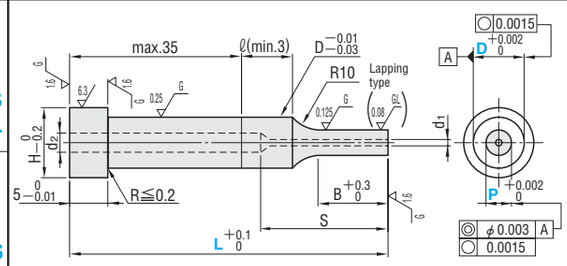
Alteration Catalog No. — L(LC) — P(PC) — (BC・HC・TC⋯etc.)
VPAS 4 — 50 — P2.000 — TC4 —LKC

Alterations	Code	Spec.	¥/1Code
Blade PC	PC	Changes blade diameter P PC≧Pmin./2 0.001 mm increments (P 0.500～0.799 Bmax. 6; 0.800～0.999 8; 1.000～1.999 13; 2.000～ 19)	1,200
Blade BC	BC	Changes blade length B. 2≦BC≦Bmax. 0.1 mm increments Full length L (LC) requires BC+25mm or more.	2,000
Blade PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 ⊗PCC・GC：Not applicable	2,000
Blade PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 ⊗PRC・GC：Not applicable	1,600
Blade GC	GC	Changes to pointed tip. 20°≦GC＜90° 1° increments Blade length B ≧ f+2 f=P/2×tan(90°−GC°) ⊗P≦1.000：Not applicable ⊗LKC・PRC・PCC：Not applicable The edge of lapping type is rounded.	1,200
Full length LC	LC	Changes full length. 25+B(C)≦LC＜L 0.1mm increments (Combination with LKC→0.01mm increments) When LC−B (or BC) is 25mm or less, B (or BC) is LC−25mm. When LC30.1～LC34.9 (LC30.01～LC34.99 when LKC combined), D T $^{+0}_{-0.003}$	600
Full length LKC	LKC	Changes full length tolerance. L $^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	1,600
Head KC	KC	Adds single key flat at head. ⊗KFC：Not applicable	600
Head WKC	WKC	Adds double key flats in parallel. ⊗KFC：Not applicable	1,200
Head KFC	KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC：Not applicable	1,200
Head HC	HC	Changes head diameter. D≦HC＜H 0.1 mm increments	600
Head TC	TC	Changes head thickness. 2≦TC＜T 0.1 mm increments L is shortened according to (T−TC). When LC, L=LC.	600
Head TCC	TCC	Adds chamfering at head. Strengthen the punch head. P.1223 0.5≦TCC≦(H−D)/2 0.1mm increments H≦5：TCC0.5	600
Shank SKC	SKC	Adds key flat on shank. P≦D−1.2 (Machining width 0.5) ⊗KC・WKC・KFC：Not applicable	1,800
Shank NDC	NDC	No press-in lead ℓ≧3 ⇨ ℓ＝0	0

PRECISION CARBIDE SHOULDER PUNCHES WITH AIR HOLE

The volume discount rate is also applicable to alteration cost. P.39

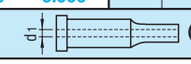
Type	M H	Catalog No.	Shape
RoHS —Lapping type—	V30(HIP) 88～89HRA	VJAS VJAL Lapping type L—VJAS L—VJAL	
	Super corpuscle (HIP) 90～92HRA	VXJAS VXJAL Lapping type L—VXJAS L—VXJAL	



Air hole of the super corpuscle type is straight. Dimensions S and d_2 are not available.

Catalog No. Type	D	L	0.001mm increments min. P max.	B	d_1	S	d_2	H
S Lapping type VJAS L—VJAS VXJAS L—VXJAS	4	40 45 50 55 60	1.500 ～ 3.990	8	0.5	20	1.2	7
	5	(40) 45 50 55 60 65 70	2.000 ～ 4.990		0.8		2.1	8
	6	(40) 45 50 55 60 65 70	2.000 ～ 5.990				2.6	9
L Lapping type VJAL L—VJAL VXJAL L—VXJAL	4	50 55 60	1.500 ～ 3.990	13	0.5	20	1.2	7
	5	50 55 60 65 70	2.000 ～ 4.990		0.8		2.1	8
	6	50 55 60 65 70	2.000 ～ 5.990				2.6	9

L(40) ⋯▸ S=17 When L(40), dimension S is 17mm.
P＞D−0.03 ⋯▸ ℓ＝0 When P＞D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
Air hole of the super corpuscle type is straight. Dimensions S and d_2 are not available.



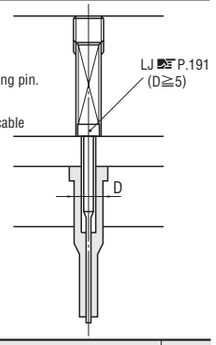
(VXJA□・L—VXJA□)

Order Catalog No. — L — P
VJAL 6 — 50 — P5.105

Price

Delivery 5 Days

Example
Can be used with jector long pin. (D≧5 is applied.)
available type：Not applicable



Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	VJAS VJAL	VXJAS VXJAL	L—VJAS L—VJAL	L—VXJAS L—VXJAL
4	11,100	12,030	11,860	12,790
5	11,490	12,430	12,250	13,190
6	11,890	12,820	12,650	13,580

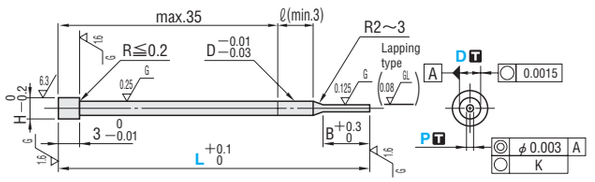
Alteration Catalog No. — L(LC・LCX) — P(PC) — (BC・HC・TC⋯etc.)
VJAL 6 — 50 — P5.105 — TC4—LKC

Alterations	Code	Spec.	¥/1Code
Blade PC	PC	Changes blade diameter P PC≧PCmin. 0.001mm increments (D 4 PCmin. 1.800; 5 1.800; 6 1.800) ⊗D4：Not applicable	1,200
Blade BC	BC	Changes blade length B. 2≦BC＜B 0.1mm increments	2,000
Blade PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 ⊗PCC：Not applicable	2,000
Blade PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 ⊗PRC：Not applicable	1,600
Full length LC	LC	Changes full length. LC＜L 0.1mm increments (Combination with LKC→0.01mm increments) B and S are shortened by (L−LC).	600
Full length LCX	LCX	Changes full length without changing blade length B. 25+B(BC)≦LCX＜L 0.1mm increments When LCX−B (or BC) is 25mm or less, B (or BC) is LCX−25mm. (Combination with LKC→0.01mm increments) ⊗V30：Not applicable	600
Full length LKC	LKC	Changes full length tolerance. L $^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	1,600
Head KC	KC	Adds single key flat at head. ⊗KFC：Not applicable	600
Head WKC	WKC	Adds double key flats in parallel. ⊗KFC：Not applicable	1,200
Head KFC	KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC：Not applicable	1,200
Head HC	HC	Changes head diameter. D≦HC＜H 0.1mm increments	600
Head TC	TC	Changes head thickness. 2≦TC＜5 0.1mm increments L is shortened by (5−TC). When LC, L=LC.	600
Head TCC	TCC	Adds chamfering at head. Strengthen the punch head. P.1223 0.5≦TCC≦(H−D)/2 0.1mm increments H≦5：TCC0.5	600
Shank SKC	SKC	Adds key flat on shank. P≦D−1.2 (Machining width 0.5) ⊗KC・WKC・KFC：Not applicable ⊗V30：Not applicable	1,800
Shank NDC	NDC	No press-in lead ℓ≧3 ⇨ ℓ＝0	0

PRECISION CARBIDE SHOULDER QUILL PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS —Lapping type—	V30(HIP) 88～89HRA	VPAS VPAL Lapping type L—VPAS L—VPAL	
	Super corpuscle (HIP) 90～92HRA	VXPAS VXPAL Lapping type L—VXPAS L—VXPAL	



L	D T
20～	+0.002 0
35～	+0.003 0

D	P T
～1.5	+0.005 0
1.6～	+0.002 0

P＜1.000 ⋯▸ K≦0.0020
P≧1.000 ⋯▸ K≦0.0015

B	H	Catalog No. Type	D	L	0.001 mm increments min. P max.	U/Price Q'ty：1～4 VPAS VPAL	VXPAS VXPAL	L—VPAS L—VPAL	L—VXPAS L—VXPAL
(4)	2.0	S Lapping type VPAS L—VPAS (D≧1.6)	1.0	20 25 30 35 40	0.150 ～ 0.990	—	—	—	—
	2.6		1.1	20 25 30 35 40	0.150 ～ 1.090	—	—	—	—
			1.2	20 25 30 35 40	0.150 ～ 1.190	13,480	14,720	—	—
			1.3	20 25 30 35 40	0.150 ～ 1.290				
			1.4	20 25 30 35 40	0.150 ～ 1.390				
			1.5	20 25 30 35 40	0.150 ～ 1.490				
4		VXPAS L—VXPAS (D≧1.6)	1.6	20 25 30 35 40 45 50 60	0.300 ～ 1.590	11,770	12,720	12,530	13,480
6	3.0		2.0	20 25 30 35 40 45 50 60	0.500 ～ 1.990				
8	3.5		2.5	20 25 30 35 40 45 50 60	1.000 ～ 2.490	9,490	10,440	10,250	11,200
(6)	2.0	L Lapping type VPAL L—VPAL (D≧1.6)	1.0	20 25 30 35 40	0.250 ～ 0.990	13,480	14,720	—	—
	2.6		1.1	20 25 30 35 40	0.250 ～ 1.090				
			1.2	20 25 30 35 40	0.250 ～ 1.190				
			1.3	20 25 30 35 40	0.250 ～ 1.290				
			1.4	20 25 30 35 40	0.250 ～ 1.390				
			1.5	20 25 30 35 40	0.250 ～ 1.490				
6		VXPAL L—VXPAL (D≧1.6)	1.6	30 35 40 45 50 60	0.500 ～ 1.590	11,770	12,720	12,530	13,480
8	3.0		2.0	30 35 40 45 50 60	0.800 ～ 1.990				
13	3.5		2.5	30 35 40 45 50 60	1.000 ～ 2.490	9,490	10,440	10,250	11,200

Blade length dimension B varies depending on dimension P. P＞D—0.03 ⋯▸ ℓ＝0 When P＞D—0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
Shape S : when P is 0.150～0.249, dimension B (4) is 3mm.
Shape L : when P is 0.250～0.399, dimension B (6) is 5mm.

Order

Catalog No.	L	P
VPAS 1.0	20	P0.200

Delivery 5 Days

Price

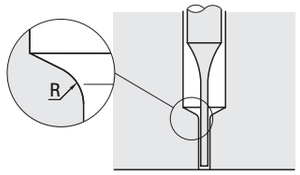
■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

WARNING : Tip Damage (P≦0.3)

(1) Pay extra attention to the tip when measuring it with a micrometer.
(2) Place the punch on a soft surface.
(3) Always use the punch with its tip inserted into the punch guide.
(4) Round off the punch guide edges.



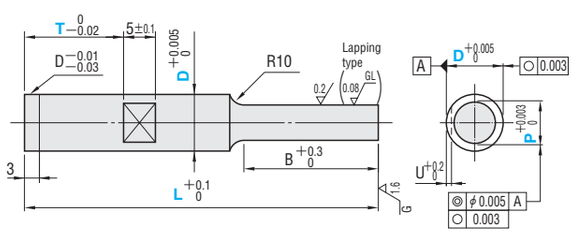
Alteration Catalog No. — L(LC) — P(PC) — (BC・HC・TC⋯etc.)
VPAS 1.0 — 20 — P0.200 — TC2 LKC

Alterations		Code	Spec.	¥/1Code
Blade		PC	Changes blade diameter P D≧1.6 PC≧Pmin./2≧0.300 0.001 mm increments ⊗Cannot be applied to D＜1.6. P: 0.300～0.499 Bmax. 4; 0.500～0.799 6; 0.800～0.999 8	1,200
		BC	Changes blade length B. 2≦BC＜B 0.1 mm increments	2,000
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P—0.2)/2 ⊗PCC・GC：Not applicable	2,000
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P—0.2)/2 ⊗PRC・GC：Not applicable	1,600
		GC	Changes to pointed tip. 20°≦GC＜90° 1° increments Blade length B ≧ f+2 f=P/2×tan(90°—GC°) ⊗P≦1.000：Not applicable ⊗LKC・PRC・PCC：Not applicable The edge of lapping type is rounded.	1,200
Full length		LC	Changes full length. Lmin.＜LC＜L 0.1 mm increments (Combination with LKC→0.01mm increments) In case of LC30.1～LC34.9 (LC30.01～LC34.99 when LKC combined), D T $^{+0.003}_{0}$	600
		LKC	Changes full length tolerance. L $^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	1,600

Alterations		Code	Spec.	¥/1Code
Head		KC	Adds single key flat at head. ⊗KFC：Not applicable	600
		WKC	Adds double key flats in parallel. ⊗KFC：Not applicable	1,200
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC：Not applicable	1,200
		HC	Changes head diameter. D≦HC＜H 0.1 mm increments	600
		TC	Changes head thickness. 2≦TC＜T 0.1 mm increments L is shortened by (T—TC). When LC, L=LC.	600
		TCC	Adds chamfering at head. Strengthen the punch head. P.1223 Ordering Code TCC 0.5 ⊗H＜2.6：Not available	600
Shank		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	0

PRECISION PUNCHES WITH KEY GROOVE

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS —Lapping type—	SKD11 or equivalent 60~63HRC	VSKAS VSKAL Lapping type L—VSKAS L—VSKAL	
	Powdered high-speed steel 64~67HRC	VPKAS VPKAL Lapping type L—VPKAS L—VPKAL	

Catalog No. Type	D	L	0.001 mm increments min. P max.	0.1mm increments T	B	U
S Lapping type VSKAS L—VSKAS VPKAS L—VPKAS	3	40 45 50 55 60	1.000 ~ 2.990	T≧2.0	8	0.5
	4	40 45 50 55 60 65 70	1.000 ~ 3.990			
	5	40 45 50 55 60 65 70	2.000 ~ 4.990			
	6	40 45 50 55 60 65 70	2.000 ~ 5.990			1.0
L Lapping type VSKAL L—VSKAL VPKAL L—VPKAL	3	50 55 60	1.000 ~ 2.990		13	0.5
	4	50 55 60 65 70	1.000 ~ 3.990			
	5	50 55 60 65 70	2.000 ~ 4.990			
	6	50 55 60 65 70	2.000 ~ 5.990			1.0

When no key groove is required, specify T=L.

Order Catalog No. — L — P — T

VPKAS 4 — 50 — P2.500 — T15.1

When no key groove is required, specify T=L.

Price

Delivery 5 Days

Alteration Catalog No.–L(LC)–P(PC)– T – (BC·LKC·UK···etc.)

VSKAS 3–40.0–PC0.800–T13.0

Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

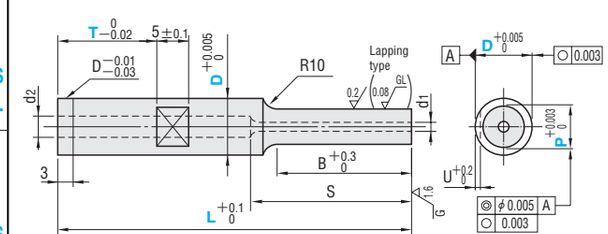
To be quoted on price & lead time above Max. Q'ty.

D	VSKAS VSKAL	VPKAS VPKAL	L—VSKAS L—VSKAL	L—VPKAS L—VPKAL
3	3,150	3,220	4,170	4,360
4	3,160	3,240	4,180	4,380
5	3,180	3,270	4,200	4,410
6	3,350	3,470	4,370	4,610

Alterations		Code	Spec.	¥/1Code
Blade		PC	Changes blade diameter P Pmin/2≦PC<P 0.001mm increments P: 0.500~0.799 Bmax 6; 0.800~0.999 8; 1.000~1.999 13; 2.000~ 19	200
		BC	Changes blade length B. 2≦BC≦Bmax 0.1mm increments Overall length L(or LC) requires BC+25mm or more	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 PCC・GC : Not applicable	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 PRC・GC : Not applicable	200
		GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B ≧ f+2 f=P/2×tan(90°−GC°) P≦1.000 : Not applicable LKC・PRC・PCC : Not applicable The edge of lapping type is rounded.	400
Full length		LC	Changes full length. 25+B(C)≦LC<L 0.1mm increments (Combination with LKC→0.01mm increments) When LC—B (or BC) is 25mm or less, B (or BC) is LC—25mm.	200
		LKC	Changes full length tolerance. L +0.1 0 ⇨ +0.01 0	600
Head		UK	Changes key groove depth. D: 4・5 U: 0.7; 6 U: 1.2 Not applicable to D3.	200
Shank		SKC	Adds key flat on shank. P≦D−1.2 (Machining width 0.5) SKC machines at the opposite side of key groove.	600
		NDC	No press-in lead 3 ⇨ ℓ=0	0

PRECISION PUNCHES WITH AIR HOLE AND KEY GROOVE

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS —Lapping type—	SKH51 61~64HRC	VSKJAS VSKJAL Lapping type L—VSKJAS L—VSKJAL	
	Powdered high-speed steel 64~67HRC	VPKJAS VPKJAL Lapping type L—VPKJAS L—VPKJAL	

Catalog No. Type	D	L	0.001 mm increments min. P max.	0.1mm increments T	B	d1	S	d2	U
S Lapping type VSKJAS L—VSKJAS VPKJAS L—VPKJAS	4	40 45 50 55 60	1.500 ~ 3.990	T≧2.0	8	0.5	20	1.2	0.5
	5	(40) 45 50 55 60 65 70	2.000 ~ 4.990			0.8		2.1	
	6	(40) 45 50 55 60 65 70	2.000 ~ 5.990					2.6	1.0
L Lapping type VSKJAL L—VSKJAL VPKJAL L—VPKJAL	4	50 55 60	1.500 ~ 3.990		13	0.5	20	1.2	0.5
	5	50 55 60 65 70	2.000 ~ 4.990			0.8		2.1	
	6	50 55 60 65 70	2.000 ~ 5.990					2.6	1.0

When no key groove is required, specify T=L.

L(40) ···▸ S=17 When L(40), dimension S is 17mm.

Order Catalog No. — L — P — T

VPKJAL 4 — 60 — P2.013 — T13.0

When no key groove is required, specify T=L.

Price

Delivery 5 Days

Alteration Catalog No.–L(LC)–P(PC)– T – (BC·LKC·UK···etc.)

VPKJAS 5–50.0–PC1.800–T16.0

Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	VSKJAS VSKJAL	VPKJAS VPKJAL	L—VSKJAS L—VSKJAL	L—VPKJAS L—VPKJAL
4	3,360	3,440	4,380	4,580
5	3,430	3,520	4,450	4,660
6	3,620	3,740	4,640	4,880

Alterations		Code	Spec.	¥/1Code
Blade		PC	Changes blade diameter P PC≧PCmin. D 5 PCmin 1.800; 6 1.800 0.001 mm increments D4 : Not available.	200
		BC	Changes blade length B. 2≦BC<B 0.1 mm increments	200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 PCC : Not applicable	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 PRC : Not applicable	200
Full length		LC	Changes full length. LC<L 0.1mm increments (Combination with LKC→0.01mm increments) B and S are shortened by (L—LC).	200
		LKC	Changes full length tolerance. L +0.1 0 ⇨ +0.01 0	600

Alterations		Code	Spec.	¥/1Code
Key Groove		UK	Changes key groove depth. D: 4・5 U: 0.7; 6 U: 1.2	200
Shank		NDC	No press-in lead 3 ⇨ ℓ=0	0

PRECISION CARBIDE PUNCHES WITH KEY GROOVE

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS —Lapping type—	V30(HIP) 88～89HRA	VKAS VKAL Lapping type L—VKAS L—VKAL	
	Super corpuscle (HIP) 90～92HRA	VXKAS VXKAL Lapping type L—VXKAS L—VXKAL	

T≧2.0

Catalog No. Type	D	L	0.001 mm increments min. P max.	0.1mm increments T	B	U
S Lapping type VKAS L—VKAS VXKAS L—VXKAS	3	40 45 50 55 60	1.000 ～ 2.990	T≧2.0	8	0.5
	4	40 45 50 55 60 65 70	1.000 ～ 3.990			
	5	40 45 50 55 60 65 70	2.000 ～ 4.990			1.0
	6	40 45 50 55 60 65 70	2.000 ～ 5.990			
L Lapping type VKAL L—VKAL VXKAL L—VXKAL	3	50 55 60	1.000 ～ 2.990		13	0.5
	4	50 55 60 65 70	1.000 ～ 3.990			
	5	50 55 60 65 70	2.000 ～ 4.990			1.0
	6	50 55 60 65 70	2.000 ～ 5.990			

When P＞D—0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order Catalog No. — L — P — T
VKAS 4 — 50 — P1.002 — T15.0
When no key groove is required, specify T=L.

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	VKAS VKAL	VXKAS VXKAL	L—VKAS L—VKAL	L—VXKAS L—VXKAL
3	11,690	12,690	12,450	13,450
4	11,630	12,560	12,390	13,320
5	11,690	12,690	12,450	13,450
6	11,830	12,760	12,590	13,520

Delivery 5 Days

Alteration Catalog No. — L(LC) — P(PC) — T — (BC・LKC・UK…etc.)
VKAS 4 — LC43 — P1.002 — T15.0 — LKC

Alterations		Code	Spec.	¥/1Code
Blade		PC	Changes blade diameter P PC≧Pmin./2≧0.500 0.001 mm increments P: 0.500～0.799 → Bmax. 6; 0.800～0.999 → 8; 1.000～1.999 → 13; 2.000～ → 19	1,200
		BC	Changes blade length B. 2≦BC≦Bmax. 0.1 mm increments Full length L (LC) requires BC+25mm or more.	2,000
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P—0.2)/2 PCC・GC：Not applicable	2,000
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P—0.2)/2 PRC・GC：Not applicable	1,600
		GC	Changes to pointed tip. 20°≦GC＜90° 1° increments Blade length B ≧ f+2 f=P/2×tan(90°—GC°) P≦1.000：Not applicable LKC・PRC・PCC：Not applicable The edge of lapping type is rounded.	1,200

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length. 25+B(C)≦LC＜L 0.1mm increments (Combination with LKC→0.01mm increments) When LC—B (or BC) is 25mm or less, B (or BC) is LC—25mm.	600
		LKC	Changes full length tolerance. L $^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	1,600
Key Groove		UK	Changes key groove depth. D: 4・5 → UK 0.7; 6 → 1.2 Not applicable D3.	400
Shank		SKC	Adds key flat on shank. P≦D—1.2 (Machining width 0.5)	1,800
		NDC	No press-in lead 3 ⇨ ℓ=0	0

■Keys P.195

PSKB PSKBH

PSKS PSKJ

PSK PSKP PSKH

PSKW

PRECISION CARBIDE PUNCHES WITH KEY GROOVE & AIR HOLE

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS —Lapping type—	V30(HIP) 88～89HRA	VJKAS VJKAL Lapping type L—VJKAS L—VJKAL	
	Super corpuscle (HIP) 90～92HRA	VXJKAS VXJKAL Lapping type L—VXJKAS L—VXJKAL	

T≧2 Air hole of the super corpuscle type is straight. Dimensions S and d2 are not available.

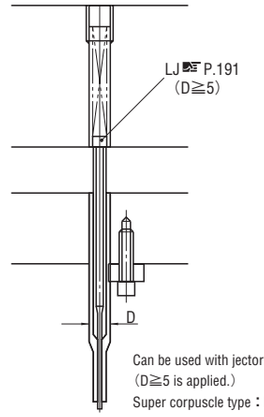
Catalog No. Type	D	L	0.001 mm increments min. P max.	0.1mm increments T	B	d1	S	d2	U
S Lapping type VJKAS L—VJKAS VXJKAS L—VXJKAS	4	40 45 50 55 60	1.500 ～ 3.990	T≧2.0	8	0.5	20	1.2	0.5
	5	(40) 45 50 55 60 65 70	2.000 ～ 4.990			0.8		2.1	
	6	(40) 45 50 55 60 65 70	2.000 ～ 5.990					2.6	1.0
L Lapping type VJKAL L—VJKAL VXJKAL L—VXJKAL	4	50 55 60	1.500 ～ 3.990		13	0.5	20	1.2	0.5
	5	50 55 60 65 70	2.000 ～ 4.990			0.8		2.1	
	6	50 55 60 65 70	2.000 ～ 5.990					2.6	1.0

L(40)…S=17 When L(40), dimension S is 17mm.
When P＞D—0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
Air hole of the super corpuscle type is straight. Dimensions S and d are not available.

(VXJKA□・L-VXJKA□)

Order Catalog No. — L — P — T
VJKAL 5 — 55 — P2.500 — T20.0
When no key groove is required, specify T=L.

Example



Can be used with jector long pin.
(D≧5 is applied.)
Super corpuscle type：Not applicable

Delivery 5 Days

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	VJKAS VJKAL	VXJKAS VXJKAL	L—VJKAS L—VJKAL	L—VXJKAS L—VXJKAL
4	12,430	13,420	13,190	14,180
5	12,630	13,620	13,390	14,380
6	12,820	13,890	13,580	14,650

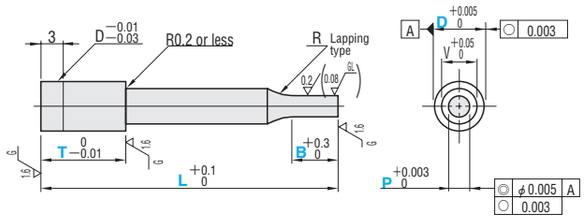
Alteration Catalog No. — L(LC・LCX) — P(PC) — T — (BC・LKC・UK…etc.)
VJKAL 5 — 55 — P2.500 — T20.0 — BC10

Alterations		Code	Spec.	¥/1Code
Blade		PC	Changes blade diameter P PC≧PCmin. D: 5 → PCmin. 1.800; 6 → 1.800 0.001 mm increments D4：Not applicable	1,200
		BC	Changes blade length B. 2≦BC＜B 0.1 mm increments	2,000
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P—d1—0.5)/2 PCC：Not applicable	2,000
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P—d1—0.5)/2 PRC：Not applicable	1,600
Full length		LC	Changes full length. LC＜L 0.1mm increments (Combination with LKC→0.01mm increments) B and S are shortened by (L—LC).	600

Alterations		Code	Spec.	¥/1Code
Full length		LCX	Changes full length without changing blade length B. 25+B(BC)≦LCX＜L 0.1mm increments When LCX—B (or BC) is 25mm or less, B (or BC) is LCX—25mm. (Combination with LKC→0.01mm increments) V30：Not applicable	600
		LKC	Changes full length tolerance. L $^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	1,600
Key Groove		UK	Changes key groove depth. D: 4・5 → UK 0.7; 6 → 1.2 V30：Not applicable	400
Shank		SKC	Adds key flat on shank. P≦D—1.2 (Machining width 0.5) V30：Not applicable	1,800
		NDC	No press-in lead 3 ⇨ ℓ=0	0

PRECISION ROUND PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS —Lapping type— 	SKD11 or equivalent 60～63HRC	VSPTAL Lapping type L—VSPTAL	
	Powdered high-speed steel 64～67HRC	VPHTAL Lapping type L—VPHTAL	

Catalog No. Type	D	L	0.001mm increments min. P max.	T	1mm increments B	V	R
Lapping type VSPTAL L—VSPTAL	4	40 50	0.500 ～ 2.000	13 16 20 13 16 20 25	2～ 6	2	2～3
	5	40 50 60	1.000 ～ 3.000	13 16 20 13 16 20 25	2～ 8	3	10
VPHTAL L—VPHTAL	6	40 50 60 70	1.500 ～ 4.000	13 16 20 13 16 20 25	2～10 2～13	4	
	8	40 50 60 70	2.000 ～ 6.000	13 16 20 13 16 20 25	2～10 2～13	6	

Order Catalog No. — L — P — T — B

VPHTAL 5 — 60 — P3.000 — T20 — B5

Example

Delivery 5 Days

Price

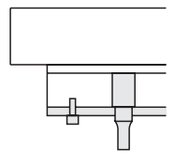
■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

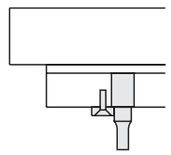
To be quoted on price & lead time above Max. Q'ty.

D	VSPTAL	VPHTAL	L—VSPTAL	L—VPHTAL
4	3,460	3,550	4,480	4,690
5	3,260	3,350	4,280	4,490
6	3,290	3,410	4,310	4,550
8	3,610	3,780	4,630	4,920

Usage example of slotted plate for punch

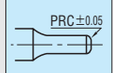
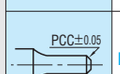
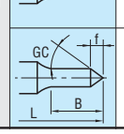


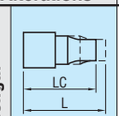
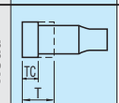
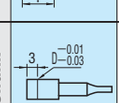
Usage example of key for fixing punch



Alteration Catalog No. — L(LC) — P — T(TC) — B — (LKC···etc.)

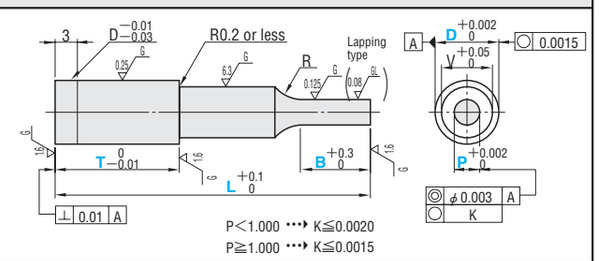
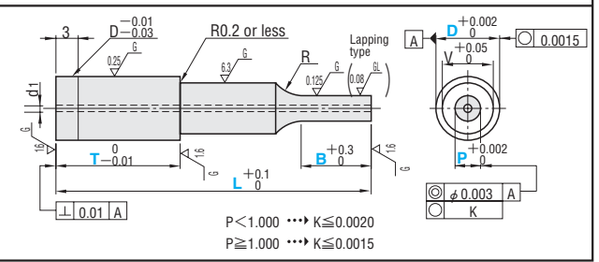
VPHTAL 5 — 60 — P3.000 — TC15.0 — B5

Alterations		Code	Spec.	¥/1Code
Blade		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P—0.2)/2 PCC・GC：Not applicable	400
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P—0.2)/2 PRC・GC：Not applicable	200
		GC	Changes to pointed tip. 20°≦GC＜90° 1° increments Blade length B≧f+2 f=P/2×tan(90°—GC°) P≦1.000：Not applicable LKC・PRC・PCC：Not applicable The edge of lapping type is rounded.	400

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length. 40＜LC＜L 0.1mm increments (Combination with LKC→0.01mm increments) When LC＜50, T and TC are 20 or less. When LC＜50 and D=6 or 8, specified range of B is 2～10.	200
		LKC	Changes full length tolerance. $L^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	600
Head		TC	Changes dimension T. 13＜TC＜25 0.1mm increments When L＜50, specified range is 13＜TC＜20 The total length L remains the same.	200
Shank		NDC	No press-in lead 3 ⇨ ℓ=0	0

PRECISION CARBIDE ROUND PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS 	Super corpuscle (HIP) 90～92HRA	VXPHAL Lapping type L—VXPHAL	 P＜1.000 ···› K≦0.0020 P≧1.000 ···› K≦0.0015
—With air hole type— RoHS 	Super corpuscle (HIP) 90～92HRA	VXJHAL Lapping type L—VXJHAL	 P＜1.000 ···› K≦0.0020 P≧1.000 ···› K≦0.0015

Catalog No. Type	D	L	0.001mm increments min. P max.	T	1mm increments B	V	d_1	R	U/Price VXPHAL VXJHAL	Q'ty：1～4 L—VXPHAL L—VXJHAL
VXPHAL Lapping type L—VXPHAL	4	40 50	0.500 ～ 2.000	13 16 20 13 16 20 25	2～ 6	2	—	2～3	13,820	14,580
	5	40 50 60	1.000 ～ 3.000	13 16 20 13 16 20 25	2～ 8	3		10	11,360	12,120
	6	40 50 60 70	1.500 ～ 4.000	13 16 20 13 16 20 25	2～10 2～13	4			11,630	12,390
	8	40 50 60 70	2.000 ～ 6.000	13 16 20 13 16 20 25	2～10 2～13	6			11,760	12,520
With air hole type VXJHAL Lapping type L—VXJHAL	5	40 50 60	1.000 ～ 3.000	13 16 20 13 16 20 25	2～ 8	3	0.4	10	13,820	14,580
	6	40 50 60 70	1.500 ～ 4.000	13 16 20 13 16 20 25	2～10 2～13	4	0.5		13,290	14,050
	8	40 50 60 70	2.000 ～ 6.000	13 16 20 13 16 20 25	2～10 2～13	6	0.8		13,690	14,450

Order Catalog No. — L — P — T — B

VXPHAL 5 — 60 — P3.000 — T20 — B6

Price

■Volume discount rate P.37

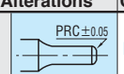
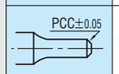
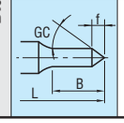
Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

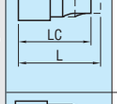
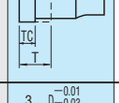
To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC) — P — T(TC) — B — (LKC···etc.)

VXPHAL 5 — LC55 — P3.000 — TC15.5 — B6 — LKC

Delivery 5 Days

Alterations		Code	Spec.	¥/1Code
Blade		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P—0.2)/2 PCC・GC：Not applicable With air hole type：PRC≦(P—d_1—0.5)/2	2,000
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P—0.2)/2 PRC・GC：Not applicable With air hole type：PCC≦(P—d_1—0.5)/2	1,600
		GC	Changes to pointed tip. 20°≦GC＜90° 1° increments Blade length B≧f+2 f=P/2×tan(90°—GC°) P≦1.000：Not applicable LKC・PRC・PCC：Not applicable With air hole type：Not applicable The edge of lapping type is rounded.	1,200

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length. 40＜LC＜L 0.1mm increments (Combination with LKC→0.01mm increments) When LC＜50, T and TC are 20 or less. When LC＜50 and D=6 or 8, specified range of B is 2～10.	600
		LKC	Changes full length tolerance. $L^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	1,600
Head		TC	Changes dimension T. 13＜TC＜25 0.1mm increments When L＜50, specified is 13＜TC＜20 The total length L remains the same.	600
Others		NDC	No press-in lead 3 ⇨ ℓ=0	0

■Keys P.195

PSKB PSKBH

PSKS PSKJ

PSK PSKP PSKH

PSKW

PRECISION CARBIDE BLOCK PUNCHES

Price P.439

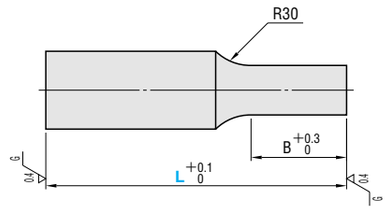
RoHS

● Machining limit

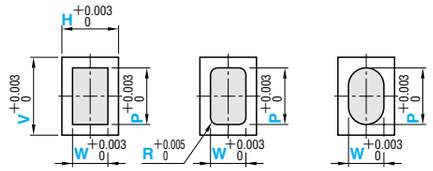
Shape D	Shape R	Shape E
P≧W	P≧W 0.15≦R<$\frac{W}{2}$	P>W

M H	Shank dimension V·H
V30(HIP) 88～89HRA	V·H 3～20

—Standard—

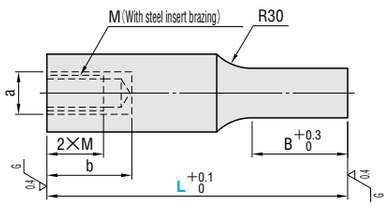


D VZPDBL R VZPRBL E VZPEBL

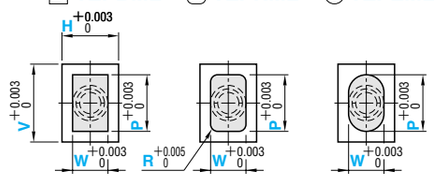


M H	Shank dimension V·H
V30(HIP) 88～89HRA	V·H 8～20

—Tapped—



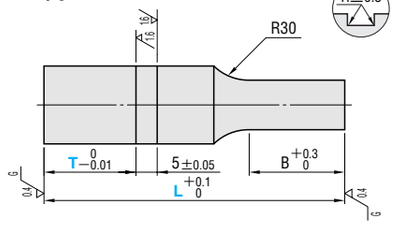
D VZPDML R VZPRML E VZPEML



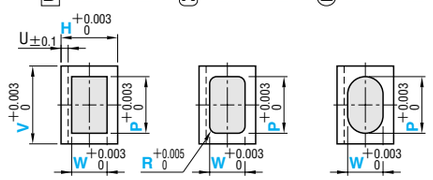
M H	Shank dimension V·H
V30(HIP) 88～89HRA	V·H 3～20

—With key groove —

Details of key groove



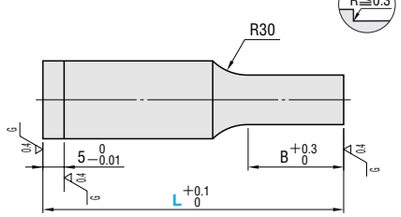
D VZPDKL R VZPRKL E VZPEKL



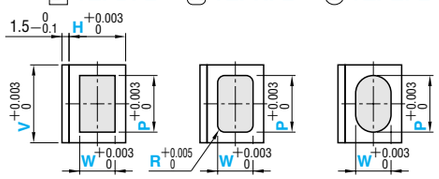
M H	Shank dimension V·H
V30(HIP) 88～89HRA	V·H 3～16 Not available for products marked ● on the standard table.

—With single flanged—

Details of flange



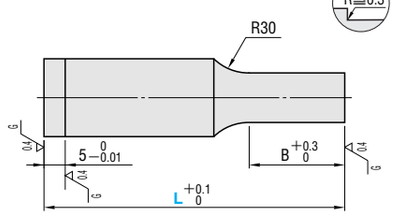
D VZPDFL R VZPRFL E VZPEFL



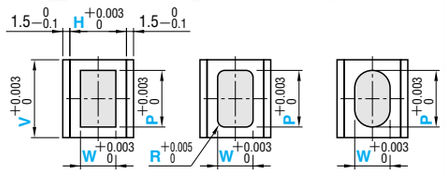
M H	Shank dimension V·H
V30(HIP) 88～89HRA	V·H 3～16 Not available for products marked ● on the standard table.

—With double flanged—

Details of flange



D VZPDWL R VZPRWL E VZPEWL



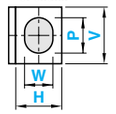
The volume discount rate is also applicable to alteration cost. P.39

Catalog No. Type	Shape	Type	H \ V	V 3	4	5	6	8	10	13	16	20
			W min. \ P min.	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0
VZP	D	BL KL FL WL	3	1.0	○	○	○	○	○	○	○	●
			4	1.0		○	○	○	○	○	○	●
			5	2.0			○	○	○	○	○	●
			6	2.0				○	○	○	○	●
	R E	BL ML KL FL WL	8	2.0					○	○	○	●
			10	2.5						○	○	●
			13	3.0						○	○	●
			16	4.0							○	●
			20	5.0								●

L	0.1mm T	B L 40	B L 50	B L 60·70	M	a	b	U
40	T≧2	13	13	13	—	—	—	1.0
50					4	6	12	1.5
60			19		6	8	16	
70				19	8	10	20	
				25				

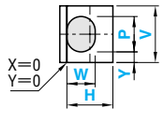
Order

(1) When the point is on the center of shank



Catalog No.	V	H	L	0.001mm increments P	W	R (R only)	0.1mm incr. T	K·F·WF
VZPEBL	20	08	60	P18.000	W 4.000			
VZPEML	20	10	70	P16.000	W 9.000			
VZPEKL	10	06	60	P 8.000	W 5.000		T25.5	K0
VZPEFL	16	13	60	P15.000	W12.000			F90
VZPEWL	13	10	40	P 8.000	W 5.000			WF90

(2) When the point is not on the center of shank



Catalog No.	V	H	L	0.001mm increments P	W	R (R only)	0.1mm incr. T	K·F·WF	0.001mm incr. X − Y
VZPEFL	16	13	50	P15.000	W12.000			F0	X0.000−Y0.500

■Key position/Flange position (Free of charge)

With key groove	K0	K90	K180	K270	Single flanged	F0	F90	F180	F270
Double flanged	WF0	WF90							

Delivery 10 Days

Price P.439

Alteration

Catalog No.	V	H	L (LC)	P (PC)·W (WC)·R	T	K·F·WF	(BC·HC·TC···etc.)
VZPEBL	20	08	60.0	P18.000—WC1.500			LKC—WK

Alterations		Code	Spec.	¥/1Code
Blade		PC WC	Changes dimension P・W. PC≧V×0.3≧1.000 WC≧H×0.15≧0.500 0.001mm increments P·W: 0.500～0.999 Bmax. 8; 1.000～1.999 13; 2.000～2.999 20; 3.000～4.999 30; 5.000～ 35	1,500
		BC	Changes blade length B. 2≦BC≦Bmax. 0.1mm increments L≧BC+30 Full length L(LC) requires BC+30mm or more.	600
Full length		LC	Changes full length. 30+B(BC)≦LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) When LC-B (or BC) is 30mm or less, Blade length is (L)-30.	600
		LKC	Changes full length tolerance. $L\ ^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	1,600
Key Groove		WK	Adds key groove at opposite position of specified key groove. H−{2×U(UK)}≧2 (K0,K180) V−{2×U(UK)}≧2 (K90,K270) Combination with UK is applicable	800
		UK	Changes key groove depth. 0.5≦UK≦U+0.2 0.1mm increments H(V)−UK≧2 Combination with WK is applicable	600

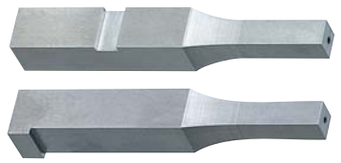
Alterations		Code	Spec.	¥/1Code
Flange		HC	Changes flange width. 0≦HC<1.5 0.1mm increments	600
		TC	Changes flange thickness. 2≦TC<5 0.1mm increments L is shortened by (5−TC). When LC, L=LC.	600
		FK	Adds chamfering to the head to prevent flange breakage. Standard, tap, key groove type : Not applicable	Single flanged 600 Double flanged 1,200
Tap		MC	Changes tap size. H \ V: 8 10 13 16 20 8: M4→M3 10: — M6→M5 13: — — M8→M6 16: — — — M8→M6 20: — — — — M8→M6 Dimension a・b remains the same.	0
Others		VHM	V・H $^{+0.003}_{0}$ ⇨ V・H $^{0}_{-0.003}$	1,200
		DC	Adds press-in lead. 3mm (H.V $^{-0.01}_{-0.03}$) press-in lead . With flange type : Not applicable	600

PRECISION CARBIDE BLOCK PUNCHES WITH AIR HOLE

Price P.439

The volume discount rate is also applicable to alteration cost. P.39

RoHS

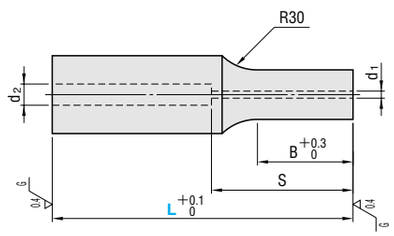


Machining limit

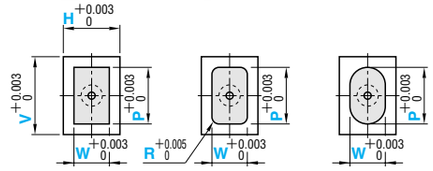
Shape D	Shape R	Shape E
P≧W	P≧W 0.15≦R<$\frac{W}{2}$	P>W

M H	Shank dimension V·H
V30(HIP) 88～89HRA	V·H 4～20

—Standard—



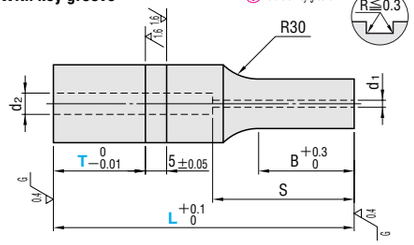
D VZJDBL R VZJRBL E VZJEBL



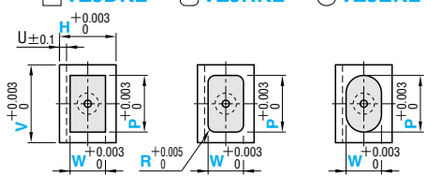
M H	Shank dimension V·H
V30(HIP) 88～89HRA	V·H 4～20

—With key groove—

Details of key groove



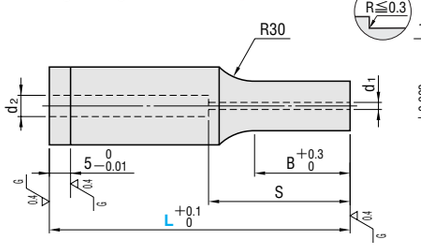
D VZJDKL R VZJRKL E VZJEKL



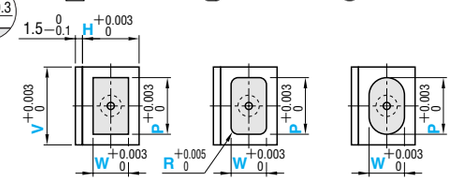
M H	Shank dimension V·H
V30(HIP) 88～89HRA	V·H 4～16 Not available for products marked ● on the standard table.

—With single flanged—

Details of flange



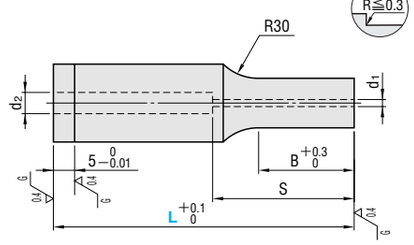
D VZJDFL R VZJRFL E VZJEFL



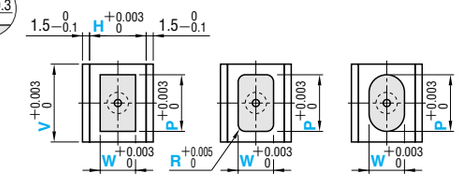
M H	Shank dimension V·H
V30(HIP) 88～89HRA	V·H 4～16 Not available for products marked ● on the standard table.

—With double flanged—

Details of flange



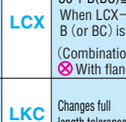
D VZJDWL R VZJRWL E VZJEWL



Catalog No. Type	Shape	Type	H \ V / W \ P min.	4	5	6	8	10	13	16	20	L	0.1mm T	B L 40	B L 50	B L 60·70	d1×S L 40	d1×S L 50	d1×S L 60·70	d2	U
				2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0										
VZJ	D R E	BL KL FL WL	4 1.5	○	○	○	○	○	○	○	●	40 50 60 70	T≧2	13	13	13	0.5×17			1.2	1.0
			5 2.0		○	○	○	○	○	○	●						0.8×17	0.8×20		2.1	
			6 2.0			○	○	○	○	○	●									2.6	
			8 2.5				○	○	○	○	●				19	19	1.2×17	1.2×27		3.4	1.5
			10 3.0					○	○	○	●						1.6×17	1.6×28		4.4	
			13 3.0						○	○	●						1.9×17	1.9×28			
			16 4.0							○	●					25	2.9×17	2.9×24	2.9×36		
			20 5.0								●										

Order

(1) When the point is on the center of shank



Catalog No.	V	H	–	L	–	0.001mm increments P	–	W	–	R(Ronly)	–	0.1mm incr. T	–	K·F·WF
VZJEBL	20	08	–	60	–	P18.000	–	W 4.000						
VZJEKL	10	06	–	60	–	P 8.000	–	W 5.000			–	T25.5	–	K0
VZJEFL	16	13	–	60	–	P15.000	–	W12.000					–	F90
VZJEWL	13	10	–	40	–	P 8.000	–	W 5.000					–	WF90

(2) When the point is not on the center of shank : Not machinable.

■Key position／Flange position (Free of charge)

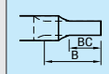
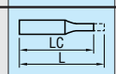
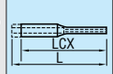
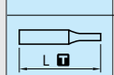
With key groove	K0 K90	Single flanged	F0 F90	Double flanged	WF0 WF90

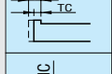
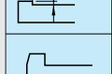
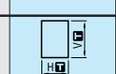
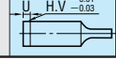
Delivery 10 Days

Price P.439

Alteration

Catalog No.	V	H	–	L(LC・LCX)	–	P·W·R–	–	T	–	K·F·WF	–	(BC·HC·TC···etc.)
VZJEBL	20	08	–	60.0	–	P18.000–W3.000					–	LKC–DC

Alterations		Code	Spec.	¥/1Code
Blade		BC	Changes blade length B. 2≦BC<B 0.1mm increments	600
Full length		LC	Changes full length. LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) B is shortened by (L−LC).	600
		LCX	Changes full length without changing blade length B. 30+B(BC)≦LCX<L 0.1mm increments When LCX−B (or BC) is 30mm or less, B (or BC) is LCX−30mm. (Combination with LKC→0.01mm increments) ⊗ With flange type : Not applicable	600
		LKC	Changes full length tolerance. $L^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	1,600
Key Groove		UK	Changes key groove depth. 0.5≦UK≦U+0.2 0.1mm increments H(V)−(UK+d2)≧2 Applicable to key groove type only.	600

Alterations		Code	Spec.	¥/1Code
Flange		TC	Changes flange thickness. 2≦TC<5 0.1mm increments L is shortened according to (5−TC). When LC, L=LC.	600
		HC	Changes flange width. 0≦HC<1.5 0.1mm increments	600
		FK	Adds chamfering to the head to prevent flange breakage. ⊗ Standard, key groove type : Not applicable	Single flanged 600 Double flanged 1,200
Others		VHM	V·H $^{+0.003}_{0}$ ⇨ $^{0}_{-0.003}$	1,200
		DC	Adds press-in lead. 3mm (H·V $^{-0.01}_{-0.03}$) Press-in lead. ⊗ With flange type : Not applicable	600

PRECISION CARBIDE STRAIGHT PUNCHES

Price P.440

The volume discount rate is also applicable to alteration cost. P.39

RoHS

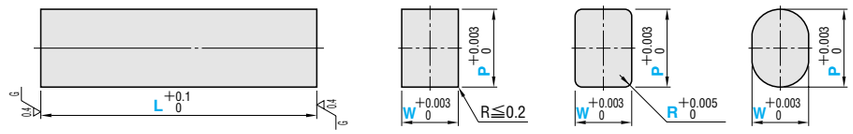
● Machining limit

Shape D	Shape R	Shape E
P≧W	P≧W 0.15≦R<$\frac{W}{2}$	P>W

M H	Blade dimension P·W
V30(HIP) 88～89HRA	P·W 2.000～20.000

—Standard—

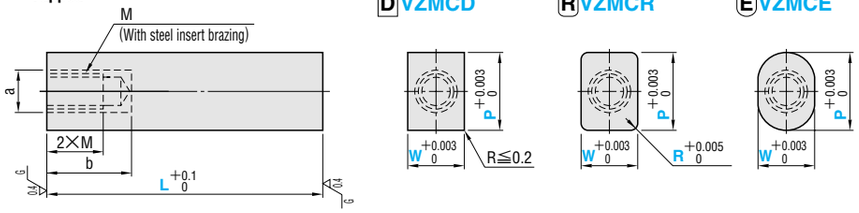
D VZPCD R VZPCR E VZPCE



M H	Blade dimension P·W
V30(HIP) 88～89HRA	P·W 12.000～20.000

—Tapped—

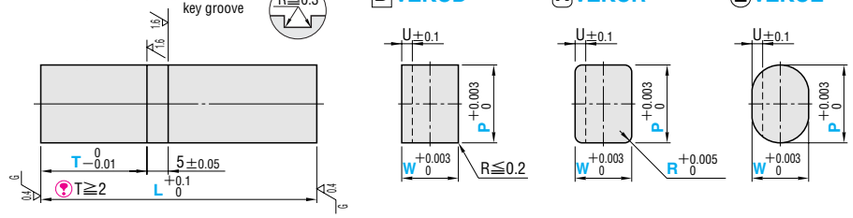
D VZMCD R VZMCR E VZMCE



M H	Blade dimension P·W
V30(HIP) 88～89HRA	P·W 2.000～20.000

—With key groove— Details of key groove

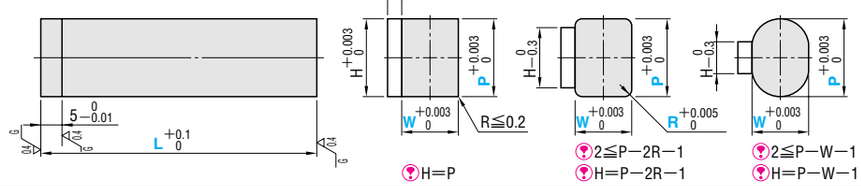
D VZKCD R VZKCR E VZKCE



M H	Blade dimension P·W
V30(HIP) 88～89HRA	P·W 2.000～16.000 Not available for products marked ● on the standard table.

—With single flanged— Details of flange

D VZFCD R VZFCR E VZFCE

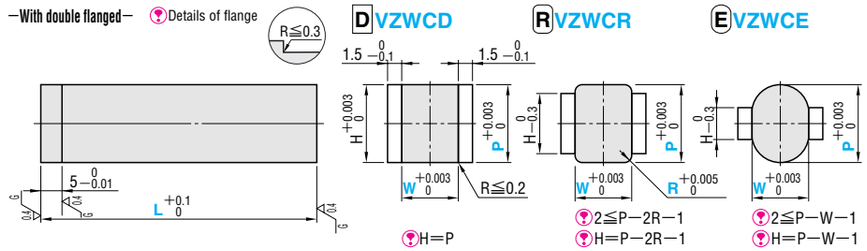


H=P　2≦P−2R−1　H=P−2R−1　2≦P−W−1　H=P−W−1

M H	Blade dimension P·W
V30(HIP) 88～89HRA	P·W 2.000～16.000 Not available for products marked ● on the standard table.

—With double flanged— Details of flange

D VZWCD R VZWCR E VZWCE



H=P　2≦P−2R−1　H=P−2R−1　2≦P−W−1　H=P−W−1

Catalog No. Type	Shape	L	W \ P	2.000～5.000	5.001～10.000	10.001～16.000	16.001～20.000	0.1mm increments T	U
VZPC VZKC VZFC VZWC	D R E	40 50 60 70	2.000～ 3.000	○	○	○		T≧2	1.0
			3.001～ 4.000	○	○	○	●		
			4.001～ 5.000	○	○	○	●		
			5.001～ 6.000		○	○	●		1.5
			6.001～ 8.000		○	○	●		
			8.001～10.000		○	○	●		
			10.001～16.000			○	●		
			16.001～20.000				●		

Catalog No. Type	Shape	L	W \ P	12.000～16.000	16.001～20.000	M	a	b
VZMC	D R E	40 50 60 70	12.000～13.000	○	○	8	10	20
			13.001～16.000	○	○			
			16.001～20.000		○			

Order

Catalog No.	L	0.001mm increments P	W	R (Ⓡonly)	0.1mm incr. T≧2	K·F·WF
VZPCD	60	P14.280	W 9.280			
VZMCR	60	P15.000	W12.000	R0.300		
VZKCR	60	P14.280	W 9.280	R0.500	T25.5	K0
VZFCE	60	P10.000	W 5.500			F0
VZWCE	60	P12.010	W 8.050			WF0

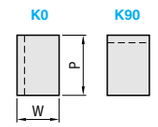
Delivery 10 Days

Price P.440

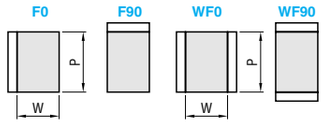
Alteration

Catalog No.	L(LC)	P	W	R	T	K·F·WF	(HC・TC・LKC…etc.)
VZPCD	LC65.5	P5.80	W5.20				LKC − UK0.5

■Key position



■Flange position



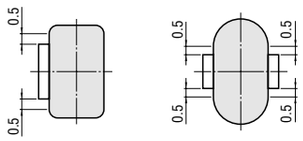
Shape E : Applicable for F0・WF0 only

F90 or WF90, dimension H is as follows.

Shape D : H=W

Shape R : 2≦W−2R−1　H=W−2R−1

Shape Shape R and E of flanged type (both single and double) has 0.5mm straight part at flange side.



Alterations		Code	Spec.	¥/1Code
Full length	LC	LC	Changes full length. 20≦LC<L 0.1mm increments (Combination with LKC→0.01mm increments)	600
	LKC	LKC	Changes full length tolerance. L +0.1 0 ⇨ +0.01 0	1,600
Key Groove	WK	WK	Adds key groove at opposite position of specified key groove. W− {2×U(UK)}≧2 (K0) P− {2×U(UK)}≧2 (K90) Combination with UK is applicable	800
	UK	UK	Changes key groove depth. 0.5≦UK≦U+0.2 0.1mm increments W(P)−UK≧2 Combination with WK is applicable	600
Flange	HC	HC	Changes flange width. 0≦HC<1.5 0.1mm increments	600
	TC	TC	Changes flange thickness. 2≦TC<5 0.1mm increments L is shortened by (5−TC). When LC, L=LC.	600
	FK	FK	Adds chamfering to the head to prevent flange breakage. Standard, tap, key groode type : Not applicable	Single flanged 600 Double flanged 1,200

Alterations		Code	Spec.	¥/1Code
Tap	MC	MC	Changes tap size. Changes from M8 to M6. Dimension a・b remains the same.	0
Others	PHM	PHM	Changes P・W tolerance. P・W +0.003 0 ⇨ P・W 0 −0.003	1,200
	CCN	CCN	Adds chamfering (4 corners) on the shank. 5≦CCN≦L(LC) 1mm increments Applicable to shape D only. Flange side is CCN−T(TC) for flanged type.	1,200

PRECISION CARBIDE STRAIGHT PUNCHES WITH AIR HOLE

Price P.440

The volume discount rate is also applicable to alteration cost. P.39

RoHS

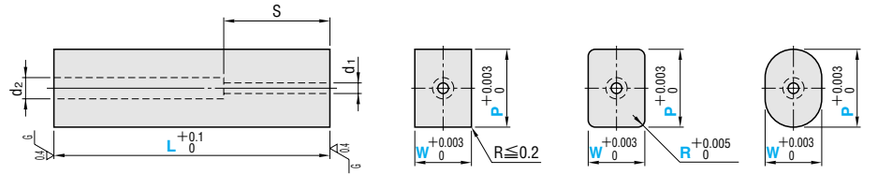
● Machining limit

Shape D	Shape R	Shape E
P≧W	P≧W 0.15≦R＜W/2	P＞W

M H	Blade dimension P·W
V30(HIP) 88～89HRA	P·W 4.000～20.000

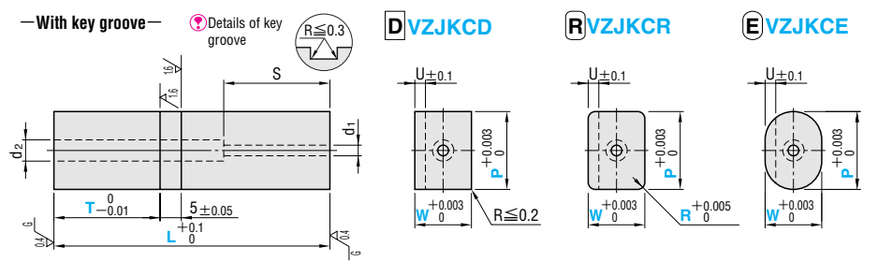
—Standard—

D VZJCD R VZJCR E VZJCE



—With key groove— Details of key groove

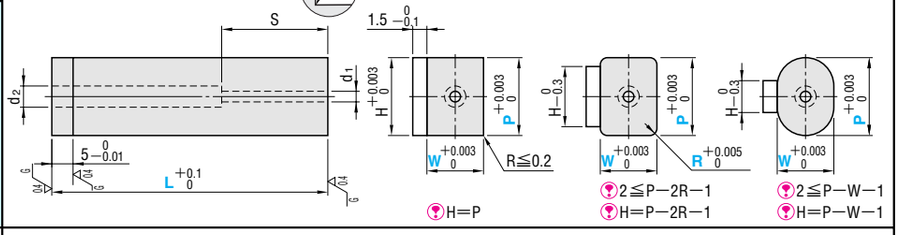
D VZJKCD R VZJKCR E VZJKCE



M H	Blade dimension P·W
V30(HIP) 88～89HRA	P·W 4.000～16.000 Not available for products marked ● on the standard table.

—With single flanged— Details of flange

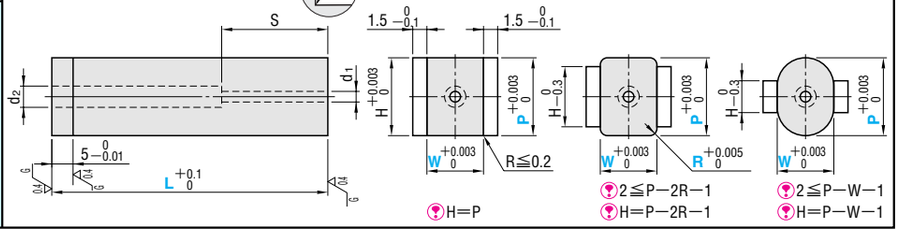
D VZJFCD R VZJFCR E VZJFCE



M H	Blade dimension P·W
V30(HIP) 88～89HRA	P·W 4.000～16.000 Not available for products marked ● on the standard table.

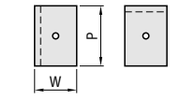
—With double flanged— Details of flange

D VZJWCD R VZJWCR E VZJWCE

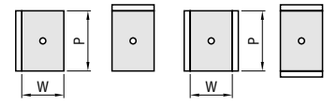


Catalog No. Type	Shape	L	W \ P	4.000～5.000	5.001～6.000	6.001～8.000	8.001～10.000	10.001～13.000	13.001～16.000	16.001～20.000	0.1mm increments T	d_1×S L=40	d_1×S L=50	d_1×S L=60·70	d_2	U
VZJC VZJKC VZJFC VZJWC	D	40	4.000～5.000	○	○	○	○	○	○	●	T≧2	0.5×17			1.2	1.0
	R	50	5.001～6.000		○	○	○	○	○	●		0.8×17	0.8×20		2.6	
	E	60	6.001～8.000			○	○	○	○	●		1.2×17	1.2×27		3.4	
		70	8.001～10.000				○	○	○	●		1.6×17	1.6×28		4.4	1.5
			10.001～13.000					○	○	●		1.9×17	1.9×28			
			13.001～16.000						○	●		2.9×17	2.9×24	2.9×36		
			16.001～20.000							●						

■Key position



■Flange position



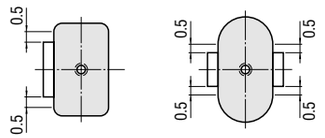
Shape E : Applicable for F0・WF0 only

F90 or WF90, dimension H is as follows.

Shape D : H=W

Shape R : 2≦W−2R−1 H=W−2R−1

Shape Shape R and E of flanged type (both single and double) has 0.5mm straight part at flange side.



Order

Catalog No.	L	0.001mm increments P	W	R (R only)	0.1mm incr. T≧2	K·F·WF
VZJCD	60	P14.281	W 9.281			
VZJKCR	60	P14.281	W 9.281	R0.500	T25.5	K0
VZJFCE	60	P13.182	W 6.502			F0
VZJWCD	60	P14.280	W14.280			WF90

Delivery 10 Days

Price P.440

Alteration

Catalog No.	LC(LC·LCX)	P	W	R	T	K·F·WF	(HC・TC・LKC…etc.)
VZJCD	LC65.5	P5.801	W5.201				LKC

Alterations		Code	Spec.	¥/1Code
Full length	LC	LC	Changes full length. LC＜L 0.1mm increments (Combination with LKC→0.01mm increments) Dimension S is shortened by (L−LC).	600
	LCX	LCX	Changes full length without changing S dimension. 30≦LCX＜L 0.1mm increments When LCX−B (or BC) is 30mm or less, B (or BC) is LCX−30mm. (Combination with LKC→0.01mm increments) ⊗ With flange type : Not applicable	600
	LKC	LKC	Changes full length tolerance. $L^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	1,600
Key Groove	UK	UK	Changes key groove depth. 0.5≦UK≦U+0.2 0.1mm increments W(P)−d_2(d_1)≧2	600

Alterations		Code	Spec.	¥/1Code
Flange	TC	TC	Changes flange thickness. 2≦TC＜5 0.1mm increments L is shortened by (5−TC). When LC, L=LC.	600
	HC	HC	Changes flange width. 0≦HC＜1.5 0.1mm increments	600
	FK	FK	Adds chamfering to the head to prevent flange breakage. ⊗ Standard, tap, key groode type : Not applicable	Single flanged 600 Double flanged 1,200
Others	PHM	PHM	Changes P・W tolerance. P・W $^{+0.003}_{0}$ ⇨ $^{0}_{-0.003}$	1,200
	CCN	CCN	Adds chamfering (4 corners) on the shank. 5≦CCN≦L 1mm increments Applicable to shape D only. Flange side is CCN−T(TC) for flanged type.	1,200

PRECISION —PRICE— CARBIDE BLOCK PUNCHES AND STRAIGHT PUNCHES

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Precision carbide block punches P.431

■Standard type

Catalog No.	H \ V	3	4	5	6	8	10	13	16	20
VZPDBL	3	18,610	18,770	18,940	17,360	18,200	18,690	19,480	20,480	21,180
	4		18,740	16,420	17,640	18,550	18,960	19,950	21,120	21,930
	5			16,680	17,920	18,920	19,420	20,550	21,820	22,800
	6				18,240	19,340	19,890	21,160	22,540	23,690
	8					20,540	21,280	22,670	24,330	25,870
	10						22,230	23,860	25,760	27,590
	13							26,240	28,540	30,880
	16								30,650	33,560
	20									37,090
VZPRBL	3	26,340	26,510	26,680	25,090	26,220	26,730	27,520	29,030	29,980
	4		26,480	24,160	25,380	26,590	27,000	27,990	29,670	30,480
	5			24,420	25,650	26,960	27,460	28,590	30,360	31,350
	6				25,980	27,380	27,930	29,200	31,090	32,240
	8					28,580	29,330	30,710	32,880	33,660
	10						30,270	31,900	34,310	34,420
	13							34,290	37,090	37,570
	16								39,200	39,430
	20									42,110
VZPEBL	3	25,940	26,100	26,270	24,680	25,820	26,320	27,120	28,620	29,330
	4		26,070	23,790	24,970	26,180	26,600	27,590	29,260	30,070
	5			24,010	25,250	26,550	27,050	28,650	29,950	30,940
	6				25,570	26,980	27,530	28,800	30,680	31,830
	8					28,050	28,920	30,310	32,470	34,010
	10						29,860	31,500	33,900	35,740
	13							33,880	38,110	39,020
	16								38,790	41,710
	20									45,230

■Tapped type ··· Standard type unit price＋1,800 yen
■Key groove type ··· Standard type unit price＋2,000 yen
■Single flanged type ··· Standard type unit price＋2,400 yen
■Double flanged type ··· Standard type unit price＋3,600 yen

Precision carbide block punches with air hole P.433

■Standard type

Catalog No.	H \ V	4	5	6	8	10	13	16	20
VZJDBL	4	21,600	19,280	20,500	21,410	21,820	22,810	23,980	24,790
	5		19,540	20,780	21,770	22,280	23,410	24,660	25,660
	6			21,100	22,200	22,750	24,020	25,400	26,540
	8				23,390	24,140	26,960	27,180	31,340
	10					25,090	26,720	28,620	31,880
	13						29,100	31,400	33,730
	16							33,500	36,420
	20								39,950
VZJRBL	4	29,340	27,020	28,240	29,450	29,860	30,850	32,530	33,340
	5		27,280	28,510	29,810	30,320	31,450	33,210	34,210
	6			28,830	30,240	30,790	32,060	33,950	35,090
	8				31,430	32,180	33,570	35,090	35,730
	10					33,130	34,760	37,170	37,280
	13						37,140	39,950	40,430
	16							42,050	42,280
	20								44,970
VZJEBL	4	28,930	26,650	27,830	29,040	29,450	30,440	32,120	32,930
	5		26,870	28,100	29,410	29,910	31,500	32,810	33,800
	6			28,430	29,830	30,380	31,650	33,540	34,690
	8				30,910	31,780	33,160	35,330	36,870
	10					32,720	34,350	36,760	38,590
	13						36,740	40,970	41,880
	16							41,650	44,560
	20								48,090

■Key groove type ··· Standard type unit price＋2,000 yen
■Single flanged type ··· Standard type unit price＋2,400 yen
■Double flanged type ··· Standard type unit price＋3,600 yen

Precision carbide straight punches P.435

■Standard type

Catalog No.	W \ P	2.000 ≀ 5.000	5.001 ≀ 10.000	10.001 ≀ 16.000	16.001 ≀ 20.000
VZPCD	2.000～ 3.000	10,290	9,400	11,130	
	3.001～ 4.000	9,780	10,370	11,680	12,620
	4.001～ 5.000	9,520	10,690	12,200	13,260
	5.001～ 6.000		11,010	12,750	14,050
	6.001～ 8.000		12,510	13,800	15,500
	8.001～10.000		14,610	14,880	16,980
	10.001～16.000			17,650	20,590
	16.001～20.000				24,590
VZPCR	2.000～ 3.000	17,760	19,440	20,500	
	3.001～ 4.000	17,140	19,700	21,090	22,110
	4.001～ 5.000	16,510	20,030	21,640	22,850
	5.001～ 6.000		20,380	22,240	23,610
	6.001～ 8.000		21,500	23,360	25,190
	8.001～10.000		22,690	24,520	26,740
	10.001～16.000			27,430	30,590
	16.001～20.000				34,850
VZPCE	2.000～ 3.000	18,540	19,440	20,500	
	3.001～ 4.000	18,380	19,700	21,090	22,110
	4.001～ 5.000	16,810	20,020	22,010	22,850
	5.001～ 6.000		20,370	22,240	23,610
	6.001～ 8.000		21,540	23,350	25,190
	8.001～10.000		22,690	24,510	25,310
	10.001～16.000			27,460	30,590
	16.001～20.000				34,860

■Tapped type ··· Standard type unit price＋1,800 yen
■Key groove type ··· Standard type unit price＋2,000 yen
■Single flanged type ··· Standard type unit price＋2,400 yen
■Double flanged type ··· Standard type unit price＋3,600 yen

Precision carbide straight punches with air hole P.437

■Standard type

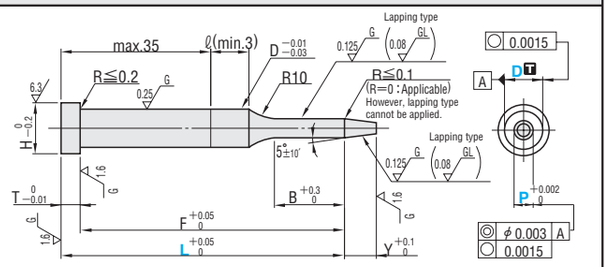
Catalog No.	W \ P	4.000 ≀ 5.000	5.001 ≀ 6.000	6.001 ≀ 8.000	8.001 ≀ 10.000	10.001 ≀ 13.000	13.001 ≀ 16.000	16.001 ≀ 20.000
VZJCD	4.000～ 5.000	11,160	11,860	12,930	13,490	15,630	16,900	18,120
	5.001～ 6.000		13,210	14,000	14,610	16,760	18,400	20,010
	6.001～ 8.000			13,860	15,540	17,680	19,960	21,930
	8.001～10.000				17,680	21,970	20,170	25,210
	10.001～13.000					20,520	22,670	28,050
	13.001～16.000						24,960	28,050
	16.001～20.000							31,830
VZJCR	4.000～ 5.000	19,760	20,660	22,020	24,120	26,700	27,770	29,480
	5.001～ 6.000		22,800	24,160	24,760	28,200	29,270	30,560
	6.001～ 8.000			25,170	25,860	29,820	30,890	32,610
	8.001～10.000				26,940	31,470	32,540	34,620
	10.001～13.000					32,330	33,400	38,110
	13.001～16.000						37,740	41,130
	16.001～20.000							45,160
VZJCE	4.000～ 5.000	21,860	22,500	22,020	24,120	26,700	28,200	29,480
	5.001～ 6.000		23,580	24,160	24,760	28,200	29,270	30,560
	6.001～ 8.000			25,170	25,950	29,780	30,860	32,610
	8.001～10.000				27,370	31,530	32,510	34,620
	10.001～13.000					34,370	35,440	38,110
	13.001～16.000						37,410	41,130
	16.001～20.000							45,180

■Key groove type ··· Standard type unit price＋2,000 yen
■Single flanged type ··· Standard type unit price＋2,400 yen
■Double flanged type ··· Standard type unit price＋3,600 yen

Express service system P.38 · MISUMI Press 2007 · http://misumi.jp/press/ · For inquiry, ordering and other information, refer to P.1269

PRECISION CARBIDE PILOT PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS —Lapping type—	V30(HIP) 88～89HRA	VTPAS VTPAL Lapping type L—VTPAS L—VTPAL	
	Super corpuscle (HIP) 90～92HRA	VXTPAS VXTPAL Lapping type L—VXTPAS L—VXTPAL	

D	L	DT
2.0	22～32	+0.002 0
2.5	37～52	+0.003 0
3～	42～72	+0.002 0

Catalog No. Type	D	L	0.001mm increments min. P max.	B	H	Y	T
S Lapping type VTPAS L—VTPAS VXTPAS L—VXTPAS	2.0	22 27 32 37 42 47 52	1.000 ～ 1.990	8	3.0	4	3
	2.5	22 27 32 37 42 47 52	1.000 ～ 2.490	10	3.5		
	3	42 47 52 57 62	1.000 ～ 2.990		5		5
	4	42 47 52 57 62 67 72	1.000 ～ 3.990		7		
	5	42 47 52 57 62 67 72	2.000 ～ 4.990		8	5	
	6	42 47 52 57 62 67 72	2.000 ～ 5.990		9		
L Lapping type VTPAL L—VTPAL VXTPAL L—VXTPAL	2.0	32 37 42 47 52	1.000 ～ 1.990	10	3.0	4	3
	2.5	32 37 42 47 52	1.000 ～ 2.490	15	3.5		
	3	52 57 62	1.000 ～ 2.990		5		5
	4	52 57 62 67 72	1.000 ～ 3.990		7		
	5	52 57 62 67 72	2.000 ～ 4.990		8	5	
	6	52 57 62 67 72	2.000 ～ 5.990		9		

P>D−0.03 ···▶ ℓ=0 When P>D−0.03, $D^{-0.01}_{-0.03}$ (Press-in lead) is not available.

Order Catalog No. — L — P — (R)

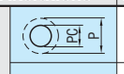
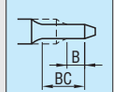
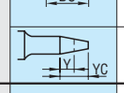
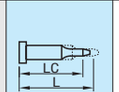
VTPAS 4 — 42 — P1.998
VXTPAL 5 — 57 — P2.301 — R0

Only R=0 can be specified (excluding the lapping type).

Delivery 5 Days

Alteration Catalog No. — L(LC) — P(PC) — (R) — (BC·YC·HC·TC···etc.)

VTPAS 4 — LC45.0 — P1.998 — YC3.0

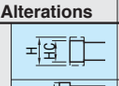
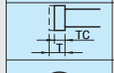
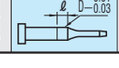
Alterations		Code	Spec.	¥/1Code
Blade		PC	Changes blade diameter P. Y=Y max. PC≧Pmin./2≧1.000 0.001mm increments (P: 1.000～1.999 Bmax 15 Ymax 4; 2.000～ Bmax 22 Ymax 5)	1,200
		BC	Changes blade length B. D≦2.5 2≦BC<B; D≧3 2≦BC≦Bmax. L requires BC+25mm or more. 0.1mm increments	2,000
		YC	Changes tip taper length Y. 1≦YC≦Ymax. 0.1mm increments (P: 1.000～1.999 Ymax 4; 2.000～ Ymax 5)	600
Full length		LC	Changes full length. D≦2.5 22<LC<52 0.1mm increments; D≧3 25+B(BC)≦LC<L 0.1mm increments. When LC−B (or BC) is 25mm or less, B (BC) is LC−25mm. In case of LC32.1～LC36.9, D T +0.003 0	600

Price Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

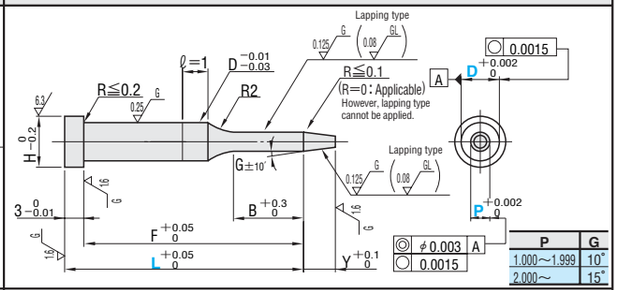
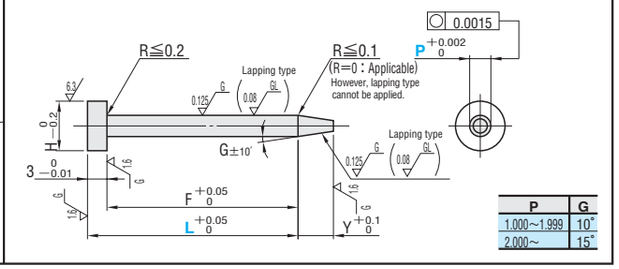
To be quoted on price & lead time above Max. Q'ty.

D	VTPAS VTPAL	VXTPAS VXTPAL	L—VTPAS L—VTPAL	L—VXTPAS L—VXTPAL
2.0	12,360	13,360	13,120	14,120
2.5	12,360	13,220	13,120	13,980
3	12,290	13,160	13,050	13,920
4	12,290	13,160	13,050	13,920
5	12,360	13,220	13,120	13,980
6	12,430	13,290	13,120	14,050

Alterations		Code	Spec.	¥/1Code
Head		HC	Changes head diameter. D≦HC<H 0.1mm increments	600
		TC	Changes head thickness. 2≦TC<T 0.1mm increments. L is shortened according to (T-TC). If LC is applied, L is equal to LC.	600
		KC	Adds single key flat at head.	600
		WKC	Adds double key flats in parallel.	1,200
Shank		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	0

PRECISION CARBIDE PILOT PUNCHES —FIXED IN STRIPPER PLATE—

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS —Lapping type—	V30(HIP) 88～89HRA	VTPTP Lapping type L—VTPTP	
	Super corpuscle (HIP) 90～92HRA	VXTPTP Lapping type L—VXTPTP	
—Straight type—	V30(HIP) 88～89HRA	VTPT Lapping type L—VTPT	
—Straight type, lapping type—	Super corpuscle (HIP) 90～92HRA	VXTPT Lapping type L—VXTPT	

P	G
1.000～1.999	10°
2.000～	15°

Catalog No. Type	D	0.1mm increments L	0.001mm increments min. P max.	B	Y	H
VTPTP VXTPTP Lapping type L—VTPTP L—VXTPTP	2.0	12.0 ～32.0	0.500 ～ 1.990	4	1	3
	2.5		1.000 ～ 2.490		2	3.5
	3		1.000 ～ 2.990			5
	4		2.000 ～ 3.990			7
	5		2.000 ～ 4.990		3	8
	6		2.500 ～ 5.990			9

P>D−0.03 ···▶ ℓ=0 When P>D−0.03, $D^{-0.01}_{-0.03}$ (Press-in lead) is not available.

Order Catalog No. — L — P — (R)

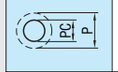
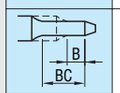
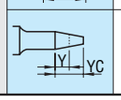
VTPTP 3 — 23.0 — P1.998
VTPT 2.5 — 23.0 — P1.998 — R0

Only R=0 can be specified (excluding the lapping type).

Delivery 5 Days

Alteration Catalog No. — L — P(PC) — (R) — (BC·YC·HC·TC···etc.)

VTPTP 3 — 18 — PC0.900 — YC1.0

Alterations		Code	Spec.	¥/1Code
Blade		PC	Changes blade diameter P. Y=Y max. PC≧Pmin./2≧0.5 0.001mm increments. Not applicable to straight type (P: 0.500～0.799 Bmax 6 Ymax 1; 0.800～0.999 Bmax 8 Ymax 1; 1.000～1.499 Bmax 13 Ymax 2; 1.500～1.999 Bmax 13 Ymax 3; 2.000～2.499 Bmax 19 Ymax 3; 2.500～ Bmax 19 Ymax 4)	1,200
		BC	Changes blade length B. 2≦BC≦Bmax. 0.1mm increments. L requires BC+8mm or more. Not applicable to straight type	2,000
		YC	Changes tip taper length Y. 1≦YC≦Ymax. 0.1mm increments (P: 1.000～1.499 Ymax 2; 1.500～2.499 Ymax 3; 2.500～ Ymax 4)	600

■Straight type

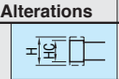
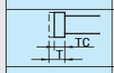
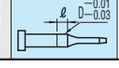
Catalog No. Type	No.	0.1mm increments L	0.001mm increments min. P max.	Y	H
VTPT VXTPT Lapping type L—VTPT L—VXTPT	2.0	12.0 ～ 23.0	1.000 ～ 2.000	2	3
	2.5		1.500 ～ 2.500		3.5
	3	12.0 ～ 32.0	2.000 ～ 3.000		5
	4		3.000 ～ 4.000		7
	5		4.000 ～ 5.000	3	8
	6		5.000 ～ 6.000		9

Price Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

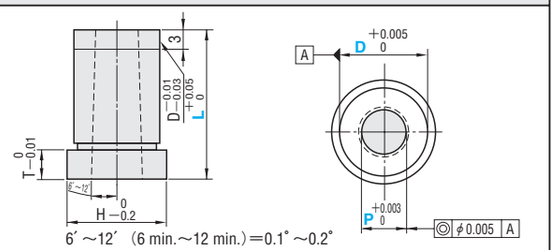
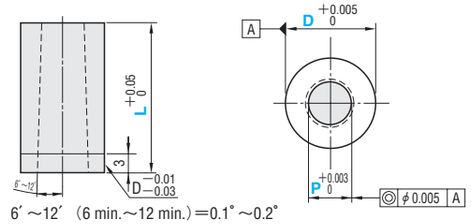
D	VTPTP VTPT	VXTPTP VXTPT	L—VTPTP L—VTPT	L—VXTPTP L—VXTPT
2.0	13,020	14,020	13,780	14,780
2.5	11,690	12,560	12,450	13,320
3	11,630	12,490	12,390	13,250
4	11,560	12,430	12,320	13,190
5	11,560	12,430	12,320	13,190
6	11,560	12,430	12,320	13,190

Alterations		Code	Spec.	¥/1Code
Head		HC	Changes head diameter. D・P≦HC<H 0.1mm increments	600
		TC	Changes head thickness. 2≦TC<3 0.1mm increments. Overall length does not change.	600
		KC	Adds single key flat at head.	600
		WKC	Adds double key flats in parallel.	1,200
Shank		NDC	No press-in lead ℓ=1 ⇨ ℓ=0. Not applicable to straight type	0

PRESS ADD.SPEC. Printed in Red

PRECISION ANGULAR BUTTON DIES
—FULLY TAPERED TYPE—

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
—Head type— RoHS	D3～5 SKH51 61～64HRC	VSAHD	
	D6・8 SKD11 or equivalent 60～63HRC		
	Powdered high-speed steel 64～67HRC	VPAHD	
	Carbide V40(HIP) 87～88HRA	VWAHD	
—Straight type— RoHS	D3～5 SKH51 61～64HRC	VSASD	
	D6・8 SKD11 or equivalent 60～63HRC		
	Powdered high-speed steel 64～67HRC	VPASD	
	Carbide V40(HIP) 87～88HRA	VWASD	

6′～12′ (6 min.～12 min.)＝0.1°～0.2°

Catalog No. Type	D	L	0.001mm increments min. P max.	H	T	Head type U/price VSAHD	VPAHD	VWAHD	Straight type U/price VSASD	VPASD	VWASD
Head type VSAHD VPAHD VWAHD / Straight type VSASD VPASD VWASD	3	8 13 16 20 22 25 30	0.500 ～ 1.000	4	3	6,090	7,150	13,330	5,590	6,590	11,600
	4		0.500 ～ 1.500	5		5,500	6,310	13,330	4,990	5,760	11,600
	5		0.500 ～ 2.500	6		5,340	6,110	13,330	4,850	5,560	11,600
	6	13 16 20 22 25 30	1.000 ～ 3.000	9	5	5,120	5,810	11,310	4,550	5,140	9,960
	8		1.000 ～ 4.000	11		5,120	5,810	11,830	4,550	5,140	9,490
	10		2.000 ～ 6.000	13		5,740	6,530	13,410	5,760	6,550	12,280

The tip may have the straight portion of 1mm at max.

Order: Catalog No. — L — P
VSAHD 8 — 20 — P3.300

Delivery: 5 Days

- When L=8,the lead-in part D$^{-0.01}_{-0.03}$ is not available.
- The lead-in part D$^{-0.01}_{-0.03}$ is not available on VWAHD.
- The part of VWAHD below the flange is not machined. When D3～5, R is ≦0.2, and When D6～10, R is ≦0.5.

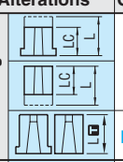
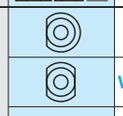
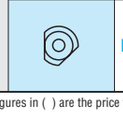
Alteration: Catalog No. — L(LC) — P — (HC・TC…etc.)
VSAHD 6 — 16 — P2.475 — HC8.0

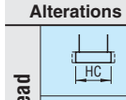
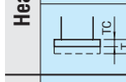
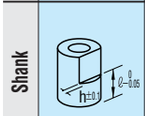
Price

Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

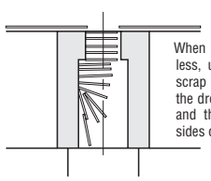
Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length. 10≦LC＜L 0.01mm increments Press-in lead is (L—LC) shorter.	200 (600)
		LKC	Changes full length tolerance. L $^{+0.05}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗L＜16：Not available	400 (1,600)
Head		KC	Adds single key flat at head. ⊗Straight type：Not applicable	200 (600)
		WKC	Adds double key flats in parallel. ⊗Straight type：Not applicable	400 (1,200)
		KFC	 Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC：Not applicable ⊗L＜16：Not applicable ⊗Not applicable Straight type	400 (1,200)

Alterations		Code	Spec.	¥/1Code
Head		HC	Changes head diameter. D≦HC＜H 0.1mm increments ⊗Not applicable Straight type	200 (600)
		TC	Changes head thickness. 2≦TC＜T 0.01mm increments L is shortened by (T—TC). When LC, L=LC. ⊗Not applicable Straight type	200 (600)
Shank		KM	Adds key groove on shank. ⊗Not applicable Head type ⊗D＜6：Not applicable	400 (1,200)

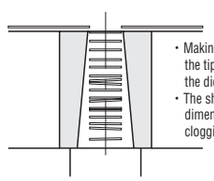
D	h	ℓ
6	1	5≦ ℓ ＜L 0.1mm increments
8	1.5	
10		

Figures in ( ) are the price for carbide VWAHD and VWASD.

Example



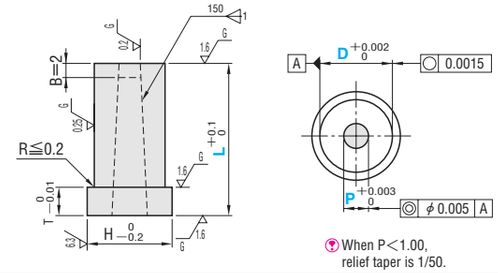
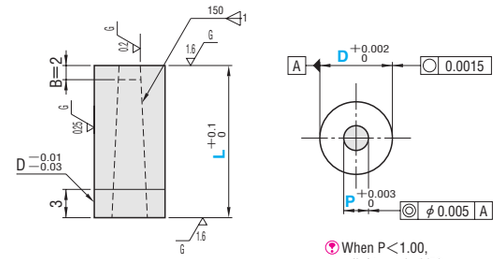
When punching the thin material of 0.5mm or less, using a standard button die may cause scrap clogging because scraps is tumbling in the drop between the blade tip straight portion and the relief hole, and scraps stick to the sides of the die.



- Making the relief hole angular with smaller angle than the tip will prevent scraps from sticking to the sides of the die and reduces troubles by scrap clogging.
- The shorter the full length of the button dies are against dimension P, the more it will be effective against scrap clogging.

PRECISION CARBIDE ANGULAR BUTTON DIES

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
—Head type— RoHS	V40(HIP) 87～88HRA	VAHD	
	Super corpuscle (HIP) 90～92HRA	VXAHD	
—Straight type— RoHS	V40(HIP) 87～88HRA	VASD	
	Super corpuscle (HIP) 90～92HRA	VXASD	

When P＜1.00, relief taper is 1/50.

Catalog No. Type	D	L	0.001mm increments min. P max.	H	T
Head type VAHD VXAHD / Straight type VASD VXASD	3	13	0.500 ～1.000	4	3
	4	16	0.500 ～1.500	5	
	5	20	0.500 ～2.500	6	
	6	22	1.000 ～3.000	9	5
	8	25	1.000 ～4.000	11	
	10		2.000 ～6.000	13	

Order: Catalog No. — L — P
VAHD 6 — 20 — P2.500

Delivery: 5 Days

Alteration: Catalog No. — L(LC) — P — (BC・HC・TC…etc.)
VAHD 6 — LC18 — P2.500 — LKC — KM5

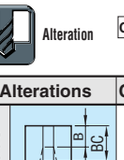
Price

Volume discount rate P.37

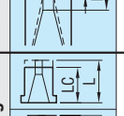
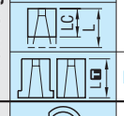
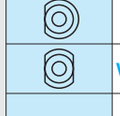
Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

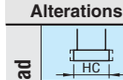
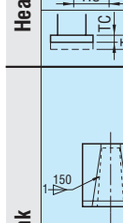
To be quoted on price & lead time above Max. Q'ty.

D	Head type U/price VAHD	VXAHD	Straight type U/price VASD	VXASD
3	17,750	20,470	16,420	18,810
4	17,750	20,470	16,420	18,810
5	17,750	20,470	16,420	18,810
6	16,420	18,810	15,090	17,280
8	16,420	18,810	15,090	17,280
10	16,420	18,810	15,090	17,280

Alterations		Code	Spec.	¥/1Code
Blade		BC	Changes shaped hole depth B 1≦BC≦Bmax. 0.1mm increments	2,800

P	Bmax.
0.500～0.899	2
0.900～1.199	3
1.200～	4

Full length		LC	Changes full length for head type. L—3≦LC＜L 0.1mm incr. (Comb. with LKC→0.01mm incr.) Changes full length for straight type. 8≦LC＜L 0.1mm incr. (Comb. with LKC→0.01mm incr.)	600
		LKC	Changes full length tolerance. L $^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗L＜16：Not applicable	1,600
Head		KC	Adds single key flat at head. ⊗Straight type：Not applicable	600
		WKC	Adds double key flats in parallel. ⊗Straight type：Not applicable	1,200
		KFC	 Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC：Not applicable ⊗L＜16：Not applicable ⊗Not applicable Straight type	1,200

Alterations		Code	Spec.	¥/1Code
Head		HC	Changes head diameter. D≦HC＜H 0.1mm increments ⊗Not applicable Straight type	600
		TC	Changes head thickness. 2≦TC＜T 0.1mm increments L is shortened by (T—TC). When LC, L=LC. ⊗Not applicable Straight type	600
Shank		ANF	Changes back relief angle. 0.4≦ANF≦1.2 0.2° increments d≦d max d=P+2{(L—B)×tanANF°} P—B tanANF°≧0.6 ⊗P＜1.00, D＜4：Not applicable ⊗KM：Not applicable	600

D	d max.
4	2.4
5	2.9
6	3.4
8	4.4
10	6.4

Taper	1/150
Angle	0.191°

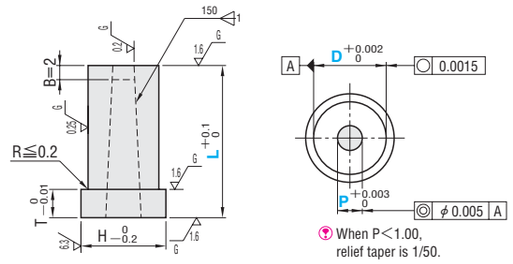
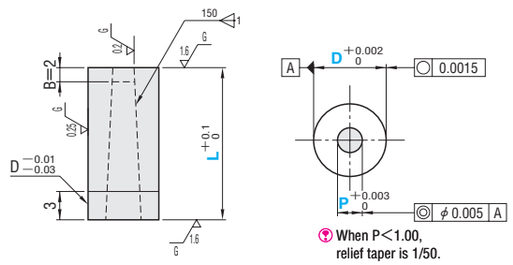
		KM	Adds key groove on shank. ⊗D＜6：Not applicable ⊗Not applicable Head type 5≦ ℓ ＜L 0.1mm increments ⊗ANF：Not applicable	1,200

D	h	ℓ
6	1	
8	1.5	
10		

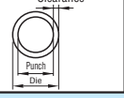
PRECISION SCRAP RETENTION CARBIDE ANGULAR BUTTON DIES

PRODUCTS DATA P.1229 SCRAP RETENSION BUTTON DIES

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
—Head type— RoHS	V40(HIP) 87～88HRA	SR—VAHD	
	Super corpuscle (HIP) 90～92HRA	SR—VXAHD	
—Straight type— RoHS	V40(HIP) 87～88HRA	SR—VASD	
	Super corpuscle (HIP) 90～92HRA	SR—VXASD	

When P<1.00, relief taper is 1/50.

Catalog No. Type	D	L	0.001mm increments min. P max.	MT (Material thickness) 0.01mm increments	C (Clearance) 0.001mm increments	H	T
Head type Straight type SR—VAHD SR—VASD SR—VXAHD SR—VXASD	3	13	0.800 ～1.000	MT≧0.10 Specifiable with material thickness 0.10mm or more.	C≧0.005 Specifiable with clearance 0.005mm or more. 	4	3
	4	16	0.800 ～1.500			5	
	5	20	0.800 ～2.500			6	
	6	22	1.000 ～3.000			9	5
	8	25	1.000 ～4.000			11	
	10		2.000 ～6.000			13	

Applicable only to the material with the tensile strength up to 1177N/mm² (120kgf/mm²).
Worked material thickness and clearance are used for scrap retention working data. Specify the blade dimension (P) with finished dimension.

Order: Catalog No. — L — P — MT — C
SR—VAHD 6 — 20 — P2.500 — MT1.50 — C0.105

Delivery: 5 Days

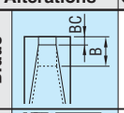
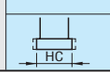
Alteration: Catalog No. — L(LC) — P — MT — C — (BC·HC·TC···etc.)
SR—VAHD6 — LC18.5 — P2.500 — MT1.50 — C0.105 — LKC

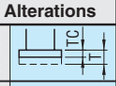
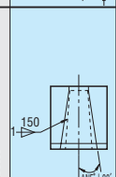
■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	Head type SR—VAHD	Head type SR—VXAHD	Straight type SR—VASD	Straight type SR—VXASD
3	21,480	24,630	20,080	22,880
4	20,920	24,010	19,520	22,260
5	20,920	24,010	19,520	22,260
6	19,380	22,110	17,980	20,500
8	19,380	22,110	17,980	20,500
10	19,380	22,110	17,980	20,500

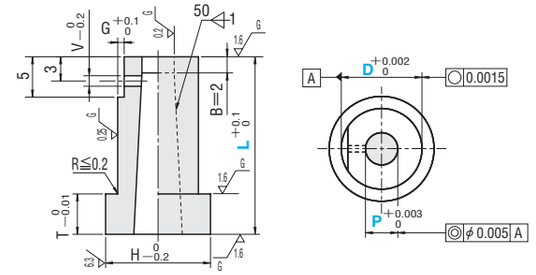
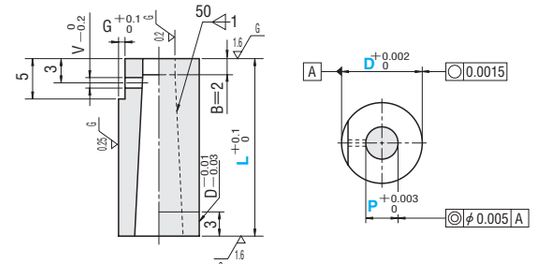
Alterations		Code	Spec.	¥/1Code
Blade		BC	Changes shaped hole depth B 1≦BC≦2 0.1mm increments	2,800
Full length		LC	Changes full length for head type. 10≦LC<L 0.1mm incr. (Comb. with LKC→0.01mm incr.) Changes full length for straight type. 8≦LC<L 0.1mm incr. (Comb. with LKC→0.01mm incr.)	600
		LKC	Changes full length tolerance. L +0.1 0 ⇨ +0.01 0 ⊗L<16:Not applicable	1,600
Head		KC	Adds single key flat at head. ⊗Straight type : Not applicable ⊗KFC: Not applicable	600
		WKC	Adds double key flats in parallel. ⊗Straight type : Not applicable ⊗KFC: Not applicable	1,200
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC : Not applicable ⊗L<16 : Not applicable ⊗Not applicable Straight type	1,200
		HC	Changes head diameter. D≦HC<H 0.1mm increments ⊗Not applicable Straight type	600

Alterations		Code	Spec.	¥/1Code
Head		TC	Changes head thickness. 2≦TC<T 0.1mm increments L is shortened by (T—TC). When LC, L=LC. ⊗Not applicable Straight type	600
Shank		ANF	Changes back relief angle. 0.4≦ANF≦1.2 0.2° increments d≦d max d=P+2{(L—B)×tanANF°} P—B tanANF°≧0.6 ⊗P<1.00, D<4 : Not applicable ⊗KM : Not applicable	600
		KM	Adds key groove on shank. ⊗D<6 : Not applicable ⊗Not applicable Head type 5≦ℓ<L 0.1mm increments ⊗ANF : Not available	1,200

PRECISION CARBIDE ANGULAR BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP

PRODUCTS DATA P.1231 BUTTON DIES WITH AIR HOLE

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
—Head type— RoHS	V40(HIP) 87～88HRA	SV-VAHD	
	Super corpuscle (HIP) 90～92HRA	SV-VXAHD	
—Straight type— RoHS	V40(HIP) 87～88HRA	SV-VASD	
	Super corpuscle (HIP) 90～92HRA	SV-VXASD	

Catalog No. Type	D	L	0.001mm increments min. P max.	V	G	H	T	SV-VAHD	SV-VXAHD	SV-VASD	SV-VXASD
Head type Straight type SV—VAHD SV—VASD SV—VXAHD SV—VXASD	3	13	0.500 ～ 1.000	0.4	0.2	4	3	19,470	22,040	18,210	20,510
	4	16	0.500 ～ 1.500			5		19,470	22,040	18,210	20,510
	5	20	0.500 ～ 2.500			6		19,470	22,040	18,210	20,510
	6	22	1.000 ～ 3.000	0.8	0.3	9	5	17,760	20,060	16,500	18,620
	8	25	1.000 ～ 4.000			11		17,760	20,060	16,500	18,620
	10		2.000 ～ 6.000			13		17,760	20,060	16,500	18,620

Order: Catalog No. — L — P
SV-VAHD6 — 20 — P2.500

Delivery: 5 Days

Alteration: Catalog No. — L(LC) — P — (BC·HC·TC···etc.)
SV-VASD6 — LC18 — P2.500 — LKC

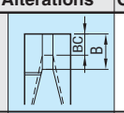
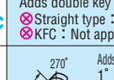
Price

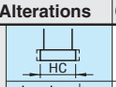
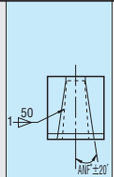
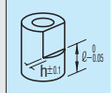
■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Features
- These non-clogging button dies are intended to be used in combination with a vacuum device such as a vacuum pump. A scrap vacuum unit (P.297) can be used for the vacuum device.
- The air inlet hole near the tip portion create air flow inside the button die when scrap is sucked out by the vacuum device. As a result effectiveness of scrap elimination is higher than that of a button die without air inlet hole.
- Button dies for preventing clogging of scrap [Products Data] P.1231

Alterations		Code	Spec.	¥/1Code
Blade		BC	Changes shaped hole depth B 1≦BC<2 0.1mm increments	2,800
Full length		LC	Changes full length for head type. 13≦LC<L 0.1mm incr. (Comb. with LKC→0.01mm incr.) Changes full length for straight type. 8≦LC<L 0.1mm incr. (Comb. with LKC→0.01mm incr.)	600
		LKC	Changes full length tolerance. L +0.1 0 ⇨ +0.01 0 ⊗L<16:Not applicable	1,600
Head		KC	Adds single key flat at head. ⊗Straight type : Not applicable ⊗KFC : Not applicable	600
		WKC	Adds double key flats in parallel. ⊗Straight type : Not applicable ⊗KFC : Not applicable	1,200
		KFC	 Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC : Not applicable ⊗L<16 : Not applicable ⊗Not applicable Straight type	1,200

Alterations		Code	Spec.	¥/1Code
Head		HC	Changes head diameter. D≦HC<H 0.1mm increments	600
		TC	Changes head thickness. 2≦TC<T 0.1mm increments L is shortened by (T—TC). When LC, L=LC.	600
Shank		ANF	Changes back relief angle. 0.2≦ANF≦1.2 0.2° increments d≦d max d=P+2{(L—B)×tanANF°} P—B tanANF°≧0.6 ⊗P<1.00, D<4 : Not applicable ⊗KM : Not applicable	600
		KM	Adds key groove on shank. ⊗D<6 : Not applicable ⊗Not applicable Head type 5≦ℓ<L 0.1mm increments KM is machined at the opposite side of air-in lead. ⊗ANF : Not applicable	1,200

Express service system P.38
MISUMI Press 2007 http://misumi.jp/press/
For inquiry, ordering and other information, refer to P.1269

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

CARBIDE PUNCHES

CARBIDE PUNCHES

Add. Blade length X type

Add. Blade length X type

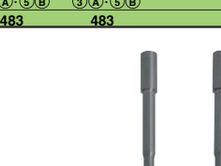
Add. Blade length X type

Name	CARBIDE SHOULDER PUNCHES —Standard type—	CARBIDE SHOULDER PUNCHES —Lapping type—	CARBIDE SHOULDER PUNCHES —TiCN coating type—	CARBIDE SHOULDER PUNCHES WITH AIR HOLE —Standard type—	CARBIDE SHOULDER PUNCHES WITH AIR HOLE —Lapping type—
Catalog No.	③Ⓐ·⑤Ⓑ	③Ⓐ·⑤Ⓑ	⑧Ⓒ	③Ⓐ·⑤Ⓑ	③Ⓐ·⑤Ⓑ
Delivery					
Page	449	449	451	453	453

Add. Blade length X type

New

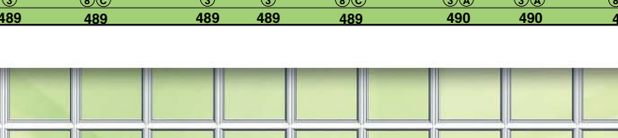
Add.



New

CARBIDE SHOULDER PUNCHES WITH AIR HOLE —TiCN coating type—	CARBIDE JECTOR PUNCHES —Standard type—	CARBIDE JECTOR PUNCHES —Lapping type—	CARBIDE JECTOR PUNCHES —TiCN coating type—	CARBIDE SHOULDER QUILL PUNCHES —Standard type—	CARBIDE SHOULDER QUILL PUNCHES —Lapping type—	CARBIDE SHOULDER QUILL PUNCHES —TiCN coating type—	CARBIDE SHOULDER PUNCHES —Mirror finished type—
⑧Ⓒ	③Ⓐ·⑤Ⓑ	③Ⓐ·⑤Ⓑ	⑧Ⓒ	③·⑤·⑤Ⓑ	③·⑤·⑤Ⓑ	⑧Ⓒ	③·⑤
455	459	459	459	461	461	461	463

Add.



CARBIDE SHOULDER PUNCHES—Short type— —Standard type—	—Lapping type—	—TiCN coating type—	CARBIDE DOUBLE STEPPED PUNCHES —Standard type—	—TiCN coating type—	CARBIDE D-CUT SHANK SHOULDER PUNCHES —Standard type—	—TiCN coating type—	CARBIDE D-CUT SHANK SHOULDER PUNCHES WITH AIR HOLE —Standard type—	—TiCN coating type—
③	③	⑧	③·⑤·⑤Ⓑ	⑧Ⓒ	③Ⓐ·⑤Ⓑ	⑧Ⓒ	③Ⓐ·⑤Ⓑ	⑧Ⓒ
465	465	465	467	467	469	469	471	471

New

TAPPED CARBIDE PUNCHES —Standard type—	—Lapping type—	—TiCN coating type—	CARBIDE PUNCHES WITH KEY GROOVE —Standard type—	—Lapping type—	CARBIDE PUNCHES WITH KEY GROOVE —TiCN coating type—	CARBIDE PUNCHES WITH KEY GROOVE —Standard type—	—Lapping type—	—With negative shank tolerance— —TiCN coating type—
③Ⓐ·⑤Ⓑ	③Ⓐ·⑤Ⓑ	⑧Ⓒ	③Ⓐ·⑤Ⓑ	③Ⓐ·⑤Ⓑ	⑧Ⓒ	③Ⓐ	③Ⓐ	⑧Ⓒ
473	473	473	475	475	477	479	479	479

New

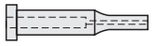
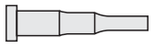
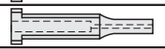
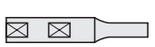
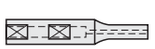
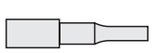
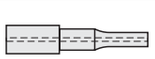
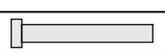
CARBIDE DOUBLE STEPPED PUNCHES WITH KEY GROOVE —Standard type—	—TiCN coating type—	CARBIDE PUNCHES WITH KEY GROOVE AND AIR HOLE —Standard type—	—Lapping type—	CARBIDE PUNCHES WITH KEY GROOVE AND AIR HOLE —TiCN coating type—
③·⑤·⑤Ⓑ	⑧Ⓒ	③Ⓐ·⑤Ⓑ	③Ⓐ·⑤Ⓑ	⑧Ⓒ
481	481	483	483	485

CARBIDE PUNCHES WITH KEY GROOVE AND AIR HOLE—With negative shank tolerance— —Standard type—	—Lapping type—	—TiCN coating type—	CARBIDE ROUND PUNCHES —Standard type—	—With air hole type—	—TiCN coating type—	CARBIDE ROUND PUNCHES—Negative shank tolerance— —Standard type—	—With air hole type—	—TiCN coating type—	CARBIDE STRAIGHT PUNCHES —Standard type—	—Lapping type—	—TiCN coating type—
③Ⓐ	③Ⓐ	⑧Ⓒ	③	③	⑧Ⓒ	③	③	⑧Ⓒ	③Ⓐ	③Ⓐ	⑧Ⓒ
487	487	487	489	489	489	489	489	489	490	490	490

CARBIDE PUNCHES —GUIDE—

■Carbide punches

Printed in red/green：New products & added spec.

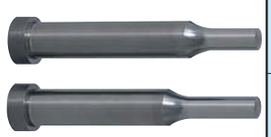
Type		Material	Shank diameter tolerance	Standard type		Lapping type Mirror finished type (green)		TiCN coating type	
Carbide shoulder		V30(HIP)	D_{m5}	WP□□	P.449	L—WP□□ L—WPA□	P.449 P.463	H—WP□□	P.451
		Super corpuscle (HIP)		WXP□□		L—WXP□□ L—WXPA□		H—WXP□□	
		V30(HIP)	$D^{+0.005}_{0}$	A—WP□□		AL—WP□□ AM—WPA□		AH—WP□□	
		Super corpuscle (HIP)		A—WXP□□		AL—WXP□□ AM—WXPA□		AH—WXP□□	
Carbide shoulder with air hole		V30(HIP)	D_{m5}	WJ□□	P.453	L—WJ□□	P.453	H—WJ□□	P.455
		Super corpuscle (HIP)		WXJ□□		L—WXJ□□		H—WXJ□□	
		V30(HIP)	$D^{+0.005}_{0}$	A—WJ□□		AL—WJ□□		AH—WJ□□	
		Super corpuscle (HIP)		A—WXJ□□		AL—WXJ□□		AH—WXJ□□	
Carbide shoulder jector		V30(HIP)	D_{m5}	WJP□□	P.459	L—WJP□□	P.459	H—WJP□□	P.459
			$D^{+0.005}_{0}$	A—WJP□□		AL—WJP□□		AH—WJP□□	
Carbide shoulder quill		V30(HIP)	D_{m5}	WPA□ WPLTA□	P.461	L—WPA□ L—WPLTA□ M—WPA□ M—WPLTA□	P.461 P.463	H—WPA□ H—WPLTA□	P.461
		Super corpuscle (HIP)		WXPA□		L—WXPA□ M—WXPA□		H—WXPA□	
		V30(HIP)	$D^{+0.005}_{0}$	A—WPA□ A—WPLTA□		AL—WPA□ AL—WPLTA□ AM—WPA□ AM—WPLTA□		AH—WPA□ AH—WPLTA□	
		Super corpuscle (HIP)		A—WXPA□		AL—WXPA□ AM—WXPA□		AH—WXPA□	
Carbide shoulder short		V30(HIP)	D_{m5}	WSA□	P.465	L—WSA□	P.465	H—WSA□	P.465
		Super corpuscle (HIP)		WXSA□		L—WXSA□		H—WXSA□	
		V30(HIP)	$D^{+0.005}_{0}$	A—WSA□		AL—WSA□		AH—WSA□	
		Super corpuscle (HIP)		A—WXSA□		AL—WXSA□		AH—WXSA□	
Carbide double stepped shoulder		V30(HIP)	D_{m5}	WPTW□	P.467	Alteration SC	P.468	H—WPTW□	P.467
		Super corpuscle (HIP)		WXPTW□				H—WXPTW□	
		V30(HIP)	$D^{+0.005}_{0}$	A—WPTW□				AH—WPTW□	
		Super corpuscle (HIP)		A—WXPTW□				AH—WXPTW□	
Carbide D-cut shank shoulder		V30(HIP)	$D^{+0.005}_{0}$	G—WP□□	P.469	Alteration SC	P.470	GH—WP□□	P.469
		Super corpuscle (HIP)		G—WXP□□				GH—WXP□□	
Carbide D-cut shank with air hole		V30(HIP)	$D^{+0.005}_{0}$	G—WJ□□	P.471	Alteration SC	P.472	GH—WJ□□	P.471
Carbide tapped		V30(HIP)	$D^{+0.005}_{0}$	A—WM□□	P.473	AL—WM□□	P.473	AH—WM□□	P.473
		Super corpuscle (HIP)		A—WXM□□		AL—WXM□□		AH—WXM□□	
Carbide With key groove		V30(HIP)	D_{m5}	WK□□	P.475	L—WK□□	P.475	H—WK□□	P.477
		Super corpuscle (HIP)		WXK□□		L—WXK□□		H—WXK□□	
		V30(HIP)	$D^{+0.005}_{0}$	A—WK□□		AL—WK□□		AH—WK□□	
		Super corpuscle (HIP)		A—WXK□□		AL—WXK□□		AH—WXK□□	
		V30(HIP)	$D^{-0.001}_{-0.006}$	B—WK□□	P.479	BL—WK□□	P.479	BH—WK□□	P.479
		Super corpuscle (HIP)		B—WXK□□		BL—WXK□□		BH—WXK□□	
Carbide double stepped with key groove		V30(HIP)	D_{m5}	WKTW□	P.481	Alteration SC	P.482	H—WKTW□	P.481
		Super corpuscle (HIP)		WXKTW□				H—WXKTW□	
		V30(HIP)	$D^{+0.005}_{0}$	A—WKTW□				AH—WKTW□	
		Super corpuscle (HIP)		A—WXKTW□				AH—WXKTW□	
Carbide With key groove & air hole		V30(HIP)	D_{m5}	WJK□□	P.483	L—WJK□□	P.483	H—WJK□□	P.485
		Super corpuscle (HIP)		WXJK□□		L—WXJK□□		H—WXJK□□	
		V30(HIP)	$D^{+0.005}_{0}$	A—WJK□□		AL—WJK□□		AH—WJK□□	
		Super corpuscle (HIP)		A—WXJK□□		AL—WXJK□□		AH—WXJK□□	
		V30(HIP)	$D^{-0.001}_{-0.006}$	B—WJK□□	P.487	BL—WJK□□	P.487	BH—WJK□□	P.487
		Super corpuscle (HIP)		B—WXJK□□		BL—WXJK□□		BH—WXJK□□	
Carbide Round		Super corpuscle (HIP)	$D^{+0.005}_{0}$	WXPHAL	P.489	Alteration SC	P.489	H—WXPHAL	P.489
			$D^{-0.001}_{-0.006}$	B—WXPHAL				BH—WXPHAL	
Carbide Round with air hole		Super corpuscle (HIP)	$D^{+0.005}_{0}$	WXJHAL	P.489	Alteration SC	P.489	H—WXJHAL	P.489
			$D^{-0.001}_{-0.006}$	B—WXJHAL				BH—WXJHAL	
Carbide Straight		V30(HIP)	—	WPC	P.490	L—WPC	P.490	H—WPC	P.490
		Super corpuscle (HIP)		WXPC		L—WXPC		H—WXPC	

PRESS ADD.SPEC. Printed in Red

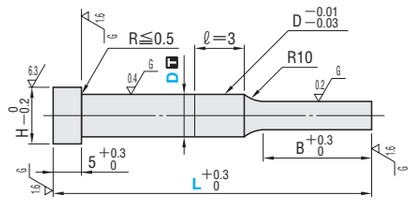
CARBIDE SHOULDER PUNCHES
—STANDARD TYPE / LAPPING TYPE—

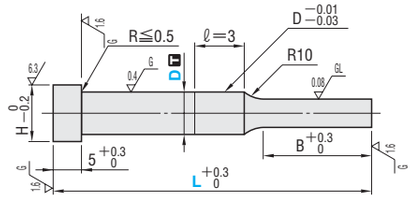
Price P.457

The volume discount rate is also applicable to alteration cost. P.39

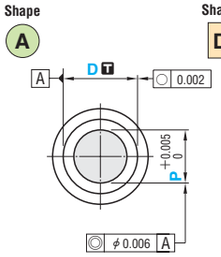
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length
RoHS Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	D_{m5}	V30(HIP) 88~89HRA	WP	A D R E G	S L X
		Super corpuscle (HIP) 90~92HRA	WXP (D3~6)		
	$D^{+0.005}_{0}$	V30(HIP) 88~89HRA	A—WP		
		Super corpuscle (HIP) 90~92HRA	A—WXP (D3~6)		
—Lapping type— RoHS  Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	D_{m5}	V30(HIP) 88~89HRA	L—WP		Blade length (B) X>L>S
		Super corpuscle (HIP) 90~92HRA	L—WXP (D3~6)		
	$D^{+0.005}_{0}$	V30(HIP) 88~89HRA	AL—WP		
		Super corpuscle (HIP) 90~92HRA	AL—WXP (D3~6)		

Select tip shape from Shape A~G shown below.





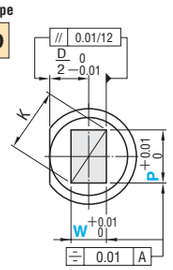
Shape A



P≧W

K=$\sqrt{P^2+W^2}$

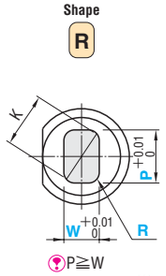
Shape D



P≧W

K=$\sqrt{P^2+W^2}$

Shape R

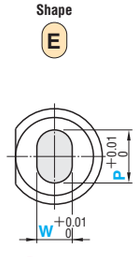


P≧W

0.15≦R< W/2

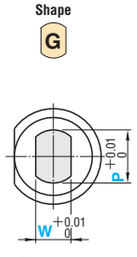
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.001 mm increments Ⓐ min.	P max.	0.01 mm increments DREG P・Kmax.	P・Wmin.	R	B	H
(D_{m5}) ($D^{+0.005}_{0}$) WP A—WP WXP A—WXP (D3~6) (D3~6) —Lapping type— L—WP AL—WP L—WXP AL—WXP (D3~6) (D3~6)	A D R E G	S	3	40 50 60 70	1.000~	2.990	—	—	0.15≦R< W/2 (Ⓡonly)	8	5
			4	40 50 60 70	1.000~	3.990	3.97	1.50			7
			5	40 50 60 70	2.000~	4.990	4.97	1.50			8
			6	40 50 60 70	2.000~	5.990	5.97	1.50			9
			8	(40) 50 60 70 80	3.000~	7.990	7.97	2.00		13	11
			10	(40) 50 60 70 80	3.000~	9.990	9.97	2.50			13
			13	(40) 50 60 70 80	6.000~	12.990	12.97	3.00			16
			16	(40) 50 60 70 80	10.000~	15.990	15.97	4.00		19	19
		L	3	40 50 60 70	1.000~	2.990	—	—		13	5
			4	50 60 70	1.000~	3.990	3.97	2.00			7
			5	50 60 70	2.000~	4.990	4.97	2.00			8
			6	50 60 70	2.000~	5.990	5.97	2.00			9
			8	50 60 70 80	3.000~	7.990	7.97	2.50		19	11
			10	50 60 70 80	3.000~	9.990	9.97	2.50			13
			13	50 60 70 80	6.000~	12.990	12.97	3.00			16
			16	60 70 80	10.000~	15.990	15.97	4.00		25	19
(D_{m5}) ($D^{+0.005}_{0}$) WP A—WP —Lapping type— L—WP AL—WP	A	X	3	50 60 70	2.000~	2.990	—	—	—	19	5
			4	50 60 70	2.000~	3.990					7
			5	50 60 70	3.000~	4.990				25	8
			6	50 60 70	3.000~	5.990					9
			8	60 70 80	3.000~	7.990				30	11
			10	60 70 80	3.000~	9.990					13
			13	60 70 80	6.000~	12.990					16
			16	70 80	10.000~	15.990				40	19

L(40) ···▸ B=8 When L (40), the blade length is fixed to 8mm.

Ⓐ: P>D−0.03 ···▸ ℓ=0 When P>D−0.03 of the round punch, D $^{-0.01}_{-0.03}$ (press in lead) is not available.

DREG: P・K>D−0.05 ···▸ ℓ=0 When P・K>D−0.05 of not-round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order

Catalog No.	L	P	W	R (Ⓡonly)
WPAS 10	60	P7.770		
A—WPEL 4	50	P3.65	W2.80	

Delivery

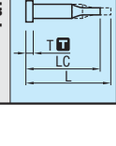
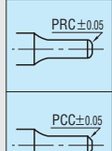
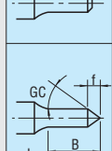
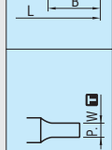
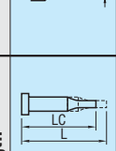
● Ⓐ 3 Days — Express A 1,500/1Pc. P.38 — A flat charge of 4,050 yen for 3 pieces or more of the same size.

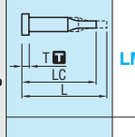
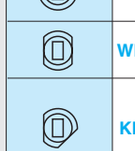
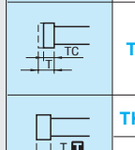
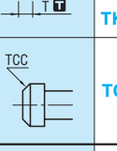
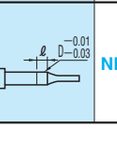
● DREG 5 Days — Express B 1,500/1Pc. P.38 — A flat charge of 4,050 yen for 3 pieces or more of the same size.

Price P.457

Alteration

Catalog No.	L(LC·LCT·LMT)	P(PC)	W(WC)	R	(BC・HC・TC···etc.)
WPAS 8	50	PC1.800			TKC

Alterations		Code	Ⓐ	DREG	¥/1Code
Blade		PC WC	Changes dimension P. PC≧Pmin/2 Specified in 0.001 mm increments ⊗Blade length X: Not applicable P(PC) / Bmax: 0.500~0.999 / 4; 1.000~1.999 / 13; 2.000~2.999 / 19; 3.000~3.999 / 30; 4.000~5.999 / 40; 6.000~ / 45	Changes dimension P・W. PC/WC≧Wmin×2/3≧1.00 Specified in 0.01 mm increments (Combination with PKC →0.001mm increments) P(PC)・W(WC) / Bmax: 1.000~1.999 / 8; 2.000~2.499 / 13; 2.500~3.999 / 19; 4.000~ / 25	Ⓐ 1,200 DREG 2,500
		BC	Changes blade length B 2≦BC≦Bmax Specified in 0.1 mm increments (?) Full length L (LC) requires BC+25mm or more.	Changes blade length B 2≦BC≦Bmax Specified in 0.1 mm increments (?) Full length L (LC) requires BC+30mm or more.	600
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (?) PRC≦(P−0.2)/2 ⊗PCC・GC: Not applicable	——	2,000
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (?) PCC≦(P−0.2)/2 ⊗PRC・GC: Not applicable	——	1,600
		GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B ≧ f+2 f=P/2×tan(90°−GC°) (?) The edge of lapping type is rounded. ⊗P≦1.000: Not applicable ⊗LKC・LKZ・LCT・LMT・PRC・PCC: Not applicable	——	1,200
		PKC	Changes tolerance on P (Dimension P: 0.001mm incr.) $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$	Changes tolerance on P・W. (Dimensions P and W: 0.001mm incr.) $P{\cdot}W^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Ⓐ 1,600 DREG 2,300
		PKV	Changes tolerance on P $P^{+0.005}_{0}$ ⇨ ±0.002 (?) Dimension P unit doesn't change.	Changes tolerance on P・W. $P{\cdot}W^{+0.01}_{0}$ ⇨ ±0.005 (?) Dimension P unit doesn't change.	0
Full length		LC	Changes full length 25+B(BC)≦LC<L Specified in 0.1 mm increments (?) When LC−B(or BC) is 25mm or less, B(or BC) is LC−25mm.	Changes full length 30+B(BC)≦LC<L Specified in 0.1 mm increments (?) When LC−B(or BC) is 30mm or less, B(or BC) is LC−30mm. (Combination with LKC・LKZ→0.01mm increments)	600
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (?) are the same as LC. TKC (Thickness) $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC (Full length) + Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		1,400

Alterations		Code	Ⓐ	DREG	¥/1Code
Full length		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (?) are the same as LC. TKM (Thickness) $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC (Full length) + Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		1,400
		LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		1,200
		LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		1,800
Head		KC	Adds single key flat at head. ⊗KFC: Not applicable	90° Changes the position of key flat. 1° incr. 0°~180°~270° ⊗KFC: Not applicable	600
		WKC	Adds double key flats in parallel. ⊗KFC: Not applicable	Adds double key flats in parallel. KC: Applicable. ⊗KFC: Not applicable	1,200
		KFC	90° Adds 1 key flat at 0° and the other on another angle. 1° increments 0°~180°~270° ⊗KC・WKC: Not applicable	90° Adds 1 key flat at 0° and the other on another angle. 1° increments 0°~180°~270° ⊗KC・WKC: Not applicable	1,200
		NKC	——	No key flat.	0
		HC	Changes head diameter. D≦HC<H Specified in 0.1 mm increments		600
		TC	Changes head thickness 2≦TC<5 0.1mm increments (Combination with TKC・TKM・LCT・LMT →0.01mm increments) (?) L is shortened by (5−TC). When LC, LCT and LMT are combined, L=specified dimention.		600
		TKC	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		1,200
		TKM	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		1,200
		TCC	Adds chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 (?) H≦5: TCC 0.5		600
Shank		NDC	No press-in lead ℓ=3 ⇨ ℓ=0		0

PRESS ADD.SPEC. Printed in Red

CARBIDE SHOULDER PUNCHES
—TiCN COATING TYPE—

PRODUCTS DATA P.1220

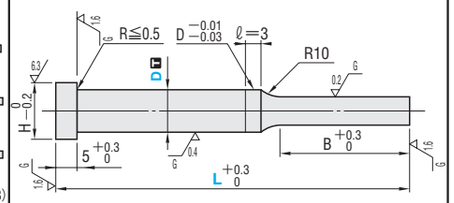
COATING PUNCHES — TiCN —

Price P.457

The volume discount rate is also applicable to alteration cost. P.39

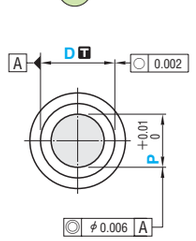
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A~G shown below.
—TiCN coating type— RoHS	D_{m5}	V30(HIP) 88~89HRA Surface 3000HV	H—WP	A D R E G	S	
		Super corpuscle (HIP) 90~92HRA Surface 3000HV	H—WXP (D3~6)		L	
	$D^{+0.005}_{0}$	V30(HIP) 88~89HRA Surface 3000HV	AH—WP		X	
		Super corpuscle (HIP) 90~92HRA Surface 3000HV	AH—WXP (D3~6)		Blade length (B) X>L>S	

Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable

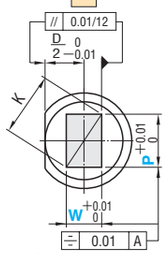


Tip surface is ground before coating.

Shape A



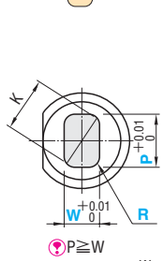
Shape D



P≧W

$K=\sqrt{P^2+W^2}$

Shape R

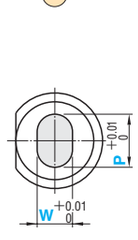


P≧W

$0.15 \leqq R < \frac{W}{2}$

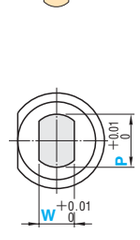
$K=\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01 mm increments Ⓐ min. P max.	DREG P・Kmax.	DREG P・Wmin.	Ⓡ R	B	H
(D_{m5}) H—WP H—WXP (D3~6)	A D R E G	S	3	40 50 60 70	1.00~ 2.99	—	—	$0.15 \leqq R < \frac{W}{2}$ (Ⓡonly)	8	5
			4	40 50 60 70	1.00~ 3.99	3.97	1.50			7
			5	40 50 60 70	2.00~ 4.99	4.97	1.50			8
			6	40 50 60 70	2.00~ 5.99	5.97	1.50			9
			8	(40) 50 60 70 80	3.00~ 7.99	7.97	2.00		13	11
			10	(40) 50 60 70 80	3.00~ 9.99	9.97	2.50			13
			13	(40) 50 60 70 80	6.00~12.99	12.97	3.00			16
			16	(40) 50 60 70 80	10.00~15.99	15.97	4.00		19	19
($D^{+0.005}_{0}$) AH—WP AH—WXP (D3~6)		L	3	40 50 60 70	1.00~ 2.99	—	—		13	5
			4	50 60 70	1.00~ 3.99	3.97	2.00			7
			5	50 60 70	2.00~ 4.99	4.97	2.00			8
			6	50 60 70	2.00~ 5.99	5.97	2.00			9
			8	50 60 70 80	3.00~ 7.99	7.97	2.50		19	11
			10	50 60 70 80	3.00~ 9.99	9.97	2.50			13
			13	50 60 70 80	6.00~12.99	12.97	3.00			16
			16	60 70 80	10.00~15.99	15.97	4.00		25	19
(D_{m5}) H—WP ($D^{+0.005}_{0}$) AH—WP	A	X	3	50 60 70	2.00~ 2.99	—	—	—	19	5
			4	50 60 70	2.00~ 3.99					7
			5	50 60 70	3.00~ 4.99				25	8
			6	50 60 70	3.00~ 5.99					9
			8	60 70 80	3.00~ 7.99				30	11
			10	60 70 80	3.00~ 9.99					13
			13	60 70 80	6.00~12.99					16
			16	70 80	10.00~15.99				40	19

Ⓡ L(40) ···▸ B=8 When L (40), the blade length is fixed to 8mm.

Ⓐ : P>D−0.03 ···▸ ℓ=0 When P>D−0.03 of the round punch, $D^{-0.01}_{-0.03}$(press in lead) is not available.

DREG: P・K>D−0.05 ···▸ ℓ=0 When P・K>D−0.05 of not-round punch, $D^{-0.01}_{-0.03}$(press-in lead) is not available.

Order Catalog No. — L — P — W — R (Ⓡonly)
H—WPAS 10 — 60 — P7.77

Delivery 8 Days | Express C 1,500/1Pc. P.38
Ⓡ A flat charge of 4,050 yen for 3 pieces or more of the same.

Price P.457

Alteration Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC・HC・TC···etc.)
H—WPAS 8 — 50 — PC1.95 — TKC

Alterations	Code	Ⓐ	DREG	¥/1Code
Blade	PC WC	Changes dimension P. PC≧Pmin/2≧1.00 0.01 mm increments (Combination with PKC →0.001mm increments) ⊗D3・4 : Not applicable ⊗Blade length X : Not applicable P(PC) / Bmax: 1.000~1.999 / 13; 2.000~2.999 / 19; 3.000~3.999 / 30; 4.000~ / 40	Changes dimension P・W. PC≧$\frac{P}{W}$min×$\frac{2}{3}$≧1.00 WC≧W 0.01 mm increments P(PC)・W(WC) / Bmax: 1.00~1.99 / 8; 2.00~2.49 / 13; 2.50~3.99 / 19; 4.00~ / 25	Ⓐ 1,200 DREG 2,500
	BC	Changes blade length B 2≦BC≦Bmax≦L/2 0.1 mm increments Ⓡ Full length L (LC) requires BC+25mm or more.	Changes blade length B 2≦BC≦Bmax 0.1 mm increments Ⓡ Full length L (LC) requires BC+30mm or more.	600
	SC	Changes tip roughness. 0.2 G ⇨ 0.08 GL Surface finished before coating.		Ⓐ 800 DREG 1,200
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓡ PRC≦(P−0.2)/2 ⊗PCC・GC : Not applicable	——	2,000
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓡ PCC≦(P−0.2)/2 ⊗PRC・GC : Not applicable	——	1,600
	GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B ≧ f+2 f=P/2×tan(90°−GC°) Ⓡ When combined with SC, tip and edge are rounded. ⊗P≦1.00 : Not applicable ⊗LKC・LCT・LMT・PRC・PCC : Not applicable	——	1,200
	PKC	Changes tolerance on P P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ (Dimension P : 0.001mm incr.) ⊗D16 : Not applicable	——	1,600
	PKV	Changes tolerance on P P $^{+0.01}_{0}$ ⇨ ±0.005 ⊗ Dimension P unit doesn't change.	——	0
Full length	LC	Changes full length 25+B(BC)≦LC<L 0.1 mm increments Ⓡ When LC−B (or BC) is 25mm or less, B (or BC) is LC−25mm. (Combination with LKC→0.01mm increments)	Changes full length 30+B(BC)≦LC<L 0.1 mm increments Ⓡ When LC−B (or BC) is 30mm or less, B (or BC) is LC−30mm.	600

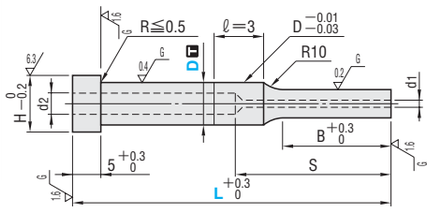
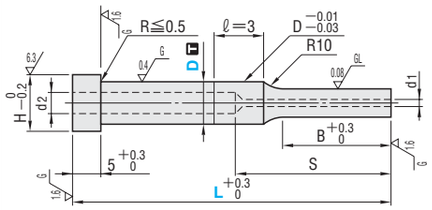
Alterations	Code	Ⓐ	DREG	¥/1Code
Full length	LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓡ) are the same as LC. TKC (Thickness) T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC (Full length) L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ + Changes full length tolerance.		1,400
	LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓡ) are the same as LC. TKM (Thickness) T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC (Full length) L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ + Changes full length tolerance.		
	LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		1,200
Head	KC	Adds single key flat at head. ⊗KFC : Not applicable	90° Changes the position of key flat. 1° incr. ⊗KFC : Not applicable	600
	WKC	Adds double key flats in parallel. ⊗KFC : Not applicable	Adds double key flats in parallel. KC : Applicable. ⊗KFC : Not applicable	1,200
	KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC : Not applicable	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC : Not applicable	1,200
	NKC	——	No key flat.	0
	HC	Changes head diameter. D≦HC<H 0.1 mm increments		600
	TC	Changes head thickness 2≦TC<5 0.1 mm increments (Combination with TKC・TKM・LCT・LMT →0.01mm increments) Ⓡ L is shortened by (5−TC). When LC, LCT and LMT are combined, L=specified dimention.		600
	TKC	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		1,200
	TKM	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		1,200
	TCC	Adds chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓡ H≦5 : TCC 0.5		600
Shank	NDC	No press -in lead	ℓ=3 ⇨ ℓ=0	0

PRESS ADD.SPEC. Printed in Red

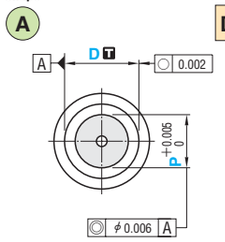
CARBIDE SHOULDER PUNCHES WITH AIR HOLE
—STANDARD TYPE / LAPPING TYPE—

Price P.458

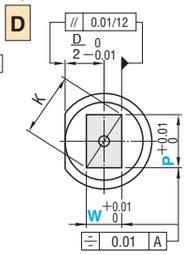
The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A～G shown below.
RoHS Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	D_{m5}	V30(HIP) 88～89HRA	WJ	A D R E G	S L X Blade length (B) X>L>S	
		Super corpuscle (HIP) 90～92HRA	WXJ (D4～6)			
	$D^{+0.005}_{0}$	V30(HIP) 88～89HRA	A—WJ			
		Super corpuscle (HIP) 90～92HRA	A—WXJ (D4～6)			
—Lapping type— RoHS Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	D_{m5}	V30(HIP) 88～89HRA	L—WJ			
		Super corpuscle (HIP) 90～92HRA	L—WXJ (D4～6)			
	$D^{+0.005}_{0}$	V30(HIP) 88～89HRA	AL—WJ			
		Super corpuscle (HIP) 90～92HRA	AL—WXJ (D4～6)			

Shape A



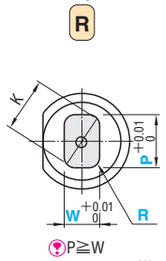
Shape D



P≧W

K=$\sqrt{P^2+W^2}$

Shape R

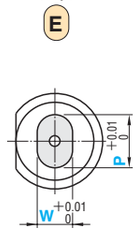


P≧W

0.15≦R< W/2

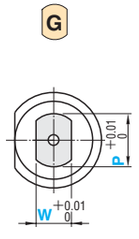
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.001 mm increments Ⓐ min. P	0.001 mm increments Ⓐ max. P	0.01 mm increments DREG P・Kmax.	0.01 mm increments DREG P・Wmin.	R	B	d_1	S	d_2	H
(D_{m5}) WJ	A D R E G	S	3	40 50 60 70	1.000～	2.990	—	—	0.15≦R< W/2 (R only)	8	0.3	—	0.3	5
($D^{+0.005}_{0}$) A—WJ			4	40 50 60 70	1.500～	3.990	3.97	1.50			0.5	20	1.2	7
WXJ (D4～6)			5	40 50 60 70	2.000～	4.990	4.97	2.00			0.8		2.1	8
A—WXJ (D4～6)			6	40 50 60 70	2.000～	5.990	5.97	2.00					2.6	9
—Lapping type—			8	(40) 50 60 70 80	3.000～	7.990	7.97	3.00		13	1.2	28	3.4	11
L—WJ AL—WJ			10	(40) 50 60 70 80	3.000～	9.990	9.97	3.00			1.6		4.4	13
L—WXJ AL—WXJ (D4～6)			13	(40) 50 60 70 80	6.000～	12.990	12.97	6.00			1.9			16
			16	(40) (50) 60 70 80	10.000～	15.990	15.97	6.00		19	2.9	36		19
		L	3	40 50 60 70	1.000～	2.990	—	—		13	0.3	—	0.3	5
			4	50 60 70	1.500～	3.990	3.97	2.00			0.5	20	1.2	7
			5	50 60 70	2.000～	4.990	4.97	2.00			0.8		2.1	8
			6	50 60 70	2.000～	5.990	5.97	2.00					2.6	9
			8	50 60 70 80	3.000～	7.990	7.97	3.00		19	1.2	28	3.4	11
			10	50 60 70 80	3.000～	9.990	9.97	3.00			1.6		4.4	13
			13	50 60 70 80	6.000～	12.990	12.97	6.00			1.9			16
			16	60 70 80	10.000～	15.990	15.97	6.00		25	2.9	36		19
(D_{m5}) WJ	A	X	4	50 60 70	2.000～	3.990	—	—	—	19	0.5	26	1.2	7
($D^{+0.005}_{0}$) A—WJ			5	50 60 70	3.000～	4.990				25	0.8	32	2.1	8
—Lapping type—			6	50 60 70	3.000～	5.990							2.6	9
L—WJ AL—WJ			8	60 70 80	3.000～	7.990				30	1.2	40	3.4	11
			10	60 70 80	3.000～	9.990					1.6		4.4	13
			13	60 70 80	6.000～	12.990					1.9			16
			16	70 80	10.000～	15.990				40	2.9	50		19

When L (40) or (50), the dimension B and S are as follows.

L	(40)	(50)
B	8	13

D \ L	(40)	(50)
8～16	S=17	
16		S=24

Ⓐ : P>D−0.03 ···▸ ℓ =0 When P>D−0.03 of the round punch, $D^{-0.01}_{-0.03}$(press in lead) is not available.

DREG: P・K>D−0.05 ···▸ ℓ =0 When P・K>D−0.05 of not-round punch, $D^{-0.01}_{-0.03}$(press-in lead) is not available.

Air hole of super corpuscle punch is straight. Dimension S and d2 are not available.

Order

Catalog No.	L	P	W	R (R only)
WJDS 10	60	P8.00	W3.00	

Delivery

● Ⓐ 3 Days — Express A 1,500/1Pc. P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

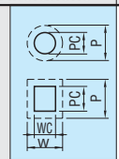
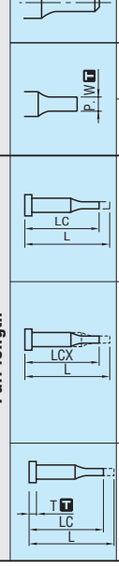
● DREG 5 Days — Express B 1,500/1Pc. P.38

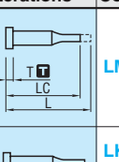
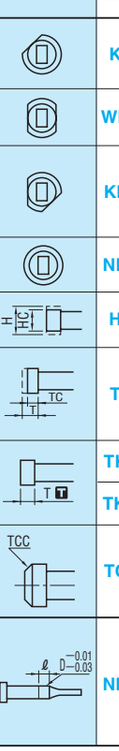
A flat charge of 4,050 yen for 3 pieces or more of the same size.

Price P.458

Alteration

Catalog No.	L(LC・LCX・LCT・LMT)	P(PC)	W(WC)	R	(BC・HC・TC…etc.)
WJDS 10	60	P8.00	W3.00		BC10

Alterations	Code	Ⓐ	DREG	¥/1Code
Blade 	PC WC	Changes dimension P. PC≧PCmin 0.001 mm increments ⊗D3・4 : Not applicable ⊗Blade length X : Not applicable D / PCmin: 5 1.800; 6 1.800; 8 2.300; 10 2.800; 13 5.000; 16 8.000	Changes dimension P・W. PC WC ≧PC・WCmin 0.01 mm increments (Combination with PKC→0.001mm increments) ⊗D4 : Not available. D / PC・WCmin: 5 1.80; 6 1.80; 8 2.50; 10 2.80; 13 5.00; 16 5.00	Ⓐ 1,200 DREG 2,500
	BC	Changes blade length B 2≦BC<B 0.1 mm increments (?) When LC, B is shortened by (L—LC).		600
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (?) PRC≦(P−d_1−0.5)/2 ⊗PCC : Not applicable	——	2,000
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (?) PCC≦(P−d_1−0.5)/2 ⊗PRC : Not applicable	——	1,600
	PKC	Changes tolerance on P $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$	Changes tolerance on P・W. (Dimensions P and W : 0.001mm incr.) $P・W^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Ⓐ 1,600 DREG 2,300
	PKV	Changes tolerance on P $P^{+0.005}_{0}$ ⇨ ±0.002 (?) Dimension P unit doesn't change.	Changes tolerance on P・W. $P・W^{+0.01}_{0}$ ⇨ ±0.005 (?) Dimension P unit doesn't change.	0
Full length 	LC	Changes full length 25+B(BC)≦LC<L 0.1mm increments (?) B and S are shortened by (L—LC). (Combination with LKC・LKZ→0.01mm increments)	Changes full length 30+B(BC)≦LC<L 0.1mm increments (?) B and S are shortened by (L—LC).	600
	LCX	Changes full length without changing blade length B. 25+B(BC)≦LCX<L 0.1mm increments (?) When LCX—B (or BC) is 25mm or less, B (or BC) is LCX—25mm. (Combination with LKC・LKZ→0.01mm increments) ⊗V30 : Not applicable	Changes full length without changing blade length B. 30+B(BC)≦LCX<L 0.1mm increments (?) When LCX—B (or BC) is 30mm or less, B (or BC) is LCX—30mm.	600
	LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (?) are the same as LC. TKC (Thickness) $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC (Full length) + $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		1,400

Alterations	Code	Ⓐ	DREG	¥/1Code
Full length 	LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (?) are the same as LC. TKM (Thickness) $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC (Full length) + $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		1,400
	LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		1,200
	LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		1,800
Head 	KC	Adds single key flat at head. ⊗KFC : Not applicable	90° Changes the position of key flat. 1° incr. 0° 180° 270° ⊗KFC : Not applicable	600
	WKC	Adds double key flats in parallel. ⊗KFC : Not applicable	Adds double key flats in parallel. KC : Applicable. ⊗KFC : Not applicable	1,200
	KFC	90° Adds 1 key flat at 0° and 180° the other on another angle. 1° increments 0° 180° 270° ⊗KC・WKC : Not applicable	90° Adds 1 key flat at 0° and 180° the other on another angle. 1° increments 0° 180° 270° ⊗KC・WKC : Not applicable	1,200
	NKC	——	No key flat.	0
	HC	Changes head diameter. D≦HC<H 0.1 mm increments		600
	TC	Changes head thickness 2≦TC<5 0.1mm increments (Combination with TKC・TKM・LCT・LMT→0.01mm increments) (?) L is shortened by (5—TC). When LC, LCT and LMT are combined, L=specified dimention.		600
	TKC	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		1,200
	TKM	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		1,200
	TCC	Adds chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 (?) H≦5 : TCC 0.5		600
Shank	NDC	No press-in lead ℓ =3 ⇨ ℓ =0		0

PRESS ADD.SPEC. Printed in Red

CARBIDE SHOULDER PUNCHES WITH AIR HOLE
—TiCN COATING TYPE—

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

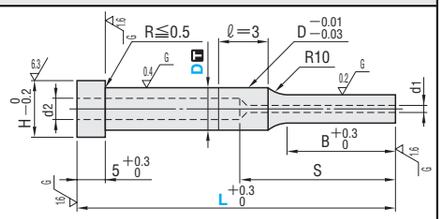
Price P.458

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. DT	M H	Catalog No. Type	Shape	B Blade length
—TiCN coating type— RoHS	D_{m5}	V30(HIP) 88～89HRA Surface 3000HV	H—WJ	A D R E G	S
		Super corpuscle(HIP) 90～92HRA Surface 3000HV	H—WXJ (D4～6)		L
	$D^{+0.005}_{0}$	V30(HIP) 88～89HRA Surface 3000HV	AH—WJ		X
		Super corpuscle(HIP) 90～92HRA Surface 3000HV	AH—WXJ (D4～6)		Blade length (B) X>L>S

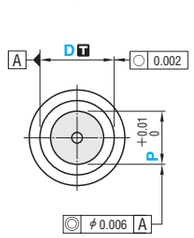
Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable

Select tip shape from Shape A～G shown below.

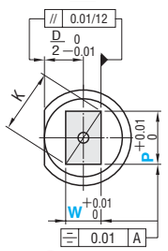


Tip surface is ground before coating.

Shape A



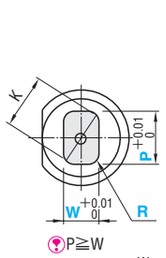
Shape D



P≧W

K=$\sqrt{P^2+W^2}$

Shape R

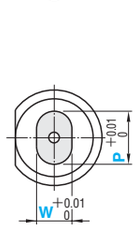


P≧W

0.15≦R<$\frac{W}{2}$

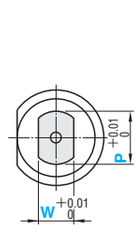
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01mm increments Ⓐ min. P max.	ⒹⓇⒺⒼ P・Kmax.	ⒹⓇⒺⒼ P・Wmin.	Ⓡ R	B	d_1	S	d_2	H
(D_{m5}) H—WJ H—WXJ (D4～6)	A D R E G	S	3	40 50 60 70	1.00～2.99	—	—	0.15≦R<$\frac{W}{2}$ (Ⓡonly)	8	0.3	—	0.3	5
			4	40 50 60 70	1.50～3.99	3.97	1.50			0.5	20	1.2	7
			5	40 50 60 70	2.00～4.99	4.97	2.00			0.8		2.1	8
			6	40 50 60 70	2.00～5.99	5.97	2.00					2.6	9
			8	(40) 50 60 70 80	3.00～7.99	7.97	3.00		13	1.2	27	3.4	11
			10	(40) 50 60 70 80	3.00～9.99	9.97	3.00			1.6	28	4.4	13
			13	(40) 50 60 70 80	6.00～12.99	12.97	6.00			1.9			16
			16	(40) (50) 60 70 80	10.00～15.99	15.97	6.00		19	2.9	36		19
($D^{+0.005}_{0}$) AH—WJ AH—WXJ (D4～6)		L	3	40 50 60 70	1.00～2.99	—	—		13	0.3	—	0.3	5
			4	50 60 70	1.50～3.99	3.97	2.00			0.5	20	1.2	7
			5	50 60 70	2.00～4.99	4.97	2.00			0.8		2.1	8
			6	50 60 70	2.00～5.99	5.97	2.00					2.6	9
			8	50 60 70 80	3.00～7.99	7.97	3.00		19	1.2	28	3.4	11
			10	50 60 70 80	3.00～9.99	9.97	3.00			1.6		4.4	13
			13	50 60 70 80	6.00～12.99	12.97	6.00			1.9			16
			16	60 70 80	10.00～15.99	15.97	6.00		25	2.9	36		19
(D_{m5}) H—WJ ($D^{+0.005}_{0}$) AH—WJ	A	X	4	50 60 70	2.00～3.99			—	19	0.5	26	1.2	7
			5	50 60 70	3.00～4.99				25	0.8	32	2.1	8
			6	50 60 70	3.00～5.99							2.6	9
			8	60 70 80	3.00～7.99	—	—		30	1.2	40	3.4	11
			10	60 70 80	3.00～9.99					1.6		4.4	13
			13	60 70 80	6.00～12.99					1.9			16
			16	70 80	10.00～15.99				40	2.9	50		19

When L (40) or (50), the dimension B and S are as follows.

L	(40)	(50)
B	8	13

D L	(40)
8～16	S=17

D L	(50)
16	S=24

Ⓐ : P>D−0.03 ···▸ ℓ=0 When P>D−0.03 of the round punch, $D^{-0.01}_{-0.03}$ (press in lead) is not available.

ⒹⓇⒺⒼ: P・K>D−0.05 ···▸ ℓ=0 When P・K>D−0.05 of not-round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.

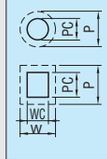
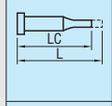
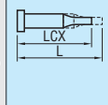
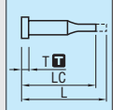
Air hole of super corpuscle punch is straight. Dimension S and d2 are not available.

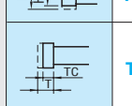
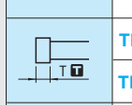
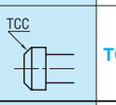
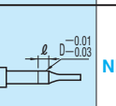
Order: Catalog No. — L — P — W — R (Ⓡonly)
H—WJDS 10 — 60 — P8.00 — W3.00

Delivery: 8 Days | Express C | 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size.

Price P.458

Alteration: Catalog No. — L(LC・LCX・LCT・MT) — P(PC) — W(WC) — R — (BC・HC・TC···etc.)
H—WJDS 10 — 60 — P8.00 — W3.00 — BC10

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Blade		PC WC	Changes dimension P. PC≧PCmin 0.01mm increments (Combination with PKC→0.01mm increments) ⊗D3・D4：Not applicable. ⊗Blade length X：Not applicable	Changes dimension P・W. PC WC ≧PC・WCmin 0.01mm increments ⊗D4：Not applicable.	Ⓐ 1,200 DREG 2,500
		BC	Changes blade length B 2≦BC<B 0.1mm increments		600
		SC	Changes tip roughness. 0.2 S ⇨ 0.08 GL Surface finished before coating.		Ⓐ 800 DREG 1,200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (P)PRC≦(P−d_1−0.5)/2 ⊗PCC：Not applicable	——	2,000
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (P)PCC≦(P−d_1−0.5)/2 ⊗PRC：Not applicable	——	1,600
		PKC	Changes tolerance on P P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P)(Dimension P：0.001mm incr.) ⊗D16：Not applicable	——	1,600
		PKV	Changes tolerance on P P $^{+0.01}_{0}$ ⇨ ±0.005 (P)Dimension P unit doesn't change.	——	0
Full length		LC	Changes full length 25+B(BC)≦LC<L 0.1mm increments (P)B and S are shortened by (L−LC). (Combination with LKC→0.01mm increments)	Changes full length 30+B(BC)≦LC<L 0.1mm increments (P)B and S are shortened by (L−LC).	600
		LCX	Changes full length without changing blade length B. 25+B(BC)≦LCX<L 0.1mm increments (P)When LCX−B (or BC) is 25mm or less, B (or BC) is LCX−25mm. (Combination with LKC→0.01mm increments) ⊗V30：Not applicable	Changes full length without changing blade length B. 30+B(BC)≦LCX<L 0.1mm increments (P)When LCX−B (or BC) is 30mm or less, B (or BC) is LCX−30mm.	600
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (P) are the same as LC. TKC (Thickness) T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC (Full length) L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		1,400
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (P) are the same as LC. TKM (Thickness) T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC (Full length) L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Full length		LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		1,200
Head		KC	Adds single key flat at head. ⊗KFC：Not applicable	90° 0° 180° 270° Changes the position of key flat. 1° incr. ⊗KFC：Not applicable	600
		WKC	Adds double key flats in parallel. ⊗KFC：Not applicable	Adds double key flats in parallel. KC：Applicable. ⊗KFC：Not applicable	1,200
		KFC	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC：Not applicable	90° 0° 180° 270° Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC：Not applicable	1,200
		NKC	——	No key flat.	0
		HC	Changes head diameter. D≦HC<H 0.1mm increments		600
		TC	Changes head thickness 2≦TC<5 0.1mm increments (Combination with TKC・TKM・LCT・LMT →0.01mm increments) (P) L is shortened by (5−TC). When LC, LCT and LMT are combined, L=specified dimention.		600
		TKC	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		1,200
		TKM	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		1,200
		TCC	Adds chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 (P)H≦5：TCC 0.5		600
Shank		NDC	No press -in lead	ℓ=3 ⇨ ℓ=0	0

CARBIDE PUNCHES / CARBIDE PUNCHES WITH AIR HOLE
—PRICE—

Price

■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

CARBIDE PUNCHES

■V30 (HIP) Standard type (P.449)

D	Ⓐ		Ⓓ	Ⓡ	Ⓔ	Ⓖ
	WPAS WPAL A—WPAS A—WPAL	A—WPAX	WPDS WPDL A—WPDS A—WPDL	WPRS WPRL A—WPRS A—WPRL	WPES WPEL A—WPES A—WPEL	WPGS WPGL A—WPGS A—WPGL
3	3,090	3,660	—	—	—	—
4	3,130	3,700	5,080	5,750	5,610	4,910
5	3,180	3,750	5,130	5,790	5,660	4,960
6	3,580	4,150	5,220	5,970	5,830	5,000
8	4,590	5,160	6,400	7,200	6,970	6,180
10	5,680	6,250	7,420	8,260	8,040	7,150
13	6,890	7,460	8,960	9,700	9,440	8,610
16	8,990	9,540	10,360	11,290	11,020	10,010

■Super corpuscle (HIP) Standard type (P.449)

D	Ⓐ	Ⓓ	Ⓡ	Ⓔ	Ⓖ
	WXPAS WXPAL A—WXPAS A—WXPAL	WXPDS WXPDL A—WXPDS A—WXPDL	WXPRS WXPRL A—WXPRS A—WXPRL	WXPES WXPEL A—WXPES A—WXPEL	WXPGS WXPGL A—WXPGS A—WXPGL
3	4,770	—	—	—	—
4	4,840	7,930	8,850	8,660	7,690
5	4,900	8,000	8,910	8,730	7,750
6	5,410	8,120	9,160	8,980	7,810

■V30 (HIP) Lapping type (P.449)

D	Ⓐ		Ⓓ	Ⓡ	Ⓔ	Ⓖ
	L—WPAS L—WPAL AL—WPAS AL—WPAL	AL—WPAX	L—WPDS L—WPDL AL—WPDS AL—WPDL	L—WPRS L—WPRL AL—WPRS AL—WPRL	L—WPES L—WPEL AL—WPES AL—WPEL	L—WPGS L—WPGL AL—WPGS AL—WPGL
3	3,850	4,420	—	—	—	—
4	3,890	4,460	6,220	6,890	6,750	6,050
5	3,940	4,510	6,270	6,930	6,800	6,100
6	4,340	4,910	6,360	7,110	6,970	6,140
8	5,350	5,920	7,540	8,340	8,110	7,320
10	6,440	7,010	8,560	9,400	9,180	8,290
13	7,650	8,220	10,100	10,840	10,580	9,750
16	9,750	10,320	11,500	12,430	12,160	11,150

■Super corpuscle (HIP) Lapping type (P.449)

D	Ⓐ	Ⓓ	Ⓡ	Ⓔ	Ⓖ
	L—WXPAS L—WXPAL AL—WXPAS AL—WXPAL	L—WXPDS L—WXPDL AL—WXPDS AL—WXPDL	L—WXPRS L—WXPRL AL—WXPRS AL—WXPRL	L—WXPES L—WXPEL AL—WXPES AL—WXPEL	L—WXPGS L—WXPGL AL—WXPGS AL—WXPGL
3	5,530	—	—	—	—
4	5,600	9,070	9,990	9,800	8,830
5	5,660	9,140	10,050	9,870	8,890
6	6,170	9,260	10,300	10,120	8,950

■V30 (HIP) TiCN coating type (P.451)

D	Ⓐ		Ⓓ	Ⓡ	Ⓔ	Ⓖ
	H—WPAS H—WPAL AH—WPAS AH—WPAL	AH—WPAX	H—WPDS H—WPDL AH—WPDS AH—WPDL	H—WPRS H—WPRL AH—WPRS AH—WPRL	H—WPES H—WPEL AH—WPES AH—WPEL	H—WPGS H—WPGL AH—WPGS AH—WPGL
3	4,620	5,190	—	—	—	—
4	4,690	5,260	6,640	7,310	7,170	6,470
5	4,810	5,380	6,760	7,420	7,290	6,590
6	5,390	5,960	7,030	7,780	7,640	6,810
8	6,590	7,160	8,400	9,200	8,970	8,180
10	7,880	8,450	9,620	10,460	10,240	9,350
13	9,300	9,870	11,370	12,110	11,850	11,020
16	11,630	12,200	13,000	13,930	13,660	12,650

■Super corpuscle (HIP) TiCN coating type (P.451)

D	Ⓐ	Ⓓ	Ⓡ	Ⓔ	Ⓖ
	H—WXPAS H—WXPAL AH—WXPAS AH—WXPAL	H—WXPDS H—WXPDL AH—WXPDS AH—WXPDL	H—WXPRS H—WXPRL AH—WXPRS AH—WXPRL	H—WXPES H—WXPEL AH—WXPES AH—WXPEL	H—WXPGS H—WXPGL AH—WXPGS AH—WXPGL
3	6,300	—	—	—	—
4	6,400	9,490	10,410	10,220	9,250
5	6,530	9,630	10,540	10,360	9,380
6	7,220	9,930	10,970	10,790	9,620

CARBIDE PUNCHES WITH AIR HOLE

■V30 (HIP) Standard type (P.453)

D	Ⓐ		Ⓓ	Ⓡ	Ⓔ	Ⓖ
	WJAS WJAL A—WJAS A—WJAL	A—WJAX	WJDS WJDL A—WJDS A—WJDL	WJRS WJRL A—WJRS A—WJRL	WJES WJEL A—WJES A—WJEL	WJGS WJGL A—WJGS A—WJGL
3	4,820	—	—	—	—	—
4	3,530	4,980	5,530	6,050	5,920	5,180
5	3,690	5,140	5,660	6,150	5,970	5,260
6	4,130	5,580	5,750	6,320	6,230	5,350
8	5,130	6,330	7,200	7,770	7,590	6,720
10	6,540	7,740	8,340	8,830	8,610	7,720
13	7,880	9,080	9,970	10,360	10,150	9,260
16	9,630	10,830	10,890	11,640	11,290	10,760

■Super corpuscle (HIP) Standard type (P.453)

D	Ⓐ	Ⓓ	Ⓡ	Ⓔ	Ⓖ
	WXJAS WXJAL A—WXJAS A—WXJAL	WXJDS WXJDL A—WXJDS A—WXJDL	WXJRS WXJRL A—WXJRS A—WXJRL	WXJES WXJEL A—WXJES A—WXJEL	WXJGS WXJGL A—WXJGS A—WXJGL
4	5,410	8,620	9,350	9,160	8,120
5	5,600	8,800	9,470	9,220	8,250
6	6,170	8,920	9,710	9,590	8,370

■V30 (HIP) Lapping type (P.453)

D	Ⓐ		Ⓓ	Ⓡ	Ⓔ	Ⓖ
	L—WJAS L—WJAL AL—WJAS AL—WJAL	AL—WJAX	L—WJDS L—WJDL AL—WJDS AL—WJDL	L—WJRS L—WJRL AL—WJRS AL—WJRL	L—WJES L—WJEL AL—WJES AL—WJEL	L—WJGS L—WJGL AL—WJGS AL—WJGL
3	5,580	—	—	—	—	—
4	4,290	5,740	6,670	7,190	7,060	6,320
5	4,450	5,900	6,800	7,290	7,110	6,400
6	4,890	6,340	6,890	7,460	7,370	6,490
8	5,890	7,090	8,340	8,910	8,730	7,860
10	7,300	8,500	9,480	9,970	9,750	8,860
13	8,640	9,840	11,110	11,500	11,290	10,400
16	10,390	11,590	12,030	12,780	12,430	11,900

■Super corpuscle (HIP) Lapping type (P.453)

D	Ⓐ	Ⓓ	Ⓡ	Ⓔ	Ⓖ
	L—WXJAS L—WXJAL AL—WXJAS AL—WXJAL	L—WXJDS L—WXJDL AL—WXJDS AL—WXJDL	L—WXJRS L—WXJRL AL—WXJRS AL—WXJRL	AL—WXJES AL—WXJEL AL—WXJES AL—WXJEL	AL—WXJGS L—WXJGL AL—WXJGS AL—WXJGL
4	6,170	9,760	10,490	10,300	9,260
5	6,360	9,940	10,610	10,360	9,390
6	6,930	10,060	10,850	10,730	9,510

■V30 (HIP) TiCN coating type (P.455)

D	Ⓐ		Ⓓ	Ⓡ	Ⓔ	Ⓖ
	H—WJAS H—WJAL AH—WJAS AH—WJAL	H—WJAX AH—WJAX	H—WJDS H—WJDL AH—WJDS AH—WJDL	H—WJRS H—WJRL AH—WJRS AH—WJRL	H—WJES H—WJEL AH—WJES AH—WJEL	H—WJGS H—WJGL AH—WJGS AH—WJGL
3	6,350	—	—	—	—	—
4	5,090	6,540	7,090	7,610	7,480	6,740
5	5,320	6,770	7,290	7,780	7,600	6,890
6	5,940	7,390	7,560	8,130	8,040	7,160
8	7,130	8,330	9,200	9,770	9,590	8,720
10	8,740	9,940	10,540	11,030	10,810	9,920
13	10,290	11,490	12,380	12,770	12,560	11,670
16	12,270	13,470	13,530	14,280	13,930	13,400

■Super corpuscle (HIP) TiCN coating type (P.455)

D	Ⓐ	Ⓓ	Ⓡ	Ⓔ	Ⓖ
	H—WXJAS H—WXJAL AH—WXJAS AH—WXJAL	H—WXJDS H—WXJDL AH—WXJDS AH—WXJDL	H—WXJRS H—WXJRL AH—WXJRS AH—WXJRL	H—WXJES H—WXJEL AH—WXJES AH—WXJEL	H—WXJGS H—WXJGL AH—WXJGS AH—WXJGL
4	6,970	10,180	10,910	10,720	9,680
5	7,230	10,430	11,100	10,850	9,880
6	7,980	10,730	11,520	11,400	10,180

PRESS NEW

CARBIDE JECTOR PUNCHES
—STANDARD TYPE / LAPPING TYPE / TiCN COATING TYPE—

PRODUCTS DATA P.1220

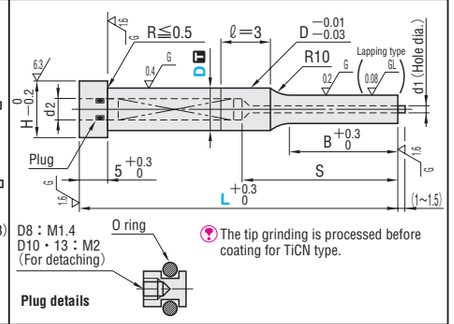
COATING PUNCHES
— TiCN —

¥ The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H
RoHS Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable	D_{m5} $D^{+0.005}_{0}$	Punch V30(HIP) 88~89HRA Plug SUM23 O ring Fluorine rubber

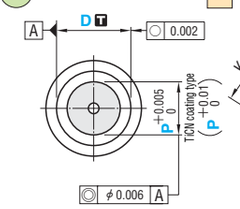
Catalog No. Type	Shape	B Blade length
WJP Lapping type L—WJP TiCN coating type H—WJP	A D R E G	S L Blade length (B) L>S
A—WJP Lapping type AL—WJP TiCN coating type AH—WJP		

Select tip shape from Shape A~G shown below.

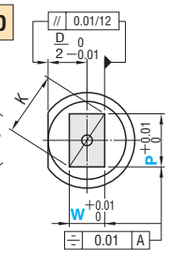


The tip grinding is processed before coating for TiCN type.

Shape A

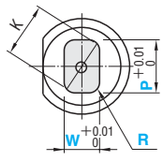


Shape D



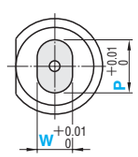
P≧W
K=$\sqrt{P^2+W^2}$

Shape R



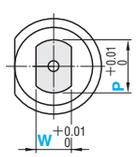
P≧W
0.15≦R< W/2
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.001 mm increments Ⓐ min. P max.	0.01 mm increments D R E G P・Kmax.	0.01 mm increments D R E G P・Wmin.	R	B	d_1	S	d_2	H
(D_{m5}) $(D^{+0.005}_{0})$ WJP A—WJP —Lapping type— L—WJP AL—WJP —TiCN coating type— H—WJP AH—WJP	A D R E G	S	8	(40) 50 60 70 80	3.000~ 7.990	7.97	3.00	0.15≦R< W/2 (Ronly)	13	1.2	27	3.4	11
			10	(40) 50 60 70 80	3.000~ 9.990	9.97	3.00			1.6	28	4.4	13
			13	(40) 50 60 70 80	6.000~12.990	12.97	6.00			1.9			16
		L	8	50 60 70 80	3.000~ 7.990	7.97	3.00		19	1.2	27	3.4	11
			10	50 60 70 80	3.000~ 9.990	9.97	3.00			1.6	28	4.4	13
			13	50 60 70 80	6.000~12.990	12.97	6.00			1.9			16

L(40) ···▸ B=8 When L (40), blade length B=8, S=17.
Ⓐ : P>D−0.03 ···▸ ℓ=0 When P>D−0.03 of the round punch, D $^{-0.01}_{-0.03}$ (press in lead) is not available.
D R E G : P・K>D−0.05 ···▸ ℓ=0 When P・K>D−0.05 of not-round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
Specify dimension P at 0.01mm increments for TiCN coating type.

Order

Catalog No.	L	P	W	R (Ronly)
WJPDS 10	60	P8.00	W3.00	

Delivery

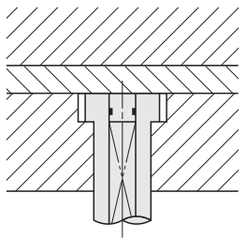
● Ⓐ
3 Days — Express A 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size.

● D R E G
5 Days — Express B 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size.

● TiCN coating type
8 Days — Express C 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size.

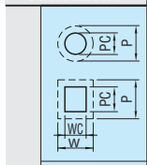
■Features
- The integration of Punch, Jector pin, and Spring offers easy scrap prevention with Carbide punches. (Attaching spring from punch holder is unnecessary).
- No tapping at head minimized head strength lowering.
- The plug that pushes the spring is for temporary use. Make sure to use backing plates to support both head and spring upon the use. (Unsupported spring may cause plug and spring fall off while in use).

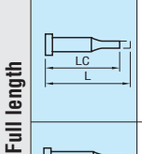
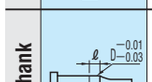
■Example of use
Support the plug with the backing plate.



Alteration

Catalog No.	L(LC・LCT・LMT)	P(PC)	W(WC)	R	(BC・HC・TC···etc.)
WJPDS 10	60	P8.00	W3.00		BC10

Alterations	Code	Ⓐ	D R E G	¥/1Code
Blade 	PC WC	Changes dimension P. PC≧PCmin Specified in 0.001 mm increments D / PCmin: 8 2.300; 10 2.800; 13 5.000	Changes dimension P・W. PC WC≧PC・WCmin Specified in 0.01 mm increments (Combination with PKC →0.001mm increments) D / PC・WCmin: 8 2.50; 10 2.80; 13 5.00	Ⓐ 1,200 D R E G 2,500
	BC	Changes blade length B 2≦BC<B Specified in 0.1 mm increments When LC, B is shortened by (L—LC).		600
	SC	Changes tip roughness. 0.2 G ⇨ 0.08 GL Surface finished before coating. Applicable to coating type.		Ⓐ 800 D R E G 1,200
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−d_1−0.5)/2	——	2,000
	PKC	Changes tolerance on P Standard type P $^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ TiCN coating type P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Changes tolerance on P・W. (Dimensions P and W : 0.001mm incr.) P・W $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗TiCN coating type : Not applicable	Ⓐ 1,600 D R E G 2,300
	PKV	Changes tolerance on P Standard type P $^{+0.005}_{0}$ ⇨ ±0.002 TiCN coating type P $^{+0.01}_{0}$ ⇨ ±0.005 Dimension P unit doesn't change.	Changes tolerance on P・W. (Dimensions P and W : 0.001mm incr.) P・W $^{+0.01}_{0}$ ⇨ ±0.005 ⊗TiCN coating type : Not applicable	0

Alterations	Code	Ⓐ	D R E G	¥/1Code
Full length 	LC	Changes full length 25+B(BC)≦LC<L Specified in 0.1 mm increments B and S are shortened by (L—LC). (Combination with LKC・LKZ→0.01mm increments)	Changes full length 30+B(BC)≦LC<L Specified in 0.1 mm increments B and S are shortened by (L—LC).	600
	LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		1,200
	LKZ	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗TiCN coating type : Not applicable		1,800
Head	KC	Adds single key flat at head.	90° 0° 180° 270° Changes the position of key flat. 1° incr.	600
	WKC	Adds double key flats in parallel.	Adds double key flats in parallel.	1,200
	NKC	——	No key flat.	0
	HC	Changes head diameter. D≦HC<H Specified in 0.1 mm increments		600
	TKC	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		1,200
	TKM	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		1,200
	TCC	Adds chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2		600
Shank 	NDC	No press-in lead ℓ=3 ⇨ ℓ=0		0

Price

Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	Ⓐ	D	R	E	G
	WJPAS WJPAL A—WJPAS A—WJPAL	WJPDS WJPDL A—WJPDS A—WJPDL	WJPRS WJPRL A—WJPRS A—WJPRL	WJPES WJPEL A—WJPES A—WJPEL	WJPGS WJPGL A—WJPGS A—WJPGL
8	5,980	8,200	8,770	8,590	7,720
10	7,390	9,340	9,830	9,610	8,720
13	8,730	10,970	11,360	11,150	10,260

D	Ⓐ	D	R	E	G
	L—WJPAS L—WJPAL AL—WJPAS AL—WJPAL	L—WJPDS L—WJPDL AL—WJPDS AL—WJPDL	L—WJPRS L—WJPRL AL—WJPRS AL—WJPRL	L—WJPES L—WJPEL AL—WJPES AL—WJPEL	L—WJPGS L—WJPGL AL—WJPGS AL—WJPGL
8	6,740	9,340	9,910	9,730	8,860
10	8,150	10,480	10,970	10,750	9,860
13	9,490	12,110	12,500	12,290	11,400

D	Ⓐ	D	R	E	G
	H—WJPAS H—WJPAL AH—WJPAS AH—WJPAL	H—WJPDS H—WJPDL AH—WJPDS AH—WJPDL	H—WJPRS H—WJPRL AH—WJPRS AH—WJPRL	H—WJPES H—WJPEL AH—WJPES AH—WJPEL	H—WJPGS H—WJPGL AH—WJPGS AH—WJPGL
8	7,980	10,200	10,770	10,590	9,720
10	9,590	11,540	12,030	11,810	10,920
13	11,140	13,380	13,770	13,560	12,670

PRESS ADD.SPEC. Printed in Red

CARBIDE SHOULDER QUILL PUNCHES
—STANDARD TYPE / LAPPING TYPE / TiCN COATING TYPE—

PRODUCTS DATA P.1220

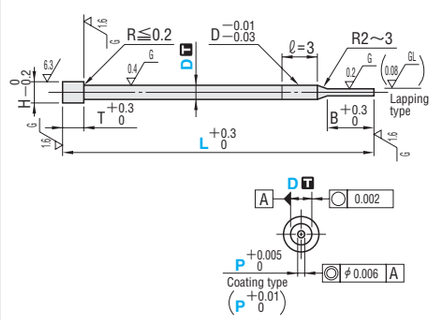
COATING PUNCHES — TiCN —

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type T=3mm	Catalog No. Type T=5mm	Shape	B Blade length
RoHS —Lapping type— (D≧1.6)	Dm5	V30(HIP) 88~89HRA	WP Lapping type L—WP TiCN coating type H—WP	WPLT Lapping type L—WPLT TiCN coating type H—WPLT	Ⓐ	S
		Super corpuscle (HIP) 90~92HRA	WXP Lapping type L—WXP TiCN coating type H—WXP	—		
—TiCN coating type—	D +0.005 0	V30(HIP) 88~89HRA	A—WP Lapping type AL—WP TiCN coating type AH—WP	A—WPLT Lapping type AL—WPLT TiCN coating type AH—WPLT		L
		Super corpuscle (HIP) 90~92HRA	A—WXP Lapping type AL—WXP TiCN coating type AH—WXP	—		Blade length (B) L>S

Shank Dia.Tolerance D T m5 +0.005 0 Selectable

Shape



The tip grinding is processed before coating for TiCN type.

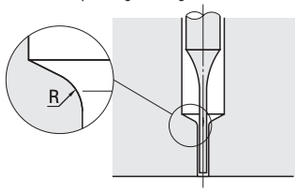
B	H	Catalog No. Type Thickness T=3mm	Catalog No. Type Thickness T=5mm	D	L	0.001 mm increments (0.01mm increments) Ⓐ min. P max. (TiCN coating type)
3	2.0	S (Dm5) (D +0.005 0) WPAS A—WPAS WXPAS (D≧1.6) A—WXPAS (D≧1.6) —Lapping type— (D≧1.6) L—WPAS AL—WPAS L—WXPAS AL—WXPAS —TiCN coating type— (D≧1.1) H—WPAS AH—WPAS H—WXPAS (D≧1.6) AH—WXPAS (D≧1.6)	S (Dm5) (D +0.005 0) WPLTAS (D≧1.6) A—WPLTAS (D≧1.6) —Lapping type— (D≧1.6) L—WPLTAS AL—WPLTAS —TiCN coating type— (D≧1.6) H—WPLTAS AH—WPLTAS	1.0	20 25 30 35 40	0.150~0.990
	2.6			1.1	20 25 30 35 40	0.150~1.090 (1.00~1.09)
4				1.2	20 25 30 35 40	0.150~1.190 (1.00~1.19)
				1.3	20 25 30 35 40	0.150~1.290 (1.00~1.29)
				1.4	20 25 30 35 40	0.150~1.390 (1.00~1.39)
				1.5	20 25 30 35 40	0.150~1.490 (1.00~1.49)
				1.6	20 25 30 35 40 50 60	0.300~1.590 (1.00~1.59)
6	3.0			2.0	20 25 30 35 40 50 60	0.500~1.990 (1.00~1.99)
8	3.5			2.5	20 25 30 35 40 50 60	0.800~2.490 (1.00~2.49)
5	2.0	L (Dm5) (D +0.005 0) WPAL A—WPAL WXPAL (D≧1.6) A—WXPAL (D≧1.6) —Lapping type— (D≧1.6) L—WPAL AL—WPAL L—WXPAL AL—WXPAL —TiCN coating type— (D≧1.1) H—WPAL AH—WPAL H—WXPAL (D≧1.6) AH—WXPAL (D≧1.6)	L (Dm5) (D +0.005 0) WPLTAL (D≧1.6) A—WPLTAL (D≧1.6) —Lapping type— (D≧1.6) L—WPLTAL AL—WPLTAL —TiCN coating type— (D≧1.6) H—WPLTAL AH—WPLTAL	1.0	20 25 30 35 40	0.250~0.990
	2.6			1.1	20 25 30 35 40	0.250~1.090 (1.00~1.09)
6				1.2	20 25 30 35 40	0.250~1.190 (1.00~1.19)
				1.3	20 25 30 35 40	0.250~1.290 (1.00~1.29)
				1.4	20 25 30 35 40	0.250~1.390 (1.00~1.39)
				1.5	20 25 30 35 40	0.250~1.490 (1.00~1.49)
				1.6	30 35 40 50 60	0.500~1.590 (1.00~1.59)
8	3.0			2.0	30 35 40 50 60	0.500~1.990 (1.00~1.99)
13	3.5			2.5	30 35 40 50 60	0.800~2.490 (1.00~2.49)

Ⓐ: P>D−0.03 ··· ℓ=0 When P>D−0.03 of the round punch, D −0.01 −0.03 (press in lead) is not available.
Shape S : when dimension P is 0.150~0.249, dimension B (4) is 3mm.
Shape L : when dimension P is 0.250~0.399, dimension B (6) is 5mm.
TiCN coated punch is P min 1.00mm
Dimension P of TiCN coated punch ··· 0.01mm increments. (Combination with PKC→0.001mm incr.)
See the following table for shank diameter (D).

S	M	Type		Tmm	Range of D
Standard	V30	WPA□	A—WPA□	3	D1.0~2.5
		WPLTA□	A—WPLTA□	5	D1.6~2.5
	Super corpuscle	WXP□	A—WXP□	3	
Lapping type	V30	L—WPA□	AL—WPA□	3	D1.6~2.5
		L—WPLTA□	AL—WPLTA□	5	
	Super corpuscle	L—WXP□	AL—WXP□	3	
TiCN coating type	V30	H—WPA□	AH—WPA□	3	D1.1~2.5
		H—WPLTA□	AH—WPLTA□	5	D1.6~2.5
	Super corpuscle	H—WXP□	AH—WXP□	3	

WARNING : Tip Damage (P≦0.3)

(1) Pay extra attention to the tip when measuring it with a micrometer.
(2) Place the punch on a soft surface.
(3) Always use the punch with its tip inserted into the punch guide.
(4) Round off the punch guide edges.



Order

Catalog No. — L — P
L—WPAS 2.5 — 50 — P1.600

Delivery

- V30 (D≦1.5) 5 Days
- V30 (D≧1.6) 3 Days
- SUPER CORPUSCLE 5 Days
- Express B 1,500/1Pc. P.38

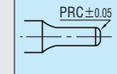
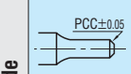
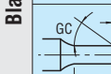
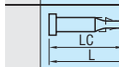
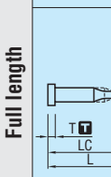
A flat charge of 4,050 yen for 3 pieces or more of the same size.

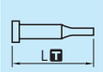
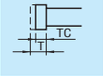
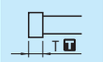
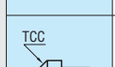
- TiCN coating type 8 Days
- Express C 1,500/1Pc. P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration

Catalog No. — L(LC·LCT·LMT) — P — (BC · HC · TC···etc.)
L—WPAS 2.5— LC45 — P1.600 — BC6.0—PKC

Alterations		Code	Spec.	¥/1Code
Blade		BC	Changes blade length B 2≦BC<B 0.1 mm increments	600
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (P)PRC≦(P−0.2)/2 ⊗PCC·GC : Not applicable	2,000
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (P)PCC≦(P−0.2)/2 ⊗PRC·GC : Not applicable	1,600
		GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B ≧ f+2 f=P/2×tan(90°−GC°) (P)The edge of lapping type is rounded. ⊗P≦1.000 : Not applicable ⊗LKC·LKZ·LCT·LMT·PRC·PCC : Not applicable	1,200
		PKC	Changes tolerance on P • Standard type P +0.005 0 ⇨ +0.003 0 • Lapping type • coating type P +0.01 0 ⇨ +0.005 0 (Dimension P : 0.001mm incr.)	1,800
		PKV	Changes tolerance on P • Standard type P +0.005 0 ⇨ ±0.002 • Lapping type • coating type P +0.01 0 ⇨ ±0.005 (P)Dimension P unit doesn't change.	0
Full length		LC	Changes full length 20≦LC<L 0.1mm increments (Combination with LKC·LKZ→0.01mm increments)	600
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks ((P)) are the same as LC. TKC (Thickness) T +0.3 0 ⇨ +0.02 0 + LC (Full length) + Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	1,400
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks ((P)) are the same as LC. TKM (Thickness) T +0.3 0 ⇨ −0.02 + LC (Full length) + Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	

Alterations		Code	Spec.	¥/1Code
Full length		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	1,200
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0 ⊗TiCN coating type : Not applicable	1,800
Head		KC	Adds single key flat at head.	600
		WKC	Adds double key flats in parallel.	1,200
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC·WKC : Not applicable	1,200
		HC	Changes head diameter. D≦HC<H Specified in 0.1 mm increments	600
		TC	Changes head thickness 2≦TC<T 0.1 mm increments (Combination with TKC·TKM·LCT·LMT →0.01mm increments) (P)L is shortened by (T−TC) When LC, LCT and LMT are combined, L=specified dimention.	600
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0	1,200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02	1,200
		TCC	Adds chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 (P)H≦5 : TCC 0.5 ⊗H<2.6 : Not applicable	600
Shank		NDC	No press -in lead ℓ=3 ⇨ ℓ=0	0

Price

Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

(P)To be quoted on price & lead time above Max. Q'ty.

■M V30 (HIP)

D	Ⓐ WPAS WPAL A—WPAS A—WPAL	Ⓐ WPLTAS WPLTAL A—WPLTAS A—WPLTAL	Ⓐ L—WPAS L—WPAL AL—WPAS AL—WPAL	Ⓐ L—WPLTAS L—WPLTAL AL—WPLTAS AL—WPLTAL	Ⓐ H—WPAS H—WPAL AH—WPAS AH—WPAL	Ⓐ H—WPLTAS H—WPLTAL AH—WPLTAS AH—WPLTAL
1.0	7,350		—		—	
1.1					8,880	
1.2						
1.3	6,760		—		8,290	
1.4						
1.5						
1.6	5,190		5,950		6,720	
2.0	3,510		4,270		5,040	
2.5	3,400		4,160		4,930	

■M Super corpuscle (HIP)

D	Ⓐ WXPAS WXPAL A—WXPAS A—WXPAL	Ⓐ L—WXPAS L—WXPAL AL—WXPAS AL—WXPAL	Ⓐ H—WXPAS H—WXPAL AH—WXPAS AH—WXPAL
1.6	7,230	7,990	8,760
2.0	5,220	5,980	6,750
2.5	4,960	5,720	6,490

PRESS NEW

CARBIDE SHOULDER PUNCHES
—MIRROR FINISHED TYPE—

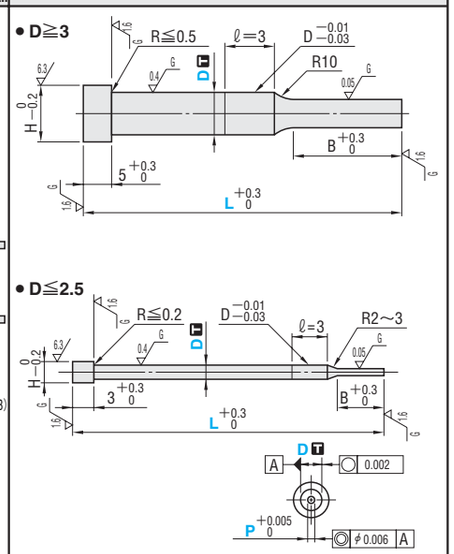
The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type T=3mm	Catalog No. Type T=5mm	Shape	B Blade length
RoHS	Dm5	V30(HIP) 88～89HRA	M—WP	M—WPLT (D2.0・2.5)	Ⓐ	S
		Super corpuscle (HIP) 90～92HRA	M—WXP	—		
	D +0.005 0	V30(HIP) 88～89HRA	AM—WP	AM—WPLT (D2.0・2.5)		L
		Super corpuscle (HIP) 90～92HRA	AM—WXP	—		

Shank Dia.Tolerance D T m5・ +0.005 0 Selectable

Blade length (B) L>S

View



Catalog No. Type Thickness T=3mm	Catalog No. Type Thickness T=5mm	D	L	0.001 mm increments Ⓐ min. P max.	B	H
S (Dm5) M—WPAS M—WXPAS (D2.0～6)	S (Dm5) M—WPLTAS (D2.0・2.5)	2.0	40 50 60	0.500～1.990	6	3
		2.5	40 50 60	0.800～2.490	8	3.5
		3	40 50 60 70	1.000～2.990		5
		4	40 50 60 70	1.000～3.990		7
(D +0.005 0) AM—WPAS AM—WXPAS (D2.0～6)	(D +0.005 0) AM—WPLTAS (D2.0・2.5)	5	40 50 60 70	2.000～4.990		8
		6	40 50 60 70	2.000～5.990		9
		8	(40) 50 60 70 80	3.000～7.990	13	11
		10	(40) 50 60 70 80	3.000～9.990		13
L (Dm5) M—WPAL M—WXPAL (D2.0～6)	L (Dm5) M—WPLTAL (D2.0・2.5)	2.0	40 50 60	0.500～1.990	8	3
		2.5	40 50 60	0.800～2.490	13	3.5
		3	40 50 60 70	1.000～2.990		5
		4	50 60 70	1.000～3.990		7
(D +0.005 0) AM—WPAL AM—WXPAL (D2.0～6)	(D +0.005 0) AM—WPLTAL (D2.0・2.5)	5	50 60 70	2.000～4.990		8
		6	50 60 70	2.000～5.990		9
		8	50 60 70 80	3.000～7.990	19	11
		10	50 60 70 80	3.000～9.990		13

(Ⓨ) L(40) ••• B=8 When L (40), the blade length is fixed to 8mm.
(Ⓨ) Ⓐ : P>D−0.03 ••• ℓ=0 When P>D−0.03 of the round punch, D −0.01 −0.03 (press in lead) is not available.

Order Catalog No. — L — P
M—WPAS2.5 — 50 — P1.600

Delivery
• V30 3 Days
• SUPER CORPUSCLE (D≦2.5) 5 Days
(D≧3) 3 Days

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

(Ⓨ) To be quoted on price & lead time above Max. Q'ty.

■M V30 (HIP)

D	Ⓐ M—WPAS M—WPAL AM—WPAS AM—WPAL	Ⓐ M—WPLTAS M—WPLTAL AM—WPLTAS AM—WPLTAL
2.0	3,870	3,870
2.5	3,760	3,760
3	3,450	—
4	3,490	
5	3,540	
6	3,940	
8	4,950	
10	6,040	

■M Super corpuscle (HIP)

D	Ⓐ M—WXPAS M—WXPAL AM—WXPAS AM—WXPAL
2.0	5,580
2.5	5,320
3	5,130
4	5,200
5	5,260
6	5,770
8	—
10	

Alteration — Catalog No. — L(LC・LCT・LMT) — P(PC) — (BC・HC・TC…etc.)
M—WPAS2.5 — LC45 — P1.600 — BC6.0

Alterations		Code	Spec.	¥/1Code
Blade		PC	Changes dimension P. PC≧Pmin/2 0.001mm increments ⊗D≦2.5 : Not applicable (P / Bmax: 0.500～0.999 / 4; 1.000～1.999 / 13; 2.000～2.999 / 19; 3.000～3.999 / 30; 4.000～5.999 / 40; 6.000～ / 45)	1,200
		BC	Changes blade length B ・D≦2.5 2≦BC<B 0.1 mm increments ・D≧3 2≦BC≦Bmax. (Ⓨ) Full length L requires BC+25mm or more.	600
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (Ⓨ) PRC≦(P−0.2)/2 ⊗PCC : Not applicable	2,000
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (Ⓨ) PCC≦(P−0.2)/2 ⊗PRC : Not applicable	1,600
		PKV	Changes tolerance on P P +0.005 0 ⇨±0.002	0
Full length		LC	Changes full length 20≦LC<L (D≦2.5) 25+B(BC)≦LC<L (D≧3) 0.1mm increments (Combination with LKC・LKZ→0.01mm increments) (Ⓨ) When LC−B (or BC) is 25mm or less, B (or BC) is LC−25mm.	600
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKC (Thickness) T +0.3 0 ⇨ +0.02 0 + LC (Full length) + Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	1,400
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKM (Thickness) T +0.3 0 ⇨ −0.02 + LC (Full length) + Changes full length tolerance. L +0.3 0 ⇨ +0.1 0	

Alterations		Code	Spec.	¥/1Code
Full length		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	1,200
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0	1,800
Head		HC	Changes head diameter. D≦HC<H Specified in 0.1 mm increments	600
		TC	Changes head thickness 2≦TC<T 0.1 mm increments (Combination with TKC・TKM・LCT・LMT →0.01mm increments) (Ⓨ) L is shortened by (T−TC) When LC, LCT and LMT are combined, L=specified dimention.	600
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0	1,200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ −0.02 0	1,200
		TCC	Adds chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 (Ⓨ) H≦5 : TCC 0.5 ⊗H<2.6 : Not applicable	600
Shank		NDC	No press -in lead ℓ=3 ⇨ ℓ=0	0

■Features
- The punch is finished with same or above tip surface roughness as lapping type by polishing. (Tip gloss may be less than lapping type to some extent).
- Unlike lapping type Punches, mirror finished punches do no have very slight waves at the tip.

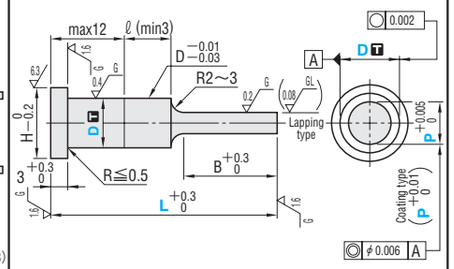
CARBIDE SHOULDER PUNCHES

—SHORT TYPE, STANDARD TYPE / LAPPING TYPE / TiCN COATING TYPE—

PRODUCTS DATA P.1220

COATING PUNCHES
— TiCN —

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type	Shape	Blade B length	Shape
RoHS —Lapping type— —TiCN coating type— Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	D_{m5}	V30(HIP) 88～89HRA	WS Lapping type L—WS TiCN coating type H—WS	Ⓐ	S	
		Super corpuscle (HIP) 90～92HRA (D3～6)	WXS Lapping type L—WXS TiCN coating type H—WXS			
	$D^{+0.005}_{0}$	V30(HIP) 88～89HRA	A—WS Lapping type AL—WS TiCN coating type AH—WS		L	
		Super corpuscle (HIP) 90～92HRA (D3～6)	A—WXS Lapping type AL—WXS TiCN coating type AH—WXS		Blade length (B) L>S	

The tip grinding is processed before coating for TiCN type.

Catalog No. Type	D	L	0.001 mm increments Ⓐ min. P max.	B	H
S (D_{m5}) ($D^{+0.005}_{0}$) WSAS A—WSAS WXSAS A—WXSAS (D3～6) (D3～6) —Lapping type— L—WSAS AL—WSAS L—WXSAS AL—WXSAS (D3～6) (D3～6) —TiCN coating type— H—WSAS AH—WSAS H—WXSAS AH—WXSAS (D3～6) (D3～6)	3	25 30 35	1.000～2.990	8	5
	4		2.000～3.990		7
	5		2.000～4.990		8
	6		2.500～5.990		9
	8		5.000～7.990		11
	10		7.000～9.990		13
L (D_{m5}) ($D^{+0.005}_{0}$) WSAL A—WSAL WXSAL A—WXSAL (D3～6) (D3～6) —Lapping type— L—WSAL AL—WSAL L—WXSAL AL—WXSAL (D3～6) (D3～6) —TiCN coating type— H—WSAL AH—WSAL H—WXSAL AH—WXSAL (D3～6) (D3～6)	3	30 35 40	1.000～2.990	13	5
	4		2.000～3.990		7
	5		2.000～4.990		8
	6		2.500～5.990		9
	8		5.000～7.990		11
	10		7.000～9.990		13

Dimension P of TiCN coated punch ···▸ 0.01mm increments. (Combination with PKC→0.001mm incr.)

Order Catalog No. — L — P
WSAS 4 — 30 — P2.000

Delivery 3 Days

● TiCN coating type
8 Days

Alteration Catalog No. — L(LC·LCT·LMT) — P — (BC・HC・TC···etc.)
WSAS 4 — LC28 — P3.020 — BC10 — KFC150

Alterations		Code	Spec.	¥/1Code
Blade		BC	Changes blade length B 2≦BC＜Bmax 0.1 mm increments (P) Full length L requires BC+15mm or more. (P 1.000～1.199 Bmax 15; 1.200～ 20)	600
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (P) PRC≦(P−0.2)/2 ⊗PCC・GC：Not applicable	2,000
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (P) PCC≦(P−0.2)/2 ⊗PRC・GC：Not applicable	1,600
		GC	Changes to pointed tip. 20°≦GC＜90° 1° increments Blade length B ≧ f+2 f=P/2×tan(90°−GC°) ⊗P≦1.000：Not applicable (P) The edge of lapping type is rounded. ⊗LKC・LKZ・LCT・LMT・PRC・PCC：Not applicable	1,200
		PKC	Changes tolerance on P ・Standard type P $^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ ・Lapping type ・Coating type P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (Dimension P : 0.001mm increments)	1,600 Coating type 1,800
		PKV	Changes tolerance on P ・Standard type P $^{+0.005}_{0}$ ⇨±0.002 ・Lapping type ・Coating type P $^{+0.01}_{0}$ ⇨±0.005 (P) Dimension P unit doesn't change.	0
Full length		LC	Changes full length 15+B(BC)≦LC＜L 0.1mm increments (P) When LC− B (or BC) is 15mm or less, B(or BC) is LC− 15mm. (Combination with LKC・LKZ→0.01mm increments)	600
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (P) are the same as LC. TKC (Thickness) T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC (Full length) + Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	1,400
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (P) are the same as LC. TKM (Thickness) T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC (Full length) + Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	
		LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	1,200
		LKZ	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗TiCN coating type：Not applicable	1,800

Alterations		Code	Spec.	¥/1Code
Head		KC	Adds single key flat at head.	600
		WKC	Adds double key flats in parallel.	1,200
		KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗KC・WKC：Not applicable	1,200
		HC	Changes head diameter. D≦HC＜H 0.1 mm increments	600
		TC	Changes head thickness 2≦TC＜3 0.1mm increments (Combination with TKC・TKM・LCT・LMT→0.01mm increments) (P) L is shortened by (3−TC). When LC, LCT and LMT are combined, L=specified dimention.	600
		TKC	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	1,200
		TKM	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	1,200
		TCC	Adds chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 (P) H≦5：TCC 0.5	600
Shank		SKC	Adds key flat on shank. Ⓐ ・D3～6 P≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 (Machining width 1) ⊗KC・WKC・KFC：Not applicable	1,800
		NDC	No press-in lead ℓ ≧ 3 ⇨ ℓ = 0	0

Price

Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

(P) To be quoted on price & lead time above Max. Q'ty.

■ M V30 (HIP)

D	Ⓐ WSAS WSAL A—WSAS A—WSAL	L—WSAS L—WSAL AL—WSAS AL—WSAL	H—WSAS H—WSAL AH—WSAS AH—WSAL
3	3,570	4,330	5,100
4	3,640	4,400	5,200
5	3,700	4,460	5,330
6	4,150	4,910	5,960
8	5,310	6,070	7,310
10	6,580	7,340	8,780

■ M Super corpuscle (HIP)

D	Ⓐ WXSAS WXSAL A—WXSAS A—WXSAL	L—WXSAS L—WXSAL AL—WXSAS AL—WXSAL	H—WXSAS H—WXSAL AH—WXSAS AH—WXSAL
3	5,170	5,930	6,700
4	5,230	5,990	6,790
5	5,300	6,060	6,930
6	5,850	6,610	7,660

PRESS ADD.SPEC. Printed in Red

CARBIDE DOUBLE STEPPED TYPE PUNCHES
—STANDARD TYPE / TiCN COATING TYPE—

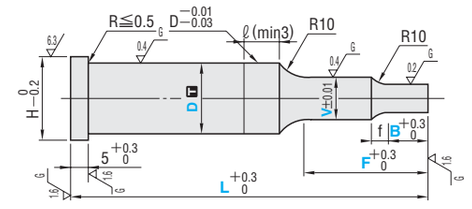
PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

When P≦1.000, applicable range of blade length (dimension B and F) is widened.

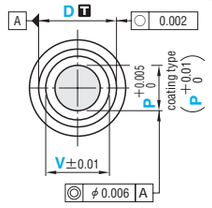
Type	Shank dia. D T	M H	Catalog No. Type	Shape
RoHS —TiCN coating type— Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	Dm5	V30(HIP) 88~89HRA	WPTW TiCN coating type H—WPTW	A D R E G
		Super corpuscle (HIP) 90~92HRA (D3~6)	WXPTW TiCN coating type H—WXPTW	
	$D^{+0.005}_{0}$	V30(HIP) 88~89HRA	A—WPTW TiCN coating type AH—WPTW	
		Super corpuscle (HIP) 90~92HRA (D3~6)	A—WXPTW TiCN coating type AH—WXPTW	

Select tip shape from Shape A~G shown below.

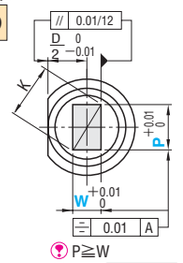


The tip grinding is processed before coating for TiCN type.

Shape A

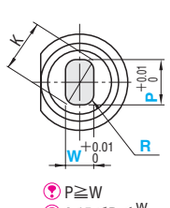


Shape D



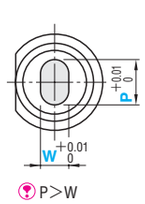
P≧W
K=$\sqrt{P^2+W^2}$

Shape R



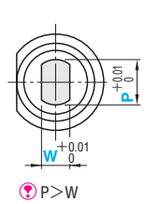
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	D	L (Selection)	0.001 mm increments / 0.1 mm increments Ⓐ P	Ⓐ B	Diagonal Kmax.	0.01 mm increments / 0.1 mm increments DREG P・W	B	0.01mm R R	0.01mm increments V	0.1 mm increments F	H
(Dm5)		3	40・50・60	0.500~ 0.749	2.0~ 5.0	2.96	1.00~ 1.99	2.0~ 8.0	0.15≦R<$\frac{W}{2}$ (Ⓡonly)	Round : D>V>P+0.01 V≧1.00 Shaped : D>V>(P,K)+0.03 V≧1.00	Round : B+f+2<F≦Fmax Shaped : B+f+3.5<F≦Fmax & Round : F≦L−25 Shaped : F≦L−30	5
				0.750~ 0.999	2.0~ 8.0							
				1.000~ 1.999	2.0~13.0		2.00~ 2.49	2.0~13.0				
				2.000~ 2.980	2.0~19.0		2.50~ 2.96	2.0~19.0				
WPTW		4	40・50・60・70	0.500~ 0.749	2.0~ 5.0	3.96	1.00~ 1.99	2.0~ 8.0				7
WXPTW				0.750~ 0.999	2.0~ 8.0							
(D3~6)				1.000~ 1.999	2.0~13.0		2.00~ 2.49	2.0~13.0				
				2.000~ 2.999	2.0~19.0		2.50~ 3.96	2.0~19.0				
TiCN coating type				3.000~ 3.980	2.0~30.0		2.50~ 3.96	2.0~19.0				
H—WPTW	A	5	40・50・60・70	1.000~ 1.999	2.0~13.0	4.96	1.00~ 1.99	2.0~ 8.0				8
H—WXPTW	D			2.000~ 2.999	2.0~19.0		2.00~ 2.49	2.0~13.0				
(D3~6)	R			3.000~ 3.999	2.0~30.0		2.50~ 3.99	2.0~19.0				
	E			4.000~ 4.980	2.0~40.0		4.00~ 4.96	2.0~25.0				
($D^{+0.005}_{0}$)	G	6	40・50・60・70	1.000~ 1.999	2.0~13.0	5.96	1.00~ 1.99	2.0~ 8.0				9
A—WPTW				2.000~ 2.999	2.0~19.0		2.00~ 2.49	2.0~13.0				
A—WXPTW				3.000~ 3.999	2.0~30.0		2.50~ 3.99	2.0~19.0				
(D3~6)				4.000~ 4.980	2.0~40.0		4.00~ 5.96	2.0~25.0				
		8	40・50・60・70・80	1.500~ 1.999	2.0~13.0	7.96	1.40~ 1.99	2.0~ 8.0				11
				2.000~ 2.999	2.0~19.0		2.00~ 2.49	2.0~13.0				
				3.000~ 3.999	2.0~30.0		2.50~ 3.99	2.0~19.0				
				4.000~ 5.999	2.0~40.0		4.00~ 7.96	2.0~25.0				
				6.000~ 7.980	2.0~45.0		4.00~ 7.96	2.0~25.0				
TiCN coating type		10	40・50・60・70・80	1.500~ 1.999	2.0~13.0	9.96	1.70~ 1.99	2.0~ 8.0				13
AH—WPTW				2.000~ 2.999	2.0~19.0		2.00~ 2.49	2.0~13.0				
				3.000~ 3.999	2.0~30.0		2.50~ 3.99	2.0~19.0				
AH—WXPTW				4.000~ 5.999	2.0~40.0		4.00~ 9.96	2.0~25.0				
(D3~6)				6.000~ 9.980	2.0~45.0		4.00~ 9.96	2.0~25.0				
		13	40・50・60・70・80	3.000~ 3.999	2.0~30.0	12.96	2.00~ 2.49	2.0~13.0				16
				4.000~ 5.999	2.0~40.0		2.50~ 3.99	2.0~19.0				
				6.000~12.980	2.0~45.0		4.00~12.96	2.0~25.0				
		16	40・50・60・70・80	4.000~ 5.999	2.0~40.0	15.96	2.70~ 3.99	2.0~19.0				19
				6.000~15.980	2.0~45.0		4.00~15.96	2.0~25.0				

V>D−0.03 ···▸ ℓ =0 When V>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not available. TiCN coated punch is P min 1.00
Dimension P of TiCN coated punch ···▸ 0.01mm increments. (Combination with PKC→0.001mm incr.)

V	Fmax
1.00~1.99	19
2.00~2.99	30
3.00~3.99	40
4.00~5.99	45
6.00~	45

For dimension f, make sure that (V−P)/2=X is true for round type and (V−W)/2=X is true for shaped type referring to punch R lengths on P.1208.

Order

Catalog No.	L	P	W	B	V	F	R (Ⓡonly)
WPTWA 10	80	P9.500		B25	V9.80	F40	
A-WPTWR13	80	P10.50	W7.34	B10	V12.00	F30	R0.5

The volume discount rate is also applicable to alteration cost. P.39

Delivery

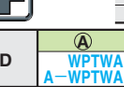
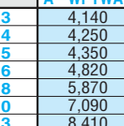
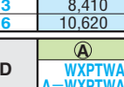
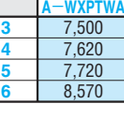
V30		Super corpuscle		TiCN coating type	
Ⓐ	3 Days	Ⓐ	5 Days	Ⓐ D R E G	8 Days
D R E G	5 Days	D R E G	5 Days		

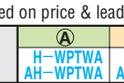
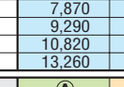
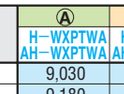
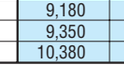
Express B 1,500/1Pc. P.38 — A flat charge of 4,050 yen for 3 pieces or more of the same size.

Express C 1,500/1Pc. P.38 — A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration

Catalog No. — L(LC·LCT·LMT) — P — W — B — V — F — R — (HC・TC・KC…etc.)
WPTWA 10 — LC72 — P4.800 — B10 — V6.80 — F40 — HC12

Alterations		Code	Ⓐ	D R E G	¥/1Code
Blade		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (P−0.2)/2 PCC・GC : Not applicable	——	2,000
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (P−0.2)/2 PRC・GC : Not applicable	——	1,600
		GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B≧f+2 f=P/2×tan(90°−GC°) When combined with SC, tip and edge are rounded. P≦1.000 : Not applicable LKC・LKZ・LCT・LMT・PRC・PCC : Not applicable	——	1,200
		SC	Changes tip roughness. 0.2 G ⇨ 0.08 GL		Ⓐ 800 DREG 1,200
		PKC	Changes tolerance on P Standard P +0.005 0 ⇨ +0.003 0 TiCN coating type P +0.01 0 ⇨ +0.005 0 TiCN coating type.D16 : Not applicable	Changes tolerance on P・W. (Dimensions P and W : 0.001mm incr.) P・W +0.01 0 ⇨ +0.005 0 TiCN coating type : Not applicable	Ⓐ Normal 1,600 Coating 1,800 DREG 2,300
		PKV	Changes tolerance on P Standard P +0.005 0 ⇨ ±0.002 TiCN coating type P +0.01 0 ⇨ ±0.005 Dimension P unit doesn't change.	Changes tolerance on P・W. P・W +0.01 0 ⇨ ±0.005 TiCN coating type : Not applicable Dimension P unit doesn't change.	0
		VKC	Changes V tolerance. V +0.01 0 ⇨ +0.005 0 Dimension V : 0.001mm incr.	Changes V tolerance. V±0.01 ⇨ ±0.005 TiCN coating type : Not applicable	Ⓐ 1,600 DREG 2,300
Full length		LC	Changes full length 25+f≦LC<L 0.1 mm increments (Combination with LKC→0.01mm increments)	Changes full length 30+f≦LC<L 0.1 mm increments (Combination with LKC→0.01mm increments)	600
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓡ) are the same as LC. TKC (Thickness) T +0.3 0 ⇨ +0.02 0 + LC (Full length) L +0.3 0 ⇨ +0.1 0		1,400
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓡ) are the same as LC. TKM (Thickness) T +0.3 0 ⇨ 0 −0.02 + LC (Full length) L +0.3 0 ⇨ +0.1 0		

Alterations		Code	Ⓐ	D R E G	¥/1Code
Full length		LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		1,200
		LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0	Ⓡ TiCN coating type : Not applicable	1,800
Head		KC	Adds single key flat at head.	Changes the position of key flat. 1° incr.	600
		WKC	Adds double key flats in parallel.	Adds double key flats in parallel. KC : Applicable.	1,200
		KFC	Adds 1 key flat at 0° and 180° the other on another angle. 1° increments	Adds 1 key flat at 0° and 180° the other on another angle. 1° increments	1,200
			KC・WKC : Not applicable	KC・WKC : Not applicable	
		NKC	——	No key flat.	0
		HC	Changes head diameter. D≦HC<H 0.1 mm increments		600
		TC	Changes head thickness 2≦TC<5 0.1mm increments (Combination with TKC→0.01mm increments) L is shortened by (5−TC). When LC・LCT・LMT are combined, L=specified dimention.		600
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0		1,200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02		1,200
		TCC	Adds chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 H≦5 : TCC 0.5		600
Shank		SKC	Adds key flat on shank. D/2 −0.5 0 −0.01 ・D3~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8~ P≦D−2.2 W≦D−2.2 (Machining width 1)	Ⓐ D R E G	1,800
			KC・WKC・KFC : Not applicable		
		NDC	No press -in lead ℓ≧3 ⇨ ℓ=0		0

Price

Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	Ⓐ WPTWA A—WPTWA	D WPTWD A—WPTWD	R WPTWR A—WPTWR	E WPTWE A—WPTWE	G WPTWG A—WPTWG
3	4,140	6,910	7,560	7,420	6,730
4	4,250	7,030	7,690	7,560	6,860
5	4,350	7,100	7,760	7,640	6,930
6	4,820	7,440	8,180	8,060	7,220
8	5,870	9,240	10,030	9,810	9,020
10	7,090	10,930	11,760	11,540	10,670
13	8,410	13,200	13,960	13,700	12,850
16	10,620	15,900	16,830	16,570	15,550

D	Ⓐ WXPTWA A—WXPTWA	D WXPTWD A—WXPTWD	R WXPTWR A—WXPTWR	E WXPTWE A—WXPTWE	G WXPTWG A—WXPTWG
3	7,500	10,460	11,370	11,180	10,210
4	7,620	10,640	11,560	11,370	10,390
5	7,720	10,730	11,660	11,480	10,500
6	8,570	11,210	12,240	12,060	10,900

D	Ⓐ H—WPTWA AH—WPTWA	D H—WPTWD AH—WPTWD	R H—WPTWR AH—WPTWR	E H—WPTWE AH—WPTWE	G H—WPTWG AH—WPTWG
3	5,670	8,440	9,090	8,950	8,260
4	5,810	8,590	9,250	9,120	8,420
5	5,980	8,730	9,390	9,270	8,560
6	6,630	9,250	9,990	9,870	9,030
8	7,870	11,240	12,030	11,810	11,020
10	9,290	13,130	13,960	13,740	12,870
13	10,820	15,610	16,370	16,110	15,260
16	13,260	18,540	19,470	19,210	18,190

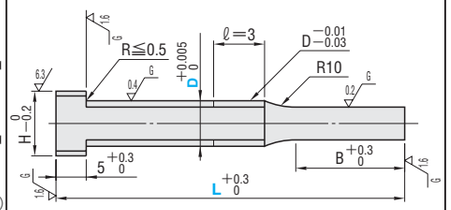
D	Ⓐ H—WXPTWA AH—WXPTWA	D H—WXPTWD AH—WXPTWD	R H—WXPTWR AH—WXPTWR	E H—WXPTWE AH—WXPTWE	G H—WXPTWG AH—WXPTWG
3	9,030	11,990	12,900	12,710	11,740
4	9,180	12,200	13,120	12,930	11,950
5	9,350	12,360	13,290	13,110	12,130
6	10,380	13,020	14,050	13,870	12,710

CARBIDE D-CUT SHANK SHOULDER PUNCHES
—STANDARD TYPE / TiCN COATING TYPE—

PRODUCTS DATA P.1220

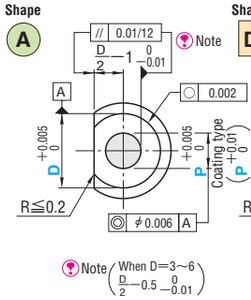
COATING PUNCHES — TiCN —

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A~G shown below.
RoHS	$D^{+0.005}_{0}$	V30(HIP) 88~89HRA	G—WP	A D R E G	S	
			TiCN coating type GH—WP			
		Super corpuscle 90~92HRA	G—WXP (D3~6)		L	
			TiCN coating type GH—WXP (D3~6)		Blade length (B) L>S	

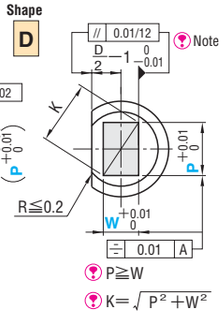
The tip grinding is processed before coating for TiCN type.

Shape A



Note (When D=3~6 D/2−0.5 0 −0.01)

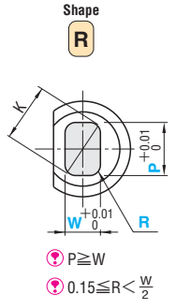
Shape D



P≧W

K=$\sqrt{P^2+W^2}$

Shape R

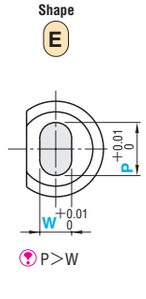


P≧W

0.15≦R<$\frac{W}{2}$

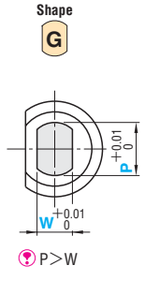
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G

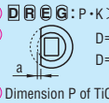


P>W

Catalog No. Type	Shape	B Blade length	D	L	0.001mm increments Ⓐ min. P max.	0.01mm increments DREG P·Kmax.	DREG W max.	DREG P·W min.	R R	B	H
G—WP	A D R E G	S	3	40 50 60 70	1.000~ 1.800	—	—	—	0.15≦R<$\frac{W}{2}$ (Ronly)	8	5
G—WXP (D3~6)			4	40 50 60 70	1.000~ 2.800	3.97	2.80	1.50			7
—TiCN coating type—			5	40 50 60 70	2.000~ 3.800	4.97	3.80	1.50			8
GH—WP			6	40 50 60 70	2.000~ 4.800	5.97	4.80	1.50			9
GH—WXP (D3~6)			8	(40) 50 60 70 80	3.000~ 5.800	7.97	5.80	2.00		13	11
			10	(40) 50 60 70 80	3.000~ 7.800	9.97	7.80	2.50			13
			13	(40) 50 60 70 80	6.000~10.800	12.97	10.80	3.00			16
			16	(40) 50 60 70 80	10.000~13.800	15.97	13.80	4.00		19	19
		L	3	50 60 70	1.000~ 1.800	—	—	—		13	5
			4	50 60 70	1.000~ 2.800	3.97	2.80	2.00			7
			5	50 60 70	2.000~ 3.800	4.97	3.80	2.00			8
			6	50 60 70	2.000~ 4.800	5.97	4.80	2.00			9
			8	50 60 70 80	3.000~ 5.800	7.97	5.80	2.50			11
			10	50 60 70 80	3.000~ 7.800	9.97	7.80	2.50		19	13
			13	50 60 70 80	6.000~10.800	12.97	10.80	3.00			16
			16	60 70 80	10.000~13.800	15.97	13.80	4.00		25	19

L(40) ···▸B=8 When L (40), the blade length is fixed to 8mm.

DREG: P·K>D−0.05 ···▸ ℓ=0 When P·K>D−0.05 of not-round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not available.



D=3~ 6 ···▸a=0.5 When dimension D is 3~6, part a is 0.5mm.

D=8~16 ···▸a=1 When dimension D is 8~16, part a is 1.0mm.

Dimension P of TiCN coated punch ···▸0.01mm increments. (Combination with PKC→0.001mm incr.)

Order

Catalog No.	L	P	W	R (Ronly)
G—WPAS 10	60	P7.770		

Delivery

● G—WP · G—WXP Ⓐ

3 Days	Express A	1,500/1Pc.	P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

DREG

5 Days	Express B	1,500/1Pc.	P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

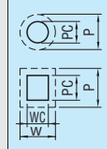
● GH—WP · GH—WXP

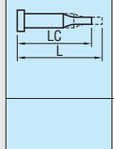
8 Days	Express C	1,500/1Pc.	P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration

Catalog No.	L(LC·LCT·LMT)	P(PC)	W(WC)	R	(BC · HC · TC···etc.)
G—WPAS 8	50	PC2.950			BC15

Alterations	Code	Ⓐ	DREG	¥/1Code
Blade 	PC WC	Changes dimension P. PC≧Pmin/2 0.001mm increments Ⓨ TiCN coating type 0.01mm increments PC≧Pmin/2≧1.00 ⊗ TiCN coating type, D3・4:Not applicable P(PC) | Bmax: 0.500~0.999 | 4; 1.000~1.999 | 13; 2.000~2.999 | 19; 3.000~3.999 | 30; 4.000~5.999 | 40; 6.000~ | 45	Changes dimension P・W. $\frac{PC}{WC}$≧Wmin×$\frac{2}{3}$≧1.00 0.01mm increments (Combination with PKC →0.001mm increments) P(PC)・W(WC) | Bmax: 1.000~1.999 | 8; 2.000~2.499 | 13; 2.500~3.999 | 19; 4.000~ | 25	Ⓐ 1,200 DREG 2,500
	BC	Changes blade length B 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L (LC) requires BC+25mm or more.	Changes blade length B 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L (LC) requires BC+30mm or more.	600
	SC	Changes tip roughness. 0.2 ⇨ 0.08 Ⓨ Surface finished before coating.		Ⓐ 800 DREG 1,200
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 ⊗ PCC・GC : Not applicable	——	2,000
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 ⊗ PRC・GC : Not applicable	——	1,600
	GC	Changes to pointed tip. 20°≦GC<90° 1° increments Point length B≧(f+2 f=P/2×tan(90°−GC°) Ⓨ When combined with SC, tip and edge are rounded. ⊗ P≦1.000 : Not applicable ⊗ LKC・LKZ・LCT・LMT・PRC・PCC : Not applicable	——	1,200
	PKC	Changes tolerance on P Standard type $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ TiCN coating type $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ TiCN coating type, D16:Not applicable	Changes tolerance on P・W. (Dimensions P and W : 0.001mm incr.) $P\cdot W^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ TiCN coating type :Not applicable	Ⓐ 1,600 DREG 2,300
	PKV	Changes tolerance on P Standard type $P^{+0.005}_{0}$ ⇨ ±0.002 TiCN coating type $P^{+0.01}_{0}$ ⇨ ±0.005 Ⓨ Dimension P unit doesn't change.	Changes tolerance on P・W. $P\cdot W^{+0.01}_{0}$ ⇨ ±0.005 ⊗ TiCN coating type :Not applicable Ⓨ Dimension P unit doesn't change.	0

Alterations	Code	Ⓐ	DREG	¥/1Code
Full length 	LC	Changes full length 25+B(BC)≦LC<L 0.1mm increments Ⓨ When LC−B(or BC) is 25mm or less, B(or BC) is LC−25mm.	Changes full length 30+B(BC)≦LC<L 0.1mm increments Ⓨ When LC−B(or BC) is 30mm or less, B(or BC) is LC−30mm.	600
	LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKC (Thickness) $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC (Full length) + Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		1,400
	LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓨ) are the same as LC. TKM (Thickness) $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC (Full length) + Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
	LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		1,200
	LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ TiCN coating type :Not applicable		1,800
Head	WKC	Adds double key flats in parallel.		1,200
	HC	Changes head diameter. D≦HC<H 0.1mm increments		600
	TC	Changes head thickness 2≦TC<5 0.1mm increments (Combination with TKC→0.01mm increments) Ⓨ L is shortened by (5−TC) When LC・LCT・LMT is combined, L=specified dimention.		600
	TKC	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		1,200
	TKM	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		1,200
	TCC	Adds chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓨ H≦5 : TCC 0.5		600
Shank	SKF	Adds single key flat on the shank with dimension specified. $SKF^{0}_{-0.01}$ Ⓐ P≦2(SKF−0.1) 0.1mm increments DREG W≦2(SKF−0.1) 0.1mm increments 0.3≦SKF≦D/2−0.1 ⊗ WKC : Not applicable		600
	NDC	No press-in lead ℓ=3 ⇨ ℓ=0		0

Price

Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

D	Ⓐ G—WPAS G—WPAL	D G—WPDS G—WPDL	R G—WPRS G—WPRL	E G—WPES G—WPEL	G G—WPGS G—WPGL	Ⓐ GH—WPAS GH—WPAL	D GH—WPDS GH—WPDL	R GH—WPRS GH—WPRL	E GH—WPES GH—WPEL	G GH—WPGS GH—WPGL
3	3,440	—	—	—	—	4,970	—	—	—	—
4	3,490	5,400	5,920	6,050	5,220	5,050	6,960	7,480	7,610	6,780
5	3,530	5,430	5,970	6,100	5,260	5,160	7,060	7,600	7,730	6,890
6	3,930	5,530	6,150	6,270	5,310	5,740	7,340	7,960	8,080	7,120
8	5,030	6,800	7,370	7,590	6,580	7,030	8,800	9,370	9,590	8,580
10	6,180	7,860	8,470	8,690	7,590	8,380	10,060	10,670	10,890	9,790
13	7,490	9,480	9,970	10,230	9,130	9,900	11,890	12,380	12,640	11,540
16	9,680	10,980	11,640	11,900	10,630	12,320	13,620	14,280	14,540	13,270

D	Ⓐ G—WXPAS G—WXPAL	D G—WXPDS G—WXPDL	R G—WXPRS G—WXPRL	E G—WXPES G—WXPEL	G G—WXPGS G—WXPGL	Ⓐ GH—WXPAS GH—WXPAL	D GH—WXPDS GH—WXPDL	R GH—WXPRS GH—WXPRL	E GH—WXPES GH—WXPEL	G GH—WXPGS GH—WXPGL
3	5,210	—	—	—	—	6,740	—	—	—	—
4	5,270	8,360	9,090	9,280	8,120	6,830	9,920	10,650	10,840	9,680
5	5,340	8,430	9,160	9,340	8,180	6,970	10,060	10,790	10,970	9,810
6	5,840	8,550	9,400	9,590	8,240	7,650	10,360	11,210	11,400	10,050

CARBIDE D-CUT SHANK SHOULDER PUNCHES WITH AIR HOLE
—STANDARD TYPE / TiCN COATING TYPE—

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

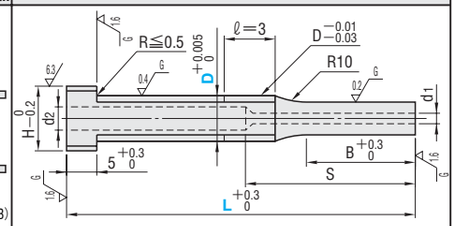
The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H
RoHS	$D^{+0.005}_{0}$	V30(HIP) 88~89HRA

Catalog No.

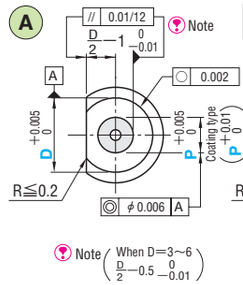
Type	Shape	B Blade length
G—WJ TiCN coating type GH—WJ	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S, L

Select tip shape from Shape Ⓐ~Ⓖ shown below.



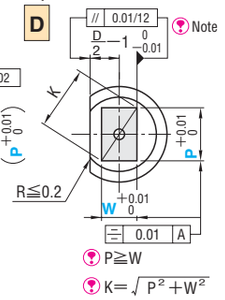
The tip grinding is processed before coating for TiCN type.

Shape A



Note (When D=3~6 $\frac{D}{2}-0.5\ ^{0}_{-0.01}$)

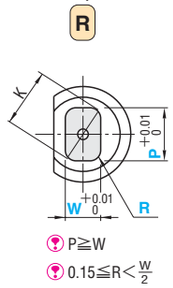
Shape D



Ⓟ P≧W

Ⓟ $K=\sqrt{P^2+W^2}$

Shape R

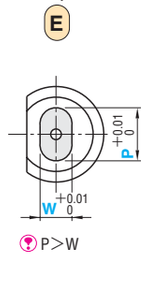


Ⓟ P≧W

Ⓟ $0.15 \leqq R < \frac{W}{2}$

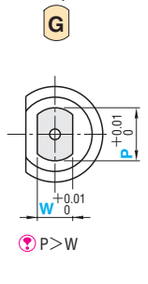
Ⓟ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



Ⓟ P>W

Shape G



Ⓟ P>W

Catalog No. Type	Shape	B Blade length	D	L	0.001 mm increments Ⓟ Ⓐ min. P max.	0.01 mm increments Ⓓ Ⓡ Ⓔ Ⓖ P·Kmax.	Wmax.	P·Wmin.	Ⓡ R	B	d_1	S	d_2	H
G—WJ —TiCN coating type— GH—WJ	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	3	40 50 60 70	1.000~ 1.800	—	—	—	$\frac{W}{2}$ (Ⓡ only) $0.15 \leqq R <$	8	0.3	—	0.3	5
			4	40 50 60 70	1.500~ 2.800	3.97	2.80	1.50			0.5	20	1.2	7
			5	40 50 60 70	2.000~ 3.800	4.97	3.80	2.00			0.8		2.1	8
			6	40 50 60 70	2.000~ 4.800	5.97	4.80	2.00					2.6	9
			8	(40) 50 60 70 80	3.000~ 5.800	7.97	5.80	3.00		13	1.2	27	3.4	11
			10	(40) 50 60 70 80	3.000~ 7.800	9.97	7.80	3.00			1.6	28	4.4	13
			13	(40) 50 60 70 80	6.000~10.800	12.97	10.80	6.00			1.9			16
			16	(40) (50) 60 70 80	10.000~13.800	15.97	13.80	6.00		19	2.9	36		19
		L	3	40 50 60 70	1.000~ 1.800	—	—	—		13	0.3	—	0.3	5
			4	50 60 70	1.500~ 2.800	3.97	2.80	2.00			0.5	20	1.2	7
			5	50 60 70	2.000~ 3.800	4.97	3.80	2.00			0.8		2.1	8
			6	50 60 70	2.000~ 4.800	5.97	4.80	2.00					2.6	9
			8	50 60 70 80	3.000~ 5.800	7.97	5.80	3.00		19	1.2	27	3.4	11
			10	50 60 70 80	3.000~ 7.800	9.97	7.80	3.00			1.6	28	4.4	13
			13	50 60 70 80	6.000~10.800	12.97	10.80	6.00			1.9			16
			16	60 70 80	10.000~13.800	15.97	13.80	6.00		25	2.9	36		19

Ⓟ L(40)···▸B=8 When L (40), the blade length is fixed to 8mm.

Ⓟ Ⓓ Ⓡ Ⓔ Ⓖ: P・K>D−0.05 ···▸ℓ=0 When P・K>D−0.05 of not-round punch, $D^{-0.01}_{-0.03}$(press-in lead) is not available.

Ⓟ D=3~6···▸a=0.5 When dimension D is 3~6, part a is 0.5mm.
D=8~16 ···▸a=1 When dimension D is 8~16, part a is 1mm.

Ⓟ Dimension P of TiCN coated punch ···▸0.01mm increments. (Combination with PKC→0.001mm incr.)

Order

Catalog No.	L	P	W	R(Ⓡonly)
G—WJDS 10	60	P8.00	W3.00	

Delivery

● G—WJ Ⓐ

3 Days — Express A 1,500/1Pc. P.38

Ⓟ A flat charge of 4,050 yen for 3 pieces or more of the same size.

Ⓓ Ⓡ Ⓔ Ⓖ

5 Days — Express B 1,500/1Pc. P.38

Ⓟ A flat charge of 4,050 yen for 3 pieces or more of the same size.

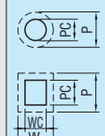
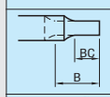
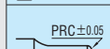
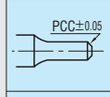
● GH—WJ

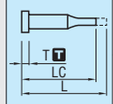
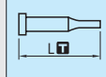
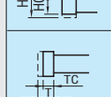
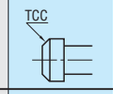
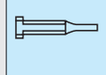
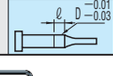
8 Days — Express C 1,500/1Pc. P.38

Ⓟ A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration

Catalog No.	L(LC·LCT·LMT)	P(PC)	W(WC)	R	(BC・HC・TC···etc.)
G—WJDS 10	60	P8.00	W3.00		BC10

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Blade		PC WC	Changes dimension P. PC≧PCmin 0.001 mm increments Ⓟ TiCN coating type 0.01mm increments ⊗ D3・D4 : Not applicable. D 5 6 8 10 13 16 / PCmin 1.800 1.800 2.300 2.800 5.000 8.000	Changes dimension P・W. PC WC≧PC・WCmin 0.01 mm increments (Combination with PKC →0.001mm increments) ⊗ D4 : Not applicable. D 5 6 8 10 13 16 / PC・WCmin 1.80 1.80 2.50 2.80 5.00 5.00	Ⓐ 1,200 DREG 2,500
		BC	Changes blade length B 2≦BC<B 0.1 mm increments		600
		SC	Changes tip roughness. Ⓟ Surface finished before coating.	G ⇨ GL	Ⓐ 800 DREG 1,200
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−d1−0.5)/2 ⊗ PCC : Not applicable	——	2,000
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−d1−0.5)/2 ⊗ PRC : Not applicable	——	1,600
		PKC	Changes tolerance on P Standard type $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ TiCN coating type $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ TiCN coating type, D16 : Not applicable	Changes tolerance on P・W. (Dimensions P and W : 0.001mm incr.) $P・W^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ TiCN coating type : Not applicable	Ⓐ 1,600 DREG 2,300
		PKV	Changes tolerance on P Standard type $P^{+0.005}_{0}$ ⇨ ±0.002 TiCN coating type $P^{+0.01}_{0}$ ⇨ ±0.005 Ⓟ Dimension P unit doesn't change.	Changes tolerance on P・W. $P・W^{+0.01}_{0}$ ⇨ ±0.005 ⊗ TiCN coating type :Not applicable Ⓟ Dimension P unit doesn't change.	0
Full length		LC	Changes full length 25+B(BC)≦LC<L 0.1 mm increments Ⓟ B and S are shortened by L−(LC). (Combination with LKC・LKZ→0.01mm increments)	Changes full length 30+B(BC)≦LC<L 0.1 mm increments Ⓟ B and S are shortened by L−(LC).	600

Alterations		Code	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Full length		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓟ) are the same as LC. TKC (Thickness) $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC (Full length) + Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	1,400
		LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓟ) are the same as LC. TKM (Thickness) $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC (Full length) + Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	
		LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	1,200
		LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ TiCN coating type : Not applicable	1,800
Head		WKC	Adds double key flats in parallel.	1,200
		HC	Changes head diameter. D≦HC<H 0.1 mm increments	600
		TC	Changes head thickness 2≦TC<5 0.1mm increments (Combination with TKC・TKM・LCT・LMT →0.01mm increments) Ⓟ L is shortened by (5−TC). When LC, LCT and LMT are combined, L=specified dimention.	600
		TKC	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	1,200
		TKM	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	1,200
		TCC	Adds chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓟ H≦5 : TCC 0.5	600
Shank		SKF	Adds single key flat on the shank with dimension specified. Ⓐ $SKF\ ^{0}_{-0.01}$ P≦2(SKF−0.1) 0.1mm increments Ⓓ Ⓡ Ⓔ Ⓖ W≦2(SKF−0.1) 0.1mm increments D3~6 D/2−0.5≦SKF≦D/2−0.1 D8~16 D/2−1.0≦SKF≦D/2−0.1 ⊗ WKC : Not applicable	600
		NDC	No press -in lead ℓ=3 ⇨ ℓ=0	0

Price

Volume discount rate P.37

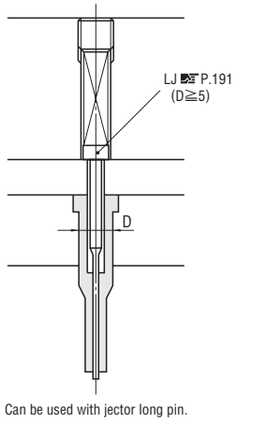
Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

D	Ⓐ G—WJAS G—WJAL	Ⓓ G—WJDS G—WJDL	Ⓡ G—WJRS G—WJRL	Ⓔ G—WJES G—WJEL	Ⓖ G—WJGS G—WJGL
3	5,220	—	—	—	—
4	3,930	5,830	6,270	6,310	5,490
5	4,080	5,970	6,360	6,360	5,580
6	4,530	6,050	6,540	6,620	5,660
8	5,640	7,590	7,990	8,160	7,110
10	7,110	8,780	9,040	9,260	8,160
13	8,580	10,500	10,670	10,890	9,790
16	10,440	11,500	11,900	12,250	11,370

D	Ⓐ GH—WJAS GH—WJAL	Ⓓ GH—WJDS GH—WJDL	Ⓡ GH—WJRS GH—WJRL	Ⓔ GH—WJES GH—WJEL	Ⓖ GH—WJGS GH—WJGL
3	6,750	—	—	—	—
4	5,490	7,390	7,830	7,870	7,050
5	5,710	7,600	7,990	7,990	7,210
6	6,340	7,860	8,350	8,430	7,470
8	7,640	9,590	9,990	10,160	9,110
10	9,310	10,980	11,240	11,460	10,360
13	10,990	12,910	13,080	13,300	12,200
16	13,080	14,140	14,540	14,890	14,010

Example



Can be used with jector long pin.
(D≧5 is applied.)

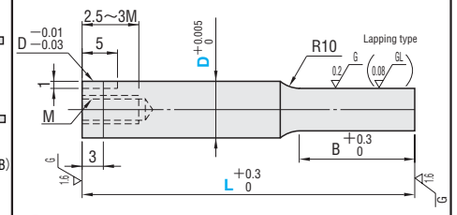
PRESS NEW

TAPPED CARBIDE PUNCHES
—STANDARD TYPE / LAPPING TYPE / TiCN COATING TYPE—

PRODUCTS DATA P.1220

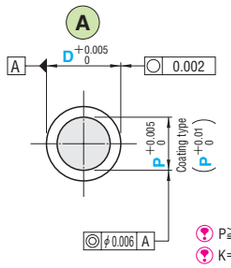
COATING PUNCHES
— TiCN —

¥ The volume discount rate is also applicable to alteration cost. P.39

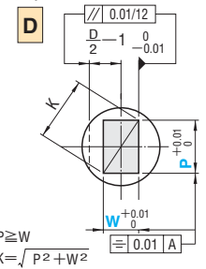
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A~G shown below.
RoHS	$D^{+0.005}_{0}$	V30(HIP) 88~89HRA	A—WMP	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S / L	
		Super corpuscle 90~92HRA	A—WXMP (D5~8)			
—Lapping type— RoHS		V30(HIP) 88~89HRA	AL—WMP			
		Super corpuscle (HIP) 90~92HRA	AL—WXMP (D5~8)			
—TiCN coating type— RoHS		V30(HIP) 88~89HRA	AH—WMP			
		Super corpuscle (HIP) 90~92HRA	AH—WXMP (D5~8)			

Ⓨ The tip grinding is processed before coating for TiCN type.

Shape Ⓐ

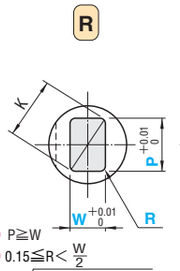


Shape Ⓓ



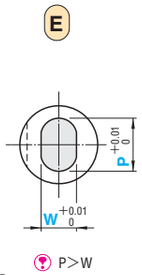
Ⓨ P≧W
Ⓨ $K=\sqrt{P^2+W^2}$

Shape Ⓡ



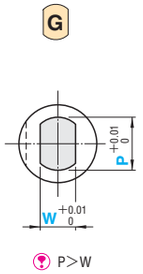
Ⓨ P≧W
Ⓨ $0.15 \leqq R < \frac{W}{2}$
Ⓨ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape Ⓔ



Ⓨ P>W

Shape Ⓖ



Ⓨ P>W

Catalog No. Type	Shape	B Blade length	D	L					Ⓨ 0.001 mm increments Ⓐ min. P max.	0.01 mm increments DREG P·Kmax.	DREG P·Wmin.	R	B	M
—Standard— A—WMP	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	5	40	50	60	70		2.000~ 4.999	—	—	$0.15 \leqq R < \frac{W}{2}$ (Ⓡonly)	8	3
A—WXMP (D5~8)			6	40	50	60	70		2.000~ 5.999	5.97	1.50			
			8	(40)	50	60	70	80	3.000~ 7.999	7.97	2.00		13	4
—Lapping type— AL—WMP			10	(40)	50	60	70	80	3.000~ 9.999	9.97	2.50			5
AL—WXMP (D5~8)			13	(40)	50	60	70	80	6.000~12.999	12.97	3.00			6
—TiCN coating type— AH—WMP			16	(40)	50	60	70	80	10.000~15.999	15.97	4.00		19	
AH—WXMP (D5~8)		L	5		50	60	70		2.000~ 4.999	—	—		13	3
			6		50	60	70		2.000~ 5.999	5.97	2.00			
			8		50	60	70	80	3.000~ 7.999	7.97	2.50		19	4
			10		50	60	70	80	3.000~ 9.999	9.97	2.50			5
			13		50	60	70	80	6.000~12.999	12.97	3.00			6
			16			60	70	80	10.000~15.999	15.97	4.00		25	

Ⓨ L(40)•••▸B=8 When L (40), the blade length is fixed to 8mm.
Ⓨ Dimension P of TiCN coated punch •••▸0.01mm increments. (Combination with PKC→0.001mm incr.)

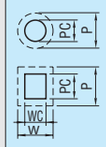
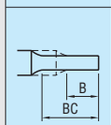
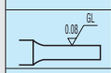
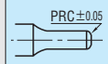
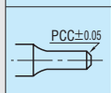
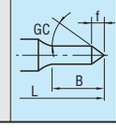
■Features

- The end side screw is machined with direct tapping (tap before sintering), and is compatible with tapped punch of steel material.
- If screw loosening is expected, alternation KC and SKC (addition of single key flat) is strongly recommended.

Order Catalog No. — L — P — W — R(Ⓡonly)
A—WMPAS 10 — 60 — P7.770

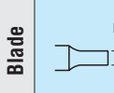
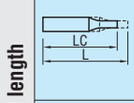
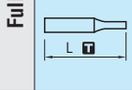
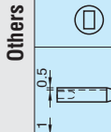
Delivery
- Standard · Lapping type Ⓐ: 3 Days — Express A 1,500/1Pc. P.38
  Ⓨ A flat charge of 4,050 yen for 3 pieces or more of the same size.
- DREG: 5 Days — Express B 1,500/1Pc. P.38
  Ⓨ A flat charge of 4,050 yen for 3 pieces or more of the same size.
- TiCN coating type: 8 Days — Express C 1,500/1Pc. P.38
  Ⓨ A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC·WKC···etc.)
A—WMPAS 13 — 80 — P8.24 — KC— LKC

Alterations	Code	Ⓐ	DREG	¥/1Code
Blade 	PC WC	Changes dimension P. PC≧Pmin/2 0.001 mm increments Ⓨ TiCN coating type 0.01mm increments PC≧Pmin/2≧1.00 P(PC) / Bmax: 1.000~1.999 13; 2.000~2.999 19; 3.000~3.999 30; 4.000~5.999 40; 6.000~ 45	Changes dimension P・W. PC/WC≧Wmin×2/3≧1.00 0.01 mm increments (Combination with PKC →0.001mm increments) P(PC)・W(WC) / Bmax: 1.000~1.999 8; 2.000~2.499 13; 2.500~3.999 19; 4.000~ 25	Ⓐ 1,200 DREG 2,500
	BC	Changes blade length B 2≦BC≦Bmax 0.1 mm increments Ⓨ Full length L (LC) requires BC+25mm or more.	Changes blade length B 2≦BC≦Bmax 0.1 mm increments Ⓨ Full length L (LC) requires BC+30mm or more.	600
	SC	Changes tip roughness. 0.2 G ⇨ 0.08 GL Ⓨ Applicable to coating type Ⓨ Surface finished before coating.		Ⓐ 800 DREG 1,200
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 ⊗ PCC・GC : Not applicable	—	2,000
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 ⊗ PRC・GC : Not applicable	—	1,600
	GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B ≧ f+2 f=P/2×tan(90°−GC°) Ⓨ When combined with SC, tip and edge are rounded. ⊗ P≦1.000 : Not applicable ⊗ LKC・LKZ・PRC・PCC : Not applicable	—	1,200

Ⓨ **Volume discount rate** P.37 Ⓨ To be quoted on price & lead time above Max. Q'ty.

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

Alterations	Code	Ⓐ	DREG	¥/1Code
Blade 	PKC	Changes tolerance on P Standard・Lapping type $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ TiCN coating type $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ TiCN coating type, D16 : Not applicable	Changes tolerance on P・W. (Dimensions P and W : 0.001mm incr.) $P・W^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ TiCN coating type : Not applicable	Ⓐ 1,600 DREG 2,300
	PKV	Changes tolerance on P Standard・Lapping type $P^{+0.005}_{0}$ ⇨ ±0.002 TiCN coating type $P^{+0.01}_{0}$ ⇨ ±0.005 Ⓨ Dimension P unit doesn't change.	Changes tolerance on P・W. $P・W^{+0.01}_{0}$ ⇨ ±0.005 ⊗ TiCN coating type : Not applicable Ⓨ Dimension P unit doesn't change.	0
Full length 	LC	Changes full length 25+B(BC)≦LC<L 0.1 mm increments Ⓨ When LC−B (or BC) is 25mm or less, B (or BC) is LC−25mm. (Combination with LKC・LKZ→0.01mm increments)	Changes full length 30+B(BC)≦LC<L 0.1 mm increments Ⓨ When LC−B (or BC) is 30mm or less, B (or BC) is LC−30mm.	600
	LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		1,200
	LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		1,800
Others	KC	Adds single key flat at head. Ⓨ D5 : Not applicable	90° Changes the position 180° of key flat. 1° incr.	600
	WKC	Adds double key flats in parallel. Ⓨ D5 : Not applicable	Adds double key flats in parallel. KC : Applicable.	1,200
	NKC	—	No key flat.	0
	SKC	Adds key flat on shank. Ⓐ DREG $\frac{D}{2}-0.5^{\ 0}_{-0.01}$・D6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ KC・WKC : Not applicable		1,800

D	Ⓐ A—WMPAS A—WMPAL	Ⓓ A—WMPDS A—WMPDL	Ⓡ A—WMPRS A—WMPRL	Ⓔ A—WMPES A—WMPEL	Ⓖ A—WMPGS A—WMPGL
5	5,600	—	—	—	—
6	6,040	7,840	8,550	8,420	7,630
8	7,350	9,260	9,970	9,770	9,060
10	8,900	10,800	11,550	11,350	10,570
13	11,210	13,440	14,090	13,860	13,130
16	13,990	15,540	16,330	16,100	15,060

D	Ⓐ A—WXMPAS A—WXMPAL	Ⓓ A—WXMPDS A—WXMPDL	Ⓡ A—WXMPRS A—WXMPRL	Ⓔ A—WXMPES A—WXMPEL	Ⓖ A—WXMPGS A—WXMPGL
5	7,460	—	—	—	—
6	8,020	10,740	11,730	11,550	10,450
8	9,820	12,780	13,810	13,560	12,490

D	Ⓐ AL—WMPAS AL—WMPAL	Ⓓ AL—WMPDS AL—WMPDL	Ⓡ AL—WMPRS AL—WMPRL	Ⓔ AL—WMPES AL—WMPEL	Ⓖ AL—WMPGS AL—WMPGL
5	6,360	—	—	—	—
6	6,800	8,980	9,690	9,560	8,770
8	8,110	10,400	11,110	10,910	10,200
10	9,660	11,940	12,690	12,490	11,710
13	11,970	14,580	15,230	15,000	14,270
16	14,750	16,680	17,470	17,240	16,200

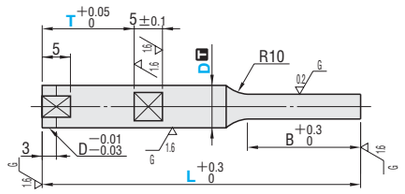
D	Ⓐ AL—WXMPAS AL—WXMPAL	Ⓓ AL—WXMPDS AL—WXMPDL	Ⓡ AL—WXMPRS AL—WXMPRL	Ⓔ AL—WXMPES AL—WXMPEL	Ⓖ AL—WXMPGS AL—WXMPGL
5	8,220	—	—	—	—
6	8,780	11,880	12,870	12,690	11,590
8	10,580	13,920	14,950	14,700	13,630

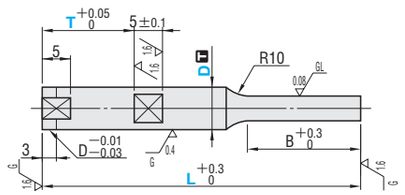
D	Ⓐ AH—WMPAS AH—WMPAL	Ⓓ AH—WMPDS AH—WMPDL	Ⓡ AH—WMPRS AH—WMPRL	Ⓔ AH—WMPES AH—WMPEL	Ⓖ AH—WMPGS AH—WMPGL
5	7,230	—	—	—	—
6	7,850	9,650	10,360	10,230	9,440
8	9,350	11,260	11,970	11,770	11,060
10	11,100	13,000	13,750	13,550	12,770
13	13,620	15,850	16,500	16,270	15,540
16	16,630	18,180	18,970	18,740	17,700

D	Ⓐ AH—WXMPAS AH—WXMPAL	Ⓓ AH—WXMPDS AH—WXMPDL	Ⓡ AH—WXMPRS AH—WXMPRL	Ⓔ AH—WXMPES AH—WXMPEL	Ⓖ AH—WXMPGS AH—WXMPGL
5	9,090	—	—	—	—
6	9,830	12,550	13,540	13,360	12,260
8	11,820	14,780	15,810	15,560	14,490

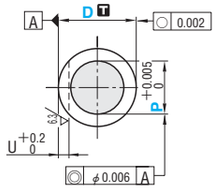
CARBIDE PUNCHES WITH KEY GROOVE

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length
RoHS Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	D_{m5}	V30(HIP) 88~89HRA	WK	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S
		Super corpuscle (HIP) 90~92HRA	WXK (D3~6)		
	$D^{+0.005}_{0}$	V30(HIP) 88~89HRA	A—WK		
		Super corpuscle (HIP) 90~92HRA	A—WXK (D3~6)		
—Lapping type— RoHS Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	D_{m5}	V30(HIP) 88~89HRA	L—WK		L
		Super corpuscle (HIP) 90~92HRA	L—WXK (D3~6)		Blade length (B) L>S
	$D^{+0.005}_{0}$	V30(HIP) 88~89HRA	AL—WK		
		Super corpuscle (HIP) 90~92HRA	AL—WXK (D3~6)		

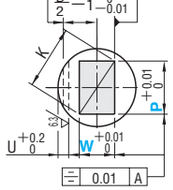




Shape A

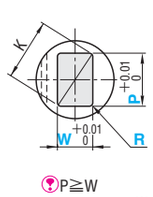


Shape D



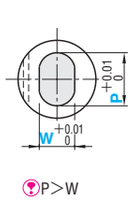
Ⓟ P≧W
Ⓟ $K=\sqrt{P^2+W^2}$

Shape R



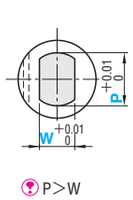
Ⓟ P≧W
Ⓟ $0.15 \leqq R < \frac{W}{2}$
Ⓟ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



Ⓟ P>W

Shape G



Ⓟ P>W

Catalog No. Type	Shape	B Blade length	D	L	0.001 mm increments Ⓐ min. P max.	0.01 mm increments D R E G P·Kmax.	0.01 mm increments D R E G P·Wmin.	R	0.1mm increments T	B	U Key groove depth
(D_{m5}) ($D^{+0.005}_{0}$) WK A—WK	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	3	40 50 60	1.000~ 2.990	—	—	0.15≦R<W/2 (Ⓡ only)	T≧5.0	8	0.5
WXK (D3~6) A—WXK (D3~6)			4	40 50 60 70	1.000~ 3.990	3.97	1.50				1.0
			5	40 50 60 70	2.000~ 4.990	4.97	1.50			13	1.5
			6	40 50 60 70	2.000~ 5.990	5.97	1.50				
			8	(40) 50 60 70 80	3.000~ 7.990	7.97	2.00				
			10	(40) 50 60 70 80	3.000~ 9.990	9.97	2.50				
			13	(40) 50 60 70 80	6.000~12.990	12.97	3.00				
			16	(40) 50 60 70 80	10.000~15.990	15.97	4.00			19	
—Lapping type— L—WK AL—WK		L	3	50 60	1.000~ 2.990	—	—			13	0.5
L—WXK (D3~6) AL—WXK (D3~6)			4	50 60 70	1.000~ 3.990	3.97	2.00				1.0
			5	50 60 70	2.000~ 4.990	4.97	2.00				
			6	50 60 70	2.000~ 5.990	5.97	2.00				
			8	50 60 70 80	3.000~ 7.990	7.97	2.50			19	1.5
			10	50 60 70 80	3.000~ 9.990	9.97	2.50				
			13	50 60 70 80	6.000~12.990	12.97	3.00				
			16	60 70 80	10.000~15.990	15.97	4.00			25	

Ⓟ L(40) ···▸B=8 When L (40), the blade length is fixed to 8mm.
Ⓟ When no key groove is required, specify T=L.

Order Catalog No. — L — P — W — R(Ⓡ)only — T
A—WKAS 8 — 70 — P6.500 — T20

Ⓟ When no key groove is required, specify T=L.

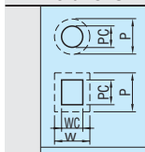
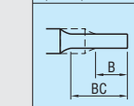
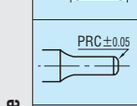
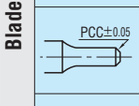
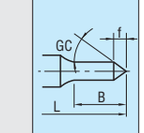
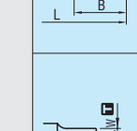
Delivery

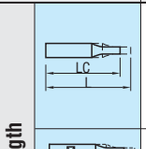
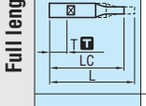
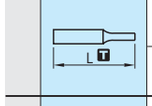
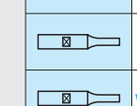
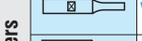
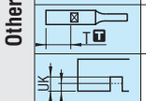
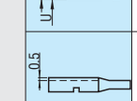
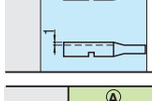
Ⓐ **3** Days — Express A 1,500/1Pc. P.38
Ⓟ A flat charge of 4,050 yen for 3 pieces or more of the same size.

• D R E G **5** Days — Express B 1,500/1Pc. P.38
Ⓟ A flat charge of 4,050 yen for 3 pieces or more of the same size.

The volume discount rate is also applicable to alteration cost. P.39

Alteration Catalog No. — L(LC·LCT) — P(PC) — W(WC) — R — T — (BC · KC · KD···etc.)
A—WKAS 8 — LC65.5 — P6.500 — T20 — PKC

Alterations		Code	Ⓐ	D R E G	¥/1Code
Blade		PC WC	Changes dimension P. PC≧Pmin/2 0.001 mm increments P(PC) / Bmax: 0.500~0.999 / 4; 1.000~1.999 / 13; 2.000~2.999 / 19; 3.000~3.999 / 30; 4.000~5.999 / 40; 6.000~ / 45	Changes dimension P・W. PC≧P, WC≧W, min×2/3≧1.00 0.01 mm increments (Combination with PKC →0.001mm increments) P(PC)・W(WC) / Bmax: 1.000~1.999 / 8; 2.000~2.499 / 13; 2.500~3.999 / 19; 4.000~ / 25	Ⓐ 1,200 D R E G 2,500
		BC	Changes blade length B 2≦BC≦Bmax 0.1 mm increments Ⓟ Full length L (LC) requires BC+25mm or more.	Changes blade length B 2≦BC≦Bmax 0.1 mm increments Ⓟ Full length L (LC) requires BC+30mm or more.	600
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−0.2)/2 ⊗ PCC・GC : Not applicable	——	2,000
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−0.2)/2 ⊗ PRC・GC : Not applicable	——	1,600
		GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B ≧ f+2 f=P/2×tan(90°−GC°) Ⓟ The edge of lapping type is rounded. ⊗ P≦1.000 : Not applicable ⊗ LKC・LKZ・LCT・PRC・PCC : Not applicable	——	1,200
		PKC	Changes tolerance on P P $^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$	Changes tolerance on P・W. (Dimensions P and W : 0.001mm incr.) P・W $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Ⓐ 1,600 D R E G 2,300
		PKV	Changes tolerance on P P $^{+0.005}_{0}$ ⇨ ±0.002 Ⓟ Dimension P unit doesn't change.	Changes tolerance on P・W. P・W $^{+0.01}_{0}$ ⇨ ±0.005 Ⓟ Dimension P unit doesn't change.	0

Alterations		Code	Ⓐ	D R E G	¥/1Code
Full length		LC	Changes full length 25+B(BC)≦LC<L 0.1 mm increments Ⓟ When LC−B (or BC) is 25mm or less, B (or BC) is LC−25mm. (Combination with LKC・LKZ→0.01mm increments)	Changes full length 30+B(BC)≦LC<L 0.1 mm increments Ⓟ When LC−B (or BC) is 30mm or less, B (or BC) is LC−30mm.	600
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓟ) are the same as LC. TKC (Thickness) T $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ + LC (Full length) L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		1,400
		LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		1,200
		LKZ	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		1,800
Others		KC	——	Ⓟ Changes the position of key flat. 1° incr.	600
		NKC	——	No key flat.	0
		KD	——	Ⓟ Changes the position of key flat. 1° incr.	600
		WKD	Adds double key flats in parallel.	Adds double key flats in parallel. KD : Applicable	1,200
		TKC	Changes dimension T tolerance. T $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		1,200
		UK	Changes key groove depth. D: 4·5 / 6 / 8~16; UK: 0.7 / 1.2 / 1.7 ⊗ Cannot be applied to D3.		400
		SKC	Adds key flat on shank. Ⓐ D R E G ·D3~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ KC : Not applicable		1,800

Price ■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

D	Ⓐ WKAS WKAL A—WKAS A—WKAL	D WKDS WKDL A—WKDS A—WKDL	R WKRS WKRL A—WKRS A—WKRL	E WKES WKEL A—WKES A—WKEL	G WKGS WKGL A—WKGS A—WKGL
3	3,550	—	—	—	—
4	3,600	5,970	6,500	6,620	5,790
5	3,650	6,150	6,670	6,800	5,970
6	4,060	6,540	7,150	7,290	6,320
8	5,170	7,690	8,290	8,510	7,420
10	6,270	8,640	9,260	9,480	8,390
13	7,590	10,280	10,760	11,020	9,930
16	9,680	11,900	12,560	12,820	11,550

D	Ⓐ WXKAS WXKAL A—WXKAS A—WXKAL	D WXKDS WXKDL A—WXKDS A—WXKDL	R WXKRS WXKRL A—WXKRS A—WXKRL	E WXKES WXKEL A—WXKES A—WXKEL	G WXKGS WXKGL A—WXKGS A—WXKGL
3	6,110	—	—	—	—
4	6,170	9,220	9,960	10,140	8,980
5	6,480	9,540	10,270	10,450	9,290
6	7,350	10,010	10,870	11,060	9,710

D	Ⓐ L—WKAS L—WXKAL AL—WXKAS AL—WXKAL	D L—WKDS L—WKDL AL—WKDS AL—WKDL	R L—WKRS L—WKRL AL—WKRS AL—WKRL	E L—WKES L—WKEL AL—WKES AL—WKEL	G L—WKGS L—WKGL AL—WKGS AL—WKGL
3	4,310	—	—	—	—
4	4,360	7,110	7,640	7,760	6,930
5	4,410	7,290	7,810	7,940	7,110
6	4,820	7,680	8,290	8,430	7,460
8	5,930	8,830	9,430	9,650	8,560
10	7,030	9,780	10,400	10,620	9,530
13	8,350	11,420	11,900	12,160	11,070
16	10,440	13,040	13,700	13,960	12,690

D	Ⓐ L—WXKAS L—WXKAL AL—WXKAS AL—WXKAL	D L—WXKDS L—WXKDL AL—WXKDS AL—WXKDL	R L—WXKRS L—WXKRL AL—WXKRS AL—WXKRL	E L—WXKES L—WXKEL AL—WXKES AL—WXKEL	G L—WXKGS L—WXKGL AL—WXKGS AL—WXKGL
3	6,870	—	—	—	—
4	6,930	10,360	11,100	11,280	10,120
5	7,240	10,680	11,410	11,590	10,430
6	8,110	11,150	12,010	12,200	10,850

■Keys P.195

PSKB PSKBH PSKS PSKJ PSK PSKP PSKH PSKW

CARBIDE PUNCHES WITH KEY GROOVE
—TiCN COATING TYPE—

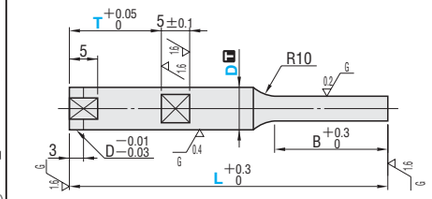
PRODUCTS DATA P.1220

COATING PUNCHES
— TiCN —

The volume discount rate is also applicable to alteration cost. P.39

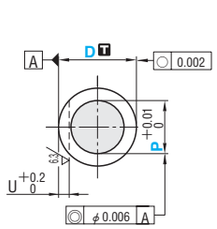
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A~G shown below.
—TiCN coating type— RoHS	D_{m5}	V30(HIP) 88~89HRA Surface 3000HV	H—WK	A	S	
		Super corpuscle(HIP) 90~92HRA Surface 3000HV	H—WXK (D3~6)	D		
	$D^{+0.005}_{0}$	V30(HIP) 88~89HRA Surface 3000HV	AH—WK	R	L	
		Super corpuscle(HIP) 90~92HRA Surface 3000HV	AH—WXK (D3~6)	E G	Blade length (B) L>S	

Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable

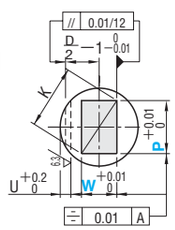


Tip surface is ground before coating.

Shape A

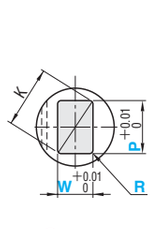


Shape D



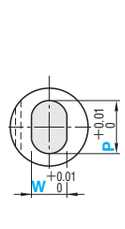
P≧W
K=$\sqrt{P^2+W^2}$

Shape R



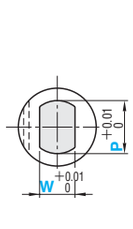
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L					0.01 mm increments Ⓐ min. ~ P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	0.1mm increments T	B	U Key groove depth
(D_{m5}) H—WK / H—WXK (D3~6)	A D R E G	S	3	40	50	60	70		1.00 ~ 2.99	—	—	0.15≦R<$\frac{W}{2}$ (R)only	T≧5.0	8	0.5
			4	40	50	60	70		1.00 ~ 3.99	3.97	1.50				1.0
			5	40	50	60	70		2.00 ~ 4.99	4.97	1.50			13	1.5
			6	40	50	60	70		2.00 ~ 5.99	5.97	1.50				
			8	(40)	50	60	70	80	3.00 ~ 7.99	7.97	2.00				
			10	(40)	50	60	70	80	3.00 ~ 9.99	9.97	2.50				
			13	(40)	50	60	70	80	6.00 ~ 12.99	12.97	3.00			19	1.5
			16	(40)	50	60	70	80	10.00 ~ 15.99	15.97	4.00				
($D^{+0.005}_{0}$) AH—WK / AH—WXK (D3~6)		L	3		50	60			1.00 ~ 2.99	—	—			13	0.5
			4		50	60	70		1.00 ~ 3.99	3.97	2.00				1.0
			5		50	60	70		2.00 ~ 4.99	4.97	2.00				
			6		50	60	70		2.00 ~ 5.99	5.97	2.00				
			8		50	60	70	80	3.00 ~ 7.99	7.97	2.50			19	1.5
			10		50	60	70	80	3.00 ~ 9.99	9.97	2.50				
			13		50	60	70	80	6.00 ~ 12.99	12.97	3.00				
			16			60	70	80	10.00 ~ 15.99	15.97	4.00			25	

L(40) ···▸ B=8 When L (40), the blade length is fixed to 8mm.
When no key groove is required, specify T=L.

Order

Catalog No.	L	P	W	R(R)only	T
H—WKAS 8	70	P6.50			T20

When no key groove is required, specify T=L.

Delivery 8 Days — Express C 1,500/1Pc. P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alterations Catalog No. — L(LC·LCT) — P(PC) — W(WC) — R — T — (BC · KC · KD···etc.)
H—WKAS 8 — LC65.5 — P6.50 — T20 — TKC

Alterations	Code	Ⓐ	D R E G	¥/1Code
Blade: PC WC	PC WC	Changes dimension P. PC≧Pmin/2≧1.00 0.01 mm increments (Combination with PKC→0.001mm increments) ⊗D3・4：Not applicable P(PC) / Bmax: 1.000~1.999 13; 2.000~2.999 19; 3.000~3.999 30; 4.000~ 40	Changes dimension P・W. PC≧$\frac{P}{W}$ min×$\frac{2}{3}$≧1.00 0.01 mm increments P(PC)・W(WC) / Bmax: 1.00~1.99 8; 2.00~2.49 13; 2.50~3.99 19; 4.00~ 25	Ⓐ 1,200 D R E G 2,500
Blade: BC	BC	Changes blade length B 2≦BC≦Bmax≦L/2 0.1 mm increments (?) Full length L (LC) requires BC+25mm or more.	Changes blade length B 2≦BC≦Bmax 0.1 mm increments (?) Full length L (LC) requires BC+30mm or more.	600
Blade: SC	SC	Changes tip roughness. 0.2 G ⇨ 0.08 GL Surface finished before coating.		Ⓐ 800 D R E G 1,200
Blade: PRC	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (?) PRC≦(P−0.2)/2 ⊗PCC・GC：Not applicable	——	2,000
Blade: PCC	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (?) PCC≦(P−0.2)/2 ⊗PRC・GC：Not applicable	——	1,600
Blade: GC	GC	Changes to pointed tip. 20°≦GC<90° 1° increments Blade length B≧f+2 f=P/2×tan(90°−GC°) (?) When combined with SC, tip and edge are rounded. ⊗P≦1.00：Not applicable ⊗LKC・LCT・PRC・PCC：Not applicable	——	1,200
Blade: PKC	PKC	Changes tolerance on P $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (Dimension P：0.001mm incr.) ⊗D16：Not applicable	——	1,600
Blade: PKV	PKV	Changes tolerance on P $P^{+0.01}_{0}$ ⇨ ±0.005 (?) Dimension P unit doesn't change.	——	0
Full length: LC	LC	Changes full length 25+B(BC)≦LC<L 0.1 mm increments (?) When LC—B (or BC) is 25mm or less, B (or BC) is LC—25mm. (Combination with LKC→0.01mm increments)	Changes full length 30+B(BC)≦LC<L 0.1 mm increments (?) When LC—B (or BC) is 30mm or less, B (or BC) is LC—30mm.	600
Full length: LCT	LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks ((?)) are the same as LC. TKC (Thickness) T $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ + LC (Full length) L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		1,400
Full length: LKC	LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		1,200
Others: KC	KC	——	90° 0° 180° 270° Changes the position of key flat. 1° incr.	600
Others: NKC	NKC	——	No key flat.	0
Others: KD	KD	——	90° 0° 180° 270° Changes the position of key flat. 1° incr.	600
Others: WKD	WKD	Adds double key flats in parallel.	Adds double key flats in parallel. KD：Applicable	1,200
Others: TKC	TKC	Changes dimension T T $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ T tolerance.		1,200
Others: UK	UK	Changes key groove depth. ⊗Not applicable to D3.	D: 4・5 UK 0.7; 6 1.2; 8~16 1.7	400
Others: SKC	SKC	Adds key flat on shank. Ⓐ D R E G ·D3~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC：Not applicable		1,800

Price — Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

(?) To be quoted on price & lead time above Max. Q'ty.

D	Ⓐ H—WKAS H—WKAL AH—WKAS AH—WKAL	D H—WKDS H—WKDL AH—WKDS AH—WKDL	R H—WKRS H—WKRL AH—WKRS AH—WKRL	E H—WKES H—WKEL AH—WKES AH—WKEL	G H—WKGS H—WKGL AH—WKGS AH—WKGL
3	5,080	—	—	—	—
4	5,160	7,530	8,060	8,180	7,350
5	5,280	7,780	8,300	8,430	7,600
6	5,870	8,350	8,960	9,100	8,130
8	7,170	9,690	10,290	10,510	9,420
10	8,470	10,840	11,460	11,680	10,590
13	10,000	12,690	13,170	13,430	12,340
16	12,320	14,540	15,200	15,460	14,190

D	Ⓐ H—WXKAS H—WXKAL AH—WXKAS AH—WXKAL	D H—WXKDS H—WXKDL AH—WXKDS AH—WXKDL	R H—WXKRS H—WXKRL AH—WXKRS AH—WXKRL	E H—WXKES H—WXKEL AH—WXKES AH—WXKEL	G H—WXKGS H—WXKGL AH—WXKGS AH—WXKGL
3	7,640	—	—	—	—
4	7,730	10,780	11,520	11,700	10,540
5	8,110	11,170	11,900	12,080	10,920
6	9,160	11,820	12,680	12,870	11,520

Keys P.195

PSKB PSKBH

PSKS PSKJ

PSK PSKP PSKH

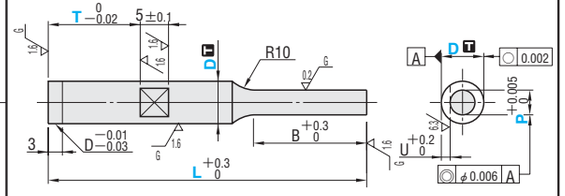
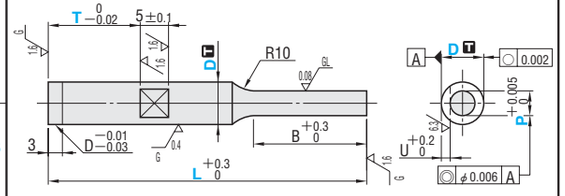
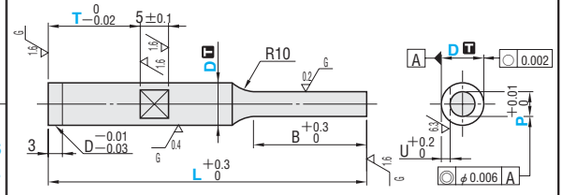
PSKW

CARBIDE PUNCHES WITH KEY GROOVE
—WITH NEGATIVE SHANK TOLERANCE—

PRODUCTS DATA P.1220

COATING PUNCHES
— TiCN —

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D	M H	Catalog No.	Shape
RoHS	D −0.001 −0.006	V30(HIP) 88～89HRA	B—WKAS B—WKAL	 Blade length (B) L>S
		Super corpuscle (HIP) 90～92HRA	B—WXKAS B—WXKAL (D3～6)	
—Lapping type— RoHS	D −0.001 −0.006	V30(HIP) 88～89HRA	BL—WKAS BL—WKAL	 Blade length (B) L>S
		Super corpuscle (HIP) 90～92HRA	BL—WXKAS BL—WXKAL (D3～6)	
—TiCN coating type— RoHS	D −0.001 −0.006	V30(HIP) 88～89HRA Surface 3000HV	BH—WKAS BH—WKAL	 Tip surface is ground before coating. Blade length (B) L>S
		Super corpuscle (HIP) 90～92HRA Surface 3000HV	BH—WXKAS BH—WXKAL (D3～6)	

Catalog No. Type	Shape	B Blade length	D	L	0.001 mm increments Ⓐ min. P max.	0.1mm increments T	B	U Key groove depth
B—WK B—WXK (D3～6) —Lapping type— BL—WK BL—WXK (D3～6) —TiCN coating type— BH—WK BH—WXK (D3～6)	Ⓐ	S	3	40 50 60	1.000～ 2.990	T≧5.0	8	0.5
			4	40 50 60 70	1.000～ 3.990			
			5	40 50 60 70	2.000～ 4.990			1.0
			6	40 50 60 70	2.000～ 5.990			
			8	(40) 50 60 70 80	3.000～ 7.990		13	1.5
			10	(40) 50 60 70 80	3.000～ 9.990			
			13	(40) 50 60 70 80	6.000～12.990			
			16	(40) 50 60 70 80	10.000～15.990		19	
		L	3	50 60	1.000～ 2.990		13	0.5
			4	50 60 70	1.000～ 3.990			
			5	50 60 70	2.000～ 4.990			1.0
			6	50 60 70	2.000～ 5.990			
			8	50 60 70 80	3.000～ 7.990		19	1.5
			10	50 60 70 80	3.000～ 9.990			
			13	50 60 70 80	6.000～12.990			
			16	60 70 80	10.000～15.990		25	

The specifying unit of the P dimension for the TiCN-coated type is 0.01 mm. (Combination with PKC→0.001mm incr.)
When no key groove is required, specify T=L.
L(40) ···› B=8 When L (40), the blade length is fixed to 8mm.

Order Catalog No. — L — P — T (When no key groove is required, specify T=L.)
B—WKAS 8 — 70 — P6.500 — T20

Delivery 3 Days | Express A | 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size.

● TiCN coating type
8 Days | Express C | 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC) — P(PC) — T — (BC・WKD···etc.)
B—WKAS 8 — LC65.5 — P6.500 — T20 — PKC

Alterations	Code	Spec.	¥/1Code
Blade	PC	Changes dimension P. PC≧Pmin/2 The coating type. PC≧Pmin/2≧1.00 0.001 mm increments P(PC) / Bmax: 0.500～0.999 / 4; 1.000～1.999 / 13; 2.000～2.999 / 19; 3.000～3.999 / 30; 4.000～5.999 / 40; 6.000～ / 45	1,200
	BC	Changes blade length B 2≦BC≦Bmax The coating type. 2≦BC≦Bmax≦L/2 0.1 mm increments Full length L (LC) requires BC+25mm or more.	600
	SC	Changes tip roughness. 0.2G ⇨ 0.08GL Applicable for coating type only. Surface finished before coating.	800
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 ⊗PCC・GC：Not applicable	2,000
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 ⊗PRC・GC：Not applicable	1,600
	GC	20°≦GC<90° 1° increments Blade length B ≧ f+2 f=P/2×tan(90°−GC°) When combined with SC, tip and edge are rounded. ⊗P≦1.000：Not applicable ⊗LKC・LKZ・PRC・PCC：Not applicable	1,200

Alterations	Code	Spec.	¥/1Code
Blade	PKC	Changes tolerance on P Standard / Lapping type P +0.005 0 ⇨ +0.003 0 ; TiCN coating type P +0.01 0 ⇨ +0.005 0	1,600
	PKV	Changes tolerance on P (Dimension P unit doesn't change.) Standard / Lapping type P +0.005 0 ⇨ ±0.002 ; TiCN coating type P +0.01 0 ⇨ ±0.005	0
Full length	LC	Changes full length 25+B(C)≦LC<L 0.1 mm increments (Combination with LKC・LKZ→0.01mm increments) When LC—B (or BC) is 25mm or less, B (or BC) is LC—25mm.	600
	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	1,200
	LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0 ⊗Not applicable to the coating type.	1,800
Key groove	WKD	Adds double key flats in parallel.	1,200
	RTC	Changes dimension T tolerance. T 0 −0.02 ⇨ +0.05 0	0
	UK	Changes key groove depth. D: 4・5 / 6 / 8～16; UK: 0.7 / 1.2 / 1.7 ⊗Not applicable to D3.	400
Shank	SKC	Adds key flat on shank. Ⓐ D3～6 P≦D−1.2 (Machining width 0.5) ; D8～ P≦D−2.2 (Machining width 1)	1,800

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

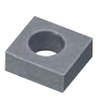
■V30 (HIP)

D	Ⓐ B—WKAS B—WKAL	BL—WKAS BL—WKAL	BH—WKAS BH—WKAL
3	3,550	4,310	5,080
4	3,600	4,360	5,170
5	3,650	4,410	5,280
6	4,060	4,820	5,870
8	5,170	5,930	7,170
10	6,270	7,030	8,470
13	7,590	8,350	10,000
16	9,680	10,440	12,320

■Super corpuscle (HIP)

D	Ⓐ B—WXKAS B—WXKAL	BL—WXKAS BL—WXKAL	BH—WXKAS BH—WXKAL
3	6,110	6,870	7,640
4	6,170	6,930	7,730
5	6,480	7,240	8,110
6	7,350	8,110	9,160

■Keys P.195

PSKB PSKBH
PSKS PSKJ
PSK PSKP PSKH 
PSKW

PRESS NEW

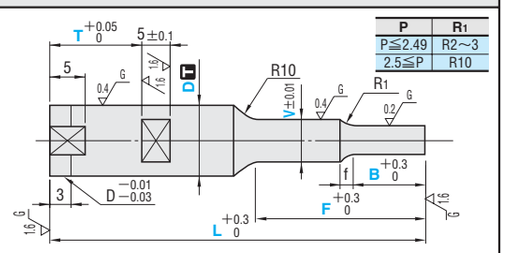
CARBIDE DOUBLE STEPPED PUNCHES WITH KEY GROOVE
—STANDARD TYPE / TiCN COATING TYPE—

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

Type	Shank dia. D T	M H	Catalog No. Type	Catalog No. Shape
RoHS —TiCN coating type— Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	Dm5	V30(HIP) 88~89HRA	WKTW TiCN coating type H—WKTW	A D R E G
		Super corpuscle (HIP) 90~92HRA (D3~6)	WXKTW TiCN coating type H—WXKTW	
	$D^{+0.005}_{0}$	V30(HIP) 88~89HRA	A—WKTW TiCN coating type AH—WKTW	
		Super corpuscle (HIP) 90~92HRA (D3~6)	A—WXKTW TiCN coating type AH—WXKTW	

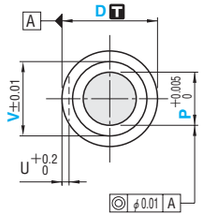
Select tip shape from Shape A~G shown below.



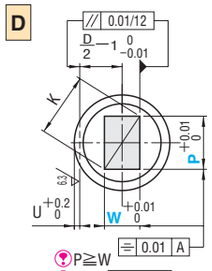
P	R1
P≦2.49	R2~3
2.5≦P	R10

The tip grinding is processed before coating for TiCN type.

Shape A

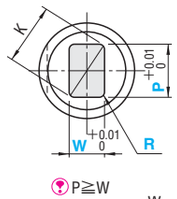


Shape D



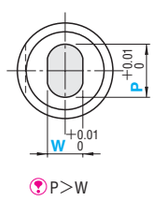
P≧W
K=$\sqrt{P^2+W^2}$

Shape R



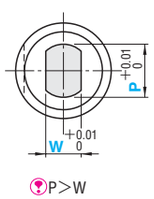
P≧W
0.15≦R< $\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	D	L (Selectable)	Ⓐ P (0.001 mm increments)	Ⓐ B (0.1 mm increments)	Diagonal Kmax.	D R E G P・W (0.01 mm increments)	D R E G B (0.1 mm increments)	R R (0.01mm)	V (0.01mm increments)	F (0.1 mm increments)	T (0.1mm)	U
(Dm5) WKTW WXKTW (D3~6) _TiCN coating_ type H—WKTW H—WXKTW (D3~6) ($D^{+0.005}_{0}$) A—WKTW A—WXKTW (D3~6) _TiCN coating_ type AH—WKTW AH—WXKTW (D3~6)	A D R E G	3	40・50・60	0.500~ 0.749	2.0~ 5.0	2.96	1.00~ 1.99	2.0~ 8.0	0.15≦R< W/2 (Ⓡ only)	Round: D>V>P+0.01 V≧1.00 Shaped: D>V>(P,K)+0.03 V≧1.00	Round: B+f+2<F≦Fmax Shaped: B+f+3.5<F≦Fmax & Round: F≦L−25 Shaped: F≦L−30	T≧5	0.5
				0.750~ 0.999	2.0~ 8.0								
				1.000~ 1.999	2.0~13.0		2.00~ 2.49	2.0~13.0					
				2.000~ 2.980	2.0~19.0		2.50~ 2.96	2.0~19.0					
		4	40・50・60・70	0.500~ 0.749	2.0~ 5.0	3.96	1.00~ 1.99	2.0~ 8.0					
				0.750~ 0.999	2.0~ 8.0								
				1.000~ 1.999	2.0~13.0		2.00~ 2.49	2.0~13.0					
				2.000~ 2.999	2.0~19.0		2.50~ 3.96	2.0~19.0					
				3.000~ 3.980	2.0~30.0		2.50~ 3.96	2.0~19.0					
		5	40・50・60・70	1.000~ 1.999	2.0~13.0	4.96	1.00~ 1.99	2.0~ 8.0					
				2.000~ 2.999	2.0~19.0		2.00~ 2.49	2.0~13.0					
				3.000~ 3.999	2.0~30.0		2.50~ 3.99	2.0~19.0					
				4.000~ 4.980	2.0~40.0		4.00~ 4.96	2.0~25.0					
		6	40・50・60・70	1.000~ 1.999	2.0~13.0	5.96	1.00~ 1.99	2.0~ 8.0					1.0
				2.000~ 2.999	2.0~19.0		2.00~ 2.49	2.0~13.0					
				3.000~ 3.999	2.0~30.0		2.50~ 3.99	2.0~19.0					
				4.000~ 5.980	2.0~40.0		4.00~ 5.96	2.0~25.0					
		8	40・50・60・70・80	1.500~ 1.999	2.0~13.0	7.96	1.40~ 1.99	2.0~ 8.0					
				2.000~ 2.999	2.0~19.0		2.00~ 2.49	2.0~13.0					
				3.000~ 3.999	2.0~30.0		2.50~ 3.99	2.0~19.0					
				4.000~ 5.999	2.0~40.0		4.00~ 7.96	2.0~25.0					
				6.000~ 7.980	2.0~45.0		4.00~ 7.96	2.0~25.0					
		10	40・50・60・70・80	1.500~ 1.999	2.0~13.0	9.96	1.70~ 1.99	2.0~ 8.0					1.5
				2.000~ 2.999	2.0~19.0		2.00~ 2.49	2.0~13.0					
				3.000~ 3.999	2.0~30.0		2.50~ 3.99	2.0~19.0					
				4.000~ 5.999	2.0~40.0		4.00~ 9.96	2.0~25.0					
				6.000~ 9.980	2.0~45.0		4.00~ 9.96	2.0~25.0					
		13	40・50・60・70・80	3.000~ 3.999	2.0~30.0	12.96	2.00~ 2.49	2.0~13.0					
				4.000~ 5.999	2.0~40.0		2.50~ 3.99	2.0~19.0					
				6.000~12.980	2.0~45.0		4.00~12.96	2.0~25.0					
		16	40・50・60・70・80	4.000~ 5.999	2.0~40.0	15.96	2.70~ 3.99	2.0~19.0					
				6.000~15.980	2.0~45.0		4.00~15.96	2.0~25.0					

TiCN coated punch is P min 1.00

Dimension P of TiCN coated punch ···▸ 0.01mm increments. (Combination with PKC→0.001mm incr.)

The volume discount rate is also applicable to alteration cost. P.39

Order

Catalog No.	L	P	W	B	V	F	R (Ⓡ only)	T
WKTWA 10	80	P9.500		B25	V9.80	F40		T20
A-WKTWR13	80	P10.50	W7.34	B10	V12.00	F30	R0.5	T25

When no key groove is required, specify T=L.

Delivery

■V30
- Ⓐ: 3 Days
- D R E G: 5 Days

■Super corpuscle
- Ⓐ: 5 Days
- D R E G: 5 Days

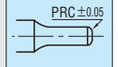
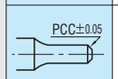
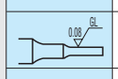
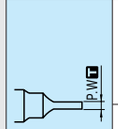
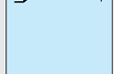
Express B 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size.

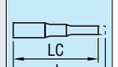
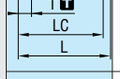
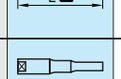
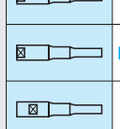
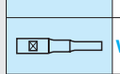
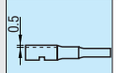
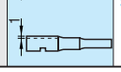
■TiCN coating type
- Ⓐ D R E G: 8 Days

Express C 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration

Catalog No.	L(LC・LCT・LMT)	P	W	B	V	F	R	T	(HC・TC・KC···etc.)
WKTWA 10	LC72	P4.800		B10	V6.80	F40		T20	HC12

Alterations	Code	Ⓐ	D R E G	¥/1Code
Blade 	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 PCC・GC: Not applicable	——	2,000
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 PCC・GC: Not applicable	——	1,600
	GC	20°≦GC<90° 1° increments Blade length B≧f+2 f=P/2×tan(90°−GC°) When combined with SC, tip and edge are rounded. P≦1.000: Not applicable LKC・LKZ・LCT・LMT・PRC・PCC: Not applicable	——	1,200
	SC	Changes tip roughness. 0.2G ⇨ 0.08GL		Ⓐ 800 D R E G 1,200
	PKC	Changes tolerance on P Standard $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ TiCN coating type $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ TiCN coating type D16: Not applicable	Changes tolerance on P・W. (Dimensions P and W: 0.001mm incr.) $P\cdot W^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ TiCN coating type: Not applicable	Ⓐ Standard 1,600 Coating 1,800 D R E G 2,300
	PKV	Changes tolerance on P Standard $P^{+0.005}_{0}$ ⇨ $^{+0.002}_{0}$ TiCN coating type $P^{+0.01}_{0}$ ⇨ ±0.005 Dimension P unit doesn't change.	Changes tolerance on P・W. $P\cdot W^{+0.01}_{0}$ ⇨ ±0.005 TiCN coating type: Not applicable Dimension P unit doesn't change.	0
	VKC	Changes V tolerance. $V^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Dimension V: 0.001mm incr. TiCN coating type: Not applicable	Changes V tolerance. V±0.01 ⇨ ±0.005	Ⓐ 1,600 D R E G 2,300

Alterations	Code	Ⓐ	D R E G	¥/1Code
Full length 	LC	Changes full length 25+B(BC)≦LC<L 0.1 mm increments When LC−B(or BC) is 25mm or less, B(or BC) is LC−25mm. (Combination with LKC・LKZ→0.01mm increments)	Changes full length 30+B(BC)≦LC<L 0.1 mm increments When LC−B(or BC) is 30mm or less, B(or BC) is LC−30mm.	600
	LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓡ) are the same as LC. TKC (Thickness) $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ + LC (Full length) $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.		1,400
	LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		1,200
	LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ TiCN coating type: Not applicable		1,800
Others 	KC	——	90° 0° 180° 270° Changes the position of key flat. 1° incr.	600
	NKC	——	No key flat.	0
	KD	——	90° 0° 180° 270° Changes the position of key flat. 1° incr.	600
	WKD	Adds double key flats in parallel.	Adds double key flats in parallel. KD: Applicable	1,200
	TKC	Changes dimension T tolerance. $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		1,200
	UK	Changes key groove depth.	D: 4・5 UK: 0.7; 6 1.2; 8~16 1.7 D3: Not applicable	400
	SKC	Adds key flat on shank. D/2 −0.5 −0.01 ·D3~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8~ P≦D−2.2 W≦D−2.2 (Machining width 1)	Ⓐ D R E G KC: Not applicable	1,800

Price

■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	Ⓐ WKTWA A—WKTWA	D WKTWD A—WKTWD	R WKTWR A—WKTWR	E WKTWE A—WKTWE	G WKTWG A—WKTWG
3	4,630	7,830	8,480	8,490	7,660
4	4,760	7,950	8,490	8,630	7,780
5	4,860	8,170	8,690	8,830	7,990
6	5,320	8,800	9,420	9,570	8,580
8	6,490	10,580	11,190	11,410	10,310
10	7,710	12,220	12,830	13,060	11,950
13	9,150	14,590	15,090	15,350	14,230
16	11,370	17,520	18,180	18,450	17,170

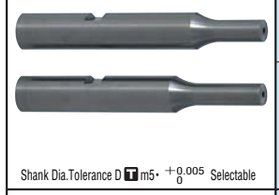
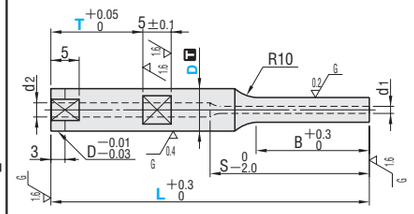
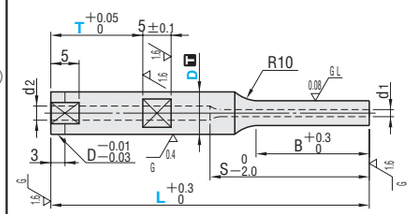
D	Ⓐ WXKTWA A—WXKTWA	D WXKTWD A—WXKTWD	R WXKTWR A—WXKTWR	E WXKTWE A—WXKTWE	G WXKTWG A—WXKTWG
3	8,890	11,820	12,730	12,710	11,570
4	9,010	11,990	12,920	12,900	11,750
5	9,350	12,330	13,070	13,260	12,100
6	10,570	13,170	14,020	14,210	12,860

D	Ⓐ H—WKTWA AH—WKTWA	D H—WKTWD AH—WKTWD	R H—WKTWR AH—WKTWR	E H—WKTWE AH—WKTWE	G H—WKTWG AH—WKTWG
3	6,160	9,360	10,010	10,020	9,190
4	6,320	9,510	10,050	10,190	9,340
5	6,490	9,800	10,320	10,460	9,620
6	7,130	10,610	11,230	11,380	10,390
8	8,490	12,580	13,190	13,410	12,310
10	9,910	14,420	15,030	15,260	14,150
13	11,560	17,000	17,500	17,760	16,640
16	14,010	20,160	20,820	21,090	19,810

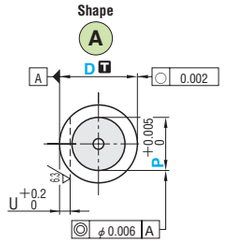
D	Ⓐ H—WXKTWA AH—WXKTWA	D H—WXKTWD AH—WXKTWD	R H—WXKTWR AH—WXKTWR	E H—WXKTWE AH—WXKTWE	G H—WXKTWG AH—WXKTWG
3	10,420	13,350	14,260	14,240	13,100
4	10,570	13,550	14,480	14,460	13,310
5	10,980	13,960	14,700	14,890	13,730
6	12,380	14,980	15,830	16,020	14,670

CARBIDE PUNCHES WITH KEY GROOVE & AIR HOLE

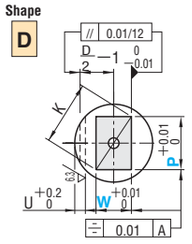
The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length	Select tip shape from Shape A~G shown below.
RoHS  Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	D_{m5}	V30(HIP) 88~89HRA	WJK	A D R E G	S	
		Super corpuscle (HIP) 90~92HRA	WXJK (D4~6)			
	$D^{+0.005}_{0}$	V30(HIP) 88~89HRA	A—WJK			
		Super corpuscle (HIP) 90~92HRA	A—WXJK (D4~6)			
—Lapping type— RoHS Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	D_{m5}	V30(HIP) 88~89HRA	L—WJK		L	 Blade length (B) L>S
		Super corpuscle (HIP) 90~92HRA	L—WXJK (D4~6)			
	$D^{+0.005}_{0}$	V30(HIP) 88~89HRA	AL—WJK			
		Super corpuscle (HIP) 90~92HRA	AL—WXJK (D4~6)			

Shape A



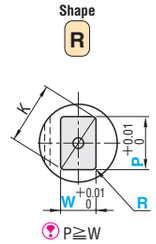
Shape D



P≧W

K=$\sqrt{P^2+W^2}$

Shape R

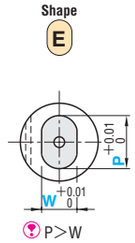


P≧W

0.15≦R<$\frac{W}{2}$

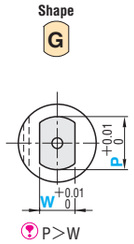
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.001 mm increments Ⓐ min.	P max.	0.01 mm increments DREG P·Kmax.	P·Wmin.	R	0.1mm increments T	B	d_1	S	d_2	U Key groove depth
(D_{m5}) ($D^{+0.005}_{0}$)	A D R E G	S	4	40 50 60	1.500~	3.990	3.97	1.50	R≧$\frac{W}{2}$ (R only)	T≧5.0	8	0.5	20	1.2	0.5
WJK A—WJK			5	40 50 60 70	2.000~	4.990	4.97	2.00				0.8		2.1	
WXJK A—WXJK (D4~6) (D4~6)			6	40 50 60 70	2.000~	5.990	5.97	2.00						2.6	1.0
—Lapping type— L—WJK AL—WJK			8	(40) 50 60 70 80	3.000~	7.990	7.97	3.00			13	1.2	27	3.4	
L—WXJK AL—WXJK (D4~6) (D4~6)			10	(40) 50 60 70 80	3.000~	9.990	9.97	3.00				1.6	28	4.4	1.5
			13	(40) 50 60 70 80	6.000~	12.990	12.97	6.00				1.9			
			16	(40) (50) 60 70 80	10.000~	15.990	15.97	6.00			19	2.9	36		
		L	4	50 60	1.500~	3.990	3.97	2.00			13	0.5	20	1.2	0.5
			5	50 60 70	2.000~	4.990	4.97	2.00				0.8		2.1	
			6	50 60 70	2.000~	5.990	5.97	2.00						2.6	1.0
			8	50 60 70 80	3.000~	7.990	7.97	3.00			19	1.2	27	3.4	
			10	50 60 70 80	3.000~	9.990	9.97	3.00				1.6	28	4.4	1.5
			13	50 60 70 80	6.000~	12.990	12.97	6.00				1.9			
			16	60 70 80	10.000~	15.990	15.97	6.00			25	2.9	36		

When L (40) or (50), the dimension B and S are as follows.

D	L	(40)
8~16		B=8 S=17

D	L	(50)
16		B=13 S=24

When no key groove is required, specify T=L.

Air hole of super corpuscle punch is straight. Dimension S and d2 are not available.

Order

Catalog No. — L — P — W — R(R only) — T

A—WJKEL16 — 70 — P12.00 — W6.00 — T20

When no key groove is required, specify T=L.

Delivery

● Ⓐ: 3 Days — Express A 1,500/1Pc. P.38

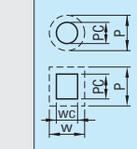
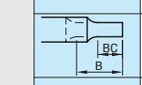
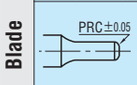
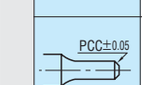
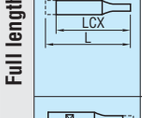
● DREG: 5 Days — Express B 1,500/1Pc. P.38

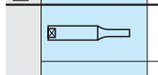
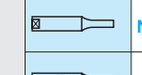
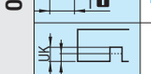
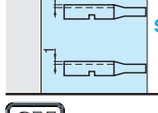
A flat charge of 4,050 yen for 3 pieces or more of the same size.

A flat charge of 4,050 yen for 3 pieces or more of the same size.

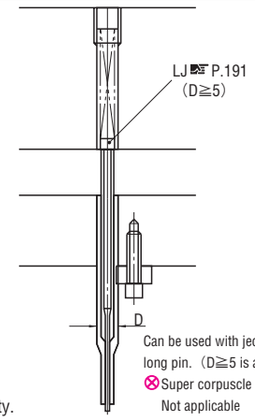
Alterations Catalog No. — L(LC·LCX·LCT) — P(PC) — W(WC) — R — T — (BC · KC · KD···etc.)

A—WJKEL16 — LC65.5 — P12.00 — W6.00 — T20 — PKC

Alterations		Code	Ⓐ	DREG	¥/1Code
Blade		PC WC	Changes dimension P. PC≧PCmin 0.001 mm increments D / PCmin: 5 1.800; 6 1.800; 8 2.300; 10 2.800; 13 5.000; 16 8.000 ⊗D4 : Not applicable.	Changes dimension P・W. PC WC ≧PC・WCmin 0.01 mm increments (Combination with PKC→0.001mm increments) D / PC・WCmin: 5 1.80; 6 1.80; 8 2.50; 10 2.80; 13 5.00; 16 5.00 ⊗D4 : Not applicable.	Ⓐ 1,200 DREG 2,500
		BC	Changes blade length B 2≦BC<B 0.1 mm increments		600
		PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments (R)PRC≦(P−d_1−0.5)/2 ⊗PCC : Not applicable	——	2,000
		PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments (R)PCC≦(P−d_1−0.5)/2 ⊗PRC : Not applicable	——	1,600
		PKC	Changes tolerance on P $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$	Changes tolerance on P・W. (Dimensions P and W : 0.001mm incr.) $P{\cdot}W^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Ⓐ 1,600 DREG 2,300
		PKV	Changes tolerance on P $P^{+0.005}_{0}$ ⇨ ±0.002 (R)Dimension P unit doesn't change.)	Changes tolerance on P・W. $P{\cdot}W^{+0.01}_{0}$ ⇨ ±0.005 (R)Dimension P unit doesn't change.)	0
Full length		LC	Changes full length LC<L 0.1 mm increments (Combination with LKC・LKZ→0.01mm increments) (R) B and S are shortened by its length.		600
		LCX	Changes full length without changing blade length B. 25+B(BC)≦LCX<L 0.1mm increments (R) When LCX−B (or BC) is 25mm or less, B (or BC) is LCX−25mm. (Combination with LKC・LKZ→0.01mm increments)	Changes full length without changing blade length B. 30+B(BC)≦LCX<L 0.1mm increments (R) When LCX−B (or BC) is 30mm or less, B (or BC) is LCX−30mm.	600
		LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (R) are the same as LC. TKC (Thickness) T $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ + LC (Full length) + Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		1,400

Alterations		Code	Ⓐ	DREG	¥/1Code
Full length		LKC	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		1,200
		LKZ	Changes full length tolerance. L $^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		1,800
Others		KC	——	0°, 90°, 180°, 270° Changes the position of key flat. 1° incr.	600
		NKC	——	No key flat.	0
		KD	——	0°, 90°, 180°, 270° Changes the position of key flat. 1° incr.	600
		WKD	Adds double key flats in parallel.	Adds double key flats in parallel. KD : Applicable	1,200
		TKC	Changes dimension T tolerance. T $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		1,200
		UK	Changes key groove depth. (R) Applicable to super corpuscle only.	D / UK: 4・5 0.7; 6 1.2; 8~16 1.7	400
		SKC	Adds key flat on shank. Ⓐ DREG $\frac{D}{2}-0.5^{\ 0}_{-0.01}$ ·D4~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC : Not applicable		1,800

Example



Can be used with jector long pin. (D≧5 is applied.)
⊗Super corpuscle type : Not applicable

Price

Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

(R) To be quoted on price & lead time above Max. Q'ty.

D	Ⓐ	D	R	E	G
	WJKAS WJKAL A—WJKAS A—WJKAL	WJKDS WJKDL A—WJKDS A—WJKDL	WJKRS WJKRL A—WJKRS A—WJKRL	WJKES WJKEL A—WJKES A—WJKEL	WJKGS WJKGL A—WJKGS A—WJKGL
4	4,000	6,230	6,750	6,890	6,050
5	4,150	6,450	6,970	7,110	6,270
6	4,600	6,970	7,460	7,590	6,620
8	5,720	8,120	8,740	8,960	7,860
10	7,120	9,310	9,930	10,150	9,040
13	8,590	10,930	11,420	11,680	10,580
16	10,340	12,560	13,220	13,480	12,210

D	Ⓐ	D	R	E	G
	L—WJKAS L—WJKAL AL—WJKAS AL—WJKAL	L—WJKDS L—WJKDL AL—WJKDS AL—WJKDL	L—WJKRS L—WJKRL AL—WJKRS AL—WJKRL	L—WJKES L—WJKEL AL—WJKES AL—WJKEL	L—WJKGS L—WJKGL AL—WJKGS AL—WJKGL
4	4,760	7,370	7,890	8,030	7,190
5	4,910	7,590	8,110	8,250	7,410
6	5,360	8,110	8,600	8,730	7,760
8	6,480	9,260	9,880	10,100	9,000
10	7,880	10,450	11,070	11,290	10,180
13	9,350	12,070	12,560	12,820	11,720
16	11,100	13,700	14,360	14,620	13,350

D	Ⓐ	D	R	E	G
	WXJKAS WXJKAL A—WXJKAS A—WXJKAL	WXJKDS WXJKDL A—WXJKDS A—WXJKDL	WXJKRS WXJKRL A—WXJKRS A—WXJKRL	WXJKES WXJKEL A—WXJKES A—WXJKEL	WXJKGS WXJKGL A—WXJKGS A—WXJKGL
4	6,610	9,650	10,390	10,570	9,410
5	6,930	9,970	10,700	10,880	9,720
6	7,930	10,760	11,430	11,620	10,270

D	Ⓐ	D	R	E	G
	L—WJKAS L—WJKAL AL—WJKAS AL—WJKAL	L—WJKDS L—WJKDL AL—WJKDS AL—WJKDL	L—WJKRS L—WJKRL AL—WJKRS AL—WJKRL	L—WJKES L—WJKEL AL—WJKES AL—WJKEL	L—WJKGS L—WJKGL AL—WJKGS AL—WJKGL
4	7,370	10,790	11,530	11,710	10,550
5	7,690	11,110	11,840	12,020	10,860
6	8,690	11,900	12,570	12,760	11,410

CARBIDE PUNCHES WITH KEY GROOVE & AIR HOLE
—TiCN COATING TYPE—

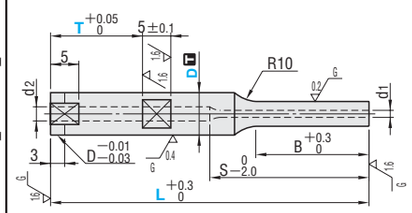
PRODUCTS DATA P.1220

COATING PUNCHES
— TiCN —

The volume discount rate is also applicable to alteration cost. P.39

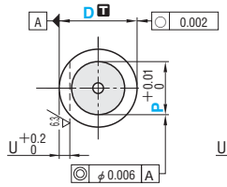
Type	Shank dia. D T	M H	Catalog No. Type	Shape	B Blade length
—TiCN coating type— RoHS Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	Dm5	V30(HIP) 88~89HRA Surface 3000HV	H—WJK	A D R E G	S
		Super corpuscle(HIP) 90~92HRA Surface 3000HV	H—WXJK (D4~6)		L
	$D^{+0.005}_{0}$	V30(HIP) 88~89HRA Surface 3000HV	AH—WJK		Blade length (B) L>S
		Super corpuscle(HIP) 90~92HRA Surface 3000HV	AH—WXJK (D4~6)		

Select tip shape from Shape A~G shown below.

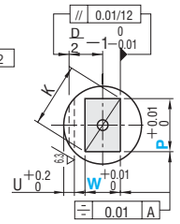


Tip surface is ground before coating.

Shape A



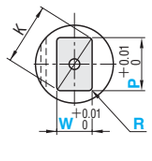
Shape D



P≧W

$K=\sqrt{P^2+W^2}$

Shape R

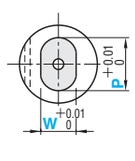


P≧W

$0.15 \leqq R < \frac{W}{2}$

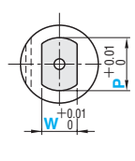
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01 mm increments Ⓐ min.	Ⓐ P max.	DREG P・Kmax.	DREG P・Wmin.	Ⓑ R	0.1mm increments T	B	d1	S	d2	U Key groove depth
(Dm5) H—WJK / H—WXJK (D4~6)	A D R E G	S	4	40 50 60	1.50~	3.99	3.97	1.50	0.15≦R< W/2 (Ⓑ only)	T≧5.0	8	0.5	20	1.2	0.5
			5	40 50 60 70	2.00~	4.99	4.97	2.00				0.8		2.1	
			6	40 50 60 70	2.00~	5.99	5.97	2.00						2.6	1.0
			8	(40) 50 60 70 80	3.00~	7.99	7.97	3.00			13	1.2	28	3.4	1.5
			10	(40) 50 60 70 80	3.00~	9.99	9.97	3.00				1.6		4.4	
			13	(40) 50 60 70 80	6.00~	12.99	12.97	6.00				1.9			
			16	(40) (50) 60 70 80	10.00~	15.99	15.97	6.00			19	2.9	36		
($D^{+0.005}_{0}$) AH—WJK / AH—WXJK (D4~6)		L	4	50 60	1.50~	3.99	3.97	2.00			13	0.5	20	1.2	0.5
			5	50 60 70	2.00~	4.99	4.97	2.00				0.8		2.1	
			6	50 60 70	2.00~	5.99	5.97	2.00						2.6	1.0
			8	50 60 70 80	3.00~	7.99	7.97	3.00			19	1.2	28	3.4	1.5
			10	50 60 70 80	3.00~	9.99	9.97	3.00				1.6		4.4	
			13	50 60 70 80	6.00~	12.99	12.97	6.00				1.9			
			16	60 70 80	10.00~	15.99	15.97	6.00			25	2.9	36		

Combination with PKC→0.001mm incr.

When L (40) or (50), the dimension B and S are as fo llows.

D \ L	(40)
8~16	B=8 S=17

D \ L	(50)
16	B=13 S=24

When no key groove is required, specify T=L.

Air hole of super corpuscle punch is straight.
Dimension S and d2 are not available.

Order

Catalog No. — L — P — W — R(Ⓡ only) — T

H—WJKEL16 — 70 — P12.00 — W6.00 — T20

When no key groove is required, specify T=L.

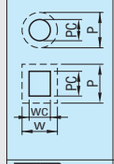
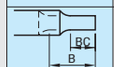
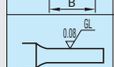
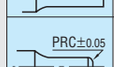
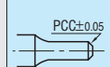
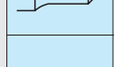
Delivery 8 Days | Express C 1,500/1Pc. P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

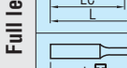
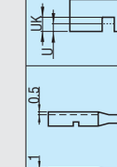
Alteration

Catalog No. — L(LC・LCX・LCT) — P(PC) — W(WC) — R — T — (BC・KC・LKC…etc.)

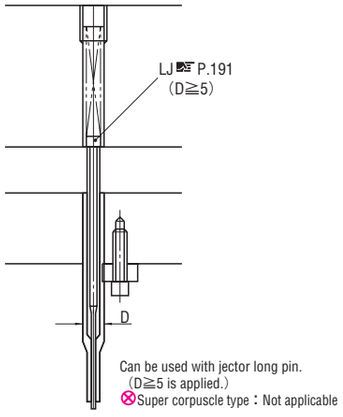
H—WJKEL16 — LC65.5 — P12.00 — W6.00 — T20 — TKC

Alterations	Code	Ⓐ	DREG	¥/1Code
Blade 	PC WC	Changes dimension P. PC≧PCmin 0.01 mm increments (Combination with PKC→ 0.001mm increments) ⊗D4：Not applicable. D / PCmin: 5 1.800; 6 1.800; 8 2.300; 10 2.800; 13 5.000; 16 8.000	Changes dimension P・W. PC WC ≧PC・WCmin 0.01 mm increments. ⊗D4：Not applicable. D / PC・WCmin: 5 1.80; 6 1.80; 8 2.50; 10 2.80; 13 5.00; 16 5.00	Ⓐ 1,200 DREG 2,500
	BC	Changes blade length B 2≦BC<B 0.1 mm increments		600
	SC	Changes tip roughness. 0.2 G ⇨ 0.06 Gl. Ⓡ Surface finished before coating.		Ⓐ 800 GDBE 1,200
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓡ PRC≦(P−d1−0.5)/2 ⊗PCC：Not applicable	——	2,000
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓡ PCC≦(P−d1−0.5)/2 ⊗PRC：Not applicable	——	1,600
	PKC	Changes tolerance on P $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (Dimension P：0.001mm incr.) ⊗D16：Not applicable	——	1,600
	PKV	Changes tolerance on P $P^{+0.01}_{0}$ ⇨ ±0.005 Ⓡ Dimension P unit doesn't change.	——	0
Full length 	LC	Changes full length LC<L 0.1 mm increments (Combination with LKC→0.01mm increments) Ⓡ B and S are shortened by its length.		600
	LCX	Changes full length without changing blade length B. 25+B(BC)≦LCX<L 0.1mm increments Ⓡ When LCX−B (or BC) is 25mm or less, B(or BC) is LCX−25mm.	Changes full length without changing blade length B. 30+B(BC)≦LCX<L 0.1mm increments Ⓡ When LCX−B (or BC) is 30mm or less, B (or BC) is LCX−30mm.	600

(Combination with LKC→0.01mm increments)

Alterations	Code	Ⓐ	DREG	¥/1Code
Full length	LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓡ) are the same as LC. TKC (Thickness) T +0.05 0 ⇨ 0 −0.02 + LC (Full length) L +0.3 0 ⇨ +0.1 0 Changes full length tolerance.		1,400
	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0		1,200
Others	KC	——	90° 0° 180° 270° Changes the position of key flat. 1° incr.	600
	NKC	——	No key flat.	0
	KD	——	90° 0° 180° 270° Changes the position of key flat. 1° incr.	600
	WKD	Adds double key flats in parallel.	Adds double key flats in parallel. KD：Applicable	1,200
	TKC	Changes dimension T tolerance. T +0.05 0 ⇨ 0 −0.02		1,200
	UK	Changes key groove depth. D: 4・5 UK 0.7; 6 1.2; 8~16 1.7. Ⓡ Applicable to super corpuscle only.		400
	SKC	Adds key flat on shank. Ⓐ DREG ・D4~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗KC：Not applicable		1,800

Example



Price

Volume discount rate P.37

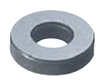
Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

Ⓡ To be quoted on price & lead time above Max. Q'ty.

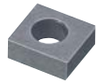
D	Ⓐ	D	Ⓑ	E	G
	H—WJKAS H—WJKAL AH—WJKAS AH—WJKAL	H—WJKDS H—WJKDL AH—WJKDS AH—WJKDL	H—WJKRS H—WJKRL AH—WJKRS AH—WJKRL	H—WJKES H—WJKEL AH—WJKES AH—WJKEL	H—WJKGS H—WJKGL AH—WJKGS AH—WJKGL
4	5,560	7,790	8,310	8,450	7,610
5	5,780	8,080	8,600	8,740	7,900
6	6,410	8,780	9,270	9,400	8,430
8	7,720	10,120	10,740	10,960	9,860
10	9,320	11,510	12,130	12,350	11,240
13	11,000	13,340	13,830	14,090	12,990
16	12,980	15,200	15,860	16,120	14,850

D	Ⓐ	D	Ⓑ	E	G
	H—WXJKAS H—WXJKAL AH—WXJKAS AH—WXJKAL	H—WXJKDS H—WXJKDL AH—WXJKDS AH—WXJKDL	H—WXJKRS H—WXJKRL AH—WXJKRS AH—WXJKRL	H—WXJKES H—WXJKEL AH—WXJKES AH—WXJKEL	H—WXJKGS H—WXJKGL AH—WXJKGS AH—WXJKGL
4	8,170	11,210	11,950	12,130	10,970
5	8,560	11,600	12,330	12,510	11,350
6	9,740	12,570	13,240	13,430	12,080

Keys P.195

PSKB PSKBH 

PSKS PSKJ

PSK PSKP PSKH 

PSKW

CARBIDE PUNCHES WITH KEY GROOVE & AIR HOLE
—WITH NEGATIVE SHANK TOLERANCE—

PRODUCTS DATA P.1220

COATING PUNCHES
— TiCN —

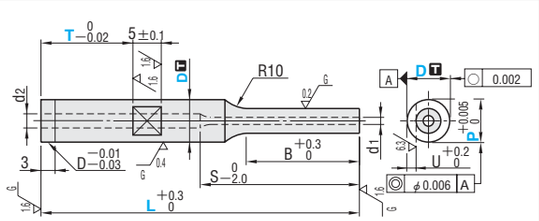
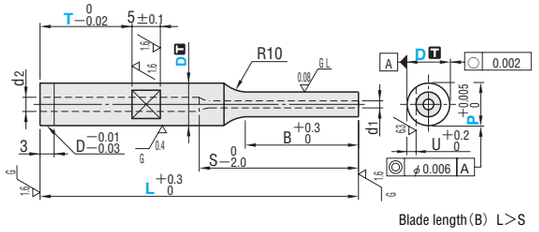
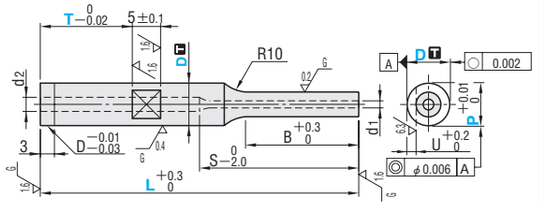
The volume discount rate is also applicable to alteration cost. P.39

Order Catalog No. — L — P — T
B—WJKAL16 — 70 — P12.000 — T20
When no key groove is required, specify T=L.

Delivery 3 Days | Express A | 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size.

● TiCN coating type
8 Days | Express C | 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC・LCX) — P(PC) — T — (BC・WKD…etc.)
B—WJKAL16 — LC65.5 — P12.000 — T20 — PKC

Type	Shank dia. D T	M H	Catalog No.	Shape
RoHS	D −0.001 −0.006	V30(HIP) 88～89HRA	B—WJKAS B—WJKAL	 Blade length(B) L>S
		Super corpuscle (HIP) 90～92HRA	B—WXJKAS B—WXJKAL (D4～6)	
—Lapping type— RoHS	D −0.001 −0.006	V30(HIP) 88～89HRA	BL—WJKAS BL—WJKAL	 Blade length(B) L>S
		Super corpuscle (HIP) 90～92HRA	BL—WXJKAS BL—WXJKAL (D4～6)	
—TiCN coating type— RoHS	D −0.001 −0.006	V30(HIP) 88～89HRA Surface 3000HV	BH—WJKAS BH—WJKAL	 Tip surface is ground before coating. Blade length(B) L>S
		Super corpuscle (HIP) 90～92HRA Surface 3000HV	BH—WXJKAS BH—WXJKAL (D4～6)	

Catalog No. Type	Shape	B Blade length	D	L	0.001 mm increments Ⓐ min. P max.	0.1mm increments T	B	d1	S	d2	U Key groove depth
B—WJK B—WXJK (D4～6) —Lapping type— BL—WJK BL—WXJK (D4～6) —TiCN coating type— BH—WJK BH—WXJK (D4～6)	Ⓐ	S	4	40 50 60	1.500～ 3.990	T≧5.0	8	0.5	20	1.2	0.5
			5	40 50 60 70	2.000～ 4.990			0.8		2.1	
			6	40 50 60 70	2.000～ 5.990					2.6	1.0
			8	(40) 50 60 70 80	3.000～ 7.990		13	1.2	27	3.4	1.5
			10	(40) 50 60 70 80	3.000～ 9.990			1.6	28	4.4	
			13	(40) 50 60 70 80	6.000～12.990			1.9			
			16	(40) (50) 60 70 80	10.000～15.990		19	2.9	36		
		L	4	50 60	1.500～ 3.990		13	0.5	20	1.2	0.5
			5	50 60 70	2.000～ 4.990			0.8		2.1	
			6	50 60 70	2.000～ 5.990					2.6	1.0
			8	50 60 70 80	3.000～ 7.990		19	1.2	27	3.4	1.5
			10	50 60 70 80	3.000～ 9.990			1.6	28	4.4	
			13	50 60 70 80	6.000～12.990			1.9			
			16	60 70 80	10.000～15.990		25	2.9	36		

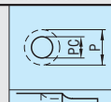
The specifying unit of the P dimension for the TiCN-coated type is 0.01 mm. (Combination with PKC→0.001mm incr.)
When L (40) or (50), the dimension B and S are as follows.

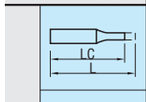
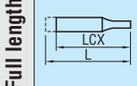
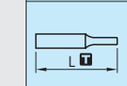
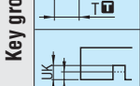
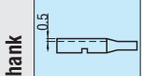
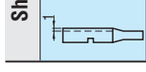
D \ L	(40)
8～16	B=8 S=17

D \ L	(50)
16	B=13 S=24

When no key groove is required, specify T=L.

Air hole of super corpuscle punch is straight. Dimension S and d2 are not available.

Alterations	Code	Spec.	¥/1Code
Blade 	PC	Changes dimension P. PC≧PCmin 0.001 mm increments ⊗D4：Not applicable	1,200
	BC	Changes blade length B 2≦BC<B 0.1 mm increments	600
	SC	Changes tip roughness. 0.2 G ⇨ 0.08 G1 Ⓨ Applicable for coating type only. Ⓨ Surface finished before coating.	800
	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−d1−0.5)/2 ⊗PCC：Not applicable	2,000
	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−d1−0.5)/2 ⊗PRC：Not applicable	1,600
	PKC	Changes tolerance on P Standard / Lapping type P +0.005 0 ⇨ +0.003 0 TiCN coating type P +0.01 0 ⇨ +0.005 0	1,600
	PKV	Changes tolerance on P (Ⓨ Dimension P unit doesn't change.) Standard / Lapping type P +0.005 0 ⇨ ±0.002 TiCN coating type P +0.01 0 ⇨ ±0.005	0

Alterations	Code	Spec.	¥/1Code
Full length 	LC	Changes full length LC<L 0.1 mm increments (Combination with LKC・LKZ→0.01mm increments) Ⓨ B and S are shortened by its length.	600
	LCX	Changes full length without changing blade length B. 25+B(BC)≦LCX<L 0.1mm increments Ⓨ When LCX−B (or BC) is 25mm or less, B (or BC) is LCX−25mm. (Combination with LKC・LKZ→0.01mm increments)	600
	LKC	Changes full length tolerance. L +0.3 0 ⇨ +0.05 0	1,200
	LKZ	Changes full length tolerance. L +0.3 0 ⇨ +0.01 0 ⊗Not applicable to the TiCN coating type.	1,800
Key groove	WKD	Adds double key flats in parallel.	1,200
	RTC	Changes dimension T tolerance. T 0 −0.02 ⇨ +0.05 0	0
	UK	Changes key groove depth. D: 4・5 UK: 0.7; 6 1.2; 8～16 1.7 Ⓨ Applicable to super corpuscle only.	400
Shank 	SKC	Adds key flat on shank. Ⓐ D/2 −0.5 0 −0.01 ・D4～6 P≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 (Machining width 1) D/2 −1 0 −0.01	1,800

Price

Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

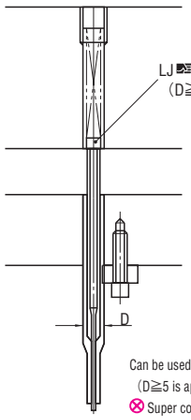
■V30 (HIP)

D	Ⓐ B—WJKAS B—WJKAL	BL—WJKAS BL—WJKAL	BH—WJKAS BH—WJKAL
4	4,000	4,760	5,570
5	4,150	4,910	5,780
6	4,600	5,360	6,410
8	5,720	6,480	7,720
10	7,120	7,880	9,320
13	8,590	9,350	11,000
16	10,340	11,100	12,980

■Super corpuscle (HIP)

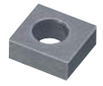
D	Ⓐ B—WXJKAS B—WXJKAL	BL—WXJKAS BL—WXJKAL	BH—WXJKAS BH—WXJKAL
4	6,610	7,370	8,180
5	6,930	7,690	8,560
6	7,930	8,690	9,740

Example



Can be used with jector long pin. (D≧5 is applied.)
⊗ Super corpuscle type：Not applicable

■Keys P.195

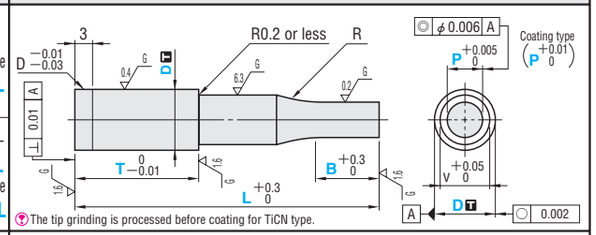
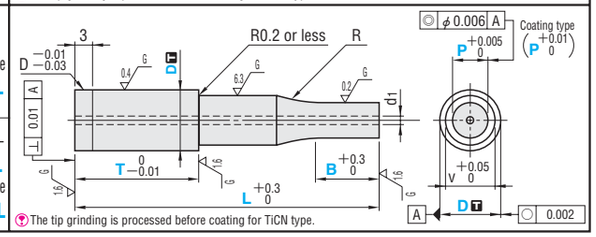
PSKB PSKBH
PSKS PSKJ
PSK PSKP PSKH 
PSKW

CARBIDE ROUND PUNCHES
—STANDARD TYPE / TiCN COATING TYPE—

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No.	Shape
RoHS	$D^{+0.005}_{0}$ / $D^{-0.001}_{-0.006}$	Super corpuscle (HIP) 90~92HRA	WXPHAL TiCN coating type H—WXPHAL —NEGATIVE SHANK TOLERANCE— B—WXPHAL TiCN coating type BH—WXPHAL	
—With air hole type— RoHS	$D^{+0.005}_{0}$ / $D^{-0.001}_{-0.006}$		WXJHAL TiCN coating type H—WXJHAL —NEGATIVE SHANK TOLERANCE— B—WXJHAL TiCN coating type BH—WXJHAL	

Catalog No. Type	D	L	0.001mm increments Ⓐ min. P max.	T	1mm increments B	V	d1	R	U/Price Q'ty：1~4 WXPHAL B—WXPHAL	H—WXPHAL BH—WXPHAL	WXJHAL B—WXJHAL	H—WXJHAL BH—WXJHAL
WXPHAL B—WXPHAL —TiCN coating type— H—WXPHAL BH—WXPHAL	4	40 50	0.500 (1.00) ~ 2.000	13 16 20 / 13 16 20 25	2~ 6 / 2~ 6	2	—	2~3	4,350	5,910	—	—
	5	40 50 60	1.000 ~ 3.000	13 16 20 / 13 16 20 25	2~ 8 / 2~ 8	3		10	4,030	5,660	—	—
	6	40 50 60 70	1.500 ~ 4.000	13 16 20 / 13 16 20 25	2~10 / 2~13	4			4,130	5,940	—	—
	8	40 50 60 70	2.000 ~ 6.000	13 16 20 / 13 16 20 25	2~10 / 2~13	6			4,770	6,710	—	—
—With air hole type— WXJHAL B—WXJHAL —TiCN coating type— H—WXJHAL BH—WXJHAL	5	40 50 60	1.000 ~ 3.000	13 16 20 / 13 16 20 25	2~ 8 / 2~ 8	3	0.4	10	—	—	5,980	7,610
	6	40 50 60 70	1.500 ~ 4.000	13 16 20 / 13 16 20 25	2~10 / 2~13	4	0.5		—	—	4,660	6,470
	8	40 50 60 70	2.000 ~ 6.000	13 16 20 / 13 16 20 25	2~10 / 2~13	6	0.8		—	—	5,400	7,400

Ⓟ (1.00) •••▸ TiCN coated punch is P min 1.00 Ⓓ Dimension P of TiCN coated punch •••▸ 0.001mm increments.

Order Catalog No. — L — P — T — B
WXPHAL 4 — 40 — P0.560 — T16 — B3
B—WXPHAL 5 — 60 — P3.000 — T20 — B5

Delivery 3 Days

● TiCN coating type
8 Days | Express C 1,500/1Pc. P.38
Ⓐ A flat charge of 4,050 yen for 3 pieces or more of the same size.

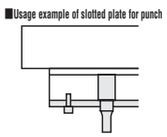
Price

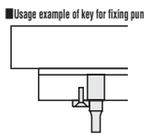
■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

Ⓠ To be quoted on price & lead time above Max. Q'ty.

Example

■Usage example of slotted plate for punch 

■Usage example of key for fixing punch 

Alteration Catalog No. — L(LC) — P — T(TC) — B — (LKC・SC…etc.)
B-WXPHAL 5 — 60 — P3.000 — TC15.0 — B5

Alterations	Code	Spec.	¥/1Code
Blade PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−0.2)/2 ⊗ PCC・GC：Not applicable Ⓟ With air hole type：PRC≦(P−d1−0.5)/2	2,000
Blade PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−0.2)/2 ⊗ PRC・GC：Not applicable Ⓟ With air hole type：PCC≦(P−d1−0.5)/2	1,600
Blade GC, f, L, B	GC	20°≦GC<90° 1° increments Blade length B ≧ f+2 f=P/2×tan(90°−GC°) Ⓟ When combined with SC, tip and edge are rounded. ⊗ P≦1.000：Not applicable ⊗ LKC・LKZ・PRC・PCC：Not applicable	1,200
0.08 GL	SC	Changes tip roughness. 0.2 G ⇨ 0.08 GL Ⓟ Coating is applied to uncoated base material.	800

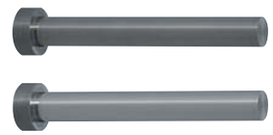
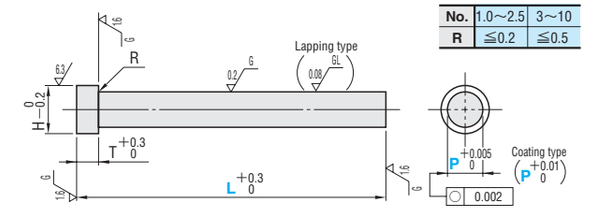
Alterations	Code	Spec.	¥/1Code
Blade P, W	PKC	Changes tolerance on P Standard type $P^{+0.005}_{0}$ ⇨ $P^{+0.003}_{0}$ TiCN coating type $P^{+0.01}_{0}$ ⇨ $P^{+0.005}_{0}$	1,600
	PKV	Changes tolerance on P (Ⓟ Dimension P unit doesn't change.) Standard type $P^{+0.005}_{0}$ ⇨ ±0.002 TiCN coating type $P^{+0.01}_{0}$ ⇨ ±0.005	0
Full length LC, L	LC	Changes full length 40<LC<L 0.1mm increments (Combination with LKC・LKZ→0.01mm increments) Ⓟ When LC<50, T and TC are 20 or less. Ⓟ When LC<50 and D=6 or 8, specified range of B is 2~10.	600
Full length LKT, L	LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	1,600
	LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ TiCN coating type：Not applicable	1,800
Head TC, T	TC	Changes dimension T. 13<TC<25 0.1mm increments Ⓟ When L<50, specified range is 13<TC<20 Ⓟ The total length L remains the same.	600

CARBIDE STRAIGHT PUNCHES
—STANDARD TYPE / TiCN COATING TYPE—

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	Shape
RoHS 	V30(HIP) 88~89HRA	WPC Lapping type L—WPC TiCN coating type H—WPC (No.1.6~10)	
	Super corpuscle (HIP) 90~92HRA	(No.1.6~6) WXPC Lapping type L—WXPC TiCN coating type H—WXPC	

No.	1.0~2.5	3~10
R	≦0.2	≦0.5

Catalog No. Type	No.	L	0.001mm increments Ⓐ min. P max.	H	T	U/Price Q'ty：1~4 WPC	L—WPC	H—WPC	WXPC	L—WXPC	H—WXPC
WPC WXPC (No.1.6~6) —Lapping type— L—WPC L—WXPC (No.1.6~6) —TiCN coating type— H—WPC (No.1.6~10) H—WXPC (No.1.6~6)	1.0	20 25 30	0.500 ~ 1.000	2.0	3	7,050	7,810	—	—	—	—
	1.6	20 25 30 35	1.000 ~ 1.600	2.6		5,280	6,040	6,770	7,680	8,440	9,170
	2.0	20 25 30 35 40 50	1.600 ~ 2.000	3.0		5,280	6,040	6,770	7,680	8,440	9,170
	2.5	20 25 30 35 40 50 60	2.000 ~ 2.500	3.5		3,090	3,850	4,580	4,770	5,530	6,260
	3	40 50 60	2.000 ~ 3.000	5	5	3,180	3,940	4,710	4,900	5,660	6,430
	4	40 50 60 70	3.000 ~ 4.000	7		3,490	4,250	5,050	5,270	6,030	6,830
	5	40 50 60 70	4.000 ~ 5.000	8		3,640	4,400	5,270	5,460	6,220	7,090
	6	40 50 60 70	5.000 ~ 6.000	9		3,840	4,600	5,650	5,720	6,480	7,530
	8	40 50 60 70 80	6.000 ~ 8.000	11		4,640	5,400	6,640	—	—	—
	10	40 50 60 70 80	8.000 ~10.000	13		5,330	6,090	7,530	—	—	—

Ⓟ Dimension P of TiCN coated punch •••▸ 0.01mm increments. (Combination with PKC→0.001mm incr.)

Order Catalog No. — L — P
WPC 2.5 — 40 — P2.050

Price

■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

Ⓠ To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC・LCT・LMT) — P — (HC・TC…etc.)
WPC 2.5 — 40 — P2.050 — PKC

Delivery 3 Days | Express A 1,500/1Pc. P.38
Ⓐ A flat charge of 4,050 yen for 3 pieces or more of the same size.

● TiCN coating type
8 Days | Express C 1,500/1Pc. P.38
Ⓐ A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alterations	Code	Spec.	¥/1Code
Blade PRC±0.05	PRC	Adds Radius to blade tip. 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−0.2)/2 ⊗ PCC・GC：Not applicable	2,000
Blade PCC±0.05	PCC	Adds Chamfering to blade tip. 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−0.2)/2 ⊗ PRC・GC：Not applicable	1,600
Blade GC, f, L	GC	20°≦GC<90° 1° increments f=P/2×tan(90°−GC°) Ⓟ The edge of lapping type is rounded. ⊗ P≦1.000：Not applicable ⊗ LKC・LKZ・LCT・LMT・PRC・PCC：Not applicable	1,200
Blade P	PKC	Changes tolerance on P Standard / Lapping type $P^{+0.005}_{0}$ ⇨ $P^{+0.003}_{0}$ TiCN coating type $P^{+0.01}_{0}$ ⇨ $P^{+0.005}_{0}$	1,600
	PKV	Changes tolerance on P (Ⓟ Dimension P unit doesn't change.) Standard / Lapping type $P^{+0.005}_{0}$ ⇨ ±0.002 TiCN coating type $P^{+0.01}_{0}$ ⇨ ±0.005	0
Full length LC, L	LC	Changes full length 20≦LC<L 0.1mm increments (Combination with LKC・LKZ→0.01mm increments)	600
Full length TT, LC, L	LCT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓟ) are the same as LC. TKC (Thickness) $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC (Full length) $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.	1,400
	LMT	Changes head thickness tolerance and full length in 1 code. Specifiable range, unit, and remarks (Ⓟ) are the same as LC. TKM (Thickness) $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC (Full length) $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Changes full length tolerance.	

Alterations	Code	Spec.	¥/1Code
Full length L T	LKC	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ ⊗ No.1.0：Not applicable	1,200
	LKZ	Changes full length tolerance. $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ TiCN coating type：Not applicable ⊗ No.1.0：Not applicable	1,800
Head	KC	Adds single key flat at head. ⊗ No.1.0~2.5：Not applicable ⊗ KFC：Not applicable	600
Head	WKC	Adds double key flats in parallel. ⊗ No.1.0~2.5：Not applicable ⊗ KFC：Not applicable	1,200
Head	KFC	Adds 1 key flat at 0° and the other on another angle. 1° increments ⊗ KC・WKC：Not applicable	1,200
Head H HC	HC	Changes head diameter. P≦HC<H 0.1mm increments ⊗ No.1.0：Not applicable Ⓟ TiCN coating type：2.6≦HC<H	600
Head TC, T	TC	Changes head thickness 2≦TC<T 0.1mm increments (Combination with TKC・TKM・LCT・LMT→0.01mm increments) Ⓟ L is shortened by (T−TC). When LC・LCT・LMT, L=LC. Ⓟ TiCN coating type：4≦TC<T ⊗ No.1.0：Not applicable	600
Head T T	TKC	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗ No.1.0：Not applicable	1,200
	TKM	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗ No.1.0：Not applicable	1,200
Head TCC	TCC	Adds chamfering to head. Strengthen the punch head. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓟ H≦5：TCC 0.5 ⊗ No.1.0：Not applicable	600

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

CARBIDE PILOT PUNCHES

CARBIDE PILOT PUNCHES

Name	CARBIDE PILOT PUNCHES			CARBIDE PILOT PUNCHES WITH KEY GROOVE	
	—Normal type—	—Lapping type—	—TiCN coating type—	—Normal type—	—Negative D tolerance—
Catalog No.	③	③	⑧Ⓒ	③	③
Delivery					
Page	493	493	495	497	499

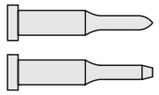
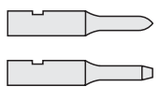
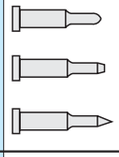
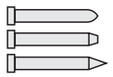
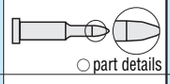
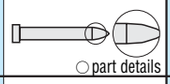
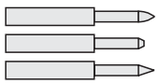
CARBIDE STRAIGHT PILOT PUNCHES			CARBIDE STRAIGHT PILOT PUNCHES WITH KEY GROOVE	CARBIDE PILOT PUNCHES—Fixed in stripper plate—		
—Normal type—	—Lapping type—	—TiCN coating type—	—Normal type—	—Normal type—	—Lapping type—	—TiCN coating type—
③	③	⑧Ⓒ	③	③	③	⑧Ⓒ
501	501	501	502	503	503	504

CARBIDE STRAIGHT PILOT PUNCHES—Fixed in stripper plate—			CARBIDE PILOT PUNCHES—Tip R&Tapered combined type·Negative head tolerance—		
—Normal type—	—Lapping type—	—TiCN coating type—	—Normal type—	—Lapping type—	—TiCN coating type—
③	③	⑧Ⓒ	③	③	⑧Ⓒ
505	505	506	507	507	507

CARBIDE STRAIGHT PILOT PUNCHES—Tip R&Tapered combined type·Negative head thickness tolerance—			CARBIDE PILOT PUNCHES—Movable type—		
—Normal type—	—Lapping type—	—TiCN coating type—	—Normal type—	—Lapping type—	—TiCN coating type—
③	③	⑧Ⓒ	③	③	⑧Ⓒ
508	508	508	509	509	509

CARBIDE PILOT PUNCHES LIST

Printed in red：New product and added spec.

Type		Material	Tip	Shank diameter tolerance	Standard		Lapping type		TiCN coating type	
Carbide Standard		V30(HIP)	R	D_{m5}	WSTA□	P.493	L—WSTA□	P.493	H—WSTA□	P.495
				$D^{+0.005}_{0}$	A—WSTA□		AL—WSTA□		AH—WSTA□	
			Taper	D_{m5}	WTPA□		L—WTPA□		H—WTPA□	
				$D^{+0.005}_{0}$	A—WTPA□		AL—WTPA□		AH—WTPA□	
Carbide with key groove		V30(HIP)	R	D_{m5}	WKSTA□	P.497	Alteration SC	P.498 P.500		
				$D^{+0.005}_{0}$	A—WKSTA□					
				$D^{-0.001}_{-0.006}$	B—WKSTA□	P.499				
			Taper	D_{m5}	WKTPA□	P.497				
				$D^{+0.005}_{0}$	A—WKTPA□					
				$D^{-0.001}_{-0.006}$	B—WKTPA□	P.499				
Carbide Straight		V30(HIP)	R	—	WSTC	P.501	L—WSTC	P.501	H—WSTC	P.501
			Taper	—	WTTC		L—WTTC		H—WTTC	
Carbide with key groove Straight		V30(HIP)	R	—	WKSTC	P.502	Alteration SC	P.502		
			Taper	—	WKTTC					
Carbide Fixed in stripper plate		V30(HIP)	R	D_{m5}	WSPTP	P.503	L—WSPTP	P.503	H—WSPTP	P.504
				$D^{+0.005}_{0}$	A—WSPTP		AL—WSPTP		AH—WSPTP	
			Taper	D_{m5}	WTPTP		L—WTPTP		H—WTPTP	
				$D^{+0.005}_{0}$	A—WTPTP		AL—WTPTP		AH—WTPTP	
			Acute -angled tip	D_{m5}	WAPTP		L—WAPTP		H—WAPTP	
				$D^{+0.005}_{0}$	A—WAPTP		AL—WAPTP		AH—WAPTP	
Carbide Fixed in stripper plate Straight		V30(HIP)	R	—	WSPT	P.505	L—WSPT	P.505	H—WSPT	P.506
			Taper	—	WTPT		L—WTPT		H—WTPT	
			Acute -angled tip	—	WAPT		L—WAPT		H—WAPT	
Carbide Fixed in stripper plate	 ○ part details	V30(HIP)	R & Taper	D_{m5}	WSPTPF	P.507	L—WSPTPF	P.507	H—WSPTPF	P.507
Carbide Fixed in stripper plate Straight	 ○ part details	V30(HIP)	R & Taper	—	WSPTF	P.508	L—WSPTF	P.508	H—WSPTF	P.508
Carbide Movable		V30(HIP)	R	D_{g6}	WSUPT	P.509	L—WSUPT	P.509	H—WSUPT	P.509
				$D^{-0.005}_{-0.010}$	A—WSUPT		AL—WSUPT		AH—WSUPT	
			Taper	D_{g6}	WTUPT		L—WTUPT		H—WTUPT	
				$D^{-0.005}_{-0.010}$	A—WTUPT		AL—WTUPT		AH—WTUPT	
			Acute -angled tip	D_{g6}	WUPT		L—WUPT		H—WUPT	
				$D^{-0.005}_{-0.010}$	A—WUPT		AL—WUPT		AH—WUPT	

■Shank diameter tolerance Dm5

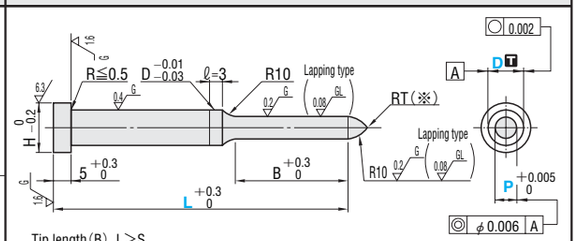
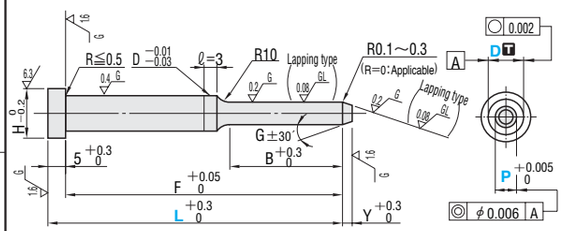
D	Tolerance（Unit:mm）
1.6	+0.006 +0.002
2.0	
2.5	
3	
4	+0.009 +0.004
5	
6	
8	+0.012 +0.006
10	
13	+0.015 +0.007
16	

■Shank diameter tolerance Dg6

D	Tolerance（Unit:mm）
1.6	−0.002 −0.008
2.0	
2.5	
3	
4	−0.004 −0.012
5	
6	
8	−0.005 −0.014
10	
13	−0.006 −0.017
16	

CARBIDE PILOT PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No.	View
—Tip R— RoHS —Tip R, Lapping— Shank Dia.Tolerance D T m5・ $^{+0.005}_{0}$ Selectable	Dm5 $D^{+0.005}_{0}$	V30 (HIP) 88~89HRA	WSTAS WSTAL Lapping type L—WSTAS L—WSTAL A—WSTAS A—WSTAL Lapping type AL—WSTAS AL—WSTAL	 Tip length(B) L>S RT(※) ···▸ The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208) Refer to the product data "R length of Punch" for the length of tip R. P.1208 ⊗ Lapping type RT=0 not applicable.
—Tip tapered— RoHS —Tip tapered・Lapping— Shank Dia.Tolerance D T m5・ $^{+0.005}_{0}$ Selectable	Dm5 $D^{+0.005}_{0}$	V30(HIP) 88~89HRA	WTPAS WTPAL Lapping type L—WTPAS L—WTPAL A—WTPAS A—WTPAL Lapping type AL—WTPAS AL—WTPAL	 Tip length(B) L>S ⊗ Lapping type R=0 not applicable. P / G: 1.000~1.999 / 10°; 2.000~ / 15°

Catalog No. Type	D	L					0.001mm increments min. P max.	B	H	Y
S (Dm5) ($D^{+0.005}_{0}$) WSTAS A—WSTAS WTPAS A—WTPAS —Lapping— L—WSTAS AL—WSTAS L—WTPAS AL—WTPAS	3	42	52	62			1.000 ~ 2.990	10	5	2
	4	42	52	62	72		1.000 ~ 3.990		7	
	5	42	52	62	72		2.000 ~ 4.990		8	3
	6	42	52	62	72		2.000 ~ 5.990		9	
	8	(42)	52	62	72	82	3.000 ~ 7.990	15	11	5
	10	(42)	52	62	72	82	3.000 ~ 9.990		13	
	13	(42)	52	62	72	82	6.000 ~ 12.990		16	8
	16	(42)	52	62	72	82	10.000 ~ 15.990	21	19	
L (Dm5) ($D^{+0.005}_{0}$) WSTAL A—WSTAL WTPAL A—WTPAL —Lapping— L—WSTAL AL—WSTAL L—WTPAL AL—WTPAL	3		52	62			1.000 ~ 2.990	15	5	2
	4		52	62	72		1.000 ~ 3.990		7	
	5		52	62	72		2.000 ~ 4.990		8	3
	6		52	62	72		2.000 ~ 5.990		9	
	8		52	62	72	82	3.000 ~ 7.990	21	11	5
	10		52	62	72	82	3.000 ~ 9.990		13	
	13		52	62	72	82	6.000 ~ 12.990		16	8
	16			62	72	82	10.000 ~ 15.990	27	19	

L(42) ···▸ B=10 When L(42), tip length B is fixed to 10mm.
P>D−0.03 ···▸ ℓ=0 When P>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.

Order

Catalog No.	L	P	(RT=0 / R=0)
WSTAL 6	62	P4.500	RT0
WTPAS 6	52	P3.850	

Only RT=0 can be specified : Applicable to tip R type of P<8 (Except lapping type).
Only R=0 can be specified : Applicable to tip tapered type (Except lapping type).

Delivery 3 Days

Alteration Catalog No. — L(LC·LCT·LMT) — P(PC) — (RT=0 / R=0) — (BC · HC · TC···etc.)

WSTAL 6 — LC65.0 — P4.500 — PKC

Alterations	Code			¥/1Code
Tip	RLC	Cuts tip R flat. Specification range 2≦RLC<$\sqrt{P(10-P/4)}$ 0.1mm increments. Applicable to P<8	——	600
	PC	Changes tip diameter P. PC≧Pmin./2 0.001mm increments. P: 0.500~0.999 Bmax. 6; 1.000~1.999 15; 2.000~2.999 21; 3.000~3.999 32; 4.000~5.999 42; 6.000~ 47	Changes tip diameter P. PC≧Pmin./2≧1.000 0.001mm increments. P: 1.000~1.499 15; 1.500~1.999 15; 2.000~2.499 21; 2.500~2.999 21; 3.000~3.499 32; 3.500~3.999 32; 4.000~4.999 42; 5.000~5.999 42; 6.000~ 47	1,200
	BC	Changes tip length B. 2≦BC≦Bmax. L requires BC+25mm or more.	0.1mm increments	600
	YC	——	Changes tip taper length Y. ・For P<2.0, 1≦YC≦P×2.83−0.3 ・For P≧2.0, 1≦YC≦P×1.86−0.3≦12 L(LC)+YC≦Lmax+8 0.1mm increments	600
	PKC	Changes tolerance on P. $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$		1,600
	PKV	Changes tolerance on P. $P^{+0.005}_{0}$ ⇨ ±0.002		0

Alterations	Code		¥/1Code
Full length	LC	Changes the full length L 25+B(BC)≦LC<L 0.1mm increments. When LC—B(or BC) is 25mm or less, B(BC) is LC—25mm.	600
	LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKC (Thickness) + LC (Length) T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	1,400
	LMT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKM (Thickness) + LC (Length) T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	
Head	KC	Adds single key flat.	600
	WKC	Adds double key flats in parallel.	1,200
	HC	Changes head diameter. D≦HC<H 0.1mm increments	600
	TC	Changes dimension T (head thickness). 2≦TC<5 0.1mm incr. (Comb. with TKC・TKM・LCT・LMT →0.01mm incr.) L is shortened by(5—TC). When LC, LCT, or LMT is combined, the full length remains as specified.	600
	TKC	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	1,200
	TKM	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	1,200
Shank	NDC	No press -in lead ℓ=3 ⇨ ℓ=0		0

Price

Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

—Tip R type—

Catalog No. Type	D	U/Price Q'ty : 1~4
WSTAS WSTAL	3	3,950
	4	4,000
	5	4,150
	6	4,520
A—WSTAS A—WSTAL	8	5,560
	10	6,690
	13	7,800
	16	9,860

Catalog No. Type	D	U/Price Q'ty : 1~4
L—WSTAS L—WSTAL	3	5,090
	4	5,140
	5	5,290
	6	5,660
AL—WSTAS AL—WSTAL	8	6,700
	10	7,830
	13	8,940
	16	11,000

—Tip tapered type—

Catalog No. Type	D	U/Price Q'ty : 1~4
WTPAS WTPAL	3	3,730
	4	3,780
	5	3,930
	6	4,300
A—WTPAS A—WTPAL	8	5,340
	10	6,360
	13	7,590
	16	9,640

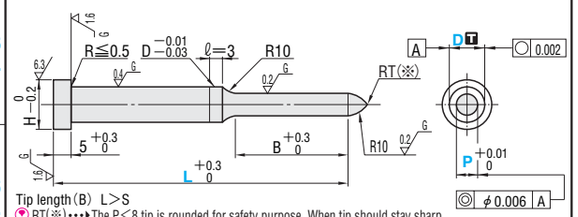
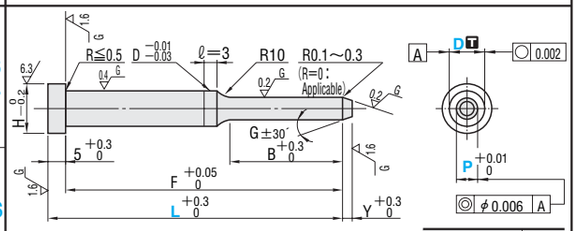
Catalog No. Type	D	U/Price Q'ty : 1~4
L—WTPAS L—WTPAL	3	4,870
	4	4,920
	5	5,070
	6	5,440
AL—WTPAS AL—WTPAL	8	6,480
	10	7,500
	13	8,730
	16	10,780

CARBIDE PILOT PUNCHES
—TiCN COATING—

PRODUCTS DATA P.1220

COATING PUNCHES
— TiCN —

¥ The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No.	View
—Tip R— RoHS Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	D_{m5}	V30(HIP) 88~89HRA Surface 3000HV	H—WSTAS H—WSTAL	 Tip length(B) L>S RT(※)•••▸The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208) Refer to the product data "R length of Punch" for the length of tip R. P.1208
	$D^{+0.005}_{0}$		AH—WSTAS AH—WSTAL	
—Tip tapered— RoHS Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	D_{m5}	V30(HIP) 88~89HRA Surface 3000HV	H—WTPAS H—WTPAL	 Tip length(B) L>S P 1.00~1.99: G 10°; P 2.00~: G 15°
	$D^{+0.005}_{0}$		AH—WTPAS AH—WTPAL	

Catalog No. Type	D	L	0.01mm increments min. P max.	B	H	Y
(D_{m5}) ($D^{+0.005}_{0}$) H—WSTAS AH—WSTAS H—WTPAS AH—WTPAS	3	42 52 62	1.00 ~ 2.99	10	5	2
	4	42 52 62 72	1.00 ~ 3.99		7	
	5	42 52 62 72	2.00 ~ 4.99		8	3
	6	42 52 62 72	2.00 ~ 5.99		9	
	8	(42) 52 62 72 82	3.00 ~ 7.99	15	11	5
	10	(42) 52 62 72 82	3.00 ~ 9.99		13	
	13	(42) 52 62 72 82	6.00 ~ 12.99		16	8
	16	(42) 52 62 72 82	10.00 ~ 15.99	21	19	
(D_{m5}) ($D^{+0.005}_{0}$) H—WSTAL AH—WSTAL H—WTPAL AH—WTPAL	3	52 62	1.00 ~ 2.99	15	5	2
	4	52 62 72	1.00 ~ 3.99		7	
	5	52 62 72	2.00 ~ 4.99		8	3
	6	52 62 72	2.00 ~ 5.99		9	
	8	52 62 72 82	3.00 ~ 7.99	21	11	5
	10	52 62 72 82	3.00 ~ 9.99		13	
	13	52 62 72 82	6.00 ~ 12.99		16	8
	16	62 72 82	10.00 ~ 15.99	27	19	

(Dm5) (D +0.005 0)

H—WSTAS AH—WSTAS

H—WTPAS AH—WTPAS

H—WSTAL AH—WSTAL

H—WTPAL AH—WTPAL

L(42) •••▸B=10 When L(42), tip length B is fixed to 10mm.
P>D−0.03•••▸When ℓ=0, P>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not available.
Combination with PKC→0.001mm increments

Order

Catalog No.	L	P	(RT=0 R=0)
H—WSTAS 5	42	P2.50	
H—WSTAL 8	62	P4.50	RT0
AH—WTPAS 10	72	P4.20	R0

Only RT=0 can be specified : Applicable to tip R type of P<8 (Except lapping type).
Only R=0 can be specified, Applicable to tip tapered type (Except lapping type).

Delivery 8 Days | Express C 1,500/1Pc. P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration — Catalog No. — L(LC·LCT·LMT) — P(PC) — (RT=0 R=0) — (BC・HC・TC···etc.)
H—WSTAL 6 — LC65.0 — P4.50 — RTO — TKC

Alterations	Code			¥/1Code
Tip — R10, RLC $^{+0.3}_{0}$	RLC	Cuts tip R flat. Specification range 2≦RLC<√P(10−P/4) 0.1mm increments Applicable to P<8	——	600
Tip — PC	PC	Changes tip diameter P. PC≧Pmin. /2≧1.00 0.01mm increments (Combination with PKC→0.001mm incr.) D3・4 : Not applicable. P: 1.00~1.99 15; 2.00~2.99 21; 3.00~3.99 32; 4.00~ 41	Changes tip diameter P. PC≧Pmin. /2≧1.00 0.01mm increments (Combination with PKC→0.001mm incr.) D3・4 : Not applicable. P: 1.00~1.49 15; 1.50~1.99 15; 2.00~2.49 21; 2.50~2.99 21; 3.00~3.49 32; 3.50~3.99 32; 4.00~4.99 41; 5.00~ 41	1,200
Tip — B, BC	BC	Changes tip length B. 2≦BC≦Bmax. ≦L/2 0.1mm increments L requires BC+25mm or more.		600
Tip — Y, YC $^{+0.3}_{0}$	YC	——	Changes tip taper length Y. ・For P<2.0, 1≦YC≦P×2.83−0.3 ・For P≧2.0, 1≦YC≦P×1.86−0.3≦12 L(LC)+YC≦Lmax+8 0.1mm increments	600
Tip — P	PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Dimension P : 0.001mm increments D>13 : Not applicable		1,800
Tip — P	PKV	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ ±0.005 Specified unit of dimension P stays the same.		0
Tip — 0.08 GL	SC	Improves surface roughness on B. 0.2 G ⇨ 0.08 GL Machining the base meterial before coating RT=0, R=0 : Not applicable		1,200

Alterations	Code		¥/1Code
Full length — LC, L	LC	Changes the full length L 25+B(BC)≦LC<L 0.1mm increments When LC=B (or BC) is 25mm or less, B (BC) is LC−25mm.	600
Full length — T, LC, L	LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKC (Thickness) + LC (Length) T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	1,400
Full length — T, LC, L	LMT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKM (Thickness) + LC (Length) T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	
Head	KC	Adds single key flat.	600
Head	WKC	Adds double key flats in parallel.	1,200
Head — H, HC	HC	Changes head diameter. D≦HC<H 0.1mm increments	600
Head — T, TC	TC	Changes dimension T(head thickness). 2≦TC<5 0.1mm incr. (Comb. with TKC・TKM・LCT・LMT →0.01mm incr.) L is shortened by (5−TC). When LC, LCT, or LMT is combined, the full length remains as specified.	600
Head — T	TKC	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	1,200
Head — T	TKM	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	1,200
Shank — ℓ, D $^{-0.01}_{-0.03}$	NDC	No press-in lead ℓ=3 ⇨ ℓ=0	0

Price

Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

—Tip R type—

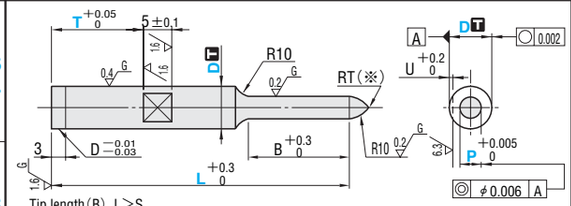
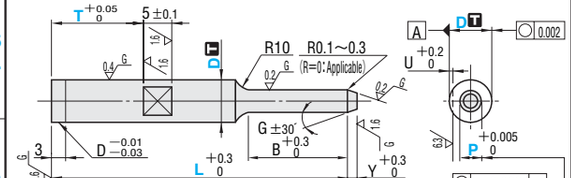
Catalog No. Type	D	U/Price Q'ty : 1~4
H—WSTAS H—WSTAL	3	5,480
	4	5,560
	5	5,780
	6	6,330
AH—WSTAS AH—WSTAL	8	7,560
	10	8,890
	13	10,210
	16	12,500

—Tip tapered type—

Catalog No. Type	D	U/Price Q'ty : 1~4
H—WTPAS H—WTPAL	3	5,260
	4	5,340
	5	5,560
	6	6,110
AH—WTPAS AH—WTPAL	8	7,340
	10	8,560
	13	10,000
	16	12,280

CARBIDE PILOT PUNCHES WITH KEY GROOVE

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No.	View
—Tip R— RoHS Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	Dm5	V30(HIP) 88~89HRA	WKSTAS WKSTAL	 Tip length (B) L>S RT(※) ···▸The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208) Refer to the product data "R length of Punch" for the length of tip R. P.1208
	$D^{+0.005}_{0}$		A—WKSTAS A—WKSTAL	
—Tip tapered— RoHS Shank Dia.Tolerance D T m5· $^{+0.005}_{0}$ Selectable	Dm5	V30(HIP) 88~89HRA	WKTPAS WKTPAL	 Tip length (B) L>S
	$D^{+0.005}_{0}$		A—WKTPAS A—WKTPAL	

P	G
1.000~1.999	10°
2.000~	15°

Catalog No. / Type	D	L					0.001mm increments min. P max.	0.1mm increments T	B	Y	U
S (Dm5) (D +0.005 0) WKSTAS A—WKSTAS WKTPAS A—WKTPAS	3	42	52	62			1.000 ~ 2.990	T>5.0	10	2	0.5
	4	42	52	62	72		1.000 ~ 3.990				
	5	42	52	62	72		2.000 ~ 4.990			3	1.0
	6	42	52	62	72		2.000 ~ 5.990				
	8	(42)	52	62	72	82	3.000 ~ 7.990		15	5	1.5
	10	(42)	52	62	72	82	3.000 ~ 9.990				
	13	(42)	52	62	72	82	6.000 ~12.990			8	
	16	(42)	52	62	72	82	10.000 ~15.990		21		
L (Dm5) (D +0.005 0) WKSTAL A—WKSTAL WKTPAL A—WKTPAL	3		52	62			1.000 ~ 2.990	T>5.0	15	2	0.5
	4		52	62	72		1.000 ~ 3.990				
	5		52	62	72		2.000 ~ 4.990			3	1.0
	6		52	62	72		2.000 ~ 5.990				
	8		52	62	72	82	3.000 ~ 7.990		21	5	1.5
	10		52	62	72	82	3.000 ~ 9.990				
	13		52	62	72	82	6.000 ~12.990			8	
	16			62	72	82	10.000 ~15.990		27		

L(42) ···▸B=10 When L(42), tip length B is fixed to 10mm.

Order

Catalog No.	L	P	T	(RT=0 / R=0)
WKSTAL 6	62	P4.500	T10	
WKTPAS 5	52	P2.015	T8	R0

Delivery 3 Days

When key groove is not required, specify T=L.
Only RT=0 can be specified : Applicable to tip R type of P<8 (Except lapping type).
Only R=0 can be specified, Applicable to tip tapered type (Except lapping type).

Alteration

Catalog No.	L(LC·LCT)	P(PC)	T	(RT=0 / R=0)	(BC · YC · WKD···etc.)
WKSTAL 6	LC65.0	P4.500	T8		PKC

Alterations	Code			¥/1Code
Tip	RLC	Cuts tip R flat. Specification range 2≦RLC<√P(10−P/4) 0.1mm increments. Applicable to P<8	——	600
	PC	Changes tip diameter P. PC≧Pmin. /2 0.001mm increments. P: 0.500~0.999 Bmax. 6; 1.000~1.999 15; 2.000~2.999 21; 3.000~3.999 32; 4.000~5.999 42; 6.000~ 47	Changes tip diameter P. PC≧Pmin. /2≧1.000 0.001mm increments. P: 1.000~1.499 15; 1.500~1.999 15; 2.000~2.499 21; 2.500~2.999 21; 3.000~3.499 32; 3.500~3.999 32; 4.000~4.999 42; 5.000~5.999 42; 6.000~ 47	1,200
	BC	Changes tip length B. 2≦BC≦Bmax. L requires BC+25mm or more.	0.1mm increments	600
	YC	——	Changes tip taper length Y. ・For P<2.0, 1≦YC≦PX2.83−0.3 ・For P≧2.0, 1≦YC≦PX1.86−0.3≦12 L(LC)+YC≦Lmax+8 0.1mm increments	600
	PKC	Changes tolerance on P. $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$		1,600
	PKV	Changes tolerance on P. $P^{+0.005}_{0}$ ⇨ ±0.002		0
	SC	Improves surface roughness on B. 0.2 G ⇨ 0.08 GL. RT=0, R=0 : Not applicable		1,200

Alterations	Code		¥/1Code
Full length	LC	Changes the full length L. 25+B(BC)≦LC<L 0.1mm increments. When LC—B (or BC) is 25mm or less, B (BC) is LC—25mm.	600
	LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKC (Thickness) $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ + LC (Length)	1,400
Key groove	WKD	Adds parallel key grooves.	1,200
	UK	Changes depth of key groove. D: 4・5 U: 0.7; 6 1.2; 8~16 1.7. Cannot be applied to D3.	400
	TKC	Changes dimension T tolerance. $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$	1,200

Price

Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

—Tip R type—

Catalog No. / Type	D	U/Price Q'ty : 1~4
WKSTAS WKSTAL	3	4,380
	4	4,430
	5	4,590
	6	4,960
	8	6,100
A—WKSTAS A—WKSTAL	10	7,120
	13	8,450
	16	10,520

—Tip tapered type—

Catalog No. / Type	D	U/Price Q'ty : 1~4
WKTPAS WKTPAL	3	4,170
	4	4,210
	5	4,370
	6	4,740
	8	5,880
A—WKTPAS A—WKTPAL	10	6,910
	13	8,240
	16	10,300

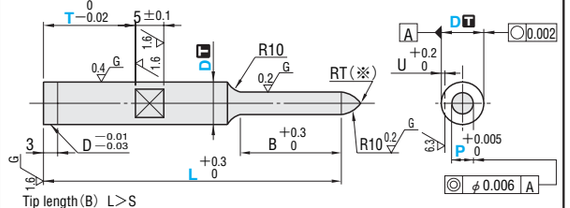
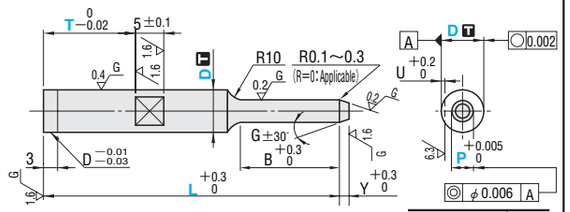
Keys for punches with key groove P.195

PSKB PSKBH
PSKS PSKJ
PSK PSKP PSKH
PSKW

Express service system P.38 | MISUMI Press 2007 | http://misumi.jp/press/ | For inquiry, ordering and other information, refer to P.1269

CARBIDE PILOT PUNCHES WITH KEY GROOVE
—NEGATIVE D TOLERANCE—

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No.	View
—Tip R— RoHS	D −0.001 −0.006	V30(HIP) 88~89HRA	B—WKSTAS B—WKSTAL	 Tip length(B) L>S ⓟ RT(※)•••The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208) ⓟ Refer to the product data "R length of Punch" for the length of tip R. P.1208
—Tip tapered— RoHS	D −0.001 −0.006	V30(HIP) 88~89HRA	B—WKTPAS B—WKTPAL	 Tip length(B) L>S

P	G
1.000～1.999	10°
2.000～	15°

Catalog No. Type	D	L					0.001mm increments min. P max.	0.1mm increments T	B	Y	U
S B—WKSTAS B—WKTPAS	3	42	52	62			1.000 ～ 2.990	T>5.0	10	2	0.5
	4	42	52	62	72		1.000 ～ 3.990				
	5	42	52	62	72		2.000 ～ 4.990			3	1.0
	6	42	52	62	72		2.000 ～ 5.990				
	8	(42)	52	62	72	82	3.000 ～ 7.990		15	5	1.5
	10	(42)	52	62	72	82	3.000 ～ 9.990				
	13	(42)	52	62	72	82	6.000 ～ 12.990			8	
	16	(42)	52	62	72	82	10.000 ～ 15.990		21		
L B—WKSTAL B—WKTPAL	3		52	62			1.000 ～ 2.990	T>5.0	15	2	0.5
	4		52	62	72		1.000 ～ 3.990				
	5		52	62	72		2.000 ～ 4.990			3	1.0
	6		52	62	72		2.000 ～ 5.990				
	8		52	62	72	82	3.000 ～ 7.990		21	5	1.5
	10		52	62	72	82	3.000 ～ 9.990				
	13		52	62	72	82	6.000 ～ 12.990			8	
	16			62	72	82	10.000 ～ 15.990		27		

ⓟ L(42)•••B=10 When L(42), tip length B is fixed to 10mm.

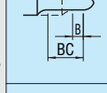
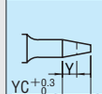
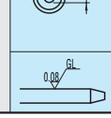
Order

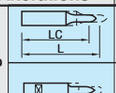
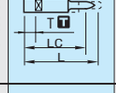
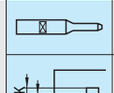
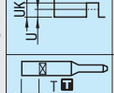
Catalog No.	L	P	T	(RT=0 R=0)
B—WKSTAL 6 —	62 —	P4.500 —	T10 —	RT0
B—WKTPAS 6 —	42 —	P2.105 —	T8	

ⓟ When key groove is not required, specify T=L.
ⓟ Only RT=0 can be specified : Applicable to the tip R type of P<8 (Except lapping type).
ⓟ Only R=0 can be specified, Applicable to the tip tapered type (Except lapping type).

Delivery 3 Days

Alteration Catalog No. — L(LC・LCT) — P(PC) — T — (RT=0 R=0) — (BC・YC・WKD…etc.)
B—WKSTAL 6 — LC65.5 — P4.500 — T10 — — PKC

Alterations		Code			¥/1Code
Tip		RLC	Cuts tip R flat. Specification range 2≦RLC<P(10—P/4) 0.1mm increments ⓟ Applicable to P<8	——	600
		PC	Changes tip diameter P. PC≧Pmin. /2 0.001mm increments (P / Bmax.: 0.500～0.999 / 6; 1.000～1.999 / 15; 2.000～2.999 / 21; 3.000～3.999 / 32; 4.000～5.999 / 42; 6.000～ / 47)	Changes tip diameter P. PC≧Pmin. /2≧1.000 0.001mm increments (P / Bmax.: 1.000～1.499 / 15; 1.500～1.999 / 15; 2.000～2.499 / 21; 2.500～2.999 / 21; 3.000～3.499 / 32; 3.500～3.999 / 32; 4.000～4.999 / 42; 5.000～5.999 / 42; 6.000～ / 47)	1,200
		BC	Changes tip length B. 2≦BC≦Bmax 0.1mm increments ⓟ L requires BC+25mm or more.		600
		YC	——	Changes tip taper length Y. ・For P<2.0, 1≦YC≦PX2.83—0.3 ・For P≧2.0, 1≦YC≦PX1.86—0.3≦12 L(LC)+YC≦Lmax+8 0.1mm increments	600
		PKC	Changes tolerance on P. P +0.005 0 ⇨ +0.003 0		1,600
		PKV	Changes tolerance on P. P +0.005 0 ⇨ ±0.002		0
		SC	Improves surface roughness on B. 0.2 G ⇨ 0.08 GL ⓧ RT=0, R=0 : Not applicable		1,200

Alterations		Code		¥/1Code
Full length		LC	Changes the full length L. 25+B(BC)≦LC<L 0.1mm increments ⓟ When LC—B(or BC)is 25mm or less, B(BC) is LC—25mm.	600
		LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. RTC + LC 0 −0.02 ⇨ T +0.05 0	1,400
Key groove		WKD	Adds parallel key grooves.	1,200
		UK	Changes depth of key groove. (D / UK: 4・5 / 0.7; 6 / 1.2; 8～16 / 1.7) ⓧ Cannot be applied to D3.	400
		RTC	Changes dimension T tolerance. T 0 −0.02 ⇨ +0.05 0	0

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

ⓟ To be quoted on price & lead time above Max. Q'ty.

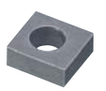
—Tip R type—

Catalog No. Type	D	U/Price Q'ty : 1～4
B—WKSTAS B—WKSTAL	3	4,380
	4	4,430
	5	4,590
	6	4,960
	8	6,100
	10	7,120
	13	8,450
	16	10,520

—Tip tapered type—

Catalog No. Type	D	U/Price Q'ty : 1～4
B—WKTPAS B—WKTPAL	3	4,170
	4	4,210
	5	4,370
	6	4,740
	8	5,880
	10	6,910
	13	8,240
	16	10,300

■Keys for punches with key groove P.195

PSKB PSKBH
PSKS PSKJ
PSK PSKP PSKH 
PSKW

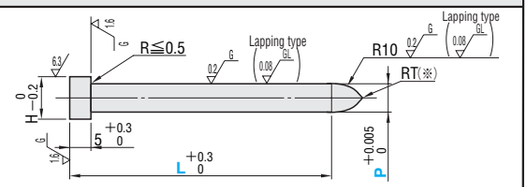
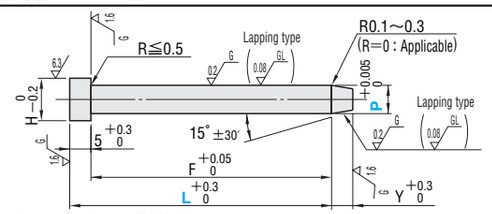
Express service system P.38 | MISUMI Press 2007 | http://misumi.jp/press/ | For inquiry, ordering and other information, refer to P.1269

CARBIDE STRAIGHT PILOT PUNCHES

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	View
—Tip R— RoHS —Tip R, Lapping— —TiCN coating—	V30 (HIP) 88~89HRA	WSTC Lapping type L—WSTC	
	V30 (HIP) 88~89HRA Surface 3000HV	TiCN coating type H—WSTC	
—Tip tapered— RoHS —Tip tapered · Lapping— —TiCN coating—	V30 (HIP) 88~89HRA	WTTC Lapping type L—WTTC	
	V30 (HIP) 88~89HRA Surface 3000HV	TiCN coating type H—WTTC	

※ RT(※) ···▸ The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208)
※ Refer to the product data "R length of Punch" for the length of tip R. P.1208
⊗ Lapping type RT=0 not applicable.
⊗ Lapping type R=0 not applicable.

Catalog No. Type	No.	L				0.001mm increments (coating 0.01mm incr.) min. P max.	Y	H
(Tip R) WSTC (Tip tapered) WTTC —Lapping— L—WSTC L—WTTC —TiCN coating— H—WSTC H—WTTC	3	42	52	62		2.000 ~ 3.000	2	5
	4	42	52	62	72	3.000 ~ 4.000		7
	5	42	52	62	72	4.000 ~ 5.000	3	8
	6	42	52	62	72	5.000 ~ 6.000		9
	8	42	52	62	72	6.000 ~ 8.000	5	11
	10	42	52	62	72	8.000 ~ 10.000		13

※ Specifying unit of dimension P ···▸ 0.01mm increments for coating punches. (0.001mm increments available with alternation PKC)

Order

Catalog No.	—	L	—	P	—	(RT=0 R=0)
WSTC 3	—	42	—	P2.490		
WTTC 3	—	42		P2.490	—	R0

※ Only RT=0 can be specified : Applicable to tip R type (Except lapping type).
※ Only R=0 can be specified : Applicable to tip tapered type (Except lapping type).

Delivery

● WSTC · L—WSTC · WTTC · L—WTTC
3 Days

● H—WSTC · H—WTTC
8 Days — Express C 1,500/1Pc.

※ A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alterations Catalog No. — L(LC · LCT · LMT) — P — (RT=0 R=0) — (HC · TC···etc.)
WTTC 3 — LC45.0 — P2.490 — YC3

Price

■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

※ To be quoted on price & lead time above Max. Q'ty.

—Tip R type—

No.	WSTC	L—WSTC	H—WSTC
3	4,040	5,180	5,570
4	4,320	5,460	5,890
5	4,570	5,710	6,200
6	4,750	5,890	6,560
8	5,600	6,740	7,600
10	6,210	7,350	8,410

—Tip tapered type—

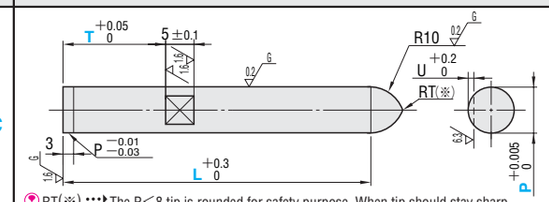
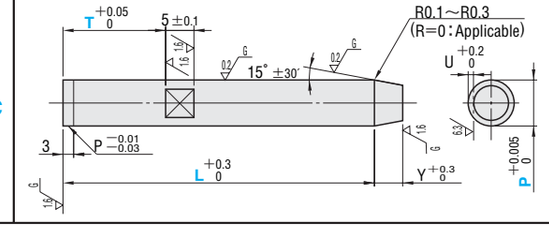
No.	WTTC	L—WTTC	H—WTTC
3	3,800	4,940	5,330
4	4,000	5,140	5,570
5	4,160	5,300	5,790
6	4,370	5,510	6,180
8	5,190	6,330	7,190
10	5,680	6,820	7,880

Alterations		Code			¥/1Code
Tip	R10, RLC +0.3 0	RLC	Cuts tip R flat. Specification range 2≦RLC<√P(10−P/4) 0.1mm increments ※ Applicable to P<8	——	600
	P	PKC	Changes tolerance on P. ※ Dimension P : 0.001mm increments · Normal P +0.005 0 ⇨ +0.003 0 · Lapping type P +0.01 0 ⇨ +0.005 0 · TiCN coating P +0.01 0 ⇨ +0.005 0		1,600 (TiCN coating 1,800)
		PKV	Changes tolerance on P. ※ Specified unit of dimension P stays the same. · Normal P +0.005 0 ⇨ ±0.002 · Lapping type P +0.01 0 ⇨ ±0.005 · TiCN coating P +0.01 0 ⇨ ±0.005		0
	Y, YC +0.3 0	YC	——	Changes tip taper length Y. 1≦YC≦PX1.86−0.3≦12 L(LC)+YC≦Lmax+8 0.1mm increments	600
Full length	LC, L	LC	Changes the full length L. 32≦LC<L 0.1mm increments		600

Alterations		Code		¥/1Code
Full length	T, LC, L	LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKC (Thickness) + LC (Length) T +0.3 0 ⇨ +0.02 0	1,400
		LMT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKM + LC T +0.3 0 ⇨ 0 −0.02	
Head		KC	Adds single key flat.	600
		WKC	Adds double key flats in parallel.	1,200
	H, HC	HC	Changes head diameter. P≦HC<H 0.1mm increments	600
	TC	TC	Changes dimension T (head thickness). 2≦TC<5 TiCN coating 4≦TC<5 0.1mm incr. (Comb. with TKC · TKM · LCT · LMT →0.01mm incr.) ※ L is shortened by (5−TC). When LC, LCT, or LMT is combined, the full length remains as specified.	600
	T	TKC	Changes head thickness tolerance. T +0.3 0 ⇨ +0.02 0	1,200
		TKM	Changes head thickness tolerance. T +0.3 0 ⇨ 0 −0.02	1,200

CARBIDE STRAIGHT PILOT PUNCHES —WITH KEY GROOVE—

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	View
—Tip R— RoHS	V30(HIP) 88~89HRA	WKSTC	
—Tip tapered— RoHS	V30(HIP) 88~89HRA	WKTTC	

※ RT(※) ···▸ The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. (When P≧8, tip end is flat. P.1208)
※ Refer to the product data "R length of Punch" for the length of tip R. P.1208

Catalog No. Type	No.	L					0.001mm increments min. P max.	0.1mm increments T	Y	U
WKSTC WKTTC	3	42	52	62			2.000 ~ 3.000	T≧5.0	2	0.5
	4	42	52	62	72		3.000 ~ 4.000			
	5	42	52	62	72		4.000 ~ 5.000		3	1.0
	6	42	52	62	72		5.000 ~ 6.000			
	8	42	52	62	72		6.000 ~ 8.000		5	1.5
	10	42	52	62	72		8.000 ~ 10.000			

Order

Catalog No.	—	L	—	P	—	T	—	(RT=0 R=0)
WKSTC 3	—	42	—	P2.490	—	T10.0	—	RT0
WKTTC 3	—	42	—	P2.490	—	T10.0		

※ When key groove is not required, specify T=L.
※ Only RT=0 can be specified : Applicable to tip R type. (Except lapping type)
※ Only R=0 can be specified, Applicable to tip tapered type. (Except lapping type)

Delivery
3 Days

Price

■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

※ To be quoted on price & lead time above Max. Q'ty.

—Tip R type—

No.	WKSTC
3	4,470
4	4,760
5	5,010
6	5,190
8	6,150
10	6,800

—Tip tapered type—

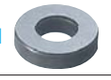
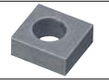
No.	WKTTC
3	4,260
4	4,540
5	4,790
6	4,970
8	5,930
10	6,580

Alterations Catalog No. — L(LC · LCT) — P — T — (RT=0 R=0) — (YC···etc.)
WKTTC 3 — LC45.0 — P2.490 — T10.0 — YC3

Alterations		Code		¥/1Code
Tip	R10, RLC +0.3 0	RLC	Cuts tip R flat. Specification range 2≦RLC<√P(10−P/4) 0.1mm increments ※ Applicable to P<8	600
	P	PKC	Changes tolerance on P. P +0.005 0 ⇨ +0.003 0	1,600
		PKV	Changes tolerance on P. P +0.005 0 ⇨ ±0.002	0
	Lapped area (B)	SC	Improves surface roughness on B. ※ Dimension P tolerance stays the same. Lapped area (B): P 2.00~2.99 (B) 13; 3.00~9.99 19; 10.00 25. ※ If L<(B)+20, (B) becomes L−20. ⊗ Tip R type, RT=0 : Not available ⊗ Tip tapered type, R=0 : Not available	1,200

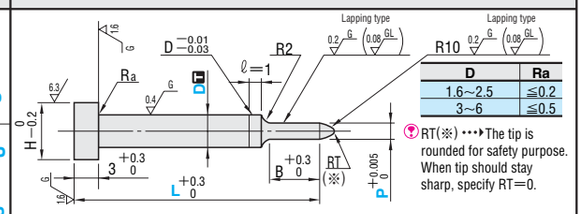
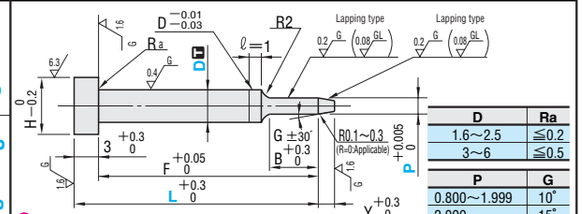
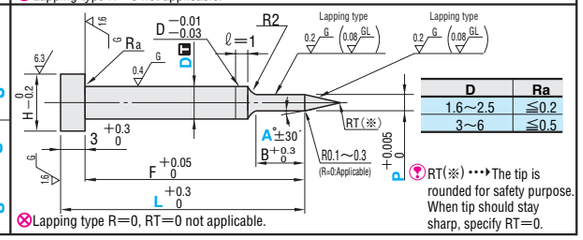
Alterations		Code		¥/1Code
Tip	Y, YC +0.3 0	YC	——	Changes tip taper length Y. 1≦YC≦PX1.86−0.3≦12 L(LC)+YC≦Lmax+8 0.1mm increments	600
Full length	LC, L	LC	Changes the full length L. 32≦LC<L 0.1mm increments	600
	T, LC, L	LCT	Changes head thickness tolerance and the full length in 1 code. Specifiable range, unit, remarks is the same as LC. TKC + LC T +0.05 0 ⇨ 0 −0.02	1,400
Key groove		WKD	Adds parallel key grooves. / Adds parallel key grooves.	600
	T	TKC	Changes dimension T tolerance. T +0.05 0 ⇨ 0 −0.02	1,200
	U	UK	Changes depth of key groove. ⊗ Cannot be applied to No.3. (No. 4·5: UK 0.7; 6: 1.2; 8~10: 1.7)	400

■Keys for punches with key groove P.195

PSKB PSKBH  PSKS PSKJ PSK PSKP PSKH  PSKW

CARBIDE PILOT PUNCHES
—FIXED IN STRIPPER PLATE—

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No.	View
—Tip R— RoHS —Tip R, Lapping— Shank Dia.Tolerance D T m5・ $^{+0.005}_{0}$ Selectable	D m5 D $^{+0.005}_{0}$	V30(HIP) 88~89HRA	WSPTP Lapping type L—WSPTP A—WSPTP Lapping type AL—WSPTP	
—Tip tapered— RoHS —Tip tapered・Lapping— Shank Dia.Tolerance D T m5・ $^{+0.005}_{0}$ Selectable	D m5 D $^{+0.005}_{0}$	V30(HIP) 88~89HRA	WTPTP Lapping type L—WTPTP A—WTPTP Lapping type AL—WTPTP	
—Tip acute-angle— RoHS —Tip acute-angle・Lapping— Shank Dia.Tolerance D T m5・ $^{+0.005}_{0}$ Selectable	D m5 D $^{+0.005}_{0}$	V30(HIP) 88~89HRA	WAPTP Lapping type L—WAPTP A—WAPTP Lapping type AL—WAPTP	

Refer to the product data "R length of Punch" for the length of tip R. P.1208

⊗Lapping type RT=0 not applicable.

D	Ra
1.6~2.5	≦0.2
3~6	≦0.5

RT(※) ····▸The tip is rounded for safety purpose. When tip should stay sharp, specify RT=0.

P	G
0.800~1.999	10°
2.000~	15°

⊗Lapping type R=0 not applicable.

⊗Lapping type R=0, RT=0 not applicable.

Catalog No. Type	D	0.1mm increments L	0.001mm increments min. P max.	A	B	Y	H
(Dm5) (D $^{+0.005}_{0}$)	1.6	10.0 ~ 32.0	0.800 ~ 1.599	(10)	4	2	2.6
WSPTP A—WSPTP	2.0		1.000 ~ 1.990				3
WTPTP A—WTPTP	2.5		1.000 ~ 2.490	15			3.5
WAPTP A—WAPTP	3		1.000 ~ 2.990	20			5
—Lapping type—	4	10.0 ~ 40.0	2.000 ~ 3.990	25		3	7
L—WSPTP AL—WSPTP	5		2.000 ~ 4.990	30			8
L—WTPTP AL—WTPTP	6		2.500 ~ 5.990				9
L—WAPTP AL—WAPTP							

P>D−0.03···▸When ℓ=0, P>D−0.03, D $^{-0.01}_{-0.03}$ (Press-in lead) is not available.
A(10)···▸P<2.000 When P≧2.000, A=10 cannot be selected.

Price

■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	——	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	Tip R type WSPTP A—WSPTP	Tip R type L—WSPTP AL—WSPTP	Tip tapered type WTPTP A—WTPTP	Tip tapered type L—WTPTP AL—WTPTP	Tip acute-angle type WAPTP A—WAPTP	Tip acute-angle type L—WAPTP AL—WAPTP
1.6	5,140	6,280	4,890	6,030	5,140	6,280
2.0	3,910	5,050	3,430	4,570	4,020	5,160
2.5	3,910	5,050	3,430	4,570	4,030	5,170
3	3,910	5,050	3,430	4,570	4,080	5,220
4	4,080	5,220	3,590	4,730	4,130	5,270
5	4,250	5,390	3,750	4,890	4,290	5,430
6	4,460	5,600	3,960	5,100	4,720	5,860

Order

Catalog No. — L — P — A — (RT=0 / R=0)

WSPTP 6 — 29.0 — P4.071 — A15
WTPTP 6 — 20.0 — P5.020 — R0

Only R=0 can be specified：Applicable to tip tapered and tip acute-angle type (Except lapping type).
Only RT=0 can be specified：Applicable to tip R type of P<8 and tip acute-angle type (Except lapping type).

Delivery: 3 Days

Alteration

Catalog No. — L — P — A(AC) — (RT=0 / R=0) — (HC・TC···etc.)
WAPTP 6 — 20.0 — P5.020 — AC18 — HC6—PKC

Alterations		Code	Tip R type	Tapered/Acute-angle types	¥/1Code
Tip		PKC	Changes tolerance on P. P $^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$		1,600
		PKV	Changes tolerance on P. P $^{+0.005}_{0}$ ⇨ +0.002		0
	YC $^{+0.3}_{0}$	YC	——	Changes tip taper length Y. ・For P<2.0, 1≦YC≦P+2.83−0.3 ・For P≧2.0, 1≦YC≦P+2.83−0.3 L(LC)+YC≦Lmax+8 0.1mm increments ⊗Not applicable for tip acute-angle type	600
Head		HC	Changes head diameter. D≦HC<H 0.1mm increments		600
		KC	Adds single key flat.		600
		WKC	Adds double key flats in parallel.		1,200
		TC	Changes dimension T (head thickness). 2≦TC<3 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) The full length remains as specified.		600
		TKC	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		1,200
		TKM	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		1,200
Shank	ℓ D $^{-0.01}_{-0.03}$	NDC	No press -in lead ℓ=1 ⇨ ℓ=0		0

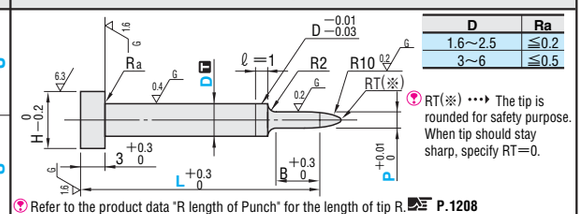
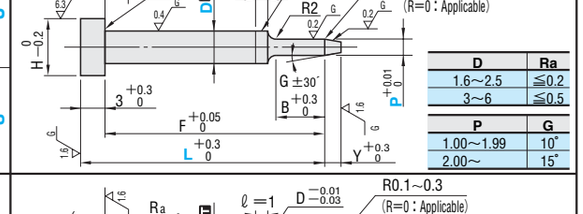
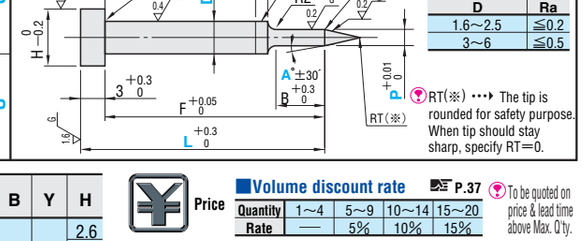
Alterations		Code	Tip R type	Tapered/Acute-angle types	¥/1Code
Tip	RLC $^{+0.3}_{0}$	RLC	Cuts tip R flat. Specification range 2≦RLC<√P(10−P/4) 0.1mm increments	——	600
	BC B	BC	Changes tip length B. 2≦BC≦Bmax 0.1mm increments (P: 0.800~1.999 → Bmax 15; 2.000~ → Bmax 21) L requires BC+8mm or more.		600
	AC L	AC	——	Changes tip angle. 15°<AC≦45° 1° increments ⊗Not applicable for tip tapered type	600

CARBIDE PILOT PUNCHES
—FIXED IN STRIPPER PLATE/TiCN COATING —

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No.	View
—Tip R— RoHS Shank Dia.Tolerance D T m5・ $^{+0.005}_{0}$ Selectable	D m5 D $^{+0.005}_{0}$	V30(HIP) 88~89HRA Surface 3000HV	H—WSPTP AH—WSPTP	
—Tip tapered— RoHS Shank Dia.Tolerance D T m5・ $^{+0.005}_{0}$ Selectable	D m5 D $^{+0.005}_{0}$	V30(HIP) 88~89HRA Surface 3000HV	H—WTPTP AH—WTPTP	
—Tip acute-angle— RoHS Shank Dia.Tolerance D T m5・ $^{+0.005}_{0}$ Selectable	D m5 D $^{+0.005}_{0}$	V30(HIP) 88~89HRA Surface 3000HV	H—WAPTP AH—WAPTP	

Refer to the product data "R length of Punch" for the length of tip R. P.1208

RT(※) ····▸The tip is rounded for safety purpose. When tip should stay sharp, specify RT=0.

D	Ra
1.6~2.5	≦0.2
3~6	≦0.5

P	G
1.00~1.99	10°
2.00~	15°

Catalog No. Type	D	0.1mm increments L	0.01mm increments min. P max.	A	B	Y	H
(Dm5) (D $^{+0.005}_{0}$)	1.6	10.0 ~ 32.0	1.00 ~ 1.59	(10)	4	2	2.6
H—WSPTP AH—WSPTP	2.0		1.00 ~ 1.99				3
H—WTPTP AH—WTPTP	2.5		1.00 ~ 2.49	15			3.5
H—WAPTP AH—WAPTP	3		1.00 ~ 2.99	20			5
	4	10.0 ~ 40.0	2.00 ~ 3.99	25		3	7
	5		2.00 ~ 4.99	30			8
	6		2.50 ~ 5.99				9

P>D−0.03···▸When ℓ=0, P>D−0.03, D $^{-0.01}_{-0.03}$ (Press-in lead) is not available.
The shank has thin coating layer.
A(10)···▸P<2.00 When P≧2.00, A=10 cannot be selected. P=0.001 increments available with PKC alteration.

Price

■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	——	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	Tip R type H—WSPTP AH—WSPTP	Tip tapered type H—WTPTP AH—WTPTP	Tip acute-angle type H—WAPTP AH—WAPTP
1.6	6,630	6,380	6,630
2.0	5,400	4,920	5,510
2.5	5,400	4,920	5,520
3	5,440	4,960	5,610
4	5,640	5,150	5,690
5	5,880	5,380	5,920
6	6,270	5,770	6,530

Order

Catalog No. — L — P — A — (RT=0 / R=0)

H—WAPTP 6 — 29.0 — P4.00 — A15 — R0—RT0
H—WSPTP 6 — 20.0 — P5.02

Only R=0 can be specified：Applicable to tip tapered and tip acute-angle type (Except lapping type).
Only RT=0 can be specified：Applicable to tip R type of P<8 and tip acute-angle type (Except lapping type).

Delivery: 8 Days

Express C 1,500/1Pc. P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration

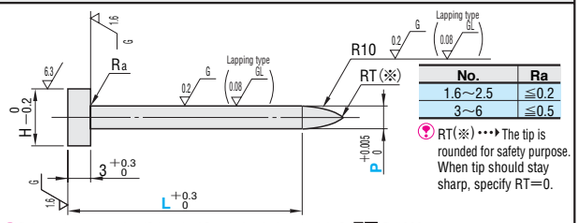
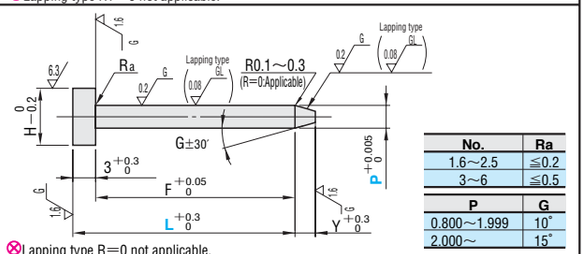
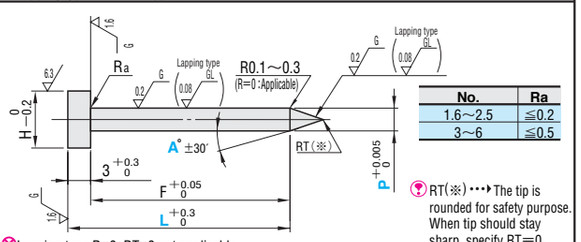
Catalog No. — L — P — A(AC) — (RT=0 / R=0) — (HC・TC···etc.)
H—WAPTP 6 — 20.0 — P5.02 — AC18 — HC7

Alterations		Code	Tip R	Tapered/Acute-angle	¥/1Code
Tip	RLC $^{+0.3}_{0}$	RLC	Cuts tip R flat. Specification range 2≦RLC<√P(10−P/4) 0.1mm increments	——	600
	BC B	BC	Changes tip length B. (P: 1.00~1.99 → Bmax 15; 2.00~ → Bmax 16) 2≦BC≦Bmax≦L/2 0.1mm increments L requires BC+8mm or more.		600
		PKC	Changes to lerance on P. P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Dimension P：0.001mm increments available		1,800
		PKV	Changes to lerance on P. P $^{+0.01}_{0}$ ⇨ ±0.005 Specified unit of dimension P stays the same.		0
	0.08 GL	SC	Improves surface roughness on B. 0.2 G ⇨ 0.08 GL Machining the base meterial before coating. ⊗RT=0, R=0:Not available		1,200
	AC L	AC	——	Changes tip angle. 15°<AC≦45° 1° increments ⊗Not applicable for tip tapered type	600

Alterations		Code	Tip R type	Tapered/Acute-angle types	¥/1Code
Tip	YC $^{+0.3}_{0}$	YC	——	Changes the full length L. ・For P<2.0, 1≦YC≦P+2.83−0.3 ・For P≧2.0, 1≦YC≦P+2.83−0.3 L(LC)+YC≦Lmax+8 0.1mm increments ⊗Not applicable for tip acute-angle type	600
Head		HC	Changes head diameter. D≦HC<H 0.1mm increments		600
		KC	Adds single key flat.		600
		WKC	Adds double key flats in parallel.		1,200
		TC	Changes dimension T (head thickness). 2≦TC<3 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) The full length remains as specified.		600
		TKC	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		1,200
		TKM	Changes head thickness tolerance. T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		1,200
Shank	ℓ D $^{-0.01}_{-0.03}$	NDC	No press -in lead ℓ=1 ⇨ ℓ=0		0

CARBIDE STRAIGHT PILOT PUNCHES
—FIXED IN STRIPPER PLATE—

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	View
—Tip R— RoHS —Tip R, Lapping—	V30(HIP) 88～89HRA	WSPT Lapping type L—WSPT	
—Tip tapered— RoHS —Tip tapered・Lapping—	V30(HIP) 88～89HRA	WTPT Lapping type L—WTPT	
—Tip acute-angle— RoHS —Tip acute-angle・Lapping—	V30(HIP) 88～89HRA	WAPT Lapping type L—WAPT	

Refer to the product data "R length of Punch" for the length of tip R. P.1208
⊗Lapping type RT=0 not applicable.

⊗Lapping type R=0 not applicable.

⊗Lapping type R=0, RT=0 not applicable.

Catalog No. Type	No.	0.1mm increments L	0.001mm increments min. P max.	A	Y	H
(Tip R) (Tip tapered) (Tip acute-angle) WSPT WTPT WAPT	1.6	10.0 ~ 32.0	0.600 ~ 1.600	(10)	2	2.6
	2.0		1.000 ~ 2.000			3
	2.5		1.500 ~ 2.500	15		3.5
—Lapping— L—WSPT L—WTPT L—WAPT	3	10.0 ~ 40.0	2.000 ~ 3.000	20		5
	4		3.000 ~ 4.000	25		7
	5		4.000 ~ 5.000	30	3	8
	6		5.000 ~ 6.000			9

A(10)・・・・▸P＜2.000 When P≧2.000, A=10 cannot be selected.

Price — Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	——	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

No.	Tip R type WSPT	Tip R type L—WSPT	Tip tapered type WTPT	Tip tapered type L—WTPT	Tip acute-angle type WAPT	Tip acute-angle type L—WAPT
1.6	5,140	6,280	4,900	6,040	5,140	6,280
2.0	3,880	5,020	3,430	4,570	4,020	5,160
2.5	3,880	5,020	3,430	4,570	4,030	5,170
3	3,960	5,100	3,510	4,650	4,080	5,220
4	4,080	5,220	3,550	4,690	4,130	5,270
5	4,160	5,300	3,710	4,850	4,290	5,430
6	4,370	5,510	3,910	5,050	4,720	5,860

Order — Catalog No. — L — P — A — (RT=0 R=0)

WAPT 6 — 25.0 — P5.990 — A30 — RT0 — R0
WTPT 6 — 20.0 — P5.020

Only R=0 can be specified : Applicable to tip tapered and tip acute-angle type(Except lapping type).
Only RT=0 can be specified : Applicable to tip R type of P＜8 and tip acute-angle type(Except lapping type).

Delivery 3 Days

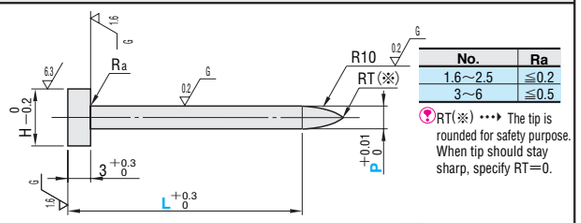
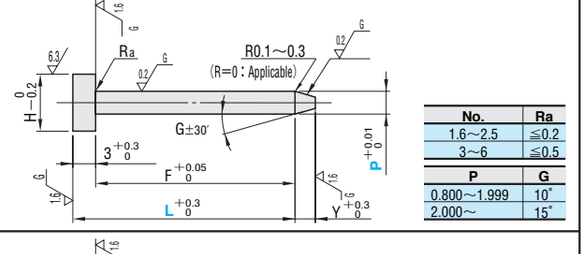
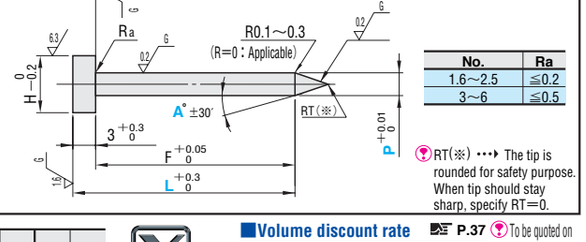
Alteration — Catalog No. — L — P — A(AC) — (R) — (RT) —(HC・TC・・・etc.)
WAPT6 — 20.0 — P5.020 — AC18

Alterations	Code	Tip R type	Tapered/Acute-angle types	¥/1Code
Tip	RLC	Cuts tip R flat. Specification range 2≦RLC＜√P(10−P/4) 0.1mm increments	——	600
Tip	AC	——	Changes tip angle. 15°＜AC≦45° 1° increments ⊗Not applicable for tip tapered type	600
Tip	PKC	Changes tolerance on P. $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$		1,600
Tip	PKV	Changes tolerance on P. $P^{+0.005}_{0}$ ⇨ ±0.002		0
Tip	YC	——	Changes tip taper length Y. ・For P＜2.0, 1≦YC≦PX2.83−0.3 ・For P≧2.0, 1≦YC≦PX1.86−0.3 L(LC)+YC≦Lmax+8 0.1mm increments ⊗Not applicable for tip acute-angle type	600
Head	HC	Changes head diameter. P≦HC＜H 0.1mm increments		600
Head	KC	Adds single key flat.		600
Head	WKC	Adds double key flats in parallel.		1,200
Head	TC	Changes dimension T (head thickness). 2≦TC＜3 0.1mm incr.(Comb. with TKC・TKM→0.01mm incr.) Overall length does not change.		600
Head	TKC	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		1,200
Head	TKM	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		1,200

CARBIDE STRAIGHT PILOT PUNCHES
—FIXED IN STRIPPER PLATE/TiCN COATING —

PRODUCTS DATA P.1220

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No.	View
—Tip R— RoHS	V30(HIP) 88～89HRA Surface 3000HV	H—WSPT	
—Tip tapered— RoHS	V30(HIP) 88～89HRA Surface 3000HV	H—WTPT	
—Tip acute-angle— RoHS	V30(HIP) 88～89HRA Surface 3000HV	H—WAPT	

Refer to the product data "R length of Punch" for the length of tip R. P.1208

Catalog No. Type	No.	0.1mm increments L	0.01mm increments min. P max.	A	Y	H
H—WSPT	1.6	10.0 ~ 32.0	1.00 ~ 1.60	(10)	2	2.6
	2.0		1.00 ~ 2.00			3
	2.5		1.50 ~ 2.50	15		3.5
H—WTPT	3	10.0 ~ 40.0	2.00 ~ 3.00	20		5
	4		3.00 ~ 4.00	25		7
H—WAPT	5		4.00 ~ 5.00	30	3	8
	6		5.00 ~ 6.00			9

A(10)・・・・▸P＜2.00 When P≧2.00, A=10 cannot be selected.
P=0.001 increments available with PKC alteration.

Price — Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	——	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

No.	Tip R type H—WSPT	Tip tapered type H—WTPT	Tip acute-angle type H—WAPT
1.6	6,630	6,390	6,630
2.0	5,370	4,920	5,510
2.5	5,370	4,920	5,510
3	5,490	5,040	5,610
4	5,650	5,120	5,700
5	5,790	5,340	5,920
6	6,180	5,720	6,530

Order — Catalog No. — L — P — A — (RT=0 R=0)

H—WAPT 6 — 25.0 — P5.99 — A30
H—WSPT 6 — 20.0 — P5.02 — RT0

Only R=0 can be specified: Applicable to tip tapered and tip acute-angle type.
Only RT=0 can be specified: Applicable to tip R type of P＜8 and tip acute-angle type.

Delivery 8 Days — Express C 1,500/1Pc. P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

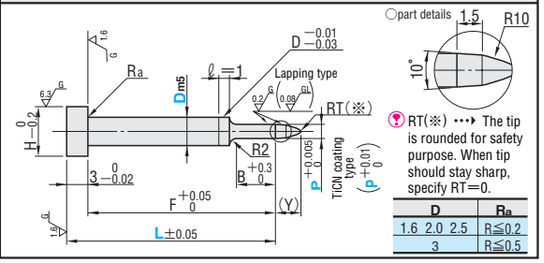
Alteration — Catalog No. — L — P — A(AC) — (R) — (RT) —(HC・TC・・・etc.)
H—WAPT6 — 20.0 — P5.02 — AC18

Alterations	Code	Tip R type	Tapered/Acute-angle types	¥/1Code
Tip	RLC	Cuts tip R flat. Specification range 2≦RLC＜√P(10−P/4) 0.1mm increments	——	600
Tip	AC	——	Changes tip angle. 15°＜AC≦45° 1° increments ⊗Not applicable for tip tapered type	600
Tip	PKC	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Dimension P：0.001mm increments		1,800
Tip	PKV	Changes tolerance on P. $P^{+0.01}_{0}$ ⇨ ±0.005 Specified unit of dimension P stays the same.		0
Tip	YC	——	Changes the full length L. ・For P＜2.0, 1≦YC≦PX2.83−0.3 ・For P≧2.0, 1≦YC≦PX1.86−0.3 L(LC)+YC≦Lmax+8 0.1mm increments ⊗Not applicable for tip acute-angle type	600
Head	HC	Changes head diameter. P≦HC＜H 0.1mm increments		600
Head	KC	Adds single key flat.		600
Head	WKC	Adds double key flats in parallel.		1,200
Head	TKC	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		1,200
Head	TKM	Changes head thickness tolerance. $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		1,200

CARBIDE PILOT PUNCHES
—FIXED IN STRIPPER PLATE/LAPPING TYPE·TiCN COATING —

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

Type	M H	Catalog No. Normal	Lapping type	TiCN coating type Surface 3000HV	View
RoHS	V30(HIP) 88~89HRA	WSPTPF	L—WSPTPF	H—WSPTPF	

RT(※) ···▸ The tip is rounded for safety purpose. When tip should stay sharp, specify RT=0.

D	Ra
1.6 2.0 2.5	R≦0.2
3	R≦0.5

Catalog No. Type			D	0.1mm increments L	0.001mm increments (TiCN coating 0.01mm incr.) min. P max.	B	H
Normal	Lapping	TiCN coating					
WSPTPF	L—WSPTPF	H—WSPTPF	1.6	10.0 ~ 32.0	0.800~ 1.599	4	2.6
			2.0		1.000~ 1.999		3.0
			2.5		1.500~ 2.499		3.5
			3	10.0 ~ 40.0	2.000~ 2.999		5

(P) P>D−0.03 ···▸ When ℓ=0, P>D−0.03, D $^{-0.01}_{-0.03}$ (Press-in lead) is not available.
(P) TiCN coating type : The shank also has a very thin coating layer.
(P) (Y) ···▸ Dimension Y $=0.6+\sqrt{(P-0.2)(39.8-P)/4}$

Order

Catalog No.	L	P	(RT=0)
WSPTPF 2.0	28.0	P1.900	RT0
H—WSPTPF 2.5	30.0	P2.20	

(P) Only RT=0 can be specified: (Except lapping type)

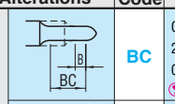
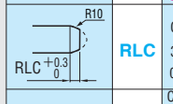
Delivery

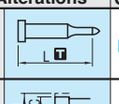
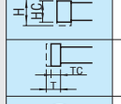
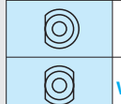
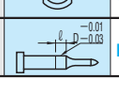
● Normal·Lapping type: 3 Days
● TiCN coating type: 8 Days
Express C 1,500/1Pc. P.38
(P) A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration

Catalog No. — L — P — (RT=0) — (BC·HC·TC···etc.)
WSPTPF 3 — 28.0 — P2.500 — RT0 — HC4.0

■Features
- This product is developed for press dies for thin plates.
- Dimension F under the head is highly precise and tip is finished with smooth round shape.

Alterations		Code	Spec.	¥/1Code
Tip		BC	Changes tip length B. 2≦BC≦Bmax 0.1mm increments (P) L requires BC+8mm or more. P: 0.800~1.999 Bmax 15; 2.000~2.999 Bmax 21	600
		RLC	Cuts tip R flat. 3≦RLC<Ymax. 0.1mm increments P: 0.800~1.499 Ymax 3; 1.500~2.499 Ymax 4; 2.500~2.999 Ymax 5	600
		PKC	Changes tolerance on P. ・Normal ・Lapping type P +0.005 0 ⇨ +0.003 0 ・TiCN coating type P +0.01 0 ⇨ +0.005 0 (P) Dimension P : 0.001mm increments	1,600 (TiCN coating 1,800)
		PKV	Changes tolerance on P. ・Normal ・Lapping type P +0.005 0 ⇨ ±0.002 ・TiCN coating type P +0.01 0 ⇨ ±0.005 (P) Specified unit of dimension P stays the same.	0

Alterations		Code	Spec.	¥/1Code
Full		LKC	Changes the full length tolerance. L±0.05 ⇨ +0.05 0 (P) Dimension F tolerance F +0.05 0 ⇨ ±0.05	0
Head		HC	Changes head diameter. D+0.1≦HC<H 0.1mm increments	600
		TC	Changes dimension T (head thickness). 2≦TC<3 0.1mm incr. (P) The full length remains as specified.	600
		KC	Adds single key flat.	600
		WKC	Adds double key flats in parallel.	1,200
Shank		NDC	No press-in lead ℓ=1 ⇨ ℓ=0	0

Price

■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

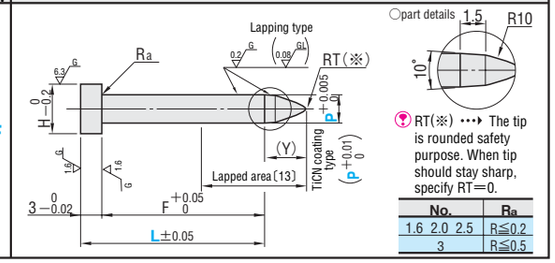
(P) To be quoted on price & lead time above Max. Q'ty.

D	Normal WSPTPF	Lapping type L—WSPTPF	TiCN coating type H—WSPTPF
1.6	5,900	7,040	7,390
2.0	4,440	5,580	5,930
2.5	4,440	5,580	5,930
3	4,440	5,580	5,930

CARBIDE STRAIGHT PILOT PUNCHES
—FIXED IN STRIPPER PLATE/LAPPING TYPE·TiCN COATING —

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

Type	M H	Catalog No. Normal	Lapping type	TiCN coating type Surface 3000HV	View
RoHS	V30(HIP) 88~89HRA	WSPTF	L—WSPTF	H—WSPTF	

RT(※) ···▸ The tip is rounded safety purpose. When tip should stay sharp, specify RT=0.

No.	Ra
1.6 2.0 2.5	R≦0.2
3	R≦0.5

Catalog No. Type			No.	0.1mm increments L	0.001mm increments (TiCN coating 0.01mm incr.) min. P max.	H
Normal	Lapping	TiCN coating				
WSPTF	L—WSPTF	H—WSPTF	1.6	10.0 ~ 32.0	0.800~ 1.600	2.6
			2.0		1.000~ 2.000	3.0
			2.5		1.500~ 2.500	3.5
			3	10.0 ~ 40.0	2.000~ 3.000	5

(P) (Y) ···▸ Dimension Y $=0.6+\sqrt{(P-0.2)(39.8-P)/4}$

Order

Catalog No.	L	P	(RT=0)
WSPTF 2.0	28.0	P1.900	RT0
L—WSPTF 2.5	30.0	P2.205	

(P) Only RT=0 can be specified: (Except lapping type)

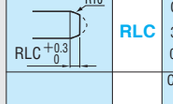
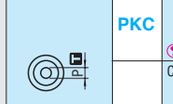
■Features
- This product is developed for press dies for thin plates.
- Dimension F under the head is highly precise and tip is finished with smooth round shape.

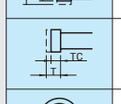
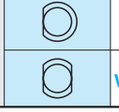
Delivery

● Normal·Lapping type: 3 Days
● TiCN coating type: 8 Days
Express C 1,500/1Pc. P.38
(P) A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration

Catalog No. — L — P — (RT=0) — (RSC·HC·TC···etc.)
WSPTF 3 — 28.0 — P2.480 — RT0 — HC4.0—PKC

Alterations		Code	Spec.	¥/1Code
Tip		RLC	Cuts tip R flat. 3≦RLC<Ymax. 0.1mm increments P: 0.800~1.499 Ymax 3; 1.500~2.499 Ymax 4; 2.500~3.000 Ymax 5	600
		PKC	Changes tolerance on P. ・Normal ・Lapping type P +0.005 0 ⇨ +0.003 0 ・TiCN coating type P +0.01 0 ⇨ +0.005 0 (P) Dimension P : 0.001mm increments	1,600 (TiCN coating 1,800)
		PKV	Changes tolerance on P. ・Normal ・Lapping type P +0.005 0 ⇨ ±0.002 ・TiCN coating type P +0.01 0 ⇨ ±0.005 (P) Specified unit of dimension P stays the same.	0

Alterations		Code	Spec.	¥/1Code
Full		LKC	Changes the full length tolerance. L±0.05 ⇨ +0.05 0 (P) Dimension F tolerance F +0.05 0 ⇨ ±0.05	0
Head		HC	Changes head diameter. 2.6≦P+0.1≦HC<H 0.1mm increments	600
		TC	Changes dimension T (head thickness). 2≦TC<3 0.1mm incr. (P) The full length remains as specified. ⊗ TiCN coating type : Not applicable	600
		KC	Adds single key flat.	600
		WKC	Adds double key flats in parallel.	1,200

Price

■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

(P) To be quoted on price & lead time above Max. Q'ty.

No.	Normal WSPTF	Lapping type L—WSPTF	TiCN coating type H—WSPTF
1.6	5,910	7,050	7,400
2.0	5,440	5,580	5,930
2.5	5,440	5,580	5,930
3	5,440	5,580	5,930

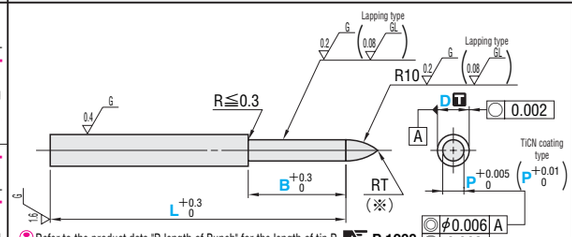
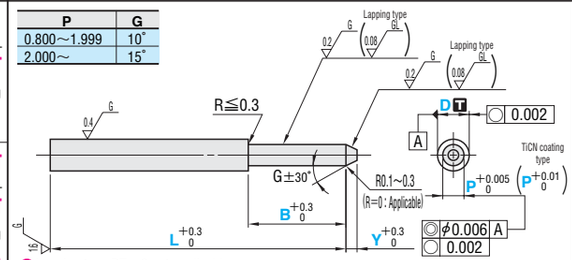
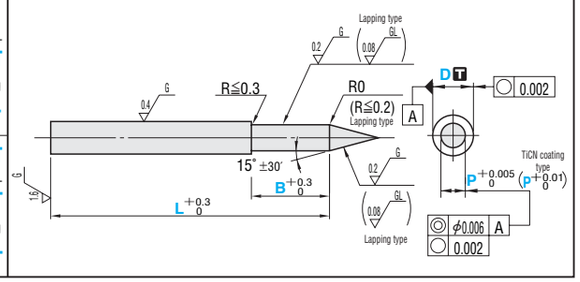
PRESS ADD.SPEC. Printed in Red

CARBIDE PILOT PUNCHES
—MOVABLE TYPE—

PRODUCTS DATA P.1220

COATING PUNCHES — TiCN —

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No.	View
—Tip R— RoHS	D_{g6} / $D^{-0.005}_{-0.010}$	V30(HIP) 88~89HRA	WSUPT —Lapping type— L—WSUPT —TiCN coating type— H—WSUPT A—WSUPT —Lapping type— AL—WSUPT —TiCN coating type— AH—WSUPT	
—Tip tapered— RoHS	D_{g6} / $D^{-0.005}_{-0.010}$	V30(HIP) 88~89HRA	WTUPT —Lapping type— L—WTUPT —TiCN coating type— H—WTUPT A—WTUPT —Lapping type— AL—WTUPT —TiCN coating type— AH—WTUPT	
—Tip acute-angle— RoHS	D_{g6} / $D^{-0.005}_{-0.010}$	V30(HIP) 88~89HRA Surface 3000HV	WUPT —Lapping type— L—WUPT —TiCN coating type— H—WUPT A—WUPT —Lapping type— AL—WUPT —TiCN coating type— AH—WUPT	

P	G
0.800~1.999	10°
2.000~	15°

Refer to the product data "R length of Punch" for the length of tip R. P.1208
⊗Lapping type RT=0 not applicable.
RT(※)•••▸The P<8 tip is rounded for safety purpose. When tip should stay sharp, specify RT=0. P.1208

Catalog No. Type	D	L	0.001mm increments (coating type 0.01mm increments) min. P max.	0.1mm increments B	Y
(D_{g6} / $D^{-0.005}_{-0.010}$) (Tip R) WSUPT (Tip tapered) WTUPT (Tip acute-angle) WUPT / A—WSUPT A—WTUPT A—WUPT	3	42 52 62	1.000 ~ 2.500	5≦B≦23 TiCN coating type 5≦B≦L/2≦23	2
	4	42 52 62 72	1.500 ~ 3.500		
—Lapping type— (D_{g6} / $D^{-0.005}_{-0.010}$) L—WSUPT L—WTUPT L—WUPT / AL—WSUPT AL—WTUPT AL—WUPT	5	42 52 62 72	2.000 ~ 4.500		3
	6	42 52 62 72	2.500 ~ 5.500		
—TiCN coating type— (D_{g6} / $D^{-0.005}_{-0.010}$) H—WSUPT H—WTUPT H—WUPT / AH—WSUPT AH—WTUPT AH—WUPT	8	42 52 62 72 82	3.000 ~ 7.500		5

Specifying unit of dimension P •••▸0.01mm increments for coating punches. (0.001mm increments available with alternation PKC)

Order

Catalog No.	L	P	B
WUPT 6	62	P4.320	B20

Delivery

● Normal · Lapping type: 3 Days

● TiCN coating type: 8 Days — Express C 1,500/1Pc. P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

Alteration

Catalog No. — L(LC) — P(PC) — B — (PKC···etc.)
WUPT 6 — LC60 — PC2.000 — B20 — PKC — GC30

Alterations	Code	Tip R	tapered/Acute-angle	¥/1Code
Tip	PC	Changes tip diameter P. PC≧Pmin/2 0.001mm increments. Ⓥ When PC is 0.500~0.999, Bmax. is 8mm. ・TiCN coating P≧Pmin./2≧1.00 0.01mm incr.		1,200
	PKC	Changes tolerance on P. ・Normal ・Lapping type $P^{+0.005}_{0}$ ⇨ $P^{+0.003}_{0}$ ・TiCN coating $P^{+0.01}_{0}$ ⇨ $P^{+0.005}_{0}$ Ⓥ Dimension P : 0.001mm increments		1,600 (TiCN coating 1,800)
	PKV	Changes tolerance on P. ・Normal ・Lapping type $P^{+0.005}_{0}$ ⇨ ±0.002 ・TiCN coating $P^{+0.01}_{0}$ ⇨ ±0.005 Ⓥ Specified unit of dimension P stays the same.		0
	RLC	Cuts tip R flat. Specification range $2≦RLC<\sqrt{P(10-P/4)}$ 0.1mm increments	——	600

Alterations	Code	Tip R	tapered/Acute-angle	¥/1Code
Tip	BKC	——	Changes the blade length tolerance. $B^{+0.3}_{0}$ ⇨ $B^{+0.05}_{0}$	1,200
	SC	Improves surface roughness on B. ▽0.2 G ⇨ ▽0.08 GL Machining the base meterial before coating. Ⓥ Applicable to coating type only ⊗R0 •••▸R≦0.2		1,200
	GC	——	Changes tip angle. 15°<GC≦45° 1° increments ⊗Not available for tip tapered type	600
	YC	——	Changes the full length L. ・For P<2.0, 1≦YC≦P×2.83−0.3 ・For P≧2.0, 1≦YC≦P×1.86−0.3≦12 L(LC)+YC≦Lmax+8 0.1mm increments ⊗Not applicable for tip acute-angle type	600
Full length	LC	Changes the full length tolerance. B+9≦LC<L 0.1mm increments		600

Price

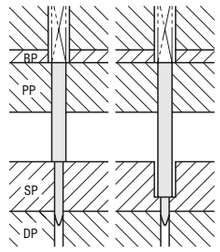
■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

Ⓥ To be quoted on price & lead time above Max. Q'ty.

D	Tip R type WSUPT A—WSUPT	L—WSUPT AL—WSUPT	H—WSUPT AH—WSUPT	Tip tapered type WTUPT A—WTUPT	L—WTUPT AL—WTUPT	H—WTUPT AH—WTUPT	Tip acute-angle type WUPT A—WUPT	L—WUPT AL—WUPT	H—WUPT AH—WUPT
3	3,790	4,930	5,320	3,740	4,880	5,270	3,840	4,980	5,370
4	3,990	5,130	5,550	3,940	5,080	5,500	4,040	5,180	5,600
5	4,200	5,340	5,830	4,150	5,290	5,780	4,250	5,390	5,880
6	4,440	5,580	6,250	4,400	5,540	6,210	4,490	5,630	6,300
8	5,630	6,770	7,630	5,590	6,730	7,590	5,680	6,820	7,680

Example



■Features
① No height adjustment is required after regrinding.
② Pilot punches can be removed without disassembling the dies, and it reduces regriding process.
③ When a misfeed occurs, the pilot punch works and it prevents from biting the material or breakage.

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

CARBIDE BUTTON DIES

CARBIDE BUTTON DIES

Name	CARBIDE BUTTON DIES	SCRAP RETENTION CARBIDE BUTTON DIES	CARBIDE BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP
Catalog No.			
Delivery	③·⑤·Ⓑ	③·⑤·Ⓑ	③
Page	513	515	517

CARBIDE ANGULAR BUTTON DIES	SCRAP RETENTION CARBIDE ANGULAR BUTTON DIES	CARBIDE ANGULAR BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP
③·⑤·Ⓑ·⑧	③·⑤·Ⓑ	③
519	521	523

CARBIDE BUTTON DIE BLANKS	SPACERS FOR BUTTON DIE —For angular button die—	SPACERS FOR BUTTON DIE —For straight button die drain hole—
③Ⓐ	③Ⓐ	①
525	526	526

CARBIDE BUTTON DIES
—GUIDE—

Type		Material	Shank dimension tolerance	Normal Round	Normal Shaped	page	For scrap retention Round	For scrap retention Shaped	page	For preventing clogging of scrap Round	page
Carbide head type		V40(HIP)	Dm5	WHD	WHD□	P.513	SR—WHD	SR—WHD□	P.515	SV—WHD	P.517
			$D^{+0.005}_{0}$	A—WHD	A—WHD□		SRA—WHD	SRA—WHD□		SVA—WHD	
Carbide straight		V40(HIP)	Dn5	WSD	WSD□	P.513	SR—WSD	SR—WSD□	P.515	SV—WSD	P.517
			$D^{+0.005}_{0}$	A—WSD	A—WSD□		SRA—WSD	SRA—WSD□		SVA—WSD	
Carbide angular head type		V40(HIP)	Dm5	WAHD	WAHD□	P.519	SR—WAHD	SR—WAHD□	P.521	SV—WAHD	P.523
			$D^{+0.005}_{0}$	A—WAHD	A—WAHD□		SRA—WAHD	SRA—WAHD□		SVA—WAHD	
Carbide angular straight type		V40(HIP)	Dn5	WASD	WASD□	P.519	SR—WASD	SR—WASD□	P.521	SV—WASD	P.523
			$D^{+0.005}_{0}$	A—WASD	A—WASD□		SRA—WASD	SRA—WASD□		SVA—WASD	

■Scrap retention button dies (Products Data P.1229)

•Available range

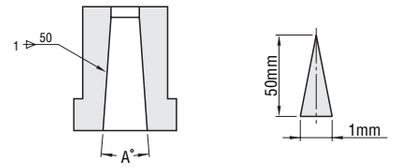
1. Hole diameter····· ϕ 1.0～ϕ 16
2. Workpiece material·····Tensile strength up to 1177N/mm² (120Kgf/mm²)
3. Thickness of workpiece materials·····0.15mm or over
4. The scrap retention effect cannot be expected when the clearance (C) of one side is larger than the workpiece thickness (MT) by 20%. Therefore, keep it to 20% or less.

Either side of clearance (C) < workpiece thickness (MT) ×20%

The scrap retention button die prevents a slug from being pulled up by forming small protrusions on the slug. Therefore, this type is not appropriate when precision holes are required or for products with punched out slug.

■Button dies for preventing clogging of scrap (Products Data P.1231)

■Notation for dimensions of button die relief angle



$1 \rightarrow^{50}$ indicates taper broadened by 1mm against 50mm distance.

Taper	1/50	1/100	1/150
Angle (A°)	1.146°	0.573°	0.382°

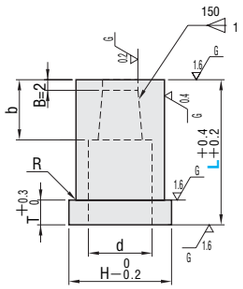
CARBIDE BUTTON DIES
—HEAD TYPE / STRAIGHT TYPE—

The volume discount rate is also applicable to alteration cost. P.39

—Head type— RoHS

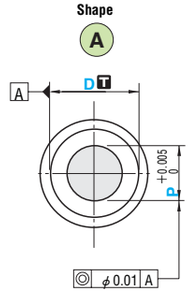
Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable

M H	Shank dia. D T	Catalog No.
V40(HIP) 87～88HRA	D_{m5}	Ⓐ WHD Ⓓ WHDD Ⓡ WHDR Ⓔ WHDE Ⓖ WHDG
	$D\ ^{+0.005}_{0}$	Ⓐ A—WHD Ⓓ A—WHDD Ⓡ A—WHDR Ⓔ A—WHDE Ⓖ A—WHDG

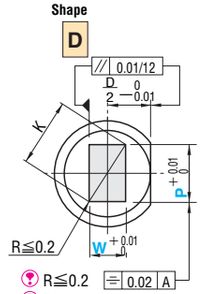


D	3・4・5	6～25
R	R≦0.2	R≦0.5

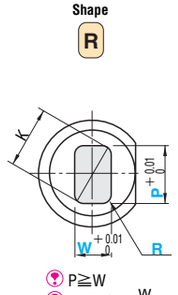
Shape Ⓐ



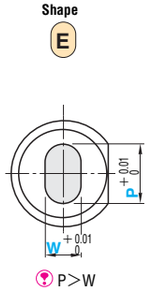
Shape Ⓓ



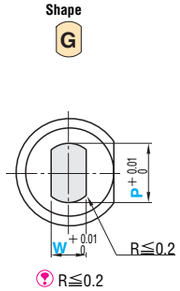
Shape Ⓡ



Shape Ⓔ



Shape Ⓖ



Ⓐ Ⓓ
- R≦0.2
- P≧W
- $K=\sqrt{P^2+W^2}$

Ⓡ
- P≧W
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

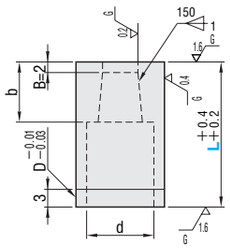
Ⓔ
- P＞W

Ⓖ
- R≦0.2
- P＞W

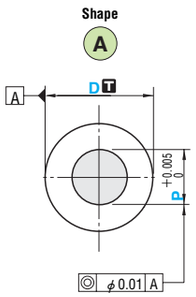
—Straight type— RoHS

Shank Dia.Tolerance D T n5 · $^{+0.005}_{0}$ Selectable

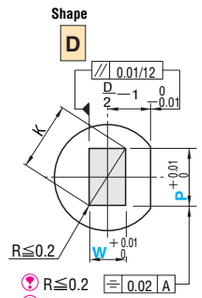
M H	Shank dia. D T	Catalog No.
V40(HIP) 87～88HRA	D_{n5}	Ⓐ WSD Ⓓ WSDD Ⓡ WSDR Ⓔ WSDE Ⓖ WSDG
	$D\ ^{+0.005}_{0}$	Ⓐ A—WSD Ⓓ A—WSDD Ⓡ A—WSDR Ⓔ A—WSDE Ⓖ A—WSDG



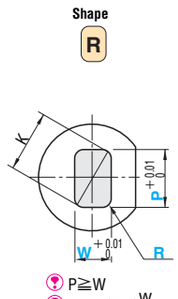
Shape Ⓐ



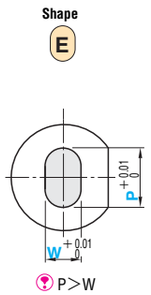
Shape Ⓓ



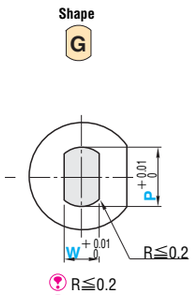
Shape Ⓡ



Shape Ⓔ



Shape Ⓖ



Ⓐ Ⓓ
- R≦0.2
- P≧W
- $K=\sqrt{P^2+W^2}$

Ⓡ
- P≧W
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Ⓔ
- P＞W

Ⓖ
- R≦0.2
- P＞W

D tolerance D	m5	n5	Catalog No. Type (Head (Dm5))	Type (Straight (Dn5))	D	L	0.01mm increments Ⓐ min.	Ⓐ P	Ⓐ max.	ⒹⓇⒺⒼ P·Kmax.	ⒹⓇⒺⒼ P·Wmin.	Ⓡ R	b	d	H	T
3	+0.006 +0.002	+0.008 +0.004			(3)		0.50～	1.00		—	—			1.4	4	
4					(4)		0.50～	1.50		—	—		2	2.0	5	3
5	+0.009 +0.004	+0.013 +0.008			(5)	13	0.50～	2.50		—	—			3.0	6	
6			WHD	WSD	6	16	1.00～	3.00		3.00	1.00		3	3.4	9	
8	+0.012 +0.006	+0.016 +0.010	WHDD	WSDD	8	20	1.00～	4.00		4.00	1.00		4	4.4	11	
10			WHDR	WSDR	10	22	2.00～	6.00		6.00	1.20	0.15≦R＜W/2 (Ⓡ only)	6	6.4	13	
13	+0.015 +0.007	+0.020 +0.012	WHDE	WSDE	13	25	3.00～	8.00		8.00	1.50			8.4	16	5
16			WHDG	WSDG	16	(30)	5.00～	10.00		10.00	2.00		8	10.6	19	
20	+0.017 +0.008	+0.024 +0.015	($D^{+0.005}_{0}$) A—WHD	($D^{+0.005}_{0}$) A—WSD	20	(35)	7.00～	12.00		12.00	2.00			12.6	23	
25			A—WHDD	A—WSDD	25		10.00～	16.00		16.00	2.00			16.6	28	
			A—WHDR	A—WSDR												
			A—WHDE	A—WSDE												
			A—WHDG	A—WSDG												

Ⓓ=(3), (4) and (5) are available for shape Ⓐ (round) only. Shapes ⒹⓇⒺⒼ are not available. Full lengths (30) and (35) are available for D8 to 25 only.

Order

Catalog No.	L	P	W	R(Ⓡ only)
WHDR 13	25	P6.50	W4.00	R1.00

Delivery

- Ⓐ: 3 Days
- ⒹⓇⒺⒼ: 5 Days
- Express B: 1,500/1Pc. P.38
- A flat charge of 4,050 yen for 3 pieces or more of the same size.

Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No. Type	D	U/Price Q'ty : 1～4
WHD	3	7,760
	4	7,760
	5	7,760
	6	5,830
	8	6,290
A—WHD	10	7,090
	13	7,880
	16	9,830
	20	12,930
	25	14,730

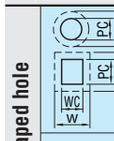
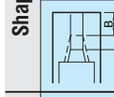
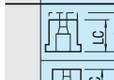
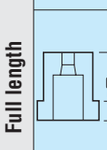
Catalog No. Type	D	U/Price Q'ty : 1～4
	3	—
	4	—
WHDD	5	—
WHDR	6	7,590
WHDE	8	8,170
WHDG	10	9,210
A—WHDD	13	10,250
A—WHDR	16	12,790
A—WHDE	20	16,810
A—WHDG	25	19,150

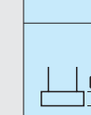
Catalog No. Type	D	U/Price Q'ty : 1～4
	3	7,180
	4	7,180
	5	7,180
	6	5,330
WSD	8	4,840
A—WSD	10	5,540
	13	6,290
	16	7,930
	20	9,430
	25	11,330

Catalog No. Type	D	U/Price Q'ty : 1～4
	3	—
	4	—
WSDD	5	—
WSDR	6	6,930
WSDE	8	6,290
WSDG	10	7,200
A—WSDD	13	8,170
A—WSDR	16	10,320
A—WSDE	20	12,260
A—WSDG	25	14,730

Alterations Catalog No. — L(LC·SLC) — P(PC) — W(WC) — R — (BC·HC·TC·CKC·MKC…etc.)

WHDD 10 — 25 — P5.00 — W3.20 — TC3.0—TKC—KFC45

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Shaped hole		PC WC	Changes dimension P(W) min : $\frac{P}{W} > \frac{PC}{WC} \geqq \frac{P \cdot Wmin}{2} \geqq 1.00$ 0.01mm increments max : $\frac{P}{W} < \frac{PC}{WC} \leqq P \cdot Kmax + 0.2$ 0.01mm increments		1,200
		BC	Changes dimension of shaped hole depth 1≦BC≦b 0.1mm increments Ⓐ only is 1≦BC≦4 for PC1.00～1.99	Ⓐ 900 ⒹⓇⒺⒼ 1,400	
Full length		LC	Changes full length 10≦L−(b−1)≦LC＜L 0.1mm incr. (Comb. with LKC・LKZ・CKC・MKC→0.01mm incr.) b is shortened by (L−LC). Changes full length 8≦LC＜L 0.1mm incr. (Comb. with LKC・LKZ→0.01mm incr.)		600
		LKC	Changes L tolerance $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$ ⊗L(LC)＜10：Not applicable		1,200
		LKZ	Changes L tolerance $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.01}_{0}$ ⊗L(LC)＜10：Not applicable		1,800
		CKC	Changes head thickness tolerance and full length tolerance in one code. See detail of each unit's alternation for machining limit. (Thickness) TKC $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ + (Length) LKC $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$ ⊗L(LC)＜16：Not applicable		1,900
		MKC	TKM $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ + LKC $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$ ⊗L(LC)＜16：Not applicable		1,900
		SLC	Changes full length and full length tolerance in one code. Specifiable range, unit, how to order and notes are the same as LC. LC + LKC $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$ 0.01mm increments Applicable only for straight type ⊗L(LC)＜10：Not applicable		1,400

Alterations		Code	Ⓐ	ⒹⓇⒺⒼ	¥/1Code
Head		KC	Adds single key flat at head.	Changes position of single key flat. 1° increments	600
			Adds single key flat. ⊗D3～5：Not applicable	Changes position of single key flat. 1° increments	
		WKC	Adds double key flats in parallel ⊗The combination of KC and KFC N/A. ⊗Straight type, D3～5：Not applicable		1,200
		KFC	Adds 1 key flat at 0° and the other on another angle	Adds 1 key flat at 0° and the other on another angle ⊗Straight type：Not applicable ⊗L(LC)＜16：Not applicable ⊗KC・WKC：Not applicable	1,200
		HC	Changes head diameter D≦HC＜H 0.1mm increments		600
		TC	Changes head thickness 2≦TC＜T 0.1mm incr. (Comb. with TKC・TKM・CKC・MKC→0.01mm incr.) L is shortened by (T−TC). When LC is applied, L is equal to LC.		600
		TKC	Changes head thickness tolerance $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ ⊗L(LC)＜16：Not applicable		1,200
		TKM	Changes head thickness tolerance $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ ⊗L(LC)＜16：Not applicable		1,200
Shank		SKC	Adds key flat on the shank Applicable only for head type Applicable to D≧8, L≧20 ⊗Combination with KC・WKC・KFC：Not applicable		1,200

SCRAP RETENTION CARBIDE BUTTON DIES
—HEAD TYPE/STRAIGHT TYPE—

PRODUCTS DATA P.1229 SCRAP RETENTION DIES

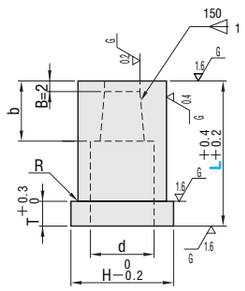
The volume discount rate is also applicable to alteration cost. P.39

—Head type—

RoHS

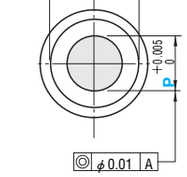
Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable

M H	Shank dia. D T	Catalog No.
V40(HIP) 87~88HRA	D_{m5}	(A) SR—WHD (D) SR—WHDD (R) SR—WHDR (E) SR—WHDE (G) SR—WHDG
	$D^{+0.005}_{0}$	(A) SRA—WHD (D) SRA—WHDD (R) SRA—WHDR (E) SRA—WHDE (G) SRA—WHDG

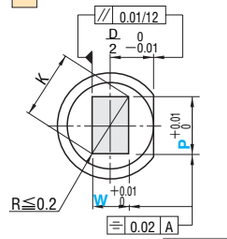


D	4·5	6~25
R	R≦0.2	R≦0.5

Shape (A)

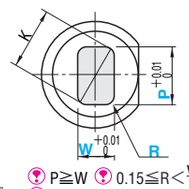


Shape (D)



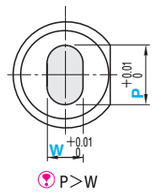
(P) P≧W (P) K=$\sqrt{P^2+W^2}$
(P) P−0.4≧1.5
(Dimension P straight part 1.5mm or more)

Shape (R)



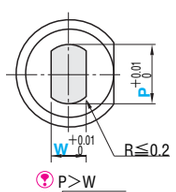
(P) P≧W (P) 0.15≦R<$\frac{W}{2}$
(P) P−2R≧1.5
(Dimension P straight part 1.5mm or more)
(P) K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape (E)



(P) P>W

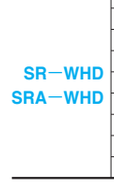
Shape (G)



(P) P>W
(P) $\sqrt{P^2-W^2}$≧1.5
(Dimension P straight part 1.5mm or more)

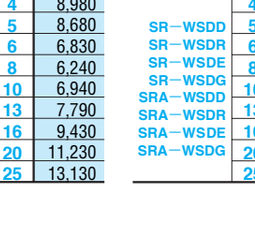
—Straight type—

RoHS

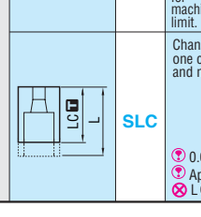


Shank Dia.Tolerance D T n5 · $^{+0.005}_{0}$ Selectable

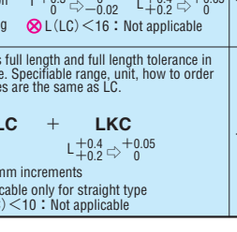
M H	Shank dia. D T	Catalog No.
V40(HIP) 87~88HRA	D_{n5}	(A) SR—WSD (D) SR—WSDD (R) SR—WSDR (E) SR—WSDE (G) SR—WSDG
	$D^{+0.005}_{0}$	(A) SRA—WSD (D) SRA—WSDD (R) SRA—WSDR (E) SRA—WSDE (G) SRA—WSDG



Shape (A)

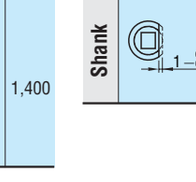


Shape (D)



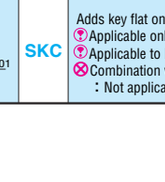
(P) P≧W (P) K=$\sqrt{P^2+W^2}$
(P) P−0.4≧1.5
(Dimension P straight part 1.5mm or more)

Shape (R)



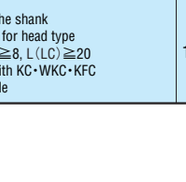
(P) P≧W (P) 0.15≦R<$\frac{W}{2}$
(P) P−2R≧1.5
(Dimension P straight part 1.5mm or more)
(P) K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape (E)



(P) P>W

Shape (G)



(P) P>W
(P) $\sqrt{P^2-W^2}$≧1.5
(Dimension P straight part 1.5mm or more)

D tolerance			Catalog No. Type		D	L	0.01mm increments Ⓐ min.	0.01mm increments Ⓐ P max.	0.01mm increments DREG P·Kmax.	0.01mm increments DREG P·Wmin.	R	MT (Material thickness)	0.005mm increments C (Clearance)	b	d	H	T
D	m5	n5	Head (D_{m5})	Straight (D_{n5})													
4	+0.009 +0.004	+0.013 +0.008	SR—WHD	SR—WSD	(4)	13	1.00~	1.50	—	—	0.15≦R<W/2 (Ⓡonly)	MT≧0.15 Specifiable with material thickness 0.15mm or more.	C≧0.010 Specifiable with clearance 0.010mm or more.	2	2.0	5	3
5			SR—WHDD	SR—WSDD	(5)		1.00~	2.50	—	—					3.0	6	
6			SR—WHDR	SR—WSDR	6	16	1.00~	3.00	3.00	1.00				3	3.4	9	5
8	+0.012 +0.006	+0.016 +0.010	SR—WHDE	SR—WSDE	8	20	1.00~	4.00	4.00	1.00				4	4.4	11	
10			SR—WHDG	SR—WSDG	10	22	2.00~	6.00	6.00	1.20				6	6.4	13	
13	+0.015 +0.007	+0.020 +0.012	($D^{+0.005}_{0}$) SRA—WHD	($D^{+0.005}_{0}$) SRA—WSD	13	25	3.00~	8.00	8.00	1.50				8	8.4	16	
16			SRA—WHDD	SRA—WSDD	16	(30)	5.00~	10.00	10.00	2.00					10.6	19	
20	+0.017 +0.008	+0.024 +0.015	SRA—WHDR	SRA—WSDR	20	(35)	7.00~	12.00	12.00	2.00					12.6	23	
25			SRA—WHDE	SRA—WSDE	25		10.00~	16.00	16.00	2.00					16.6	28	
			SRA—WHDG	SRA—WSDG													

(P) D=(4) and (5) are available for shape Ⓐ (round) only. Shapes DREG are not available.
(P) Full lengths (30) and (35) are available for D8 to 25 only.
(P) Applicable only to the workpiece which has the tensile strength up to 1177N/mm² (120kgf/mm²).
(P) Workpiece thickness and clearance should be used for machining data of scrap retentions. Specify dimension (P, W, R) with finished dimensions of Button die.

Order

Catalog No.	L	P	W	R(Ⓡ only)	MT	C
SR—WHDR 13	25	P6.50	W4.00	R1.00	MT1.50	C0.105

• Ⓐ 3 Days
• DREG 5 Days
Express B 1,500/1Pc. P.38
(P) A flat charge of 4,050 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

(P) To be quoted on price & lead time above Max. Q'ty.

Catalog No. Type	D	U/Price Q'ty : 1~4
SR—WHD SRA—WHD	4	9,560
	5	9,260
	6	7,330
	8	7,690
	10	8,490
	13	9,380
	16	11,330
	20	14,730
	25	16,530

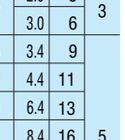
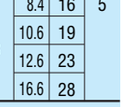
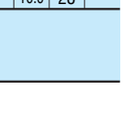
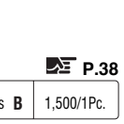
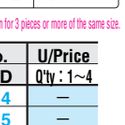
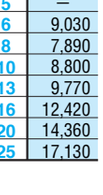
Catalog No. Type	D	U/Price Q'ty : 1~4
	4	—
SR—WHDD	5	—
SR—WHDR	6	9,690
SR—WHDE	8	9,770
SR—WHDG	10	10,810
SRA—WHDD	13	11,850
SRA—WHDR	16	14,890
SRA—WHDE	20	18,910
SRA—WHDG	25	21,550

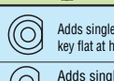
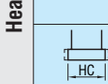
Catalog No. Type	D	U/Price Q'ty : 1~4
	4	8,980
	5	8,680
	6	6,830
	8	6,240
SR—WSD	10	6,940
SRA—WSD	13	7,790
	16	9,430
	20	11,230
	25	13,130

Catalog No. Type	D	U/Price Q'ty : 1~4
	4	—
SR—WSDD	5	—
SR—WSDR	6	9,030
SR—WSDE	8	7,890
SR—WSDG	10	8,800
SRA—WSDD	13	9,770
SRA—WSDR	16	12,420
SRA—WSDE	20	14,360
SRA—WSDG	25	17,130

Alteration

Catalog No. — L(LC·SLC) — P(PC) — W(WC) — R — MT — C — (BC·HC·TC·CKC·MKC···etc.)
SR—WHDD 10 — 25 — P5.00 — W3.20 — MT1.50 — C0.105 — TC3.0 — TKC

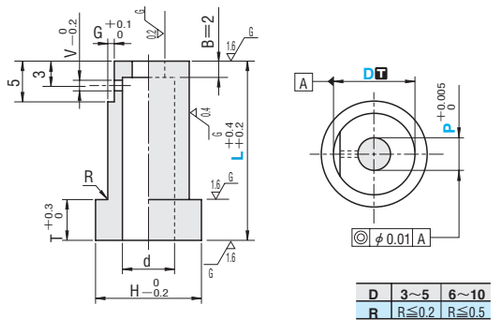
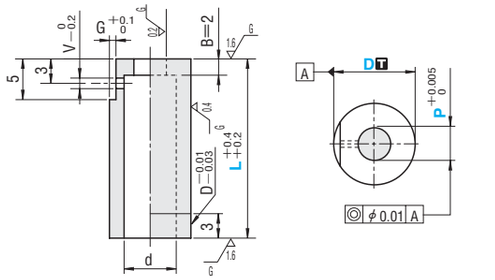
Alterations		Code	Ⓐ	DREG	¥/1Code
Shaped hole		PC WC	Changes dimension P(W) min : $\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P+Wmin}{2}\geqq1.00$ 0.01mm increments ⊗Cannot combine with BC. max : $\frac{P}{W}<\frac{PC}{WC}\leqq P+Kmax+0.2$ 0.01mm increments		1,200
		BC	Changes dimension of shaped hole depth 1≦BC<2 0.1mm increments	Ⓐ 900 DREG 1,400	
Full length		LC	Changes full length 10≦L−(b−1)≦LC<L 0.1mm incr. (Comb. with LKC·LKZ·CKC·MKC→0.01mm incr.) (P) b is shortened by (L−LC).		600
		LC	Changes full length 8≦LC<L 0.1mm incr. (Comb. with LKC·LKZ→0.01mm incr.)		
		LKC	Changes L tolerance $L^{+0.4}_{+0.2}\Rightarrow^{+0.05}_{0}$ ⊗L(LC)<10 : Not applicable		1,200
		LKZ	Changes L tolerance $L^{+0.4}_{+0.2}\Rightarrow^{+0.01}_{0}$ ⊗L(LC)<16 : Not applicable		1,800
		CKC	Changes head thickness tolerance and full length tolerance in one code. See detail of each unit's alternation for machining limit. (Thickness) TKC $T^{+0.3}_{0}\Rightarrow^{+0.02}_{0}$ + (Length) LKC $L^{+0.4}_{+0.2}\Rightarrow^{+0.05}_{0}$ ⊗L(LC)<16 : Not applicable		1,900
		MKC	TKM $T^{+0.3}_{0}\Rightarrow^{0}_{-0.02}$ + LKC $L^{+0.4}_{+0.2}\Rightarrow^{+0.05}_{0}$ ⊗L(LC)<16 : Not applicable		1,900
		SLC	Changes full length and full length tolerance in one code. Specifiable range, unit, how to order and notes are the same as LC. LC + LKC $L^{+0.4}_{+0.2}\Rightarrow^{+0.05}_{0}$ (P) 0.01mm increments (P) Applicable only for straight type ⊗L(LC)<10 : Not applicable		1,400

Alterations		Code	Ⓐ	DREG	¥/1Code
Head		KC	Adds single key flat at head. Adds single key flat. ⊗D4/5 : Not applicable	 Changes position of single key flat. 1° increments	600
		WKC	Adds double key flats in parallel ⊗The combination of KC and KFC N/A. ⊗Straight type, D4/5 : Not applicable		1,200
		KFC	Adds 1 key flat at 0° and the other on another angle 1° increments ⊗Straight type : Not applicable ⊗L(LC)<16 : Not applicable ⊗KC·WKC : Not applicable		1,200
		HC	Changes head diameter D≦HC<H 0.1mm increments		600
		TC	Changes head thickness 2≦TC<T 0.1mm incr. (Comb. with TKC·TKM·CKC·MKC →0.01mm incr.) (P) L is shortened by (T−TC). When LC is applied, L is equal to LC.		600
		TKC	Changes head thickness tolerance $T^{+0.3}_{0}\Rightarrow^{+0.02}_{0}$ ⊗L(LC)<16 : Not applicable		1,200
		TKM	Changes head thickness tolerance $T^{+0.3}_{0}\Rightarrow^{0}_{-0.02}$ ⊗L(LC)<16 : Not applicable		1,200
Shank		SKC	Adds key flat on the shank (P) Applicable only for head type (P) Applicable to D≧8, L(LC)≧20 ⊗Combination with KC·WKC·KFC : Not applicable		1,200

CARBIDE BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP
—HEAD TYPE/STRAIGHT TYPE—

PRODUCTS DATA P.1231 BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP
RELATED PRODUCTS P.297 SCRAP VACUUM UNIT

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Shank dia.	Catalog No.	View
—Head type— RoHS Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable	V40(HIP) 87~88HRA	Dm5	SV—WHD	
		$D^{+0.005}_{0}$	SVA—WHD	
—Straight type— RoHS Shank Dia.Tolerance D T n5 · $^{+0.005}_{0}$ Selectable	V40(HIP) 87~88HRA	Dn5	SV—WSD	
		$D^{+0.005}_{0}$	SVA—WSD	

D	3~5	6~10
R	R≦0.2	R≦0.5

D tolerance D	m5	n5	Catalog No. Type	D	L	0.01mm increments min. P max.	V	G	d	H	T
3	+0.006 +0.002	+0.008 +0.004	Head (Dm5) SV—WHD / Straight (Dn5) SV—WSD	3	13 16 20 22 25	0.50~1.00	0.4	0.2	1.4	4	3
4	+0.009 +0.004	+0.013 +0.008		4		0.50~1.50			2.0	5	
5				5		0.50~2.50			3.0	6	
6			($D^{+0.005}_{0}$) SVA—WHD / ($D^{+0.005}_{0}$) SVA—WSD	6		1.00~3.00	0.8	0.3	3.4	9	5
8	+0.012 +0.006	+0.016 +0.010		8		1.00~4.00			4.4	11	
10				10		2.00~6.00			6.4	13	

Order — Catalog No. — L — P
SV—WHD10 — 25 — P4.50

Delivery — 3 Days

Price

■Volume discount rate P.37

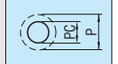
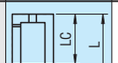
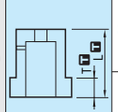
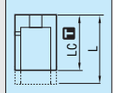
Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No. Type	D	U/Price Q'ty : 1~4
SV—WHD SVA—WHD	3	10,170
	4	10,170
	5	10,170
	6	8,140
	8	8,620
	10	9,460

Catalog No. Type	D	U/Price Q'ty : 1~4
SV—WSD SVA—WSD	3	9,560
	4	9,560
	5	9,560
	6	7,610
	8	7,090
	10	7,830

Alteration — Catalog No. — L(LC・SLC) — P(PC) — (HC・TC・CKC・MKC…etc.)
SV—WSD8 — LC18 — PC4.20 — LKC

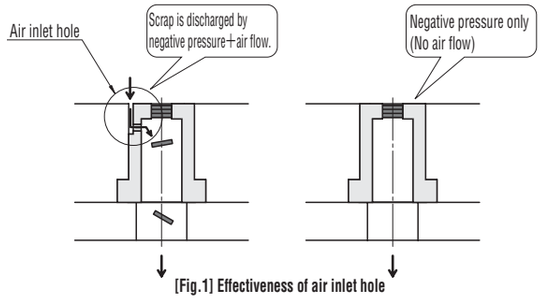
Alterations		Code	Spec.	¥/1Code
Shaped hole		PC	Changes dimension P min : P > PC ≧ Pmin/2 ≧1.00 0.01mm increments max : P < PC ≦Pmax+0.2 0.01mm increments	1,200
Full length		LC	Changes full length 8≦LC<L 0.1mm incr.(Comb. with LKC・LKZ→0.01mm incr.) Press-in lead is (L—LC) shorter. ⊗Head type : Not applicable	600
		LKC	Changes L tolerance $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗L(LC)<10 : Not applicable	1,200
		LKZ	Changes L tolerance $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗L(LC)<16 : Not applicable	1,800
		CKC	(Thickness) TKC + (Length) LKC Changes head thickness tolerance and full length tolerance in one code. See detail of each unit's alternation for machining limit. T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗L(LC)<16 : Not applicable	1,900
		MKC	TKM + LKC T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗L(LC)<16 : Not applicable	1,900
		SLC	Changes full length and full length tolerance in one code. Specifiable range, unit, how to order and notes are the same as LC. LC + LKC L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ 0.01mm increments Applicable only for straight type ⊗L(LC)<10 : Not applicable	1,400

Alterations		Code	Spec.	¥/1Code
Head		KC	Adds single key flat at head. Adds single key flat. ⊗D3~5 : Not applicable	600
		WKC	Adds double key flats in parallel ⊗The combination of KC and KFC N/A. ⊗Straight type : Not applicable	1,200
		KFC	Adds 1 key flat at 0° and the other on another angle 1° increments ⊗Straight type : Not applicable ⊗L(LC)<16 : Not applicable ⊗KC・WKC : Not applicable	1,200
		HC	Changes head diameter D≦HC<H 0.1mm increments	600
		TC	Changes head thickness 2≦TC<T 0.1mm incr.(Comb. with TKC・TKM・CKC・MKC→0.01mm incr.) L is shortened by (T—TC). When LC is applied, L is equal to LC.	600
		TKC	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗L(LC)<16 : Not applicable	1,200
		TKM	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗L(LC)<16 : Not applicable	1,200

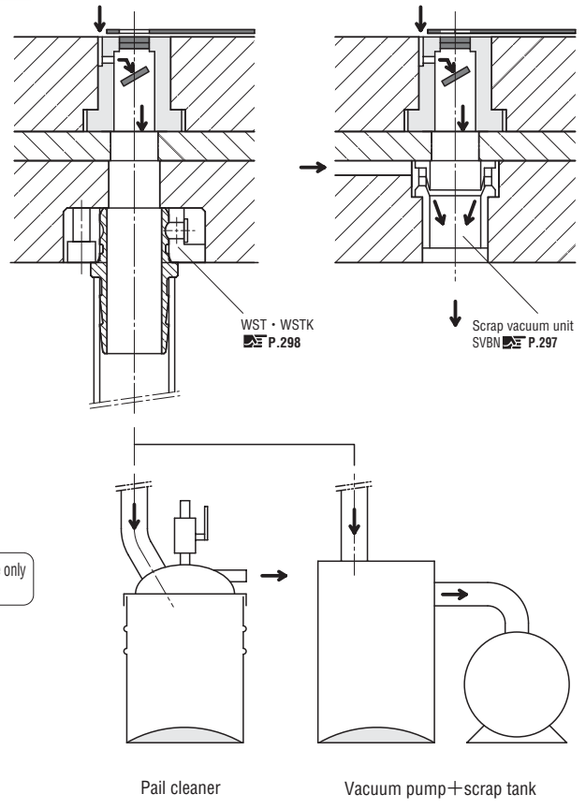
Example

■Features

- These carbide button dies for preventig clogging of scrap are intended to be used in combination with a vacuum device such as a vacuum pump.
- Due to the air inlet hole near the shaped hole, there will be air flow produced inside of Button die when the vacuum device is on. This results in higher scrap discharge effectiveness than that of Button die without air inlet. [Fig.1]
- For the vacuum device, it is also possible to use a scrap vacuum unit (P.297)or a commercially available pail-mounted type cleaner, instead of a vacuum pump. In such a case, compressed air from a compressor is the drive source. [Fig.2]
- Button dies for preventing clogging of scrap P.1231 [Products Data]



[Fig.1] Effectiveness of air inlet hole



[Fig.2] Examples of use in combination with different vacuum devices

CARBIDE ANGULAR BUTTON DIES
—HEAD TYPE / STRAIGHT TYPE—

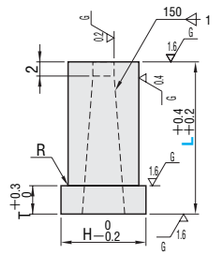
¥ The volume discount rate is also applicable to alteration cost. P.39

—Head type—

RoHS

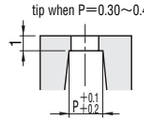
Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable

M H	Shank dia. D T	Catalog No.
V40(HIP) 87～88HRA	D_{m5}	Ⓐ WAHD D WAHDD R WAHDR E WAHDE G WAHDG
	$D^{+0.005}_{0}$	Ⓐ A—WAHD D A—WAHDD R A—WAHDR E A—WAHDE G A—WAHDG



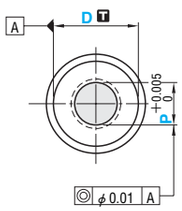
Ⓡ In case of D2・2.5・3・4・5, the relief angle is 1/50.

Ⓡ Magnified view of the tip when P=0.30～0.49

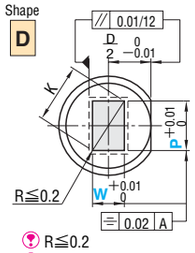


D	2・2.5・3・4・5	6～25
R	R≦0.2	R≦0.5

Shape Ⓐ

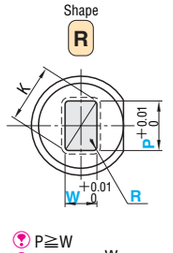


Shape Ⓓ



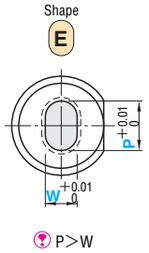
Ⓡ R≦0.2
Ⓡ P≧W
Ⓡ $K=\sqrt{P^2+W^2}$

Shape Ⓡ



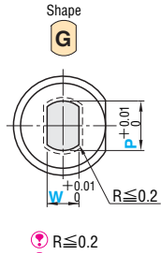
Ⓡ P≧W
Ⓡ $0.15 \leqq R < \frac{W}{2}$
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape Ⓔ



Ⓡ P>W

Shape Ⓖ



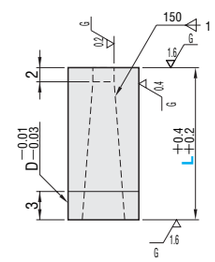
Ⓡ R≦0.2
Ⓡ P>W

—Straight type—

RoHS

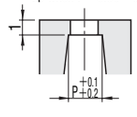
Shank Dia.Tolerance D T n5 · $^{+0.005}_{0}$ Selectable

M H	Shank dia. D T	Catalog No.
V40(HIP) 87～88HRA	D_{n5}	Ⓐ WASD D WASDD R WASDR E WASDE G WASDG
	$D^{+0.005}_{0}$	Ⓐ A—WASD D A—WASDD R A—WASDR E A—WASDE G A—WASDG

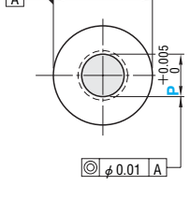


Ⓡ In case of D2・2.5・3・4・5, the relief angle is 1/50.

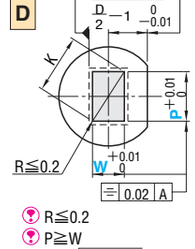
Ⓡ Magnified view of the tip when P=0.30～0.49



Shape Ⓐ

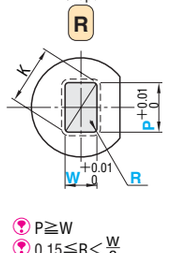


Shape Ⓓ



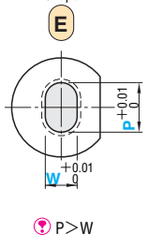
Ⓡ R≦0.2
Ⓡ P≧W
Ⓡ $K=\sqrt{P^2+W^2}$

Shape Ⓡ



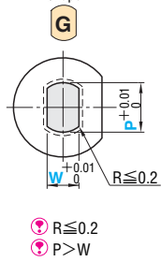
Ⓡ P≧W
Ⓡ $0.15 \leqq R < \frac{W}{2}$
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape Ⓔ



Ⓡ P>W

Shape Ⓖ



Ⓡ R≦0.2
Ⓡ P>W

D tolerance D	m5	n5	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P・Kmax.	Ⓓ Ⓡ Ⓔ Ⓖ P・Wmin.	R	H	T
2	+0.006 +0.002	+0.008 +0.004	Head (Dm5) / Straight (Dn5)	(2)	10	0.30～ 0.49	—	—	—	3	3
2.5				(2.5)	13	0.30～ 0.49	—	—		3.5	
3				(3)	16	0.30～ 0.49	—	—		4	
3				(3)		0.50～ 1.00	—	—		4	
4	+0.009 +0.004	+0.013 +0.008		(4)	13	0.50～ 1.50	—	—		5	
5				(5)		0.50～ 2.50	—	—		6	
6				6	16	1.00～ 3.00	3.00	1.00		9	
8	+0.012 +0.006	+0.016 +0.010		8	20	1.00～ 4.00	4.00	1.00		11	5
10				10	22	2.00～ 6.00	6.00	1.20		13	
13	+0.015 +0.007	+0.020 +0.012		13	25	3.00～ 8.00	8.00	1.50		16	
16				16	(30)	5.00～ 10.00	10.00	2.00		19	
20	+0.017 +0.008	+0.024 +0.015		20	(35)	7.00～ 12.00	12.00	2.00		23	
25				25		10.00～ 16.00	16.00	2.00		28	

Head (Dm5): WAHD, WAHDD, WAHDR, WAHDE, WAHDG — (D $^{+0.005}_{0}$): A—WAHD, A—WAHDD, A—WAHDR, A—WAHDE, A—WAHDG

Straight (Dn5): WASD, WASDD, WASDR, WASDE, WASDG — (D $^{+0.005}_{0}$): A—WASD, A—WASDD, A—WASDR, A—WASDE, A—WASDG

Ⓡ D(2), (2.5), (3), (4), and (5) are available for shape Ⓐ(round) only. Shapes Ⓓ Ⓡ Ⓔ Ⓖ are not available.
Ⓡ When P is 0.30～0.49, this is applicable for L10/13/16 only.
Ⓡ Full lengths (30) and (35) are applicable for D8 to 25 only.

Order

Catalog No.	L	P	W	R(Ⓡ only)
WAHDR 13	25	P6.50	W4.00	R1.00

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

Ⓡ To be quoted on price & lead time above Max. Q'ty.

Ⓐ P≧0.5	Ⓐ P≦0.49	Ⓓ Ⓡ Ⓔ Ⓖ
3 Days	8 Days	5 Days

Express B 1,500/1Pc. P.38

Ⓡ A flat charge of 4,050 yen for 3 pieces or more of the same size.

Catalog No. Type	D	U/Price Q'ty : 1～4
WAHD / A—WAHD	2	11,510
	2.5	11,510
	3	9,340
	4	9,340
	5	9,340
	6	6,980
	8	7,580
	10	8,730
	13	9,680
	16	12,780
	20	16,380
	25	18,380

Catalog No. Type	D	U/Price Q'ty : 1～4
	2	—
	2.5	—
WAHDD	3	—
WAHDR	4	—
WAHDE	5	—
WAHDG	6	9,080
A—WAHDD	8	9,860
A—WAHDR	10	11,350
A—WAHDE	13	12,600
A—WAHDG	16	16,620
	20	21,300
	25	23,900

Catalog No. Type	D	U/Price Q'ty : 1～4
WASD / A—WASD	2	10,640
	2.5	10,640
	3	8,550
	4	8,550
	5	8,550
	6	6,630
	8	6,080
	10	8,180
	13	9,190
	16	11,930
	20	15,530
	25	17,530

Catalog No. Type	D	U/Price Q'ty : 1～4
	2	—
	2.5	—
WASDD	3	—
WASDR	4	—
WASDE	5	—
WASDG	6	8,630
A—WASDD	8	7,910
A—WASDR	10	10,640
A—WASDE	13	11,940
A—WASDG	16	14,960
	20	18,030
	25	21,000

Alteration

Catalog No. — L(LC・SLC・LCT・LMT) — P(PC) — W(WC) — R — (BC・HC・TC・CKC・MKC…etc.)

WAHDD 10 — 25 — P5.00 — W3.20 — TC3.0—TKC

Alterations	Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Shaped hole	PC WC	Changes dimension P(W) $\min: \frac{P}{W} > \frac{PC}{WC} \geqq \frac{P \cdot Wmin}{2} \geqq 1.00$ 0.01mm increments $\max: \frac{P}{W} < \frac{PC}{WC} \leqq P \cdot Kmax + 0.2$ 0.01mm increments		1,200
	BC	Changes dimension of shaped hole depth 1≦BC≦4 0.1mm increments ⊗P0.30～0.49 are not applicable.	Ⓐ 900 Ⓓ Ⓡ Ⓔ Ⓖ 1,400	
Full length	LC	Changes full length 10≦LC<L 0.1mm incr. (Comb. with LKC・LKZ・CKC・MKC→0.01mm incr.) Ⓡ When P = 0.30 ~ 0.49, full length is 7≦LC≦16. Changes full length 8≦LC<L 0.1mm incr. (Comb. with LKC・LKZ→0.01mm incr.)		600
	LKC	Changes L tolerance L ±0.4 ±0.2 ⇨ $^{+0.05}_{0}$ ⊗L(LC)<16 : Not applicable		1,200
	LKZ	Changes L tolerance L ±0.4 ±0.2 ⇨ $^{+0.01}_{0}$ ⊗L(LC)<16 : Not applicable		1,800
	CKC	Changes head thickness tolerance and full length tolerance in one code. See detail of each unit's alternation for machining limit.	(Thickness) TKC + (Length) LKC ⊗L(LC)<16 : Not applicable	1,900
	MKC		TKM + LKC ⊗L(LC)<16 : Not applicable	1,900
	SLC	Changes full length and full length tolerance in one code. Specifiable range, unit, how to order and notes are the same as LC.	LC + LKC Ⓡ 0.01mm increments Ⓡ Applicable only for straight type ⊗L(LC)<10 : Not applicable	1,400
	LCT	Changes head thickness tolerance and full length tolerance in one code. How to order is as the same as LC. See details of each unit's alternation for machining limit and remarks	TKC + LC + LKC Ⓡ 0.01mm increments ⊗L(LC)<16 : Not applicable	2,400
	LMT		TKM + LC + LKC Ⓡ 0.01mm increments ⊗L(LC)<16 : Not applicable	2,400
Head	WKC	Adds double key flats in parallel ⊗ The combination of KC and KFC N/A. ⊗Straight type, D5 or less : Not applicable		1,200

Alterations	Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Head	KC	Adds single key flat at head. Adds single key flat. ⊗D5 or less : Not applicable	270° 180° 90° 0° Changes position of single key flat. 1° increments	600
	KFC	270° 180° 90° 0° Adds 1 key flat at 0° and the other on another angle 1° increments	270° 180° 90° 0° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗Straight type : Not applicable ⊗L(LC)<16 : Not applicable ⊗KC・WKC : Not applicable	1,200
	HC	Changes head diameter D≦HC<H 0.1mm increments		600
	TC	Changes head thickness 2≦TC<T 0.1mm incr. (Comb. with TKC・TKM・CKC・MKC →0.01mm incr.) Ⓡ L is shortened by (T−TC). When LC is applied, L is equal to LC.		600
	TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0 ⊗L(LC)<16 : Not applicable		1,200
	TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02 ⊗L(LC)<16 : Not applicable		1,200
Shank	SKC	Adds key flat on the shank Ⓡ Applicable only for head type Ⓡ Applicable to D≧8, L(LC)≧20 ⊗Combination with KC・WKC・KFC・ANF : Not applicable		1,200
	ANF	Changes angle of back relief. 0.4≦ANF≦1.2 0.2° increments Ⓡ d≦dmax Ⓡ d=P+2{(L−B)×tan(ANF°)} P−Btan(ANF°)≧0.6 W−Btan(ANF°)≧0.6 ⊗P・W<1.00 : Not applicable ⊗D<6 : Not applicable ⊗SKC・KM : Not applicable	D / d max: 6/3.4, 8/4.4, 10/6.4, 13/8.4, 16/10.6, 20/12.6, 25/16.6 Taper 1/150, Angle 0.191°	600
	KM	Add key groove on the shank. ⊗Cannot be applied to the Head type ⊗D<6 : Not applicable ⊗WKC・ANF : Not applicable When D=6, only working end shape Ⓐ is applicable.	D / h: 6/1, 8/1.5, 10/1.5, 13/1.5, 16/1.5, 20/2, 25/2; ℓ: 5≦ℓ<L, 0.1mm increments Ⓡ KM is machined symmetrically to key flats.	1,200

SCRAP RETENTION CARBIDE ANGULAR BUTTON DIES
—HEAD TYPE / STRAIGHT TYPE—

PRODUCTS DATA P.1229

SCRAP RETENTION DIES

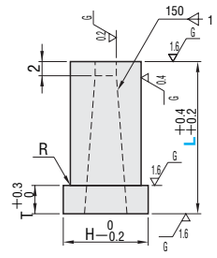
The volume discount rate is also applicable to alteration cost. P.39

—Head type—

RoHS

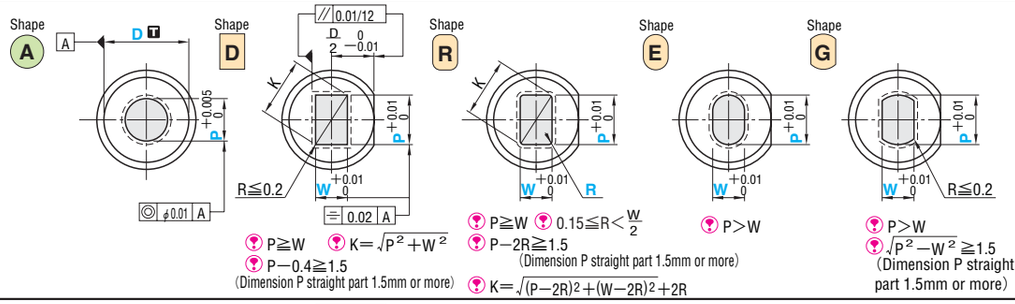
Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable

M / H	Shank dia. D T	Catalog No.
V40(HIP) 87～88HRA	D_{m5}	(A) SR—WAHD (D) SR—WAHDD (R) SR—WAHDR (E) SR—WAHDE (G) SR—WAHDG
	$D\ ^{+0.005}_{0}$	(A) SRA—WAHD (D) SRA—WAHDD (R) SRA—WAHDR (E) SRA—WAHDE (G) SRA—WAHDG



In case of D4・5, relief taper is 1/50.

D	4・5	6～25
R	R≦0.2	R≦0.5

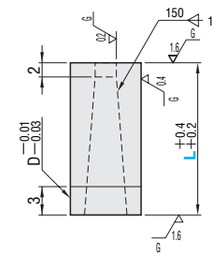


—Straight type—

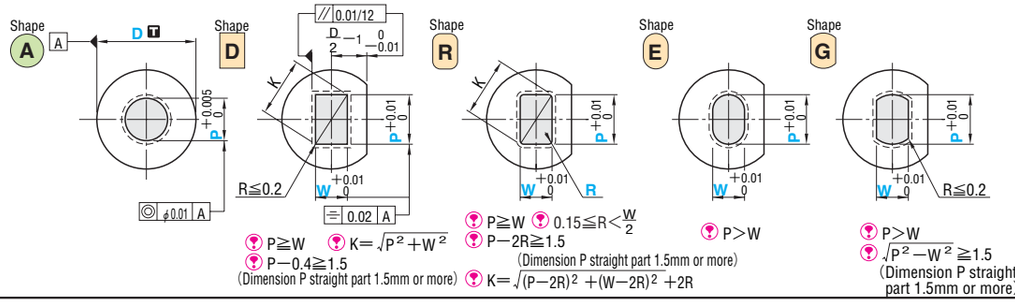
RoHS

Shank Dia.Tolerance D T n5 · $^{+0.005}_{0}$ Selectable

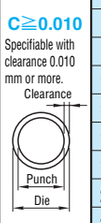
M / H	Shank dia. D T	Catalog No.
V40(HIP) 87～88HRA	D_{n5}	(A) SR—WASD (D) SR—WASDD (R) SR—WASDR (E) SR—WASDE (G) SR—WASDG
	$D\ ^{+0.005}_{0}$	(A) SRA—WASD (D) SRA—WASDD (R) SRA—WASDR (E) SRA—WASDE (G) SRA—WASDG



In case of D4・5, relief taper is 1/50.



D tolerance D	m5	n5	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	Ⓡ R	MT (Material thickness)	0.005mm increments C (Clearance)	H	T
4	+0.009 +0.004	+0.013 +0.008	Head (Dm5) / Straight (Dn5)	(4)	13	1.00～ 1.50	—	—	0.15≦R<W/2 (Ⓡ only)	MT≧0.15 Specifiable with material thickness 0.15mm or more.	C≧0.010 Specifiable with clearance 0.010 mm or more.	5	3
5			SR—WAHD / SR—WASD	(5)		1.00～ 2.50	—	—				6	
6			SR—WAHDD / SR—WASDD	6	16	1.00～ 3.00	3.00	1.00				9	5
8	+0.012 +0.006	+0.016 +0.010	SR—WAHDR / SR—WASDR	8	20	1.00～ 4.00	4.00	1.00				11	
10			SR—WAHDE / SR—WASDE	10	22	2.00～ 6.00	6.00	1.20				13	
13	+0.015 +0.007	+0.020 +0.012	SR—WAHDG / SR—WASDG	13	25	3.00～ 8.00	8.00	1.50				16	
16			(D $^{+0.005}_{0}$) SRA—WAHD / SRA—WASD	16	(30)	5.00～ 10.00	10.00	2.00				19	
20	+0.017 +0.008	+0.024 +0.015	SRA—WAHDD / SRA—WASDD	20	(35)	7.00～ 12.00	12.00	2.00				23	
25			SRA—WAHDR / SRA—WASDR	25		10.00～ 16.00	16.00	2.00				28	
			SRA—WAHDE / SRA—WASDE										
			SRA—WAHDG / SRA—WASDG										



(D(4) and (5) are available for shape Ⓐ(round) only. Shapes DREG are not available.
Full lengths (30) and (35) are available for D8 to 25 only. Applicable only to the workpiece which has the tensile strength up to 1177N/mm² (120kgf/mm²).
Workpiece thickness and clearance should be used for machining data of scrap retentions. Specify dimension (P, W, R) with finished dimensions of Button die.

Order

Catalog No.	L	P	W	R(Ⓡ only)	MT	C
SR—WAHDR 13	25	P6.50	W4.00	R1.00	MT1.50	C0.105

• Ⓐ 3 Days

• DREG 5 Days

Express B 1,500/1Pc. P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No. Type	D	U/Price Q'ty : 1～4
SR—WAHD / SRA—WAHD	4	11,140
	5	11,140
	6	8,670
	8	9,220
	10	10,430
	13	11,480
	16	14,580
	20	18,180
	25	20,180

Catalog No. Type	D	U/Price Q'ty : 1～4
	4	—
SR—WAHDD	5	—
SR—WAHDR	6	11,180
SR—WAHDE	8	11,460
SR—WAHDG	10	12,950
SRA—WAHDD	13	14,200
SRA—WAHDR	16	14,720
SRA—WAHDE	20	23,400
SRA—WAHDG	25	26,300

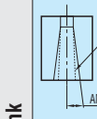
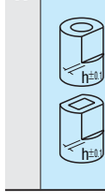
Catalog No. Type	D	U/Price Q'ty : 1～4
	4	10,350
	5	10,350
	6	8,300
	8	7,640
SR—WASD	10	9,850
SRA—WASD	13	10,990
	16	13,730
	20	17,330
	25	19,330

Catalog No. Type	D	U/Price Q'ty : 1～4
	4	—
SR—WASDD	5	—
SR—WASDR	6	10,730
SR—WASDE	8	9,510
SR—WASDG	10	12,240
SRA—WASDD	13	13,540
SRA—WASDR	16	17,060
SRA—WASDE	20	20,130
SRA—WASDG	25	23,400

Alteration

Catalog No. — L(LC·SLC·LCT·LMT) — P(PC) — W(WC) — R — MT — C — (BC·HC·TC·CKC·MKC···etc.)
SR—WAHDD 10 — 25 — P5.00 — W3.20 — MT1.50 — C0.105 — TC3.0 — TKC

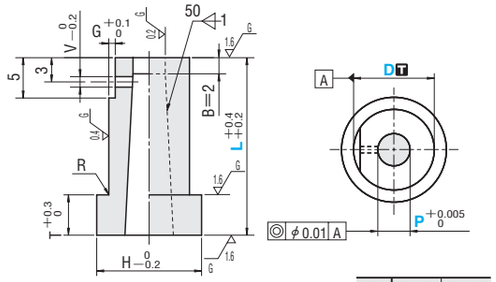
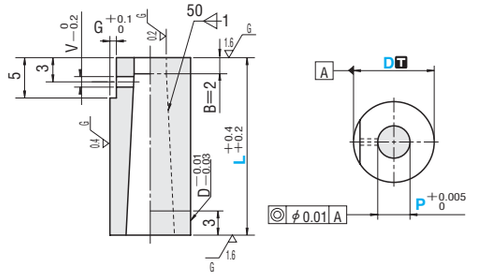
Alterations		Code	Ⓐ	DREG	¥/1Code
Shaped hole		PC WC	Changes dimension P(W) min : $\frac{P}{W}<\frac{PC}{WC}\geqq\frac{P\cdot Wmin.}{2}\geqq 1.00$ 0.01mm increments max : $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax+0.2$ 0.01mm increments		1,200
		BC	Changes dimension of shaped hole depth 1≦BC<2 0.1mm increments	Ⓐ 900 DREG 1,400	
Full length		LC	Changes full length 10≦LC<L 0.1mm incr. (Comb. with LKC·LKZ·CKC·MKC →0.01mm incr.) Changes full length 8≦LC<L 0.1mm incr. (Comb. with LKC·LKZ→0.01mm incr.)		600
		LKC	Changes L tolerance ⊗L(LC)<16 : Not applicable $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$		1,200
		LKZ	Changes L tolerance ⊗L(LC)<16 : Not applicable $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.01}_{0}$		1,800
		CKC MKC	Changes head thickness tolerance and full length tolerance in one code. See detail of each unit's alternation for machining limit. TKC + LKC ⊗L(LC)<16 : Not applicable TKM + LKC ⊗L(LC)<16 : Not applicable		1,900 1,900
		SLC	Changes full length and full length tolerance in one code. Specifiable range, unit, how to order and notes are the same as LC. LC + LKC 0.01mm increments Applicable only for straight type ⊗L(LC)<10 : Not applicable		1,400
		LCT LMT	Changes head thickness tolerance and full length tolerance in one code. How to order is as the same as LC. See details of each unit's alternation for machining limit and remarks TKC + LC + LKC 0.01mm increments ⊗L(LC)<16 : Not applicable TKM + LC + LKC 0.01mm increments ⊗L(LC)<16 : Not applicable		2,400 2,400
Head		WKC	Adds double key flats in parallel ⊗The combination of KC and KFC N/A. ⊗Straight type, D4/5 : Not applicable		1,200

Alterations		Code	Ⓐ	DREG	¥/1Code
Head		KC	Adds single key flat at head. Adds single key flat. ⊗D4/5 : Not applicable	270° 180° 90° 0° Changes position of single key flat. 1° increments	600
		KFC	270° 180° 90° 0° Adds 1 key flat at 0° and the other on another angle 1° increments ⊗Straight type : Not applicable ⊗L(LC)<16 : Not applicable ⊗KC·WKC : Not applicable		1,200
		HC	Changes head diameter D≦HC<H 0.1mm increments		600
		TC	Changes head thickness 2≦TC<T 0.1mm incr. (Comb. with TKC·TKM·CKC·MKC→0.01mm incr.) L is shortened by (T−TC). When LC is applied, L is equal to LC.		600
		TKC	Changes head thickness tolerance $T^{+0.3}_{0}\Rightarrow{}^{+0.02}_{0}$ ⊗L(LC)<16 : Not applicable		1,200
		TKM	Changes head thickness tolerance $T^{+0.3}_{0}\Rightarrow{}^{0}_{-0.02}$ ⊗L(LC)<16 : Not applicable		1,200
Shank		SKC	Adds key flat on the shank Applicable only for head type Applicable to D≧8, L(LC)≧20 ⊗Combination with KC·WKC·KFC·ANF : Not applicable		1,200
		ANF	Changes angle of back relief. 0.4≦ANF≦1.2 0.2° increments d≦dmax d=P+2((L−B)×tan(ANF°)) P−Btan(ANF°)≧0.6 W−Btan(ANF°)≧0.6 ⊗P·W<1.00 : Not applicable ⊗SKC·KM : Not applicable Taper 1/150 Angle 0.191°	D / d max: 4 2.4; 5 2.9; 6 3.4; 8 4.4; 10 6.4; 13 8.4; 16 10.6; 20 12.6; 25 16.6	600
		KM	Add key groove on the shank. ⊗Cannot be applied to the Head type ⊗D<6 : Not applicable ⊗WKC·ANF : Not applicable When D=6, only working end shape Ⓐ is applicable. 5≦ℓ<L 0.1mm increments KM is machined symmetrically to key flats.	D / h / ℓ: 6 1; 8 1.5; 10 1.5; 13 1.5; 16 1.5; 20 2; 25 2	1,200

CARBIDE ANGULAR BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP
—HEAD TYPE/STRAIGHT TYPE—

PRODUCTS DATA P.1231 BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP
RELATED PRODUCTS P.297 SCRAP VACUUM UNIT

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Shank dia. D T	Catalog No.	View
—Head type— RoHS Shank Dia.Tolerance D T m5 · +0.005 0 Selectable	V40(HIP) 87~88HRA	Dm5	SV—WAHD	
		D +0.005 0	SVA—WAHD	
—Straight type— RoHS Shank Dia.Tolerance D T n5 · +0.005 0 Selectable	V40(HIP) 87~88HRA	Dn5	SV—WASD	
		D +0.005 0	SVA—WASD	

D	R
3~5	R≦0.2
6~10	R≦0.5

D tolerance			Catalog No.			L	0.01mm increments	V	G	H	T
D	m5	n5	Type		D		min. P max.				
3	+0.006 +0.002	+0.008 +0.004	Head (Dm5) SV—WAHD	Straight (Dn5) SV—WASD	3	13 16 20 22 25	0.50~1.00	0.4	0.2	4	3
4	+0.009 +0.004	+0.013 +0.008			4		0.50~1.50			5	
5					5		0.50~2.50			6	
6			(D +0.005 0) SVA—WAHD	(D +0.005 0) SVA—WASD	6		1.00~3.00	0.8	0.3	9	5
8	+0.012 +0.006	+0.016 +0.010			8		1.00~4.00			11	
10					10		2.00~6.00			13	

Order Catalog No. — L — P
SV—WAHD10 — 25 — P4.50

Delivery 3 Days

Price

■Volume discount rate P.37

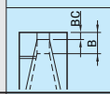
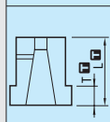
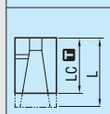
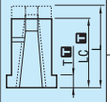
Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

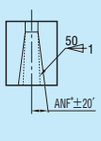
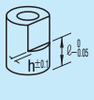
To be quoted on price & lead time above Max. Q'ty.

Catalog No. Type	D	U/Price Q'ty : 1~4
SV—WAHD SVA—WAHD	3	12,830
	4	11,830
	5	11,830
	6	9,350
	8	9,980
	10	11,190

Catalog No. Type	D	U/Price Q'ty : 1~4
SV—WASD SVA—WASD	3	12,000
	4	11,000
	5	11,000
	6	8,980
	8	8,400
	10	10,610

Alteration Catalog No. — L(LC·SLC·LCT·LMT) — P(PC) — (BC · HC · TC · CKC · MKC···etc.)
SV—WAHD10 — LC18 — PC6.20 — TKC — ANF1.0

Alterations		Code	Spec.	¥/1Code
Shaped hole		PC	Changes dimension P min : P > PC ≧ Pmin/2 ≧1.00 0.01mm increments max : P < PC ≦Pmax+0.2 0.01mm increments	1,200
		BC	Changes dimension of shaped hole depth 1≦BC<2 0.1mm increments	900
Full length		LC	Changes full length 13≦LC<L 0.1mm incr. (Comb. with LKC·LKZ·CKC·MKC→0.01mm incr.) Changes full length 8≦LC<L 0.1mm incr. (Comb. with LKC·LKZ→0.01mm incr.)	600
		LKC	Changes L tolerance ⊗L(LC)<16 : Not applicable L +0.4 0.2 ⇨ +0.05 0	1,200
		LKZ	Changes L tolerance ⊗L(LC)<16 : Not applicable L +0.4 0.2 ⇨ +0.01 0	1,800
		CKC	Changes head thickness tolerance and full length tolerance in one code. See detail of each unit's alternation for machining limit. (Thickness) TKC + (Length) LKC ⊗L(LC)<16 : Not applicable	1,900
		MKC	TKM + LKC ⊗L(LC)<16 : Not applicable	1,900
		SLC	Changes full length and full length tolerance in one code. Specifiable range, unit, how to order and notes are the same as LC. LC + LKC 0.01mm increments Applicable only for straight type ⊗L(LC)<10 : Not applicable	1,400
		LCT	Changes head thickness tolerance and full length tolerance in one code. How to order is as the same as LC. See details of each unit's alternation for machining limit and remarks TKC + LC + LKC 0.01mm increments ⊗L(LC)<16 : Not applicable	2,400
		LMT	TKM + LC + LKC 0.01mm increments ⊗L(LC)<16 : Not applicable	2,400

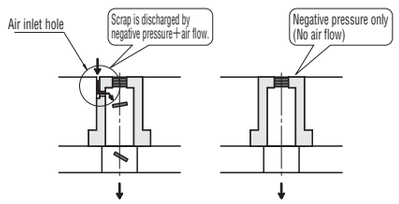
Alterations		Code	Spec.	¥/1Code
Head		KC	Adds single key flat at head. ⊗Straight type : Not applicable	600
			Adds single key flat. ⊗D3~5 : Not applicable ⊗Cannot be applied to the Head type	
		WKC	Adds double key flats in parallel ⊗The combination of KC and KFC N/A. ⊗Straight type : Not applicable	1,200
		KFC	Adds 1 key flat at 0° and the other on another angle 1° increments ⊗Straight type : Not applicable ⊗L(LC)<16 : Not applicable ⊗KC·WKC : Not applicable	1,200
		HC	Changes head diameter D≦HC<H 0.1mm increments	600
		TC	Changes head thickness 2≦TC<T 0.1mm incr. (Comb. with TKC · TKM · CKC · MKC→0.01mm incr.) L is shortened by (T−TC). When LC is applied, L is equal to LC.	600
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0 ⊗L(LC)<16 : Not applicable	1,200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ −0.02 0 ⊗L(LC)<16 : Not applicable	1,200
Shank		ANF	Changes angle of back relief. 0.2≦ANF≦1.2 0.2° increments d≦dmax d=P+2((L−B)×tan(ANF°)) P−Btan(ANF°)≧0.6 ⊗P<1.00 : Not applicable ⊗KM : Not applicable	600
		KM	Add key groove on the shank. ⊗Cannot be applied to the Head type ⊗D<6 : Not applicable ⊗WKC·ANF : Not applicable 5≦ℓ<L 0.1mm increments KM is machined symmetrically to key flats.	1,200

Example

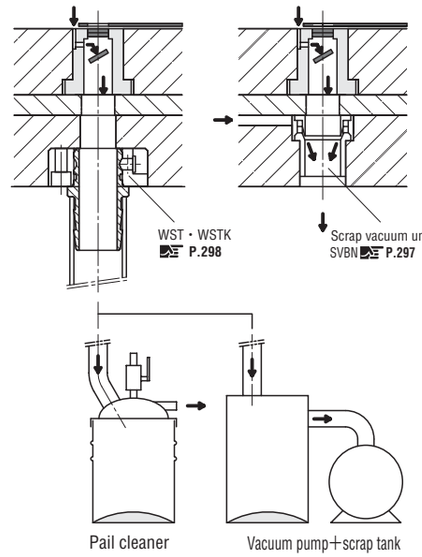
■Features

- These carbide angular button dies for preventig clogging of scrap are intended to be used in combination with a vacuum device such as a vacuum pump.
- Due to the air inlet hole near the shaped hole, there will be air flow produced inside of Button die when the vacuum device is on. This results in higher scrap discharge effectiveness than that of Button die without air inlet. [Fig.1]
- For the vacuum device, it is also possible to use a scrap vacuum unit (P.297) or a commercially available pail-mounted type cleaner instead of a vacuum pump. In such a case,compressed air from a compressor is the drive source. [Fig.2]

- Button dies for preventing clogging of scrap [Products Data] P.1231



[Fig.1] Effectiveness of air inlet hole



[Fig.2] Examples of use in combination with different vacuum devices

CARBIDE BUTTON DIE BLANKS
—HEAD TYPE/STRAIGHT TYPE—

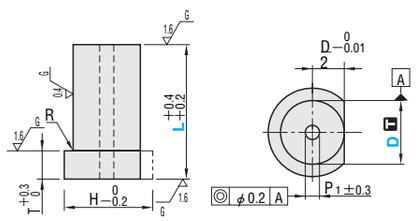
The volume discount rate is also applicable to alteration cost. P.39

—Head type—

RoHS

Shank Dia.Tolerance D T m5 · $^{+0.005}_{0}$ Selectable

M / H	Shank dia. D T	Catalog No.
V40(HIP) 87～88HRA	D_{m5}	WAHD—B
	$D^{+0.005}_{0}$	A—WAHD—B



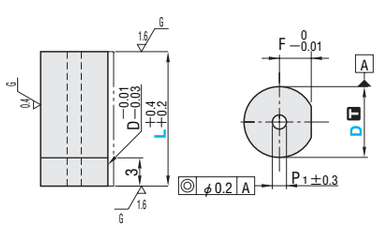
D	3・4・5	6～25
R	6～25	R≦0.5

—Straight type—

RoHS

Shank Dia.Tolerance D T n5 · $^{+0.005}_{0}$ Selectable

M / H	Shank dia. D T	Catalog No.
V40(HIP) 87～88HRA	D_{n5}	WASD—B
	$D^{+0.005}_{0}$	A—WASD—B



Catalog No. Type	D	L	P_1	F	H	T	U/Price Q'ty:1～4 WAHD—B A—WAHD—B	U/Price Q'ty:1～4 WASD—B A—WASD—B
Head (D_{m5}) WAHD—B	3	13	0.7	1.0	4	3	3,890	3,580
	4			1.5	5		3,890	3,580
($D^{+0.005}_{0}$) A—WAHD—B	5	16		2.0	6		3,890	3,580
	6	20	1.7	2.0	9	5	3,890	3,580
	8	22		3.0	11		5,130	3,730
Straight (D_{n5}) WASD—B	10	25		4.0	13		5,830	4,180
	13			5.5	16		6,430	4,680
($D^{+0.005}_{0}$) A—WASD—B	16	(30)	2.2	7.0	19		7,840	5,740
	20	(35)		9.0	23		10,730	7,930
	25			11.5	28		12,990	9,590

Full lengths L(30) and (35) are available for D8 to 25 only.

Order Catalog No. — L
A—WAHD—B 13 — 25

Alteration Catalog No. — L(LC・SLC) — (HC・TC・TKC・TKM…etc.)
WAHD—B 13 — LC23 — TC3.0 — TKC

Delivery 3 Days | Express A 800/1Pc. P.38

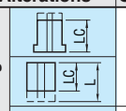
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length 10≦LC＜L 0.1mm incr. (Comb. with LKC・LKZ→0.01mm incr.) Changes full length 8≦LC＜L 0.1mm incr. (Comb. with LKC・LKZ→0.01mm incr.)	600
		LKC	Changes L tolerance ⊗L(LC)＜16：Not available $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$	1,200
		LKZ	Changes L tolerance ⊗L(LC)＜16：Not available $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$	1,800

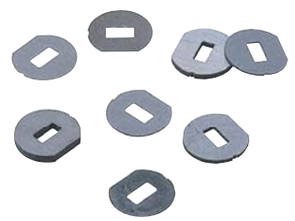
Alterations		Code	Spec.	¥/1Code
Head		WKC	Adds double key flats in parallel ⊗WASD—B・A—WASD—B D3～5：Not available ⊗Straight type：Not available	1,200
		KFC	Adds 1 key flat at 0° and the other on another angle 1° increments ⊗WKC：Not available ⊗L(LC)＜16：Not available ⊗Straight type：Not available	1,200
		NKC	No key flat.	0
		HC	Changes head diameter D≦HC＜H 0.1mm increments	600
		TC	Changes head thickness 2≦TC＜T 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) L is shortened according to (T−TC). When LC is applied, L is equal to LC.	600
		TKC	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗L(LC)＜16：Not available	1,200
		TKM	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗L(LC)＜16：Not available	1,200

SPACERS FOR BUTTON DIE
—FOR ANGULAR BUTTON DIES AND STRAIGHT BUTTON DIE DRAIN HOLE TYPE—

The volume discount rate is also applicable to alteration cost. P.39

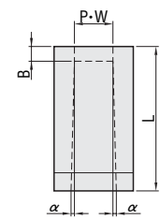
—For angular button die—

RoHS



M SK5
H 45HRC～

■Dimension L of button dies and extent width of dimension P and W

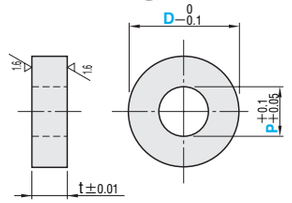


Dimension(α×2)：Extent width of P and W (when B=2)

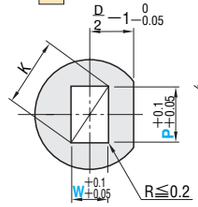
Below table shows the figures for both ends of α.

L \ Taper	1/50	1/100	1/150
16	0.28	0.14	0.09
20	0.36	0.18	0.12
22	0.40	0.20	0.13
25	0.46	0.23	0.15
30	0.56	0.28	0.19
35	0.66	0.33	0.22

Shape A SSD

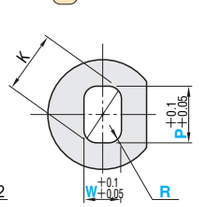


Shape D SSDD



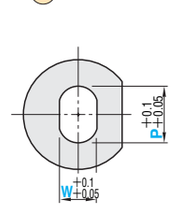
P≧W
$K=\sqrt{P^2+W^2}$

Shape R SSDR



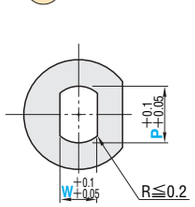
P≧W
0.15≦R＜W/2
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E SSDE



P＞W

Shape G SSDG



P＞W

Catalog No. Type	D	0.01mm increments A min. P max.	D R E G P・Kmax.	D R E G P・Wmin.	R R	t	U/Price (1set：8spacers) Q'ty：1～4 sets
A SSD	6	1.00～ 4.00	—	—	—	0.05	2,220
D SSDD	8	1.00～ 5.00	5.00	1.00	—	0.1	2,560
R SSDR	10	2.00～ 7.00	7.00	1.20	—	0.2	2,920
E SSDE	13	3.00～ 9.00	9.00	1.50	—	0.3	3,320
G SSDG	16	5.00～12.00	12.00	2.00	—	0.5	3,480
	20	7.00～16.00	16.00	3.00	—	1.0	4,210
	25	10.00～20.00	20.00	3.00	0.15≦R＜W/2 (R only)	2.0	4,370

1 set consists of 8 spacers(1 piece for each t size).

Order Catalog No. — P — W — R (R only)
SSDG 10 — P5.65 — W3.25

Delivery 3 Days | Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 sets or more.

Alteration Catalog No. — P — W — R — (KC)
SSDD 8 — P3.60 — W2.85 — KC90

Alteration		Code	A	D R E G	¥/1Code
Head		KC	Adds single key flat.	Changes position of single key flat. 1° increments	200

Price

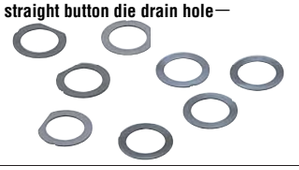
Volume discount rate P.37

Quantity	1～4 sets	5～9	10～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

—For straight button die drain hole—

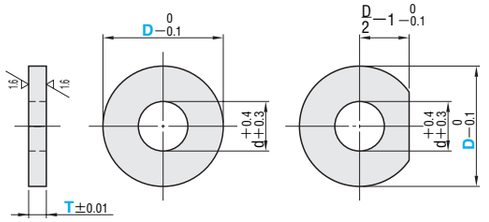
RoHS



M SK5
H 45HRC～

Shape A SSDN

Shape D R E G SSDHN



d	Catalog No. Type	D	T	U/Price (1set：5spacers) Q'ty：1～9 sets T0.05	T0.1	T0.2	T0.5	T1.0
3.4	SSDN (Round D6～25) SSDHN (Shaped D8～25)	6	0.05	330	340	350	360	370
4.4		8	0.1	390	400	410	410	420
6.4		10	0.2	450	460	470	480	490
8.4		13	0.5	510	520	530	540	550
10.6		16	1.0	570	580	590	590	600
12.6		20		690	700	710	720	730
16.6		25		810	820	830	840	850

A set consists 5 spacers of an identical T dimension, ie when T0.1 the set consists of 5 spacers of 0.1 thickness.

Order Catalog No. — T
SSDN 6 — 0.1

Delivery 1 Day

Price

Volume discount rate P.37

Quantity	1～9 sets	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

CARBIDE BLOCK PUNCHES

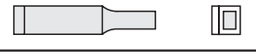
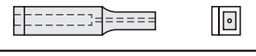
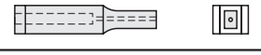
CARBIDE BLOCK PUNCHES

Name	CARBIDE BLOCK PUNCHES	CARBIDE BLOCK PUNCHES WITH AIR HOLE	CARBIDE BLOCK PUNCHES—Configurable type—
Catalog No.	ZP□BL ZP□ML ZP□KL ZP□FL ZP□WL	ZJ□BL ZJ□KL ZJ□FL ZJ□WL	FZP□BL FZP□ML FZP□KL FZP□FL FZP□WL
Delivery	⑤	⑩	⑩
Page	529	531	535

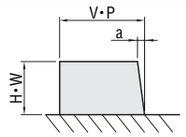
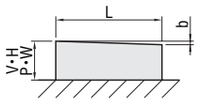
CARBIDE STRAIGHT PUNCHES	CARBIDE STRAIGHT PUNCHES WITH AIR HOLE	CARBIDE BLOCK PUNCH BLANKS	CARBIDE BLOCK PUNCH BLANKS
ZPC□ ZMC□ ZKC□ ZFC□ ZWC□	ZJC□ ZJKC□ ZJFC□ ZJWC□	ZPDB ZPDM ZPDK ZPDF ZPDW	ZPB B-ZPB ZPM ZPK B-ZPK ZPF ZPW
⑤	⑩	⑤Ⓑ	⑤Ⓑ
539	541	547	549

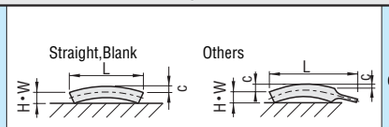
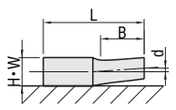
CARBIDE BLOCK PUNCH BLANKS WITH AIR HOLE	CARBIDE BLOCKS
ZJB ZJK ZJF ZJW	Z
⑩	①
551	553

CARBIDE BLOCK PUNCHES LIST
—GUIDE—

Shank shape		M	Standard type		Configurable type	
Carbide standard		V30(HIP)	ZP□BL	P.529	FZP□BL	P.535
Carbide with air hole		V30(HIP)	ZJ□BL	P.531		
Carbide tapped		V30(HIP)	ZP□ML	P.529	FZP□ML	P.535
Carbide with key groove		V30(HIP)	ZP□KL	P.529	FZP□KL	P.535
Carbide with air hole and key groove		V30(HIP)	ZJ□KL	P.531		
Carbide single flanged		V30(HIP)	ZP□FL	P.529	FZP□FL	P.535
Carbide with air hole and single flanged		V30(HIP)	ZJ□FL	P.531		
Carbide double flanged		V30(HIP)	ZP□WL	P.529	FZP□WL	P.535
Carbide with air hole and double flanged		V30(HIP)	ZJ□WL	P.531		
Carbide straight		V30(HIP)	ZPC□	P.539		
Carbide straight with air hole		V30(HIP)	ZJC□	P.541		
Carbide straight and tapped		V30(HIP)	ZMC□	P.539		
Carbide straight with key groove		V30(HIP)	ZKC□	P.539		
Carbide with air hole straight with key groove		V30(HIP)	ZJKC□	P.541		
Carbide straight single flanged		V30(HIP)	ZFC□	P.539		
Carbide with air hole straight single flanged		V30(HIP)	ZJFC□	P.541		
Carbide straight double flanged		V30(HIP)	ZWC□	P.539		
Carbide with air hole straight double flanged		V30(HIP)	ZJWC□	P.541		

■Carbide block punch accuracy criteria

Accuracy criteria		
Perpendicularity		a≦0.005
Parallelism		b≦0.005

Accuracy criteria		
Warpage		c≦0.005
Bends at the blade		d≦0.005

CARBIDE BLOCK PUNCHES

Price P.533

The volume discount rate is also applicable to alteration cost. P.39

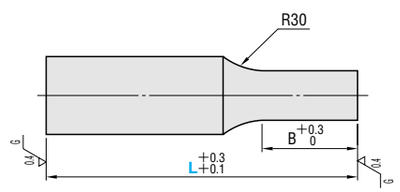
RoHS

● Machining limit of blade

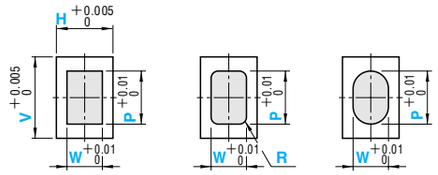
Shape D	Shape R	Shape E
P≧W	P≧W 0.15≦R< W/2	P>W

M / H	Shank dimension V・H
V30（HIP） 88～89HRA	V・H 3～20

–Standard–

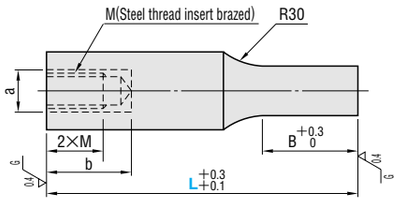


D ZPDBL　R ZPRBL　E ZPEBL

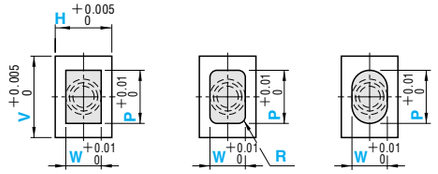


M / H	Shank dimension V・H
V30（HIP） 88～89HRA	V・H 8～20

–Tapped–

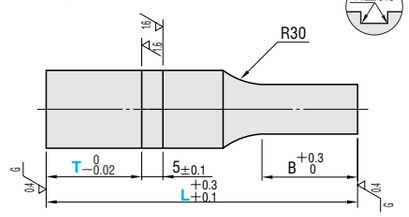


D ZPDML　R ZPRML　E ZPEML

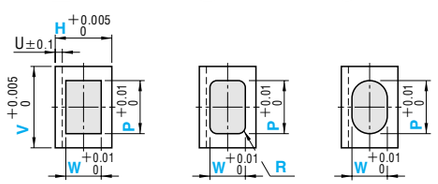


M / H	Shank dimension V・H
V30（HIP） 88～89HRA	V・H 3～20

–With key groove–　Details of key groove　R≦0.3

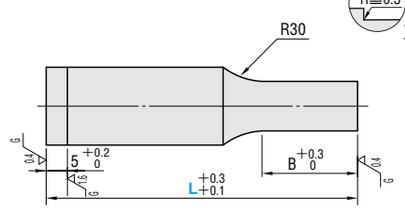


D ZPDKL　R ZPRKL　E ZPEKL

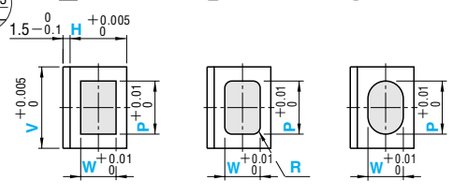


M / H	Shank dimension V・H
V30（HIP） 88～89HRA	V・H 3～16 Not applicable to products marked ● on the standard table.

–Single flanged–　Details of flange　R≦0.3

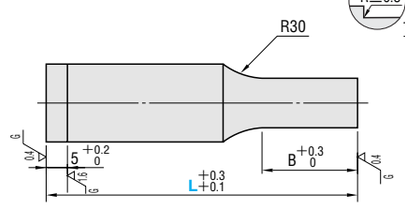


D ZPDFL　R ZPRFL　E ZPEFL

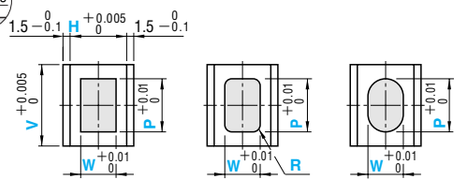


M / H	Shank dimension V・H
V30（HIP） 88～89HRA	V・H 3～16 Not applicable to products marked ● on the standard table.

–Double flanged–　Details of flange　R≦0.3



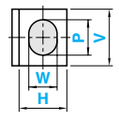
D ZPDWL　R ZPRWL　E ZPEWL



Catalog No. Type	Shape	Type	H	Wmin.	Pmin.	V 3 1.5	4 2.0	5 2.5	6 3.0	8 3.0	10 4.0	13 5.0	16 7.0	20 8.0	L	0.1mm T	B L40	B L50	B L60・70	M	a	b	U
ZP	D	BL	3	1.0		○	○	○	○	○	○	○	○	●	40	T≧2.0	13	13	13	–	–	–	1.0
		KL	4	1.0			○	○	○	○	○	○	○	●									
		FL	5	2.0				○	○	○	○	○	○	●	50								
		WL	6	2.0					○	○	○	○	○	●	60								
	R	BL	8	2.0						○	○	○	○	●	70								
		ML	10	2.5							○	○	○	●									
	E	KL	13	3.0								○	○	●				19	19	4	6	12	1.5
		FL	16	4.0									○	●						6	8	16	
		WL	20	5.0										●				19	25	8	10	20	

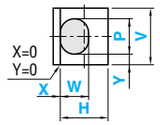
Order

(1) When the blade is in the center of shank



Catalog No.	V	H	–	L	–	0.01mm increments P	–	W	–	R (Ⓡonly)	–	0.1mm incr. T≧2	–	K・F・WF
ZPEML	20	10	–	70	–	P16.00	–	W 9.00						
ZPEKL	10	06	–	60	–	P 8.00	–	W 5.00				T25.5	–	K0
ZPEFL	16	13	–	60	–	P15.00	–	W12.00					–	F90
ZPEWL	13	10	–	40	–	P 8.00	–	W 5.00					–	WF90
ZPRBL	10	10	–	60	–	P 5.00	–	W 4.00	–	R0.15				

(2) When the blade is not in the center of shank



Catalog No.	V	H	–	L	–	0.01mm increments P	–	W	–	R (Ⓡonly)	–	0.1mm incr. T	–	K・F・WF	–	0.01mm increments X	–	Y
ZPEFL	16	13	–	50	–	P15.00	–	W12.00					–	F90	–	X0.00	–	Y0.55

■Positioning change of Key groove and Flange（free of charge）

Key groove	K0	K90	K180	K270	Single flanged	F0	F90	F180	F270	Double flanged	WF0	WF90
	○ V H	○	○	○		○ V H	○	○	○		○ V H	○

Delivery　5 Days　Price　P.533

Alteration

Catalog No.	V	H	–	L (LC)	–	P (PC)・W (WC)・R	–	T	–	K・F・WF	– (BC・HC・TC …etc.)
ZPEBL	20	08	–	60	–	P18.00—WC1.50					– VKC

Alteration	Code	Spec.	¥/1Code
Blade	PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments P・W: 0.50～0.99 → Bmax. 8; 1.00～1.99 → 13; 2.00～2.99 → 20; 3.00～4.99 → 30; 5.00～ → 35	1,500
	BC	Changes blade length B 2≦BC≦Bmax. 0.1mm increments ⓟ L≧BC+30 Full length L requires BC+30mm or more.	600
	PKC	Changes blade tolerance (P・W) P・W +0.01 0 ⇨ +0.005 0	2,300
	PKV	Changes blade tolerance (P・W) P・W +0.01 0 ⇨ ±0.005	0
Full lenght	LC	Changes full length 30+B(BC)≦LC<L 0.1mm incr. (Combination with LKC・LKZ→0.01mm incr.) ⓟ When LC—B is 30mm or less, blade length is full length—30.	600
	LKC	Changes full length tolerance L ±0.3 ±0.1 ⇨ +0.05 0	1,200
	LKZ	Changes full length tolerance L ±0.3 ±0.1 ⇨ +0.01 0	1,800
Flange	HC	Changes flange width 0≦HC<1.5 0.1mm increments	600
	TC	Changes flange thickness 2≦TC<5 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) ⓟ L is shortened by (5—TC). When LC is applied, L is equal to LC.	600
	TKC	Changes flange thickness tolerance T +0.2 0 ⇨ +0.02 0	1,200
	TKM	Changes flange thickness tolerance T +0.2 0 ⇨ 0 −0.02	1,200
	FK	Adds relief chamfering to flange (for breakage prevention) ⊗ Standard, tapped, key groove types：Not applicable	Single flanged 600 Double flanged 1,200
Tap	MC	Changes tap size H \ V: 8 / 10 / 13 / 16 / 20 8: M4→M3 10: – / M6→M5 13: – / – / M8→M6 16: – / – / – / M8→M6 20: – / – / – / – / M8→M6 ⓟ The dimensions a and b are not changed.	0

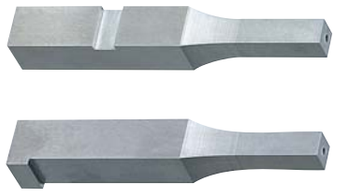
Alteration	Code	Spec.	¥/1Code
Key groove	RTC	Changes tolerance on key groove position T T 0 −0.02 ⇨ +0.05 0 ⓟ Applicable to key groove type only.	0
	WK	Adds key groove at symmetrical position H— (2×U(UK)) ≧2.0 (K0,K180) V— (2×U(UK)) ≧2.0 (K90,K270) K0・180　K90・270 The additional key groove position is symmetrical with the specified key groove position. ⓟ Combination with UK is applicable　ⓟ Applicable to key groove type only.	800
	UK	Changes key groove depth 0.5≦UK≦U+0.2　0.1mm increments H(V)—UK≧2.0 ⓟ Combination with WK is applicable　ⓟ Applicable to key groove type only.	600
Others	CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. 0.5mm or more	Standard Tapped With key groove 600 Single flanged Double flanged 800
	CCP	Adds chamfering (C1.0) to a corner of shank (error prevention). Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 blade corner　blade corner ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270 ⓟ Applicable to Standard and tapped types only.	600
	VKC	Changes shank tolerance (V・H) V・H +0.005 0 ⇨ +0.003 0	2,000
	VKM	Changes shank tolerance (V・H) V・H +0.005 0 ⇨ 0 −0.003	2,000
	VHM	Changes shank tolerance (V・H) V・H +0.005 0 ⇨ 0 −0.005	1,200
	DC	Adds press-in lead 3mm press-in lead (V・H −0.01 −0.03) added ⊗ Single and double flanged types：Not applicable	600

CARBIDE BLOCK PUNCHES WITH AIR HOLE

Price P.534

The volume discount rate is also applicable to alteration cost. P.39

RoHS

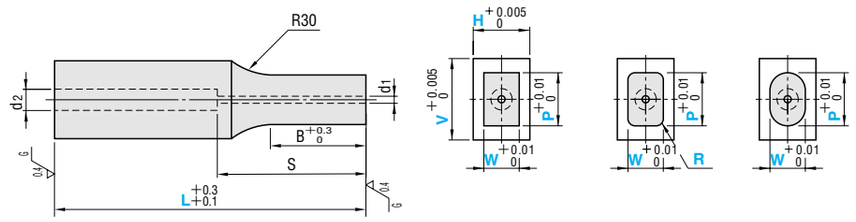


● Machining limit of blade

Shape D	Shape R	Shape E
P≧W	P≧W 0.15≦R< W/2	P>W

M H	Shank dimension V·H
V30 (HIP) 88～89HRA	V·H 5～20

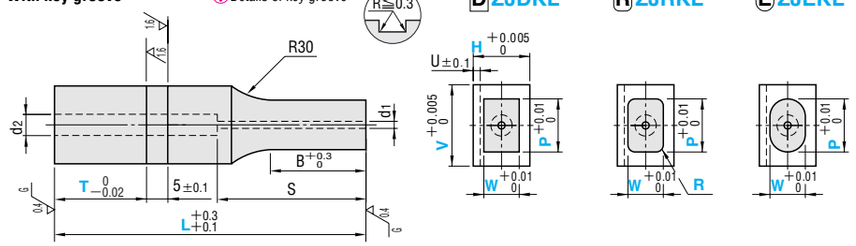
–Standard–



D ZJDBL　R ZJRBL　E ZJEBL

M H	Shank dimension V·H
V30 (HIP) 88～89HRA	V·H 5～20

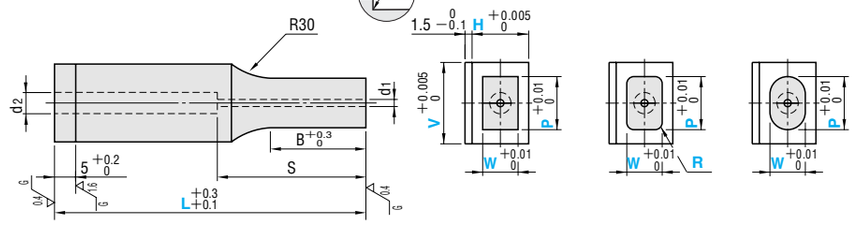
–With key groove–　Details of key groove　R≦0.3



D ZJDKL　R ZJRKL　E ZJEKL

M H	Shank dimension V·H
V30 (HIP) 88～89HRA	V·H 5～16 Not applicable to products marked ● on the standard table.

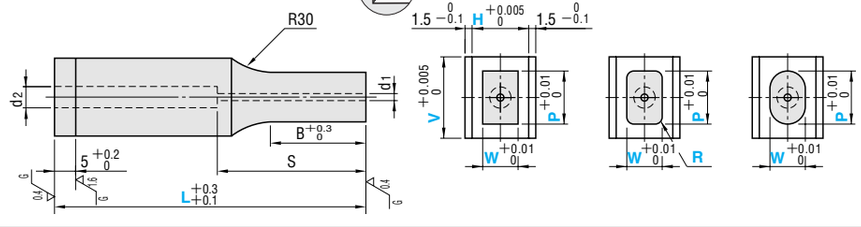
–Single flanged–　Details of flange　R≦0.3



D ZJDFL　R ZJRFL　E ZJEFL

M H	Shank dimension V·H
V30 (HIP) 88～89HRA	V·H 5～16 Not applicable to products marked ● on the standard table.

–Double flanged–　Details of flange　R≦0.3

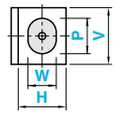


D ZJDWL　R ZJRWL　E ZJEWL

Catalog No. Type	Shape	Type	Shank / blade dimensions (mm) H \ W min, V, P min	V 5	6	8	10	13	16	20	L	0.1mm T	B L 40	B L 50	B L 60·70	d1×S L 40	d1×S L 50	d1×S L 60·70	d2	U
				P min 2.5	3.0	3.0	4.0	5.0	7.0	8.0										
ZJ	D R E	BL KL FL WL	5 2.5	○	○	○	○	○	○	●	40	T≧2.0	13	13	13	0.8×17	0.8×20		2.1	1.0
			6 2.5		○	○	○	○	○	●	40								2.6	
			8 2.5			○	○	○	○	●	50			19	19	1.2×17	1.2×27		3.4	1.5
			10 3.0				○	○	○	●	60					1.6×17	1.6×28		4.4	
			13 3.5					○	○	●	70					1.9×17	1.9×28			
			16 4.5						○	●					25	2.9×17	2.9×24	2.9×36		
			20 5.0							●										

Order

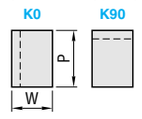
(1) When the blade is in the center of shank



Catalog No.	V	H	− L	− 0.01mm increments P	− W	− R (R only)	− 0.1mm incr. T≧2	− K·F·WF
ZJEBL	20	08	− 60	− P18.00	− W 4.00			
ZJEKL	10	06	− 60	− P 8.00	− W 5.00		− T25.5	− K0
ZJEFL	16	13	− 60	− P15.00	− W12.00			− F90
ZJEWL	13	10	− 40	− P 8.00	− W 5.00			− WF90
ZJRBL	08	08	− 50	− P 5.00	− W 3.00	− R0.15		

(2) When the blade is not in the center of shank : Manufacturing is not available.

■Specifications of key groove position



■Specifications of flange position

Shape E : Only F0・WF0 are specifiable

In case of F90 or WF90, dimension H is as follows.

Shape D : 2≦W　H=W

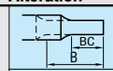
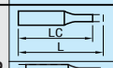
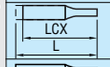
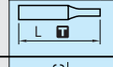
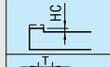
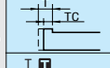
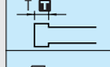
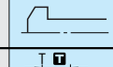
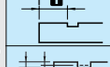
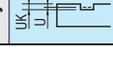
Shape R : 2≦W−2R−1　H=W−2R−1

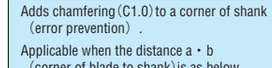
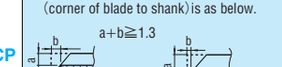
Delivery 10 Days

Price P.534

Alteration

Catalog No.	V	H	− L (LC)	− P·W·R	− T	− K·F·WF	− (BC·HC·TC ···etc.)
ZJEBL	20	08	− 60	− P18.00−W 3.00			− VKC

Alteration		Code	Spec.	¥/1Code
Blade		BC	Changes blade length B (Shorter than standard length) 2≦BC<B 0.1mm increments	600
		PKC	Changes blade tolerance (P·W) P·W +0.01 0 ⇨ +0.005 0	2,300
		PKV	Changes blade tolerance (P·W) P·W +0.01 0 ⇨ ±0.005	0
Full length		LC	Changes full length LC<L 0.1mm increments (Combination with LKC・LKZ→0.01mm incr) B is shortened by (L−LC).	600
		LCX	Changes full length without changing blade length B 30+B(BC)≦LCX<L 0.1mm increments When L−B (or BC) is 30mm or less, B (or BC) is L−30 Combination with LKC・LKZ→0.01mm increments Single and double flanged types : Not applicable	600
		LKC	Changes full length tolerance L +0.3 +0.1 ⇨ +0.05 0	1,200
		LKZ	Changes full length tolerance L +0.3 +0.1 ⇨ +0.01 0	1,800
Flange		HC	Changes flange width 0≦HC<1.5 0.1mm increments	600
		TC	Changes flange thickness 2≦TC<5 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) L is shortened by (5−TC). When LC is applied, L is equal to LC.	600
		TKC	Changes flange thickness tolerance T +0.2 0 ⇨ +0.02 0	1,200
		TKM	Changes flange thickness tolerance T +0.2 0 ⇨ 0 −0.02	1,200
		FK	Adds relief chamfering to flange (for breakage prevention)	single flanged 600 Double flanged 1,200
Key groove		RTC	Changes tolerance on key groove position T T −0.02 ⇨ +0.05 0	0
		UK	Changes key groove depth 0.5≦UK≦U+0.2 0.1mm increments H(V) −UK≧2.0 Applicable to key groove type only.	600

Alteration		Code	Spec.	¥/1Code
Contour		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. 	Standard With key groove 600 Single flanged Double flanged 800
		CCP	Adds chamfering (C1.0) to a corner of shank (error prevention). Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3  ■Specifiable position of chamfering.  CCP0 CCP90 CCP180 CCP270 Applicable to standard type only.	600
		VKC	Changes shank tolerance (V・H) V·H +0.005 0 ⇨ +0.003 0	2,000
		VKM	Changes shank tolerance (V・H) V·H +0.005 0 ⇨ 0 −0.003	2,000
		VHM	Changes shank tolerance (V・H) V·H +0.005 0 ⇨ 0 −0.005	1,200
		DC	Adds press-in lead 3mm press-in lead (V·H −0.01 −0.03) added Single and double flanged types : Not applicable	600

CARBIDE BLOCK PUNCHES
—PRICE—

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Carbide block punches P.529

■Standard type

V	H	ZPDBL	ZPRBL	ZPEBL
3	3	6,010	8,720	8,580
4	3	6,070	8,780	8,630
	4	6,060	8,770	8,620
5	3	6,120	8,840	8,690
	4	5,240	7,950	7,810
	5	5,330	8,040	7,900
6	3	5,570	8,280	8,140
	4	5,670	8,380	8,240
	5	5,770	8,480	8,330
	6	5,880	8,590	8,450
8	3	5,860	8,680	8,540
	4	5,990	8,810	8,660
	5	6,120	8,930	8,790
	6	6,270	9,080	8,940
	8	6,680	9,500	9,360
10	3	6,040	8,850	8,710
	4	6,130	8,950	8,810
	5	6,290	9,110	8,970
	6	6,460	9,280	9,130
	8	6,950	9,760	9,620
	10	7,280	10,090	9,950
13	3	6,310	9,130	8,990
	4	6,480	9,300	9,160
	5	6,690	9,510	9,360
	6	6,900	9,720	9,580
	8	7,430	10,250	10,110
	10	7,850	10,670	10,530
	13	8,680	11,500	11,360
16	3	6,660	9,660	9,520
	4	6,890	9,880	9,740
	5	7,130	10,130	9,980
	6	7,390	10,380	10,240
	8	8,010	11,010	10,860
	10	8,520	11,510	11,370
	13	9,490	12,480	12,340
	16	10,230	13,220	13,080
20	3	6,910	9,910	9,760
	4	7,170	10,170	10,020
	5	7,480	10,470	10,330
	6	7,790	10,780	10,640
	8	8,550	11,550	11,410
	10	9,160	12,150	12,010
	13	10,310	13,300	13,160
	16	11,250	14,240	14,100
	20	12,480	15,480	15,340

■With key groove type

V	H	ZPDKL	ZPRKL	ZPEKL
3	3	6,540	9,250	9,110
4	3	6,600	9,310	9,170
	4	6,590	9,300	9,160
5	3	6,660	9,370	9,230
	4	5,780	8,490	8,350
	5	5,870	8,580	8,440
6	3	6,100	8,810	8,670
	4	6,210	8,920	8,770
	5	6,300	9,010	8,870
	6	6,410	9,120	8,980
8	3	6,400	9,210	9,070
	4	6,520	9,340	9,200
	5	6,650	9,470	9,330
	6	6,800	9,620	9,480
	8	7,220	10,040	9,890
10	3	6,570	9,390	9,250
	4	6,670	9,490	9,340
	5	6,830	9,650	9,500
	6	6,990	9,810	9,670
	8	7,480	10,300	10,150
	10	7,810	10,630	10,490
13	3	6,850	9,670	9,520
	4	7,020	9,830	9,690
	5	7,220	10,040	9,900
	6	7,440	10,260	10,110
	8	7,970	10,780	10,640
	10	8,390	11,200	11,060
	13	9,220	12,040	11,890
16	3	7,200	10,200	10,050
	4	7,420	10,420	10,280
	5	7,660	10,660	10,520
	6	7,920	10,920	10,770
	8	8,550	11,540	11,400
	10	9,050	12,050	11,900
	13	10,020	13,020	12,880
	16	10,760	13,760	13,620
20	3	7,440	10,440	10,300
	4	7,710	10,700	10,560
	5	8,010	11,010	10,860
	6	8,320	11,320	11,180
	8	9,090	12,080	11,940
	10	9,690	12,690	12,550
	13	10,840	13,840	13,690
	16	11,780	14,780	14,640
	20	13,020	16,020	15,870

■Single flanged type

V	H	ZPDFL	ZPRFL	ZPEFL
3	3	6,810	9,520	9,380
4	3	6,870	9,580	9,440
	4	6,860	9,570	9,430
5	3	6,930	9,640	9,500
	4	6,040	8,750	8,610
	5	6,140	8,850	8,710
6	3	6,370	9,080	8,940
	4	6,470	9,180	9,040
	5	6,570	9,280	9,140
	6	6,680	9,390	9,250
8	3	6,660	9,480	9,340
	4	6,790	9,610	9,470
	5	6,920	9,740	9,590
	6	7,070	9,890	9,740
	8	7,480	10,300	10,160
10	3	6,840	9,660	9,510
	4	6,930	9,750	9,610
	5	7,100	9,910	9,770
	6	7,260	10,080	9,940
	8	7,750	10,570	10,420
	10	8,080	10,900	10,750
13	3	7,120	9,940	9,790
	4	7,280	10,100	9,960
	5	7,490	10,310	10,170
	6	7,710	10,520	10,380
	8	8,230	11,050	10,910
	10	8,650	11,470	11,330
	13	9,490	12,310	12,160
16	3	7,470	10,460	10,320
	4	7,690	10,690	10,540
	5	7,930	10,930	10,780
	6	8,190	11,180	11,040
	8	8,810	11,810	11,670
	10	9,320	12,310	12,170
	13	10,290	13,290	13,140
	16	11,030	14,030	13,880

■Tapped type

V	H	ZPDML	ZPRML	ZPEML
8	8	7,860	10,680	10,540
10	8	8,120	10,940	10,800
	10	8,450	11,270	11,130
13	8	8,610	11,430	11,280
	10	9,030	11,840	11,700
	13	9,860	12,680	12,540
16	8	9,190	12,190	12,040
	10	9,690	12,690	12,550
	13	10,670	13,660	13,520
	16	11,400	14,400	14,260
20	8	9,730	12,730	12,580
	10	10,330	13,330	13,190
	13	11,480	14,480	14,340
	16	12,420	15,420	15,280
	20	13,660	16,660	16,510

■Double flanged type

V	H	ZPDWL	ZPRWL	ZPEWL
3	3	7,610	10,320	10,180
4	3	7,670	10,380	10,240
	4	7,660	10,370	10,230
5	3	7,730	10,440	10,300
	4	6,850	9,560	9,420
	5	6,940	9,650	9,510
6	3	7,170	9,880	9,740
	4	7,280	9,990	9,840
	5	7,370	10,080	9,940
	6	7,480	10,200	10,050
8	3	7,470	10,280	10,140
	4	7,590	10,410	10,270
	5	7,720	10,540	10,400
	6	7,870	10,690	10,550
	8	8,290	11,110	10,960
10	3	7,640	10,460	10,320
	4	7,740	10,580	10,410
	5	7,900	10,720	10,570
	6	8,060	10,880	10,740
	8	8,550	11,370	11,220
	10	8,880	11,700	11,560
13	3	7,920	10,740	10,590
	4	8,090	10,900	10,760
	5	8,290	11,110	10,970
	6	8,510	11,320	11,180
	8	9,040	11,850	11,710
	10	9,460	12,270	12,130
	13	10,290	13,110	12,960
16	3	8,270	11,270	11,120
	4	8,490	11,490	11,350
	5	8,730	11,730	11,590
	6	8,990	11,950	11,840
	8	9,620	12,610	12,470
	10	10,120	13,120	12,970
	13	11,090	14,090	13,950
	16	11,830	14,830	14,690

■Carbide block punches with air hole P.531

■Standard type

V	H	ZJDBL	ZJRBL	ZJEBL
5	5	7,210	9,920	9,780
6	5	7,640	10,360	10,210
	6	7,760	10,470	10,330
8	5	7,990	10,810	10,670
	6	8,140	10,960	10,820
	8	8,560	11,380	11,240
10	5	8,170	10,990	10,850
	6	8,330	11,150	11,010
	8	8,820	11,640	11,500
	10	9,160	11,970	11,830
13	5	8,570	11,380	11,240
	6	8,780	11,600	11,460
	8	9,310	12,130	11,990
	10	9,910	12,730	12,590
	13	10,750	13,570	13,420
16	5	9,010	12,000	11,860
	6	9,260	12,260	12,120
	8	10,080	13,070	12,930
	10	10,580	13,580	13,430
	13	11,560	14,550	14,410
	16	12,480	15,480	15,330
20	5	9,350	12,350	12,210
	6	9,660	12,660	12,520
	8	10,620	13,610	13,470
	10	11,220	14,220	14,070
	13	12,370	15,370	15,230
	16	13,500	16,500	16,360
	20	14,740	17,740	17,590

■With key groove type

V	H	ZJDKL	ZJRKL	ZJEKL
5	5	7,750	10,460	10,310
6	5	8,180	10,890	10,750
	6	8,290	11,000	10,860
8	5	8,530	11,350	11,200
	6	8,680	11,500	11,350
	8	9,100	11,910	11,770
10	5	8,710	11,520	11,380
	6	8,870	11,690	11,550
	8	9,360	12,180	12,030
	10	9,690	12,510	12,360
13	5	9,100	11,920	11,780
	6	9,320	12,130	11,990
	8	9,840	12,660	12,520
	10	10,450	13,270	13,120
	13	11,280	14,100	13,960
16	5	9,540	12,540	12,390
	6	9,800	12,800	12,650
	8	10,610	13,610	13,470
	10	11,120	14,110	13,970
	13	12,090	15,090	14,940
	16	13,010	16,010	15,870
20	5	9,890	12,880	12,740
	6	10,200	13,200	13,050
	8	11,150	14,150	14,010
	10	11,760	14,750	14,610
	13	12,910	15,900	15,760
	16	14,040	17,030	16,890
	20	15,270	18,270	18,130

■Single flanged type

V	H	ZJDFL	ZJRFL	ZJEFL
5	5	8,010	10,720	10,580
6	5	8,450	11,160	11,010
	6	8,560	11,270	11,130
8	5	8,800	11,610	11,470
	6	8,950	11,760	11,620
	8	9,360	12,180	12,040
10	5	8,970	11,790	11,650
	6	9,140	11,960	11,810
	8	9,620	12,440	12,300
	10	9,960	12,770	12,630
13	5	9,370	12,190	12,050
	6	9,580	12,400	12,260
	8	10,110	12,930	12,790
	10	10,720	13,530	13,390
	13	11,550	14,370	14,230
16	5	9,810	12,800	12,660
	6	10,070	13,060	12,920
	8	10,880	13,880	13,730
	10	11,380	14,380	14,240
	13	12,360	15,350	15,210
	16	13,280	16,280	16,140

■Double flanged type

V	H	ZJDWL	ZJRWL	ZJEWL
5	5	8,820	11,530	11,380
6	5	9,250	11,960	11,820
	6	9,360	12,070	11,930
8	5	9,600	12,420	12,270
	6	9,750	12,570	12,420
	8	10,170	12,980	12,840
10	5	9,780	12,590	12,450
	6	9,940	12,760	12,620
	8	10,430	13,250	13,100
	10	10,760	13,580	13,430
13	5	10,170	12,990	12,850
	6	10,390	13,200	13,060
	8	10,910	13,730	13,590
	10	11,520	14,340	14,190
	13	12,350	15,170	15,030
16	5	10,610	13,610	13,460
	6	10,870	13,870	13,720
	8	11,680	14,680	14,540
	10	12,190	15,180	15,040
	13	13,160	16,160	16,010
	16	14,080	17,080	16,940

Express service system P.38 · MISUMI Press 2007 · http://misumi.jp/press/ · For inquiry, ordering and other information, refer to P.1269

CARBIDE BLOCK PUNCHES
—CONFIGURABLE TYPE—

Price P.537

The volume discount rate is also applicable to alteration cost. P.39

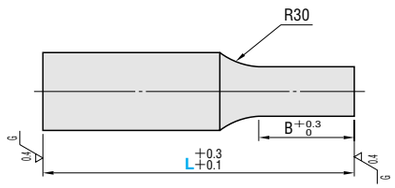
• Machining limit of blade

RoHS

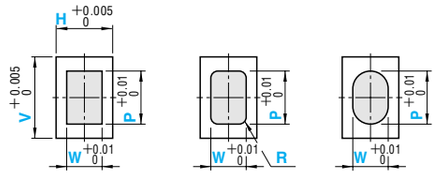
Shape D	Shape R	Shape E
P≧W	P≧W 0.15≦R< W/2	P>W

M H	Shank dimension V·H	
V30 (HIP) 88～89HRA	V·H 2.0～20.0	—Standard—
V30 (HIP) 88～89HRA	V·H 8.1～20.0	—Tapped—
V30 (HIP) 88～89HRA	V·H 3.1～20.0	—With key groove—
V30 (HIP) 88～89HRA	V·H 2.0～16.0 Not applicable to products marked ● on the standard table.	—Single flanged—
V30 (HIP) 88～89HRA	V·H 2.0～16.0 Not applicable to products marked ● on the standard table.	—Double flanged—

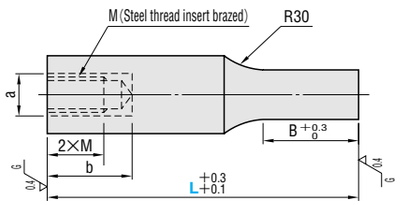
—Standard—



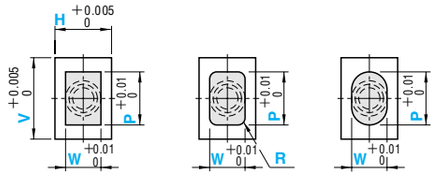
D FZPDBL R FZPRBL E FZPEBL



—Tapped—

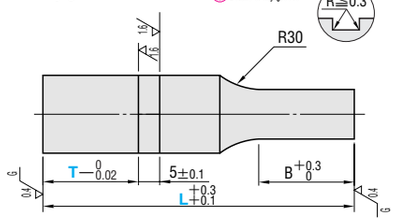


D FZPDML R FZPRML E FZPEML

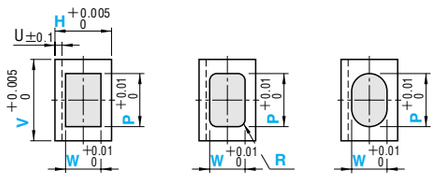


—With key groove—

Details of key groove

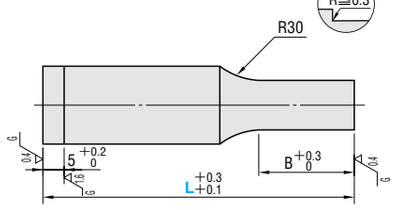


D FZPDKL R FZPRKL E FZPEKL

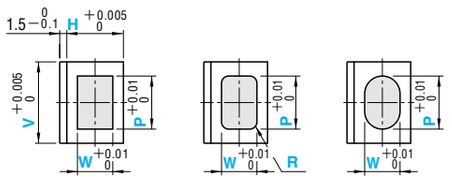


—Single flanged—

Details of flange

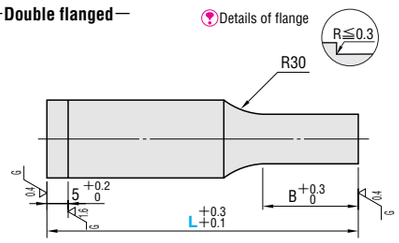


D FZPDFL R FZPRFL E FZPEFL

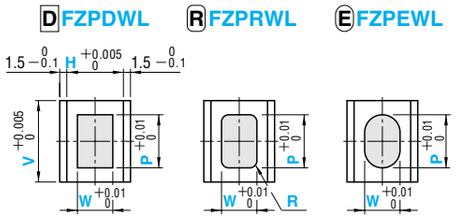


—Double flanged—

Details of flange



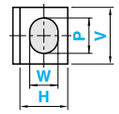
D FZPDWL R FZPRWL E FZPEWL



Catalog No. Type	Shape	Type	H \ V	Wmin.	Pmin.	2.0～3.0	3.1～4.0	4.1～5.0	5.1～6.0	6.1～8.0	8.1～10.0	10.1～13.0	13.1～16.0	16.1～20.0	L	0.1mm T	B L40	B L50	B L60·70	M	a	b	U
						1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0									
FZP	D	BL	2.0～3.0	1.0		○	○	○	○	○	○	○	○	●	40	—	13	13	—	—	—	—	1.0
		ML	3.1～4.0	1.0			○	○	○	○	○	○	○	●	50	T≧2.0							
	R	KL	4.1～5.0	2.0				○	○	○	○	○	○	●	60		13		—	—	—	—	
		FL	5.1～6.0	2.0					○	○	○	○	○	●	70			19	19	4	6	12	1.5
	E	WL	6.1～8.0	2.0						○	○	○	○	●						6	8	16	
			8.1～10.0	2.5							○	○	○	●					25	8	10	20	
			10.1～13.0	3.0								○	○	●									
			13.1～16.0	4.0									○	●									
			16.1～20.0	5.0										●									

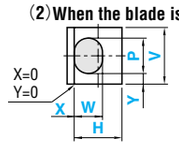
Order

(1) When the blade is in the center of shank



Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R (Ⓡonly)	0.1mm incr. T≧2	K·F·WF
FZPEML−	V19.5	H 9.0	− 70	−P16.00	−W 9.00			
FZPEKL−	V 9.0	H 6.0	− 60	−P 8.00	−W 5.00		− T25.5	− K0
FZPEFL−	V15.5	H 3.0	− 60	−P15.00	−W 2.50			− F90
FZPEWL−	V12.0	H 7.0	− 40	−P 8.00	−W 5.00			− WF90
FZPRBL−	V15.5	_H 9.5	− 60	−P10.00	−W 8.00	− R0.15		

(2) When the blade is not in the center of shank



Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R (Ⓡonly)	0.1mm incr. T	K·F·WF	0.01mm increments X	Y
FZPEFL−	V15.0	−H12.0	− 50	− P14.00	− W3.00		− F90		− X0.00	− Y0.55

(Specifications of X and Y should be 0.02 or more, or 0. Tolerance±0.01)

■Positioning change of Key groove and Flange (free of charge)

With key groove	K0	K90	K180	K270	Single flanged	F0	F90	F180	F270	Double flanged	WF0	WF90
	○ V H	○	○	○		○ V H	○	○	○		○ V H	○

Delivery 10 Days

Price P.537

Alteration

Catalog No.	V	H	L (LC)	P (PC)·W (WC)·R	T	K·F·WF	(BC·HC·TC ···etc.)
FZPEBL	− V19.0	− H16.0	− 60	− P18.00	− WC1.50		− VKC

Alteration	Code	Spec.	¥/1Code
Blade	PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments P·W: 0.50～0.99 → 8; 1.00～1.99 → 13; 2.00～2.99 → 20; 3.00～4.99 → 30; 5.00～ → 35	1,500
	BC	Changes blade length B 2≦BC≦Bmax. 0.1mm increments (P) L≧BC+30 Full length L requires BC+30mm or more.	600
	PKC	Changes blade tolerance (P·W) P·W +0.01 0 ⇨ +0.005 0	2,300
	PKV	Changes blade tolerance (P·W) P·W +0.01 0 ⇨ ±0.005	0
Full length	LC	Changes full length 30+B(BC)≦LC<L 0.1mm incr. (Combination with LKC·LKZ→0.01mm incr.) (P) When LC−B is 30mm or less, blade length is the full length−30.	600
	LKC	Changes full length tolerance L +0.3 +0.1 ⇨ +0.05 0	1,200
	LKZ	Changes full length tolerance L +0.3 +0.1 ⇨ +0.01 0	1,800
Flange	HC	Changes flange width 0≦HC<1.5 0.1mm increments	600
	TC	Changes flange thickness 2≦TC<5 0.1mm incr. (Comb. with TKC·TKM→0.01mm incr.) (P) L is shortened by (5−TC). When LC is applied, L is equal to LC.	600
	TKC	Changes flange thickness tolerance T +0.2 0 ⇨ +0.02 0	1,200
	TKM	Changes flange thickness tolerance T +0.2 0 ⇨ 0 −0.02	1,200
	FK	Adds relief chamfering to flange (for breakage prevention) ⊗Standard, tapped, key groove types : Not applicable	Single flanged 600 Double flanged 1,200
Tap	MC	Changes tap size H \ V: 8.1～10.0 | 10.1～13.0 | 13.1～16.0 | 16.1～20.0 8.1～10.0: M4→M3 10.1～13.0: — | M6→M5 13.1～16.0: — | — | M8→M6 16.1～20.0: — | — | — | M8→M6 (P) The dimensions a and b are not changed.	0

Alteration	Code	Spec.	¥/1Code
Key groove	RTC	Changes tolerance on key groove position T T 0 −0.02 ⇨ +0.05 0	0
	WK	Adds key groove at symmetrical position H−|2×U(UK)|≧2.0 (K0,K180) V−|2×U(UK)|≧2.0 (K90,K270) The additional key groove position is symmetrical with the specified key groove position. (P) Combination with UK is applicable (P) Applicable to key groove type only.	800
	UK	Changes key groove depth 0.5≦UK≦U+0.2 0.1mm increments H(V)−UK≧2.0 (P) Combination with WK is applicable (P) Applicable to key groove type only.	600
Others	CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. 0.5mm or more	Standard Tapped With key groove 600 Single flanged Double flanged 800
	CCP	Adds chamfering (C1.0) to a corner of shank (error prevention). Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 ■Specifiable position of chamfering. (P) Applicable to standard and tapped type only. CCP0 CCP90 CCP180 CCP270	600
	VKC	Changes shank tolerance (V・H) V·H +0.005 0 ⇨ +0.003 0	2,000
	VKM	Changes shank tolerance (V・H) V·H +0.005 0 ⇨ 0 −0.003	2,000
	VHM	Changes shank tolerance (V・H) V·H +0.005 0 ⇨ 0 −0.005	1,200
	DC	Adds press-in lead 3mm press-in lead (V·H −0.01 −0.03) added ⊗Single and double flanged types : Not applicable	600

CARBIDE BLOCK PUNCHES
—CONFIGURABLE TYPE— PRICE

Price

■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Standard type

Catalog No.	H \ V	2.0~3.0	3.1~4.0	4.1~5.0	5.1~6.0	6.1~8.0	8.1~10.0	10.1~13.0	13.1~16.0	16.1~20.0
FZPDBL	2.0~ 3.0	8,270	8,350	8,430	7,660	8,060	8,310	9,480	10,000	11,240
	3.1~ 4.0		8,330	7,210	7,800	8,240	8,440	9,730	10,340	11,660
	4.1~ 5.0			7,340	7,940	8,420	8,660	10,040	10,700	12,160
	5.1~ 6.0				8,090	8,620	8,890	10,360	11,090	12,660
	6.1~ 8.0					9,200	9,560	11,160	12,030	13,910
	8.1~10.0						10,010	11,780	12,780	14,890
	10.1~13.0							13,030	14,240	18,290
	13.1~16.0								15,350	18,290
	16.1~20.0									20,300
FZPRBL	2.0~ 3.0	11,990	12,070	12,160	11,390	11,940	12,180	13,710	14,500	16,110
	3.1~ 4.0		12,060	10,940	11,530	12,110	12,310	13,950	14,830	16,530
	4.1~ 5.0			11,070	11,660	12,290	12,530	14,270	15,200	17,030
	5.1~ 6.0				11,820	12,500	12,760	14,590	15,580	17,530
	6.1~ 8.0					13,070	13,430	15,380	16,520	17,530
	8.1~10.0						13,890	16,010	17,270	18,780
	10.1~13.0							17,260	18,730	19,760
	13.1~16.0								19,840	21,630
	16.1~20.0									23,160
FZPEBL	2.0~ 3.0	11,800	11,880	11,960	11,190	11,740	11,980	13,490	14,280	15,880
	3.1~ 4.0		11,860	10,750	11,330	11,920	12,120	13,740	14,620	16,300
	4.1~ 5.0			10,870	11,470	12,090	12,340	14,050	14,980	16,800
	5.1~ 6.0				11,620	12,300	12,560	14,370	15,370	17,300
	6.1~ 8.0					12,870	13,230	15,170	16,310	18,540
	8.1~10.0						13,690	15,790	17,060	19,530
	10.1~13.0							17,050	18,520	21,400
	13.1~16.0								19,630	22,920
	16.1~20.0									24,930

■With key groove type

Catalog No.	H \ V	3.1~4.0	4.1~5.0	5.1~6.0	6.1~8.0	8.1~10.0	10.1~13.0	13.1~16.0	16.1~20.0
FZPDKL	3.1~ 4.0	8,870	7,750	8,340	8,770	8,970	10,260	10,880	12,200
	4.1~ 5.0		7,870	8,470	8,950	9,190	10,580	11,240	12,700
	5.1~ 6.0			8,620	9,160	9,420	10,900	11,620	13,200
	6.1~ 8.0				9,730	10,090	11,690	12,560	14,440
	8.1~10.0					10,550	12,320	13,320	15,430
	10.1~13.0						13,570	14,780	18,820
	13.1~16.0							15,880	18,820
	16.1~20.0								20,830
FZPRKL	3.1~ 4.0	12,600	11,480	12,070	12,650	12,850	14,490	15,370	17,070
	4.1~ 5.0		11,600	12,200	12,830	13,070	14,800	15,730	17,560
	5.1~ 6.0			12,350	13,030	13,290	15,120	16,120	18,070
	6.1~ 8.0				13,610	13,970	15,920	17,050	18,070
	8.1~10.0					14,420	16,540	17,810	19,310
	10.1~13.0						17,800	19,270	20,290
	13.1~16.0							20,380	22,160
	16.1~20.0								23,690
FZPEKL	3.1~ 4.0	12,400	11,280	11,870	12,450	12,650	14,270	15,160	16,830
	4.1~ 5.0		11,410	12,000	12,630	12,870	14,590	15,520	17,330
	5.1~ 6.0			12,180	12,840	13,100	14,910	15,900	17,840
	6.1~ 8.0				13,410	13,770	15,700	16,840	19,080
	8.1~10.0					14,220	16,330	17,590	20,060
	10.1~13.0						17,580	19,060	21,930
	13.1~16.0							20,160	23,460
	16.1~20.0								25,470

■Tapped type

Catalog No.	H \ V	8.1~10.0	10.1~13.0	13.1~16.0	16.1~20.0
FZPDML	8.1~10.0	11,210	12,980	13,980	16,090
	10.1~13.0		14,230	15,440	19,490
	13.1~16.0			16,550	19,490
	16.1~20.0				21,500
FZPRML	8.1~10.0	15,090	17,210	18,470	19,980
	10.1~13.0		18,460	19,930	20,960
	13.1~16.0			21,040	22,830
	16.1~20.0				24,360
FZPEML	8.1~10.0	14,890	16,990	18,260	20,730
	10.1~13.0		18,250	19,720	22,600
	13.1~16.0			20,830	24,120
	16.1~20.0				26,130

■Single flanged type

Catalog No.	H \ V	2.0~3.0	3.1~4.0	4.1~5.0	5.1~6.0	6.1~8.0	8.1~10.0	10.1~13.0	13.1~16.0
FZPDFL	2.0~ 3.0	9,070	9,150	9,230	8,470	8,860	9,110	10,280	10,810
	3.1~ 4.0		9,140	8,020	8,610	9,040	9,240	10,530	11,140
	4.1~ 5.0			8,140	8,740	9,220	9,460	10,840	11,500
	5.1~ 6.0				8,890	9,420	9,690	11,160	11,890
	6.1~ 8.0					10,000	10,360	11,980	12,830
	8.1~10.0						10,810	12,580	13,580
	10.1~13.0							13,840	15,040
	13.1~16.0								16,150
FZPRFL	2.0~ 3.0	12,800	12,880	12,960	12,190	12,740	12,980	14,510	15,300
	3.1~ 4.0		12,860	11,740	12,330	12,920	13,120	14,760	15,640
	4.1~ 5.0			11,870	12,460	13,090	13,330	15,070	16,000
	5.1~ 6.0				12,620	13,300	13,560	15,390	16,380
	6.1~ 8.0					13,870	14,230	16,190	17,320
	8.1~10.0						14,690	16,810	18,080
	10.1~13.0							18,060	19,540
	13.1~16.0								20,640
FZPEFL	2.0~ 3.0	12,600	12,680	12,760	12,000	12,540	12,780	14,290	15,090
	3.1~ 4.0		12,670	11,550	12,140	12,720	12,920	14,540	15,420
	4.1~ 5.0			11,670	12,270	12,900	13,140	14,860	15,780
	5.1~ 6.0				12,420	13,100	13,370	15,180	16,170
	6.1~ 8.0					13,680	14,040	15,970	17,110
	8.1~10.0						14,490	16,600	17,860
	10.1~13.0							17,850	19,320
	13.1~16.0								20,430

■Double flanged type

Catalog No.	H \ V	2.0~3.0	3.1~4.0	4.1~5.0	5.1~6.0	6.1~8.0	8.1~10.0	10.1~13.0	13.1~16.0
FZPDWL	2.0~ 3.0	9,870	9,950	10,030	9,270	9,670	9,910	11,080	11,610
	3.1~ 4.0		9,940	8,820	9,410	9,840	10,040	11,330	11,950
	4.1~ 5.0			8,940	9,540	10,020	10,260	11,650	12,310
	5.1~ 6.0				9,700	10,230	10,490	11,970	12,690
	6.1~ 8.0					10,800	11,160	12,760	13,630
	8.1~10.0						11,620	13,390	14,390
	10.1~13.0							14,640	15,850
	13.1~16.0								16,950
FZPRWL	2.0~ 3.0	13,600	13,680	13,760	13,000	13,540	13,780	15,310	16,100
	3.1~ 4.0		13,660	12,550	13,140	13,720	13,920	15,560	16,440
	4.1~ 5.0			12,670	13,270	13,900	14,140	15,870	16,800
	5.1~ 6.0				13,420	14,100	14,370	16,190	17,190
	6.1~ 8.0					14,680	15,040	16,990	18,130
	8.1~10.0						15,490	17,610	18,880
	10.1~13.0							18,870	20,340
	13.1~16.0								21,450
FZPEWL	2.0~ 3.0	13,400	13,480	13,560	12,800	13,350	13,590	15,100	15,890
	3.1~ 4.0		13,470	12,350	12,940	13,520	13,720	15,340	16,230
	4.1~ 5.0			12,480	13,070	13,700	13,940	15,660	16,590
	5.1~ 6.0				13,230	13,910	14,170	15,980	16,970
	6.1~ 8.0					14,480	14,840	16,770	17,910
	8.1~10.0						15,290	17,400	18,670
	10.1~13.0							18,650	20,130
	13.1~16.0								21,230

CARBIDE STRAIGHT PUNCHES

Price P.543

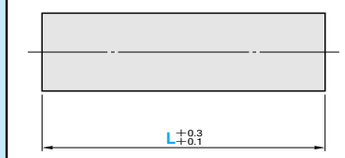
The volume discount rate is also applicable to alteration cost. P.39

● Machining limit of blade

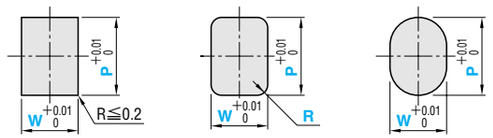
RoHS

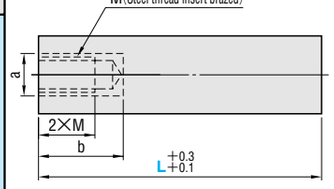
Shape D	Shape R	Shape E
P≧W	P≧W 0.15≦R<$\frac{W}{2}$	P>W

M H	Blade dimension P·W	
V30（HIP） 88～89HRA	P·W 2.00～20.00	—Standard—
V30（HIP） 88～89HRA	P·W 12.00～20.00	—Tapped—
V30（HIP） 88～89HRA	P·W 2.00～20.00	—With key groove—
V30（HIP） 88～89HRA	P·W 2.00～16.00 Not applicable to products marked ●on the standard table.	—Single flanged—
V30（HIP） 88～89HRA	P·W 2.00～16.00 Not applicable to products marked ●on the standard table.	—Double flanged—

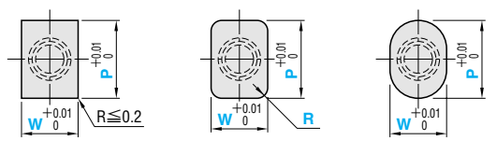


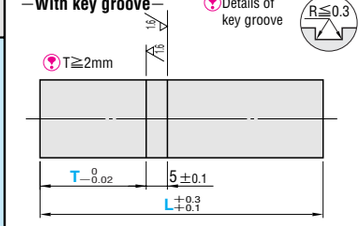
D ZPCD　R ZPCR　E ZPCE



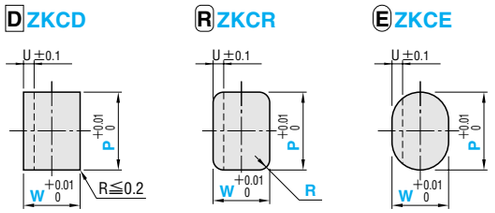


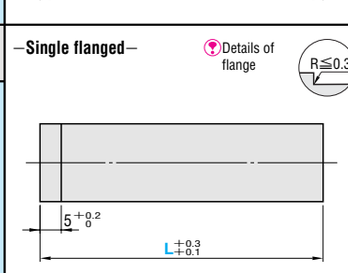
D ZMCD　R ZMCR　E ZMCE



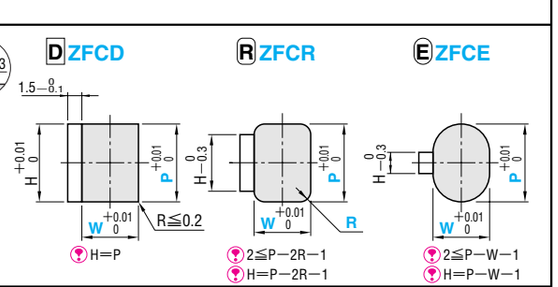


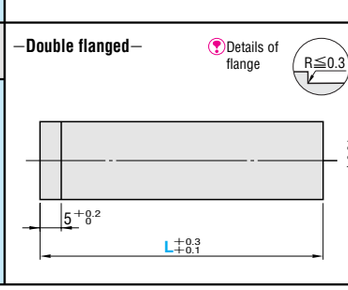
D ZKCD　R ZKCR　E ZKCE



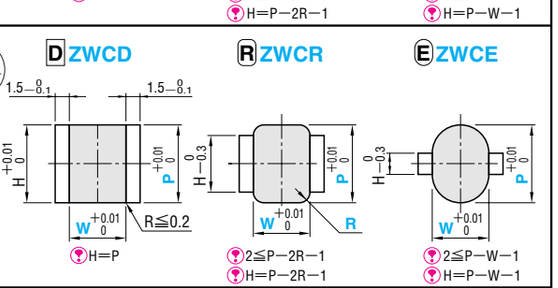


D ZFCD　R ZFCR　E ZFCE





D ZWCD　R ZWCR　E ZWCE



Catalog No. Type	Shape	L	W \ P	2.00～5.00	5.01～10.00	10.01～16.00	16.01～20.00	0.1mm T	U
ZPC ZKC ZFC ZWC	D R E	40 50 60 70	2.00～ 3.00	○	○	○		T≧2	1.0
			3.01～ 4.00	○	○	○	●		
			4.01～ 5.00	○	○	○	●		
			5.01～ 6.00		○	○	●		1.5
			6.01～ 8.00		○	○	●		
			8.01～10.00		○	○	●		
			10.01～16.00			○	●		
			16.01～20.00				●		

Catalog No. Type	Shape	L	W \ P	12.00～16.00	16.01～20.00	M	a	b
ZMC	D R E	40 50 60 70	12.00～13.00	○	○	8	10	20
			13.01～16.00	○	○			
			16.01～20.00		○			

Order

Catalog No.	–	L	–	0.01mm increments P	–	W	–	R (Ⓡonly)	–	0.1mm incr. T≧2	–	K·F·WF
ZPCD	–	60	–	P14.28	–	W 9.28						
ZMCR	–	60	–	P15.00	–	W12.00	–	R0.15				
ZKCR	–	60	–	P14.28	–	W 9.28	–	R0.5	–	T25.5	–	K0
ZFCE	–	60	–	P10.00	–	W 5.50					–	F0
ZWCE	–	60	–	P12.01	–	W 8.05					–	WF0

Delivery 5 Days　Price P.543

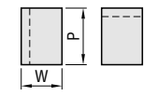
Alteration

Catalog No.	–	L (LC)	–	P	–	W	–	R	–	T	–	K·F·WF	–	(PKC…etc.)
ZPCD	—	LC65.5	—	P5.80	—	W5.20							—	PKC — FK

Alteration		Code	Spec.	¥/1Code
Blade		PKC	Changes blade tolerance (P·W) P·W +0.01 0 ⇨ +0.005 0	2,300
		PKM	Changes blade tolerance (P·W) P·W +0.01 0 ⇨ 0 −0.005	2,300
		PKV	Changes blade tolerance (P·W) P·W +0.01 0 ⇨ ±0.005	0
Full length		LC	Changes full length 20≦LC<L 0.1mm incr. (Combination with LKC·LKZ→0.01mm incr.)	600
		LKC	Changes full length tolerance L +0.3 +0.1 ⇨ +0.05 0	1,200
		LKZ	Changes full length tolerance L +0.3 +0.1 ⇨ +0.01 0	1,800
Flange		HC	Changes flange width 0≦HC<1.5 0.1mm increments	600
		TC	Changes flange thickness 2≦TC<5 0.1mm incr. (Comb. with TKC·TKM→0.01mm incr.) L is shortened by (5−TC) When LC is applied, L is equal to LC.	600
		TKC	Changes flange thickness tolerance T +0.2 0 ⇨ +0.02 0	1,200
		TKM	Changes flange thickness tolerance T +0.2 0 ⇨ 0 −0.02	1,200
		FK	Adds relief chamfering to flange (for breakage prevention) ⊗Standard, tapped, key groove types : Not applicable	Single flanged 600 Double flanged 1,200

Alteration		Code	Spec.	¥/1Code
Key groove		RTC	Changes tolerance on key groove position T T 0 −0.02 ⇨ +0.05 0	0
		WK	Adds key groove at symmetrical position K0 K90 U (UK) W P W−{2×U(UK)}≧2.0 (K0) P−{2×U(UK)}≧2.0 (K90) The additional key groove position is symmetrical with the specified key groove position. ●Combination with UK is applicable ●Applicable to key groove type only.	800
		UK	Changes key groove depth 0.5≦UK≦U+0.2 0.1mm increments P(W)−UK≧2.0 ●Combination with WK is applicable ●Applicable to key groove type only.	600
Tap		MC	Changes tap size Changes M8 to M6. ●The dimensions a and b are not changed.	0
Contour		CCN	Adds chamfering to four corners of shank 5≦CCN≦L 1mm increments ●Applicable to blade shape D only. ●For flanged type, chamfered length of the flanged sides : CCN−T(TC).	1,200

■Specifications of key groove position



■Specifications of flange position

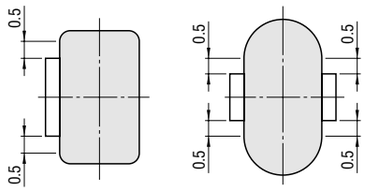
●Shape E : Only F0・WF0 are specifiable

●In case of F90 or WF90, dimension H is as follows.

Shape D : 2≦W　H=W

Shape R : 2≦W−2R−1　H=W−2R−1

●Shape R·E of single and double flanged types : there are flat parts of 0.5mm on each side of flanges



CARBIDE STRAIGHT PUNCHES WITH AIR HOLE

Price P.545

The volume discount rate is also applicable to alteration cost. P.39

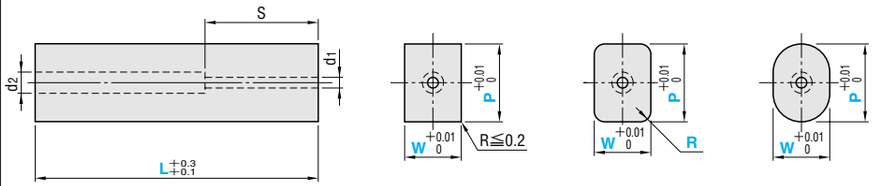
RoHS

● Machining limit of blade

Shape D	Shape R	Shape E
P≧W	P≧W 0.15≦R<$\frac{W}{2}$	P>W

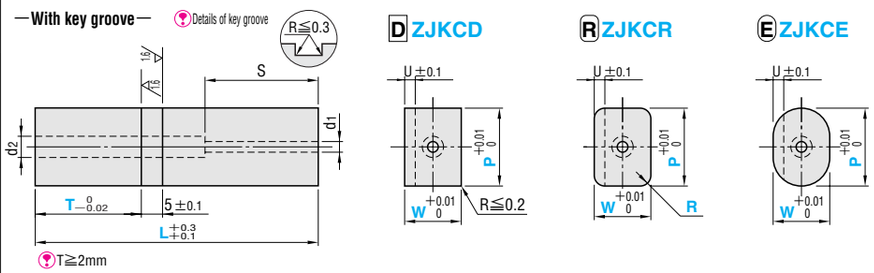
M H	Blade dimension P·W
V30 (HIP) 88～89HRA	P·W 5.00～20.00

—Standard—



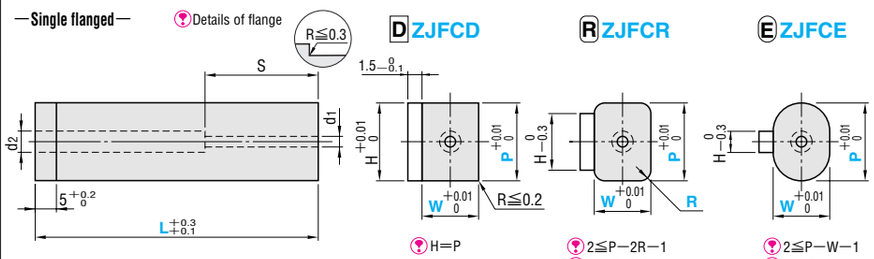
M H	Blade dimension P·W
V30 (HIP) 88～89HRA	P·W 5.00～20.00

—With key groove— Details of key groove



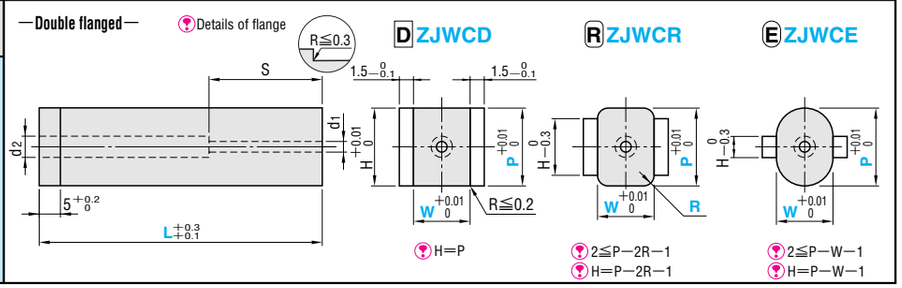
M H	Blade dimension P·W
V30 (HIP) 88～89HRA	P·W 5.00～16.00 Not applicable to products marked ● on the standard table.

—Single flanged— Details of flange



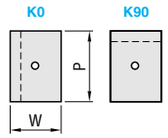
M H	Blade dimension P·W
V30 (HIP) 88～89HRA	P·W 5.00～16.00 Not applicable to products marked ● on the standard table.

—Double flanged— Details of flange

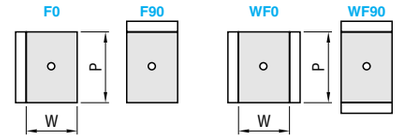


Catalog No. Type	Shape	L	P \ W	5.00 ～ 6.00	6.01 ～ 8.00	8.01 ～ 10.00	10.01 ～ 16.00	16.01 ～ 20.00	0.1mm T	d_1×S L=40	d_1×S L=50	d_1×S L=60·70	d_2	U
ZJC ZJKC ZJFC ZJWC	D R E	40	5.00～ 6.00	○	○	○	○	●	T≧2.0	0.8×17	0.8×20		2.6	1.0
		50	6.01～ 8.00		○	○	○	●		1.2×17	1.2×27		3.4	
		60	8.01～10.00			○	○	●		1.6×17	1.6×28		4.4	1.5
		70	10.01～13.00				○	●		1.9×17	1.9×28			
			13.01～16.00				○	●		2.9×17	2.9×24	2.9×36		
			16.01～20.00					●						

■Specifications of key groove position



■Specifications of flange position



Shape E : Only F0 · WF0 are specifiable

In case of F90 or WF90, dimension H is as follows.

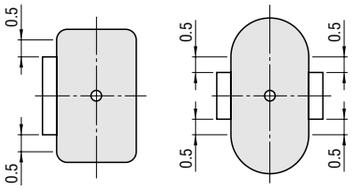
Shape D : 2≦W H=W

Shape R : 2≦W−2R−1 H=W−2R−1

Order

Catalog No.	L	P	W	R (R only)	T≧2	K·F·WF
		0.01mm increments			0.1mm incr.	
ZJCD	60	P14.28	W 9.28			
ZJKCR	60	P14.28	W 9.28	R0.15	T25.5	K0
ZJFCE	60	P13.18	W 6.50			F0
ZJWCD	60	P14.28	W14.28			WF90

Shape R·E of single and double flanged type : there are flat parts of 0.5mm on each side of flanges



Delivery 10 Days

Price P.545

Alteration

Catalog No.	L(LC)	P	W	R	T	K·F·WF	(PKC···etc.)
ZJCD	LC65.5	P5.80	W5.20				PKC

Alteration		Code	Spec.	¥/1Code
Blade	W T P	PKC	Changes blade tolerance (P·W) P·W +0.01 0 ⇨ +0.005 0	2,300
		PKM	Changes blade tolerance (P·W) P·W +0.01 0 ⇨ 0 −0.005	2,300
		PKV	Changes blade tolerance (P·W) P·W +0.01 0 ⇨ ±0.005	0
Full length	LC L	LC	Changes full length 30≦LC<L 0.1mm incr. (Combination with LKC·LKZ→0.01mm incr.)	600
	LCX L	LCX	Changes full length without changing length S 30≦LCX<L 0.1mm increments Combination with LKC·LKZ→0.01mm increments ⊗Single, double flanged types : Not applicable	600
	L T	LKC	Changes full length tolerance L +0.3 +0.1 ⇨ +0.05 0	1,200
		LKZ	Changes full length tolerance L +0.3 +0.1 ⇨ +0.01 0	1,800
Key groove	T T	RTC	Changes tolerance on key groove position T T 0 −0.02 ⇨ +0.05 0	0
	UK U L	UK	Changes key groove depth 0.5≦UK≦U+0.2 0.1mm increments W(P)−{UK+d_2 (d_1)}≧2.0 Applicable to key groove type only.	600

Alteration		Code	Spec.	¥/1Code
Flange	HC	HC	Changes flange width 0≦HC<1.5 0.1mm increments	600
	T TC	TC	Changes flange thickness 2≦TC<5 0.1mm incr. (Comb. with TKC·TKM→0.01mm incr.) L is shortened by (5−TC). When LC is applied, L is equal to LC.	600
	T T	TKC	Changes flange thickness tolerance T +0.2 0 ⇨ +0.02 0	1,200
		TKM	Changes flange thickness tolerance T +0.2 0 ⇨ 0 −0.02	1,200
		FK	Adds relief chamfering to flange (for breakage prevention) ⊗Standard, key groove type : Not applicable	Single flanged 600 Double flanged 1,200
Contour	4−C0.5 CCN	CCN	Adds chamfering to four corners of shank 5≦CCN≦L 1mm increments Applicable to blade shape D only. ⊗For flanged type, chamfered length of the flanged sides : CCN−T(TC).	1,200

CARBIDE STRAIGHT PUNCHES
—PRICE—

Price

■Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Standard type

Catalog No.	W \ P	2.00~2.99	3.00~3.99	4.00~4.99	5.00~5.99	6.00~7.99	8.00~9.99	10.00~12.99	13.00~15.99	16.00~20.00
ZPCD	2.00~ 2.99	3,020	3,020	3,310	2,900	3,030	3,220	3,390	3,560	
	3.00~ 3.99		3,110	2,700	3,010	3,150	3,300	3,590	3,810	4,100
	4.00~ 4.99			2,800	3,110	3,280	3,460	3,800	4,050	4,400
	5.00~ 5.99				3,220	3,420	3,620	4,010	4,310	4,700
	6.00~ 7.99					3,750	4,010	4,400	4,800	5,310
	8.00~ 9.99						4,340	4,810	5,300	5,930
	10.00~12.99							5,560	6,170	6,990
	13.00~15.99								6,920	7,920
	16.00~20.00									9,140
ZPCR	2.00~ 2.99	6,270	6,270	6,270	6,830	6,950	7,140	7,330	7,510	
	3.00~ 3.99		6,360	5,660	6,930	7,080	7,240	7,550	7,790	8,090
	4.00~ 4.99			5,740	7,030	7,220	7,410	7,760	8,040	8,410
	5.00~ 5.99				7,160	7,370	7,580	7,990	8,310	8,730
	6.00~ 7.99					7,710	7,960	8,410	8,840	9,400
	8.00~ 9.99						8,340	8,850	9,370	10,050
	10.00~12.99							9,650	10,310	11,180
	13.00~15.99								11,060	12,160
	16.00~20.00									13,460
ZPCE	2.00~ 2.99	6,250	6,280	7,250	6,830	6,950	7,140	7,330	7,510	
	3.00~ 3.99		7,270	5,780	6,930	7,080	7,240	7,550	7,780	8,090
	4.00~ 4.99			5,860	7,030	7,210	7,410	8,070	8,070	8,410
	5.00~ 5.99				7,160	7,360	7,580	7,990	8,310	8,730
	6.00~ 7.99					7,710	8,000	8,410	8,830	9,400
	8.00~ 9.99						8,340	8,850	9,360	10,050
	10.00~12.99							9,650	10,310	11,180
	13.00~15.99								11,090	12,160
	16.00~20.00									13,470

■With key groove type

Catalog No.	W \ P	2.00~2.99	3.00~3.99	4.00~4.99	5.00~5.99	6.00~7.99	8.00~9.99	10.00~12.99	13.00~15.99	16.00~20.00
ZKCD	2.00~ 2.99	3,800	3,830	3,900	3,490	3,610	3,790	3,970	4,140	
	3.00~ 3.99		3,910	3,280	3,590	3,730	3,880	4,170	4,390	4,680
	4.00~ 4.99			3,380	3,700	3,870	4,040	4,370	4,630	4,980
	5.00~ 5.99				3,860	4,000	4,200	4,590	4,890	5,280
	6.00~ 7.99					4,330	4,590	4,980	5,380	5,900
	8.00~ 9.99						4,920	5,390	5,870	6,510
	10.00~12.99							6,140	6,760	7,570
	13.00~15.99								7,490	8,500
	16.00~20.00									9,720
ZKCR	2.00~ 2.99	6,850	6,850	6,850	7,440	7,570	7,760	7,950	8,130	
	3.00~ 3.99		6,900	6,240	7,550	7,700	7,860	8,170	8,400	8,710
	4.00~ 4.99			6,320	7,650	7,840	8,030	8,380	8,660	9,030
	5.00~ 5.99				7,780	7,990	8,200	8,610	8,930	9,350
	6.00~ 7.99					8,330	8,610	9,050	9,450	10,010
	8.00~ 9.99						8,960	9,470	9,980	10,670
	10.00~12.99							10,270	10,930	11,800
	13.00~15.99								11,710	12,780
	16.00~20.00									14,080
ZKCE	2.00~ 2.99	6,790	6,830	6,890	7,440	7,570	7,760	7,950	8,130	
	3.00~ 3.99		6,900	6,320	6,610	7,700	7,860	8,170	8,400	8,700
	4.00~ 4.99			6,410	7,650	7,840	8,030	8,380	8,660	9,030
	5.00~ 5.99				7,780	7,990	8,200	8,610	8,930	9,350
	6.00~ 7.99					8,330	8,610	9,030	9,380	10,010
	8.00~ 9.99						8,960	9,470	9,950	10,670
	10.00~12.99							10,290	10,930	11,800
	13.00~15.99								11,710	12,780
	16.00~20.00									14,080

■Tapped type

Catalog No.	W \ P	12.00~12.99	13.00~15.99	16.00~20.00
ZMCD	12.00~12.99	7,300	7,960	8,820
	13.00~15.99		8,740	9,810
	16.00~20.00			11,120
ZMCR	12.00~12.99	11,020	11,670	12,530
	13.00~15.99		12,460	13,520
	16.00~20.00			14,830
ZMCE	12.00~12.99	11,020	11,670	12,530
	13.00~15.99		12,460	13,520
	16.00~20.00			14,830

■Single flanged type

Catalog No.	W \ P	2.00~2.99	3.00~3.99	4.00~4.99	5.00~5.99	6.00~7.99	8.00~9.99	10.00~12.99	13.00~16.00
ZFCD	2.00~ 2.99	3,730	3,730	4,010	3,620	3,740	3,920	4,090	4,260
	3.00~ 3.99		3,810	3,420	3,720	3,860	4,000	4,290	4,500
	4.00~ 4.99			3,510	3,810	3,990	4,160	4,480	4,730
	5.00~ 5.99				3,930	4,120	4,310	4,680	4,980
	6.00~ 7.99					4,440	4,690	5,070	5,450
	8.00~ 9.99						5,010	5,470	5,940
	10.00~12.99							6,190	6,790
	13.00~16.00								7,510
ZFCR	2.00~ 2.99	6,880	6,880	6,880	7,420	7,540	7,730	7,910	8,090
	3.00~ 3.99		6,970	6,280	7,520	7,670	7,820	8,120	8,350
	4.00~ 4.99			6,370	7,620	7,800	7,990	8,330	8,600
	5.00~ 5.99				7,740	7,940	8,150	8,540	8,860
	6.00~ 7.99					8,280	8,520	8,960	9,370
	8.00~ 9.99						8,890	9,380	9,890
	10.00~12.99							10,160	10,800
	13.00~16.00								11,530
ZFCE	2.00~ 2.99	6,860	6,890	7,830	7,420	7,540	7,730	7,910	8,090
	3.00~ 3.99		7,850	6,400	7,520	7,670	7,820	8,120	8,340
	4.00~ 4.99			6,490	7,620	7,790	7,980	8,630	8,630
	5.00~ 5.99				7,740	7,940	8,150	8,540	8,860
	6.00~ 7.99					8,280	8,550	8,960	9,360
	8.00~ 9.99						8,890	9,380	9,880
	10.00~12.99							10,160	10,800
	13.00~16.00								11,560

■Double flanged type

Catalog No.	W \ P	2.00~2.99	3.00~3.99	4.00~4.99	5.00~5.99	6.00~7.99	8.00~9.99	10.00~12.99	13.00~16.00
ZWCD	2.00~ 2.99	4,530	4,530	4,810	4,420	4,540	4,720	4,890	5,060
	3.00~ 3.99		4,620	4,230	4,520	4,640	4,800	5,090	5,300
	4.00~ 4.99			4,320	4,620	4,790	4,960	5,290	5,530
	5.00~ 5.99				4,730	4,920	5,110	5,490	5,780
	6.00~ 7.99					5,240	5,490	5,870	6,250
	8.00~ 9.99						5,810	6,270	6,740
	10.00~12.99							7,000	7,590
	13.00~16.00								8,310
ZWCR	2.00~ 2.99	7,680	7,680	7,680	8,220	8,340	8,530	8,710	8,890
	3.00~ 3.99		7,770	7,090	8,330	8,470	8,620	8,930	9,150
	4.00~ 4.99			7,170	8,420	8,600	8,790	9,130	9,400
	5.00~ 5.99				8,540	8,750	8,950	9,350	9,660
	6.00~ 7.99					9,080	9,320	9,760	10,170
	8.00~ 9.99						9,690	10,190	10,690
	10.00~12.99							10,960	11,600
	13.00~16.00								12,330
ZWCE	2.00~ 2.99	7,660	7,690	8,630	8,220	8,340	8,530	8,710	8,890
	3.00~ 3.99		8,660	7,210	8,330	8,470	8,620	8,930	9,140
	4.00~ 4.99			7,290	8,420	8,590	8,780	9,430	9,430
	5.00~ 5.99				8,540	8,740	8,950	9,350	9,660
	6.00~ 7.99					9,080	9,350	9,760	10,170
	8.00~ 9.99						9,690	10,190	10,680
	10.00~12.99							10,960	11,600
	13.00~16.00								12,360

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CARBIDE STRAIGHT PUNCHES WITH AIR HOLE
—PRICE—

Price

Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Standard type

Catalog No.	W \ P	5.00~5.99	6.00~7.99	8.00~9.99	10.00~12.99	13.00~15.99	16.00~20.00
ZJCD	5.00~ 5.99	4,840	5,040	5,240	5,640	5,950	6,360
	6.00~ 7.99		5,380	5,650	6,050	6,470	7,000
	8.00~ 9.99			5,980	6,480	6,980	7,640
	10.00~12.99				7,250	7,890	8,730
	13.00~15.99					8,650	9,690
	16.00~20.00						10,950
ZJCR	5.00~ 5.99	8,350	8,350	8,930	9,240	9,560	9,960
	6.00~ 7.99		8,940	9,250	9,660	10,060	10,610
	8.00~ 9.99			9,590	10,080	10,580	11,240
	10.00~12.99				10,860	11,500	12,340
	13.00~15.99					12,250	13,290
	16.00~20.00						14,560
ZJCE	5.00~ 5.99	8,440	8,640	8,850	9,240	9,560	9,960
	6.00~ 7.99		8,990	9,250	9,660	10,060	10,600
	8.00~ 9.99			9,590	10,080	10,580	11,240
	10.00~12.99				10,860	11,500	12,340
	13.00~15.99					12,250	13,290
	16.00~20.00						14,560

■With key groove type

Catalog No.	W \ P	5.00~5.99	6.00~7.99	8.00~9.99	10.00~12.99	13.00~15.99	16.00~20.00
ZJKCD	5.00~ 5.99	5,430	5,630	5,840	6,230	6,560	6,960
	6.00~ 7.99		5,980	6,250	6,650	7,070	7,600
	8.00~ 9.99			6,590	7,080	7,580	8,240
	10.00~12.99				7,860	8,490	9,330
	13.00~15.99					9,250	10,290
	16.00~20.00						11,550
ZJKCR	5.00~ 5.99	9,030	9,240	9,450	9,840	10,160	10,560
	6.00~ 7.99		9,580	9,850	10,260	10,660	11,200
	8.00~ 9.99			10,190	10,690	11,180	11,840
	10.00~12.99				11,460	12,100	12,940
	13.00~15.99					12,860	13,890
	16.00~20.00						15,160
ZJKCE	5.00~ 5.99	9,030	9,240	9,450	9,840	10,160	10,560
	6.00~ 7.99		9,580	9,850	10,260	10,660	11,200
	8.00~ 9.99			10,190	10,690	11,180	11,840
	10.00~12.99				11,460	12,100	12,940
	13.00~15.99					12,860	13,890
	16.00~20.00						15,160

■Single flanged type

Catalog No.	W \ P	5.00~5.99	6.00~7.99	8.00~9.99	10.00~12.99	13.00~16.00
ZJFCD	5.00~ 5.99	5,640	5,840	6,040	6,440	6,760
	6.00~ 7.99		6,180	6,450	6,850	7,270
	8.00~ 9.99			6,790	7,280	7,790
	10.00~12.99				8,060	8,690
	13.00~16.00					9,450
ZJFCR	5.00~ 5.99	9,150	9,150	9,730	10,050	10,360
	6.00~ 7.99		9,750	10,050	10,460	10,860
	8.00~ 9.99			10,390	10,890	11,380
	10.00~12.99				11,660	12,300
	13.00~16.00					13,060
ZJFCE	5.00~ 5.99	9,240	9,450	9,650	10,050	10,360
	6.00~ 7.99		9,790	10,050	10,460	10,860
	8.00~ 9.99			10,390	10,890	11,380
	10.00~12.99				11,660	12,300
	13.00~16.00					13,060

■Double flanged type

Catalog No.	W \ P	5.00~5.99	6.00~7.99	8.00~9.99	10.00~12.99	13.00~16.00
ZJWCD	5.00~ 5.99	6,440	6,640	6,850	7,240	7,560
	6.00~ 7.99		6,980	7,250	7,660	8,070
	8.00~ 9.99			7,590	8,090	8,590
	10.00~12.99				8,860	9,500
	13.00~16.00					10,260
ZJWCR	5.00~ 5.99	9,950	9,950	10,530	10,850	11,160
	6.00~ 7.99		10,550	10,860	11,260	11,670
	8.00~ 9.99			11,190	11,690	12,190
	10.00~12.99				12,460	13,100
	13.00~16.00					13,860
ZJWCE	5.00~ 5.99	10,040	10,250	10,450	10,850	11,160
	6.00~ 7.99		10,590	10,860	11,260	11,670
	8.00~ 9.99			11,190	11,690	12,190
	10.00~12.99				12,460	13,100
	13.00~16.00					13,860

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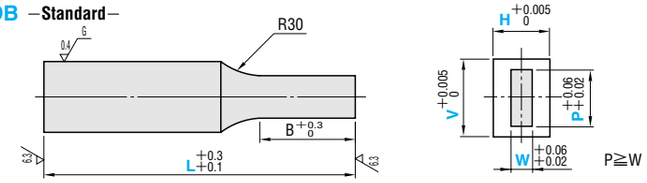
CARBIDE BLOCK PUNCH BLANKS
—MODIFIABLE BLADE—

M / H	Shank dimension V·H
V30 (HIP) 88~89HRA	V·H 3~20

ZPDB —Standard—

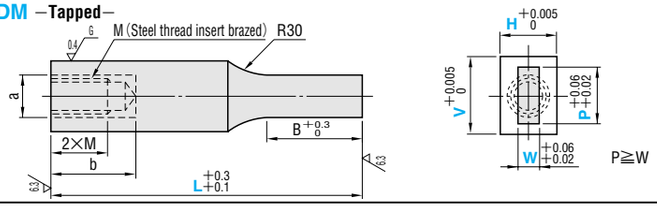
RoHS



M / H	Shank dimension V·H
V30 (HIP) 88~89HRA	V·H 8~20

ZPDM —Tapped—

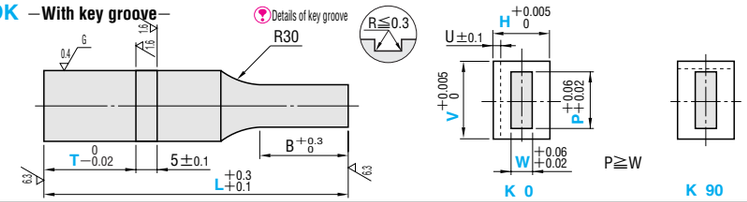
RoHS



M / H	Shank dimension V·H
V30 (HIP) 88~89HRA	V·H 3~20

ZPDK —With key groove—

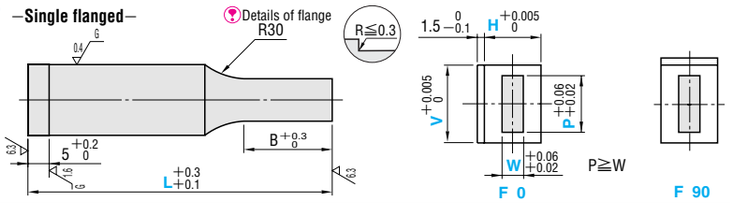
RoHS



M / H	Shank dimension V·H
V30 (HIP) 88~89HRA	V·H 3~16 Not applicable to products marked ● on the standard table.

ZPDF —Single flanged—

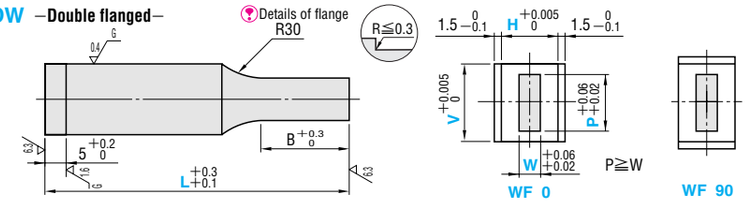
RoHS



M / H	Shank dimension V·H
V30 (HIP) 88~89HRA	V·H 3~16 Not applicable to products marked ● on the standard table.

ZPDW —Double flanged—

RoHS



Price

Volume discount rate P.37

Quantity	1~4	5~9	10~14	15~20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Additional working fee will be added for the following types :
- **Tapped type (ZPDM) ····· ZPDB U/Price + ¥1,800**
- **With key groove type (ZPDK) ····· ZPDB U/Price + ¥ 800**
- **Single flanged type (ZPDF) ····· ZPDB U/Price + ¥1,200**
- **Double flanged type (ZPDW) ····· ZPDB U/Price + ¥2,400**

Catalog No.	L	H \ V	3	4	5	6	8	10	13	16	20
ZPDB	40	3	4,250	4,250	4,260	4,130	4,210	4,360	4,570	4,700	4,870
		4		4,180	3,820	4,210	4,310	4,410	4,680	4,830	5,050
		5			3,860	4,270	4,390	4,520	4,830	5,010	5,270
		6				4,340	4,490	4,620	4,960	5,180	5,470
		8					4,840	5,030	5,530	5,670	6,030
		10						5,240	5,810	6,010	6,460
		13							6,340	6,760	7,330
		16								7,280	7,990
		20									8,830
	50	3	4,250	4,250	4,320	4,200	4,310	4,470	4,720	4,870	5,070
		4		4,230	3,880	4,290	4,410	4,540	4,860	5,050	5,290
		5			3,960	4,380	4,520	4,690	5,030	5,270	5,560
		6				4,480	4,640	4,820	5,220	5,480	5,820
		8					5,040	5,270	5,700	6,050	6,490
		10						5,560	6,060	6,480	7,040
		13							6,820	7,350	8,070
		16								8,000	8,860
		20									9,930

Catalog No.	L	H \ V	3	4	5	6	8	10	13	16	20
ZPDB	60	3	4,730	4,790	4,850	4,270	4,390	4,570	4,860	5,040	5,290
		4		4,780	3,940	4,380	4,520	4,670	5,030	5,270	5,560
		5			4,030	4,480	4,650	4,840	5,240	5,520	5,870
		6				4,590	4,810	5,010	5,470	5,780	6,200
		8					5,240	5,510	6,010	6,430	6,980
		10						5,850	6,440	6,950	7,610
		13							7,300	7,950	8,790
		16								8,710	9,760
		20									11,040
	70	3	4,780	4,840	4,910	4,340	4,540	4,690	5,010	5,210	5,490
		4		4,830	4,020	4,460	4,640	4,820	5,220	5,480	5,840
		5			4,100	4,590	4,810	5,010	5,440	5,780	6,200
		6				4,590	4,960	5,210	5,700	6,080	6,580
		8					5,440	5,750	6,330	6,810	7,450
		10						6,150	6,830	7,540	8,210
		13							7,800	8,530	9,530
		16								9,450	10,640
		20									12,140

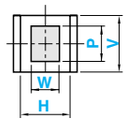
The volume discount rate is also applicable to alteration cost. P.39

Catalog No. / Type	Shank / blade dimension (mm) H	W min.	Pmin. V	3	4	5	6	8	10	13	16	20	L	0.1mm T	B L 40	B L 50	B L 60·70	M	a	b	U
				1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0									
ZPDB	3	1.0		○	○	○	○	○	○	○	○	●									
ZPDK	4	1.0			○	○	○	○	○	○	○	●	40			13	13	–	–	–	1.0
ZPDF	5	2.0				○	○	○	○	○	○	●									
ZPDW	6	2.0					○	○	○	○	○	●	50								
ZPDB	8	2.0						○	○	○	○	●						4	6	12	
ZPDM	10	2.5							○	○	○	●	60	T≧2	13	19	19	6	8	16	
ZPDK	13	3.0								○	○	●									1.5
ZPDF	16	4.0									○	●	70			19	25	8	10	20	
ZPDW	20	5.0										●									

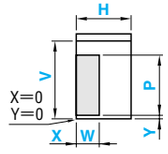
P≧V−0.05 ···▸ P=V When P≧V−0.05, dimension P is equal to dimension V.
W≧H−0.05 ···▸ W=H When W≧H−0.05, dimension W is equal to dimension H.

Order

(1) When the blade is in the center of shank



(2) When the blade is not in the center of shank



Catalog No.	V	H	L	0.01mm increments P	W	0.1mm increments T	K·F·WF	0.01mm increments X	Y
ZPDB	20	08	60	P18.00	W 4.00				
ZPDM	20	10	70	P16.00	W 9.00				
ZPDK	20	06	60	P 8.00	W 5.00	T25.0	K0		
ZPDF	16	13	60	P15.00	W12.00		F90		
ZPDW	16	10	40	P 8.00	W 5.00		WF0		

Catalog No.	V	H	L	0.01mm increments P	W	0.1mm increments T	K·F·WF	0.01mm increments X	Y
ZPDF	16	13	50	P15.00	W12.00		F90	X0.00	Y0.15

Specifications of X and Y should be 0.02 or more, or 0. Tolerance±0.01

Delivery 5 Days | Express B 800/1pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration Catalog No. | V | H | L(LC) | P(PC)−W(WC)−R−X−Y | T | K·F·WF | (BC·VKC···etc.)

ZPDK 20 08 — 60 — P18.00−WC1.50 — T25 — LKZ

Alteration	Code	Spec.	¥/1Code
Blade	PC WC	Changes blade dimension PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments (P·W: 0.50~0.99 B max. 8; 1.00~1.99 13; 2.00~2.99 20; 3.00~4.99 30; 5.00~ 35)	1,500
	BC	Changes blade length B 2≦BC≦Bmax. 0.1mm increments L≧BC+30 Full length L requires BC+30mm or more.	600
Full length	LC	Changes full length 30+B(BC)≦LC<L 0.1mm incr. (Combination with LKC·LKZ→0.01mm incr.) When LC-B is 30mm or less, blade length is full length −30.	600
	LKC	Changes full length tolerance L +0.3 +0.1 ⇨ +0.05 0	1,200
	LKZ	Changes full length tolerance L +0.3 +0.1 ⇨ +0.01 0	1,800
Flange	HC	Changes flange width 0≦HC<1.5 0.1mm increments	600
	TC	Changes flange thickness 2≦TC<5 0.1mm incr. (Comb. with TKC·TKM→0.01mm incr.) L is shortened by (5−TC) When LC is applied, L is equal to LC.	600
	TKC	Changes flange thickness tolerance T +0.2 0 ⇨ +0.02 0	1,200
	TKM	Changes flange thickness tolerance T +0.2 0 ⇨ 0 −0.02	1,200
	FK	Adds relief chamfering to flange (for breakage prevention) ⊗Standard, tapped, key groove types : Not applicable	Single flanged 600 Double flanged 1,200
Tap	MC	Changes tap size (H 8: M4→M3; 10: M6→M5; 13: M8→M6; 16: M8→M6; 20: M8→M6) The dimensions a and b are not changed.	0

Alteration	Code	Spec.	¥/1Code
Key groove	RTC	Changes tolerance on key groove position T T −0.02 0 ⇨ +0.05 0	0
	WK	Adds key groove at symmetrical position K0 K90 H−(2×U(UK)≧2.0(K0) V−(2×U(UK)≧2.0(K90) The additional key groove position is symmetrical with the specified key groove position. Combination with UK is applicable Applicable to key groove type only.	800
	UK	Changes key groove depth 0.1mm increments 0.5≦UK≦U+0.2 Combination with WK is applicable H(V)−UK≧2.0 Applicable to key groove type only.	600
Contour	CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	Standard Tapped With key groove 600; Single flanged Double flanged 800
	CCP	Adds chamfering (C1.0) to a corner of shank (error prevention). Applicable when the distance a·b (corner of blade to shank) is as below. a+b≧1.3 ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270 Applicable to standard and tapped types only.	600
	VKC	Changes shank tolerance (V·H) V·H +0.005 0 ⇨ +0.003 0	2,000
	VKM	Changes shank tolerance (V·H) V·H +0.005 0 ⇨ 0 −0.003	2,000
	VHM	Changes shank tolerance (V·H) V·H +0.005 0 ⇨ 0 −0.005	1,200
	DC	Adds press-in lead 3mm press-in lead (V·H −0.01 −0.03) added ⊗Single and double flanged types : Not applicable	600

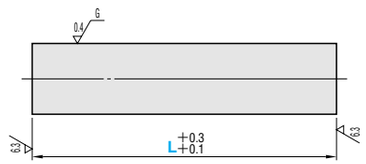
CARBIDE BLOCK PUNCH BLANKS
—POSITIVE / NEGATIVE TOLERANCE ON SHANK—

RoHS

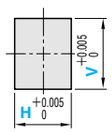
M H	Shank dimension V·H
V30 (HIP) 88～89HRA	V·H 2～20

—Standard—

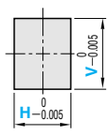
ZPB
B—ZPB



ZPB



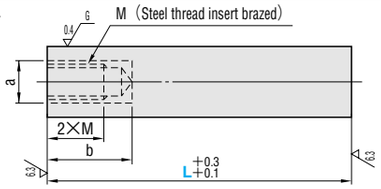
B—ZPB

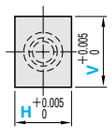


M H	Shank dimension V·H
V30 (HIP) 88～89HRA	V·H 8～20

—Tapped—

ZPM

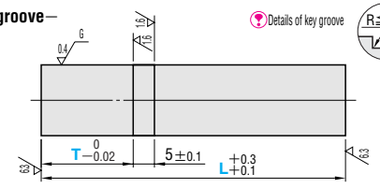




M H	Shank dimension V·H
V30 (HIP) 88～89HRA	V·H 2～20

—With key groove—

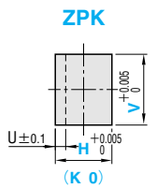
ZPK
B—ZPK



Details of key groove

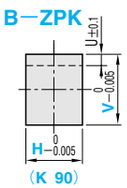
R≦0.3

ZPK



(K 0)

B—ZPK



(K 90)

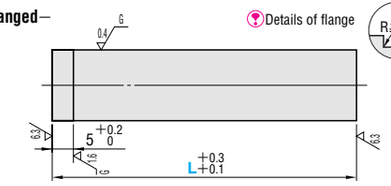
M H	Shank dimension V·H
V30 (HIP) 88～89HRA	V·H 2～16 Not applicable to products marked ● on the standard table.

—Single flanged—

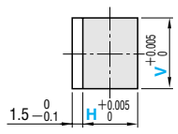
ZPF

Details of flange

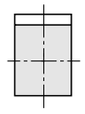
R≦0.3



F 0



F 90



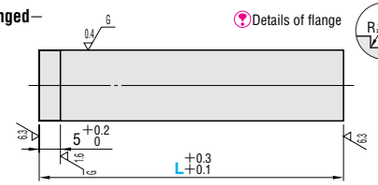
M H	Shank dimension V·H
V30 (HIP) 88～89HRA	V·H 2～16 Not applicable to products marked ● on the standard table.

—Double flanged—

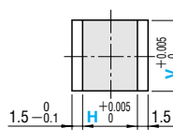
ZPW

Details of flange

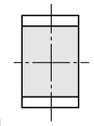
R≦0.3



WF 0



WF 90



Catalog No.	H \ V	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	8	10	13	16	20	L	0.1mm T	M	a	b	U
ZPB ZPK B—ZPB ZPF B—ZPK ZPW	2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	(20) (25) (30) 40 50 60 70	T≦2.0	–	–	–	1.0
	2.5		○	○	○	○	○	○	○	○	○	○	○	○	○	●						
	3			○	○	○	○	○	○	○	○	○	○	○	○	●						
	3.5				○	○	○	○	○	○	○	○	○	○	○	●						
	4					○	○	○	○	○	○	○	○	○	○	●						
	4.5						○	○	○	○	○	○	○	○	○	●						
	5							○	○	○	○	○	○	○	○	●						
	5.5								○	○	○	○	○	○	○	●						
	6									○	○	○	○	○	○	●						
	6.5										○	○	○	○	○	●						
ZPB ZPM ZPK B—ZPB ZPF B—ZPK ZPW	8											○	○	○	○	●			4	6	12	1.5
	10												○	○	○	●			6	8	16	
	13													○	○	●			8	10	20	
	16														○	●						
	20															●						

⊗L(20), (25), and (30) are not applicable to ZPM, ZPK and B—ZPK.

Order (When V3, H2.5)

Catalog No.	V	H	—	L	—	0.1mm increments T≦2	—	K·F·WF
ZPB	03	025	—	50				
ZPM	20	10	—	70				
ZPK	10	045	—	60	—	T25.0	—	K0
ZPF	16	13	—	50			—	F90
ZPW	13	10	—	40			—	WF0

Make sure in case H and V dimensions are in 0.5 mm increments.

Delivery

5 Days

Express B 800/1pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No. | V | H | — | L (LC) | — | T | — | K·F·WF | — (HC·TC·WK···etc.)

ZPB 20 08 — 50 — VKC
B—ZPK 16 03 — 50 — K90 — WK

Alteration		Code	Spec.	¥/1Code
Full length	LC	LC	Changes full length 20<LC<L For ZPM, ZPK and B-ZPK, 30≦LC<L 0.1mm incr. (Combination with LKC·LKZ→0.01mm incr.)	600
	L T	LKC	Changes full length tolerance L +0.3 +0.1 ⇨ +0.05 0	1,200
		LKZ	Changes full length tolerance L +0.3 +0.1 ⇨ +0.01 0	1,800
Flange	HC	HC	Changes flange width 0≦HC<1.5 0.1mm increments	600
	T TC	TC	Changes flange thickness 2≦TC<5 0.1mm incr. (Comb. with TKC·TKM→0.01mm incr.) L is shortened by (5—TC). When LC is applied, L is equal to LC.	600
	T T	TKC	Changes flange thickness tolerance T +0.2 0 ⇨ +0.02 0	1,200
		TKM	Changes flange thickness tolerance T +0.2 0 ⇨ 0 −0.02	1,200
		FK	Adds relief chamfering to flange (for breakage prevention) ⊗Standard, tapped, key groove types : Not applicable	Single flanged 600 Double flanged 1,200
Key groove	T T	RTC	Changes tolerance on key groove position T T 0 −0.02 ⇨ +0.05 0	0
		WK	Adds key groove at symmetrical position K0 K90 H—{2×U(UK)}≧2.0(K0) V—{2×U(UK)}≧2.0(K90) The additional key groove position is symmetrical with the specified key groove position. Combination with UK is applicable Applicable to key groove type only.	800
	UK U	UK	Changes key groove depth 0.1mm increments 0.5≦UK≦U+0.2 H(V)—UK≧2.0 Combination with WK is applicable Applicable to key groove type only.	600

Alteration		Code	Spec.	¥/1Code
Tap	M (Steel thread insert brazed) a 2×M b	MC	Changes tap size H \ V: 8 / 10 / 13 / 16 / 20 8: M4→M3 10: — / M6→M5 13: — / — / M8→M6 16: — / — / — / M8→M6 20: — / — / — / — / M8→M6 The dimensions a and b are not changed.	0
Others	4—C0.5 V H	CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more. 0.5mm or more V P W H	Standard Tapped With key groove 600 Single flanged Double flanged 800
	C1.0 V H	CCP	Adds chamfering (C1.0) to a corner of shank (error prevention). Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 blade corner blade corner ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270 Applicable to standard and tapped types only.	600
	H T V T	VKC	Changes shank tolerance (V・H) V・H +0.005 0 ⇨ +0.003 0 (B—ZPB・B—ZPK : V・H 0 −0.005 ⇨ 0 −0.003)	2,000
		VKM	Changes shank tolerance (V・H) V・H +0.005 0 ⇨ 0 −0.003 ⊗B—ZPB・B—ZPK : Not applicable	2,000
		VHM	Changes shank tolerance (V・H) V・H +0.005 0 ⇨ 0 −0.005 ⊗ZPB・ZPK・B—ZPB・B—ZPK : Not applicable	1,200

Price

Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No.	L	H \ V	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	8	10	13	16	20
ZPB B—ZPB Additional machining is required for the following types : ZPM +¥1,800 ZPK +¥800 B—ZPK +¥800 ZPF +¥1,200 ZPW +¥2,400	(20) (25) (30) 40	2	3,620	3,620	3,620	3,620	3,620	3,630	3,630	3,460	3,460	3,540	3,940	4,080	4,200	4,330	4,500
		2.5		3,620	3,320	3,620	3,320	3,630	3,330	3,460	3,160	3,540	3,740	3,880	4,000	4,130	4,300
		3			2,820	3,320	2,820	3,330	2,830	3,160	2,660	3,240	2,740	2,880	3,000	3,130	3,300
		3.5				3,620	3,320	3,280	2,980	3,540	3,240	3,640	3,840	3,940	4,150	4,300	4,510
		4					2,840	2,980	2,480	3,240	2,740	3,340	2,840	2,940	3,150	3,300	3,510
		4.5						3,330	3,030	3,610	3,310	3,640	3,920	4,050	4,300	4,480	4,730
		5							2,530	3,310	2,810	3,420	2,920	3,050	3,300	3,480	3,730
		5.5								3,670	3,370	3,820	4,020	4,150	4,430	4,640	4,930
		6									2,870	3,820	3,020	3,150	3,430	3,640	3,930
		6.5										4,060	4,260	4,450	4,850	4,990	5,350
		8											3,260	3,450	3,850	3,990	4,350
		10												3,660	4,130	4,330	4,780
		13													4,560	4,980	5,550
		16														5,500	6,200
		20															7,040
	50	2	3,620	3,620	3,620	3,620	3,620	3,680	3,680	3,520	3,520	3,640	4,040	4,200	4,350	4,500	4,700
		2.5		3,620	3,320	3,620	3,320	3,680	3,380	3,520	3,220	3,640	3,840	4,000	4,150	4,300	4,500
		3			2,820	3,320	2,820	3,380	2,880	3,220	2,720	3,340	2,840	3,000	3,150	3,300	3,500
		3.5				3,700	3,400	3,340	3,040	3,620	3,320	3,740	3,940	4,060	4,330	4,510	4,760
		4					2,900	3,040	2,540	3,320	2,820	3,440	2,940	3,060	3,330	3,510	3,760
		4.5						3,420	3,120	3,700	3,400	3,850	4,050	4,210	4,500	4,730	5,030
		5							2,620	3,400	2,900	3,550	3,050	3,210	3,500	3,730	4,030
		5.5								3,800	3,500	3,960	4,160	4,350	4,680	4,940	5,280
		6									3,000	3,660	3,160	3,350	3,680	3,940	4,280
		6.5										4,260	4,460	4,690	5,030	5,370	5,810
		8											3,460	3,690	4,030	4,370	4,810
		10												3,980	4,150	4,800	5,360
		13													5,050	5,570	6,280
		16														6,220	7,070
		20															8,130
	60	2	4,100	4,100	4,100	4,160	3,860	3,680	3,680	3,610	3,610	3,720	4,120	4,300	4,480	4,660	4,910
		2.5		4,100	3,800	4,160	3,860	3,680	3,380	3,610	3,310	3,720	4,120	4,300	4,480	4,660	4,910
		3			3,300	3,860	3,360	3,380	3,420	3,310	2,810	3,420	2,920	3,100	3,280	3,460	3,710
		3.5				4,240	3,940	3,100	3,100	3,700	3,400	3,850	4,250	4,400	4,700	4,930	5,230
		4					3,440	3,100	2,600	3,400	2,900	3,550	3,050	3,200	3,500	3,730	4,030
		4.5						3,500	3,200	3,800	3,500	3,980	4,380	4,560	4,910	5,180	5,530
		5							2,700	3,500	3,000	3,680	3,180	3,360	3,710	3,980	4,330
		5.5								3,910	3,610	4,130	4,530	4,730	5,130	5,440	5,850
		6									3,110	3,830	3,330	3,530	3,930	4,240	4,650
		6.5										4,160	4,860	5,130	5,530	5,950	6,490
		8											3,660	3,930	4,330	4,750	5,290
		10												4,270	4,760	5,260	5,920
		13													5,520	6,170	7,010
		16														6,920	7,960
		20															9,240
	70	2	4,150	4,150	4,150	4,210	4,210	4,280	4,280	3,670	3,670	3,860	4,260	4,410	4,630	4,830	5,110
		2.5		4,150	3,850	4,210	3,910	4,280	3,980	3,670	3,370	3,860	4,260	4,410	4,630	4,830	5,110
		3			3,350	3,910	3,410	3,980	3,480	3,370	2,870	3,560	3,060	3,210	3,430	3,630	3,910
		3.5				4,300	4,000	3,400	3,100	3,700	3,400	3,850	4,360	4,550	4,880	5,140	5,490
		4					3,500	3,100	2,680	3,400	2,990	3,550	3,160	3,350	3,680	3,940	4,290
		4.5						3,570	3,270	3,910	3,610	4,130	4,530	4,730	5,110	5,440	5,850
		5							2,770	3,610	3,110	3,830	3,330	3,530	3,910	4,240	4,650
		5.5								3,990	3,690	4,280	4,680	4,930	5,360	5,730	6,230
		6									3,190	3,980	3,480	3,730	4,160	4,530	5,030
		6.5										4,660	5,060	5,370	5,850	6,330	6,960
		8											3,860	4,170	4,650	5,130	5,760
		10												4,560	5,150	5,850	6,500
		13													6,020	6,740	7,730
		16														7,650	8,840
		20															10,320

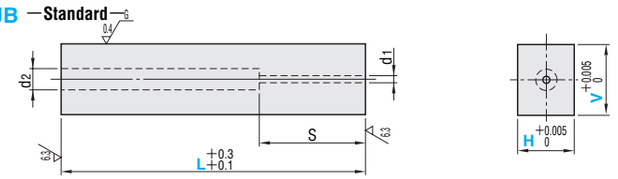
L(20), (25), and (30) are only applicable to ZPB, B—ZPB, ZPF, and ZPW.

CARBIDE BLOCK PUNCH BLANKS WITH AIR HOLE

RoHS

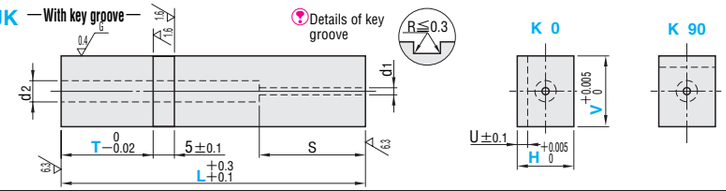
M H	Shank dimension V·H
V30 (HIP) 88～89HRA	V·H 5～20

ZJB —Standard—



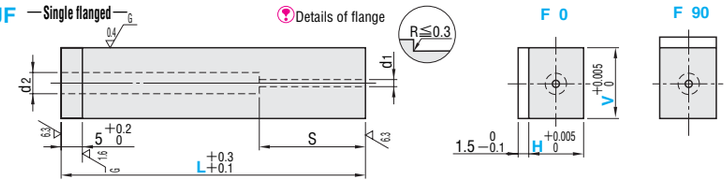
M H	Shank dimension V·H
V30 (HIP) 88～89HRA	V·H 5～20

ZJK —With key groove—



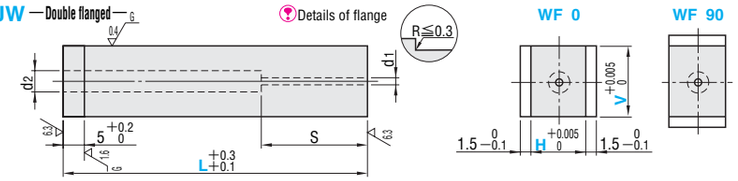
M H	Shank dimension V·H
V30 (HIP) 88～89HRA	V·H 5～16 Not applicable to products marked ● on the standard table.

ZJF —Single flanged—



M H	Shank dimension V·H
V30 (HIP) 88～89HRA	V·H 5～16 Not applicable to products marked ● on the standard table.

ZJW —Double flanged—



Catalog No. V \ H	5	6	8	10	13	16	20	L	0.1mm T	d1×S L=40	d1×S L=50	d1×S L=60·70	d2	U
ZJB	○	○	○	○	○	○	●	40	T≧2.0	0.8×17	0.8×20		2.1	1.0
ZJK		○	○	○	○	○	●	50					2.6	
ZJF			○	○	○	○	●	60		1.2×17	1.2×27		3.4	1.5
ZJW				○	○	○	●	70		1.6×17	1.6×28		4.4	
					○	○	●			1.9×17	1.9×28			
						○	●			2.9×17	2.9×24	2.9×36		
							●							

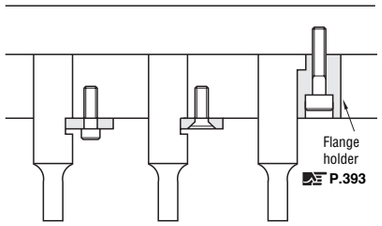
Ⓟ● is not applicable to ZJF and ZJW.

Order

Catalog No.	V	H	—	L	—	0.1mm increments T≧2	—	K·F·WF
ZJB	08	06	—	40				
ZJK	10	05	—	50	—	T25.0	—	K90
ZJF	13	10	—	70			—	F0
ZJW	16	16	—	60			—	WF90

Delivery 10 Days

Example



The volume discount rate is also applicable to alteration cost. P.39

Alteration Catalog No. | V | H | — | L(LC) | — | T | — | K·F·WF | — (TC·VKC···etc.)

ZJF 10 05 — 50 — TKC

Alteration		Code	Spec.	¥/1Code
Full length	LC	LC	Changes full length 30≦LC<L 0.1mm incr. (Combination with LKC·LKZ→0.01mm incr.)	600
	LCX	LCX	Changes full length without changing length S 30≦LCX<L 0.1mm increments ⓅCombination with LKC·LKZ→0.01mm increments ⊗Single and double flange types : Not applicable	600
		LKC	Changes full length tolerance L +0.3 +0.1 ⇨ +0.05 0	1,200
		LKZ	Changes full length tolerance L +0.3 +0.1 ⇨ +0.01 0	1,800
Flange		HC	Changes flange width 0≦HC<1.5 0.1mm increments	600
		TC	Changes flange thickness 2≦TC<5 0.1mm incr. (Comb. with TKC·TKM→0.01mm incr.) ⓅL is shortened by (5—TC) ⓅWhen LC is applied, L is equal to LC.	600
		TKC	Changes flange thickness tolerance T +0.2 0 ⇨ +0.02 0	1,200
		TKM	Changes flange thickness tolerance T +0.2 0 ⇨ 0 −0.02	1,200
		FK	Adds relief chamfering to flange (for breakage prevention)	Single flanged 600 Doubleflanged 1,200
Key groove		RTC	Changes tolerance on key groove position T T −0.02 0 ⇨ +0.05 0	0
		UK	Changes key groove depth 0.5≦UK≦U+0.2 0.1mm increments H(V) − {UK+d2 (d1)} ≧2.0 ⓅApplicable to key groove type only	600

Alteration		Code	Spec.	¥/1Code
Others		CC	Adds chamfering (C0.5) to 4 corners of shank. The distance between shank and blade must be 0.5mm or more.	Standard With key groove 600 Single flanged Double flanged 800
		CCP	Adds chamfering (C1.0) to a corner of shank (error prevention). Applicable when the distance a・b (corner of blade to shank) is as below. a+b≧1.3 ■Specifiable position of chamfering. CCP0 CCP90 CCP180 CCP270 Ⓟ Applicable to standard type only.	600
		VKC	Changes shank tolerance (V・H) V·H +0.005 0 ⇨ +0.003 0	2,000
		VKM	Changes shank tolerance (V・H) V·H +0.005 0 ⇨ 0 −0.003	2,000
		VHM	Changes shank tolerance (V・H) V·H +0.005 0 ⇨ 0 −0.005	1,200

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

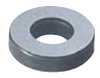
Ⓟ Additional working fee will be added for the following types :
■With key groove type (ZJK)·····ZJB U/Price＋¥800
■Single flanged type (ZJF)·····ZJB U/Price＋¥1,200
■Double flanged type (ZJW)·····ZJB U/Price＋¥2,400

Catalog No.	L	H \ V	5	6	8	10	13	16	20
ZJB	40	5	3,820	3,780	3,930	4,090	4,380	4,620	4,930
		6		3,860	4,050	4,210	4,550	4,820	5,170
		8			4,350	4,570	5,050	5,390	5,760
		10				4,840	5,410	5,740	6,280
		13					5,860	6,370	7,070
		16						7,010	7,540
		20							8,480
	50	5	3,820	3,900	4,090	4,300	4,630	4,930	5,300
		6		4,030	4,230	4,470	4,860	5,190	5,550
		8			4,590	4,890	5,430	5,780	6,330
		10				5,240	5,800	6,300	6,990
		13					6,440	7,090	7,630
		16						7,550	8,520
		20							9,720

Catalog No.	L	H \ V	5	6	8	10	13	16	20
ZJB	60	5	3,930	4,030	4,260	4,490	4,900	5,240	5,610
		6		4,170	4,440	4,690	5,170	5,490	6,000
		8			4,840	5,170	5,740	6,240	6,910
		10				5,530	6,260	6,870	7,370
		13					7,030	7,500	8,450
		16						8,360	9,530
		20							10,970
	70	5	4,030	4,170	4,440	4,690	5,160	5,490	6,000
		6		4,320	4,630	4,940	5,390	5,850	6,450
		8			5,090	5,410	6,120	6,710	7,180
		10				5,890	6,720	7,430	8,020
		13					7,330	8,150	9,270
		16						9,170	10,520
		20							12,200

■Keys P.394

PSKB PSKBH



PSKS PSKJ

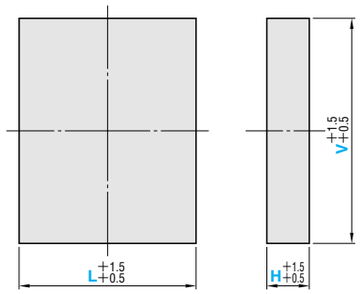
PSK PSKP PSKH

PSKW

CARBIDE BLOCKS

RoHS

Z



M V30 (HIP)
H 88～89HRA

Catalog No.	H \ V	3	4	5	6	8	10	13	16	20	100	L
Z	3	○	○	○	○	○	○	○	○	○	○	40 50 60 70
	4		○	○	○	○	○	○	○	○	○	
	5			○	○	○	○	○	○	○	○	
	6				○	○	○	○	○	○	○	
	8					○	○	○	○	○	○	
	10						○	○	○	○	○	
	13							○	○	○	○	
	16								○	○	○	
	20									○	○	
	22										○	
	25										○	

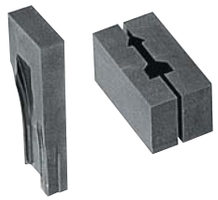
Order

Catalog No.	V	H	–	L
Z	20	08	–	70

Delivery: 1 Day

■Carbide block

MISUMI has standardized sintered carbide blocks in stock, which will realize lead time improvement and cost reduction of carbide material dies.



- The blocks whose V dimension is less than 20mm can be used for punches and dies without changing their V/H dimensions.

- The blocks of dimension V 100mm are suitable for WEDM.

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

M	Catalog No.	V	H	U/Price Q'ty：1～4 L 40	50	60	70
V30	Z	3	3	380	380	380	470
		4	3	380	380	500	580
			4	420	530	620	740
		5	3	410	500	600	720
			4	530	620	740	880
			5	600	770	910	1,050
		6	3	470	580	720	830
			4	600	740	880	1,020
			5	720	880	1,050	1,240
			6	830	1,050	1,240	1,430
		8	3	570	720	860	980
			4	720	880	1,060	1,240
			5	860	1,060	1,260	1,500
			6	1,010	1,240	1,500	1,730
			8	1,300	1,600	1,910	2,220
		10	3	670	850	1,000	1,180
			4	850	1,050	1,260	1,470
			5	1,020	1,280	1,500	1,750
			6	1,180	1,470	1,750	2,040
			8	1,520	1,890	2,250	2,620
			10	1,850	2,320	2,780	3,220
		13	3	850	1,060	1,280	1,500
			4	1,070	1,340	1,600	1,870
			5	1,300	1,600	1,930	2,220
			6	1,500	1,870	2,250	2,600
			8	1,950	2,390	2,860	3,340
			10	2,370	2,940	3,510	4,100
			13	3,020	3,740	4,460	5,210
		16	3	1,010	1,260	1,490	1,740
			4	1,260	1,570	1,880	2,190
			5	1,510	1,880	2,240	2,620
			6	1,760	2,190	2,620	3,060
			8	2,260	2,820	3,370	3,920
			10	2,770	3,440	4,120	4,790
			13	3,520	4,380	5,260	6,100
			16	4,300	5,320	6,360	7,420
		20	3	1,210	1,490	1,790	2,060
			4	1,510	1,860	2,220	2,600
			5	1,820	2,220	2,660	3,110
			6	2,100	2,600	3,110	3,650
			8	2,690	3,350	4,020	4,660
			10	3,300	4,110	4,900	5,710
			13	4,200	5,220	6,240	7,270
			16	5,110	6,340	7,590	8,820
			20	6,300	7,830	9,380	10,920
		100	3	5,780	7,170	8,600	9,990
			4	7,220	8,970	10,730	12,500
			5	8,660	10,780	12,890	14,980
			6	10,100	12,560	15,020	17,490
			8	12,980	16,140	19,320	22,470
			10	15,260	19,010	22,740	24,610
			13	19,460	24,190	28,940	31,330
			16	23,610	29,380	35,130	38,040
			20	29,160	36,290	43,400	46,980
			22	31,950	39,740	47,540	51,460
			25	36,110	44,920	53,730	58,180

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

CARBIDE BLOCK DIES

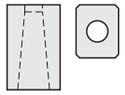
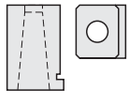
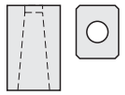
CARBIDE BLOCK DIES

Name Catalog No.	CARBIDE BLOCK DIES —Straight type, Single flanged type—	SCRAP RETENTION CARBIDE BLOCK DIES	BLOCK DIES —Free size type—
Delivery	⑧ⓒ	⑧ⓒ	⑧ⓒ
Page	557	559	561

SCRAP RETENTION CARBIDE BLOCK DIES (FREE SIZE TYPE)	CARBIDE BLOCK DIE BLANKS WBLDB WBLDBF	CARBIDE BLOCK DIE BLANKS ZD ZDA ZD□B ZD□C
⑧ⓒ	⑤Ⓑ	⑤Ⓑ·⑩
562	563	564・565

CARBIDE BLOCK DIES —GUIDE—

■List of Carbide block dies

Type		Material	Shank dimension tolerance	Normal			For scrap retention		
				Round	Shaped	page	Round	Shaped	page
Carbide block straight type		V40(HIP)	V・H $^{+0.005}_{0}$	WBLD	WBLD□	P.557	SR−WBLD	SR−WBLD□	P.559
Carbide block single flanged type		V40(HIP)	V・H $^{+0.005}_{0}$	WBLDF	WBLD□F	P.557	SR−WBLDF	SR−WBLD□F	P.559
Carbide block free size type		V40(HIP)	V・H $^{+0.005}_{0}$	WFBLD	WFBLD□	P.561	SR−WFBLD	SR−WFBLD□	P.561

■Scrap retention block dies (For details, see P.1229)

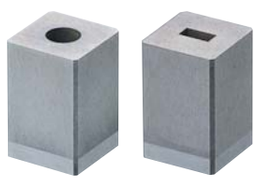
- **Available range**
  1. Hole diameter··· φ1.0～φ16
  2. Workpiece material···Tensile strength up to 1177N/mm² (120kgf/mm²)
  3. Thickness of workpiece materials···0.15mm or over
  4. The scrap retention effect cannot be expected when the clearance (C) of one side is larger than the workpiece thickness (MT) by 20%. Therefore, keep it to 20% or less.
     Either side of clearance (C) < workpiece thickness (MT) ×20%

The scrap retention block die prevents a slug from being pulled up by forming small protrusions on the slug. Therefore, this type is not appropriate when precision holes are required or for products with punched out slug.

CARBIDE BLOCK DIES
—STRAIGHT TYPE, SINGLE FLANGED TYPE—

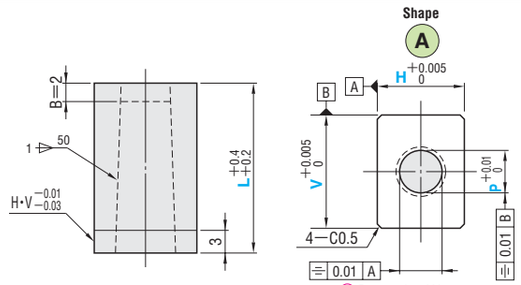
The volume discount rate is also applicable to alteration cost. P.39

—Straight type— RoHS



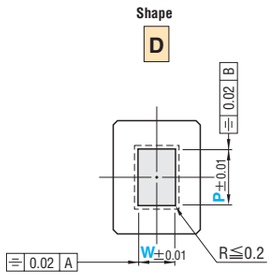
M H	Catalog No.
V40(HIP) 87～88HRA	Ⓐ WBLD Ⓓ WBLDD Ⓡ WBLDR Ⓔ WBLDE Ⓖ WBLDG

Shape Ⓐ



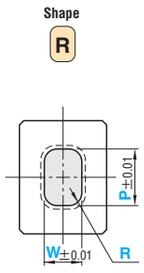
Ⓟ P･･･min. W max.
Dimension P should be specified in the range of dimension W on the standard table below.

Shape Ⓓ



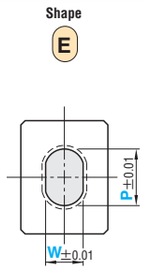
Ⓟ P≧W

Shape Ⓡ



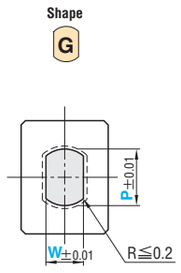
Ⓟ P≧W
Ⓟ 0.15≦R< W/2

Shape Ⓔ



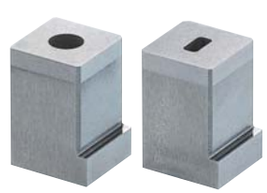
Ⓟ P>W

Shape Ⓖ



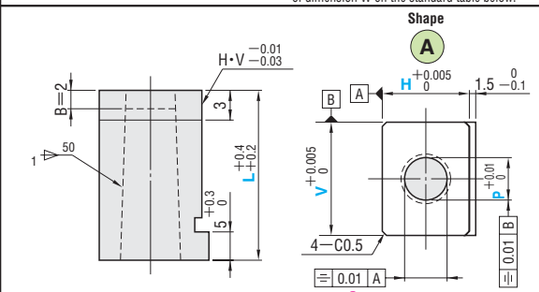
Ⓟ P>W

—Single flanged type— RoHS



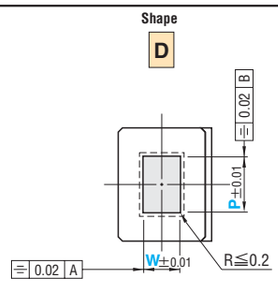
M H	Catalog No.
V40(HIP) 87～88HRA	Ⓐ WBLDF Ⓓ WBLDDF Ⓡ WBLDRF Ⓔ WBLDEF Ⓖ WBLDGF

Shape Ⓐ



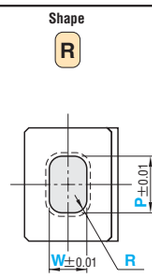
Ⓟ P･･･min. W max.
Dimension P should be specified in the range of dimension W on the standard table below.

Shape Ⓓ



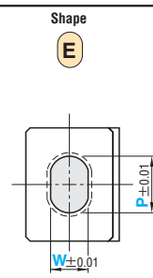
Ⓟ P≧W

Shape Ⓡ



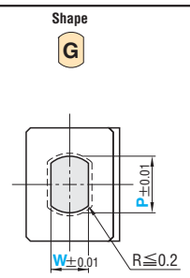
Ⓟ P≧W
Ⓟ 0.15≦R< W/2

Shape Ⓔ



Ⓟ P>W

Shape Ⓖ



Ⓟ P>W

Catalog No.		V	6	8	10	13	16	20	25	Ⓡ	L
		H / min. W max. / P max.	1.00 ～ 3.00	1.00 ～ 4.00	1.00 ～ 6.00	1.00 ～ 8.00	1.00 ～ 10.00	1.50 ～ 12.00	1.50 ～ 16.00	R	
Straight type	Single flanged type										
Ⓐ WBLD	WBLDF	6	1.00～ 3.00	○	○	○	○	○	○	○	16
Ⓓ WBLDD	WBLDDF	8	1.00～ 4.00		○	○	○	○	○	○	20
Ⓡ WBLDR	WBLDRF	10	1.00～ 6.00			○	○	○	○	○	22
Ⓔ WBLDE	WBLDEF	13	1.00～ 8.00				○	○	○	○	25
Ⓖ WBLDG	WBLDGF	16	1.00～ 10.00					○	○	○	30
		20	1.50～ 12.00						○	○	35
		25	1.50～ 16.00							○	

0.15≦R< W/2 (Ⓡonly)

Ⓟ P･W･R･･･0.01mm increments

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

■Straight type

Catalog No.	H \ V	6	8	10	13	16	20	25
WBLD	6	9,290	10,370	12,290	14,450	14,930	15,410	16,190
	8		11,630	13,610	15,890	16,370	16,790	17,510
	10			15,650	18,050	18,410	18,770	19,310
	13				20,390	20,690	20,990	21,470
	16					22,970	23,210	23,570
	20						25,610	25,910
	25							29,510
WBLDD WBLDR WBLDE WBLDG	6	10,310	11,570	13,670	16,010	16,610	17,090	17,990
	8		12,950	15,170	17,630	18,170	18,650	19,490
	10			17,390	20,030	20,450	20,810	21,470
	13				22,670	22,970	23,330	23,810
	16					25,550	25,790	26,150
	20						28,430	28,790
	25							32,750

■With single flanged type

Catalog No.	H \ V	6	8	10	13	16	20	25
WBLDF	6	10,220	11,410	13,520	15,900	16,420	16,950	17,810
	8		12,790	14,970	17,480	18,010	18,470	19,260
	10			17,220	19,860	20,250	20,650	21,240
	13				22,430	22,760	23,090	23,620
	16					25,270	25,530	25,930
	20						28,170	28,500
	25							32,460
WBLDDF WBLDRF WBLDEF WBLDGF	6	11,340	12,730	15,040	17,610	18,270	18,800	19,790
	8		14,250	16,690	19,390	19,990	20,520	21,440
	10			19,130	22,030	22,500	22,890	23,620
	13				24,940	25,270	25,660	26,190
	16					28,110	28,370	28,770
	20						31,270	31,670
	25							36,030

Order

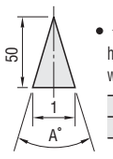
Catalog No.	V	H	—	L	—	0.01mm increments		
						P	W	R(Ⓡonly)
WBLDR	13	10	—	20	—	P6.34	W4.65	R1.50

Delivery

8 Days

Express C 2,000/1Pc. P.38

Ⓐ A flat charge of 5,400 yen for 3 pieces or more of the same size.

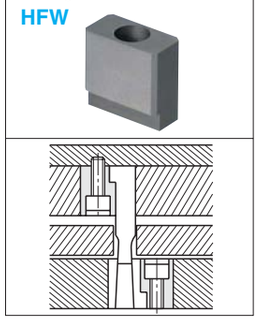


● 1/50 indicates a taper having a length of 50mm with 1mm of broadened end.

Taper	1/50
Angle(A°)	1.146°

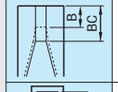
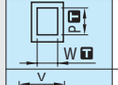
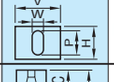
■Flange Holders P.393

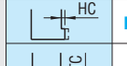
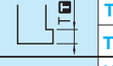
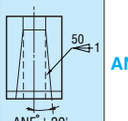
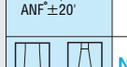
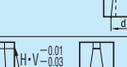
HFW



Alterations

Catalog No. V H — L(LC) — P—W—R — (BC･HC･･･etc.)
WBLDF 08 06 — 20 — P1.20 — PKC — ANF1.2

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Shaped hole		BC	Changes dimension B (shaped hole depth) 0≦BC≦4 0.1mm increments		900
		PKC	Changes tolerance on dimension P $P^{+0.01}_{0} \Rightarrow P^{+0.005}_{0}$	Changes tolerance on P･W $P･W \pm 0.01 \Rightarrow P^{+0.01}_{0}$	1,600
		HVC	———	Reverses H and V. Machines P for H, and W for V. Ⓟ P→min W max	0
Full length		LC	Changes dimension L (full length) 10≦LC<L 0.1mm incr.(Comb. with LKC･LKZ→0.01mm incr.) Ⓟ Single flanged type : When LC≦12, press-in lead is not available.		600
		LKC	Full length tolerance change $L \pm^{0.4}_{0.2} \Rightarrow +^{0.05}_{0}$		1,200
		LKZ	Full length tolerance change $L \pm^{0.4}_{0.2} \Rightarrow +^{0.01}_{0}$		1,800

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Flange		HC	Changes flange width 0≦HC<1.5 0.1mm increments		600
		TC	Flange thickness alteration 2≦TC<5 0.1mm incr.(Comb. with TKC･TKM→0.01mm incr.) Ⓟ L is shortened according to (5−TC). When LC is applied, L is equal to LC.		600
		TKC	Flange thickness tolerance change $T^{+0.3}_{0} \Rightarrow +^{0.02}_{0}$		1,200
		TKM	Flange thickness tolerance change $T^{+0.3}_{0} \Rightarrow -^{0}_{0.02}$		1,200
Others		VKC	H･V tolerance change $H･V^{+0.005}_{0} \Rightarrow +^{0.003}_{0}$		2,000
		VKM	H･V tolerance change $H･V^{+0.005}_{0} \Rightarrow -^{0}_{0.003}$		2,000
		VHM	H･V tolerance change $H･V^{+0.005}_{0} \Rightarrow -^{0}_{0.005}$		1,200
		ANF	Changes angle of back relief 0≦ANF≦1.2 0.2° increments Ⓟ d≦ dmax Ⓟ d=P+2{(L−B)tan(ANF°)} Ⓟ P−B tan(ANF°)≧0.6 W−B tan(ANF°)≧0.6	V / d max.: 6 / 3.4; 8 / 4.4; 10 / 6.4; 13 / 8.4; 16 / 10.6; 20 / 12.6; 25 / 14.6 Taper 1/50 = Angle 0.573°	600
		NDC	 No press-in lead		0

SCRAP RETENTION CARBIDE BLOCK DIES
—STRAIGHT TYPE, SINGLE FLANGED TYPE—

PRODUCTS DATA P.1229

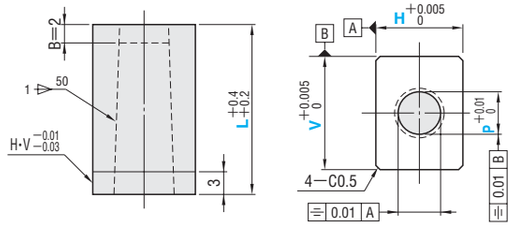
SCRAP RETENTION DIES

The volume discount rate is also applicable to alteration cost. P.39

—Straight type— RoHS

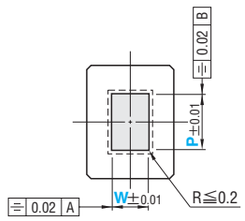
M / H	Catalog No.
V40(HIP) 87～88HRA	Ⓐ SR—WBLD Ⓓ SR—WBLDD Ⓡ SR—WBLDR Ⓔ SR—WBLDE Ⓖ SR—WBLDG

Shape Ⓐ



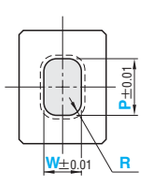
Ⓟ P ••• min. W max.
Dimension P should be specified in the range of dimension W on the standard table below.

Shape Ⓓ



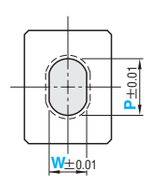
Ⓟ P≧W
Ⓟ P−0.4≧1.5
(Dimension P straight part 1.5mm or more)

Shape Ⓡ



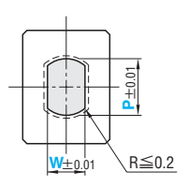
Ⓟ P≧W Ⓟ 0.15≦R< W/2
Ⓟ P−2R≧1.5
(Dimension P straight part 1.5mm or more)

Shape Ⓔ



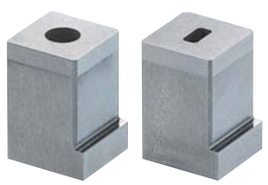
Ⓟ P>W

Shape Ⓖ



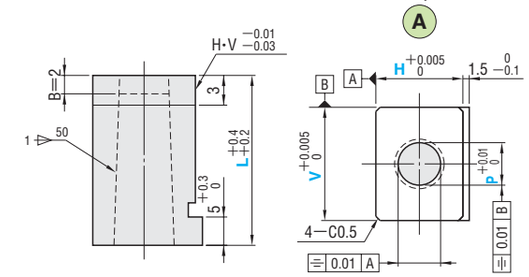
Ⓟ P>W
Ⓟ √(P²−W²)≧1.5
(Dimension P straight part 1.5mm or more)

—Single flanged type— RoHS



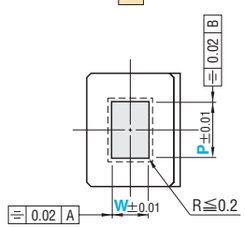
M / H	Catalog No.
V40(HIP) 87～88HRA	Ⓐ SR—WBLDF Ⓓ SR—WBLDDF Ⓡ SR—WBLDRF Ⓔ SR—WBLDEF Ⓖ SR—WBLDGF

Shape Ⓐ



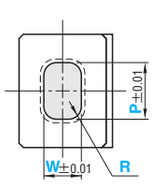
Ⓟ P ••• min. W max.
Dimension P should be specified in the range of dimension W on the standard table below.

Shape Ⓓ



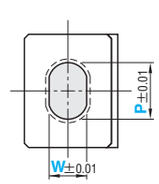
Ⓟ P≧W
Ⓟ P−0.4≧1.5
(Dimension P straight part 1.5mm or more)

Shape Ⓡ



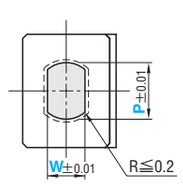
Ⓟ P≧W Ⓟ 0.15≦R< W/2
Ⓟ P−2R≧1.5
(Dimension P straight part 1.5mm or more)

Shape Ⓔ



Ⓟ P>W

Shape Ⓖ



Ⓟ P>W
Ⓟ √(P²−W²)≧1.5
(Dimension P straight part 1.5mm or more)

Catalog No.	H \ V	6	8	10	13	16	20	25	R	L	MT (Material thickness) 0.01mm increments	C (Clearance) 0.005mm increments
		min. W max. P	1.00～3.00	1.00～4.00	1.00～6.00	1.00～8.00	1.00～10.00	1.50～12.00	1.50～16.00				
Straight type / Single flanged type	6	1.00～3.00	○	○	○	○	○	○	○	0.15≦R< W/2 (Ⓡ only)	16	MT≧0.15 Specifiable with material thickness 0.15mm or more.	C≧0.010 Specifiable with clearance 0.010mm or more.
Ⓐ SR—WBLD / SR—WBLDF	8	1.00～4.00		○	○	○	○	○	○		20		
Ⓓ SR—WBLDD / SR—WBLDDF	10	1.00～6.00			○	○	○	○	○		22		
Ⓡ SR—WBLDR / SR—WBLDRF	13	1.00～8.00				○	○	○	○		25		
Ⓔ SR—WBLDE / SR—WBLDEF	16	1.00～10.00					○	○	○		30		
Ⓖ SR—WBLDG / SR—WBLDGF	20	1.50～12.00						○	○		35		
	25	1.50～16.00							○				

Ⓟ P・W・R •••▸ 0.01mm increments Ⓟ Applicable only to the material which has the tensile strength up to1177N/mm² (120kgf/mm²)
Ⓟ Workpiece material thickness and clearance are used as scrap retention working data. Specify the shaped hole with the finishing dimension(P・W・R)of the block die.

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

■Straight type

Catalog No.	H \ V	6	8	10	13	16	20	25
SR—WBLD	6	11,890	12,970	14,890	16,950	17,330	17,610	18,290
	8		14,230	16,210	18,390	18,770	18,990	19,710
	10			18,250	20,550	20,810	20,970	21,510
	13				22,990	23,090	23,190	23,570
	16					25,370	25,410	25,670
	20						27,810	28,010
	25							31,610
SR—WBLDD	6	13,210	14,370	16,570	18,910	19,210	19,590	20,390
	8		15,850	17,970	20,530	20,870	21,150	21,790
SR—WBLDR	10			20,290	22,930	23,050	23,310	23,870
	13				25,470	25,570	25,830	26,210
SR—WBLDE	16					28,150	28,290	28,550
SR—WBLDG	20						30,930	31,090
	25							35,150

■With single flanged type

Catalog No.	H \ V	6	8	10	13	16	20	25
SR—WBLDF	6	13,120	14,210	16,320	18,800	19,020	19,450	20,110
	8		15,590	17,770	20,380	20,610	20,970	21,660
	10			20,120	22,760	22,850	23,150	23,640
	13				25,230	25,460	25,590	25,920
	16					27,800	28,030	28,230
	20						30,670	30,800
	25							34,860
SR—WBLDDF	6	14,240	15,530	17,840	20,510	20,970	21,300	22,190
	8		17,150	19,590	22,190	22,690	23,020	23,840
SR—WBLDRF	10			21,930	24,830	25,100	25,390	26,020
	13				27,840	27,970	28,160	28,490
SR—WBLDEF	16					30,810	30,870	31,170
SR—WBLDGF	20						33,770	34,070
	25							38,330

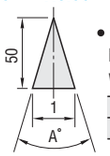
Order

Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R(Ⓡonly)	—	MT	—	C
SR—WBLDRF	13	10	—	22	—	P7.65	—	W4.65	—	R0.50	—	MT1.50	—	C0.105

Delivery

8	Days
Express	C 2,000/1Pc. P.38

Ⓟ A flat charge of 5,400 yen for 3 pieces or more of the same size.

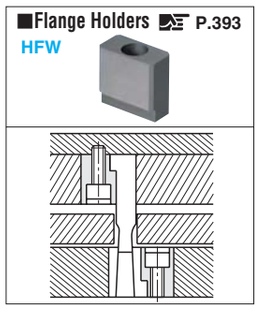


• 1/50 indicates a taper having a length of 50mm with 1mm of broadened end.

Taper	1/50
Angle (A°)	1.146°

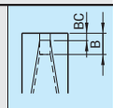
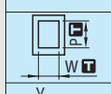
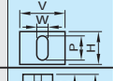
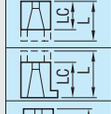
■Flange Holders P.393

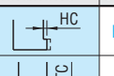
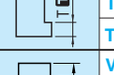
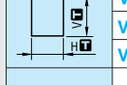
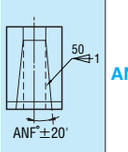
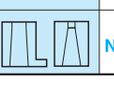
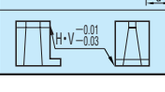
HFW



Alterations

Catalog No.	V	H	—	L(LC)	—	P	—	W	—	R	—	MT	—	C	— (BC・LKC…etc.)
SR—WBLDF	08	06	—	20	—	P2.25						MT1.50	—	C0.105	— LKC—ANF1.2

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Shaped hole		BC	Changes dimension B (shaped hole depth) 1≦BC<Bmax. 0.1mm increments P: 1.00～1.99 → Bmax. 3; 2.00～ → 4	Changes dimension B (shaped hole depth) 1≦BC<2 0.1mm increments	900
		PKC	Changes tolerance on dimension P P +0.01 0 ⇨ +0.005 0	Changes tolerance on P・W P・W±0.01 ⇨ +0.01 0	1,600
		HVC	———	Reverses H and V. Machines P for H, and W for V. Ⓟ P→ min. W max.	0
Full length		LC	Changes dimension L (full length) 10≦LC<L 0.1mm incr.(Comb. with LKC・LKZ→0.01mm incr.) Ⓟ Single flanged type : When LC≦12, press-in lead is not available.		600
		LKC	Full length tolerance change L ±0.4 ±0.2 ⇨ +0.05 0		1,200
		LKZ	Full length tolerance change L ±0.4 ±0.2 ⇨ +0.01 0		1,800

Alterations		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Flange		HC	Changes flange width 0≦HC<1.5 0.1mm increments		600
		TC	Changes flange thickness 2≦TC<5 0.1mm incr.(Comb. with TKC・TKM→0.01mm incr.) Ⓟ L is shortened according to(5—TC). When LC is applied, L is equal to LC.		600
		TKC	Changes flange thickness tolerance T +0.3 0 ⇨ +0.02 0		1,200
		TKM	Changes flange thickness tolerance T +0.3 0 ⇨ 0 −0.02		1,200
Others		VKC	Changes H・V tolerance H・V +0.005 0 ⇨ +0.003 0		2,000
		VKM	Changes H・V tolerance H・V +0.005 0 ⇨ 0 −0.003		2,000
		VHM	Changes H・V tolerance H・V +0.005 0 ⇨ 0 −0.005		1,200
		ANF	Changes angle of back relief 0≦ANF≦1.2 0.2° increments Ⓟ d≦ dmax Ⓟ d=P+2{(L−B)tan(ANF°)} Ⓟ P−B tan(ANF°)≧0.6 W−B tan(ANF°)≧0.6	V / d max.: 6 3.4; 8 4.4; 10 6.4; 13 8.4; 16 10.6; 20 12.6; 25 14.6. Taper 1/50, Angle 0.573°	600
		NDC	 ⇨ No press-in lead		0

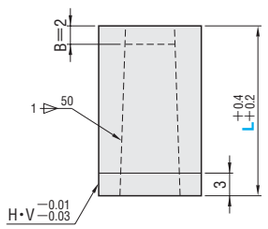
CARBIDE BLOCK DIES
—FREE SIZE TYPE—

The volume discount rate is also applicable to alteration cost. P.39

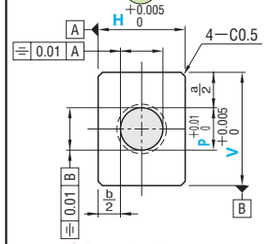
—Straight type— RoHS

M / H: V40(HIP) 87～88HRA

Catalog No.
- (A) WFBLD
- (D) WFBLDD
- (R) WFBLDR
- (E) WFBLDE
- (G) WFBLDG

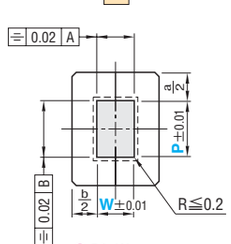


Shape A



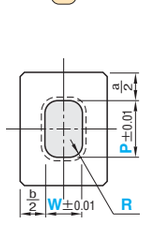
P•••min. W max.
Dimension P should be specified in the range of dimension W on the standard table below.

Shape D



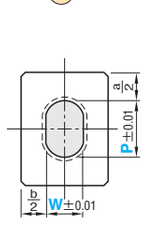
P≧W

Shape R



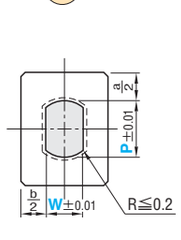
P≧W
0.15≦R< W/2

Shape E



P>W

Shape G



P>W

Catalog No.	H	V min. P max.	bmin.	6.0 ⌇ 8.0	8.1 ⌇ 10.0	10.1 ⌇ 13.0	13.1 ⌇ 16.0	16.1 ⌇ 20.0	20.1 ⌇ 25.0	R	L
			amin.	1.00 ⌇ 4.00	1.00 ⌇ 6.00	1.00 ⌇ 8.00	1.00 ⌇ 10.00	1.50 ⌇ 12.00	1.50 ⌇ 16.00	R	
(A) WFBLD	6.0～ 8.0	1.00～ 4.00	4	○	○	○	○	○	○	0.15≦R< W/2 (R only)	16
(D) WFBLDD	8.1～10.0	1.00～ 6.00	4		○	○	○	○	○		20
(R) WFBLDR	10.1～13.0	1.00～ 8.00	5			○	○	○	○		22
(E) WFBLDE	13.1～16.0	1.00～10.00	6				○	○	○		25
(G) WFBLDG	16.1～20.0	1.50～12.00	8					○	○		30
	20.1～25.0	1.50～16.00	9						○		35

V—P=a H—W=b (However, (A) round is H—P=b)
P•W•R••• 0.01mm increments V•H •••0.1mm increments

Order

Catalog No. — 0.1mm increments: V — H — L — 0.01mm increments: P — W — R((R) only)

WFBLDE — V15.8 — H12.8 — L22 — P7.25 — W5.75

Delivery: 8 Days | Express C 2,000/1Pc. P.38

A flat charge of 5,400 yen for 3 pieces or more of the same size.

Alterations P.562

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Free size type

Catalog No.	H \ V	6.0～8.0	8.1～10.0	10.1～13.0	13.1～16.0	16.1～20.0	20.1～25.0
WFBLD	6.0～ 8.0	15,860	18,050	20,460	20,750	21,330	21,960
	8.1～10.0		20,350	22,940	23,050	23,510	23,910
	10.1～13.0			25,520	25,580	25,980	26,210
	13.1～16.0				28,110	28,400	28,510
	16.1～20.0					30,980	31,040
	20.1～25.0						34,890
WFBLDD WFBLDR WFBLDE WFBLDG	6.0～ 8.0	17,590	20,060	22,760	23,110	23,680	24,370
	8.1～10.0		22,590	25,460	25,640	26,100	26,560
	10.1～13.0			28,340	28,400	28,860	29,140
	13.1～16.0				31,210	31,560	31,670
	16.1～20.0					34,430	34,490
	20.1～25.0						38,750

■Free size with scrap retention type

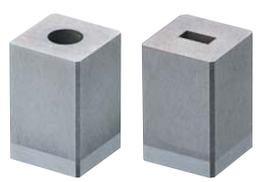
Catalog No.	H \ V	6.0～8.0	8.1～10.0	10.1～13.0	13.1～16.0	16.1～20.0	20.1～25.0
SR—WFBLD	6.0～ 8.0	18,460	20,650	23,060	23,250	23,730	24,160
	8.1～10.0		22,950	25,360	25,550	25,910	26,110
	10.1～13.0			28,080	28,080	28,380	28,410
	13.1～16.0				30,560	30,710	30,710
	16.1～20.0					33,240	33,240
	20.1～25.0						37,090
SR—WFBLDD SR—WFBLDR SR—WFBLDE SR—WFBLDG	6.0～ 8.0	20,490	22,860	25,560	25,710	26,180	26,670
	8.1～10.0		25,490	28,240	28,240	28,600	28,960
	10.1～13.0			31,100	31,100	31,360	31,440
	13.1～16.0				33,910	34,060	34,060
	16.1～20.0					36,890	36,890
	20.1～25.0						41,150

CARBIDE SCRAP RETENTION BLOCK DIES
—FREE SIZE TYPE—

PRODUCTS DATA P.1229 SCRAP RETENTION DIES

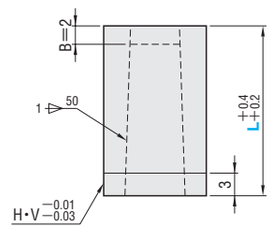
The volume discount rate is also applicable to alteration cost. P.39

—Straight type— RoHS

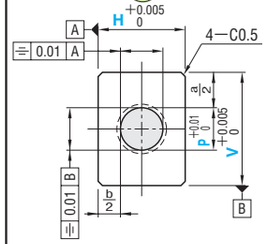


M / H: V40(HIP) 87～88HRA

Catalog No.
- (A) SR—WFBLD
- (D) SR—WFBLDD
- (R) SR—WFBLDR
- (E) SR—WFBLDE
- (G) SR—WFBLDG

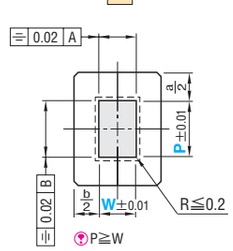


Shape A



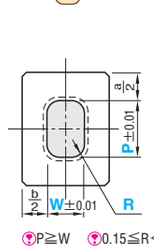
P•••min. W max.
Dimension P should be specified in the range of dimension W on the standard table below.

Shape D



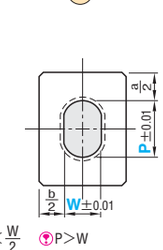
P≧W
P−0.4≧1.5
(Dimension P straight part 1.5mm or more)

Shape R



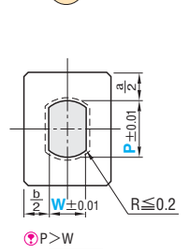
P≧W 0.15≦R< W/2
P−2R≧1.5
(Dimension P straight part 1.5mm or more)

Shape E



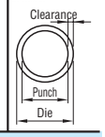
P>W

Shape G



P>W
$\sqrt{P^2-W^2}$≧1.5
(Dimension P straight part 1.5mm or more)

Catalog No.	H	V min. P max.	bmin.	6.0 ⌇ 8.0	8.1 ⌇ 10.0	10.1 ⌇ 13.0	13.1 ⌇ 16.0	16.1 ⌇ 20.0	20.1 ⌇ 25.0	R	L	MT (Material thickness)	C (Clearance)
			amin.	1.00 ⌇ 4.00	1.00 ⌇ 6.00	1.00 ⌇ 8.00	1.00 ⌇ 10.00	1.50 ⌇ 12.00	1.50 ⌇ 16.00	R		0.01mm increments	0.005mm increments
(A) SR—WFBLD	6.0～ 8.0	1.00～ 4.00	4	○	○	○	○	○	○	0.15≦R< W/2 (R only)	16	MT≧0.15 Specifiable with material thickness 0.15mm or more.	C≧0.010 Specifiable with clearance 0.010mm or more.
(D) SR—WFBLDD	8.1～10.0	1.00～ 6.00	4		○	○	○	○	○		20		
(R) SR—WFBLDR	10.1～13.0	1.00～ 8.00	5			○	○	○	○		22		
(E) SR—WFBLDE	13.1～16.0	1.00～10.00	6				○	○	○		25		
(G) SR—WFBLDG	16.1～20.0	1.50～12.00	8					○	○		30		
	20.1～25.0	1.50～16.00	9						○		35		



V—P=a H—W=b (However, (A) round is H—P=b) P•W•R••• 0.01mm increments V•H •••0.1mm increments Applied only to the material which has the tensile strength up to1177N/mm²(120kgf/mm²)
Workpiece material thickness and clearance are used as scrap retention working data. Specify the shaped hole with the finishing dimension (P・W・R) of the block die.

Order

Catalog No. — 0.1mm increments: V — H — L — 0.01mm increments: P — W — R((R) only) — MT — C

SR—WFBLDE — V15.8 — H12.8 — L22 — P7.27 — W5.25 — MT1.50 — C0.105

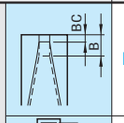
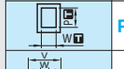
Delivery

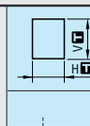
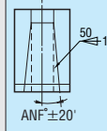
Price P.561

Alterations

Catalog No. — V — H — L(LC) — P—W—R — (BC・LKC…etc.)

SR—WFBLDD — V12.5 — H9.5 — LC28.5 — P6.25 — W4.75 — LKC—ANF1.2

Alterations		Code	(A)	(D)(R)(E)(G)	¥/1Code
Shaped hole		BC	Changes dimension B (shaped hole depth) 0≦BC≦4 0.1mm increments (P)Scrap retention 1≦BC≦8max. 0.1mm increments P: 1.00～1.99 → Bmax. 3; 2.00～ → 4	Changes dimension B (shaped hole depth) 0≦BC≦4 0.1mm increments (P)Scrap retention 1≦BC<2 0.1mm increments	900
		PKC	Changes tolerance on dimension P P +0.01 0 ⇨ +0.005 0	Changes tolerance on P・W P・W±0.01 ⇨ +0.01 0	1,600
		HVC	———	Reverses H and V. Machines P for H, and W for V (P)P→min. W max.	0
Full length		LC	Changes the full length 10≦LC<L 0.1mm incr. (Comb. with LKC・LKZ→0.01mm incr.)		600
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		1,200
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0		1,800

Alterations		Code	(A)	(D)(R)(E)(G)	¥/1Code
Others		VKC	H・V tolerance	H・V +0.005 0 ⇨ +0.003 0	2,000
		VKM	H・V tolerance	H・V +0.005 0 ⇨ 0 −0.003	2,000
		VHM	H・V tolerance	H・V +0.005 0 ⇨ 0 −0.005	1,200
		ANF	Changes angle of back relief 0≦ANF≦1.2 0.2° increments (P)d≦ dmax (P)d=P+2{(L−B)tan(ANF°)} (P)P−B tan(ANF°)≧0.6 W−B tan(ANF°)≧0.6	V: 6.0～ d max. 3.4; 8.0～ 4.4; 10.0～ 6.4; 13.0～ 8.4; 16.0～ 10.6; 20.0～ 12.6; 25.0 14.6 Taper 1/50 Angle 0.573°	600
		NDC	No press-in lead		0

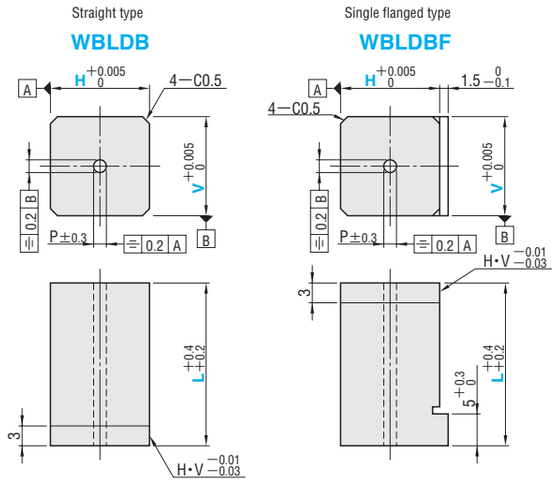
CARBIDE BLOCK DIE BLANKS

The volume discount rate is also applicable to alteration cost. P.39

RoHS

Straight type
WBLDB

Single flanged type
WBLDBF



M V40 (HIP)
H 87～88HRA

Catalog No.	H \ V	6	8	10	13	16	20	25	L	P
Straight type WBLDB / Single flanged type WBLDBF	6	○	○	○	○	○	○	○	16	0.8
	8		○	○	○	○	○	○	20	
	10			○	○	○	○	○	22	
	13				○	○	○	○	25	
	16					○	○	○	30	
	20						○	○	35	
	25							○		

Order

Catalog No.	V	H	—	L
WBLDB	08	06	—	16

Delivery

5 Days

Express B 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No.	H \ V	6	8	10	13	16	20	25
Straight type WBLDB	6	7,430	8,290	9,830	11,560	11,940	12,330	12,640
	8		9,300	10,890	12,710	13,090	13,430	14,010
	10			12,520	14,440	14,730	15,010	15,450
	13				16,310	16,550	16,790	17,170
	16					18,370	18,570	18,850
	20						20,490	20,730
	25							23,610
Single flanged type WBLDBF	6	8,170	9,130	10,810	12,720	13,130	13,560	14,250
	8		10,230	11,970	13,980	14,410	14,770	15,410
	10			13,770	15,890	16,200	16,520	16,990
	13				17,940	18,210	18,470	18,890
	16					20,210	20,420	20,740
	20						22,530	22,800
	25							25,970

Alterations

Catalog No. WBLDBF | V 13 | H 10 | — L(LC) 20 | — (HC・TC・TKC…etc.) TC4

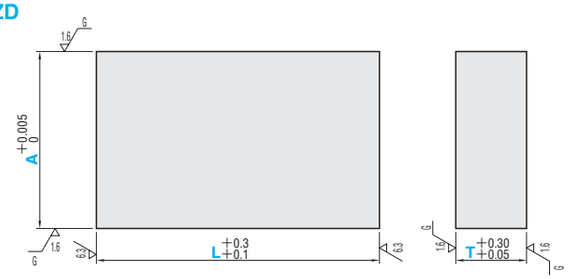
Alterations		Code	Spec.	¥/1Code
Full length	LC	LC	Changes dimension L (full length) 10≦LC＜L, 0.1mm increments (Comb. with LKC・LKZ→0.01mm incr.) Single flange type : When LC≦12, press-in lead is not adoptable.	600
	L	LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	1,200
	L	LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0	1,800
Flange	HC	HC	Changes flange width 0≦HC＜1.5, 0.1mm increments	600
	TC	TC	Changes flange thickness 2≦TC＜5, 0.1mm incr. (Comb. with TKC・TKM→0.01mm incr.) L is shortened according to (5—TC). When LC is applied, L is equal to LC.	600
	T	TKC	Changes flange thickness tolerance T +0.3 0 ⇨ +0.02 0	1,200
	T	TKM	Changes flange thickness tolerance T +0.3 0 ⇨ 0 −0.02	1,200
Others	V H	VKC	H・V tolerance change H·V +0.005 0 ⇨ +0.003 0	2,000
	V H	VKM	H・V tolerance change H·V +0.005 0 ⇨ 0 −0.003	2,000
	V H	VHM	H・V tolerance change H·V +0.005 0 ⇨ 0 −0.005	1,200
		NDC	H·V −0.01 −0.03 No press-in lead	0

CARBIDE BLOCK DIE BLANKS

The volume discount rate is also applicable to alteration cost. P.39

RoHS

ZD



M V30 (HIP)
H 88～89HRA

Catalog No. Type	T	A	L	U／Price Q'ty：1～4 40L	50L	60L	70L
ZD	10	10	40	5,320	5,770	6,200	6,630
		13		6,010	6,370	6,920	7,470
		16		6,290	6,970	7,640	8,490
		20		6,940	7,780	8,590	9,430
	13	13	50	6,630	7,330	8,010	8,730
		16	60	7,230	8,090	8,950	9,780
		20	70	8,060	9,120	10,170	11,220
	16	16		7,990	9,020	10,050	11,100
		20		9,000	10,260	11,560	12,820
	20	20		10,210	11,800	13,400	14,970

Order

Catalog No.	A	—	L
ZD 10	16	—	50

Price

Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alterations

Catalog No. ZD 10 | A 16 | — L(LC) LC45 | — (TKC) TKC

Delivery

5 Days

Express B 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

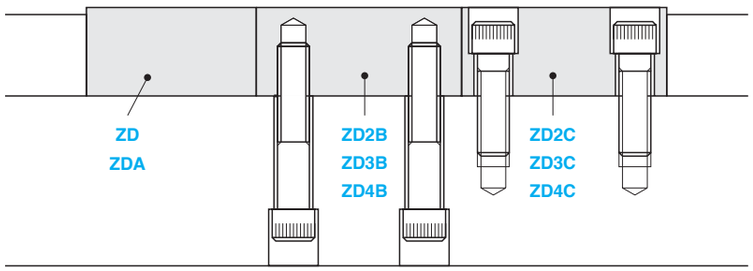
Alterations		Code	Spec.	¥/1Code
Full length	LC	LC	30≦LC＜L, 1mm increments	600

Alterations		Code	Spec.	¥/1Code
Thickness	T	TKC	Changes dimension T tolerance T +0.30 +0.05 ⇨ +0.01 0	1,200

Example

Carbide block die blanks

- ZD type＝Plate thickness T, width A and length L shares standard dimensions. The same material for punch V30 is used. ※Dimension L can be altered within the standard dimension.
- ZDA, ZD□B, ZD□C (P.565) ＝Plate thickness T, width A and length L are specificable in 0.01mm increments. V40 is used as die material. ※Alteration of material to V20 or V30 is available.



CARBIDE BLOCK DIE BLANKS
—MACHINED TYPE—

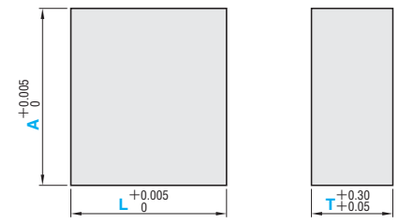
The volume discount rate is also applicable to alteration cost. P.39

RoHS

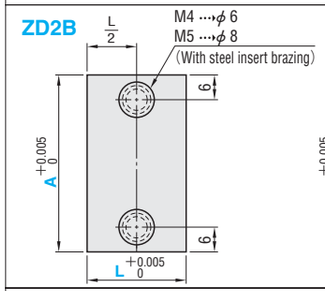
M V40 (HIP)
H 87～88HRA

A	20.00～31.99	32.00～70.00
M	4	5
d_1	4.5	5.5
d_2×t	7.5×7	9×8

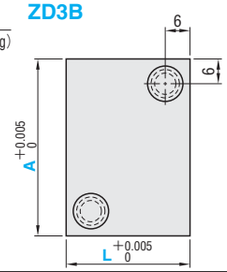
ZDA



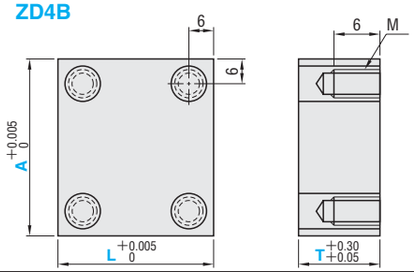
ZD2B



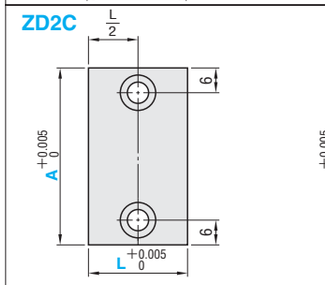
ZD3B



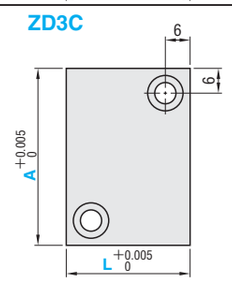
ZD4B



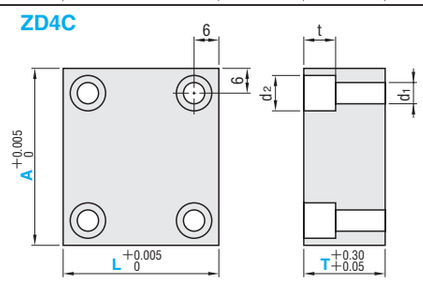
ZD2C



ZD3C



ZD4C



Catalog No.	T	A 0.01mm increments	L 0.01mm increments
ZDA	10	10.00～70.00	3.00～80.00
ZD2B ZD2C	13	30.00～70.00	13.00～70.00
ZD3B ZD3C	16	20.00～70.00	20.00～80.00
ZD4B ZD4C	20		
	22	30.00～70.00	25.00～80.00
	25		

Order

Catalog No.	T	A (0.01mm increments)	L (0.01mm increments)
ZDA	16	16.00	40.00

Delivery 10 Days

Price

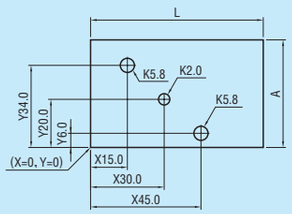
■Volume discount rate P.37

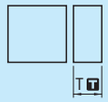
Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

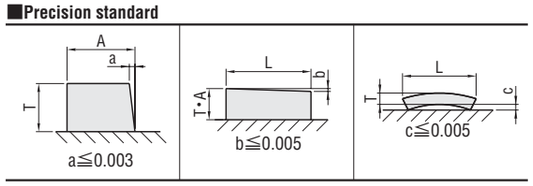
Alterations

Catalog No.	T	A	L	X・Y・K	(TKC・JC)
ZDA	25	45.00	70.00	X15.0 Y34.0 K5.8 X30.0 Y20.0 K2.0 X45.0 Y 6.0 K5.8	TKC

Alterations	Code	Spec.	¥/1Code
	X_ Y_ K_	Machines drill hole for WEDM, or pilot hole for dowel. Specify hole registration X・Y and hole diameter K. Unit for X and Y 0.1mm increments T=10・13・16 ⋯ φ 1.0≦K≦φ 10 T=20・22・25 ⋯ φ 1.5≦K≦φ 10 Unit for K 0.1mm increments The pitch tolerance between holes ±0.3	Per 300/1K (1 hole)

Alterations	Code	Spec.	¥/1Code
	TKC	Changes dimension T T +0.30 +0.05 ⇨ +0.01 0	1,200
M Material	JC2	Changes material MV40 ⇨V20	500
	JC3	Changes material MV40 ⇨V30	500

■Precision standard



ZDA	ZD2B・ZD3B	ZD4B	ZD2C・ZD3C	ZD4C
Price table	+1,900 yen	+3,800 yen	+200 yen	+500 yen

■ZDA U/Price

A	L \ T	10	13	16	20	22	25
10.00 ～ 15.00	3.00～ 9.99	3,640	4,040	4,390	5,040	5,290	5,710
	10.00～ 14.99	4,140	4,590	5,040	5,870	6,230	6,700
	15.00～ 19.99	4,640	5,190	5,790	6,750	7,170	7,790
	20.00～ 24.99	5,190	5,790	6,490	7,580	8,100	8,830
	25.00～ 29.99	5,690	6,390	7,240	8,470	9,040	9,930
	30.00～ 34.99	6,240	6,990	7,940	9,300	9,970	10,970
	35.00～ 39.99	6,740	7,590	8,640	10,180	10,910	12,050
	40.00～ 44.99	7,290	8,190	9,390	11,010	11,850	13,090
	45.00～ 49.99	7,790	8,790	10,090	11,850	12,780	14,130
	50.00～ 54.99	8,340	9,390	10,840	12,730	13,720	15,230
	55.00～ 59.99	8,840	9,990	11,540	13,570	14,650	16,270
	60.00～ 64.99	9,390	10,590	12,240	14,450	15,590	17,360
	65.00～ 69.99	9,890	11,190	12,990	15,280	16,530	18,400
	70.00～ 74.99	10,440	11,790	13,690	16,110	17,460	19,490
	75.00～ 80.00	10,940	12,390	14,440	17,000	18,400	20,530
15.01 ～ 20.00	3.00～ 9.99	4,040	4,440	4,890	5,610	5,920	6,440
	10.00～ 14.99	4,640	5,190	5,790	6,750	7,170	7,790
	15.00～ 19.99	5,340	5,990	6,740	7,890	8,410	9,190
	20.00～ 24.99	5,990	6,740	7,640	8,990	9,610	10,550
	25.00～ 29.99	6,690	7,540	8,590	10,130	10,860	11,950
	30.00～ 34.99	7,340	8,290	9,490	11,280	12,050	13,300
	35.00～ 39.99	8,040	9,090	10,440	12,370	13,300	14,710
	40.00～ 44.99	8,690	9,890	11,390	13,510	14,550	16,060
	45.00～ 49.99	9,340	10,640	12,290	14,610	15,750	17,460
	50.00～ 54.99	10,040	11,440	13,240	15,750	17,000	18,810
	55.00～ 59.99	10,690	12,240	14,190	16,890	18,250	20,220
	60.00～ 64.99	11,390	12,990	15,090	17,980	19,440	21,570
	65.00～ 69.99	12,040	13,790	16,040	19,130	20,690	22,970
	70.00～ 74.99	12,740	14,540	16,940	20,270	21,890	24,330
	75.00～ 80.00	13,390	15,340	17,890	21,370	23,130	25,730
20.01 ～ 25.00	3.00～ 9.99	4,390	4,890	5,390	6,180	6,540	7,120
	10.00～ 14.99	5,190	5,790	6,490	7,580	8,100	8,830
	15.00～ 19.99	5,990	6,740	7,640	8,990	9,610	10,550
	20.00～ 24.99	6,840	7,690	8,790	10,390	11,120	12,260
	25.00～ 29.99	7,640	8,690	9,940	11,800	12,680	13,930
	30.00～ 34.99	8,440	9,640	11,040	13,200	14,190	15,650
	35.00～ 39.99	9,290	10,590	12,190	14,550	15,690	17,360
	40.00～ 44.99	10,090	11,540	13,340	15,960	17,210	19,020
	45.00～ 49.99	10,940	12,540	14,490	17,360	18,770	20,740
	50.00～ 54.99	11,740	13,490	15,640	18,770	20,270	22,450
	55.00～ 59.99	12,540	14,440	16,790	20,170	21,780	24,120
	60.00～ 64.99	13,390	15,390	17,890	21,570	23,290	25,830
	65.00～ 69.99	14,190	16,390	19,040	22,930	24,850	27,550
	70.00～ 74.99	14,990	17,340	20,190	24,330	26,360	29,210
	75.00～ 80.00	15,840	18,290	21,340	25,730	27,860	30,930
25.01 ～ 30.00	3.00～ 9.99	4,790	5,290	5,890	6,750	7,170	7,850
	10.00～ 14.99	5,690	6,390	7,240	8,470	9,040	9,930
	15.00～ 19.99	6,690	7,540	8,590	10,130	10,860	11,900
	20.00～ 24.99	7,640	8,690	9,940	11,800	12,680	13,930
	25.00～ 29.99	8,590	9,840	11,290	13,460	14,500	15,960
	30.00～ 34.99	9,590	10,940	12,640	15,130	16,270	17,980
	35.00～ 39.99	10,540	12,090	13,990	16,790	18,090	20,010
	40.00～ 44.99	11,490	13,240	15,340	18,450	19,910	22,040
	45.00～ 49.99	12,490	14,390	16,690	20,120	21,730	24,010
	50.00～ 54.99	13,440	15,540	18,040	21,780	23,550	26,050
	55.00～ 59.99	14,390	16,690	19,390	23,450	25,370	28,070
	60.00～ 64.99	15,390	17,790	20,740	25,110	27,130	30,100
	65.00～ 69.99	16,340	18,940	22,090	26,770	28,960	32,080
	70.00～ 74.99	17,290	20,090	23,440	28,440	30,770	34,100
	75.00～ 80.00	18,290	21,240	24,790	30,100	32,600	36,130

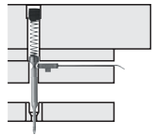
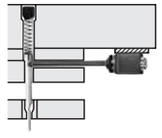
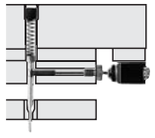
A	L \ T	10	13	16	20	22	25
30.01 ～ 35.00	3.00～ 9.99	5,140	5,740	6,390	7,330	7,790	8,570
	10.00～ 14.99	6,240	6,990	7,940	9,300	9,970	10,970
	15.00～ 19.99	7,340	8,290	9,490	11,220	12,050	13,300
	20.00～ 24.99	8,440	9,640	11,040	13,200	14,190	15,650
	25.00～ 29.99	9,590	10,940	12,640	15,130	16,270	17,980
	30.00～ 34.99	10,690	12,290	14,190	17,050	18,400	20,330
	35.00～ 39.99	11,790	13,590	15,740	18,970	20,480	22,660
	40.00～ 44.99	12,940	14,940	17,290	20,890	22,610	24,950
	45.00～ 49.99	14,040	16,240	18,890	22,870	24,690	27,290
	50.00～ 54.99	15,140	17,590	20,440	24,790	26,820	29,630
	55.00～ 59.99	16,290	18,890	21,990	26,720	28,900	31,970
	60.00～ 64.99	17,390	20,240	23,540	28,650	31,090	34,310
	65.00～ 69.99	18,490	21,540	25,140	30,620	33,110	36,650
	70.00～ 74.99	19,590	22,890	26,690	32,540	35,190	38,990
	75.00～ 80.00	20,740	24,190	28,240	34,470	37,330	41,330
35.01 ～ 40.00	3.00～ 9.99	5,490	6,190	6,890	7,890	8,410	9,300
	10.00～ 14.99	6,740	7,590	8,640	10,180	10,910	12,050
	15.00～ 19.99	8,040	9,090	10,440	12,370	13,300	14,710
	20.00～ 24.99	9,290	10,590	12,190	14,550	15,690	17,360
	25.00～ 29.99	10,540	12,090	13,990	16,790	18,090	20,010
	30.00～ 34.99	11,840	13,590	15,740	18,970	20,480	22,660
	35.00～ 39.99	13,090	15,090	17,540	21,210	22,870	25,320
	40.00～ 44.99	14,340	16,590	19,290	23,390	25,260	27,970
	45.00～ 49.99	15,590	18,140	21,040	25,570	27,710	30,620
	50.00～ 54.99	16,890	19,640	22,840	27,810	30,100	33,270
	55.00～ 59.99	18,140	21,140	24,590	30,000	32,490	35,930
	60.00～ 64.99	19,390	22,640	26,390	32,230	34,890	38,570
	65.00～ 69.99	20,640	24,140	28,140	34,410	37,270	41,230
	70.00～ 74.99	21,940	25,640	29,990	36,650	39,670	43,880
	75.00～ 80.00	23,190	27,140	31,690	38,840	42,060	46,530
40.01 ～ 50.00	3.00～ 9.99	6,240	7,040	7,890	9,040	9,660	10,700
	10.00～ 14.99	7,790	8,790	10,090	11,850	12,780	14,130
	15.00～ 19.99	9,340	10,640	12,290	14,610	15,750	17,460
	20.00～ 24.99	10,940	12,540	14,490	17,360	18,770	20,740
	25.00～ 29.99	12,490	14,390	16,690	20,120	21,730	24,010
	30.00～ 34.99	14,040	16,240	18,890	22,870	24,690	27,290
	35.00～ 39.99	15,590	18,140	21,040	25,570	27,710	30,620
	40.00～ 44.99	17,140	19,990	23,240	28,330	30,670	33,890
	45.00～ 49.99	18,740	21,840	25,440	31,090	33,640	37,170
	50.00～ 54.99	20,290	23,690	27,640	33,850	36,600	40,500
	55.00～ 59.99	21,840	25,590	29,840	36,600	39,610	43,770
	60.00～ 64.99	23,390	27,440	32,040	39,360	42,580	47,050
	65.00～ 69.99	24,940	29,290	34,190	42,060	45,540	50,330
	70.00～ 74.99	26,540	31,190	36,430	44,810	48,560	53,650
	75.00～ 80.00	28,090	33,040	38,590	47,570	51,530	56,930
50.01 ～ 60.00	3.00～ 9.99	6,990	7,890	8,890	10,180	10,970	12,160
	10.00～ 14.99	8,840	9,990	11,540	13,570	14,650	16,270
	15.00～ 19.99	10,690	12,240	14,140	16,840	18,250	20,220
	20.00～ 24.99	12,540	14,440	16,740	20,170	21,780	24,120
	25.00～ 29.99	14,390	16,690	19,390	23,450	25,370	28,070
	30.00～ 34.99	16,290	18,890	21,990	26,720	28,900	31,970
	35.00～ 39.99	18,140	21,140	24,590	30,000	32,490	35,930
	40.00～ 44.99	19,990	23,340	27,190	33,330	36,030	39,820
	45.00～ 49.99	21,840	25,590	29,840	36,600	39,610	43,770
	50.00～ 54.99	23,690	27,790	32,440	39,880	43,150	47,680
	55.00～ 59.99	25,540	30,040	35,040	43,150	46,740	51,630
	60.00～ 64.99	27,390	32,240	37,640	46,430	50,280	55,530
	65.00～ 69.99	29,240	34,490	40,290	49,750	53,860	59,480
	70.00～ 74.99	31,090	36,690	42,890	53,030	57,400	63,430
	75.00～ 80.00	32,940	38,940	45,490	56,310	60,990	67,330
60.01 ～ 70.00	3.00～ 9.99	7,740	8,740	9,890	11,330	12,210	13,610
	10.00～ 14.99	9,890	11,190	12,990	15,280	16,530	18,400
	15.00～ 19.99	12,040	13,790	16,040	19,130	20,690	22,970
	20.00～ 24.99	14,190	16,390	19,040	22,930	24,850	27,550
	25.00～ 29.99	16,340	18,940	22,090	26,770	28,950	32,130
	30.00～ 34.99	18,490	21,540	25,090	30,570	33,110	36,650
	35.00～ 39.99	20,640	24,140	28,140	34,410	37,270	41,230
	40.00～ 44.99	22,790	26,740	31,190	38,260	41,430	45,810
	45.00～ 49.99	24,940	29,290	34,190	42,060	45,540	50,330
	50.00～ 54.99	27,090	31,890	37,240	45,910	49,700	54,900
	55.00～ 59.99	29,240	34,490	40,290	49,750	53,860	59,480
	60.00～ 64.99	31,390	37,090	43,290	53,550	58,020	64,050
	65.00～ 69.99	33,540	39,640	46,340	57,400	62,130	68,630
	70.00～ 74.99	35,690	42,240	49,340	61,190	66,290	73,160
	75.00～ 80.00	37,840	44,840	52,390	65,050	70,450	77,730

Express service system P.38 | MISUMI Press 2007 | http://misumi.jp/press/ | For inquiry, ordering and other information, refer to P.1269

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

RELATED COMPONENTS OF MISFEED SENSOR

RELATED COMPONENTS OF MISFEED SENSOR

Name	RESISTANCE MISFEED SENSOR	RESISTANCE MISFEED SENSOR UNITS		MICROSWITCH MISFEED SENSOR UNIT	
Catalog No.	MFSF	MFL	SMA□	—Groove feed type—	—Hole feed type—
Delivery	③Ⓐ	①	③ⓉⒶ	① ③ⓉⒶ	① ③ⓉⒶ
Page	568	569		571	573

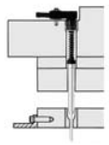


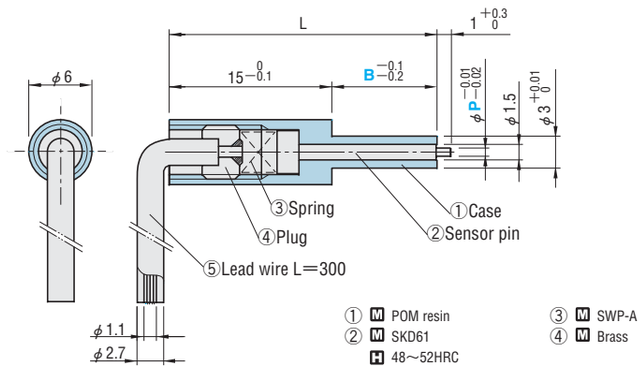
PHOTO MICRO MISFEED SENSOR UNITS		BRACKETS FOR SCRAP SENSOR		BRACKETS FOR SCRAP SENSOR		MISFEED SENSOR UNITS—Contact type—
MFG	MGA□	SNB	SNB-D	SNBA	SNBA-D	OKJS
①	③ⓉⒶ	①		①		①
575		577		577		578

MISFEED SENSOR

The volume discount rate is also applicable to alteration cost. P.39

RoHS

MFSF



L	Catalog No.	B	P 0.1mm increments	U/Price Q'ty : 1~4
23	MFSF	8	0.4~1.5	990
25		10		
28		13		

Order Catalog No. — B — P
MFSF — 10 — P1.0

Delivery 3 Days | Express A 500/1pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.

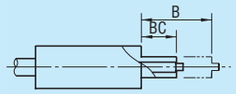
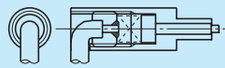
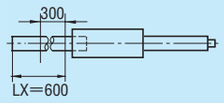
Price

■Volume discount rate P.37

Quantity	1~4	5~9	10~19	20~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

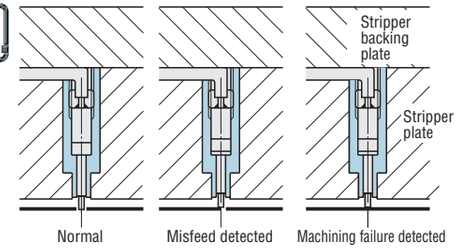
Alteration Catalog No. — B(BC) — P — (LHC・LX)
MFSF — BC6 — P0.8 — LHC—LX

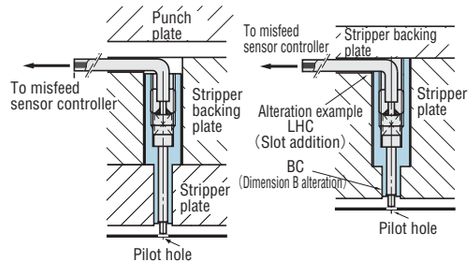
Alterations	Code	Spec.	¥/1Code
	BC	Dimension B alteration 0≦BC<B 1mm increments ⓅThe standard L will be shortened by (B—BC).	300
	LHC	Making a slot for passing through the lead wire on the case.	200
	LX	Lead wire length alteration 300mm ⇨ 600mm	200

■Features

- The lightweight sensor pin assures no shaking of the pin even during high speed operation, Thus it realizes stable sensing.
- The electricity is turned on when a workpiece makes contact with the sensor pin as a result of misfeeding. Connect the lead wire to the sensor input terminal of the misfeed sensor controller. (This type is usable only when the material possesses electrical conductivity.)
- This sensor allows reduction in total cost by its simple construction and installation, e.g. simple mounting hole machining, compared with other misfeed sensors.
- Unlike microswitch or photoelectric misfeed sensors, which react to a motion of the pilot punch, the resistance misfeed sensor MFSF reacts at the point of contact with the workpiece, allowing the press machine to stop its operation promptly.

EX

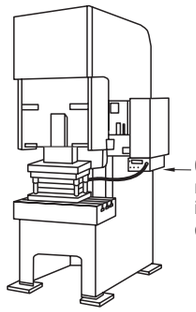




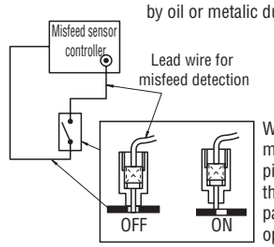
- Install the sensor to the stripper plate by light press fit or bonding.

Ⓟ If the sensor is installed to the lower die, care should be taken for potential malfunctions caused by oil or metalic dust.

■How to connect



Connect the lead wire of the misfeed sensor to the sensor input terminal (contact type) of the misfeed sensor controller.

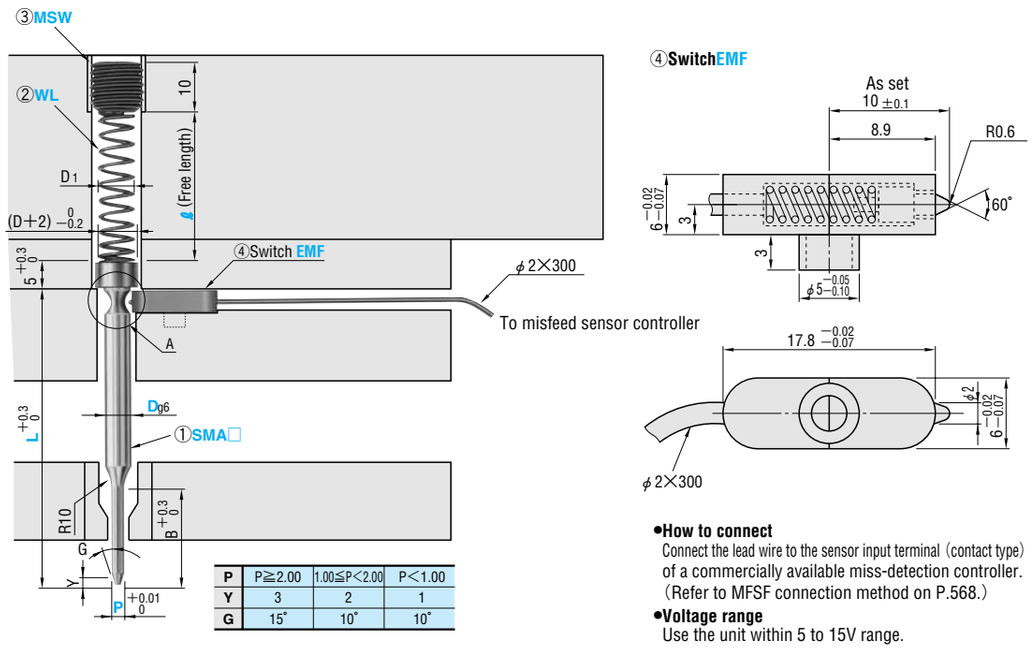


When a conductive workpiece makes contact with the sensor pin, electricity is turned on with the die working as a grounding path, stopping the press machine operation.

MISFEED SENSOR UNITS

The volume discount rate is also applicable to alteration cost. P.39

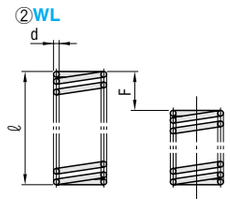
RoHS

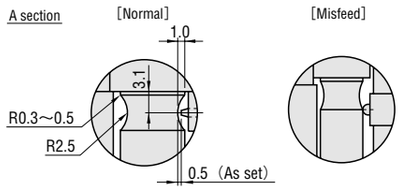


P	P≧2.00	1.00≦P<2.00	P<1.00
Y	3	2	1
G	15°	10°	10°

•How to connect
Connect the lead wire to the sensor input terminal (contact type) of a commercially available miss-detection controller. (Refer to MFSF connection method on P.568.)

•Voltage range
Use the unit within 5 to 15V range.





Part No.	Name	Catalog No.	M H	Part No.	Name	Catalog No.	M H
①	Misfeed pin	SMAS SMAL SMAX	M SKD11 or equivalent H 60〜63HRC	③	Screw plug	MSW	P.731
②	Spring for misfeed pin	WL	P.1061	④	Switch	EMF	M Polycarbonate

①		WL Spring constant 1N/mm {0.1kgf/mm}									
		D4		D5		D6		D8		D10	
φ D1		6		6		8		10		10	
Type	ℓ	d	max.F	d	max.F	d	max.F	d	max.F	d	max.F
②WL	25	0.65	10	0.65	10	0.75	10	0.9	10	0.9	10
	30	0.7	12	0.7	12	0.8	12	0.9	12	0.9	12
	35	0.7	14	0.7	14	0.8	14	0.9	14	0.9	14
	40	0.7	16	0.7	16	0.8	16	0.9	16	0.9	16
	45	0.75	18	0.75	18	0.85	18	1.0	18	1.0	18
	50	0.75	20	0.75	20	0.85	20	1.0	20	1.0	20
	55	0.75	22	0.75	22	0.85	22	1.0	22	1.0	22
	60	0.8	24	0.8	24	0.9	24	1.0	24	1.0	24
	65	0.8	26	0.8	26	0.9	26	1.1	26	1.1	26
	70	0.85	28	0.85	28	1.0	28	1.1	28	1.1	28
③MSW		M8×P1.25		M10×P1.5		M10×P1.5		M12×P1.5		M14×P1.5	

Spring load (N)=Spring constant (N/mm)×deflection (Fmm) (N)=kgf×9.80665

■Misfeed pins (①)

B	Catalog No. Type	D	L	P 0.01mm increments	U/Price Q'ty : 1〜4	5〜9	10〜19	20〜50
10	SMAS	4	50 60 70 80	1.00〜3.97	1,300	1,230	1,170	1,100
		5	50 60 70 80 90 100	2.00〜4.97				
		6	50 60 70 80 90 100	2.00〜5.97				
15		8	50 60 70 80 90 100	3.00〜7.97				
15	SMAL	4	60 70 80	1.00〜3.97				
		5	60 70 80 90 100	2.00〜4.97				
		6	60 70 80 90 100	2.00〜5.97				
21		8	60 70 80 90 100	3.00〜7.97				
		10	60 70 80 90 100 110	3.00〜9.97				
21	SMAX	4	60 70 80	1.20〜3.97				
27		5	60 70 80 90 100	2.00〜4.97				
		6	60 70 80 90 100	2.00〜5.97				
32		8	70 80 90 100	3.00〜7.97				
		10	70 80 90 100 110	3.00〜9.97				

To be quoted on price & lead time above Max. Q'ty.

Order Catalog No. — L — P
SMAS 6 — 80 — P3.00

Delivery 3 Days | Express T 1,000/1pc. | Express A 500/1pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Alteration Catalog No. — L(LC) — P(PC) — (BC·HC·NTC·PKC)
SMAS 8 — LC79 — PC2.50

Alterations	Code	Spec.	¥/1Code
	PC	Changes dimension P. PC≧ Pmin./2 ≧0.50 0.01mm increments. B is determined by P according to the list below.	200
	BC	Changes dimension B. Y+2≦BC≦Bmax. BC≦L(LC)−30 0.1mm increments	200
	LC	Changes dimension L. (B)+30≦LC<L 0.1mm increments When (L−B) is 30mm or less, point length B is (L−30mm).	200

P	Bmax.
0.50〜0.99	10
1.00〜1.99	20
2.00〜3.99	35
4.00〜5.99	45
6.00〜	60

Alterations	Code	Spec.	¥/1Code
	HC	Changes head diameter. D≦HC<D+2 0.1mm increments	200
	NTC	Makes no taper on the pin end.	0
	PKC	Changes tolerance on dimension P. P +0.01 0 ⇨ +0.005 0	400

■Sensor units (②③④)

Catalog No. Type	D	② Type	ℓ	U/Price Q'ty : 1〜4	5〜9	10〜19	20〜50
MFL	4	WL	25 30 35 40 45 50 55 60 65 70	640	610	580	540
	5						
	6						
	8						
	10						

To be quoted on price & lead time above Max. Q'ty.

Order Catalog No. — ②Type·ℓ
MFL 6 — WL 60

Delivery 1 Day

■Components (④)

Part No.	Name	Catalog No.	U/Price Q'ty : 1〜4	5〜9	10〜19	20〜50
④	Switch	EMF	590	560	530	500

To be quoted on price & lead time above Max. Q'ty.

Order Catalog No.
EMF

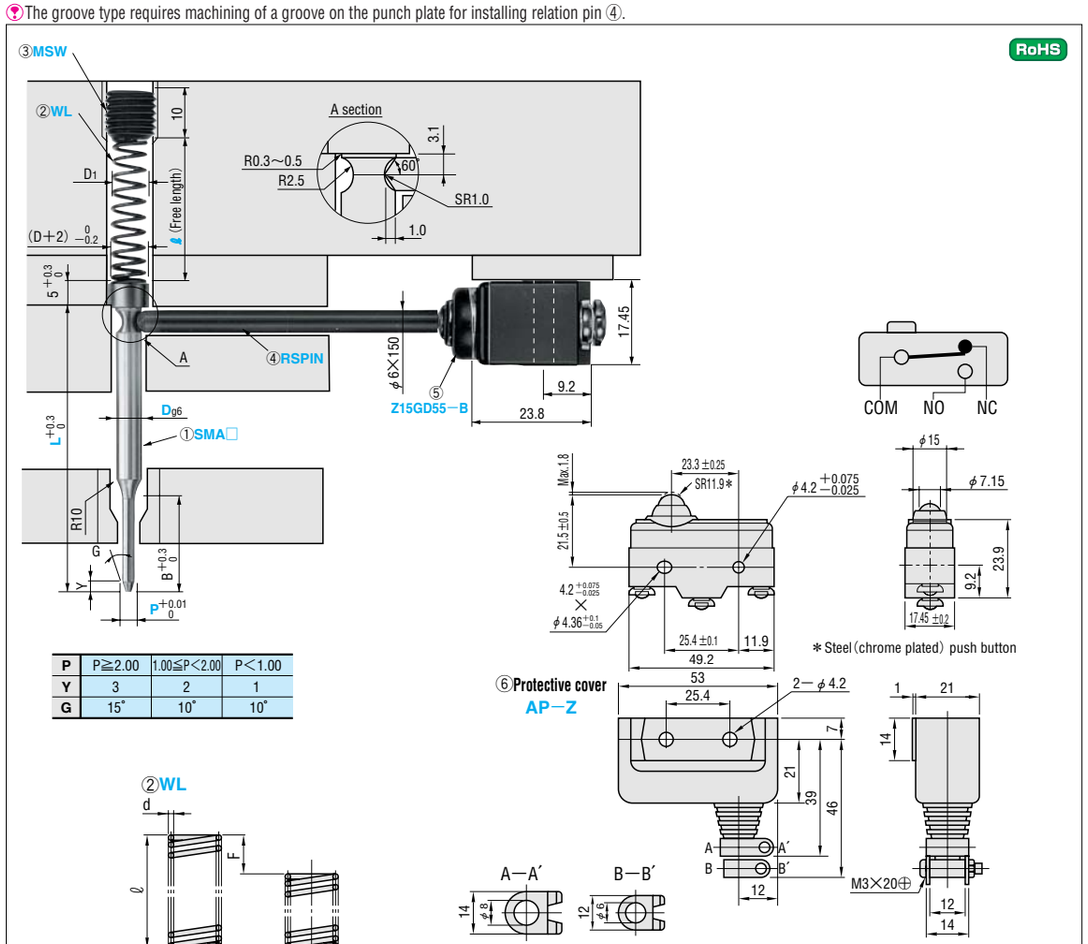
Delivery 1 Day

Refer to each page for the following components.

Part No.	Name	Catalog No.	Refer page
②	Spring for misfeed pin	WL	P.1061
③	Screw plug	MSW	P.731

MISFEED SENSOR UNITS FOR GROOVE
—GROOVE TYPE—

The groove type requires machining of a groove on the punch plate for installing relation pin ④.



P	P≧2.00	1.00≦P<2.00	P<1.00
Y	3	2	1
G	15°	10°	10°

Part No.	Name	Catalog No.	M H	Part No.	Name	Catalog No.	M H
①	Misfeed pin	SMAS SMAL SMAX	M SKD11 or equivalent H 60～63HRC	④	Relation pin	RSPIN	M SK4 S Black oxide (Fe_3O_4)
②	Spring for misfeed pin	WL	P.1061	⑤	Microswitch	Z−15GD55−B	made by OMRON
③	Screw plug	MSW	P.731	⑥	Protective cover	AP−Z	made by OMRON

①	WL Spring constant 1N/mm {0.1kgf/mm}									
	D4		D5		D6		D8		D10	
ϕD1	6		6		8		10		10	
Type / ℓ	d	maxF	d	maxF	d	maxF	d	maxF	d	maxF
②WL 25	0.65	10	0.65	10	0.75	10	0.9	10	0.9	10
30	0.7	12	0.7	12	0.8	12	0.9	12	0.9	12
35	0.7	14	0.7	14	0.8	14	0.9	14	0.9	14
40	0.7	16	0.7	16	0.8	16	0.9	16	0.9	16
45	0.75	18	0.75	18	0.85	18	1.0	18	1.0	18
50	0.75	20	0.75	20	0.85	20	1.0	20	1.0	20
55	0.75	22	0.75	22	0.85	22	1.0	22	1.0	22
60	0.8	24	0.8	24	0.9	24	1.0	24	1.0	24
65	0.8	26	0.8	26	0.9	26	1.1	26	1.1	26
70	0.85	28	0.85	28	1.0	28	1.1	28	1.1	28
③MSW	M8×P1.25		M10×P1.25		M10×P1.25		M12×P1.25		M14×P1.25	

⑤Microswitch (Z−15GD55−B)

- Force for operation OF : 540g
- Force for return RF : Min.114g
- Movement before operation PT : Max.1.8mm
- Movement after operation OT : Min.1.6mm
- Movement differential MD : Max.0.06mm
- Position of operation OP : 21.5±0.5mm
- Working ambient temperature : −15～80℃

Spring load (N)=Spring constant (N/mm)×deflection (Fmm) {N}=kgf×9.80665

The volume discount rate is also applicable to alteration cost. P.39

■Misfeed pins (①)

To be quoted on price & lead time above Max. Q'ty.

B	Catalog No. Type	D	L	P 0.01mm increments	U/Price Q'ty : 1～4	5～9	10～19	20～50
10	SMAS	4	50 60 70 80	1.00～3.97	1,300	1,230	1,170	1,100
		5	50 60 70 80 90 100	2.00～4.97				
		6	50 60 70 80 90 100	2.00～5.97				
15		8	50 60 70 80 90 100	3.00～7.97				
15	SMAL	4	60 70 80	1.00～3.97				
		5	60 70 80 90 100	2.00～4.97				
		6	60 70 80 90 100	2.00～5.97				
21		8	60 70 80 90 100	3.00～7.97				
		10	60 70 80 90 100 110	3.00～9.97				
21	SMAX	4	60 70 80	1.20～3.97				
27		5	60 70 80 90 100	2.00～4.97				
		6	60 70 80 90 100	2.00～5.97				
32		8	70 80 90 100	3.00～7.97				
		10	70 80 90 100 110	3.00～9.97				

Order — Catalog No. — L — P
SMAS 6 — 80 — P3.00

Delivery — 3 Days

Express T 1,000/1pc. / Express A 500/1pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Alteration — Catalog No. — L(LC) — P(PC) — (BC·HC·NTC·PKC)
SMAS 8 — LC79 — PC2.50

Alterations	Code	Spec.	¥1Code
P	PC	Changes dimension P. PC≧ Pmin./2 ≧0.50, 0.01mm increments. B is determined by P according to the list below.	200
B BC	BC	Changes dimension B. Y+2≦BC≦Bmax. BC≦L(LC)−30, 0.1mm increments	200
LC	LC	Changes dimension L. (B)+30≦LC<L, 0.1mm increments. When (L−B) is 30mm or less, point length B is (L−30mm).	200

P	Bmax
0.50～0.99	10
1.00～1.99	20
2.00～3.99	35
4.00～5.99	45
6.00～	60

Alterations	Code	Spec.	¥1Code
HC	HC	Changes head diameter. D≦HC<D+2, 0.1mm increments	200
	NTC	Makes no taper on the pin end.	0
P	PKC	Changes tolerance on dimension P. P +0.01 0 ⇨ +0.005 0	400

■Sensor units (②③④⑤⑥)

To be quoted on price & lead time above Max. Q'ty.

Catalog No. Type	D	② Type	ℓ	U/Price Q'ty : 1～4	5～9	10～19	20～50
MFD	4 5 6 8 10	WL	25 30 35 40 45 50 55 60 65 70	1,620	1,540	1,460	1,380

Order — Catalog No. — ②Type·ℓ
MFD 6 — WL 60

Delivery — 1 Day

■Components

To be quoted on price & lead time above Max. Q'ty.

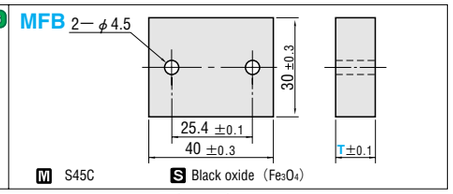
Part No.	Name	Catalog No.	U/Price Q'ty : 1～4	5～9	10～19	20～50
④	Relation pin	RSPIN	420	400	380	360
⑤	Microswitch	Z−15GD55−B	1,420	1,350	1,270	1,210
⑥	Protective cover	AP−Z	370	350	330	310

Order — Catalog No. Z−15GD55−B — Delivery — 1 Day

Refer to each page for the following components.

Part No.	Name	Catalog No.	Refer page
②	Spring for misfeed pin	WL	P.1061
③	Screw plug	MSW	P.731

Mounting plates for microswitch RoHS



Catalog No. Type	T	U/Price Q'ty : 1～4	5～9	10～19	20～50
MFB	2.6 5.6 8.2 8.6 11.2	810	770	720	680
	12.6 14.2 18.2	960	910	860	810

Order — Catalog No. MFB 11.2

Delivery — 1 Day

To be quoted on price & lead time above Max. Q'ty.
※ Production of MFB2.1, 5.1 and 12.1 was discontinued in May 2006.

■The selection standard for mounting plate thickness (T) for microswitch

The plate thickness must be decided assuming the use of protective cover.

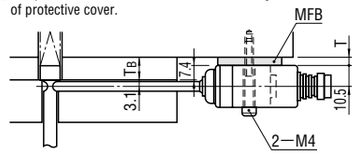


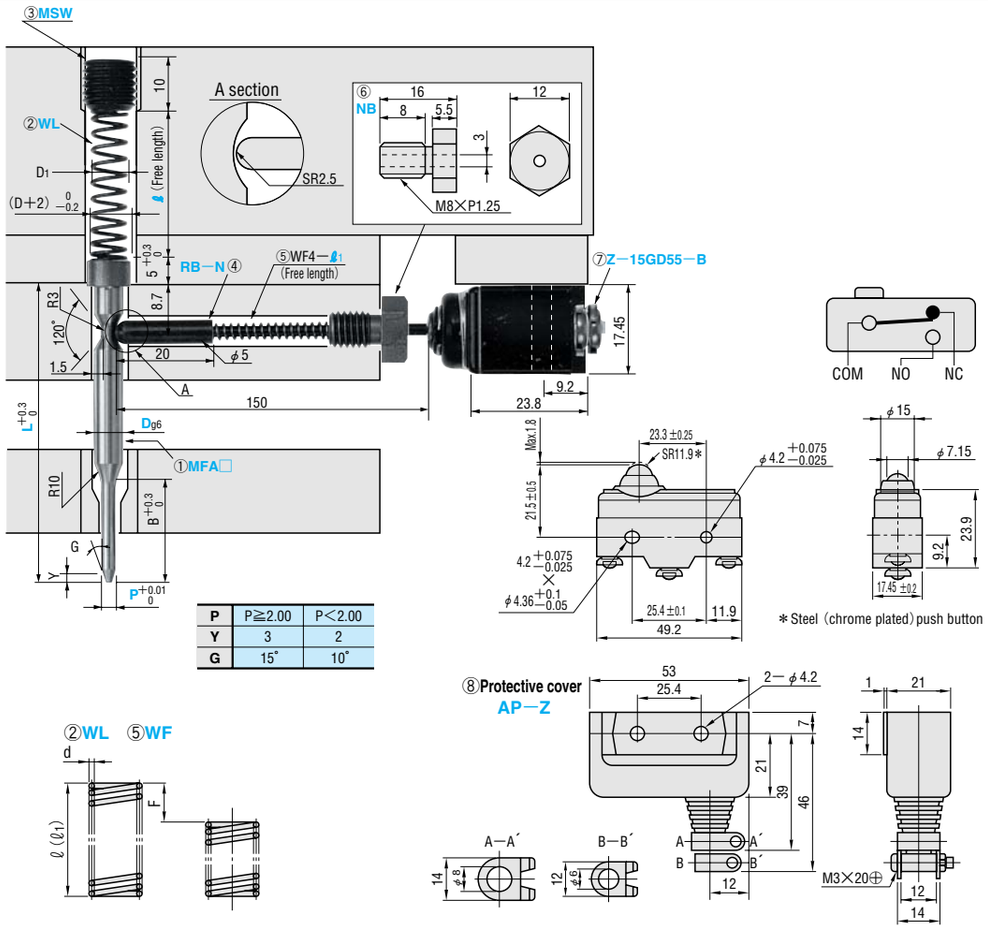
Plate thickness (T) = Backing plate thickness (T_B) − 7.4

Backing plate thickness (T_B)	Mounting plate thickness (T)
10	2.6
13	5.6
16	8.6
20	12.6

MFB8.2, 11.2, 14.2 and 18.2 are for hole types (P.573).

MICROSWITCH MISFEED SENSOR UNITS
—HOLE TYPE—

The hole type requires machining of a hole on the punch plate for installing relation pin ④.



P	P≧2.00	P<2.00
Y	3	2
G	15°	10°

Part No.	Name	Catalog No.	M H	Part No.	Name	Catalog No.	M H
①	Misfeed pin	MFAS MFAL MFAX	M SKD11 or equivalent H 60～63HRC	⑤	Spring for relation pin	WF	P.1060
②	Spring for misfeed pin	WL	P.1061	⑥	Plug for relation pin	NB	M S45C H 34～43HRC
③	Screw plug	MSW	P.731	⑦	Microswitch	Z—15GD55—B	made by OMRON
④	Relation pin	RB—N	M SK4 S Black oxide (Fe_3O_4)	⑧	Protective cover	AP—Z	made by OMRON

Type ℓ \ ① d·maxF	WL Spring constant 1N/mm {0.1kgf/mm} D5 d	D5 maxF	D6 d	D6 maxF	D8 d	D8 maxF	D10 d	D10 maxF
②WL 25	0.65	10	0.75	10	0.9	10	0.9	10
30	0.7	12	0.8	12	0.9	12	0.9	12
35	0.7	14	0.8	14	0.9	14	0.9	14
40	0.7	16	0.8	16	0.9	16	0.9	16
45	0.75	18	0.85	18	1.0	18	1.0	18
50	0.75	20	0.85	20	1.0	20	1.0	20
55	0.75	22	0.85	22	1.0	22	1.0	22
60	0.8	24	0.9	24	1.0	24	1.0	24
65	0.8	26	0.9	26	1.1	26	1.1	26
70	0.85	28	1.0	28	1.1	28	1.1	28
φD1	6		8		10		10	
③MSW	M10×P1.5		M10×P1.5		M12×P1.5		M14×P1.5	

Type	WF Spring constant 0.5N/mm {0.05kgf/mm} ℓ1	d	maxF
⑤WF	10*	0.35	4.5
	15*	0.4	6.7
	20*	0.4	9
	25*	0.45	11.2
	30*	0.45	13.5
	35	0.5	15.7
	40	0.5	18
	45	0.5	20
	50	0.5	22.5
	60	0.5	27

⑦Microswitch (Z—15GD55—B)

- Force for operation OF : 540g
- Force for return RF : Min.114g
- Movement before operation PT : Max.1.8mm
- Movement after operation OT : Min.1.6mm
- Movement differential MD : Max.0.06mm
- Position of operation OP : 21.5±0.5mm
- Working ambient temperature : −15～80°C

(*WF10～30 are not ground on both ends.) Spring load (N)=Spring constant (N/mm)×deflection (Fmm) {N}=kgf×9.80665

The volume discount rate is also applicable to alteration cost. P.39

■Misfeed pins ①

To be quoted on price & lead time above Max. Q'ty.

B	Catalog No. Type	D	L	P 0.01mm increments	U/Price Q'ty : 1～4	5～9	10～19	20～50
10	MFAS	5	50 60 70 80 90 100	2.00～4.97	1,300	1,230	1,170	1,090
		6	50 60 70 80 90 100	2.00～5.97				
15		8	50 60 70 80 90 100	3.00～7.97				
15	MFAL	5	60 70 80 90 100	2.00～4.97				
		6	60 70 80 90 100	2.00～5.97				
21		8	60 70 80 90 100	3.00～7.97				
		10	60 70 80 90 100 110	3.00～9.97				
27	MFAX	5	60 70 80 90 100	2.00～4.97				
		6	60 70 80 90 100	2.00～5.97				
32		8	70 80 90 100	3.00～7.97				
		10	70 80 90 100 110	3.00～9.97				

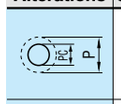
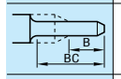
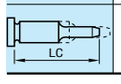
Order — Catalog No. — L — P
MFAL 10 — 80 — P6.00

Delivery — 3 Days

Express T 1,000/1pc.
Express A 500/1pc.
P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Alteration — Catalog No. — L(LC) — P(PC) — (BC·HC·NTC·PKC)
MFAL 10 — LC79 — P6.00

Alterations	Code	Spec.	¥/1Code
	PC	Changes dimension P. PC≧0.50(D=5) PC≧Pmin./2 (D=6～10) 0.01mm increments (B is determined by P according to the list below.)	200
	BC	Changes dimension B. Y+2≦BC≦Bmax. BC≦L(LC)−30 0.1mm increments	200
	LC	Changes dimension L. 0.1mm increments (B)+30≦LC<L When (L−B) is 30mm or less, point length B is (L−30mm).	200

P	Bmax
0.50～0.99	10
1.00～1.99	20
2.00～3.99	35
4.00～5.99	45
6.00～	60

Alterations	Code	Spec.	¥/1Code
	HC	Changes head diameter. D≦HC<D+2 0.1mm increments	200
	NTC	Makes no taper on the pin end.	0
	PKC	Changes tolerance on dimension P. P +0.01 0 ⇨ +0.005 0	400

■Sensor units (②③④⑤⑥⑦⑧)

To be quoted on price & lead time above Max. Q'ty.

Catalog No. Type	D	② Type	② ℓ	⑤ Type	⑤ ℓ1	U/Price Q'ty : 1～4	5～9	10～19	20～50
MF	5	WL	25 30 35 40 45 50 55 60 65 70	WF	10 15 20 25 30 35 40 45 50 60	1,820	1,730	1,640	1,550
	6								
	8								
	10								

Order — Catalog No. — ② — ⑤
MF 10 — WL 30 — WF 30

Delivery — 1 Day

■Components

To be quoted on price & lead time above Max. Q'ty.

Part No.	Name	Catalog No.	U/Price Q'ty : 1～4	5～9	10～19	20～50
④	Relation pin	RB—N	370	350	330	310
⑥	Plug for relation pin	NB	280	270	250	240
⑦	Microswitch	Z—15GD55—B	1,420	1,350	1,270	1,210
⑧	Protective cover	AP—Z	370	350	330	310

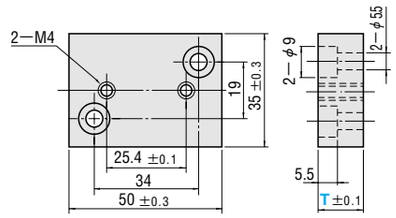
Refer to each page for the following components.

Part No.	Name	Catalog No.	Refer page
②	Spring for misfeed pin	WL	P.1061
③	Screw plug	MSW	P.731
⑤	Spring for relation pin	WF	P.1060

Order — Catalog No. RB—N — Delivery — 1 Day

Mounting plates for microswitch RoHS

MFA



M S45C S Black oxide (Fe_3O_4)

Catalog No. Type	T	U/Price Q'ty : 1～4	5～9	10～19	20～50
MFA	8.2	1,220	1,160	1,090	1,040
	11.2				
	12.1	1,320	1,250	1,190	1,120
	14.2				
	18.2				

Order — Catalog No. MFA 8.2

Delivery — 1 Day

To be quoted on price & lead time above Max. Q'ty.

■The selection standard for mounting plate thickness (T) for microswitch

The plate thickness must be decided assuming the use of protective cover.

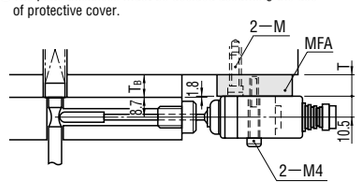
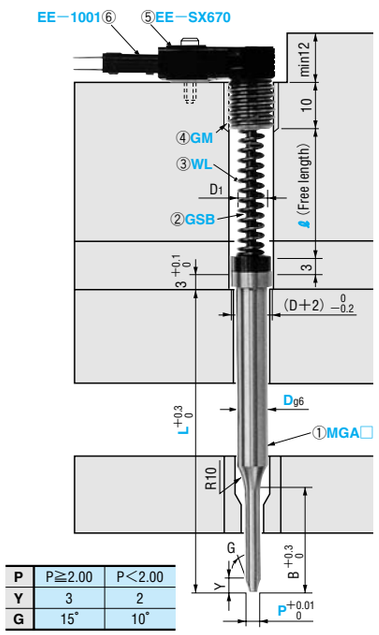


Plate thickness (T)=Backing plate thickness (T_B)−1.8

Backing plate thickness (T_B)	Mounting plate thickness (T)
10	8.2
13	11.2
16	14.2
20	18.2

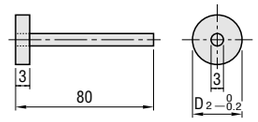
Express service system P.38 | MISUMI Press 2007 | http://misumi.jp/press/ | For inquiry, ordering and other information, refer to P.1269

PHOTO MICRO MISFEED SENSOR UNITS

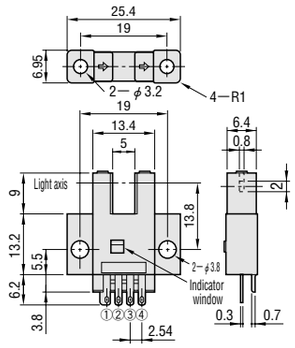


P	P≧2.00	P<2.00
Y	3	2
G	15°	10°

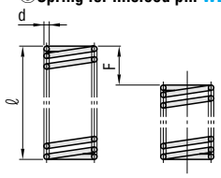
②Switch bar GSB



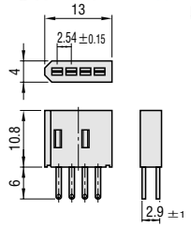
⑤Photoelectric element EE—SX670 RoHS



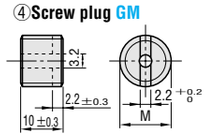
③Spring for misfeed pin WL



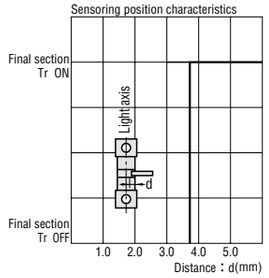
⑥Connector EE—1001 Usage P.576



④Screw plug GM

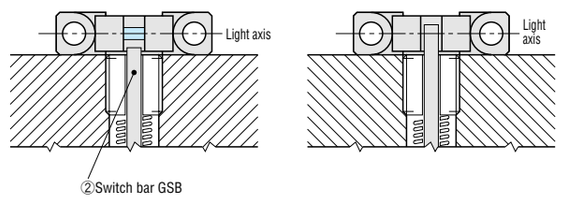


Sensoring position characteristics



(Normal) When light passes through : OFF
The light reaches to the receiving side. So the sensor is off.

(Misfeed) When light is blocked : ON
When a workpiece is misfed, switch bar is pushed up and blocks the light from lighting side. Then the sensor is ON.



Part No.	Name	Catalog No.	M H	Part No.	Name	Catalog No.	M H
①	Misfeed pin	MGAS MGAL MGAX	M SKD11 or equivalent H 60～63HRC	④	Screw plug	GM	M S45C H 34～43HRC
②	Switch bar	GSB	M SK4 S Black oxide (Fe_3O_4)	⑤	Photoelectric element	EE—SX670	made by OMRON Output : OFF when passes through
③	Spring for misfeed pin	WL	P.1061	⑥	Connector	EE—1001	made by OMRON

③WL Spring constant 1N/mm {0.1kgf/mm}

ℓ / D / dmaxF	WL25 d	WL25 maxF	WL30 d	WL30 maxF	WL35 d	WL35 maxF	WL40 d	WL40 maxF	WL45 d	WL45 maxF	WL50 d	WL50 maxF	WL55 d	WL55 maxF	WL60 d	WL60 maxF	WL65 d	WL65 maxF	WL70 d	WL70 maxF	D1	④ M×P		② φD2
5	0.65	10	0.7	12	0.7	14	0.7	16	0.75	18	0.75	20	0.75	22	0.8	24	0.8	26	0.85	28	6	10	1.5	7
6																						10		8
8																						12		10
10																						14		12

Spring load (N)=Spring constant (N/mm)×deflection (Fmm) {N}=kgf×9.80665

The volume discount rate is also applicable to alteration cost. P.39

■Misfeed pins (①)

To be quoted on price & lead time above Max. Q'ty.

B	Catalog No. Type	D	L	P 0.01mm increments	U/Price Q'ty : 1～4	5～9	10～19	20～50
10	MGAS	5	50 60 70 80 90 100	2.00～4.97	910	860	820	770
15		6	50 60 70 80 90 100	2.00～5.97				
		8	50 60 70 80 90 100	3.00～7.97				
15	MGAL	5	60 70 80 90 100	2.00～4.97	910	860	820	770
21		6	60 70 80 90 100	2.00～5.97				
		8	60 70 80 90 100	3.00～7.97				
		10	60 70 80 90 100 110	3.00～9.97				
27	MGAX	5	60 70 80 90 100	2.00～4.97	1,080	1,030	970	920
32		6	60 70 80 90 100	2.00～5.97				
		8	70 80 90 100	3.00～7.97				
		10	70 80 90 100 110	3.00～9.97				

Order: Catalog No. — L — P
MGAS 6 — 70 — P4.97

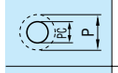
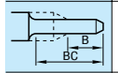
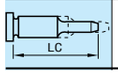
Delivery: 3 Days

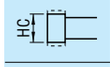
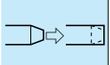
Express T 1,000/pc. / Express A 500/pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Alteration

Catalog No. — L(C) — P(C) — (BC·HC·NTC·PKC)
MGAS 6 — LC65.0 — P4.97

Alterations	Code	Spec.	¥1Code
	PC	Changes dimension P. PC ≧ Pmin./2, 0.01mm increments. B is determined by P according to the list below. P(PC) / Bmax: 1.00～1.99 / 20; 2.00～3.99 / 35; 4.00～5.99 / 45; 6.00～ / 60	200
	BC	Changes dimension B. Y+2≦BC≦Bmax, BC≦L(C)−30, 0.1mm increments	200
	LC	Changes dimension L. (B)+30≦LC<L, 0.1mm increments. When (L−B) is 30mm or less, point length B is (L−30mm).	200

Alterations	Code	Spec.	¥1Code
	HC	Changes head diameter. D≦HC<D+2, 0.1mm increments	200
	NTC	Makes no taper on the pin end.	0
	PKC	Changes tolerance on dimension P. P +0.01 0 ⇨ +0.005 0	400

■Sensor units (②③④⑤⑥)

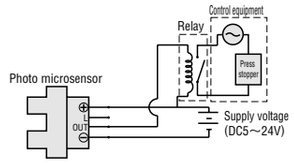
To be quoted on price & lead time above Max. Q'ty.

Catalog No. Type	D	③ Type	③ ℓ	U/Price Q'ty : 1～4	5～9	10～19	20～50
MFG	5	WL	25 30 35 40 45 50 55 60 65 70	1,820	1,730	1,640	1,550
	6						
	8						
	10						

Order: Catalog No. — Type・ℓ
MFG 6 — WL 50

Delivery: 1 Day

Photo micro misfeed sensor unit MFG



●How to use

A photoelectric microsensor (with a built-in amplifier) is used as a switch.
It switches "on" when an object is on the light axis and intercepts light allowing electricity to flow.
This flow of electricity makes the relay operate and press machine. However, this sensor is not an ordinary switch and does not open or close the circuit. It does not work to control unit directly.

●How to wire

The wiring is shown in the left illustration. Power supply voltage should be **DC5** to **24V**. Wire ⊕ and ⊖ terminals of the sensor to the power source. Then wire the ⊕ terminal and **OUT** terminal of the sensor to the relay input terminal.
(Select a relay of **100mA** or less)
However, it is difficult to obtain a **DC** power supply at the actual press working site. This photoelectric microsensor can be easily set by using a press-safety device which is available on the market.

●Directions to follow for proper application

1. Make sure that the relay on the output side is **100mA** or less.
2. Place the sensor unit as far from the high-tension wire or power line as possible to avoid misoperation due to induction. Such misoperation may damage the sensor.
3. Be sure to insert an absorber in the surge source if there are any devices which generate high surges (motors, welders and other spark generating devices).
4. The photoelectric microsensor may be affected by the ambient light. Avoid such conditions as much as possible.
5. As the photoelectric microsensor is operated by lights, wipe the light emitting and receiving sides frequently with a dry cloth.
6. Use **M3.0** screws for installing the photoelectric microsensor. The tightening force should be **5.5kg・cm** or less.
7. Be sure to use an **EE-1001** connector.

■Components

To be quoted on price & lead time above Max. Q'ty.

Part No.	Name	Misfeed pin ①	Catalog No. Type	D2・M	U/Price Q'ty : 1～4	5～9	10～19	20～50
②	Switch bar	D 5	GSB	7	510	480	460	430
		D 6		8				
		D 8		10				
		D10		12				
④	Screw plug	D 5	GM	10	280	270	250	240
		D 6						
		D 8		12				
		D10		14				
⑤	Photoelectric element	—	EE—SX670		1,510	1,430	1,360	1,280
⑥	Connector	—	EE—1001		280	270	250	240

Order: Catalog No. EE—SX670

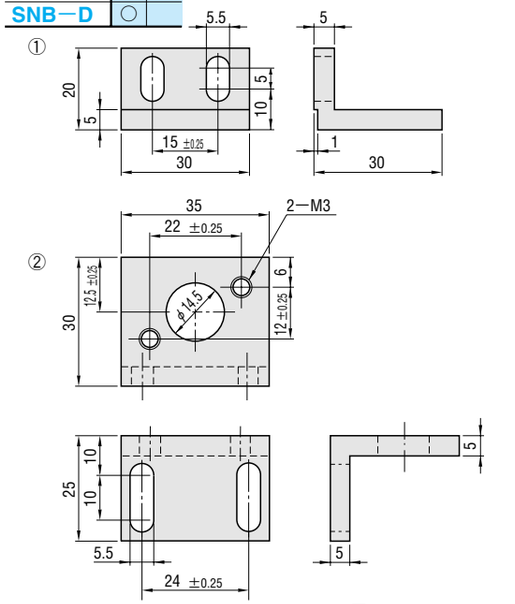
Delivery: 1 Day

③Springs WL for misfeed pin P.1061

BRACKETS FOR SCRAP SENSOR

RoHS

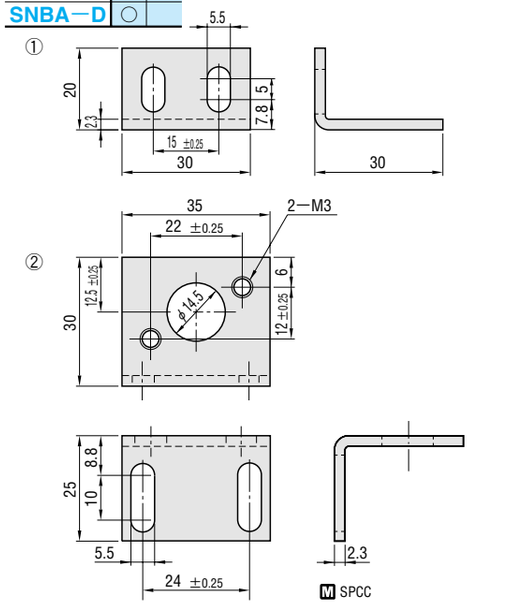
Catalog No.	①	②
SNB	○	○
SNB—D	○	



Ⓜ SS400
Ⓐ CB5—20 4pcs.
Ⓟ SNB—D comes with 2 pcs. of CB5—20

RoHS

Catalog No.	①	②
SNBA	○	○
SNBA—D	○	



Ⓜ SPCC
Ⓢ Bright chromate
Ⓐ CB5—20 4pcs.
Ⓟ SNBA—D comes with 2 pcs. of CB5-20

Order — Catalog No.: SNB

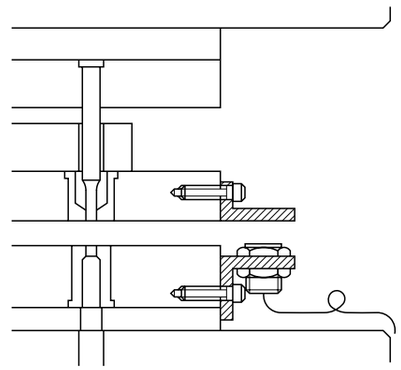
Delivery — 1 Day

Price

Catalog No.	U/Price			
	Q'ty : 1~4	5~9	10~19	20~50
SNB	1,720	1,630	1,550	1,460
SNB—D	890	850	800	710
SNBA	590	560	530	500
SNBA—D	240	230	220	200

Ⓟ To be quoted on price & lead time above Max. Q'ty.

Example



This bracket is recommended for fixing RS833H (made by RIKEN KEIKI Co.,LTD.,) or PH114 (made by KEYENCE Co.) sensors.

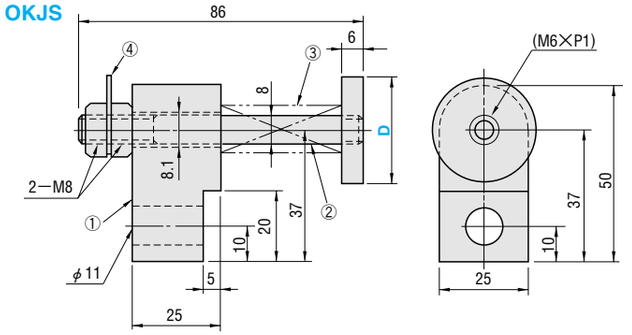
MISFEED SENSOR UNITS
—CONTACT TYPE—

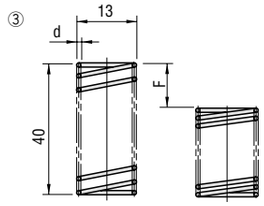
RoHS

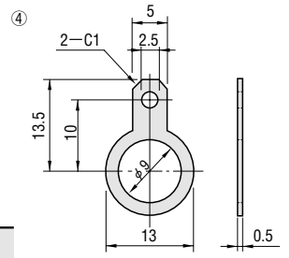
Ⓜ PF (Phenol resin)
Ⓜ S45C
Ⓢ Black oxide (Fe_3O_4)
Ⓜ SWP—A
Ⓜ SPCC
Ⓐ M8 nut

Ⓟ Bolt (M10) for mounting OKJS is not included.

OKJS







③Spring Type	D—L	kgf/mm	d	F max.	kgf max.
WF	13—40	0.05	1.0	18	0.9
WL	13—40	0.1	1.1	16	1.6
WM	13—40	0.3	1.4	14	4.2

Spring load (N)=Spring constant (N/mm)×deflection (Fmm)
(N)=kgf×9.80665

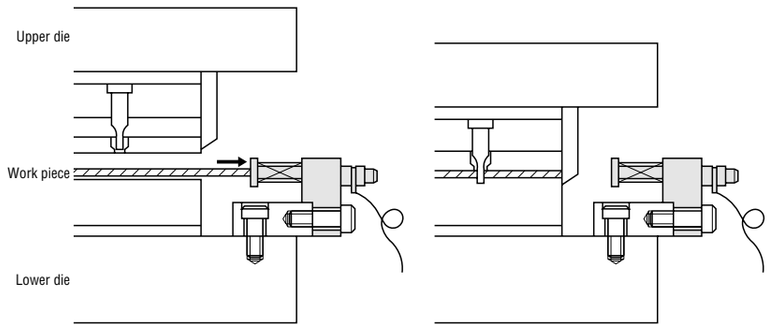
Catalog No. Type	D	③Spring	U/Price Q'ty : 1~4	5~9	10~19	20~50
OKJS	16	WF	1,170	1,110	1,050	990
	20	WL				
	30	WM				

Ⓟ To be quoted on price & lead time above Max. Q'ty.

Order — Catalog No. — ③Spring: OKJS 16 — WL

Delivery — 1 Day

Example



●The workpiece is charged with electricity. When it touches the sensor, the unit status is ON.

●When the workpiece is cut, the unit status is OFF.

Express service system P.38 · MISUMI Press 2007 · http://misumi.jp/press/ · For inquiry, ordering and other information, refer to P.1269

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

PUNCHES & DIES FOR FORMING

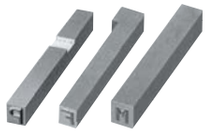
PUNCHES & DIES FOR FORMING

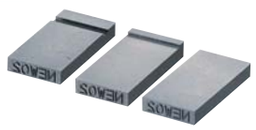
Name / Catalog No.	BURRING PUNCHES SPM T—SPM SJM	BURRING PUNCHES —Standard·Lapping type—	BURRING PUNCHES —Half-made tip R type—	BURRING PUNCHES —Half-made tip tapered type—	BURRING DIE UNITS BDU
Delivery	①	③Ⓐ	③Ⓐ·③	③Ⓐ·③	③Ⓐ·③
Page	581	582	583	585	587

SCRAPLESS BURRING PUNCHES	EMBOSSING PUNCHES —SR · Stepped SR · Stepped and tapered type—	KNOCKOUT PIN SETS FOR EMBOSSING PUNCH BMPS	KNOCKOUT PIN SETS FOR EMBOSSING PUNCH BMP	CHAMFERING PUNCHES —Shoulder · Key flat · Tapped type—	DRAWING PUNCHES —Standard · Lapping type—
③Ⓐ·③	③Ⓐ	①	①	③Ⓐ	③Ⓐ
589	591	592		593 · 595	599

DRAWING PUNCHES —Dicoat® · TiCN coating type—	JECTOR DRAWING PUNCHES —Standard · Lapping type—	JECTOR DRAWING PUNCHES —Dicoat® · TiCN coating type—	DRAWING BUTTON DIES —Steel—	KNOCKOUT PINS KOP
③	③Ⓐ	③	⑤	③Ⓐ
601	603	605	607	608

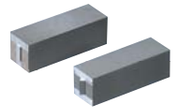
DRAWING DIES —Carbide—	DRAWING DIES	ENGRAVING PUNCHES —R · L type—	ENGRAVING PUNCHES —Free type—	ENGRAVING PUNCHES FOR SRANTED SURFACE TCPTS□M	ENGRAVING PUNCHES FOR SRANTED SURFACE TCPTL□M	SHIMS TCIM TCIMT DCIM · DCIMT
⑧	③Ⓐ	③ⓉⒶ	⑤Ⓑ	③	③	③ⓉⒶ
609	611	613		614		614 616





ENGRAVING PUNCHES KMCP KMCPW KMCPWF	DIE CHECK BUTTONS DCBA DCBAW	ENGRAVING BLOCK PUNCHES —One character type—	ENGRAVING BLOCK PUNCHES —Multiple characters specifiable type—
③Ⓐ ③Ⓐ ⑤Ⓑ	③ⓉⒶ ③Ⓐ	③Ⓐ ③	⑤Ⓑ ⑤Ⓑ ⑤Ⓑ
615	616	617	618

ENGRAVING BLOCK PUNCHES OCP□M	ENGRAVING BLOCK PUNCHES BCP□M	PRECISION ENGRAVING BLOCK PUNCHES VCF	PRECISION ENGRAVING BLOCK PUNCHES VCM	ENGRAVING PUNCH HOLDERS HCFPH HCFS	BENDING PUNCHES & DIES —Selectable type—
⑤Ⓑ	⑤Ⓑ	⑤Ⓑ	⑤Ⓑ	③Ⓐ	⑤
619	619	620		621	623



BENDING PUNCHES & DIES —Selectable · Short type—	BENDING PUNCHES & DIES —Configurable type—	BENDING DIES —Bolt fixing type—	PUNCHES FOR RIB RA□P RB□P	CAMBER ADJUSTMENT BLOCK PUNCHES CSMT CSMV
⑤	⑧	③Ⓐ	③	⑤ ⑤
625	627	629	630	631

CAMBER CORRECTION HEIGHT ADJUSTMENT UNITS CSAU	COMMON SCRAP CUTTERS SCL · SCT	SPRING CASE SET SPRC
⑧	⑤	①
632	633	634

BURRING PUNCHES

PRODUCTS DATA P.1215

DICOAT®PUNCHES

PRESS ADD.SPEC. Printed in Red

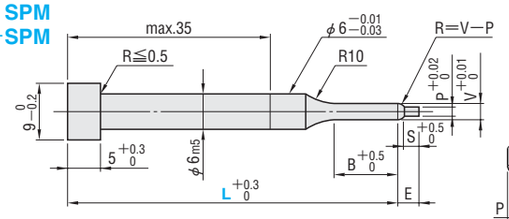
BURRING PUNCHES —STANDARD TYPE/LAPPING TYPE—

The volume discount rate is also applicable to alteration cost. P.39

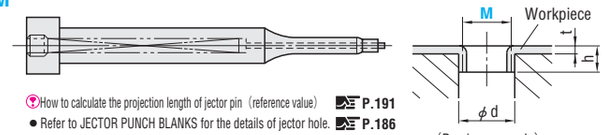
RoHS

Catalog No.	S	M	H
SPM	—	SKD11 or equivalent	60～63HRC
T—SPM	DICOAT®	SKD11 or equivalent	60～63HRC Surface 3000HV
SJM (Jector)	—	SKH51	61～64HRC

SPM
T—SPM



SJM



(Burring example)

How to calculate the projection length of jector pin (reference value) P.191
● Refer to JECTOR PUNCH BLANKS for the details of jector hole. P.186
● Refer to JECTOR PIN SETS for the jector pin. P.189

Catalog No. Type	M	L	Type	V	P	B	S	E	M × P	d : Die ins.dia., h : Burring height, Material of workpiece : SPCC (Experimental values) Type	t	0.6	0.8	1.0	1.2	1.6	2.0
SPM T—SPM	2.6	41 51	A	2.22	1.5	6	2	2.7	M2.6 × 0.45	A	d	3.12	3.34	3.72			
											h	1.3	1.47	1.77			
			B	2.25						B	d	3.15	3.37	3.75			
											h	1.3	1.5	1.8			
			C	2.32						C	d	3.22	3.44	3.82			
											h	1.35	1.6	1.82			
			D	2.35						D	d	3.25	3.47	3.85			
											h	1.35	1.6	1.82			
SPM T—SPM SJM	3	41 51	A	2.59	1.9	8	3	3.6	M3 × 0.5	A	d	3.49	3.79	3.99	4.39		
											h	1.3	1.55	1.75	2.05		
			B	2.63						B	d	3.53	3.83	4.03	4.43		
											h	1.35	1.6	1.75	2.07		
			C	2.72				3.7		C	d	3.62	3.92	4.12	4.52		
											h	1.37	1.6	1.77	2.1		
			D	2.76						D	d	3.66	3.96	4.16	4.56		
											h	1.4	1.65	1.8	2.15		
	4	61 71	A	3.39	2.4			3.9	M4 × 0.7	A	d	4.29	4.59	4.79	5.07	5.79	
											h	1.5	1.77	2.0	2.17	2.6	
			B	3.44						B	d	4.34	4.64	4.84	5.12	5.84	
											h	1.5	1.77	2.0	2.2	2.65	
			C	3.64				4.1		C	d	4.54	4.84	5.04	5.32	6.04	
											h	1.6	1.85	2.07	2.27	2.7	
			D	3.69						D	d	4.59	4.89	5.09	5.37	6.09	
											h	1.63	1.9	2.1	2.3	2.73	
	5		A	4.33	2.8		4	5.4	M5 × 0.8	A	d			5.83	6.01	6.57	7.33
											h			2.27	2.47	2.85	3.5
			B	4.38						B	d			5.88	6.06	6.62	7.38
											h			2.3	2.52	2.9	3.52
			C	4.62				5.6		C	d			6.12	6.30	6.86	7.62
											h			2.42	2.65	3.0	3.62
			D	4.67						D	d			6.17	6.35	6.91	7.67
											h			2.45	2.7	3.05	3.65

Order: Catalog No. SPM 3 — L 51 — Type B

Delivery: 1 Day

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

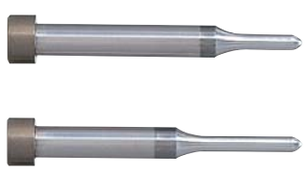
To be quoted on price & lead time above Max. Q'ty.

When alterations of size L, S ,etc. are required, please use 8C shape of drawing punch. P.598

For the specifications of half-made types P.583・P.584

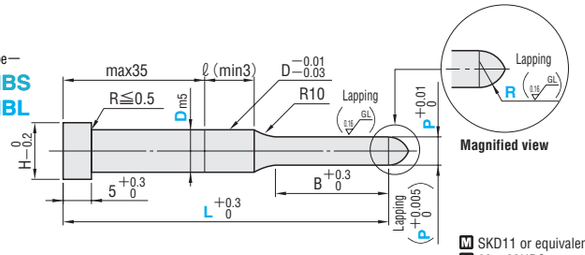
Catalog No.	U/Price Q'ty : 1～9
SPM	430
T—SPM	1,740
SJM	1,440

RoHS



SPMBS
SPMBL

—Lapping type—
L—SPMBS
L—SPMBL



M SKD11 or equivalent
H 60～63HRC

B	H	Catalog No. Type	Blade length	D	0.1mm increments L	0.01mm increments P	R	U/Price Q'ty : 1～9 SPMB	L—SPMB
10	5	SPMB —Lapping type— L—SPMB	S	3	40.0～80.0	1.50～ 2.99	2 3	670	2,030
	7			4		2.00～ 2.99	2 3	690	2,050
						3.00～ 3.99	3 4		
	8			5		2.00～ 2.99	2 3	720	2,080
						3.00～ 4.99	3 4		
	9			6		2.50～ 2.99	2 3	740	2,100
						3.00～ 4.99	3 4		
						5.00～ 5.99	4		
15	11			8	45.0～80.0	3.00～ 4.99	3 4	850	2,210
						5.00～ 6.99	4		
	13			10	45.0～90.0	3.00～ 7.99	4 5	1,050	2,400
						8.00～ 9.99	5 6		
	16			13		6.00～ 9.99	5 6	1,150	2,500
						10.00～11.99	6		
15	5		L	3	45.0～80.0	1.50～ 2.99	2 3	670	2,030
	7			4		2.00～ 2.99	2 3	690	2,050
						3.00～ 3.99	3 4		
	8			5		2.00～ 2.99	2 3	720	2,080
						3.00～ 4.99	3 4		
	9			6		2.50～ 2.99	2 3	740	2,100
						3.00～ 4.99	3 4		
						5.00～ 5.99	4		
21	11			8	50.0～80.0	3.00～ 4.99	3 4	850	2,210
						5.00～ 6.99	4		
	13			10	50.0～90.0	3.00～ 7.99	4 5	1,050	2,400
						8.00～ 9.99	5 6		
	16			13		6.00～ 9.99	5 6	1,150	2,500
						10.00～11.99	6		

P＞D—0.03 ···▸ℓ＝0 In case of P＞D—0.03, D −0.01 −0.03 (Press-in lead) is not applicable. Lapping type:Dimension P can be specified in 0.001mm increments

Order: Catalog No. SPMBS 4 — L 42.0 — P 3.64 — R R3

Delivery: 3 Days — Express A 800/1pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

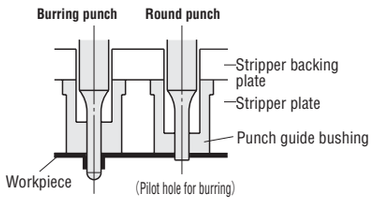
■Volume discount rate P.37

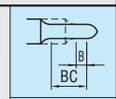
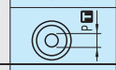
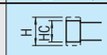
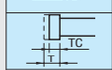
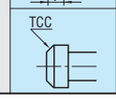
Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration: Catalog No. — L — P — R — (BC・HC・TC…etc.) SPMBS 6 — 51.0 — P2.50 — R2 — KC

Example



Alteration		Code	Spec.	¥/1Code
Blade		BC	Changes blade length B R+2≦BC≦BCmax. 0.1mm increments L (LC) requires BC+ 30mm or more. P: 1.50～1.99 BCmax. 20; 2.00～2.99 30; 3.00～3.99 35; 4.00～4.99 45; 5.00～ 60	200
		PKC	Changes tolerance on P P +0.01 0 ⇨ +0.005 0 Lapping type : Not applicable	400
Head		HC	Changes head diameter D≦HC＜H 0.1mm increments	200
		TC	Changes head thickness 2≦TC＜5 0.1mm increments (Combination with TKC→0.01mm increments) Full length does not change.	200
		TCC	Adds Chamfering to head The strength of the punch head is increased. 0.1mm increments P.1223 0.5≦TCC≦(H—D)/2 H≦5 : TCC 0.5	200

Alteration		Code	Spec.	¥/1Code
Head		KC	Adds single key flat	200
		WKC	Adds double key flats in parallel	400
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02	200
Others		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	0

BURRING PUNCHES
—HALF-MADE TIP R TYPE—

PRODUCTS DATA P.1220

COATING PUNCHES —TiCN—

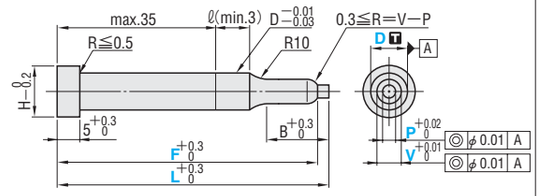
The volume discount rate is also applicable to alteration cost. P.39

RoHS

Catalog No. Dm5 Blade short	Catalog No. Dm5 Blade long	Catalog No. D +0.005 0 Blade short	Catalog No. D +0.005 0 Blade long	M	S	H
SPMS	SPMSL	A—SPMS	A—SPMSL	SKD11 or equivalent	—	60～63HRC
SJMS (Jector)	—	A—SJMS (Jector)	—	D4～6 SKH51 D8・10 SKD11 or equivalent	—	D4～6 61～64HRC D8・10 60～63HRC
SHMS	SHMSL	A—SHMS	A—SHMSL	SKH51	—	61～64HRC
H—SHMS	H—SHMSL	AH—SHMS	AH—SHMSL		TiCN coating	61～64HRC Surface 3000HV
PHMS	PHMSL	A—PHMS	A—PHMSL	Powdered high-speed steel	—	64～67HRC
H—PHMS	H—PHMSL	AH—PHMS	AH—PHMSL		TiCN coating	64～67HRC Surface 3000HV
PJMS (Jector)	—	A—PJMS (Jector)	—		—	64～67HRC
H—PJMS (Jector)	—	AH—PJMS (Jector)	—		TiCN coating	64～67HRC Surface 3000HV

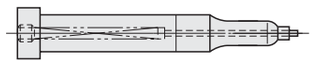
Shank dia.tolerance D T(m5) · (+0.005 0) selection

SPMS SHMS PHMS H—SHMS H—PHMS
SPMSL SHMSL PHMSL H—SHMSL H—PHMSL
A—SPMS A—SHMS A—PHMS AH—SHMS AH—PHMS
A—SPMSL A—SHMSL A—PHMSL AH—SHMSL AH—PHMSL



V−P≧0.3

SJMS PJMS H—PJMS
A—SJMS A—PJMS AH—PJMS



How to calculate the projection length of jector pin (reference value) P.191
- Refer to JECTOR PUNCH BLANKS for the details of jector hole. P.186
- Refer to JECTOR PIN SETS for the jector pin. P.189

B	H	Catalog No. Type	Catalog No. D	L	0.01mm increments min. V max.	0.01mm increments P min.	0.1mm increments F
8	7	—Blade short— (Dm5) (D +0.005 0) SPMS A—SPMS SHMS A—SHMS H—SHMS AH—SHMS PHMS A—PHMS H—PHMS AH—PHMS	4	40.0～80.0 (0.1mm increments)	1.60～3.99	1.00	F≦L−2
	8		5		1.80～4.99	1.20	
	9		6		1.80～5.99	1.20	
	11		8		2.10～7.99	1.50	
	13		10		3.00～9.99	2.50	
15	7	—Blade long— (Dm5) (D +0.005 0) SPMSL A—SPMSL SHMSL A—SHMSL H—SHMSL AH—SHMSL PHMSL A—PHMSL H—PHMSL AH—PHMSL	4	50.0～80.0 (0.1mm increments)	1.60～3.99	1.00	
	8		5		1.80～4.99	1.20	
	9		6		1.80～5.99	1.20	
	11		8		2.10～7.99	1.50	
	13		10		3.00～9.99	2.50	
8	7	—Blade short jector— (Dm5) (D +0.005 0) SJMS A—SJMS PJMS A—PJMS H—PJMS AH—PJMS	4	40 50 60 70 80	2.00～3.99	1.00	
	8		5		2.00～4.99	2.00	
	9		6		2.00～5.99	2.00	
	11		8		3.00～7.99	3.00	
	13		10		3.00～9.99	3.00	

V−P≧0.3 B≧(L−F)+√(V−P){(V−P)−(V−P)/4} +2

Order

Catalog No.	L	V	P	F
SHMS 4	41.0	V2.60	P1.00	F39.0

Delivery

3 Days	Express A 800/1pc. P.38

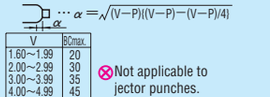
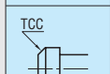
A flat charge of 2,160 yen for 3 pieces or more of the same size.

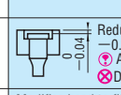
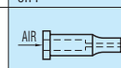
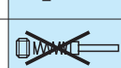
●COATING PUNCHES (H—·AH—)

3 Days

Alteration

Catalog No.	L	V	P	F	(BC·HC·TC···etc.)
SHMS 4	41.0	V1.60	P1.00	F38.5	BC10

Alteration		Code	Spec.	¥/1Code
Blade		BC	Changes blade length B 0.1mm increments (P)L (LC) requires BC+30mm or more. (L−F)+α+2≦BC≦BCmax. α varies depending on the shape.  α=√(V−P)(V−P)−(V−P)/4 V: 1.60～1.99 2.00～2.99 3.00～3.99 4.00～4.99 5.00～ BCmax.: 20 30 35 45 60 ⊗Not applicable to jector punches. Coating punches: (L−F)+α+2≦BC≦BCmax.≦L/2	200
		VKC	Changes tolerance on V +0.01 0 ⇨ +0.005 0 ⊗Not applicable to coating punches	400
Head		HC	Changes head diameter D≦HC<H 0.1mm increments	200
		TC	Changes head thickness 0.1mm increments. ● Other than Jector 2≦TC<5 (P)Full length L does not change. ● Jector 3.5≦TC<5 (P)L is shortened by (5−TC). (Combination with TKC·TKM→0.01mm increments)	200
		TCC	Adds Chamfering to head The strength of the punch head is increased. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 (P)H≦5：TCC 0.5 ⊗Combination with SRC：Not applicable	200
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02	200

Alteration		Code	Spec.	¥/1Code
Head		KC	Adds single key flat	200
		WKC	Adds double key flats in parallel	400
		RC	 0 −0.04 Reduces head thickness by −0.04～0 from retainer surface (P)Applicable only to the D10 ⊗D +0.005 0 type：Not applicable	200
		SRC	Modifies head to fit select retainer (SLS). (P)For details, refer to P.673 (P)Applicable only to D10 ⊗D +0.005 0 type：Not applicable	300
Others	L T	LKC	Changes tolerance on full length L +0.3 0 ⇨ +0.05 0	400
	F T	FKC	Changes tolerance on F F +0.3 0 ⇨ +0.05 0	800
		AC	 AIR Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole. (P)Only jecter type is applicable.	−100
		NC	 Removes the jector pin. ⊗Combination with AC：Not applicable (P)Only jecter type is applicable.	−200
	ℓ D −0.01 −0.03	NDC	No press-in lead. ℓ≧3 ⇨ ℓ=0	0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

(P)To be quoted on price & lead time above Max. Q'ty.

■Shank dia.tolerance Dm5

D	U/Price Q'ty：1～9 SPMS SPMSL	SHMS SHMSL	PHMS PHMSL	H—SHMS H—SHMSL	H—PHMS H—PHMSL
4	1,660	1,770	2,040	2,970	3,240
5	1,690	1,790	2,040	3,040	3,290
6	1,720	1,820	2,090	3,190	3,470
8	1,980	2,110	2,420	3,630	3,940
10	2,110	2,360	2,880	4,030	4,550

■Jector type Shank dia.tolerance Dm5

D	U/Price Q'ty：1～9 SJMS SJMSL	PJMS PJMSL	H—PJMS H—PJMSL
4	2,970	3,870	5,170
5	2,880	3,720	5,080
6	2,880	3,720	5,220
8	3,210	4,510	6,160
10	3,370	5,750	7,570

■Shank dia.tolerance D +0.005 0

D	U/Price Q'ty：1～9 A—SPMS A—SPMSL	A—SHMS A—SHMSL	A—PHMS A—PHMSL	AH—SHMS AH—SHMSL	AH—PHMS AH—PHMSL
4	1,760	1,870	2,140	3,070	3,340
5	1,790	1,890	2,140	3,140	3,390
6	1,820	1,920	2,190	3,290	3,570
8	2,080	2,210	2,520	3,730	4,040
10	2,210	2,460	2,980	4,130	4,650

■Jector type Shank dia.tolerance D +0.005 0

D	U/Price Q'ty：1～9 A—SJMS A—SJMSL	A—PJMS A—PJMSL	AH—PJMS AH—PJMSL
4	3,170	4,070	5,370
5	3,080	3,920	5,280
6	3,080	3,920	5,420
8	3,410	4,710	6,360
10	3,570	5,950	7,770

BURRING PUNCHES
—HALF-MADE TIP TAPERED TYPE—

PRODUCTS DATA P.1220

COATING PUNCHES —TiCN—

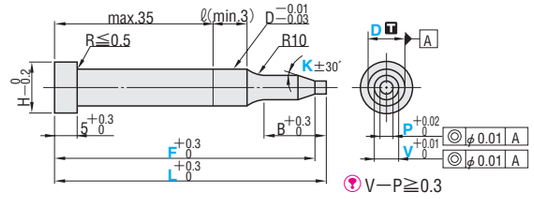
¥ The volume discount rate is also applicable to alteration cost. P.39

RoHS

Catalog No. Dm5 Blade short	Dm5 Blade long	D +0 −0.005 Blade short	D +0 −0.005 Blade long	M	S	H
SPMT	SPMTL	A—SPMT	A—SPMTL	SKD11 or equivalent	—	60~63HRC
SJMT (Jector)	—	A—SJMT (Jector)	—	D4~6 SKH51 D8・10 SKD11 or equivalent	—	D4~6 61~64HRC D8・10 60~63HRC
SHMT	SHMTL	A—SHMT	A—SHMTL	SKH51	—	61~64HRC
H—SHMT	H—SHMTL	AH—SHMT	AH—SHMTL	SKH51	TiCN coating	61~64HRC Surface 3000HV
PHMT	PHMTL	A—PHMT	A—PHMTL	Powdered high-speed steel	—	64~67HRC
H—PHMT	H—PHMTL	AH—PHMT	AH—PHMTL	Powdered high-speed steel	TiCN coating	64~67HRC Surface 3000HV
PJMT (Jector)	—	A—PJMT (Jector)	—	Powdered high-speed steel	—	64~67HRC
H—PJMT (Jector)	—	AH—PJMT (Jector)	—	Powdered high-speed steel	TiCN coating	64~67HRC Surface 3000HV

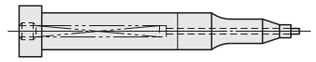
T(m5)・(+0 −0.005)selection

SPMT SHMT PHMT H—SHMT H—PHMT
SPMTL SHMTL PHMTL H—SHMTL H—PHMTL
A—SPMT A—SHMT A—PHMT AH—SHMT AH—PHMT
A—SPMTL A—SHMTL A—PHMTL AH—SHMTL AH—PHMTL



V—P≧0.3

SJMT PJMT H—PJMT
A—SJMT A—PJMT AH—PJMT



How to calculate the projection length of jector pin (reference value) P.191
- Refer to JECTOR PUNCH BLANKS for the details of jector hole P.186
- Refer to JECTOR PIN SETS for the jector pin P.189

B	H	Catalog No. Type	D	L	0.01mm increments min. V max.	0.01mm increments P min.	0.1mm increments F	1° increments K
8	7	—Blade short— (Dm5) (D +0 −0.005) SPMT A—SPMT SHMT A—SHMT H—SHMT AH—SHMT PHMT A—PHMT H—PHMT AH—PHMT	4	40.0~80.0 (0.1mm increments)	1.60~3.99	1.00	F≦L−2	0°<K<90°
	8		5		1.80~4.99	1.20		
	9		6		1.80~5.99	1.20		
	11		8		2.10~7.99	1.50		
	13		10		3.00~9.99	2.50		
15	7	—Blade long— (Dm5) (D +0 −0.005) SPMTL A—SPMTL SHMTL A—SHMTL H—SHMTL AH—SHMTL PHMTL A—PHMTL H—PHMTL AH—PHMTL	4	50.0~80.0 (0.1mm increments)	1.60~3.99	1.00		
	8		5		1.80~4.99	1.20		
	9		6		1.80~5.99	1.20		
	11		8		2.10~7.99	1.50		
	13		10		3.00~9.99	2.50		
8	7	—Blade short jector— (Dm5) (D +0 −0.005) SJMT A—SJMT PJMT A—PJMT H—PJMT AH—PJMT	4	40 50 60 70 80	2.00~3.99	1.00		
	8		5		2.00~4.99	2.00		
	9		6		2.00~5.99	2.00		
	11		8		3.00~7.99	3.00		
	13		10		3.00~9.99	3.00		

V—P≧0.3 B≧(L—F)+{(V—P)/2tanK}+2

Order: Catalog No. — L — V — P — F — K
SPMT 4 — 41.0 — V2.60 — P1.00 — F39.0 — K30

Delivery: 3 Days | Express A 800/1pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

●COATING PUNCHES (H—・AH—): 3 Days

Alteration: Catalog No. — L — V — P — F — K — (BC・HC・TC…etc.)
SPMT 4 — 41.0 — V1.60 — P1.00 — F38.5 — K30 — BC10

Alteration		Code	Spec.	¥/1Code
Blade		BC	Changes blade length B 0.1mm increments. L (LC) requires BC+30mm or more. (L—F)+α+2≦BC≦BCmax. α = (V—P) cotK° / 2. V 1.60~1.99 BCmax. 20; 2.00~2.99 30; 3.00~3.99 35; 4.00~4.99 45; 5.00~ 60. Not applicable to jector punches. Coating punches: (L—F)+α+2≦BC≦BCmax.≦L/2	200
		VKC	Changes tolerance on V V +0.01 0 ⇨ +0.005 0. Not applicable to coating punches	400
Head		HC	Changes head diameter D≦HC<H 0.1mm increments	200
		TC	Changes head thickness 0.1mm increments. ● Other than Jector 2≦TC<5 Full length L does not change. ● Jector 3.5≦TC<5 L is shortened by (5—TC). (Combination with TKC・TKM→0.01mm increments)	200
		TCC	Adds Chamfering to head The strength of the punch head is increased. P.1223 0.1mm increments 0.5≦TCC≦(H—D)/2 H≦5 : TCC 0.5 Combination with SRC : Not applicable	200
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02	200

Alteration		Code	Spec.	¥/1Code
Head		KC	Adds single key flat	200
		WKC	Adds double key flats in parallel	400
		RC	Reduces head thickness by −0.04~0 from retainer surface Applicable only to D10 D +0.005 0 type : Not applicable	200
		SRC	Modifies head to fit select retainer (SLS) For details, refer to P.673 Applicable only to D10 D +0.005 0 type : Not applicable	300
Others		LKC	Changes tolerance on full length L +0.3 0 ⇨ +0.05 0	400
		FKC	Changes tolerance on F F +0.3 0 ⇨ +0.05 0	800
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole. Only jecter type is applicable.	−100
		NC	Removes the jector pin. Combination with AC : Not applicable Only jecter type is applicable.	−200
		KKC	Changes tolerance on K K ±30′ ⇨ ±10′	400
		NDC	No press-in lead. ℓ≧3 ⇨ ℓ=0	0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Shank dia.tolerance Dm5

D	U/Price Q'ty : 1~9 SPMT SPMTL	SHMT SHMTL	PHMT PHMTL	H—SHMT H—SHMTL	H—PHMT H—PHMTL
4	1,210	1,300	1,540	2,490	2,740
5	1,220	1,310	1,540	2,560	2,790
6	1,240	1,330	1,590	2,710	2,970
8	1,570	1,720	1,920	3,240	3,440
10	1,790	2,050	2,380	3,720	4,050

■Jector type Shank dia.tolerance Dm5

D	U/Price Q'ty : 1~9 SJMT	PJMT	H—PJMT
4	2,500	3,350	4,650
5	2,410	3,210	4,570
6	2,410	3,210	4,710
8	2,750	4,000	5,650
10	3,000	5,770	7,590

■Shank dia.tolerance D +0 −0.005

D	U/Price Q'ty : 1~9 A—SPMT A—SPMTL	A—SHMT A—SHMTL	A—PHMT A—PHMTL	AH—SHMT AH—SHMTL	AH—PHMT AH—PHMTL
4	1,310	1,400	1,640	2,590	2,840
5	1,320	1,410	1,640	2,660	2,890
6	1,340	1,430	1,690	2,810	3,070
8	1,670	1,820	2,020	3,340	3,540
10	1,890	2,150	2,480	3,820	4,150

■Jector type Shank dia.tolerance D +0 −0.005

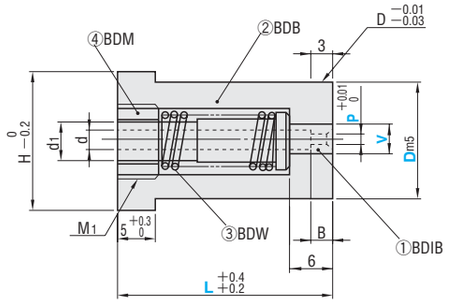
D	U/Price Q'ty : 1~9 A—SJMT	A—PJMT	AH—PJMT
4	2,700	3,550	4,850
5	2,610	3,410	4,770
6	2,610	3,410	4,910
8	2,950	4,200	5,850
10	3,200	5,970	7,790

BURRING DIE UNITS

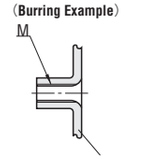
The volume discount rate is also applicable to alteration cost. P.39

RoHS

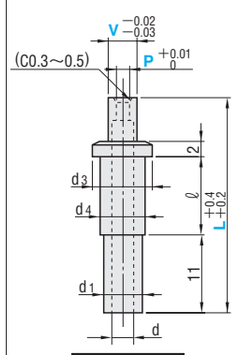
BDU (Unit)



(Burring Example)



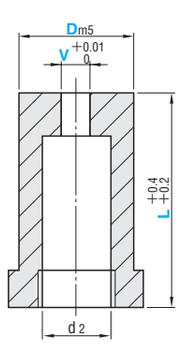
①BDIB (Inner bushing)



L	ℓ
25	6
30	11

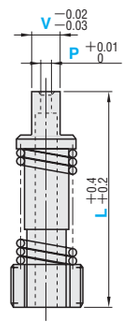
Ⓜ SKD11 or equivalent
Ⓗ 60～63HRC

②BDB (Outer bushing)

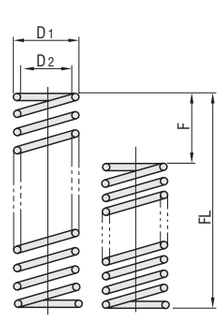


Ⓜ SKD11 or equivalent
Ⓗ 60～63HRC

BDIS (①③④)



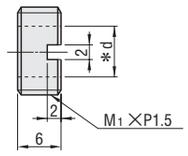
③BDW (Coil springs)



Ⓜ SWP−B

D	L	③Coil spring D1	FL	D2	kgf/mm	FL−fmax	④Screw plug ＊d
13	25	8.6	16	6.8	0.35	5.5	5.6
	30		21	6.6		11	
16	25	10.6	16	8.6		5.5	7.2
	30		21	8.4		11	

④BDM (Screw plug)



Ⓜ S45C
Ⓗ 34～43HRC

kgf=kgf/mm×Fmm
N=kgf×9.80665

D	M	B	d	d1	M1	H	d2	d3	d4	Catalog No. Type		D	L	0.01mm increments min. V max.	min. P max.	M
13	2.6	2.5	2.0	5.5	10	16	8.7	8.5	6.3	(Unit)	BDU	13	25	3.05～3.90	1.55～1.75	2.6
	3	3	2.5							①	BDIB			3.45～4.70	1.95～2.20	3
16	2.6	2.5	2.0	7.1	12	19	10.7	10.5	7.9	②	BDB	13		3.05～3.90	1.55～1.75	2.6
	3	3	2.5							(①③④)	BDIS		30	3.45～4.70	1.95～2.20	3
	4		3.1							③	BDW	16		4.15～6.20	2.45～2.75	4
	5		3.7							④	BDM			5.75～7.80	2.85～3.30	5

Order

Catalog No. — L — V — P

(Unit)	BDU 13	25	V3.75	P1.70
①	BDIB 13	25	V3.75	P1.70
②	BDB 13	25	V3.75	
(①③④)	BDIS 13	25	V3.75	P1.70
③	BDW 13	25		
④	BDM 13			

Delivery

(Unit) BDU, ① BDIB, ② BDB, (①③④) BDIS: 3 Days; Express A 800/1pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size

③ BDW, ④ BDM: 3 Days

Alteration

Catalog No. — L — V — P — (LKC・TKC…etc.)
BDU 13 — 25 — V3.75 — P1.70 — LKC

Alteration		Code	Spec.	¥/1Code
Full length	BDU L	LKC	Changes full length tolerance L +0.4 +0.2 ⇨ +0.05 0	800
	BDB L	LKC	Changes full length tolerance L +0.4 +0.2 ⇨ +0.05 0	400

Alteration		Code	Spec.	¥/1Code
Others	BDU BDB T	TKC	Changes head thickness tolerance 5 +0.3 0 ⇨ +0.02 0	400
	BDU BDB V	VKC	Changes tolerance on V V +0.01 0 ⇨ +0.005 0	400
	BDU BDIB BDIS P	PKC	Changes tolerance on P P +0.01 0 ⇨ +0.005 0	400

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No.	U/Price	Catalog No.	U/Price
(Unit) BDU	3,550	(①③④) BDIS	2,740
① BDIB	2,610	③ BDW	190
② BDB	1,290	④ BDM	75

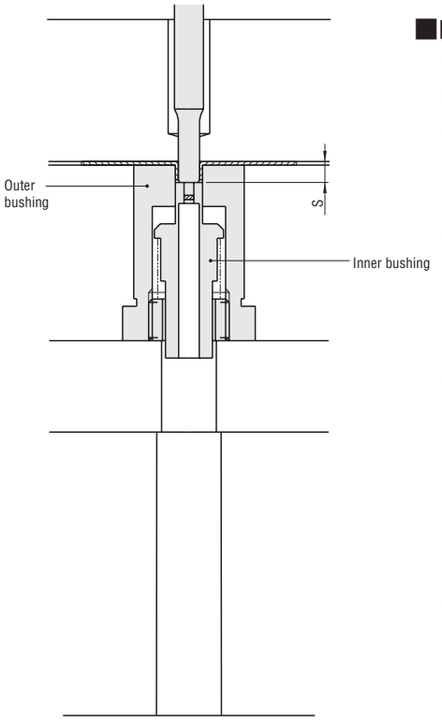
■Features

1.Scraps are pushed into the inner bushing and held there. This unit is useful for scrap retention.

2.It also knocks out the burring part at the same time. (Refer to the spring constant for knock out force.)

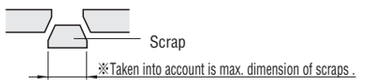
3.Unit construction makes mounting and working easier.

4.Each component can be purchased separately. Therefore the die can be used even if there is no space for outer bushing.



■Notes for usage

- Length of stroke Smax.=5mm
- Usually S=2～3mm
- However, S≧3mm is applied in the following cases.
  ①When workpiece is made of mild steel.
  ②When workpiece is thick.
- The role of chamfering of the inner bushing
  It prevents hit marks from being left on the forming face while burring, and makes scraps easily pushed into the inner bushing. When delivering, the chamfer is a little larger than actual specification. This is for adjustment purpose.
- Setting of dimension P of the inner bushing
  There are various types of scraps depending on machining method, so please specify the dimension P that brings out the best effect of the function.

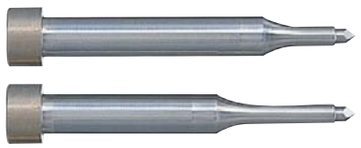


- Springs for lifting inner bushing
  The spring is intended to lift the inner bushing. It is not for shearing force.
  (Refer to the spring constant.)

SCRAPLESS BURRING PUNCHES

PRODUCTS DATA P.1220

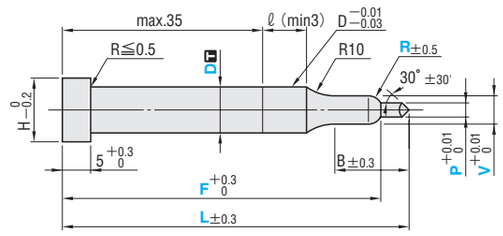
COATING PUNCHES —TiCN—



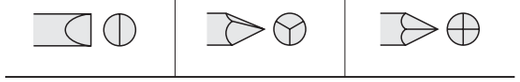
RoHS

Type				M	S	H
Dm5		D +0.005 0				
Blade short	Blade long	Blade short	Blade long			
SP	SPL	A—SP	A—SPL	SKD11 or equivalent	—	60~63HRC
SH	SHL	A—SH	A—SHL	SKH51	—	61~64HRC
H—SH	H—SHL	AH—SH	AH—SHL		TiCN coating	61~64HRC Surface 3000HV
PH	PHL	A—PH	A—PHL	Powdered high-speed steel	—	64~67HRC
H—PH	H—PHL	AH—PH	AH—PHL		TiCN coating	61~64HRC Surface 3000HV

Shank dia.tolerance D T (m5) • (+0.005 0) selection



Shape		
2E	3E	4E



B	H	Catalog No. Type	Shape	D	0.1mm increments L	0.01mm increments min. V max.	0.01mm increments P min.	0.1mm increments R	0.1mm increments F
8	8	—Blade short— (Dm5) (D +0.005 0)	2E	5	40.0~ 80.0	1.80~4.99	1.20	0.5≦R≦V—P	F≦L—(P×0.866)—1
	9	SP A—SP SH A—SH	3E	6		1.80~5.99			
13	11	H—SH AH—SH PH A—PH	4E	8	40.0~100.0	2.10~7.99	1.50		
	13	H—PH AH—PH		10		3.00~9.99	2.50		
15	8	— Blade long— (Dm5) (D +0.005 0)	2E	5	50.0~ 80.0	1.80~4.99	1.20	0.5≦R≦V—P	F≦L—(P×0.866)—1
	9	SPL A—SPL SHL A—SHL	3E	6		1.80~5.99			
21	11	H—SHL AH—SHL PHL A—PHL	4E	8	50.0~100.0	2.10~7.99	1.50		
	13	H—PHL AH—PHL		10		3.00~9.99	2.50		

V—P≧0.3
B≧L—F+R+2

Order

Catalog No.	—	L	—	V・P・R・F
SH2E 6	—	51.0	—	V4.70 — P2.50 — R0.5 — F47
SHL2E 6	—	51.0	—	V4.70 — P2.50 — R0.5 — F47

Delivery

3 Days | Express A 800/1pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

●COATING PUNCHES (H— · AH—)

3 Days

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No.	—	L	—	V	—	P	—	R	—	F	—(BC・HC・TC…etc.)
SH2E 6	—	51.0	—	V4.70	—	P2.50	—	R0.5	—	F35	— KC

Alteration		Code	Spec.	¥/1Code
Blade		BC	Changes blade length B (L—f)+R+2≦BC≦BCmax. 0.1mm increments (P)L(LC) requires BC +30mm or more. Coating punches: (L—F)+R+2≦BC≦BCmax.≦L/2 (V 1.80~1.99→BCmax.20; 2.00~2.99→30; 3.00~3.99→35; 4.00~4.99→45; 5.00~→60)	200
		VKC	Changes tolerance on V V +0.01 0 ⇨ +0.005 0 (⊗)Not applicable to coating punches	400
Head		RKC	Changes tolerance on R R±0.5 ⇨ ±0.05	400
		HC	Changes head diameter D≦HC<H 0.1mm increments	200
		TC	Changes head thickness 2≦TC<5 0.1mm increments (Combination with TKC→0.01mm increments) (P)Full length does not change.	200
		RC	Reduces head thickness by —0.04~0 from retainer surface (P)Applicable only to D10 (⊗)D +0.005 0 type : Not applicable	200

Alteration		Code	Spec.	¥/1Code
Head		TCC	Adds Chamfering to head The strength of the punch head is increased. P.1223 0.1mm increments 0.5≦TCC≦(H—D)/2 (P)H≦5 : TCC 0.5 (⊗)Combination with SRC : Not applicable	200
		SRC	Modifies head to fit select retainer (SLS) (P)For details, refer to P.673 (P)Applicable only to D10 (⊗)D +0.005 0 type : Not applicable	300
		KC	Adds single key flat	200
		WKC	Adds double key flats in parallel	400
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 —0.02	200
Others		FKC	Changes tolerance on F F +0.3 0 ⇨ +0.05 0	800
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	0

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

(P)To be quoted on price & lead time above Max. Q'ty.

■Shank dia.tolerance Dm5 MSKD11 or equivalent

D	U/Price Q'ty : 1~9 SP2E SPL2E	SP3E SPL3E	SP4E SPL4E
5	2,220	2,540	2,840
6	2,250	2,560	2,870
8	2,460	2,770	3,080
10	2,820	3,140	3,460

■Shank dia.tolerance D +0.005 0 MSKD11 or equivalent

D	U/Price Q'ty : 1~9 A—SP2E A—SPL2E	A—SP3E A—SPL3E	A—SP4E A—SPL4E
5	2,420	2,740	3,040
6	2,450	2,760	3,070
8	2,660	2,970	3,280
10	3,020	3,340	3,660

■Shank dia.tolerance Dm5 MSKH51

D	U/Price Q'ty : 1~9 SH2E SHL2E	SH3E SHL3E	SH4E SHL4E	H—SH2E H—SHL2E	H—SH3E H—SHL3E	H—SH4E H—SHL4E
5	2,420	2,760	3,110	3,670	4,010	4,360
6	2,470	2,810	3,160	3,840	4,180	4,540
8	2,700	3,040	3,390	4,220	4,560	4,910
10	3,210	3,580	3,950	4,880	5,250	5,620

■Shank dia.tolerance D +0.005 0 MSKH51

D	U/Price Q'ty : 1~9 A—SH2E A—SHL2E	A—SH3E A—SHL3E	A—SH4E A—SHL4E	AH—SH2E AH—SHL2E	AH—SH3E AH—SHL3E	AH—SH4E AH—SHL4E
5	2,620	2,960	3,310	3,870	4,210	4,560
6	2,670	3,010	3,360	4,040	4,390	4,740
8	2,900	3,240	3,590	4,420	4,760	5,110
10	3,410	3,780	4,150	5,080	5,450	5,820

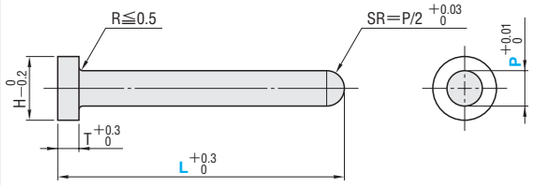
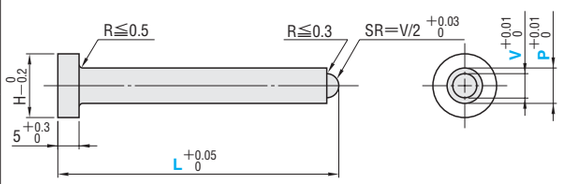
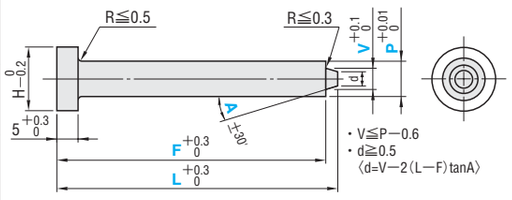
■Shank dia.tolerance Dm5 MPowdered high-speed steel

D	U/Price Q'ty : 1~9 PH2E PHL2E	PH3E PHL3E	PH4E PHL4E	H—PH2E H—PHL2E	H—PH3E H—PHL3E	H—PH4E H—PHL4E
5	2,960	3,380	3,830	4,210	4,630	5,080
6	3,040	3,470	3,910	4,420	4,850	5,290
8	3,340	3,750	4,210	4,860	5,270	5,730
10	4,150	4,620	5,100	5,820	6,290	6,770

■Shank dia.tolerance D +0.005 0 MPowdered high-speed steel

D	U/Price Q'ty : 1~9 A—PH2E A—PHL2E	A—PH3E A—PHL3E	A—PH4E A—PHL4E	AH—PH2E AH—PHL2E	AH—PH3E AH—PHL3E	AH—PH4E AH—PHL4E
5	3,160	3,580	4,030	4,410	4,830	5,280
6	3,240	3,670	4,110	4,620	5,050	5,490
8	3,540	3,950	4,410	5,060	5,470	5,930
10	4,350	4,820	5,300	6,020	6,490	6,970

EMBOSSING PUNCHES／KNOCKOUT PIN SETS FOR EMBOSSING PUNCH

Type	S	M H	Catalog No.	Shape
—SR type— RoHS	–	SKH51 61～64HRC	SHSR	
		Powdered high-speed steel 64～67HRC	PHSR	
—Stepped SR type— RoHS	–	SKD11 or equivalent 60～63HRC	SPSR	
		Powdered high-speed steel 64～67HRC	PHSRR	
—Stepped and tapered type— RoHS	–	SKD11 or equivalent 60～63HRC	SPSTT	
		SKH51 61～64HRC	SHSTT	
		Powdered high-speed steel 64～67HRC	PHSTT	

■SR type

H	T	Catalog No. Type	No.	0.1mm increments L	0.01mm increments min. P max.	U/Price Q'ty：1～9 SHSR	PHSR
2	3	SHSR PHSR	1.0	20.0 ～ 30.0	0.50 ～ 1.00	1,030	2,380
2.6			1.6	20.0 ～ 50.0	1.00 ～ 1.60		
3			2.0		1.60 ～ 2.00		
3.5			2.5		2.00 ～ 2.50		
5	5		3	20.0 ～ 80.0	2.50 ～ 3.00	1,110	2,540
7			4		3.00 ～ 4.00	1,120	2,580
8			5		4.00 ～ 5.00	1,140	2,620
9			6		5.00 ～ 6.00	1,170	2,690
11			8		6.00 ～ 8.00	1,270	2,910
13			10		8.00 ～ 10.00	1,400	3,220

■Stepped SR type

H	Catalog No. Type	No.	0.1mm increments L	0.01mm increments min. P max.	V	U/Price Q'ty：1～9 SPSR	PHSRR
5	SPSR PHSRR	3	20.0 ～ 80.0	2.00 ～ 3.00	P/2≦V＜P	1,360	2,840
7		4		3.00 ～ 4.00		1,390	2,880
8		5		4.00 ～ 5.00		1,400	2,920
9		6		5.00 ～ 6.00		1,410	2,990
11		8		6.00 ～ 8.00		1,540	3,210
13		10		8.00 ～ 10.00		1,630	3,520

■Stepped and tapered type

H	Catalog No. Type	No.	0.1mm increments L	0.01mm increments min. P max.	V	1° increments A	0.1mm increments F	U/Price Q'ty：1～9 SPSTT	SHSTT	PHSTT
5	SPSTT SHSTT PHSTT	3	20.0 ～ 80.0	2.00 ～ 3.00	P/2≦V≦P−0.6	0＜A＜90	F≦L−2	1,660	1,790	3,200
7		4		3.00 ～ 4.00				1,660	1,840	3,220
8		5		4.00 ～ 5.00				1,690	1,860	3,270
9		6		5.00 ～ 6.00				1,720	1,880	3,320
11		8		6.00 ～ 8.00				1,980	2,110	3,820
13		10		8.00 ～ 10.00				2,110	2,220	4,070

The volume discount rate is also applicable to alteration cost. P.39

Order

Catalog No.	L	P	V	A	F
SPSR 3	40.0	P2.80	V1.50		
SPSTT 6	40.0	P6.00	V4.00	A23	F38.0

Delivery

3	Days	
Express	A	800/1pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No.	L	P	V	A	F	(RSC・LKC…etc.)
SHSR 3	40.0	P2.80				LKC

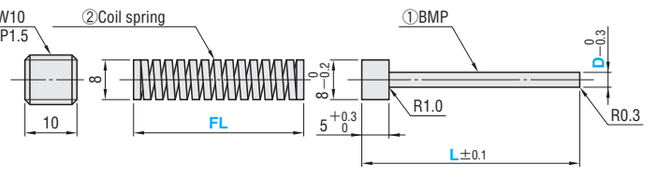
Alteration		Code	Spec.	¥/1Code
Head		HC	Changes head diameter P≦HC＜H 0.1mm increments	200
		TC	Changes head thickness 2≦TC＜T 0.1mm increments (Combination with TKC・TKM→0.01mm increments) Full length does not change.	200
		TCC	Adds Chamfering to head The strength of the punch head is increased. P.1223 0.1mm increments 0.5≦TCC≦(No.−D)/2 H≦5：TCC 0.5 ⊗H＜2.6：Not applicable	200
		KC	Adds single key flat Applicable to No.3 or more	200
		WKC	Adds double key flats in parallel Applicable to No.3 or more	400
		TKC	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	200
		TKM	Changes head thickness tolerance $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	200

Alteration		Code	Spec.	¥/1Code
Blade	R≦0.5	RSC	Adds radius to tip (R=0.5 or less) Applicable to SPSTT/SHSTT/PHSTT Applicable when d≧1.5	200
	A T	AKC	Changes tolerance on A A ±30′ ⇨ ±10′ Applicable to SPSTT·SHSTT·PHSTT	400
Others	L T	LKC	Changes tolerance on full length $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ L：0.01mm Increments ⊗SPSR·PHSRR:Not applicable	400
	F T	FKC	Changes tolerance on F $F^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ Applicable to SPSTT·SHSTT·PHSTT	800

Example ■Use example of SHSR/SPSR (Contact) (Fitting of case)

■KNOCKOUT PIN SETS FOR EMBOSSING PUNCH RoHS

BMPS (①②③) BMP (①)



①BMP M SK4 (Raw material)

Catalog No. Type	D	L	②Coil spring Type	FL	U/Price Q'ty：1～9Sets BMPS (①②③)	U/Price Q'ty：1～9 BMP (①)
BMPS (①②③) BMP (①)	1.5	20	SWL	20 25 30 35 40 45 50 60	650	550
	2.0	25	SWM		590	490
	2.5	30	SWH		550	460
	3.0	35	SWB			
	3.5					
	4.0					

Order

Catalog No.	L	②Coil spring
BMPS 2.0	30	SWL 30
BMP 2.0	30	

Detailed specification of ② coil spring P.1077

Delivery

1	Day

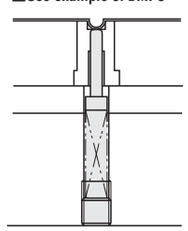
Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

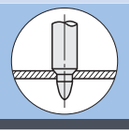
Example ■Use example of BMPS



・Add alteration to the tip of the pin to match the shape of the workpiece.

PRESS NEW Printed in Red

CHAMFERING PUNCHES —A TYPE—

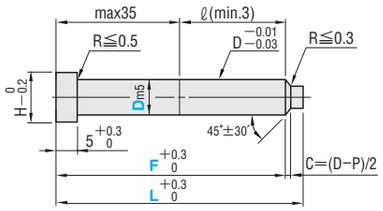


PRODUCTS DATA P.1220

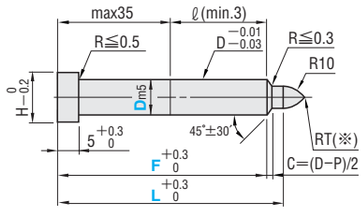
COATING PUNCHES —TiCN—

Shape	M	S	H	Catalog No. Shank shape: Shoulder	Key flat	Tapped
Straight	SKD11 or equivalent	—	60～63HRC	SPMUA	G—SPMUA	MPMUA
	SKH51	—	61～64HRC	SHMUA	G—SHMUA	—
		TiCN coating	61～64HRC Surface 3000HV	H—SHMUA	GH—SHMUA	—
	Powdered high-speed steel	—	64～67HRC	PHMUA	G—PHMUA	MPHMUA
		TiCN coating	64～67HRC Surface 3000HV	H—PHMUA	GH—PHMUA	H—MPHMUA
Pilot	SKD11 or equivalent	—	60～63HRC	SRMUA	G—SRMUA	MRMUA
	SKH51	—	61～64HRC	HSRMUA	G—HSRMUA	—
		TiCN coating	61～64HRC Surface 3000HV	H—HSRMUA	GH—HSRMUA	—
	Powdered high-speed steel	—	64～67HRC	PSRMUA	G—PSRMUA	MRHMUA
		TiCN coating	64～67HRC Surface 3000HV	H—PSRMUA	GH—PSRMUA	H—MRHMUA

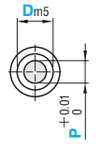
—Shoulder・Tip straight type—



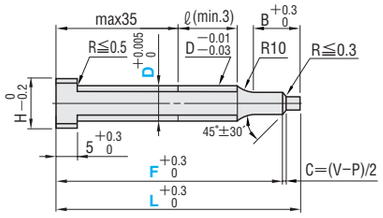
—Shoulder・Tip pilot type—



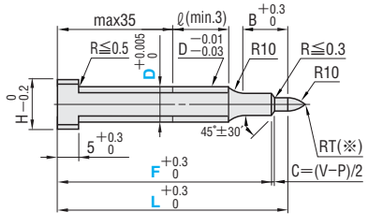
Shape A



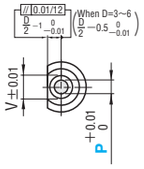
—Key flat・Tip straight type—



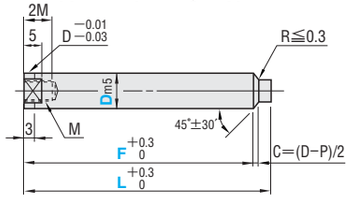
—Key flat・Tip pilot type—



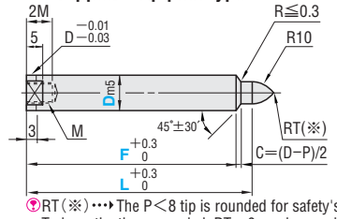
Shape A



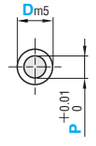
—Tapped・Tip straight type—



—Tapped・Tip pilot type—



Shape A



TiCN coating :The tip surface has been grinded before the coating is applied.

RT(※)…The P＜8 tip is rounded for safety's sake. To keep the tip unrounded, RT=0 can be specified.

For tip R length, see products data RADIUS OF PUNCHES. P.1208

B	H	V	M	Catalog No. Type	D	0.1mm increments L	0.01mm increments min. P max.	0.1mm increments F
—	5	—	—	—Shoulder— Tip Straight: SPMUA, SHMUA, H—SHMUA, PHMUA, H—PHMUA / Tip pilot: SRMUA, HSRMUA, H—HSRMUA, PSRMUA, H—PSRMUA	3	30.0～ 90.0	1.00～ 2.00	28≦F≦L−C−2.0
	7				4		1.00～ 3.00	
	8				5		2.00～ 4.00	
	9				6		2.00～ 5.00	
	11				8		3.00～ 7.00	
	13				10	30.0～100.0	3.00～ 9.00	
	16				13		6.00～12.00	
	19				16		10.00～15.00	
	23				20		13.00～19.00	
	28				25		18.00～24.00	

P	L−F
1.00～1.99	20 or less
2.00～3.99	35 or less
4.00～5.99	45 or less
6.00～	50 or less

B	H	V	M	Catalog No. Type	D	0.1mm increments L	0.01mm increments min. P max.	0.1mm increments F
8	7	2.8	—	—Key flat— Tip Straight: G—SPMUA, G—SHMUA, GH—SHMUA, G—PHMUA, GH—PHMUA / Tip pilot: G—SRMUA, G—HSRMUA, GH—HSRMUA, G—PSRMUA, GH—PSRMUA	4	40.0～ 90.0	1.00～ 1.80	29≦F≦L−C−2.0 and B≧L−F+2.0
	8	3.8			5		2.00～ 2.80	
	9	4.8			6		2.00～ 3.80	
	11	5.8			8		3.00～ 4.80	
13	13	7.8			10	50.0～100.0	3.00～ 6.80	
	16	10.8			13		6.00～ 9.80	
19	19	13.8			16		10.00～12.80	
	23	17.8			20		13.00～16.80	
	28	22.8			25		18.00～21.80	
—	—	—	3	—Tapped— Tip Straight: MPMUA, MPHMUA, H—MPHMUA / Tip pilot: MRMUA, MRHMUA, H—MRHMUA	5	30.0～ 70.0	2.00～ 4.00	28≦F≦L−C−2.0
			4		6		2.00～ 5.00	
			5		8	30.0～ 90.0	3.00～ 7.00	
			6		10		3.00～ 9.00	
					13		6.00～12.00	
					16		10.00～15.00	
					20		13.00～19.00	
					25		18.00～24.00	

P	L−F
1.00～1.99	20 or less
2.00～3.99	35 or less
4.00～5.99	45 or less
6.00～	50 or less

The volume discount rate is also applicable to alteration cost. P.39

Order: Catalog No. — L — P — F

SPMUA 5 — 60.0 — P4.5 — F37.0
G—SHMUA 10 — 70.0 — P10.6 — F65.0

Alteration: Catalog No. — L — P — F — (PKC···etc.)

SRMUA 5 — 55.0 — P2.40 — F52.0 — PKC

Delivery: 3 Days — Express A 800/1pc. P.38

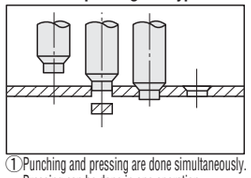
A flat charge of 2,160 yen for 3 pieces or more of the same size.

⊗TiCN coating : Express A is not available.

Alteration		Code	Spec.	¥/1Code
Blade		PC	Changes dimension P PC≧ Pmin/2 ≧1.00 0.01mm increments (Combination with PKC→0.001mm increments)	200
		PKC	Changes tolerance on P P +0.01 0 ⇨ +0.005 0 (P：0.001mm increments.) ⊗TiCN coating：Not applicable to D＞13	400 (TiCN coating 600)
		RLC	Cuts tip flat 2≦RLC＜√P(10−P/4) 0.1mm increments Applicable to P＜8 Only Tip pilot type is applicable	200
Full length		LKC	Changes tolerance on full length L +0.3 0 ⇨ +0.05 0 ⊗Tip pilot type：Not applicable (L：0.01mm increments)	400
		LKZ	Changes tolerance on full length L +0.3 0 ⇨ +0.01 0 ⊗Tip pilot type：Not applicable ⊗TiCN coating：Not applicable (L：0.01mm increments)	600
Shank		FKC	Changes tolerance on F F +0.3 0 ⇨ +0.05 0	800
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0 ⊗Tapped：Not applicable	0
Head		KC	Adds single key flat ⊗Tapped：D=5 not applicable ⊗Key flat：Not applicable	200
		WKC	Adds double key flats in parallel ⊗Tapped：D=5 not applicable ⊗Key flat：Not applicable	400
		HC	Changes head diameter D≦HC＜H 0.1mm increments ⊗With tapping：Not applicable	200
		TC	Changes head thickness 2≦TC＜5 0.1mm increments (Combination with TKC・TKM→0.01mm increments) Full length does not change. ⊗With tapping：Not applicable	200
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0 ⊗Tapped：Not applicable	200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02 ⊗Tapped：Not applicable	200
		TCC	Adds Chamfering to head The strength of the punch head is increased. 0.1mm increments 0.5≦TCC≦(H−D)/2 P.1223 H≦5：TCC 0.5 ⊗Tapped：Not applicable	200

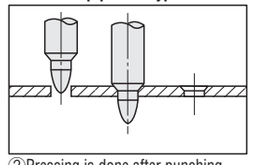
Example

Tip straight A type



①Punching and pressing are done simultaneously. Pressing can be done in one operation.

Tip pilot A type



②Pressing is done after punching. Pressing can be done in two operations.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Shoulder・Tip straight type

D	SKD11 or equivalent SPMUA	SKH51 SHMUA	SKH51(TiCN) H—SHMUA	Powdered high-speed steel PHMUA	Powdered high-speed steel(TiCN) H—PHMUA
3	910	970	2,170	1,150	2,350
4	980	1,060	2,260	1,250	2,450
5	1,030	1,090	2,340	1,290	2,540
6	1,050	1,120	2,500	1,420	2,800
8	1,170	1,280	2,800	1,660	3,180
10	1,320	1,490	3,160	1,970	3,640
13	1,480	1,600	3,430	2,600	4,430
16	1,530	1,960	3,960	3,010	5,010
20	1,730	2,300	4,510	3,640	5,850
25	2,160	3,080	5,380	4,290	6,590

■Key flat・Tip straight type

D	SKD11 or equivalent G-SPMUA	SKH51 G-SHMUA	SKH51(TiCN) HG-SHMUA	Powdered high-speed steel G-PHMUA	Powdered high-speed steel(TiCN) GH-PHMUA
4	2,280	2,350	3,550	2,530	3,730
5	2,330	2,380	3,630	2,570	3,820
6	2,340	2,400	3,780	2,690	4,070
8	2,680	2,780	4,300	3,260	4,780
10	2,850	3,010	4,680	3,600	5,270
13	3,030	3,250	5,080	4,370	6,200
16	3,270	3,700	5,700	4,890	6,890
20	3,740	4,400	6,610	5,810	8,020
25	4,200	5,170	7,470	6,560	8,860

■Tapped・Tip straight type

D	SKD11 or equivalent MPMUA	Powdered high-speed steel MPHMUA	Powdered high-speed steel(TiCN) H-MPHMUA
5	1,150	1,650	2,900
6	1,170	1,880	3,260
8	1,280	2,300	3,820
10	1,420	2,570	4,240
13	1,570	3,500	5,330
16	1,730	3,950	5,950
20	1,930	4,750	6,960
25	2,450	6,330	8,630

■Shoulder・Tip pilot type

D	SKD11 or equivalent SRMUA	SKH51 HSRMUA	SKH51(TiCN) H-HSRMUA	Powdered high-speed steel PSRMUA	Powdered high-speed steel(TiCN) H-PSRMUA
3	1,100	1,160	2,360	1,400	2,600
4	1,170	1,260	2,460	1,430	2,630
5	1,220	1,290	2,540	1,490	2,740
6	1,250	1,310	2,690	1,600	2,980
8	1,420	1,510	3,030	2,060	3,580
10	1,510	1,640	3,310	2,370	4,040
13	1,630	1,840	3,670	3,160	4,990
16	1,830	2,190	4,190	3,680	5,680
20	2,110	2,700	4,910	4,290	6,500
25	2,770	3,670	5,970	5,210	7,510

■Key flat・Tip pilot type

D	SKD11 or equivalent G-SRMUA	SKH51 G-HSRMUA	SKH51(TiCN) GH-HSRMUA	Powdered high-speed steel G-PSRMUA	Powdered high-speed steel(TiCN) GH-PSRMUA
4	2,460	2,540	3,740	2,800	4,000
5	2,500	2,570	3,820	2,860	4,110
6	2,530	2,590	3,970	2,940	4,320
8	2,910	3,000	4,520	3,660	5,180
10	3,140	3,270	4,940	4,100	5,770
13	3,280	3,500	5,330	4,960	6,790
16	3,570	4,030	6,030	5,590	7,590
20	4,130	4,830	7,040	6,610	8,820
25	4,830	5,780	8,080	7,540	9,840

■Tapped・Tip pilot type

D	SKD11 or equivalent MRMUA	Powdered high-speed steel MRHMUA	Powdered high-speed steel(TiCN) H-MRHMUA
5	1,330	1,950	3,200
6	1,360	2,170	3,550
8	1,520	2,710	4,230
10	1,720	3,070	4,740
13	1,830	4,090	5,920
16	2,030	4,660	6,660
20	2,320	5,560	7,770
25	3,090	7,310	9,610

PRESS NEW Printed in Red

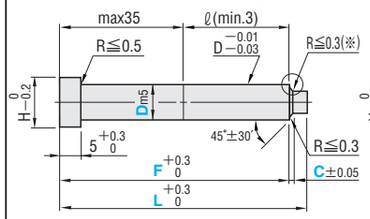
CHAMFERING PUNCHES —B Type—

PRODUCTS DATA P.1220

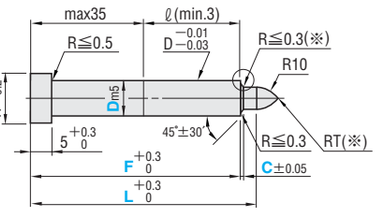
COATING PUNCHES —TiCN—

Shape	M	S	H	Catalog No. Shank shape: Shoulder	Key flat	Tapped	shape
Straight	SKD11or equivalent	—	60～63HRC	SPMUB	G—SPMUB	MPMUB	A (Specification not required)
	SKH51	—	61～64HRC	SHMUB	G—SHMUB	—	
		TiCN coating	61～64 HRC Surface 3000HV	H—SHMUB	GH—SHMUB	—	E
	Powdered high-speed steel	—	64～67HRC	PHMUB	G—PHMUB	MPHMUB	G
		TiCN coating	61～64 HRC Surface 3000HV	H—PHMUB	GH—PHMUB	H—MPHMUB	
Pilot	SKD11or equivalent	—	60～63HRC	SRMUB	G—SRMUB	MRMUB	A (Specification not required)
	SKH51	—	61～64HRC	HSRMUB	G—HSRMUB	—	
		TiCN coating	61～64 HRC Surface 3000HV	H—HSRMUB	GH—HSRMUB	—	
	Powdered high-speed steel	—	64～67HRC	PSRMUB	G—PSRMUB	MRHMUB	
		TiCN coating	61～64 HRC Surface 3000HV	H—PSRMUB	GH—PSRMUB	H—MRHMUB	

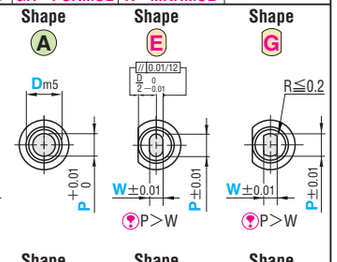
—Shoulder・Tip straight type—



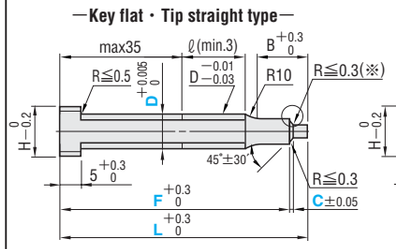
—Shoulder・Tip pilot type—



Shape A / Shape E / Shape G



—Key flat・Tip straight type—



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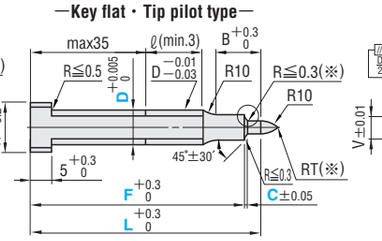
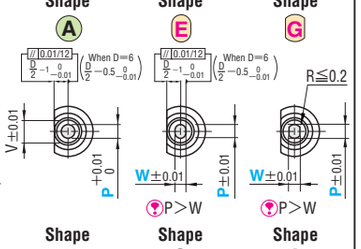
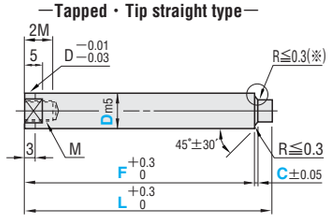


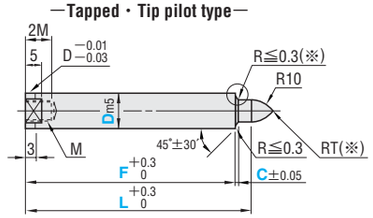
Shape A / Shape E / Shape G



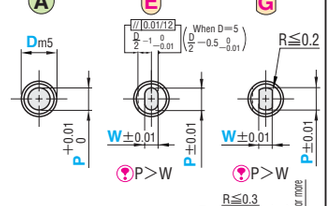
—Tapped・Tip straight type—

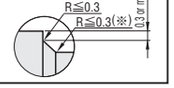


—Tapped・Tip pilot type—



Shape A / Shape E / Shape G





(P)R≦0.3(※)…→Shape E・G R≦0.5
(P)TiCN coating :The tip surface has been grinded before the coating is applied.

(P)RT(※)…→The P＜8 tip is rounded for safety's sake. To keep the tip unrounded RT＝0 can be specified.
(P)For tip R length, see products data RADIUS OF PUNCHES. P.1208

B	H	V	M	Catalog No. Type		D	0.1mm increments L	0.01mm increments Ⓐ min. P max.	Ⓔ Ⓖ P・max.	Ⓔ Ⓖ P・Wmin.	0.1mm increments F	C
—	7	—	—	—Shoulder— Tip Straight / Tip pilot		4	30.0～ 90.0	1.00 ～ 1.80	1.80	1.00	28≦F≦L−C−2.0 Shape A: P 1.00～1.99 20 or less; 2.00～3.99 35 or less; 4.00～5.99 45 or less; 6.00～ 50 or less. Shape E・G: W 1.00～1.29 8 or less; 1.30～1.49 15 or less; 1.50～ 20 or less	0.5≦C≦(D−P)/2−0.6 and (When shape E・G C≦2.0)
	8					5		2.00 ～ 2.80	2.80	1.20		
	9			SPMUB	SRMUB	6		2.00 ～ 3.80	3.80	1.50		
	11			SHMUB	HSRMUB	8		3.00 ～ 5.80	5.80	2.00		
	13			H—SHMUB	H—HSRMUB	10	30.0～100.0	3.00 ～ 7.80	7.80	2.50		
	16			PHMUB	PSRMUB	13		6.00 ～ 10.80	10.80	5.00		
	19			H—PHMUB	H—PSRMUB	16		10.00 ～ 13.80	13.80	8.00		
	23					20		13.00 ～ 17.80	17.80	12.00		
	28					25		18.00 ～ 22.80	22.80	17.00		
8	9	4.8	—	—Key flat— Tip Straight / Tip pilot		6	50.0～ 90.0	2.00 ～ 2.60	2.60	1.50	29≦F≦L−C−2.0 and B≧L−F+2.0	0.5≦C≦(V−P)/2−0.6 and (When shape E・G C≦3.5
	11	5.8				8		3.00 ～ 3.60	3.60	2.00		
13	13	7.8		G—SPMUB	G—SRMUB	10	50.0～100.0	3.00 ～ 5.60	5.60	2.50		
	16	10.8		G—SHMUB	G—HSRMUB	13		6.00 ～ 8.60	8.60	3.00		
	19	13.8		GH—SHMUB	GH—HSRMUB	16		10.00 ～ 11.60	11.60	4.00		
19	23	17.8		G—PHMUB	G—PSRMUB	20		13.00 ～ 15.60	15.60	5.00		
	28	22.8		GH—PHMUB	GH—PSRMUB	25		18.00 ～ 20.60	20.60	6.00		
—	—	—	3	—Tapped— Tip Straight / Tip pilot		5	30.0～ 70.0	2.00 ～ 2.80	2.80	1.20	28≦F≦L−C−2.0 Shape A: P 1.00～1.99 20 or less; 2.00～3.99 35 or less; 4.00～5.99 45 or less; 6.00～ 50 or less. Shape E・G: W 1.00～1.29 8 or less; 1.30～1.49 15 or less; 1.50～ 20 or less	0.5≦C≦(D−P)/2−0.6 and (When shape E・G C≦2.0
			4			6		2.00 ～ 3.80	3.80	1.50		
			5	MPMUB	MRMUB	8	30.0～ 90.0	3.00 ～ 5.80	5.80	2.00		
			6	MPHMUB	MRHMUB	10		3.00 ～ 7.80	7.80	2.50		
				H—MPHMUB	H—MRHMUB	13		6.00 ～ 10.80	10.80	5.00		
						16		10.00 ～ 13.80	13.80	8.00		
						20		13.00 ～ 17.80	17.80	12.00		
						25		18.00 ～ 22.80	22.80	17.00		

(P)Ⓔ Ⓖ Shape E・G : Availbale for SPMUB□,G—SPMUB□,MPMUB□ only.

The volume discount rate is also applicable to alteration cost. P.39

Order: Catalog No. — L — P — W — F — C
SPMUB 6 — 51.0 — P3.40 — F45.0 — C0.6
G—SPMUBG 10 — 65.0 — P6.4 — W5.6 — F60.0 — C0.5

Alteration: Catalog No. — L — P — W — F — C — (PKC…etc.)
SRMUB 5 — 55.0 — P2.40 — F52.0 — C0.5 — PKC

Delivery
● Ⓐ 3 Days — Express A 800/1pc. P.38
(P)A flat charge of 2,160 yen for 3 pieces or more of the same size.
⊗TiCN coating : Express A is not available.
● Ⓔ Ⓖ 5 Days — Express B 800/1pc. P.38
(P)A flat charge of 2,160 yen for 3 pieces or more of the same size.
⊗Key flat : Express B is not available.

Alteration		Code	Ⓐ	Ⓔ Ⓖ	¥/1Code
Blade		PC	Changes dimension P PC≧ Pmin/2 ≧1.00 0.01mm increments (Combination with PKC →0.001mm increments)	———	200
		PKC	Changes tolerance on P P +0.01 0 ⇨ +0.005 0 (P：0.001mm increments.) ⊗TiCN coating：Not applicable to D＞13	Changes tolerance on P・W P・W±0.01 ⇨ +0.01 0	400 (TiCN coating 600)
		RLC	Cuts tip flat 2≦RLC＜√P(10−P/4) 0.1mm increments (P)Applicable to P＜8 (P)Only Tip pilot type is applicable	———	200
Full length		LKC	Changes tolerance on full length L +0.3 0 ⇨ +0.05 0 ⊗Tip pilot type：Not applicable (P)(L：0.01mm increments)		400
		LKZ	Changes tolerance on full length L +0.3 0 ⇨ +0.01 0 ⊗Tip pilot type : Not applicable ⊗TiCN coating : Not applicable (P)(L : 0.01mm increments)		600
Shank		FKC	Changes tolerance on F F +0.3 0 ⇨ +0.05 0		800
		NDC	No press-in lead ℓ≧3 ⇨ ℓ＝0 ⊗Tapped : Not applicable		0

Alteration of head		Code	Ⓐ	Ⓔ Ⓖ	¥/1Code
		KC	Adds single key flat ⊗With tapping : D=5 not available ⊗Key flat : Not available	Adds 1 key flat at 0°～90° 180° 270° and the other on another angle. ⊗Key flat : not applicable	200
		WKC	Adds double key flats in parallel ⊗With tapping : D=5 not available ⊗Key flat : Not available	Adds double key flats in parallel Add KC. ⊗Key flat : not applicable	200 (A only 400)
		HC	Changes head diameter D≦HC＜H 0.1mm increments ⊗Tapped : Not applicable		200
		TC	Changes head thickness 2≦TC＜5 0.1mm increments (Combination with TKC・TKM→0.01mm increments) (P)Full length does not change ⊗With tapping : Not applicable		200
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0	⊗Tapped : Not applicable	200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02	⊗Tapped : Not applicable	200
		TCC	Adds Chamfering to head The strength of the punch head is increased. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2	⊗Tapped : Not applicable (P)H≦5：TCC 0.5	200

Price
● Ⓐ Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

(P)To be quoted on price & lead time above Max. Q'ty.

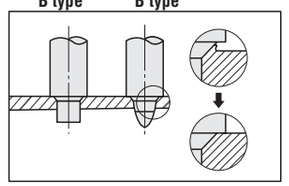
● Ⓔ Ⓖ Volume discount rate P.37

Quantity	1～4	5～9
Rate	—	5%

(P)To be quoted on price & lead time above Max. Q'ty.

Example

Tip straight B type / Tip pilot B type



Pressing is also done on raised parts while chamfering.

■Shoulder・Tip straight type

D	SKD11 or equivalent SPMUB	SPMUBE	SPMUBG	SKH51 SHMUB	SKH51(TiCN) H—SHMUB	Powdered high-speed steel PHMUB	Powdered high-speed steel(TiCN) H—PHMUB
4	2,040	7,640	6,160	2,120	3,320	2,530	3,730
5	2,050	8,250	6,850	2,140	3,390	2,530	3,780
6	2,070	8,750	7,270	2,160	3,540	2,640	4,020
8	2,360	9,510	7,640	2,490	4,010	3,300	4,820
10	2,470	10,240	8,290	2,640	4,310	3,630	5,300
13	2,580	10,630	8,630	2,670	4,500	4,390	6,220
16	2,740	10,950	8,700	4,030	6,030	5,210	7,210
20	3,220	11,500	9,250	4,950	7,160	5,970	8,180
25	3,710	12,330	10,080	5,730	8,030	6,850	9,150

■Key flat・Tip straight type

D	SKD11 or equivalent G—SPMUB	G—SPMUBE	G—SPMUBG	SKH51 G—SHMUB	SKH51(TiCN) GH—SHMUB	Powdered high-speed steel G—PHMUB	Powdered high-speed steel(TiCN) GH—PHMUB
6	3,530	12,550	11,070	3,630	5,010	4,130	5,510
8	4,060	13,780	11,910	4,200	5,720	5,040	6,560
10	4,200	14,710	12,750	4,390	6,050	5,410	7,080
13	4,340	15,240	13,240	4,440	6,270	6,360	8,190
16	4,600	16,110	13,860	5,940	7,940	7,330	9,330
20	5,370	16,940	14,690	7,310	9,510	8,410	10,620
25	5,830	18,430	16,180	8,100	10,400	9,300	11,600

■Tapped・Tip straight type

D	SKD11 or equivalent MPMUB	MPMUBE	MPMUBG	Powdered high-speed steel MPHMUB	Powdered high-speed steel(TiCN) H—MPHMUB
5	2,340	9,710	8,320	3,100	4,350
6	2,360	10,220	8,730	3,330	4,710
8	2,660	10,980	9,110	4,100	5,620
10	2,770	11,700	9,750	4,380	6,050
13	2,880	12,110	10,110	5,480	7,310
16	3,050	12,430	10,180	6,400	8,400
20	3,560	12,950	10,700	7,360	9,570
25	4,070	13,800	11,550	9,070	11,370

■Shoulder・Tip pilot type

D	SKD11 or equivalent SRMUB	SKH51 HSRMUB	SKH51(TiCN) H—HSRMUB	Powdered high-speed steel PSRMUB	Powdered high-speed steel(TiCN) H—PSRMUB
4	2,200	2,290	3,490	2,790	3,990
5	2,230	2,310	3,560	2,800	4,050
6	2,240	2,320	3,700	2,920	4,300
8	2,580	2,690	4,210	3,690	5,210
10	2,730	2,890	4,560	4,010	5,680
13	2,820	2,900	4,730	4,930	6,760
16	3,030	4,230	6,230	5,860	7,860
20	3,580	5,330	7,540	6,710	8,920
25	4,210	6,310	8,610	7,770	10,070

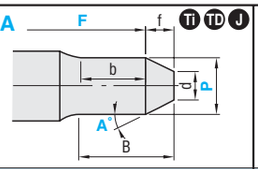
■Key flat・Tip pilot type

D	SKD11 or equivalent G—SRMUB	SKH51 G—HSRMUB	SKH51(TiCN) GH—HSRMUB	Powdered high-speed steel G—PSRMUB	Powdered high-speed steel(TiCN) GH—PSRMUB
6	3,710	3,800	5,180	4,420	5,800
8	4,300	4,410	5,920	5,450	6,970
10	4,480	4,650	6,320	5,920	7,590
13	4,600	4,690	6,520	6,940	8,770
16	4,910	6,280	8,280	8,020	10,020
20	5,750	7,730	9,940	9,210	11,420
25	6,460	8,710	11,010	10,290	12,590

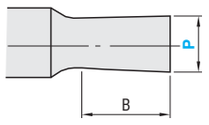
■Tapped・Tip pilot type

D	SKD11 or equivalent MRMUB	Powdered high-speed steel MRHMUB	Powdered high-speed steel(TiCN) H—MRHMUB
5	2,530	3,380	4,630
6	2,550	3,620	5,000
8	2,900	4,510	6,030
10	3,050	4,890	6,560
13	3,150	6,070	7,900
16	3,360	7,100	9,100
20	3,940	8,150	10,360
25	4,710	10,060	12,360

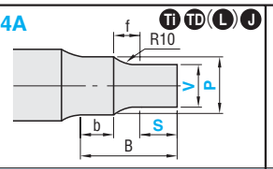
DRAWING PUNCHES
—SHAPES—

2A


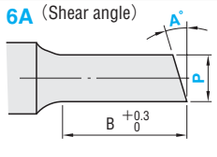
●F≦L−1 (f≧1)
●B≧L−F+2 (b≧2)
●d≧0.5
For jector punch
d≧dmin
《d=P−2(L−F)tanA》

3A (1/200 reverse taper)


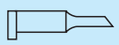
⊗PKC：Not applicable

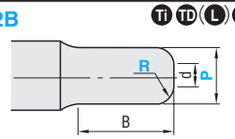
4A


●S≧2
●B≧S+f+2(b≧2)
《f=√(10(P−V)−(P−V)²/4)》

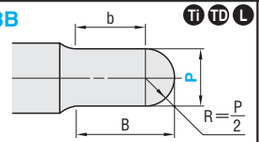
6A (Shear angle)


●0<A≦15°
● B≧PtanA+2
⊗LKC：Not applicable
For jector punch
position of alteration KC(flat cut)

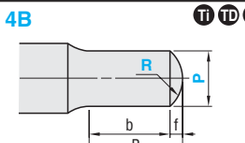


2B


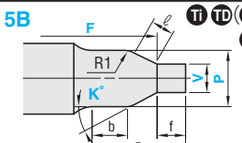
●0.5≦R≦(P−0.5)／2
For jector punch
0.5≦R≦(P−dmin)／2

3B


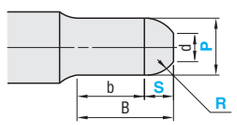
●B≧(P／2)+2 (b≧2)

4B


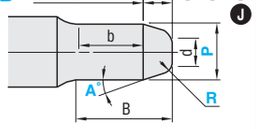
●R>P／2
●B≧f+2 (b≧2)
《f=R−√(R²−(P/2)²)》

5B


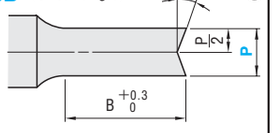
●F≦L−2 (f≧2)
●B≧L−F+ℓ+2 (b≧2)
●V≦P−0.6
《0.2≦ℓ=｛(P−V)/2sinK｝−tan｛90−(180−K)/2|R》

6B


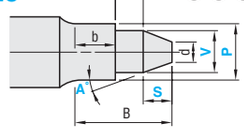
●S≧2
●R>S
●B≧S+2 (b≧2)
●d≧0.5
For jector punch
d≧dmin
《d=P−2(R−√(R²−S²))》

7B


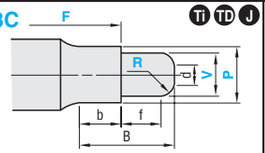
●F≦L−R−1 (f≧R+1)
●B≧L−F+2 (b≧2)
●d≧0.5
For jector punch
d≧dmin
R=0 ⋯› 2A
《d=P−2(Rtan｛(90−A)/2｝+(L−F) tanA)》

8B (Shear angle)


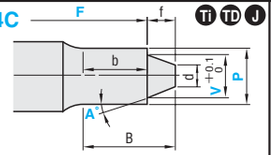
●0<A≦15°
●B>(P／2)tanA
⊗LKC：Not applicable
position of alteration KC(flat cut)

2C


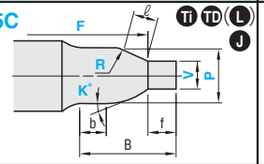
●F≦L−S−2 (f≧2)
●S≧1
●B≧L−F+2 (b≧2)
●V≦P−0.6
●d≧0.5
For jector punch
d≧dmin
《d=V−2StanA》

3C


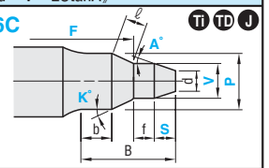
●F≦L−R−2 (f≧2)
●B≧L−F+2 (b≧2)
●V≦P−0.6
●d≧0.5
For jector punch
d≧dmin
《d=V−2R》

4C


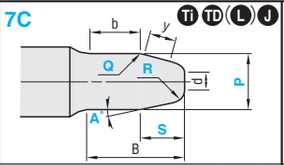
●F≦L−2 (f≧2)
●B≧L−F+2 (b≧2)
●V≦P−0.6
●d≧0.5
For jector punch
d≧dmin
《d=V−2(L−F)tanA》

5C


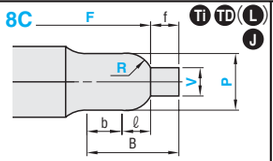
●F≦L−2 (f≧2)
●B≧L−F+ℓ+2 (b≧2)
R=1 ⋯› 5B
《0.2≦ℓ=｛(P−V)/2sinK｝−tan｛90−(180−K)/2|R》

6C


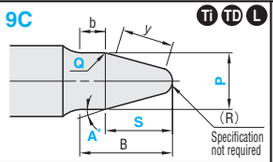
●F≦L−S−2 (f≧2)
●S≧1
●B≧L−F+ℓ+2 (b≧2)
●d≧0.5
For jector punch
d≧dmin
《d=V−2StanA》
《0.2≦ℓ=｛(P−V)/2sinK｝》

7C


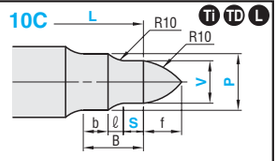
●B≧S+QtanA/2+2 (b≧2)
●y≧1 ● d≧0.5
For jector punch d≧dmin.
0.5≦R≦15 & Q=0 ⋯› 7B
R=0 & Q=0 ⋯› 2A
S is the dimension of Q before working.
《d=P−2｛Rtan｛(90−A)/2｝+StanA｝》
《y=S/cosA−Qtan(A/2)−Rtan｛(90−A)/2|》

8C


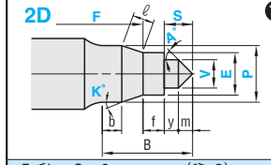
●F≦L−2 (f≧2)
●B≧L−F+ℓ+2 (b≧2)
●R≧(P−V)/2
《ℓ=√(P−V)｛R−(P−V)/4｝》

9C


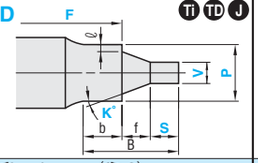
●B≧S+Qtan(A/2)+2 (b≧2)
●y≧1
S is the dimension of Q before working.
《y=S/cosA−Qtan(A/2)−Rtan｛(90−A)/2|》
《R=(P/2−StanA)/tan｛(90−A)/2|》

10C


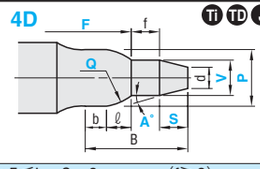
●S≧2
●B≧S+ℓ+2 (b≧2)
●L≦100−f
●V<20
《ℓ=√(10(P−V)−(P−V)²/4)》
《f=√(10V−V²/4)》

2D


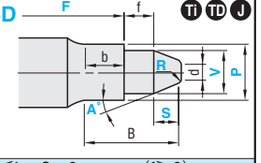
●F≦L−S−2 (f≧2)
●S≧m+2 (y≧2)
●A≧20°
●B≧L−F+ℓ+2 (b≧2)
●V≦P−0.6
⊗LKC：Not applicable
《m=(V/2)tan(90−A)》
《0.2≦ℓ=｛(P−E)/2sinK｝》

3D


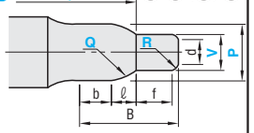
●F≦L−4 (f≧2)
●B≧6 (b≧2)
●S≧2
● ℓ≧0.3
《f=(L−F−S)》
《ℓ=｛(P−V)/2｝−(L−F−S)tanK》

4D


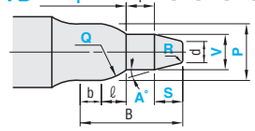
●F≦L−S−2 (f≧2)
●Q≧(P−V)/2
●S≧1
●B≧L−F+ℓ+2 (b≧2)
●V−2StanA≧0.5(d≧0.5)
For jector punch d≧dmin
Q=0 ⋯› 2C
《ℓ=√(P−V)｛Q−(P−V)/4｝》

5D


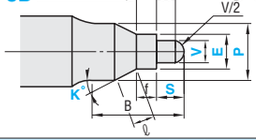
●F≦L−S−2 (f≧2)
●S≧R+1
●B≧L−F+2 (b≧2)
●V≦P−0.6
●d≧0.5
For jector punch d≧dmin.
R=0 ⋯› 2C
《d=V−2｛Rtan｛(90−A)/2｝+StanA｝》

6D


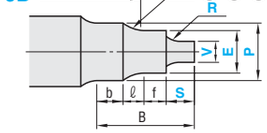
●F≦L−R−2 (f≧2)
●R≦(V−0.5)/2 (d≧0.5)
●Q≧(P−V)/2
●B≧L−F+ℓ+2 (b≧2)
For jector punch d≧dmin.
0.5≦Q≦15 & R=0 ⋯› 8C
0.5≦R≦15 & Q=0 ⋯› 3C
《ℓ=√(P−V)｛Q−(P−V)/4｝》

7D


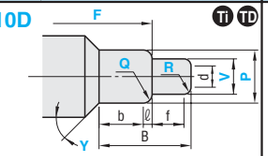
●F≦L−S−2 (f≧2)
●Q≧(P−V)/2
●B≧L−F+ℓ+2 (b≧2)
●d≧0.5
For jector punch d≧dmin.
R=0 & Q=0 ⋯› 2A R=0 ⋯› 4D Q=0 ⋯› 5D
《ℓ=√(P−V)｛Q−(P−V)/4｝》
《d=V−2｛Rtan｛(90−A)/2｝+StanA｝》

8D


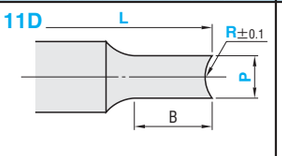
●F≦L−S−2 (f≧2)
●S≧V/2+2 (y≧2)
●B≧L−F+ℓ+2 (b≧2)
●V≦E−0.6
《0.2≦ℓ=｛(P−E)/2sinK｝》

9D


●F≦L−S−2 (f≧2)
●B≧L−F+ℓ+2 (b≧2)
● R≧(E−V)/2 ⋯›S≧√((E−V)|R−(E−V)/4| +1
● R<(E−V)/2 ⋯›≧R+1
⊗R=0：Not applicable
⊗FKC：Not applicable
《ℓ=√(10(P−E)−(P−E)²/4》

10D


●F≦L−R−2 (f≧2)
●R≦(V−0.5)/2 (d≧0.5)
●Q≧(P−V)/2
●B≧L−F+ℓ+2 (b≧2)
45°≦Y≦90° 1° increments
T Tolerance ±30'
《ℓ=√(P−V)｛Q−(P−V)/4｝》

11D


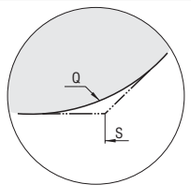
●P+5≧R≧P+1
L T Tolerance L±0.3
⊗LKC：Not applicable
⊗PKC：Not applicable
⊗RKC：Not applicable
position of alteration KC(flat cut)
The tip is not rounded surface.

■Unit designation

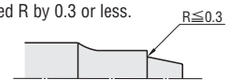
T	Unit designation
F +0.3 0	0.1mm increments
S +0.3 0	0.1mm increments
V +0.01 0	0.01mm increments
E +0.01 0	0.01mm increments
P +0.01 0	0.01mm increments
A ±30'	1° increments (0°<A<90°)
K ±30'	1° increments (0°<A<90°)
R ±0.5	0.1mm increments R=0 or 0.5≦R≦15
Q ±0.5	0.1mm increments Q=0 or 0.5≦Q≦15

Even in the case of lapped (L−) punch, the dimensional tolerance of each part and the specified unit do not change.

7C・9C
For 7C and 9C, S is the dimension of Q before working.



All interior angles are added R by 0.3 or less.

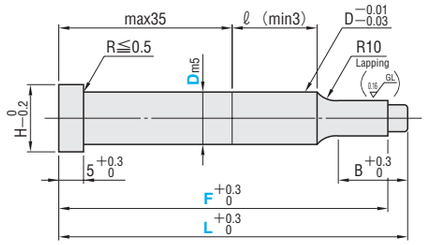


A punch that has the shape marked with Ti can be coated with TiCN. (P.601・605)
A punch that has the shape marked with TD can be coated with DICOAT.® (P601・605)
A punch that has the shape marked with L can be lapped. (P.599・603)
Note, however, that the end face of (L) shape punch is not lapped.
A punch that has the shape marked with J can be used as a jector punch. (P.603・605)
5A shape punch can be made by using GC alteration. For details, see the relevant page. (P.53～)

Express service system P.38 MISUMI Press 2007 http://misumi.jp/press/ For inquiry, ordering and other information, refer to P.1269

DRAWING PUNCHES
—STANDARD TYPE/LAPPING TYPE—

Type	M	H	Shank dia.	Catalog No.
RoHS Standard type	SKD11 or equivalent	60～63HRC	3～25	SP Lapping type L—SP
	SKH51	61～64HRC		SH Lapping type L—SH
	Powdered high-speed steel	64～67HRC		PH Lapping type L—PH
RoHS With dowel	SKD11 or equivalent	60～63HRC	10～25	SP—C Lapping type L—SP—C
RoHS Tapped	SKD11 or equivalent	60～63HRC	5～25	MP Lapping type L—MP
	Powdered high-speed steel	64～67HRC		MPH Lapping type L—MPH



SP—C ···▸ T=5 +0.03 +0.01

Lapping is applied to the range between tip and Dim B. (Except for end face)

Shape P.597

B	H	(M)	Type		Shape	D	0.1mm increments L	0.01mm increments min. P max.*	0.01mm increments V min
8	5	—	Regular type (D3～25)	SP Lapping type L—SP	2A～4A·6A	3	40.0～80.0	2.00～ 2.99	1.00
	7					4		2.00～ 3.99	1.00
	8	3		SH L—SH		5		2.00～ 4.99	1.20
	9			PH L—PH	2B ～ 8B	6		2.00～ 5.99	1.20
13	11	4	With dowel hole for locating (D10～25)	SP—C L—SP—C		8	(40.0～49.9)	3.00～ 7.99	1.50
	13	5			2C～10C	10		3.00～ 9.99	1.50
	16	6				13		6.00～ 12.99	2.00
19	19		With tapping (D5～25)	MP L—MP		16	50.0～100.0	10.00～ 15.99	3.00
	23			MPH L—MPH	2D～11D	20		13.00～ 19.99	3.00
	28					25		18.00～ 24.99	4.00

Lapping : Not applicable to shape 2A/6A/8B/2C/3C/4C/6C/2D/3D/4D/5D/8D/9D/10D/11D.
L (40.0～49.9) ···▸ B=8 When full length L is (40.0～49.9) , blade length B is 8mm uniformly.
P>D−0.03 ···▸ ℓ=0 In case of P>D−0.03, D −0.01 −0.03 (Press-in lead) is not included.
P=D can be specified P=D ···▸ P T m5 · ℓ=0 *When P=D, P tolerance is m5 and D −0.01 −0.03 (Press-in lead) is not included.
(M) ···▸ With tapping type : Applicable to MP·L—MP·MPH·L—MPH

Alteration

Catalog No. — L — P(PC)·E·V·R·Q·A·K·F·S — (BC·HC···etc.)
SP2C 16 — 75.0 — P12.00—V9.00—A30—F65.0—S3 — LKC—FKC

Alteration		Code	Spec.	¥/1Code
Blade	PC	PC	Changes dimension P PC≧ Pmin./2 ≧Vmin. 0.01mm increments	200
	BC	BC	Changes blade length B 2≦BC≦BCmax. 0.1mm increments Full length L (or LC) requires BC+30mm or more P(PC) / BCmax.: 1.00～1.19 / 15; 1.20～1.99 / 20; 2.00～2.99 / 30; 3.00～3.99 / 35; 4.00～5.99 / 45; 6.00～ / 60	200
	PT	PKC	Changes tolerance on P P +0.01 0 ⇨ +0.005 0 Lapping type : Not applicable	400
	AT	AKC	Changes tolerance on A A±30′ ⇨ ±10′ Lapping type : Not applicable	400
	KT	KKC	Changes tolerance on K K±30′ ⇨ ±10′ Lapping type : Not applicable	400
	RT	RKC	Changes tolerance on R R±0.5 ⇨±0.05 Lapping type : Not applicable Applicable within the range of 0.1≦R≦10	400
	QT	QKC	Changes tolerance on Q Q±0.5 ⇨±0.05 Lapping type : Not applicable Applicable within the range of 0.1≦Q≦10	400
Head	HC	HC	Changes head diameter D≦HC<H 0.1mm increments	200
	TC	TC	Changes head thickness 2≦TC<5 0.1mm increments (Combination with TKC·TKM→0.01mm increments) Full length does not change.	200

Alteration		Code	Spec.	¥/1Code
Head	TCC	TCC	Adds Chamfering to head The strength of the punch head is increased. P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 H≦5 : TCC 0.5 SRC : Not applicable	200
	KC	KC	Adds single key flat D5 of MP·MPH·L-MP·L-MPH : Not applicable	200
	WKC	WKC	Adds double key flats in parallel D5 of MP·MPH·L-MP·L-MPH : Not applicable	400
	RC	RC	0.04 Reduces head thickness by −0.04～0 from retainer surface	200
	SRC	SRC	Modifies head to fit select retainer (SLS) For details, refer to P.673 Applicable to D10～25	300
	TT	TKC	Changes head thickness tolerance 5 +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness tolerance 5 +0.3 0 ⇨ 0 −0.02	200
Others	LT	LKC	Changes tolerance on L L +0.3 0 ⇨ +0.05 0	400
	FT	FKC	Changes tolerance on F F +0.3 0 ⇨ +0.05 0	800
	ℓ	NDC	No press-in lead. ℓ≧3 ℓ=0 Not applicable to tapped punch.	0

The volume discount rate is also applicable to alteration cost. P.39

Order Catalog No. — L — P·E·V·R·Q·A·K·F·S
SP2C 16 — 70.0 — P12.00 — V9.00 — A30 — F65.0 — S3

Delivery 3 Days | Express A 800/1pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Standard type

Type	D	U/Price Q'ty : 1～9 2A～4A·6A	2B～8B	2C～10C	2D～11D
SP	3	910	1,190	1,660	2,130
	4	930	1,210	1,660	2,140
	5	940	1,220	1,690	2,160
	6	950	1,240	1,720	2,180
	8	1,280	1,570	1,980	2,550
	10	1,430	1,720	2,110	2,700
	13	1,570	1,840	2,220	2,830
	16	1,780	2,060	2,530	3,040
	20	2,280	2,550	3,030	3,590
	25	2,710	3,010	3,460	4,180
SH	3	1,010	1,280	1,750	2,210
	4	1,020	1,300	1,770	2,220
	5	1,030	1,310	1,790	2,260
	6	1,060	1,330	1,820	2,290
	8	1,430	1,720	2,110	2,700
	10	1,630	1,910	2,220	2,890
	13	1,780	2,060	2,380	2,940
	16	2,020	2,560	3,530	4,450
	20	2,560	3,270	4,480	5,640
	25	3,010	3,800	5,220	6,570
PH	3	1,290	1,600	2,110	2,620
	4	1,340	1,650	2,160	2,680
	5	1,370	1,690	2,200	2,690
	6	1,500	1,800	2,320	2,810
	8	2,200	2,500	3,010	3,570
	10	2,600	2,900	3,400	3,970
	13	3,570	3,870	4,370	4,940
	16	4,480	4,780	5,300	5,910
	20	5,620	5,680	6,190	6,800
	25	6,400	6,700	7,220	7,830
MP	5	1,220	1,500	1,880	2,450
	6	1,240	1,520	1,900	2,470
	8	1,570	1,840	2,210	2,830
	10	1,720	1,990	2,380	2,990
	13	1,840	2,130	2,500	3,090
	16	2,200	2,340	2,860	3,360
	20	2,550	2,830	3,300	3,870
	25	3,010	3,290	3,750	4,400
MPH	5	1,870	2,180	2,590	3,200
	6	2,120	2,420	2,830	3,450
	8	2,860	3,160	3,570	4,230
	10	3,210	3,510	3,930	4,600
	13	4,280	4,610	5,010	5,640
	16	5,050	5,200	5,770	6,310
	20	5,950	6,260	6,770	7,390
	25	7,520	7,830	8,330	9,040
SP—C	10	1,780	2,060	2,450	3,030
	13	1,890	2,160	2,540	3,130
	16	2,100	2,380	2,830	3,350
	20	2,640	2,910	3,380	3,930
	25	3,030	3,300	3,760	4,480

■Lapping type

Type	D	U/Price Q'ty : 1～9 3A·4A	2B～7B	5C·7C～10C	6D·7D
L—SP	3	2,510	2,790	3,260	3,730
	4	2,530	2,810	3,260	3,740
	5	2,540	2,820	3,290	3,760
	6	2,550	2,840	3,320	3,780
	8	2,880	3,170	3,580	4,150
	10	3,030	3,320	3,710	4,300
	13	3,170	3,440	3,820	4,430
	16	3,380	3,660	4,130	4,640
	20	3,880	4,150	4,630	5,190
	25	4,310	4,610	5,060	5,780
L—SH	3	2,710	2,980	3,450	3,910
	4	2,720	3,000	3,470	3,920
	5	2,730	3,010	3,490	3,960
	6	2,760	3,030	3,520	3,990
	8	3,130	3,420	3,810	4,400
	10	3,330	3,610	3,920	4,590
	13	3,480	3,760	4,080	4,640
	16	3,720	4,260	5,230	6,150
	20	4,260	4,970	6,180	7,340
	25	4,710	5,500	6,920	8,270
L—PH	3	3,090	3,400	3,910	4,420
	4	3,140	3,450	3,960	4,480
	5	3,170	3,490	4,000	4,490
	6	3,300	3,600	4,120	4,610
	8	4,000	4,300	4,810	5,370
	10	4,400	4,700	5,200	5,770
	13	5,370	5,670	6,170	6,740
	16	6,280	6,580	7,100	7,710
	20	7,420	7,480	7,990	8,600
	25	8,200	8,500	9,020	9,630
L—MP	5	2,820	3,100	3,480	4,050
	6	2,840	3,120	3,500	4,070
	8	3,170	3,440	3,810	4,430
	10	3,320	3,590	3,980	4,590
	13	3,440	3,730	4,100	4,690
	16	3,800	3,940	4,460	4,960
	20	4,150	4,430	4,900	5,470
	25	4,610	4,890	5,350	6,000
L—MPH	5	3,670	3,980	4,390	5,000
	6	3,920	4,220	4,630	5,250
	8	4,660	4,960	5,370	6,030
	10	5,010	5,310	5,730	6,400
	13	6,080	6,410	6,810	7,440
	16	6,850	7,000	7,570	8,110
	20	7,750	8,060	8,570	9,190
	25	9,320	9,630	10,130	10,840
L—SP—C	10	3,380	3,660	4,050	4,630
	13	3,490	3,760	4,140	4,730
	16	3,700	3,980	4,430	4,950
	20	4,240	4,510	4,980	5,530
	25	4,630	4,900	5,360	6,080

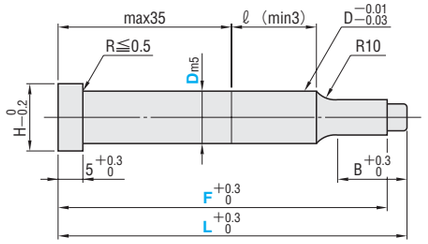
DRAWING PUNCHES
—DICOAT® TYPE/TiCN COATING TYPE—

PRODUCTS DATA P.1215·1220

DICOAT® PUNCHES
COATING PUNCHES
—TiCN—

¥ The volume discount rate is also applicable to alteration cost. P.39

Type	M	H	Shank dia.	Catalog No.
RoHS Standard type	SKD11 or equivalent	60～63HRC Surface 3000HV	3～25	DICOAT® T—SP
	Powdered high-speed steel	62～64HRC Surface 3000HV		DICOAT® T—PH
	SKH51	61～64HRC Surface 3000HV		TiCN coating H—SH
	Powdered high-speed steel	64～67HRC Surface 3000HV		TiCN coating H—PH
RoHS With dowel	SKD11 or equivalent	60～63HRC	10～25	DICOAT® T—SP—C
RoHS Tapped	Powdered high-speed steel	64～67HRC Surface 3000HV	5～25	TiCN coating H—MPH



SP—C ⋯▸ T=5 +0.03 +0.01

Shape P.597

B	H	M	Catalog No. Type	Shape	D	0.1mm increments L	0.01mm increments min. P max.	0.01mm increments V min
8	5	—	DICOAT® / TiCN coating	2A～4A·6A	3	40.0～80.0	2.00～ 2.99	1.00
	7		Standard type (D3～25) T—SP H—SH T—PH H—PH		4		2.00～ 3.99	1.00
	8	3			5		2.00～ 4.99	1.20
	9			2B ～ 8B	6		2.00～ 5.99	1.20
13	11	4			8	(40.0～49.9)	3.00～ 7.99	1.50
	13	5	With dowel (D10～25) T—SP—C	2C～10C	10		3.00～ 9.99	1.50
	16	6			13		6.00～ 12.99	2.00
19	19			2D～10D	16	50.0～100.0	10.00～ 15.99	3.00
	23		Tapped (D5～25) H—MPH		20		13.00～ 19.99	3.00
	28				25		18.00～ 24.99	4.00

- DICOAT® punches : Not applicable to shape 6A/8B/2D
- L (40.0～49.9) ⋯▸ B=8 When full length L is (40.0～49.9), blade length B is 8mm uniformly.
- P>D—0.03 ⋯▸ ℓ=0 In case of P>D—0.03, D −0.01 −0.03 (Press-in lead) is not included.

Order

Catalog No. — L — P·E·V·R·Q·A·K·F·S — (BC·HC⋯etc.)

T—SP2C 16 — 70.0 — P12.00—V9.00—A30—F65.0—S3 — LKC

Delivery 3 Days

Alteration

Alteration	Code	Spec.	¥/1Code
Blade	PC	Changes dimension P PC≧ Pmin./2 ≧Vmin. 0.01mm increments	200
Blade	BC	Changes blade length B 2≦BC≦BCmax. 0.1mm increments Full length L (or LC) requires BC+30mm or more ・TiCN coating: P(PC) 1.00～1.19 BCmax 15; 1.20～1.99 20; 2.00～2.99 30; 3.00～3.99 35; 4.00～5.99 45; 6.00～ 60 ・DICOAT®: P(PC) 1.00～1.99 BCmax 15; 2.00～2.99 25; 3.00～3.99 30; 4.00～5.99 40; 6.00～ 45 Coating punches : 2≦BC≦BCmax.≦L/2	200
Blade	SC	Finishes blade with lapping The dimension P tolerance and specification units are not changed. The base material is finished before coating. ⊗ Not applicable to DICOAT® punches ⊗ Not applicable to shape 2A/6A/8B/2C/3C/4C/6C/2D/3D/4D/5D/8D/9D/10D ⊗ AKC·KKC·RKC·QKC : Not applicable	
Blade AT	AKC	Changes tolerance on A A±30′ ⇨ ±10′ ⊗ DICOAT® punches : Not applicable	400
Blade KT	KKC	Changes tolerance on K K±30′ ⇨ ±10′ ⊗ DICOAT® punches : Not applicable	400
Blade RT	RKC	Changes tolerance on R ⊗ DICOAT® punches R±0.5 ⇨±0.05 : Not applicable Applicable within the range of 0.1≦R≦10	400
Blade QT	QKC	Changes tolerance on Q ⊗ DICOAT® punches Q±0.5 ⇨±0.05 : Not applicable Applicable within the range of 0.1≦Q≦10	400
Head	HC	Changes head diameter D≦HC<H 0.1mm increments	200
Head	TC	Changes head thickness 2≦TC<5 0.1mm increments (Combination with TKC·TKM→0.01mm increments) Full length does not change.	200
Head	TCC	Adds Chamfering to head The strength of the punch head is increasecd. P.1223 0.1mm increments 0.5≦TCC≦(H—D)／2 H≦5 : TCC 0.5 ⊗ Combination SRC : Not applicable	200
Head	KC	Adds single key flat ⊗ D5 of H-MPH : Not applicable	200
Head	WKC	Adds double key flats in parallel ⊗ D5 of H-MPH : Not applicable	400
Head	RC	Reduces head thickness by —0.04～0 from retainer surface	200
Head	SRC	Modifies head to fit select retainer (SLS) For details, refer to P.673 Applicable to D10～25	300
Head TT	TKC	Changes head thickness tolerance 5 +0.3 0 ⇨ +0.02 0	200
Head TT	TKM	Changes head thickness tolerance 5 +0.3 0 ⇨ 0 −0.02	200
Others LT	LKC	Changes tolerance on L L +0.3 0 ⇨ +0.05 0	400
Others FT	FKC	Changes tolerance on F F +0.3 0 ⇨ +0.05 0 ⊗ DICOAT® punches : Not available	800
Others	NDC	No press-in lead. ℓ≧3 ⇨ ℓ=0 ⊗ Not applicable to tapped punch.	0

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■DICOAT® type

Type	D	U/Price Q'ty : 1～9 2A～4A	2B～7B	2C～10C	3D～10D
T—SP	3	2,530	2,840	3,280	3,890
	4	2,600	2,900	3,360	3,960
	5	2,650	2,970	3,430	4,000
	6	2,860	3,190	3,640	4,220
	8	3,370	3,680	4,070	4,770
	10	3,700	4,020	4,370	5,100
	13	4,040	4,360	4,700	5,440
	16	4,720	5,040	5,460	6,120
	20	5,410	5,720	6,140	6,870
	25	6,070	6,400	6,790	7,710
T—PH	3	2,840	3,160	3,670	4,190
	4	2,920	3,230	3,770	4,300
	5	2,970	3,280	3,840	4,360
	6	3,360	3,670	4,170	4,670
	8	4,250	4,570	5,010	5,590
	10	4,720	5,050	5,580	6,160
	13	5,500	5,800	6,770	7,340
	16	6,880	7,610	8,140	8,770
	20	8,610	8,680	9,200	9,820
	25	9,610	9,890	10,430	11,050
T—SP—C	10	4,050	4,360	4,710	5,430
	13	4,360	4,680	5,020	5,740
	16	5,040	5,360	5,760	6,430
	20	5,770	6,080	6,490	7,210
	25	6,390	6,690	7,090	8,010

■TiCN coating type

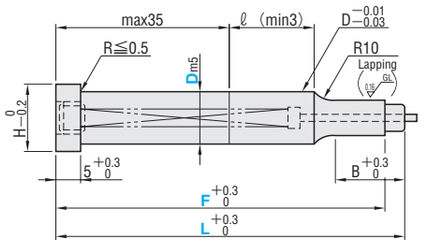
Type	D	U/Price Q'ty : 1～9 2A～4A·6A	2B～8B	2C～10C	2D～10D
H—SH	3	2,170	2,440	2,910	3,370
	4	2,210	2,490	2,970	3,420
	5	2,280	2,560	3,040	3,510
	6	2,440	2,710	3,190	3,660
	8	2,950	3,240	3,630	4,220
	10	3,300	3,580	3,890	4,560
	13	3,610	3,890	4,210	4,770
	16	4,020	4,570	5,530	6,450
	20	4,770	5,480	6,690	7,850
	25	5,310	6,100	7,520	8,870
H—PH	3	2,550	2,860	3,370	3,880
	4	2,640	2,950	3,460	3,980
	5	2,730	3,050	3,560	4,050
	6	3,000	3,300	3,820	4,310
	8	3,850	4,160	4,660	5,220
	10	4,420	4,720	5,220	5,790
	13	5,560	5,860	6,360	6,930
	16	6,660	6,970	7,490	8,100
	20	8,030	8,090	8,600	9,210
	25	8,910	9,210	9,730	10,340
H—MPH	5	3,230	3,540	3,950	4,560
	6	3,620	3,920	4,330	4,950
	8	4,520	4,810	5,220	5,890
	10	5,030	5,330	5,750	6,420
	13	6,270	6,600	7,000	7,630
	16	7,230	7,390	7,960	8,500
	20	8,360	8,670	9,180	9,800
	25	10,030	10,340	10,840	11,540

JECTOR DRAWING PUNCHES
—STANDARD TYPE/LAPPING TYPE—

How to calculate the projection length of jector pin (reference value) P.191

● Refer to JECTOR PUNCH BLANKS for the details of jector hole. P.186
● Refer to JECTOR PIN SETS for the jector pin. P.189

Type	M	H	Shank dia.D	Catalog No.
RoHS Standard type	SKH51	61~64HRC	4~6	SJ Lapping type L—SJ
	SKD11 or equivalent	60~63HRC	8~25	
	Powdered high-speed steel	64~67HRC	4~25	PJ Lapping type L—PJ
With dowel RoHS	SKD11 or equivalent	60~63HRC	10~25	SJ—C Lapping type L—SJ—C



SJ—C ···▸ T=5 +0.03 +0.01
Lapping is applied to the range between tip and Dim. B. (Except for end face)

Shape P.597

B	H	Catalog No. Type	Shape	D	L	0.01mm increments min. P max.*	Vmin.	dmin.
8	7	Standard type SJ Lapping type L—SJ / PJ L—PJ	2A~4A 2B 5B~7B 2C~8C 3D~7D 9D	4	40 50 60 70 80	2.00~ 3.99	1.00	1.00
	8			5		2.00~ 4.99	2.00	2.00
	9			6		2.00~ 5.99	2.00	2.00
13	11			8	(40) (50) 60 70 80 90 100	3.00~ 7.99	3.00	3.00
	13			10		3.00~ 9.99	3.00	3.00
	16	With dowel SJ—C L—SJ—C		13		6.00~ 12.99	6.00	6.00
19	19	(D10~25 L60~100)		16		10.00~ 15.99	6.00	6.00
	23			20		13.00~ 19.99	6.00	6.00
	28			25		18.00~ 24.99	6.00	6.00

Lapping : Not applicable to shape 2A/2C/3C/4C/6C/3D/4D/5D/9D
L(40) ···▸ B=6 When full length L is (40), blade length B is 6mm uniformly.
L(50) ···▸ B=13 When full length L is (50), blade length B is 13mm uniformly.
SJ—C ···▸ D≧10, L≧60 When SJ—C, D is 10~25 and full length L is 60 or more.
SJ—C L=60 ···▸ B=13 When SJ—C and full length L is 60, blade length B is 13mm uniformly.
P>D−0.03 ···▸ ℓ=0 In case of P>D−0.03, D $^{-0.01}_{-0.03}$ (Press-in lead) is not included.
*P=D can be specified. P=D ···▸ P T m5 ・ℓ=0 *When P=D, tolerance of P is m5 and D $^{-0.01}_{-0.03}$ (Press-in lead) is not included.
For the shapes with dimension d, please pay special attention to dmin.

Order

Catalog No.	L	P・E・V・R・Q・A・K・F・S
SJ2C 16	70	P12.00 V9.00 A30 F65.0 S3

Delivery 3 Days | Express A 800/1pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No.	L (LC)	P・E・V・R・Q・A・K・F・S	(HC・TC···etc.)
SJ2C 16	LC75.0	P 12.00 V9.00 A30 F65.0 S3	LKC FKC

Alteration	Code	Spec.	¥/1Code
Head: HC	HC	Changes head diameter D≦HC<H 0.1mm increments	200
Head: TC	TC	Changes head thickness 3.5≦TC<5 0.1mm increments (Combination with TKC・TKM→0.01mm increments) L is shortened by (5−TC).	200
Head: TCC	TCC	Adds Chamfering to head The strength of the punch head is increased P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 H≦5 : TCC 0.5 SRC : Not applicable	200
Head: KC	KC	Adds single key flat	200
Head: WKC	WKC	Adds double key flats in parallel	400
Head: RC	RC	Reduces head thickness by −0.04~0 from retainer surface	200
Head: SRC	SRC	Modifies head to fit select retainer (SLS) For details, refer to P.673 Applicable to D10~25	300
Head: T	TKC	Changes head thickness tolerance $5^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	200
Head: T	TKM	Changes head thickness tolerance $5^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	200

Alteration	Code	Spec.	¥/1Code
Full length: LC	LC	Changes full length LC<L 0.1mm increments Blade length B is shortened by (L−LC) The projection length of jector pin is 2mm.	200
Full length: LT	LKC	Changes tolerance on L $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	400
Blade: PT	PKC	Changes tolerance on P $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Lapping type : Not applicable	400
Blade: AT	AKC	Changes tolerance on A A±30′ ⇨ ±10′ Lapping type : Not applicable	400
Blade: KT	KKC	Changes tolerance on K K±30′ ⇨ ±10′ Lapping type : Not applicable	400
Blade: RT	RKC	Changes tolerance on R R±0.5 ⇨±0.05 Lapping type : Not applicable Applicable within the range of 0.1≦R≦10	400
Blade: QT	QKC	Changes tolerance on Q Q±0.5 ⇨±0.05 Lapping type : Not applicable Applicable within the range of 0.1≦Q≦10	400
Others	NDC	No press-in lead. ℓ≧3 ⇨ ℓ=0	0
Others	AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	−100
Others	NC	Removes the jector pin. Combination with AC : Not applicable	−200
Others: FT	FKC	Changes tolerance on F $F^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	800

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Standard type

Type	D	U/Price Q'ty : 1~9 2A~4A	2B·5B~7B	2C~8C	3D~7D·9D
SJ	4	2,210	2,500	2,970	3,440
	5	2,140	2,410	2,880	3,360
	6	2,140	2,410	2,880	3,360
	8	2,470	2,750	3,210	3,740
	10	2,600	2,880	3,360	3,880
	13	2,760	3,040	3,520	4,020
	16	3,240	3,520	3,990	4,530
	20	3,700	3,990	4,450	5,010
	25	4,090	4,360	4,840	5,400
PJ	4	3,040	3,350	3,870	4,370
	5	2,910	3,210	3,720	4,240
	6	2,910	3,210	3,720	4,240
	8	3,690	4,000	4,510	5,070
	10	4,160	4,460	4,980	5,550
	13	5,170	5,490	6,000	6,560
	16	6,290	6,590	7,100	7,700
	20	7,550	7,860	8,380	8,990
	25	9,160	9,430	9,960	10,570
SJ—C	10	3,160	3,440	3,820	4,400
	13	3,250	3,520	3,900	4,490
	16	3,700	3,990	4,440	4,950
	20	4,490	4,760	5,240	5,790
	25	4,650	4,930	5,380	6,110

■Lapping type

Type	D	U/Price Q'ty : 1~9 3A·4A	2B·5B~7B	5C·7C·8C	6D·7D
L—SJ	4	3,810	4,100	4,570	5,040
	5	3,740	4,010	4,480	4,960
	6	3,740	4,010	4,480	4,960
	8	4,070	4,350	4,810	5,340
	10	4,200	4,480	4,960	5,480
	13	4,360	4,640	5,120	5,620
	16	4,840	5,120	5,590	6,130
	20	5,300	5,590	6,050	6,610
	25	5,690	5,960	6,440	7,000
L—PJ	4	4,840	5,150	5,670	6,170
	5	4,710	5,010	5,520	6,040
	6	4,710	5,010	5,520	6,040
	8	5,490	5,800	6,310	6,870
	10	5,960	6,260	6,780	7,350
	13	6,970	7,290	7,800	8,360
	16	8,090	8,390	8,900	9,500
	20	9,350	9,660	10,180	10,790
	25	10,960	11,230	11,760	12,370
L—SJ—C	10	4,760	5,040	5,420	6,000
	13	4,850	5,120	5,500	6,090
	16	5,300	5,590	6,040	6,550
	20	6,090	6,360	6,840	7,390
	25	6,250	6,530	6,980	7,710

JECTOR DRAWING PUNCHES
—DICOAT® TYPE/TiCN COATING TYPE—

PRODUCTS DATA P.1215 ·1220

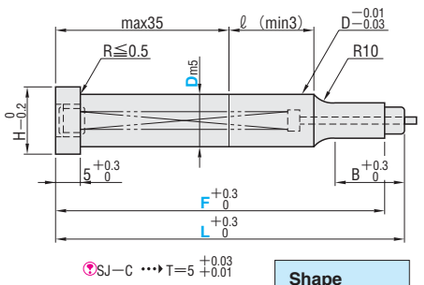
DICOAT® PUNCHES
COATING PUNCHES
—TiCN—

The volume discount rate is also applicable to alteration cost. P.39

How to calculate the projection length of jector pin (reference value) P.191

● Refer to JECTOR PUNCH BLANKS for the details of jector hole. P.186
● Refer to JECTOR PIN SETS for the jector pin. P.189

Type	M	H	Shank dia.D	Catalog No.
RoHS Standard type	SKD11 or equivalent	60~63HRC Surface 3000HV	4~25	DICOAT® T—SJ
	Powdered high-speed steel	64~67HRC Surface 3000HV	4~25	TiCN coating H—PJ
RoHS With dowel	SKD11 or equivalent	60~63HRC	10~25	DICOAT® T—SJ—C



SJ—C ···▸ T=5 +0.03 +0.01

Shape P.597

B	H	Catalog No. Type	Shape	D	L	0.01mm increments min. P max.	Vmin.	dmin.
8	7	DICOAT® Standard type T—SJ / TiCN coating H—PJ; With dowel T—SJ—C (D10~25 L60~100)	2A~4A 2B 5B~7B 2C~8C 3D~7D 9D	4	40 50 60 70 80	2.00~ 3.99	1.00	1.00
	8			5		2.00~ 4.99	2.00	2.00
	9			6		2.00~ 5.99	2.00	2.00
13	11			8	(40) (50) 60 70 80 90 100	3.00~ 7.99	3.00	3.00
	13			10		3.00~ 9.99	3.00	3.00
	16			13		6.00~ 12.99	6.00	6.00
19	19			16		10.00~ 15.99	6.00	6.00
	23			20		13.00~ 19.99	6.00	6.00
	28			25		18.00~ 24.99	6.00	6.00

L(40) ···▸ B=6 When Full length L is (40), blade length B is 6mm uniformly.
L(50) ···▸ B=13 When Full length L is (50), blade length B is 13mm uniformly.
T—SJ—C ···▸ D≧10, L≧60 When T—SJ—C, D is 10~25 and Full length L is 60 or more.
T—SJ—C L=60 ···▸ B=13 When T—SJ—C and Full length L is 60, blade length B is 13mm uniformly.
P>D−0.03 ···▸ ℓ=0 In case of P>D−0.03, D $^{-0.01}_{-0.03}$ (Press-in lead) is not included.
For the shapes with dimension d, please pay special attention to dmin.

Order

Catalog No.	—	L	—	P · E · V · R · Q · A · K · F · S
T—SJ2C 16	—	70	—	P12.00 — V9.50 — A30 — F65.0 — S3

Delivery 3 Days

Alteration

Catalog No.	—	L (LC)	—	P · E · V · R · Q · A · K · F · S	— (HC · TC···etc.)
T—SJ 2C 16	—	LC75.0	—	P 12.00— V9.50—A30—F65.0—S3	— LKC

	Alteration	Code	Spec.	¥/1Code
Head		HC	Changes head diameter D≦HC<H 0.1mm increments	200
		TC	Changes head thickness 3.5≦TC<5 0.1mm increments (Combination with TKC·TKM→0.01mm increments) Full length L is shortened by (5—TC).	200
		TCC	Adds Chamfering to head The strength of the punch head is increasecd. P.1223 0.1mm increments 0.5≦TCC≦(H—D)/2 H≦5 : TCC 0.5 ⊗Combination with SRC : Not applicable	200
		KC	Adds single key flat	200
		WKC	Adds double key flats in parallel	400
		RC	Reduces head thickness by −0.04~0 from retainer surface	200
		SRC	Modifies head to fit select retainer (SLS) For details, refer to P.673 Applicable to D10~25	300
	T	TKC	Changes head thickness tolerance 5 +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness tolerance 5 +0.3 0 ⇨ 0 −0.02	200
Full length		LC	Changes full length LC<L 0.1mm increments Blade length B is shortened by (L—LC) The projection length of jector pin is 2mm.	200
	L	LKC	Changes tolerance on L L +0.3 0 ⇨ +0.05 0	400

	Alteration	Code	Spec.	¥/1Code
Blade		SC	Finishes blade with lapping The dimension P tolerance and specification units are not been changed. The base material is finished before coating. ⊗Not applicable to DICOAT® punches ⊗Not applicable to shape 2A/2C/3C/4C/6C/3D/4D/5D/9D ⊗Combination with AKC·KKC·RKC·QKC : Not applicable	1,200
	A T	AKC	Changes tolerance on A A±30′ ⇨ ±10′ ⊗DICOAT® punches : Not applicable	400
	K T	KKC	Changes tolerance on K K±30′ ⇨ ±10′ ⊗DICOAT® punches : Not applicable	400
	R T	RKC	Changes tolerance on R R±0.5 ⇨±0.05 ⊗DICOAT® punches : Not applicable Applicable within the range of 0.1≦R≦10	400
	Q T	QKC	Changes tolerance on Q Q±0.5 ⇨±0.05 ⊗DICOAT® punches : Not applicable Applicable within the range of 0.1≦Q≦10	400
Others		NDC	No press-in lead. ℓ≧3 ⇨ ℓ=0	0
		AC	Removes jector pin and plug up the side vent with ring type resin (ABS) from inside to make the jector hole for through air hole.	—100
		NC	Removes the jector pin. ⊗Combination with AC : Not applicable	—200
	F T	FKC	Changes tolerance on F F +0.3 0 ⇨ +0.05 0 ⊗DICOAT® punches : Not applicable	800

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■DICOAT® type

Type	D	U/Price Q'ty : 1~9 2A~4A	2B·5B~7B	2C~8C	3D~7D·9D
T—SJ	4	4,520	4,820	5,360	5,880
	5	4,390	4,710	5,230	5,760
	6	4,400	4,720	5,240	5,770
	8	4,880	5,190	5,710	6,290
	10	5,250	5,550	6,090	6,670
	13	5,650	5,950	6,490	7,060
	16	6,050	6,360	6,880	7,490
	20	6,880	7,190	7,710	8,330
	25	7,290	7,600	8,140	8,760
T—SJ—C	10	5,810	6,110	6,550	7,190
	13	6,140	6,430	6,870	7,530
	16	6,510	6,830	7,330	7,910
	20	7,670	7,960	8,500	9,110
	25	7,850	8,170	8,680	9,470

■TiCN coating type

Type	D	U/Price Q'ty : 1~9 2A~4A	2B·5B~7B	2C~8C	3D~7D·9D
H—PJ	4	4,340	4,650	5,170	5,670
	5	4,270	4,570	5,080	5,600
	6	4,410	4,710	5,220	5,740
	8	5,350	5,650	6,160	6,720
	10	5,980	6,280	6,800	7,370
	13	7,160	7,480	7,990	8,550
	16	8,480	8,770	9,280	9,890
	20	9,960	10,270	10,790	11,400
	25	11,670	11,940	12,470	13,080

Express service system P.38 MISUMI Press 2007 http://misumi.jp/press/ For inquiry, ordering and other information, refer to P.1269

DRAWING BUTTON DIES / KNOCKOUT PINS
—STEEL—

PRESS ADD.SPEC. Printed in Red

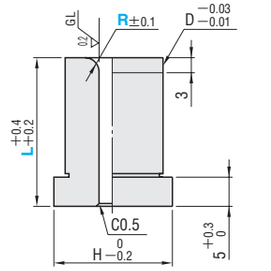
Headed type

Straight type

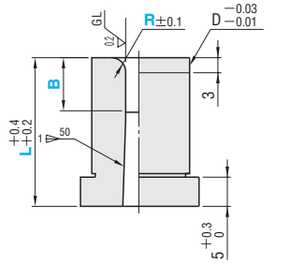
RoHS

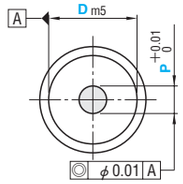
Headed type	Straight type	M	H
HDC2S	HSC2S	SKD11 or equivalent	60～63HRC
HDC2B	HSC2B		
PHC2S	PSC2S	Powdered high-speed steel	64～67HRC
PHC2B	PSC2B		

HDC2S M SKD11 or equivalent
PHC2S M Powdered high-speed steel

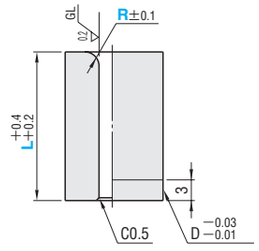


HDC2B M SKD11 or equivalent
PHC2B M Powdered high-speed steel

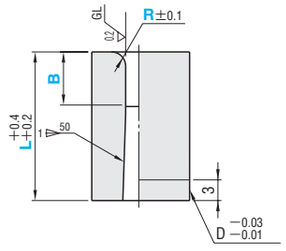


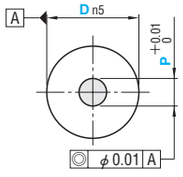


HSC2S M SKD11 or equivalent
PSC2S M Powdered high-speed steel



HSC2B M SKD11 or equivalent
PSC2B M Powdered high-speed steel





Catalog No. Type	D	0.1mm increments L	0.01mm increments min. P max.	1mm increments B	0.1mm increments R	H
M SKD11 or equivalent HDC2S / HSC2S	6	16.0 ～ 25.0	2.20 ～ 3.00	—	0.2～ (D−P−2)/2 (R=0 can also be specified)	9
	8		2.50 ～ 4.00			11
	10		3.00 ～ 5.00			13
	13		4.00 ～ 6.50			16
M Powdered high-speed steel PHC2S / PSC2S	16		5.00 ～ 8.00			19
	20		8.00 ～10.00			23
	25		10.00 ～12.50			28
M SKD11 or equivalent HDC2B / HSC2B	6	16.0 ～ 35.0	2.20 ～ 3.00	B≦P×3 and B≦L/2+2	0.2～ (D−P−2)/2 (R=0 can also be specified)	9
	8		2.50 ～ 4.00			11
	10		3.00 ～ 5.00			13
	13		4.00 ～ 6.50			16
M Powdered high-speed steel PHC2B / PSC2B	16		5.00 ～ 8.00			19
	20		8.00 ～10.00			23
	25		10.00 ～12.50			28

Order

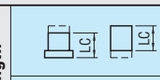
Catalog No.	L	P	B	R
PHC2S 13	22.0	P5.50		R1.4
HDC2B 13	22.0	P5.50	B8	R1.4

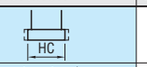
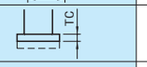
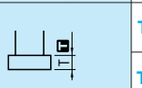
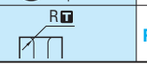
Delivery 5 Days

The volume discount rate is also applicable to alteration cost. P.39

Alteration

Catalog No. – L(LC) – P – B – R – (HC・TC…etc.)
HSC2B 13 – LC21.0 – P5.50 – B8 – R1.4 – HC15

Alteration		Code	Spec.	¥/1Code
Full length		LC	Changes full length 13≦LC＜16 0.1mm increments (Combination with LKC→0.01mm incr.) Press-in lead is shortened by (L−LC).	200
		LKC	Changes tolerance on full length L +0.4 +0.2 ⇨ +0.05 0	400

Alteration		Code	Spec.	¥/1Code
Head		HC	Changes head diameter D≦HC＜H 0.1mm increments	200
		TC	Changes head thickness 2≦TC＜5 0.1mm increments (Combination with TKC・TKM→0.01mm incr.) Full length does not change.	200
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0 ⊗L＜16：Not applicable	200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02 ⊗L＜16：Not applicable	200
Others		PKC	Changes tolerance on P P +0.01 0 ⇨ +0.005 0	400
		RKC	Changes tolerance on R R±0.1 ⇨±0.05	600

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Headed type

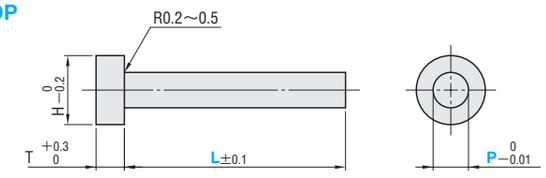
D	U/Price Q'ty：1～4			
	HDC2S	PHC2S	HDC2B	PHC2B
6	8,670	10,080	9,450	11,090
8	9,210	10,670	10,030	11,740
10	10,410	11,990	11,370	13,180
13	10,950	13,150	11,880	14,470
16	14,090	16,610	15,340	18,280
20	17,610	20,480	19,190	22,530
25	19,540	22,660	21,290	24,930

■Straight type

D	U/Price Q'ty：1～4			
	HSC2S	PSC2S	HSC2B	PSC2B
6	8,100	9,640	8,880	10,610
8	8,400	9,940	9,230	10,930
10	9,750	11,400	10,700	12,540
13	10,900	12,570	11,830	13,830
16	13,300	15,190	14,550	16,710
20	16,850	19,140	18,420	21,050
25	18,730	21,430	20,490	23,580

■Knockout pins RoHS

KOP

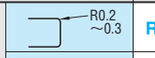
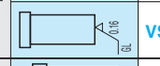
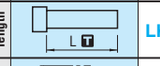
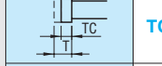
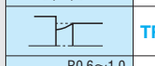
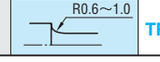


M SK4 or equivalent
H 53～58HRC

T	H	Catalog No.		0.1mm increments L	0.01mm increments min. P max.	U/Price Q'ty：1～19
3	6	KOP	4	7.0～60.0	1.00～ 4.00	460
	8		6		1.00～ 6.00	490
5	10		8		2.00～ 8.00	620
	12		10		3.00～10.00	720
	14		12		4.00～12.00	1,210
	16		13		6.00～13.00	1,360

Alteration

Catalog No. – L – P – (HC・TC…etc.)
KOP 6 – 45.5 – P5.50 – VSC

Alteration		Code	Spec.	¥/1Code
Tip		RC	Adds R0.2～0.3 to pin tip	200
		VSC	Adds lapping pin tip	300
Full length		LKC	Changes tolerance on L L±0.1 ⇢ ±0.02	400
Head		HC	Changes head diameter P≦HC＜H 0.1mm increments	200
		TC	Changes head thickness 3.5≦TC＜5 0.1mm increments Applicable to KOP8～13	200
		TRN	Adds undercut at the bottom of the head (Chamfering of plate is not required)	100
		TRC	Changes R at the bottom of the head R0.2～0.5 is changed to 0.6～1.0 Applicable to H−P≧3.5	400

Order

Catalog No.	L	P
KOP 6	15.5	P3.50

Delivery 3 Days — Express A 300/1pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size.

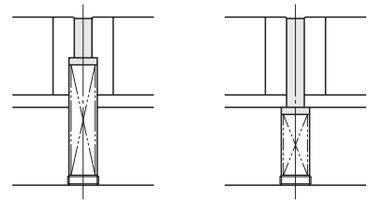
Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example



■Features

- Use as knockout pin for drawing die (P.611).
- The dimension of the head diameter is the one that can be inserted in the relief hole of the die.
- The shape of R at the bottom of the head can be changed by alteration.

DRAWING BUTTON DIES
—CARBIDE—

The volume discount rate is also applicable to alteration cost. P.39

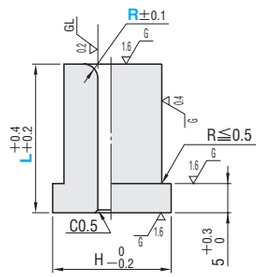
Headed type

Straight type

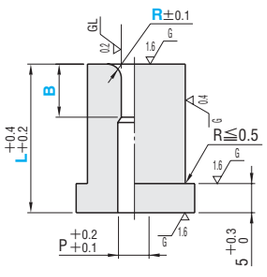
RoHS

Headed type	Straight type	M	H
WHA2S	WSA2S	Super corpuscle (HIP)	90～92HRA
WHA2A	WSA2A		
WHA2B	WSA2B		
WHB2S	WSB2S	V40 (HIP)	87～88HRA
WHB2A	WSB2A		
WHB2B	WSB2B		

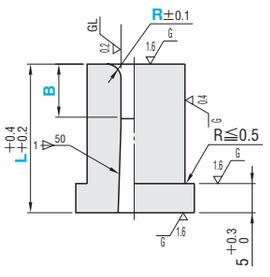
WHA2S M Super corpuscle
WHB2S M V40

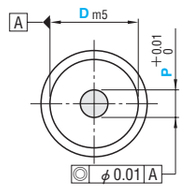


WHA2A M Super corpuscle
WHB2A M V40

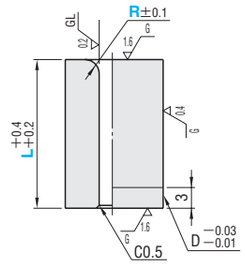


WHA2B M Super corpuscle
WHB2B M V40

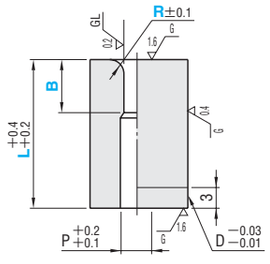




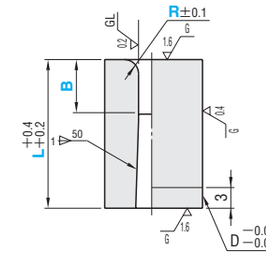
WSA2S M Super corpuscle
WSB2S M V40

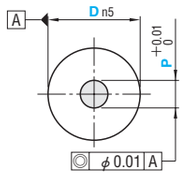


WSA2A M Super corpuscle
WSB2A M V40



WSA2B M Super corpuscle
WSB2B M V40





Catalog No. Type		D	L	0.01mm increments min. P max.	1mm increments B	0.1mm increments R	H
M Super corpuscle / M V40	WHA2S WSA2S WHB2S WSB2S	6	16	2.20～3.00	—	0.2～(D−P−2)/2 (R=0 can also be specified)	9
		8		2.50～4.00			11
		10	20	3.00～5.00			13
		13		4.00～6.50			16
		16	22	5.00～8.00			19
		20	25	8.00～10.00			23
		25		10.00～12.50			28
M Super corpuscle / M V40	WHA2A WSA2A WHB2A WSB2A WHB2B WSB2B	6	16	2.20～3.00	B≦P×3 (2B type only and B≦L/2+2)	0.2～(D−P−2)/2 (R=0 can also be specified)	9
		8		2.50～4.00			11
		10	20	3.00～5.00			13
		13		4.00～6.50			16
		16	22	5.00～8.00			19
		20	25	8.00～10.00			23
		25		10.00～12.50			28

Order

Catalog No.	L	P	B	R
WHB2S 13	22	P5.50		R1.4
WHB2A 13	22	P5.50	B8	R1.4

Delivery 8 Days

Alteration

Catalog No. — L(LC) — P — B — R — (HC・TC…etc.)
WHB2A 13 — LC21 — P5.50 — B8 — R1.4 — HC15

Alteration		Code	Spec.	¥/1Code
Head	HC	HC	Changes head diameter D≦HC＜H 0.1mm increments	600
	TC	TC	Changes head thickness 2≦TC＜5 0.1mm increments (Contination with TKC・TKM→0.01mm incr.) Full length L is shortened by (5−TC). When LC is also applied, L is equal to LC.	600
	T	TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0 ⊗L＜16：Not applicable	1,200
	T	TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02 ⊗L＜16：Not applicable	1,200

Alteration		Code	Spec.	¥/1Code
Full length	LC	LC	Changes full length 13≦LC＜L 0.1mm increments (Combination with LKC→0.01mm incr.)	600
	L	LKC	Changes tolerance on full length L +0.4 +0.2 ⇨ +0.05 0	1,200
Others	P	PKC	Changes tolerance on P P +0.01 0 ⇨ +0.005 0	1,200
	D	DKC	Changes tolerance on D Dm5 ⇨ +0.005 0	900
	R T	RKC	Changes tolerance on R R±0.1 ⇨±0.05	2,400

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Headed type

D	U/Price Q'ty：1～4					
	WHA2S	WHA2A	WHA2B	WHB2S	WHB2A	WHB2B
6	15,380	16,750	18,170	14,780	16,150	17,790
8	16,060	17,430	18,920	15,470	16,830	18,550
10	18,030	19,400	21,310	17,430	18,800	20,680
13	19,740	21,110	23,190	19,140	20,510	22,560
16	25,900	27,950	30,960	25,300	27,350	30,090
20	32,650	34,700	38,360	32,050	34,100	37,490
25	36,070	38,120	42,380	35,470	37,520	41,250

■Straight type

D	U/Price Q'ty：1～4					
	WSA2S	WSA2A	WSA2B	WSB2S	WSB2A	WSB2B
6	14,530	15,890	17,170	13,930	15,290	16,800
8	15,040	16,410	17,790	14,440	15,810	17,420
10	17,090	18,460	20,300	16,490	17,860	19,670
13	18,800	20,170	22,180	18,200	19,570	21,560
16	24,440	26,500	29,340	23,840	25,900	28,450
20	30,600	32,650	36,110	30,000	32,050	35,230
25	34,020	36,070	40,120	33,420	35,470	38,990

DRAWING BUTTON DIES

The volume discount rate is also applicable to alteration cost. P.39

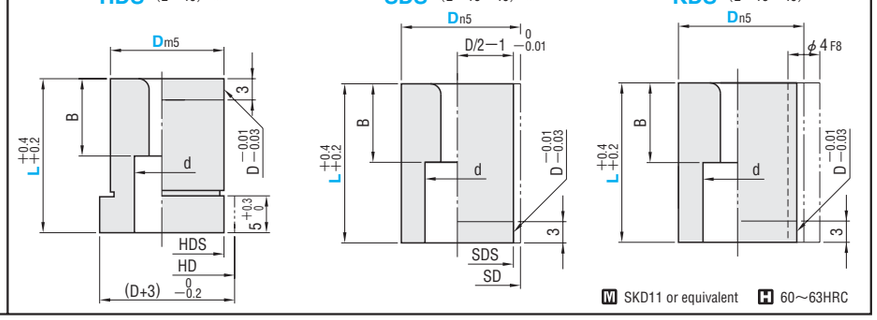
RoHS

Button dies type (For shape, select from 2A～4A/2B～5B/2C/3C shown below.)

(Headed type)
HD (L=16～35)
HDS (L=40) ＊

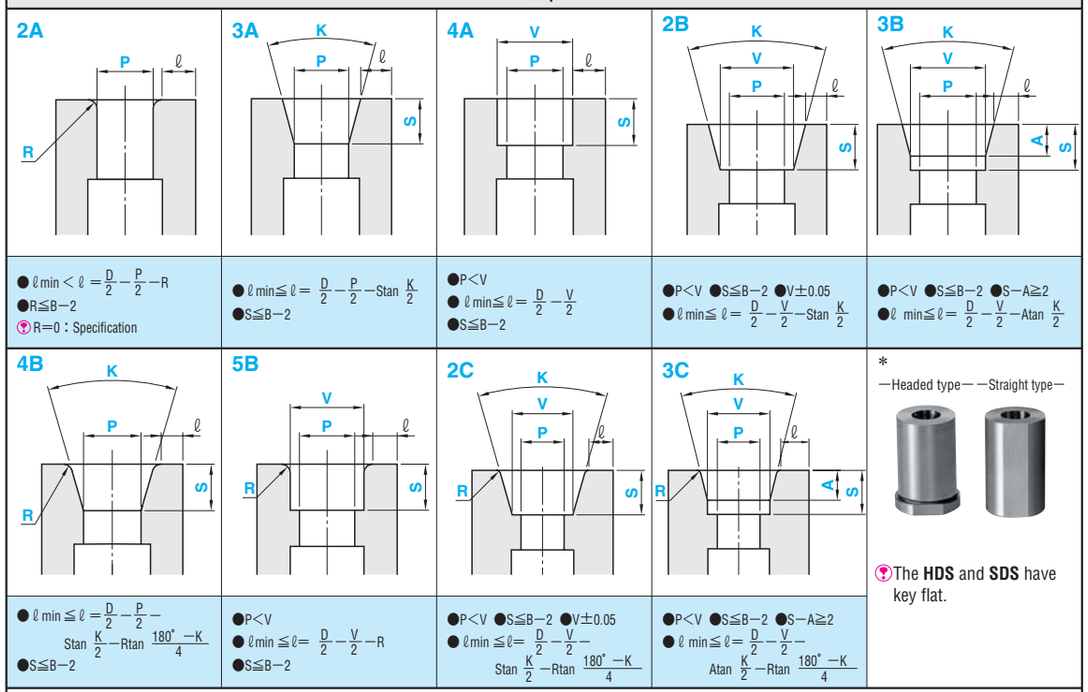
(Straight Type)
SD (L=16～35)
SDS (L=16～40) ＊

(Dowel slot type)
KD (L=16～35)
KDS (L=16～40)



M SKD11 or equivalent H 60～63HRC

Shape



2A	3A	4A	2B	3B
●ℓmin＜ℓ＝$\frac{D}{2}-\frac{P}{2}-R$ ●R≦B−2 (R=0：Specification)	●ℓmin≦ℓ＝$\frac{D}{2}-\frac{P}{2}$−Stan $\frac{K}{2}$ ●S≦B−2	●P＜V ●ℓmin≦ℓ＝$\frac{D}{2}-\frac{V}{2}$ ●S≦B−2	●P＜V ●S≦B−2 ●V±0.05 ●ℓmin≦ℓ＝$\frac{D}{2}-\frac{V}{2}$−Stan $\frac{K}{2}$	●P＜V ●S≦B−2 ●S−A≧2 ●ℓmin≦ℓ＝$\frac{D}{2}-\frac{V}{2}$−Atan $\frac{K}{2}$

4B	5B	2C	3C	＊
●ℓmin≦ℓ＝$\frac{D}{2}-\frac{P}{2}-$ Stan $\frac{K}{2}$−Rtan $\frac{180°-K}{4}$ ●S≦B−2	●P＜V ●ℓmin≦ℓ＝$\frac{D}{2}-\frac{V}{2}-R$ ●S≦B−2	●P＜V ●S≦B−2 ●V±0.05 ●ℓmin≦ℓ＝$\frac{D}{2}-\frac{V}{2}-$ Stan $\frac{K}{2}$−Rtan $\frac{180°-K}{4}$	●P＜V ●S≦B−2 ●S−A≧2 ●ℓmin≦ℓ＝$\frac{D}{2}-\frac{V}{2}-$ Atan $\frac{K}{2}$−Rtan $\frac{180°-K}{4}$	−Headed type− −Straight type−

(The **HDS** and **SDS** have key flat.)

(Internal corner) R≦0.5

Possible alteration ranges and specification unit

- R…0.2≦R≦10 T R±0.05 — 0.1mm increments
- K…1° ≦K≦179° T K±30′ — 1° increments
- S…S≧2 T S±0.1 — 0.1mm increments
- A…0.1mm increments T A±0.1
- P…0.01mm increments T P $^{+0.01}_{0}$
- V…0.01mm increments T V $^{+0.01}_{0}$
- ℓ… • HD • HDS • SD… ℓ min=0.5
  • SDS… ℓ min=1.5
  • KD • KDS… ℓ min=2.5

(Straight type SD：When KC is applied, ℓmin. is 1.5mm.

Catalog No. Type	D	L	0.01mm increments min. P max.	HD・SD KD B	HDS・SDS KDS B	d
Headed type	10	(16) 20 22 25 (28) 30 (32) 35 (40)	2.00 ～ 6.00	6		6.4
HD (L=16～35)	13		3.00 ～ 8.00	8	10	8.4
HDS(L=40)	16		5.00 ～ 10.00			10.6
Straight type	20		7.00 ～ 12.00		12	12.6
SD (L=16～35)	25		10.00 ～ 16.00			16.6
SDS(L=16～40)	32		15.00 ～ 20.00		15	20.6
Dowel slot type	38		19.00 ～ 26.00			26.6
KD (L=16～35)	45		25.00 ～ 35.00			36.0
KDS(L=16～40)	50		33.00 ～ 45.00		20	41.0
	56		38.00 ～ 45.00			46.0

(16)…Applicable to D10～38 (40)…Only applicable to HDS・SDS・KDS (28)・(32)…Only applicable to D10～32 for HD・SD・KD

Order Catalog No. — L — P・V・R・K・S・A
HD3B 16 — 30 — P5.00—V6.00—K60—S5.0—A3.0

Delivery 3 Days
Express A 800/1pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC) — P(PC)・V・R・K・S・A — (HC・TC…etc.)
HD3B 16 —LC34.0— P5.00—V6.00—K60—S5.0—A3.0 — TC4.00—TKC

Alteration	Code	Spec.	¥/1Code
Tip	PC	Changes tip diameter P＞PC≧$\frac{Pmin}{2}$≧1.90 0.01mm increments	200
Full length	LC	Changes full length ●HD・HDS L−(B−S(R))+2≦LC＜L 0.1mm increments (Press-in lead is shortened by (L−LC). (Dimension B is shortened by (L−LC). ●SD・SDS・KD・KDS 10≦LC＜L 0.1mm increments (Press-in lead is shortened by (L−LC). (Combination with LKC→0.01mm incr.)	200
	LKC	Overall length tolerance alteration L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$	400

Alteration	Code	Spec.	¥/1Code
Head	HC	Changes head diameter D≦HC＜H 0.1mm increments	200
	TC	Changes head thickness 2≦TC＜5 0.1mm increments (Combination with TKC・TKM→0.01mm incr.) (Full length L is shortened by (5−TC). When LC is also applied, L is equal to LC.	200
	KC	⊗Not applicable to HDS/SDS/KD/KDS	200
	RC	Reduces head thickness by −0.04～0 from retainer surface ⊗L＜30：Not applicable	200
	TKC	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗L＜16：Not applicable	200
	TKM	Changes head thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗L＜16：Not applicable	200

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

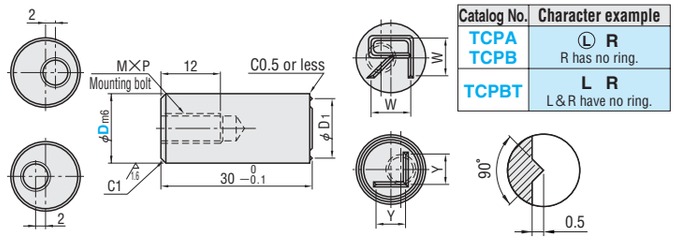
Type	D	U/Price Q'ty：1～9 2A・3A・4A	2B・3B・4B・5B	2C・3C
HD SD	10	3,550	4,250	5,280
	13	3,370	4,070	5,020
	16	3,550	4,250	5,370
	20	3,730	4,500	5,620
	25	4,070	4,850	5,980
	32	4,500	5,280	6,330
	38	5,280	6,060	7,100
	45	10,200	11,490	13,360
	50	11,650	13,030	14,890
	56	13,360	14,730	16,680
KD	10	4,070	4,760	5,710
	13	3,900	4,500	5,540
	16	4,070	4,760	5,890
	20	4,250	5,020	6,060
	25	4,590	5,370	6,500
	32	5,020	5,710	6,840
	38	5,800	6,500	7,620
	45	10,680	11,980	13,920
	50	12,140	13,520	15,460
	56	13,920	15,220	17,160

Type	D	U/Price Q'ty：1～9 2A・3A・4A	2B・3B・4B・5B	2C・3C
HDS SDS	10	3,810	4,500	5,460
	13	3,640	4,250	5,280
	16	3,810	4,500	5,620
	20	3,990	4,760	5,890
	25	4,330	5,110	6,240
	32	4,760	5,460	6,590
	38	5,540	6,240	7,360
	45	10,440	11,740	13,600
	50	11,900	13,270	15,220
	56	13,600	14,890	16,920
KDS	10	4,330	5,020	5,980
	13	4,160	4,760	5,800
	16	4,330	5,020	6,060
	20	4,500	5,280	6,330
	25	4,850	5,620	6,670
	32	5,190	5,980	7,100
	38	5,980	6,760	7,880
	45	10,930	12,220	14,080
	50	12,380	13,840	15,700
	56	14,170	15,460	17,410

ENGRAVING PUNCHES

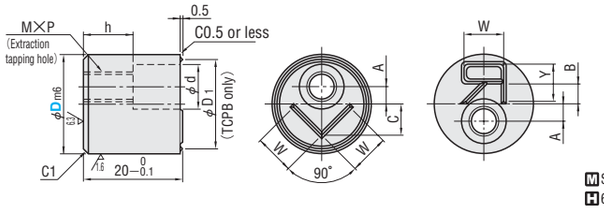
■R・L type RoHS

TCPA
(One character)



Catalog No.	Character example
TCPA TCPB	Ⓛ R R has no ring.
TCPBT	L R L & R have no ring.

TCPB (Mounting bolt M5)
TCPBT (Mounting bolt M8)
(One character)

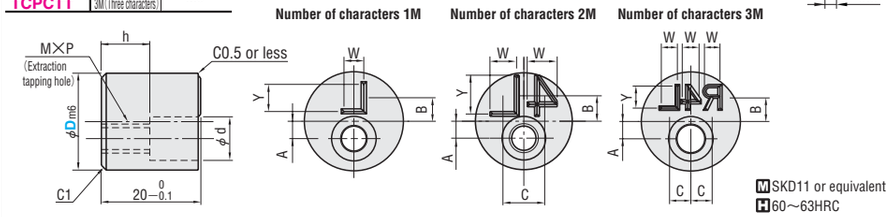


M SKD11 or equivalent
H 60～63HRC

A	B	C	M×P	ϕd	h	ϕD1	W	Y	ϕDm6	Mounting bolt	Catalog No. Type	Catalog No. D	CHR Character	U/Price Q'ty：1～4
—	—	—	M4×P0.7	—	—	8	5	3	10 +0.015 +0.006	M4	TCPA	10	R	4,040
—	—	—	M6×P1.0	—	—	12	8	6	14 +0.018 +0.007	M6	TCPA	14	R	4,220
1.5	4.5	5.7	M6×P1.0	9	10	14	4	3.2	16 +0.018 +0.007	M5	TCPB	16	R	4,220
3.5	4.0	6.5				18	8	8	20 +0.021 +0.008		TCPB	20	L	4,360
2.5	6.5	8.5	M10×P1.5	13.5	7	—	5.5	5.5	20 +0.021 +0.008	M8	TCPBT	20	L	4,360

■Free type RoHS

Type	Number of characters	Mounting bolt
TCPBS	1M (One character)	M5
TCPBW	2M (Two characters)	
TCPCT	3M (Three characters)	
TCPBWT	2M (Two characters)	M8
TCPCTT	3M (Three characters)	



M SKD11 or equivalent
H 60～63HRC

A	B	C	M×P	ϕd	h	W	Y	ϕDm6	Mounting bolt	Number of characters	Catalog No. Type	Catalog No. D	CHR Characters	U/Price Q'ty：1～4
2	5.2	—	M6×P1.0	9	10	2.5	3.5	16 +0.018 +0.007	M5	1M	TCPBS	16	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	4,600
3.5	5.2	—				4	6	20 +0.021 +0.008			TCPBS	20		5,000
5.5	4	—				6	8	24			TCPBS	24		5,600
3.5	4.75	5.6				4	5.5	20		2M	TCPBW	20		5,090
5.5	4	8				6	8	24			TCPBW	24		5,690
5.5	4	5				4	6			3M	TCPCT	24		6,200
4.5	5.8	8	M10×P1.5	13.5	7	5.5	5.5	24 +0.021 +0.008	M8	2M	TCPBWT	24		5,690
4.5	6	5				3.3	5			3M	TCPCTT	24		6,200

Order

Catalog No.	—	CHR
TCPB 20	—	L
TCPCTT 24	—	R4L

Actual engraving

Delivery

●R・L type

3 Days	Express T 1,600/1pc.
	Express A 800/1pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

●Free type

5 Days	Express B 500/1pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

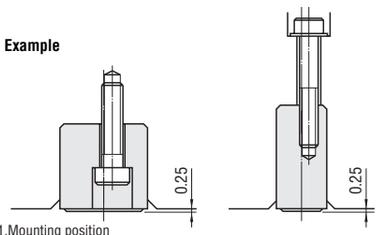
Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

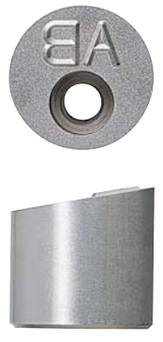
Example



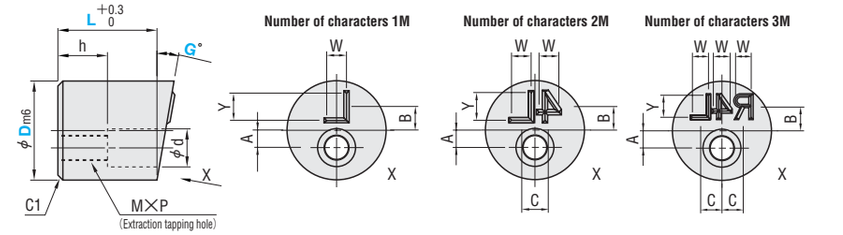
1.Mounting position
①Choose a place where an engraved mark does not affect any function of subject product.
②Then, choose the most flat surface in that place, and mount the punch to be perpendicular to the surface.
2.Mount with bolt and have the punch protrude 0.25mm past the mounting surface. (The depth of engraved character：0.25mm)

ENGRAVING PUNCHES FOR SLANTED SURFACE / SHIMS

RoHS



Catalog No. Type	Number of characters	Mounting bolt
TCPTS	1M (One character)	M5
	2M (Two characters)	
	3M (Three characters)	
TCPTL	2M (Two characters)	M8
	3M (Three characters)	



M SKD11 or equivalent
H 60～63HRC

A	B	C	M×P	ϕd	h	W	Y	Number of characters	ϕDm6	Mounting bolt	Catalog No. Type	Catalog No. D	L	1° increments G	CHR Character	U/Price Q'ty：1～4
3.5	5.2	—	M6×P1.0	9	10	4	6	1M	+0.021 +0.008	M5	TCPTS	1M 20	20	1～10°	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	7,000
5.5	4	—				6	8					1M 24				7,400
3.5	4.75	5.6				4	5.5	2M				2M 20				7,400
5.5	4	8				6	8					2M 24				7,800
5.5	4	5				4	6	3M				3M 24				8,300
4.5	5.8	8	M10×P1.5	13.5	7	5.5	5.5	2M		M8	TCPTL	2M 24	25			7,800
4.5	6	5				3.3	5	3M				3M 24				8,300

Order

Catalog No.	—	L	—	G	—	CHR
TCPTS1M20	—	25	—	G3	—	L
TCPTL3M24	—	20	—	G10	—	R4L

Actual engraving

Delivery

5 Days	Express B 500/1pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price

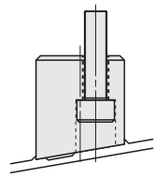
■Volume discount rate P.37

Quantity	1～4	5～9	10～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

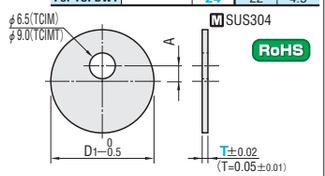
Example

Can be used to engrave character (s) on slanted surface of casting die, etc.



■Shims

Available	Type	No.	D1	A
For TCPB For TCPBW	TCIM	16	14	1.5
		20	18	3.5
		24	22	5.5
For TCPBT For TCPBWT	TCIMT	20	18	2.5
		24	22	4.5



M SUS304

RoHS

Catalog No. Type	No.	T	U/Price Q'ty：1～4
TCIM TCIMT	(16)	0.05	140
		0.1	160
		0.2	230
	20	0.3	330
		0.5	430
		1.0	540
	24	0.05	170
		0.1	190
		0.2	280
		0.3	380
		0.5	490
		1.0	600

No.（16）：TCIM only.
No. in the table are outside diameter codes for TCPB, TCPBT, TCPBW and TCPBWT.

Order

Catalog No.	—	T
TCIM 16	—	0.05

Delivery

3 Days	Express T 600/1pc.
	Express A 300/1pc.

P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

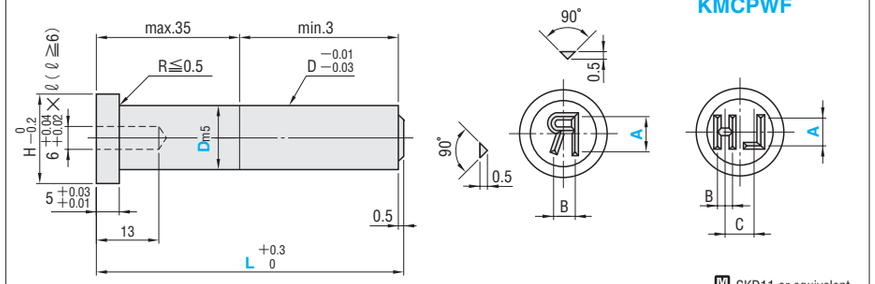
PRESS ADD.SPEC. Printed in Red

ENGRAVING PUNCHES

DIE CHECK BUTTONS / SHIMS

¥ The volume discount rate is also applicable to alteration cost. P.39

RoHS



H	B	C	Catalog No. Type	Catalog No. D	0.1 mm increments L	A	Character (Gothic) CHR	U/Price Q'ty：1～9
13	3.3	—	KMCP (One character)	10	30.0～120.0	5	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	3,370
	4			10		6		3,370
16	5.3			13		8		3,830
19	6.5			16		10		4,410
23	8.5			20		13		4,890
13	2.5	3.5	KMCPW (Two characters)	10	30.0～120.0	4	RH LH FR FL RR RL	3,800
16	3.3	5		13		5		3,830
19	4	6		16		6		4,410
23	5.3	8		20		8		4,890
28	6.5	10		25		10		5,230
13	2.5	3.5	KMCPWF (Specifiable two characters)	10	30.0～120.0	4	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	4,400
16	3.3	5		13		5		4,500
19	4	6		16		6		4,900
23	5.3	8		20		8		5,430
28	6.5	10		25		10		5,810

・KMCPW
RH···RIGHT HANDLE FR···FRONT RIGHT RR···REAR RIGHT
LH···LEFT HANDLE FL···FRONT LEFT RL···REAR LEFT

Order

Catalog No.	—	L	—	A	—	CHR
KMCP 13	—	110.0	—	A8	—	G
KMCPWF 16	—	110.0	—	A6	—	AB

Delivery

● KMCP・KMCPW: 3 Days — Express A 800/1pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

● KMCPWF: 5 Days — Express B 800/1pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

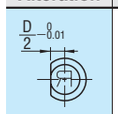
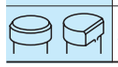
■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

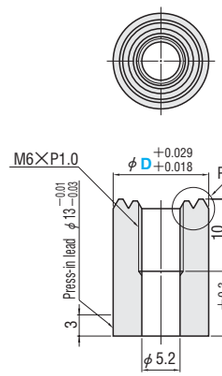
Catalog No.	—	L	—	A	—	CHR	—(KC・SRC)
KMCP 10	—	80.0	—	A5	—	R	— KC90

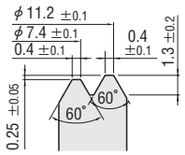
Alteration	Code	Spec.	¥/1Code
	KC	Adds single key flat 90° increments KC0 KC90 KC180 KC270	200
	SRC	Modifies head to fit select retainer (SLS). For details, refer to P.673	100

■Die check buttons

RoHS

Catalog No.	M	H
DCBAW13	SKS3	56～58HRC

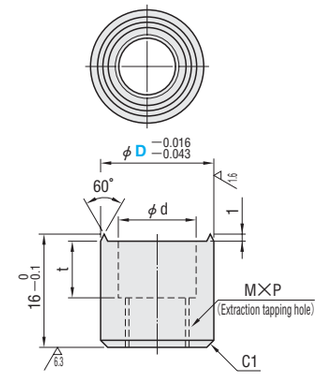




Part A details

Use a plastic hammer to press fit DCBAW13.

Catalog No.	M	H
DCBA16	SKD11 or equivalent	60～63HRC
DCBA18		



φd	M×P	t	Catalog No. Type	Catalog No. D	U/Price Q'ty：1～4
—	M 8×P1.25	—	DCBAW	13	1,280
11	M 8×P1.25	8	DCBA	16	2,250
13.5	M10×P1.5	10		18	2,530

Order

Catalog No.
DCBA 16

Delivery

• DCBA16 • DCBA18: 3 Days — Express T 1,600/1pc. / Express A 800/1pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

• DCBAW13: 3 Days — Express A 500/1pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.

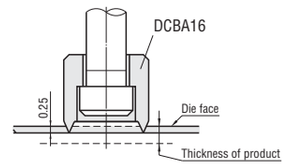
Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

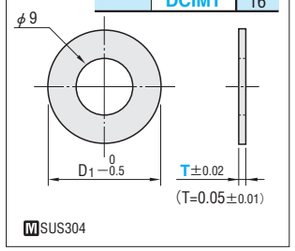
ex Example



1.Mounting position
①Choose a place where an engraved mark does not affect any function of subject product.
②Then, choose the most flat surface in that place, and mount the punch to be perpendicular to the surface.
2.Mount with bolt and have the punch protrude 0.25mm past the mounting surface.
(The depth of engraved character：0.25mm)

■Shims

Type		D1
For DCBA	DCIM	14
	DCIMT	16



M SUS304

Catalog No.	T	U/Price Q'ty：1～4 DCIM	DCIMT
DCIM DCIMT	0.05	140	160
	0.1	160	180
	0.2	230	270
	0.3	330	370
	0.5	430	480
	1.0	540	590

Order

Catalog No.	—	T
DCIM	—	0.05

Delivery

3 Days — Express T 600/1pc. / Express A 300/1pc. P.38
A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

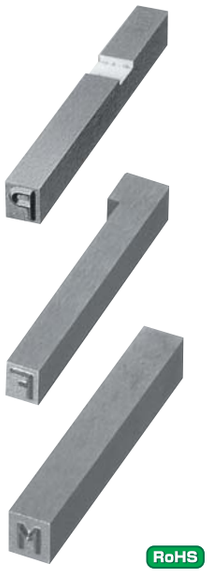
■Volume discount rate P.37

Quantity	1～4	5～9	10～29	30～50
Rate	—	5%	10%	15%

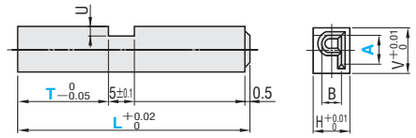
To be quoted on price & lead time above Max. Q'ty.

ENGRAVING BLOCK PUNCHES
—ONE CHARACTER TYPE—

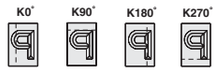
¥ The volume discount rate is also applicable to alteration cost. P.39



HCP (With key groove)

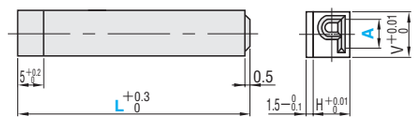


■Key groove position K

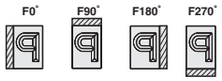


⊗ For HCP1.5, K0° and K180° cannot be specified.

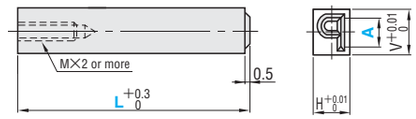
HCF (Single flanged)

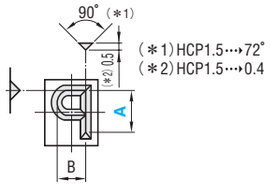


■Flange position F



HCM (Tapped)





※HCP in the photograph is K90, and HCF is F0.

Character font P.618

M SKH51
H 59～62HRC

U	M	V	H	B	Catalog No. Type	Catalog No. A	0.1mm increments L	0.1mm increments T	Character (Gothic) CHR	U/Price Q'ty：1～9
0.8	—	3	2	1	HCP	1.5	16.0～40.0	2≦T＜L	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	1,710
		4	3	1.3		2	16.0～50.0			1,710
1.0		5	4	2		3	16.0～60.0			1,830
		6	5	2.7		4	16.0～70.0			1,930
—	—	4	3	1.3	HCF	2	16.0～50.0	—		2,940
		5	4	2		3	16.0～60.0			3,040
		6	5	2.7		4	16.0～70.0			3,140
		8	6	3.4		5	16.0～70.0			3,180
—	3	5	5	1.3	HCM	2	16.0～50.0	—		2,940
		6	5	2		3	16.0～60.0			3,040
				2.7		4	16.0～70.0			3,040
	4	8	6	3.4		5	16.0～70.0			3,080

Katakana and symbols can be ordered by alteration. See Alteration below.
For the HCP 1.5, maintenance with a wire brush, etc. is recommended so that the characters closed parts do not become clogged.

Order

Catalog No.	L	T	CHR・No	K・F
HCP 3	50.0	T 15.0	P	K0
HCF 3	20.0		L	F90
HCM 3	50.0		I	

HCP → If no key groove is required, specify T as T=L.

Catalog No.	L	T	CHR	K・F
HCP 3	50.0	T50.0	P	K0

Delivery

● HCP: 3 Days — Express A 800/1pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

● HCF・HCM: 3 Days

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

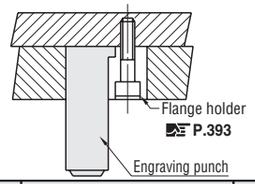
To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No.	L	T	CHR	K・F	(VKC・HKC)
HCP 3	50.0	T15.0	20 (→)	K0	

5 Days — Express delivery cannot be applied.

Example



Alteration	Character (Gothic) /Symbol No./CHR	¥/1Code
The symbols and Katakana in the table at right can be orderd as alteration. For symbols, specify the No. Applicable to HCP A2～4 only.	Symbol No. 10 11 12 13 14 15 16 17 18 19 — ± × ÷ = # % ～ ／ Symbol No. 20 21 22 23 24 25 26 27 28 29 30 → ↑ • . , ※ ( ) 「 」 ＝ Katakana アイウエオカキクケコサシスセソタチツテト ナニヌネノハヒフヘホマミムメモヤユヨラリ ルレロワン	700

Alteration	Code	Spec.	¥/1Code
V	VKC	Changes tolerance on V $V^{+0.01}_{0} \Rightarrow {}^{0}_{-0.01}$	200
H	HKC	Changes tolerance on H $H^{+0.01}_{0} \Rightarrow {}^{0}_{-0.01}$	200

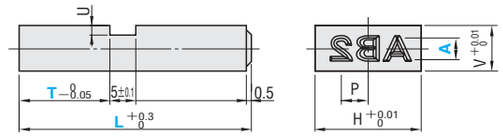
ENGRAVING BLOCK PUNCHES
—MULTIPLE CHARACTERS SPECIFIABLE TYPE—

PRESS ADD.SPEC. Printed in Red

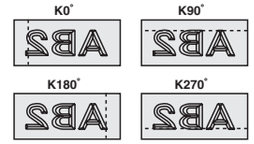
¥ The volume discount rate is also applicable to alteration cost. P.39

RoHS

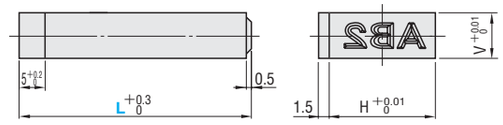
HCP□M (With key groove)



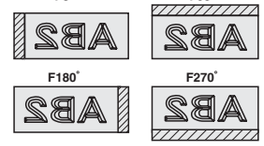
■Key groove position K



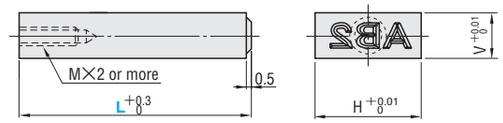
HCF□M (Single flanged)



■Flange position F



HCM□M (Tapped)

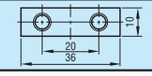


M SKD11 or equivalent
H 60～63HRC

U (With key groove)	M (Tapped)	V	H	P	B	Catalog No. Type	Catalog No. Number of characters	A	0.1mm increments L	0.1mm increments T (HCP□M only)	Character (Gothic) CHR	U/Price Q'ty：1～9
1.0	3	5	8	2.5	1.3	HCP HCF HCM	2M	2	20.0～70.0	2≦T＜L	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z (Note 1) ⌴ (Space) (Note 2) — (Hyphen)	4,200
			10				3M					4,490
							4M					4,990
			16				5M					5,910
							6M					6,410
			8	3.5	2.0		2M	3				4,700
			16				3M					4,990
							4M					5,490
			22				5M					6,600
							6M					7,100
1.5	5	8	12	4.9	3.4		2M	5				5,200
			20				3M					5,550
							4M					6,050
			30				5M					7,330
							6M					7,830
	6	10	16	6.0	4.0		2M	6				5,500
			25				3M					5,870
							4M					6,370
			36				5M					7,970
							6M					8,470

(Note 1) When specify ⌴ (space), use % instead.
(Note 2) When specify— (hyphen), use # instead.

H=36



Order

Catalog No.	A	L	T	CHR	K・F
HCP3M	3	50.0	T15.0	ABC	K90
HCF3M	3	20.0		%AB	F0
HCM4M	3	20.0		ABCD	
HCP4M	3	40.0	T10.0	A#B%C	K270
HCF5M	6	25.0		ABCDE	F0
HCM5M	6	25.0		A%B%C	

Example of marking layout

Catalog No.	A	L	T	CHR	K・F	(VKC・HKC)
HCP3M	3	50.0	T15.0	ABC		HKC

Delivery

5 Days — Express B 800/1pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration	Code	Spec.	¥/1Code
V	VKC	Changes tolerance on V $V^{+0.01}_{0} \Rightarrow {}^{0}_{-0.01}$	200
H	HKC	Changes tolerance on H $H^{+0.01}_{0} \Rightarrow {}^{0}_{-0.01}$	200

Engraving block punch	Character font
HCP (P.617) HCF (P.617) HCM (P.617) HCP□M HCF□M HCM□M	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

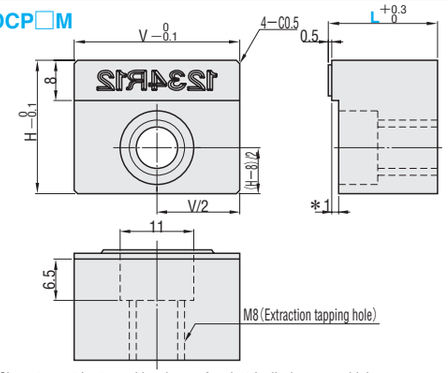
ENGRAVING BLOCK PUNCHES

PRESS NEW PRECISION ENGRAVING BLOCK PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

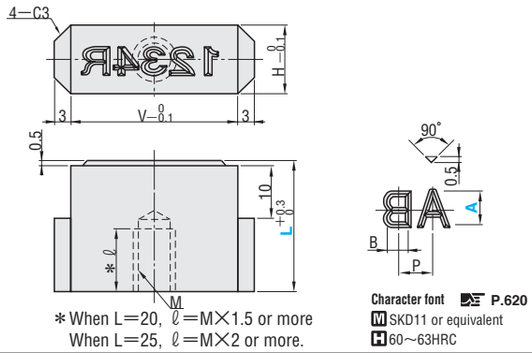
RoHS

OCP□M



*Character part is stepped in advance for electric discharge machining.

BCP□M



*When L=20, ℓ=M×1.5 or more
When L=25, ℓ=M×2 or more.

Character font P.620
M SKD11 or equivalent
H 60～63HRC

Mounting bolt M	V	H	P	B	Catalog No. Type	Catalog No. Number of characters	A	L	Character (Gothic) CHR	U/Price Q'ty：1～9
6	16	22	3.5	2	OCP	3M	3	20	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z (Note 1) [ ] (Space) (Note 2) — (Hyphen)	4,170
						4M				4,300
	25					5M		25		5,390
						6M				5,530
	32					7M				6,280
						8M				6,410
6	16	10	3.5	2	BCP	3M	3	20		4,170
						4M				4,300
	25					5M		25		5,390
						6M				5,530
	32					7M				6,280
						8M				6,410
8	25	13	6.0	4		3M	6			5,130
						4M				5,260
	32					5M				6,010

(Note 1) When specify [ ] (space), use % instead. (Note 2) When specify — (hyphen), use # instead.

Order

Catalog No.	A	L	CHR	Actual engraving
OCP3M	3	20	ABC	
OCP3M	3	25	%AB	
OCP4M	3	20	ABCD	
OCP4M	3	25	A#B%	

Delivery 5 Days | Express B 800/1pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

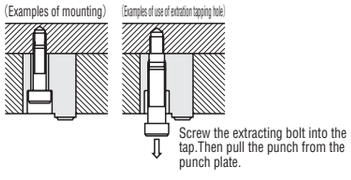
Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example

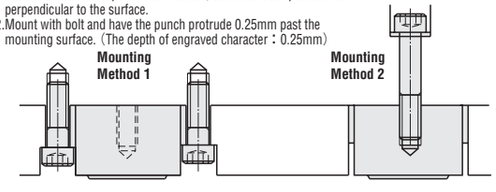
●OCP□M

1.Maintenance work can be performed without disassembling the die.
2.Using shims, etc., fine adjustment is possible even after the die assembly is finished.



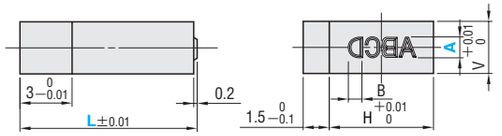
●BCP□M

1.Mounting position
Choose the most flat part on the surface, and mount the punch to be perpendicular to the surface.
2.Mount with bolt and have the punch protrude 0.25mm past the mounting surface.（The depth of engraved character：0.25mm）

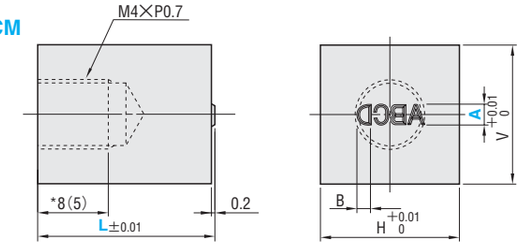


RoHS

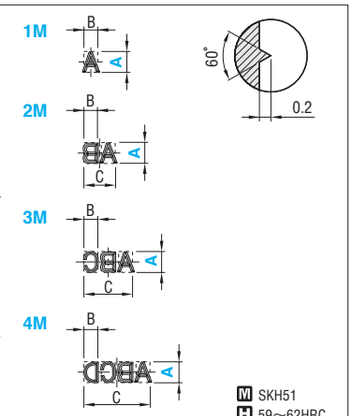
VCF



VCM



*When L＜12, tapping hole depth is 5mm.



M SKH51
H 59～62HRC

V	H	A	B	C	Catalog No. Type	Catalog No. Number of characters	A	0.1mm increments L	Character (Gothic) CHR	U/Price Q'ty：1～9
3	2	1.0	0.7	—	VCF	1M	1.0	8.0～30.0	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z (Note 1) [ ] (Space) (Note 2) — (Hyphen)	9,500
		1.2	0.8				1.2			9,000
		1.5	1.0				1.5			8,500
	3	1.0	0.7	1.8		2M	1.0			11,500
		1.2	0.8	2.0			1.2			11,000
		1.5	1.0	2.4			1.5			10,000
	6	1.0	0.7	3.0		3M	1.0			12,500
		1.2	0.8	3.3			1.2			12,000
		1.5	1.0	3.9			1.5			11,000
		1.0	0.7	4.1		4M	1.0			15,000
		1.2	0.8	4.5			1.2			13,500
		1.5	1.0	5.3			1.5			12,500
8	8	1.0	0.7	—	VCM	1M	1.0			9,500
		1.2	0.8				1.2			9,000
		1.5	1.0				1.5			8,500
		1.0	0.7	1.8		2M	1.0			11,500
		1.2	0.8	2.0			1.2			11,000
		1.5	1.0	2.4			1.5			10,000
		1.0	0.7	3.0		3M	1.0			12,000
		1.2	0.8	3.3			1.2			11,500
		1.5	1.0	3.9			1.5			11,000
		1.0	0.7	4.1		4M	1.0			14,500
		1.2	0.8	4.5			1.2			13,000
		1.5	1.0	5.3			1.5			12,000

(Note 1) When specify [ ] (space), use % instead. (Note 2) When specify — (hyphen), use # instead.

Order

Catalog No.	A	L	CHR	Actual engraving
VCF3M	1.5	20.0	ABC	
VCF3M	1.5	25.0	%AB	
VCM4M	1.5	20.0	ABCD	
VCM4M	1.5	25.0	A#B%	

Delivery 5 Days | Express B 800/1pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

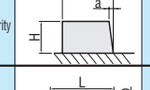
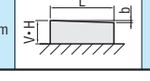
Alteration Catalog No. − A − L − CHR − (VHM・VHZ…etc.)

VCM3M − 1.2 − 15.0 − ABC − CCP180

Alteration	Code	Spec.	¥/1Code
	VHM	Changes tolerance on shank V・H +0.01 0 ⇨ 0 −0.01	400
	VHZ	Changes tolerance on shank V・H +0.01 0 ⇨ ±0.005	400
	HC	Changes flange width 0≦HC＜1.5 0.1mm increments ⊗VCM : Not applicable	200
	CCP	Adds chamfer on one corner of the shank (To prevent mistakes) C1.0 chamfering is performed on one corner of the shank. ■Specify the side chamfering position C (When it sees from engraving side) CCP0 CCP90 CCP180 CCP270 ⊗VCM : Not applicable	200

Engraving block punch	Character font
OCP□M (P.619) BCP□M (P.619) VCF□M VCM□M	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

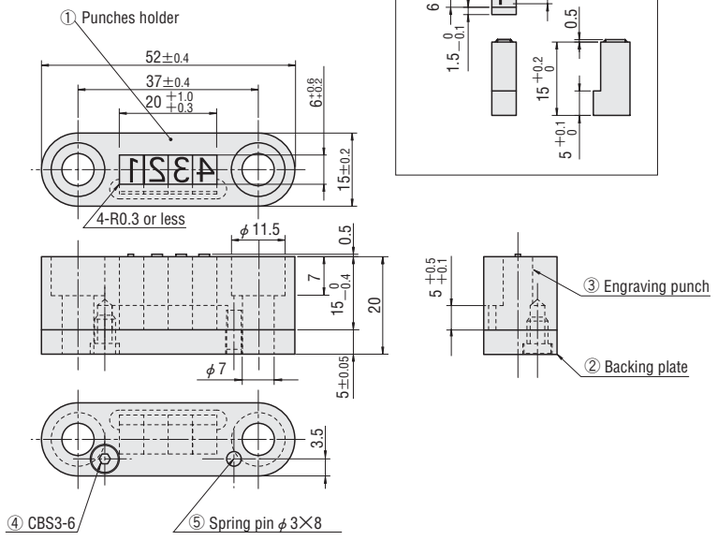
■Basis of tolerance for precision engraving block punch

Basis of tolerance		
Perpendicularity		a≦0.005
Parallelism		b≦0.005

ENGRAVING PUNCH HOLDERS

Catalog No.	Components				
	①	②	③	④	⑤
HCFPH4	○	○		○	○
HCFS4			○		

Mounting bolts (M6) must be purchased separately.



①M S45C
②M SK4
H 58～62HRC
③M SKD11
H 60～63HRC

■Engraving punch holders — For a 4-character set —

Catalog No. / Type	U/Price Q'ty：1～9
HCFPH4	7,000

Order — Catalog No.: HCFPH4

Delivery — 3 Days | Express A 800/1pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price — ■Volume discount rate P.37

Quantity	1～9	10～19	20～29
Rate	—	5%	10%

To be quoted on price & lead time above Max. Q'ty.

■Engraving punches for punch holder (This punch is sold as an individual product)

Catalog No. / Type	CHR	U/Price Q'ty：1～9
HCFS4	0 1 2 3 4 5 6 7 8 9 X Y Z	1,350

Order — Catalog No. HCFS4 — CHR X

Delivery — 3 Days | Express A 800/1pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price — ■Volume discount rate P.37

Quantity	1～9	10～19	20～29
Rate	—	5%	10%

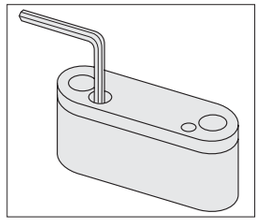
To be quoted on price & lead time above Max. Q'ty.

Character font
0 1 2 3 4 5 6 7 8 9 X Y Z

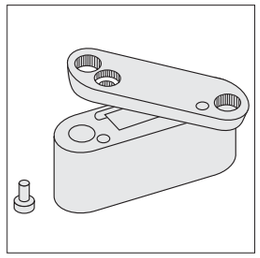
●Features

- This is an engraving punch used for the traceability of products.
- By incorporating it in the die, it can punch the production date on the product.
- This compact punch is only 20 mm high, so it occupies relatively little space.

●Replacement method



①Remove the low-head bolt fixing the backing plate.



②If you rotate the backing plate around the spring pin, you can easily replace the lowest digit of the date.
(It is possible to remove the backing plate.)

●Set of punches for engraving dates (Holder is not included.)

■Year / month / day / day (December 31, 2006)

Required number of engraving operations in fiscal 200□

CHR	0	1	2	3	4	5	6	7	8	9	X	Y	Z	Total
No.	2	4	4	3	3	3	3	3	3	3	1	1	1	34

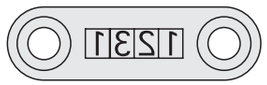
(X：October Y：November Z：December)

Order — Catalog No. 34SET — YMDD — HCFS4

Delivery — 3 Days

Price — Set price (34pcs.per set): 40,000

■Month / month / day / day (December 31)



01／01～12／31 Required number of engraving operations

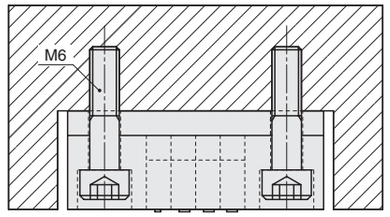
CHR	0	1	2	3	4	5	6	7	8	9	Total
No.	2	4	3	2	2	2	2	2	2	2	23

Order — Catalog No. 23SET — MMDD — HCFS4

Delivery — 3 Days

Price — Set price (23pcs.per set): 27,000

Example



■Shim tapes P.650

FGSM
FGSMW
FGSML

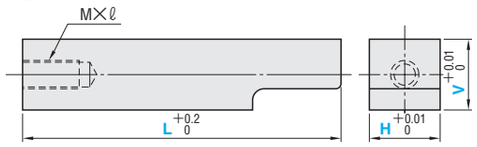
Use shims to adjuste height.

BENDING PUNCHES & DIES
—SELECTABLE—

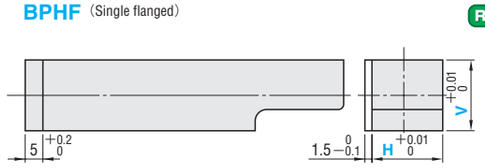
The volume discount rate is also applicable to alteration cost. P.39

Type (For point, select from figures below.)

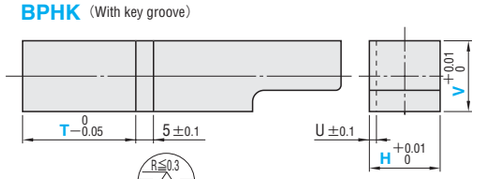
BPHM (Tapped)



BPHF (Single flanged) RoHS

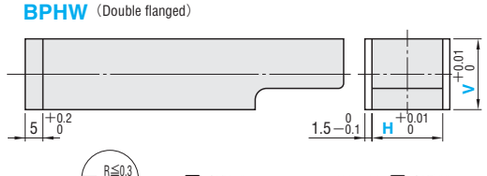


BPHK (With key groove)



Key groove part details

BPHW (Double flanged)

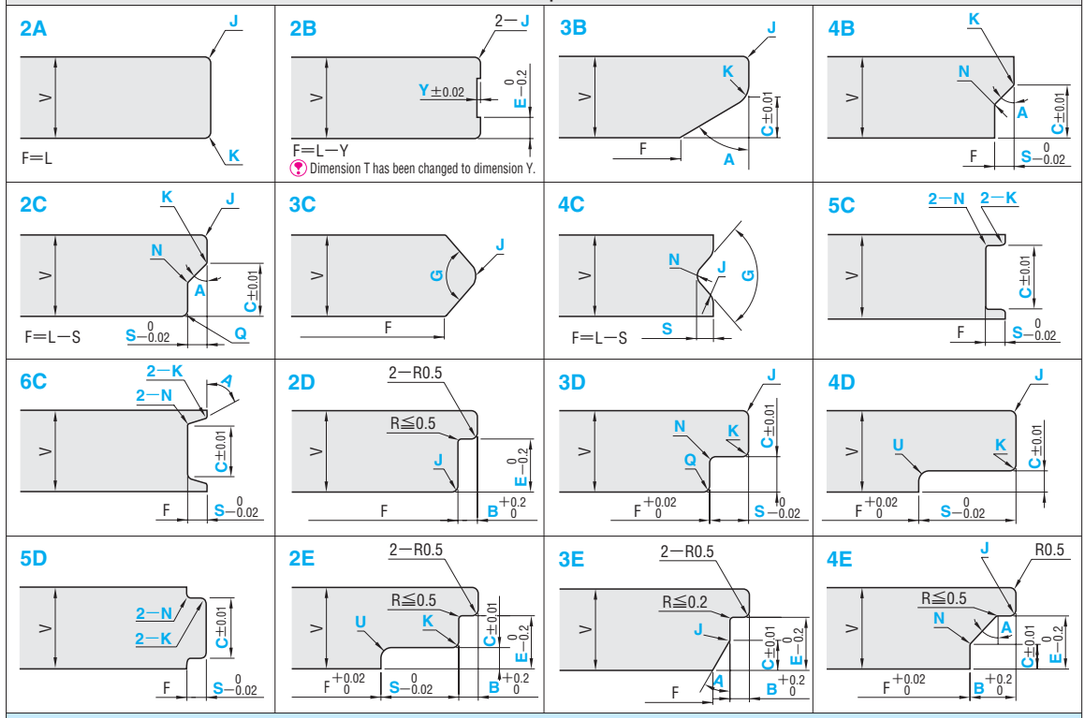


Flange part details

H5 M SKH51 H 61～64HRC

H6～30 M SKD11 or equivalent H 60～63HRC

Shape



Specification unit

C・J・K・N・Q・S・U・Y ---→ 0.01mm increments
B・E ----------→ 0.1mm increments
A・G ----------→ 0.5° increments

Machining limit

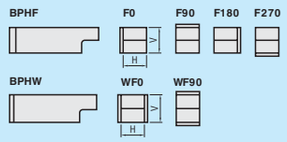
J・K・Q=0 or J・K・Q≧0.2
N・U≧0.2
1≦B≦25
Y≦1
U≦C
0.2≦C・E≦V−2
K+N<S≦25
K+U<S≦25
A≦70°
G≧40°
●Shape 2B only
0.5≦Y≦1
2.00≦E≦3.99→Ymax5
E≧4.00→Ymax10
●Shapes 5C and 6C only
1.00≦C≦V−4
●Shape 5D only
2.0≦C
●Type BPHM only
F≧Fmin
●BPHK only
F−(T+5)≧2

●Shape 5C・6C

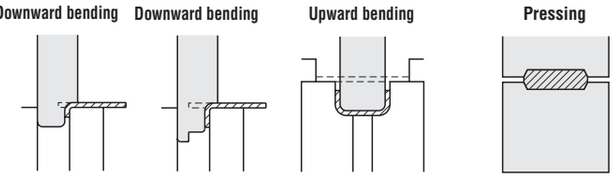
V−C / 2	S max.
2.00～3.99	5
4.00～	10

■Key groove position alteration (Free of charge)

■Flange position alteration (Free of charge)



Example



Catalog No. Type	Shape	V / H	5	6	8	10	13	16	20	22	25	28	30	40	50
Tapped BPHM	2A	5	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇		
		6	◇	○	○	○	○	○	○	○	○	○	○		
		8	◇	○	△	△	△	△	△	△	△	△	△	△	
With key groove BPHK	2B 3B 4B	10	◇	○	△	□	□	□	□	□	□	□	□	□	□
		13	◇	○	△	□	●	●	●	●	●	●	●	●	●
		16	◇	○	△	□	●	●	●	●	●	●	●	●	●
	2C 3C 4C 5C 6C	20	◇	○	△	□	●	●	●	●	●	●	●	●	●
Single flanged BPHF		22	◇	○	△	□	●	●	●	●	●	●	●	●	●
	2D 3D 4D 5D	25	◇	○	△	□	●	●	●	●	●	●	●	●	●
		28	◇	○	△	□	●	●	●	●	●	●	●	●	●
Double flanged BPHW		30	◇	○	△	□	●	●	●	●	●	●	●	●	●
	2E 3E 4E	40			△	□	●	●	●	●	●	●	●		
		50				□	●	●	●	●	●	●	●		

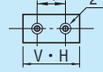
0.1mm increments

L	T	F min.	U
20.0	T≧20 (BPHK only)	15	1.0
		20	1.5
Tapped H5～H8 ⋯→ L20.0～ H10 ⋯→ L24.0～ H13～50 ⋯→ L28.0～		25	
≀ 100.0			

L min. of BPHM with tapping varies depending on dimension H.
However, if H>V, dimension V is applied.
If the key groove of BPHK is unnecessary, specify full length as dimension T. T=L

V・H=40・50⋯→2−M

V・H	40	50
ℓ1	20	24



Relationship between the Marks in the table and tap M×ℓ
◇: M3×6 □: M6×12
○: M4×8 ●: M8×16
△: M5×10

Order

Tapped
Catalog No. | V | H | − | L | − | B・C・E・J・K・N・Q・S・Y・U・A・G
BPHM 2A 06 06 − 60.5 − J3.00 − K2.00

With key groove
Catalog No. | V | H | − | L | − | T | − | B・C・E・J・K・N・Q・S・Y・U・A・G | − | KK
BPHK 2B 08 16 − 60.5 − T23.5 − E2.0 −J1.50 −Y0.5 − KK0

Flanged
Catalog No. | V | H | − | L | − | B・C・E・J・K・N・Q・S・Y・U・A・G | − | F・WF
BPHF 2B 08 16 − 60.5 − E2.0 −J1.50 −Y0.5 − F0
BPHW 3D 16 13 − 72.3 − C6.00 −J0.50 −K0.5 −N1.30 −Q0.50 −S19.27 − WF90

Delivery 5 Days

Alteration

Catalog No. | V | H | − | L | − | B・C・E・J・K・N・Q・S・Y・U・A・G | − (HC・TC⋯etc.)
BPHF 2A 06 06 − 60.5 − J3.00−K2.00−F0 − HC1.0 −TKC

Alteration	Code	Spec.	¥/1Code
	HC	Changes flange width 0≦HC<1.5 0.1mm increments	200
	TC	Changes flange thickness 2≦TC<5 0.1mm increments	200
T	TKC	Changes tolerance on position of key groove T 0 −0.05 ⇨ 0 −0.02	200
T	TKC	Changes tolerance on flange thickness 5 +0.2 0 ⇨ +0.02 0	200

Alteration	Code	Spec.	¥/1Code
L T +0.02 0	LKC	Changes tolerance on full length L +0.2 0 ⇨ +0.02 0 ⊗ 6C・2D・3D・4D・2E・3E・4E : Not applicable	800
M	MC	Changes tap size (H \ V: 6 8 10 13 16 20 22 25 28・30) 6: M4 → M3 — — / 8: — M5 → M4 — / 10: — — M6 → M5 / 13: — — — M8 → M6	0
T	RTC	Changes tolerance on position of key groove T 0 −0.05 ⇨ +0.05 0	0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■When H≦V

Type	H \ Shape	U/Price Q'ty : 1～9 A	B	C	D	E
BPHM	5・6	3,100	3,350	6,190	6,910	7,630
	8・10	3,410	3,680	6,820	7,600	8,390
	13・16	4,030	4,340	7,700	8,600	9,490
	20・22	4,430	4,770	8,480	9,470	10,440
	25・28	4,670	5,040	8,770	9,790	10,790
	30	4,900	5,540	9,650	10,760	11,870
BPHK BPHF	5・6	3,280	3,550	6,690	7,470	8,260
	8・10	3,620	3,920	7,370	8,230	9,090
	13・16	4,280	4,640	8,350	9,340	10,310
	20・22	4,730	5,120	9,200	10,280	11,360
	25・28	5,000	5,650	9,520	10,640	11,750
	30	5,260	5,940	10,480	11,720	12,940
BPHW	5・6	3,410	3,680	6,820	7,600	8,390
	8・10	3,740	4,050	7,500	8,360	9,220
	13・16	4,410	4,770	8,480	9,470	10,440
	20・22	4,860	5,250	9,320	10,400	11,480
	25・28	5,130	5,780	9,650	10,760	11,880
	30	5,390	6,070	10,610	11,840	13,070

■When H>V

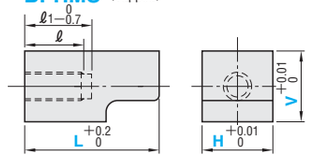
Type	H \ Shape	U/Price Q'ty : 1～9 A	B	C	D	E
BPHM	5・6	4,040	4,360	8,050	8,990	9,930
	8・10	4,440	4,800	8,870	9,890	10,910
	13・16	5,250	5,650	10,020	11,190	12,350
	20・22	5,760	6,210	11,020	12,320	13,580
	25・28	6,080	6,560	11,410	12,730	14,030
	30	6,380	7,220	12,550	14,000	15,440
	40	7,010	7,940	13,800	15,410	17,000
	50	7,370	8,330	14,490	16,160	17,840
BPHK BPHF	5・6	4,270	4,630	8,710	9,720	10,740
	8・10	4,710	5,110	9,590	10,710	11,830
	13・16	5,580	6,050	10,850	12,150	13,410
	20・22	6,160	6,660	11,960	13,360	14,780
	25・28	6,510	7,340	12,380	13,840	15,290
	30	6,840	7,730	13,630	15,240	16,830
	40	7,550	8,510	15,020	16,780	18,530
	50	7,920	8,950	15,780	17,630	19,470
BPHW	5・6	4,440	4,800	8,870	11,420	10,910
	8・10	4,880	5,270	9,760	12,690	12,000
	13・16	5,750	6,210	11,020	14,340	13,580
	20・22	6,330	6,830	12,130	15,780	14,940
	25・28	6,680	7,510	12,550	16,330	15,460
	30	7,010	7,900	13,800	17,950	17,000
	40	7,720	8,680	15,190	19,750	18,700
	50	8,090	9,120	15,950	20,740	19,640

BENDING PUNCHES & DIES
—SELECTABLE · SHORT TYPE—

The volume discount rate is also applicable to alteration cost. P.39

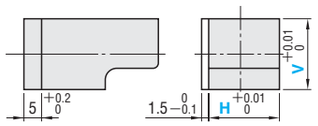
Type (For shape, select from figures below.)

BPHMS (Tapped)



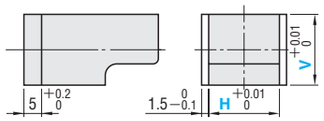
H	ℓ	ℓ1
6	6	8.5
8	7.5	10
10	9	12.5
13 16 20	12	15.5

BPHFS (Single flanged) RoHS



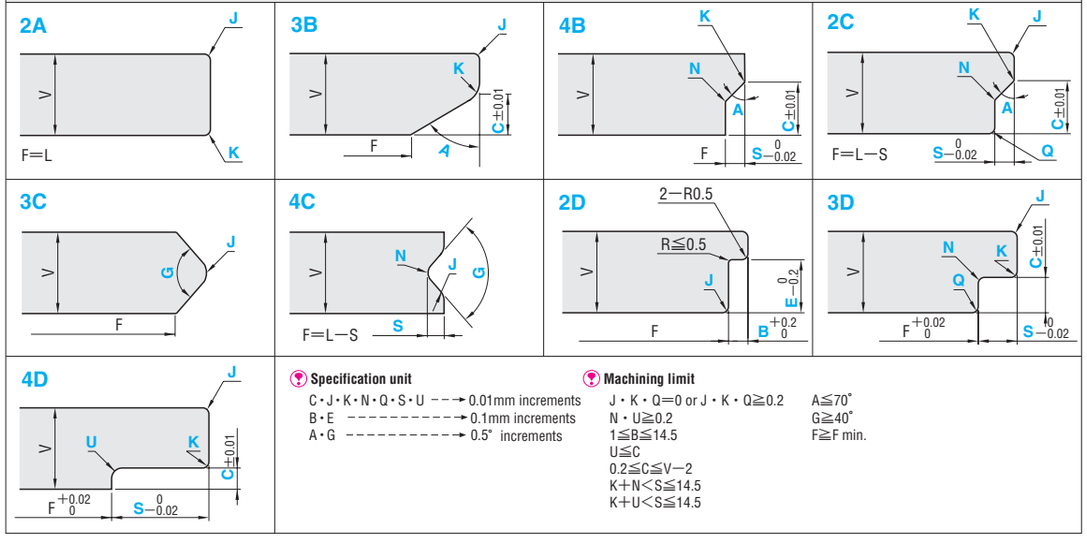
Flange part details

BPHWS (Double flanged)



M SKD11 or equivalent
H 60～63HRC

Shape



Specification unit
C・J・K・N・Q・S・U ⟶ 0.01mm increments
B・E ⟶ 0.1mm increments
A・G ⟶ 0.5° increments

Machining limit
J・K・Q=0 or J・K・Q≧0.2
N・U≧0.2
1≦B≦14.5
U≦C
0.2≦C≦V−2
K+N<S≦14.5
K+U<S≦14.5
A≦70°
G≧40°
F≧F min.

Catalog No. Type	Shape	V / H	6	8	10	13	16	20	0.1mm increments L	F min. Tapped	F min. Single, double flanged
Tapped BPHMS	2A 3B 4B 2C	6	○	○	○	○	○	○	13.0～25.0	10.5	10.5
		8	○	△	△	△	△	△		12	
Single flanged BPHFS	3C 4C	10	○	△	□	□	□	□		14.5	
	2D 3D	13	○	△	□	●	●	●		17.5	
Double flanged BPHWS	4D	16	○	△	□	●	●	●			
		20	○	△	□	●	●	●			

Relationship between the marks in the table and tap M×ℓ
○ : M4×6　□ : M6×9
△ : M5×7.5　● : M8×12

Order

Tapped

Catalog No.	V	H	—	L	—	B・C・E・J・K・N・Q・S・U・A・G
BPHMS 3B	06	06	—	24.5	—	C2.00 — J1.50 — K2.00 — A60

Flanged

■Flange position specification (Free of charge)

Catalog No.	V	H	—	L	—	B・C・E・J・K・N・Q・S・U・A・G	—	F・WF
BPHFS 3B	08	16	—	20.0	—	C2.00 — J1.50 — K 2.00 — A60	—	F0
BPHWS 3D	16	13	—	25.0	—	C6.00 — J0.50 — K 0.50 — N1.30 — Q0.50 — S14.50	—	WF90

Delivery 5 Days

Alteration

Catalog No.	V	H	—	L	—	B・C・E・J・K・N・Q・S・U・A・G	— (HC・TC…etc.)
BPHFS 2A	06	06	—	20.0	—	J1.00—K2.00—F0	— HC10—TKC

Alteration	Code	Spec.	¥/1Code
	HC	Changes flange width 0≦HC<1.5 0.1mm increments	200
	TC	Changes head thickness 2≦TC<5 0.1mm increments	200
T +0.02 0	TKC	Changes tolerance on flange thickness 5 +0.2 0 ⇨ +0.02 0	200

Alteration	Code	Spec.	¥/1Code
L T +0.02 0	LKC	Changes tolerance on full length L +0.2 0 ⇨ +0.02 0 ⊗2D/3D/4D : Not applicable	800
M	MC	Changes tap size H \ V: 6 / 8 / 10 / 13 / 16 / 20 6: M4 → M3 8: — / M5 → M4 10: — / — / M6 → M5 13: — / — / — / M8 → M6	0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■When H≦V

Type	H \ Shape	U/Price Q'ty : 1～9 A	B	C	D
BPHMS	6	3,770	4,070	7,520	8,390
	8・10	4,140	4,470	8,280	9,240
	13・16	4,890	5,270	9,360	10,450
	20	5,380	5,800	10,300	11,500
BPHFS	6	3,990	4,320	8,130	9,080
	8・10	4,390	4,770	8,950	10,000
	13・16	5,210	5,640	10,140	11,340
	20	5,750	6,220	11,170	12,480
BPHWS	6	4,140	4,470	8,280	9,240
	8・10	4,550	4,930	9,110	10,160
	13・16	5,360	5,800	10,300	11,500
	20	5,910	6,380	11,330	12,640

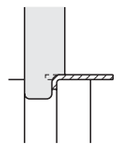
■When H>V

Type	H \ Shape	U/Price Q'ty : 1～9 A	B	C	D
BPHMS	6	—	—	—	—
	8・10	5,390	5,830	10,780	12,020
	13・16	6,380	6,860	12,170	13,590
	20	7,000	7,550	13,390	14,970
BPHFS	6	—	—	—	—
	8・10	5,720	6,200	11,660	13,010
	13・16	6,780	7,350	13,190	14,760
	20	7,490	8,090	14,530	16,230
BPHWS	6	—	—	—	—
	8・10	5,920	6,410	11,860	15,420
	13・16	6,990	7,550	13,390	17,420
	20	7,690	8,300	14,730	19,170

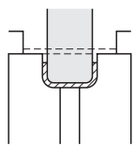
Example

■Features By keeping the tap length and pilot hole, it became possible to widen the dimensional limits of tip machining.

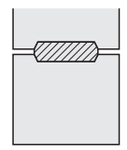
Downward bending



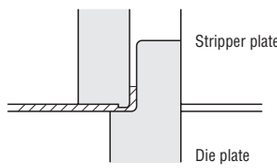
Upward bending



Pressing



Upward bending

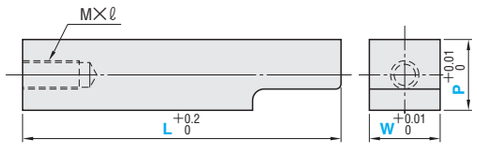


Block punch blanks —short type— P.391

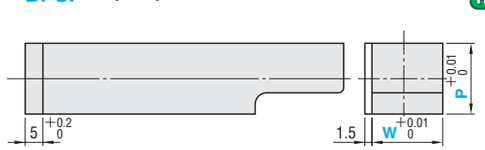
BENDING PUNCHES & DIES
—CONFIGURABLE TYPE—

Type （For shape, select from figures below.）

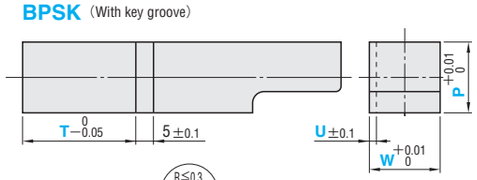
BPSM （Tapped）



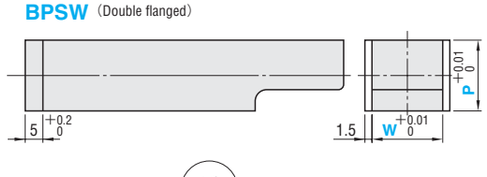
BPSF （Single flanged） RoHS



BPSK （With key groove）



BPSW （Double flanged）



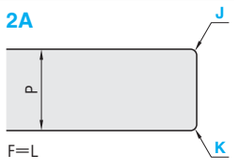
Key groove part details

Flange part details

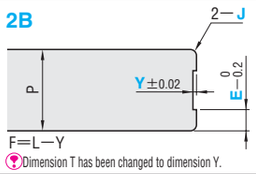
M SKD11 or equivalent
H 60～63HRC

Shape

2A

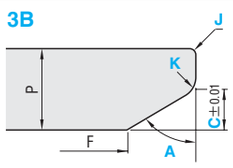


2B

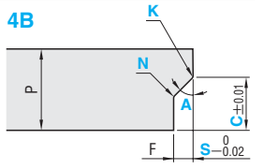


Dimension T has been changed to dimension Y.

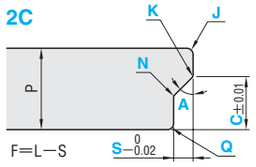
3B



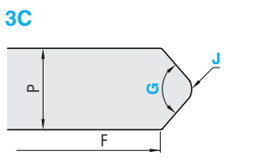
4B



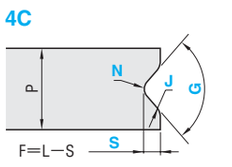
2C



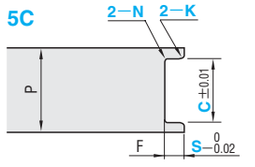
3C



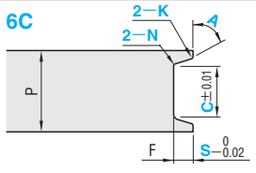
4C



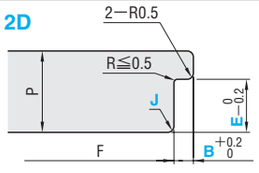
5C



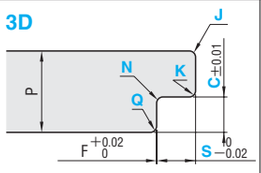
6C



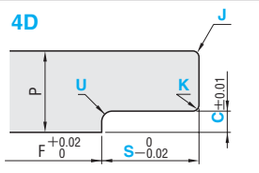
2D



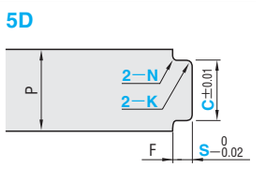
3D



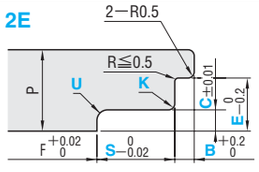
4D



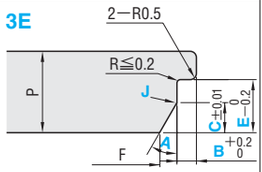
5D



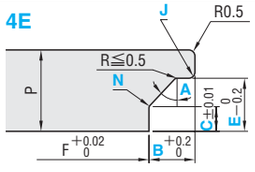
2E



3E



4E



Specification unit

C・J・K・N・Q・S・U・Y- → 0.01mm increments
B・E → 0.1mm increments
A・G → 0.5° increments

Machining limit

J・K・Q=0 or J・K・Q≧0.2
N・U≧0.2
1≦B≦25
Y≦1
U≦C

0.2≦C・E≦V−2
K+N<S≦25
K+U<S≦25
A≦70°
G≧40°

●Shape 2B only
0.5≦Y≦1
2.00≦E≦3.99→Ymax5
E≧4.00→Ymax10
●Shapes 5C and 6C only
1.00≦C≦V−4

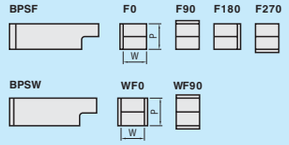
●Shape 5D only
2.0≦C
●Type BPHM only
F≧Fmin
●BPHK only
F−(T+5)≧2

●Shape 5C・6C

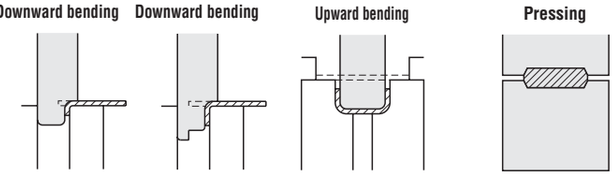
P−C / 2	Smax
2.00～3.99	5
4.00～	10

■Key groove position alteration （Free of charge）

■Flange position alteration （Free of charge）



Example



The volume discount rate is also applicable to alteration cost. P.39

Catalog No. Type		Shape	0.1mm increments L	W \ P	5.01～6.00	6.01～8.00	8.01～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00	0.1mm increments T	F min.	U
Tapped	BPSM	2A 2B 3B 4B 2C 3C 4C 5C 6C 2D 3D 4D 5D 2E 3E 4E	20.0 Tapped W5.01～8.00 ···→L20.0～ W8.01～10.00 ···→L24.0～ W10.01～30.00 ···→L28.0～ ≀ 100.0	5.01～6.00	○	○	○	○	○	○	○	T≧20 (BPSK only)	15	1.0
With key groove	BPSK			6.01～8.00	○	△	△	△	△	△	△		20	1.5
Single flanged	BPSF			8.01～10.00	○	△	□	□	□	□	□			
Double flanged	BPSW			10.01～15.00	○	△	□	●	●	●	●		25	
				15.01～20.00	○	△	□	●	●	●	●			
				20.01～25.00	○	△	□	●	●	●	●			
				25.01～30.00	○	△	□	●	●	●	●			

L min. of BPSM with tapping varies depending on dimension W. However, if W>P, dimension P is applied.
If the key groove of BPSK is unnecessary, specify the full length as dimension T. T=L

Relationship between the marks in the table and tap M×ℓ

○ : M4×8 □ : M6×12
△ : M5×10 ● : M8×16

Order

Tapped
Catalog No. — L — P・W・B・C・E・J・K・N・Q・S・Y・U・A・G
BPSM 2B — 60.5 — P6.78 — W16.00 — E2.0 — J1.50 — Y0.5

With key groove
Catalog No. — L — T — P・W・B・C・E・J・K・N・Q・S・Y・U・A・G — KK
BPSK 2B — 60.5 — T23.5 — P6.08 — W7.25 — E2.0 — J1.50 — Y0.5 — KK0

Flanged
Catalog No. — L — P・W・B・C・E・J・K・N・Q・S・Y・U・A・G — F・WF
BPSF 2B — 60.5 — P6.01 — W 5.01 — E2.0 — J1.50 — Y0.5 — F0
BPSW 3D — 72.3 — P15.50 — W12.50 — C6.00 — J0.50 — K0.50 — N1.30 — Q0.50 — S19.27 — WF90

Delivery 8 Days

Alteration

Catalog No. — L — P・W・B・C・E・J・K・N・Q・S・Y・U・A・G — (HC・TC…etc.)
BPSF 2A — 60.5 — P8.01 — W6.01 — J3.00 — K2.00 — F0 — HC1.0 — TKC

Alteration	Code	Spec.	¥/1Code
	HC	Changes flange width 0≦HC<1.5 0.1mm increments	200
	TC	Changes head thickness 2≦TC<5 0.1mm increments	200
	TKC	Changes tolerance on position of key groove T 0 −0.05 ⇨ 0 −0.02	200
		Changes tolerance on flange thickness 5 +0.2 0 ⇨ +0.02 0	200

Alteration	Code	Spec.	¥/1Code
L T +0.02 0	LKC	Changes tolerance on full length L +0.2 0 ⇨ +0.02 0 ⊗6C・2D・3D・4D・2E・3E・4E : Not applicable	800
M	MC	Changes tap size: 5.01～6.00 M4 → M3; 6.01～8.00 M5 → M4; 8.01～10.00 M6 → M5; 10.01～13.00 M8 → M6	0
T	RTC	Changes tolerance on position of key groove T 0 −0.05 ⇨ +0.05 0	0

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■When W≦P

Type	W \ Shape	U/Price Q'ty：1～9 A	B	C	D	E
BPSM BPSK	5.01～6.00	3,630	3,870	6,880	7,680	8,480
	6.01～8.00	3,810	4,070	7,090	8,000	8,900
	8.01～10.00	4,000	4,390	7,310	8,330	9,350
	10.01～12.00	4,210	4,730	7,670	8,750	9,810
	12.01～14.00	4,410	4,860	8,400	9,380	10,340
	14.01～16.00	4,540	5,020	8,570	9,570	10,560
	16.01～18.00	4,680	5,170	8,730	9,750	10,760
	18.01～20.00	4,820	5,330	8,910	9,950	10,980
	20.01～22.00	4,970	5,480	9,090	10,150	11,200
	22.01～24.00	5,120	5,650	9,270	10,350	11,420
	24.01～26.00	5,270	5,760	9,450	10,550	11,640
	26.01～28.00	5,430	5,840	9,740	10,870	11,990
	28.01～30.00	5,600	6,020	10,220	11,410	12,590
BPSF BPSW	5.01～6.00	5,070	5,310	8,320	9,120	9,920
	6.01～8.00	5,250	5,510	8,530	9,440	10,340
	8.01～10.00	5,440	5,830	8,750	9,770	10,790
	10.01～12.00	5,650	6,170	9,110	10,190	11,250
	12.01～14.00	5,850	6,300	9,840	10,820	11,780
	14.01～16.00	5,980	6,460	10,010	11,010	12,000
	16.01～18.00	6,120	6,610	10,170	11,190	12,200
	18.01～20.00	6,260	6,770	10,350	11,390	12,420
	20.01～22.00	6,410	6,920	10,530	11,590	12,640
	22.01～24.00	6,560	7,090	10,710	11,790	12,860
	24.01～26.00	6,710	7,200	10,890	11,990	13,080
	26.01～28.00	6,870	7,280	11,180	12,310	13,430
	28.01～30.00	7,040	7,460	11,660	12,850	14,030

■When W>P

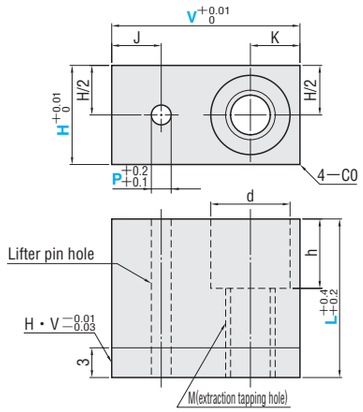
Type	W \ Shape	U/Price Q'ty：1～9 A	B	C	D	E
BPSM BPSK	5.01～6.00	4,720	5,040	8,950	9,990	11,020
	6.01～8.00	4,970	5,300	9,220	10,400	11,570
	8.01～10.00	5,210	5,710	9,500	10,840	12,170
	10.01～12.00	5,480	6,160	9,980	11,380	12,770
	12.01～14.00	5,750	6,330	10,930	12,190	13,450
	14.01～16.00	5,920	6,530	11,150	12,450	13,730
	16.01～18.00	6,100	6,730	11,360	12,680	14,000
	18.01～20.00	6,280	6,930	11,600	12,950	14,290
	20.01～22.00	6,470	7,140	11,830	13,190	14,570
	22.01～24.00	6,660	7,340	12,060	13,460	14,850
	24.01～26.00	6,870	7,500	12,290	13,720	15,140
	26.01～28.00	7,060	7,600	12,670	14,130	15,590
	28.01～30.00	7,280	7,830	13,300	14,840	16,370
BPSF BPSW	5.01～6.00	6,160	6,480	10,390	11,430	12,460
	6.01～8.00	6,400	6,730	10,660	11,840	13,010
	8.01～10.00	6,650	7,150	10,940	12,280	13,600
	10.01～12.00	6,920	7,600	11,410	12,820	14,200
	12.01～14.00	7,180	7,770	12,370	13,630	14,890
	14.01～16.00	7,350	7,970	12,580	13,890	15,170
	16.01～18.00	7,530	8,170	12,800	14,120	15,440
	18.01～20.00	7,720	8,370	13,030	14,390	15,720
	20.01～22.00	7,900	8,570	13,270	14,640	16,010
	22.01～24.00	8,100	8,790	13,500	14,900	16,290
	24.01～26.00	8,310	8,940	13,730	15,160	16,580
	26.01～28.00	8,500	9,040	14,100	15,580	17,030
	28.01～30.00	8,720	9,270	14,740	16,280	17,810

BENDING DIES
—BOLT FIXING TYPE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

BBMD



For the extraction tapping hole, use a bolt one size larger than the installation bolt.

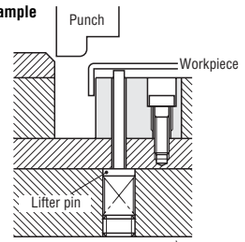
Mounting bolt	M (extraction tapping hole)
M3	M4
M4	M5
M6	M8
M8	M10

M SKD11 or equivalent
H 60～63HRC

K	Mounting bolt d	Mounting bolt h	Mounting bolt Size	J	Catalog No.	V	H	L	P	U/Price Q'ty：1～9
4	6	7.5	M3	3	BBMD	13	8	16	2	2,920
				4		16		20	4	3,040
				5		18		22	6	
				6.5		20		25	8	
5	8	8.5	M4	4		18	10			3,150
				5		20				
				6.5		22				3,330
				8		25				
6.5	11	10.5	M6	5		22	13			3,440
				6.5		25				
				8		28				3,680
				10		32				
				6.5		25	16			3,790
				8		28				
				10		32				3,910
				12.5		38				
8	14	12.5	M8	8		32	20			3,910
				10		35				
				12.5		40				4,100
				15		45				
				10		35	25			4,100
				12.5		40				
				15		45				4,270
				17.5		50				

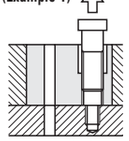
⊗P6/8/10 not available for H8; P8/10 not available for H10.

Example



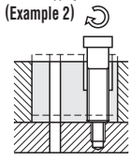
(Examples of use of the extraction tapping hole)

(Example 1)



Screw a bolt into extraction tapping hole, and pull it out of the die plate.

(Example 2)

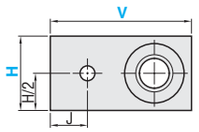


Screw a bolt into extraction tapping hole so that the die comes out of the die plate.

Order

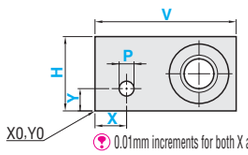
(1) When the center of the lifter pin hole is at the standard position (J, H/2)

Catalog No.	V	H	—	L	—	P
BBMD	25	13	—	20	—	P2



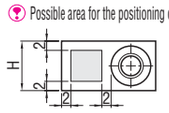
(2) When specifying the lifter pin hole position (X,Y)

Catalog No.	V	H	—	L	—	P	—	0.01mm increments X	—	Y
BBMD	25	13	—	20	—	P2	—	X4.60	—	Y3.20



0.01mm increments for both X and Y

Possible area for the positioning of the lifter pin hole.



Delivery: 3 Days | Express A 800/pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration: Catalog No. V H — L(LC) — P — (PKC・CC…etc.)

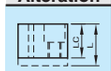
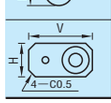
BBMD 25 13 — LC18.0 — P2 — PKC

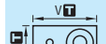
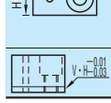
Price

Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration	Code	Spec.	¥/1Code
	LC	Changes full length 16＜LC＜35 0.1mm increments. (Combination with LKC→0.01mm incr.)	200
	PKC	Changes tolerance on P $P^{+0.2}_{+0.1}$ ⇨ $P^{+0.10}_{+0.05}$	400
	CC	Adds chamfering of C0.5 on 4 corners	400

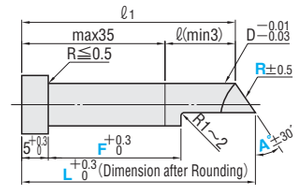
Alteration	Code	Spec.	¥/1Code
	LKC	Changes tolerance on full length $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$	400
	VKC1	Changes tolerance on V・H $V・H^{+0.01}_{0}$ ⇨ $V・H^{+0.005}_{0}$	600
	VKC2	Changes tolerance on V・H $V・H^{+0.01}_{0}$ ⇨ $V・H^{0}_{-0.005}$	600
	NDC	No press-in lead.	0

PUNCHES FOR RIB

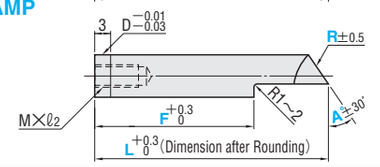
The volume discount rate is also applicable to alteration cost. P.39

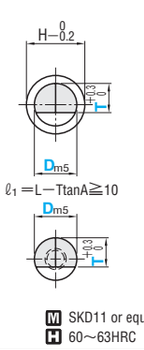
For sinking RoHS

RASP



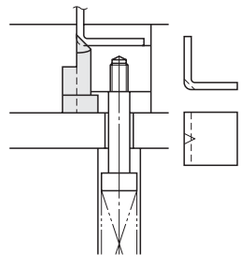
RAMP





M SKD11 or equivalent
H 60～63HRC

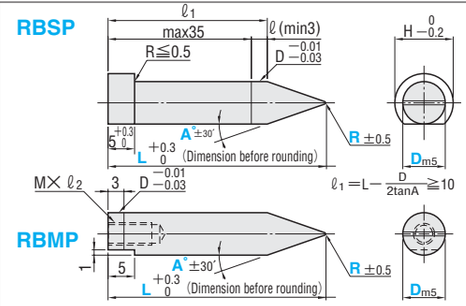
Example



H	M× ℓ2	Catalog No. Type	D	0.1mm increments L	T	Selection A	0.5 mm increments R	0.1mm increments F	U/Price Q'ty：1～9
11	4× 8	RASP RAMP	8	25～70	$\frac{D}{2}$≦T≦D−2	30 45 60	1≦R≦5 or R=0	$0≦F≦\frac{L}{2}$	2,480
13	5×10		10	30～70				RAMP ••• ▸	2,480
16	6×12		13	30～70					3,210
19			16	35～70					3,450
23			20	40～70				$\ell_2+6≦F≦\frac{L}{2}$	3,800
28			25	45～70					4,720

For V-bending RoHS

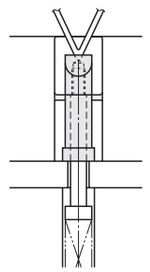
RBSP



RBMP

M SKD11 or equivalent
H 60～63HRC

Example



H	M× ℓ2	Catalog No. Type	D	0.1mm increments L	1° increments A	0.1mm increments R	U/Price Q'ty：1～9
11	4× 8	RBSP RBMP	8	20～70	A≧20	0.5≦R≦5 or R=0	1,930
13	5×10		10				1,930
16	6×12		13	30～70			2,050
19			16				2,180
23			20	40～70			2,310
28			25				2,560

Order

• For sinking

Catalog No.	—	L	—	T・A・R・F
RASP 10	—	50.0	—	T5.0—A60—R1.0—F20.0

• For V-bending

Catalog No.	—	L	—	A・R
RBSP 10	—	50.0	—	A30 — R0.5

Delivery: 3 Days

Price

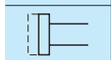
Volume discount rate P.37

Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration: Catalog No. — L — T・A・R・F — (HC・TC…etc.)

RASP 10 — 50.0 — T5.0—A60—R1.0—F20.0 — HC12.0—TC4.0

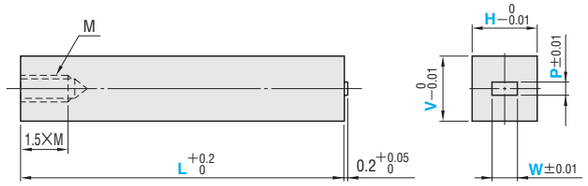
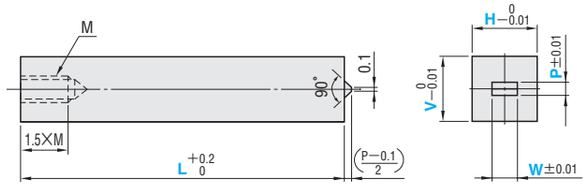
Alteration	Code	Spec.	¥/1Code
	HC	Changes flange width D≦HC＜H 0.1mm increments	200
	TC	Changes head thickness 2≦TC＜5 0.1mm increments	200
	KC	Adds single key flat/Changes angle of key flat •RASP・RBSP 1° increments 180° 90° 270° 0° •RAMP・RBMP 180° 90° 270° 0°	200

Alteration	Code	Spec.	¥/1Code
	WKC	Adds double key flats in parallel •RASP・RAMP	400
		•RBSP・RBMP	200
	SKC	Adds key flat on the shank	600

CAMBER ADJUSTMENT BLOCK PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

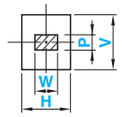
Production of these products is scheduled to discontinue in 2008.

Type	M H	Catalog No.	Shape
—Tip projection type— RoHS	SKD11 or equivalent 60～63HRC	CSMT	
—Tip V type— RoHS	SKD11 or equivalent 60～63HRC	CSMV	

M	Catalog No.	V	H	L (Selection)	P・W 0.01mm increments	U/Price Q'ty：1～9 CSMT	U/Price Q'ty：1～9 CSMV
5	CSMT (Projection type)	10	8	20	$0.50 \leqq P \leqq \frac{V}{2}$	2,240	2,440
			10	30			
6	CSMV (V type)	13	10	40	$0.50 \leqq W \leqq \frac{H}{2}$	2,390	2,590
			13				

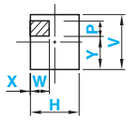
Order

(1) When the blade on the center of the shank



Catalog No.	V	H	L	0.01mm increments P	W
CSMT	10	08	20	P2.00	W4.00

(2) When the blade is not in the center of the shank



Catalog No.	V	H	L	0.01mm increments P	W	X—Y
CSMV	10	08	20	P2.00	W3.00	X0.00 — Y7.00

Specifications of X and Y are 0.02 or more, or 0. T±0.01

Delivery 5 Days

Price

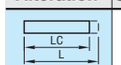
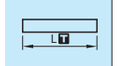
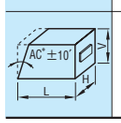
■Volume discount rate P.37

To be quoted on price & lead time above Max. Q'ty.

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

Alteration

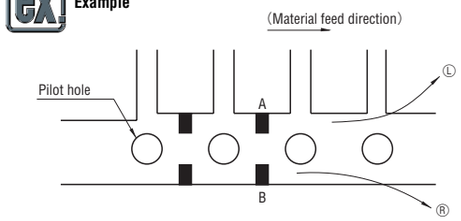
Catalog No.	V	H	L(LC)	P—W—X—Y	(LKC・AC)
CSMT	10	10	20	P 2.00— W1.00	AC3

Alteration	Code	Spec.	¥/1Code
	LC	Changes full length 16≦LC＜40 0.1mm increments (Combination with LKC→0.01mm incr.)	200
	LKC	Changes tolerance on full length $L^{+0.2}_{0}$ ⇨ $^{+0.05}_{0}$	400
	AC	Adds tapering to end surface for the height adjustment unit AC：Select 1°, 3°, 5° ⊗Combination with LKC：Not applicable	600

■Features

1.Use for correction of camber (camber of material) during thin material press operations, with lead frames, connectors, etc.
2.If used as a set with the height adjustment unit, use alteration AC (select 1°, 3° or 5°).

Example



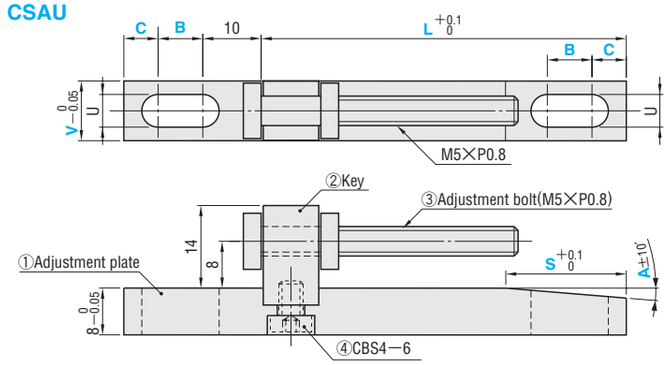
If the material is bent to side L, correct the camber by making a light groove at position A.

CAMBER CORRECTION HEIGHT ADJUSTMENT

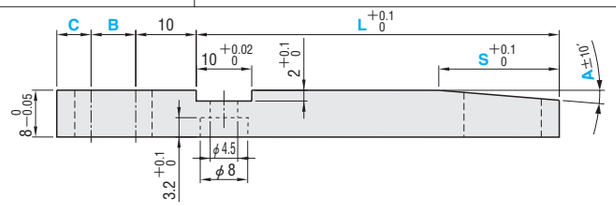
Production of these product is scheduled to discontinue in 2008.

RoHS

CSAU

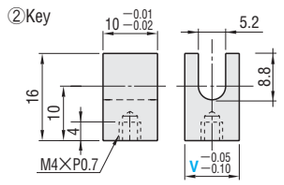


①Adjustment plate

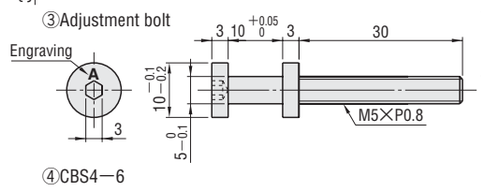


Component	M	H	S	A
①	M SKD11 or equivalent	H 60～63HRC		
②	M SKS3	H 58～62HRC		
③	M S45C	H 33～38HRC	S Electroless nickel plating	
④	M SCM435	H 39～44HRC(Strength class 8.8)		A CBS4-6

②Key



③Adjustment bolt



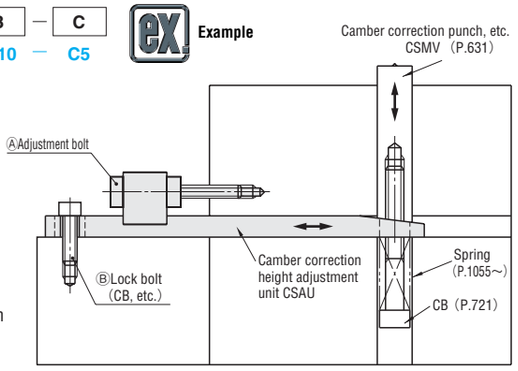
④CBS4—6

U	Catalog No. Type	Catalog No. V	1mm increments L	1mm increments S	A (Selection)	1mm increments B	1mm increments C	U/Price Q'ty：1～9
5.5	CSAU	10	70～120	10～30	1 3 5	5～20	5～10	5,810
6.5		13						6,180

Order

Catalog No.	L	S	A	B	C
CSAU 10	80	S20	A3	B10	C5

Example



Delivery 8 Days

Price

■Volume discount rate P.37

To be quoted on price & lead time above Max. Q'ty.

Quantity	1～9	10～20
Rate	—	5%

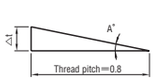
■Features

1.Slight height adjustments of block punch in flexure or warp correction or engraving, etc. can be done without disassembling the die.
2.Use as a set with CSMT or CSMV (P.631) in correction of camber when machining thin parts such as lead frames and connectors.

■How to use

1.Adjust the punch height by moving the camber correction height adjustment unit (CSAU) with the Ⓐ adjustment bolt.
See the table at right about the amount of change in the punch height when the screw is turned once. Also, in order to show the screw rotation position, an identification mark (A) is engraved on the head of the Ⓐ adjustment screw.
2.Tighten the Ⓑ lock bolt and fasten the camber correction height adjustment unit (CSAU).
3.In the case of readjustment, loosen the Ⓑ lock bolt and use it.

Amount of change in the punch height when the screw is turned once. △t (mm)



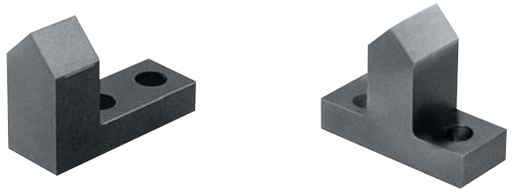
A°	1	3	5
△t (mm) 0.8×tan A°	0.014	0.042	0.070

COMMON SCRAP CUTTERS

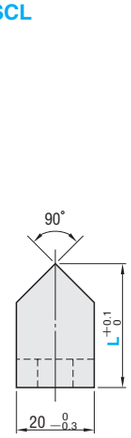
SPRING CASE SET

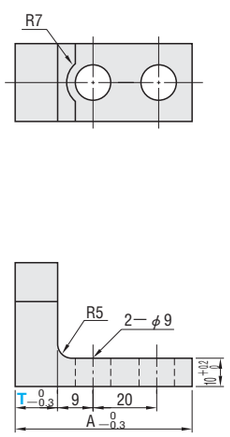
The volume discount rate is also applicable to alteration cost. P.39

RoHS

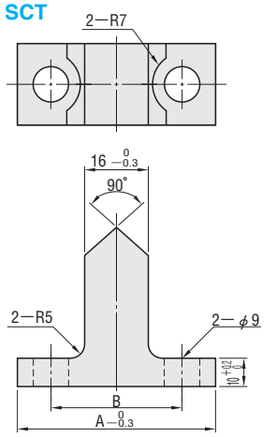


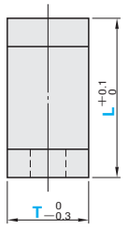
SCL





SCT





M SKD11 or equivalent
H 60～63HRC

A	B	Catalog No Type	Catalog No T	L 10mm increments	U/Price Q'ty：1～9 Min. L～L60	U/Price Q'ty：1～9 L70～L100
48	—	SCL	10	20～ 60	4,490	—
54			16		5,290	—
63			25		6,190	—
50	32	SCT	20	30～100	7,890	9,390
			25		8,890	10,590
			30		9,690	11,490

Order Catalog No. — L
SCL 16 — 20
SCT 20 — 50

Delivery 5 Days

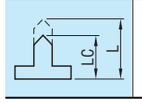
Price

■Volume discount rate P.37

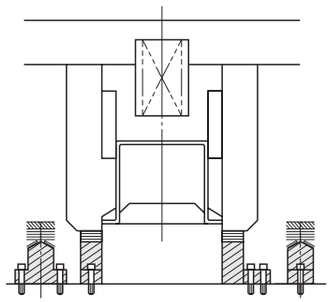
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

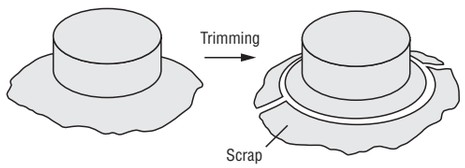
Alteration Catalog No. — L(LC)
SCT 25 — LC55

Alteration	Code	Spec.	¥/1Code
	LC	Changes dimension L 1mm increments Lmin.＜LC＜Lmax.	500

Example



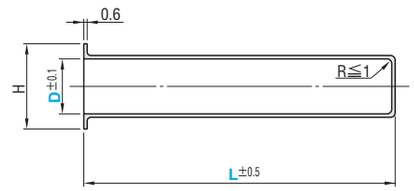
Used for cutting scrap on the ring during trimming.



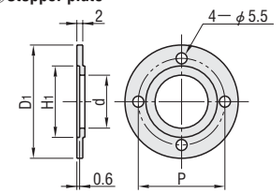
RoHS

SPRC（Spring case set）

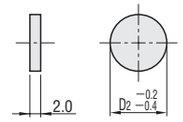
①Spring case （Thickness t =0.6）



②Stopper plate



③Washer for spring case



＊The maximum load on the bottom of the spring case is 490N（50 kgf）or less. Items with a high load cannot be used. Please exercise caution.

Trade name	①Spring case	②Stopper plate	③Washer for spring case
M	SUS304L	SPCC＋Zinc	SPCC＋Galvanizing

■SPRC（Spring case set ①＋②＋③）

Applicable spring (Outside diameter)	①Spring case H	②Stopper plate d	H1	D1	P	③Washer for spring case D2	Catalog No. Type	D	L	U/Price Q'ty：1～19Sets
16～17	27	21	27	46	36	18	SPRC	18	75	660
									100	810
									125	900
									150	960
18～20	31	25	31	50	40	22		22	75	690
									100	840
									125	930
									150	980
22～27	37	31	37	56	46	28		28	75	730
									100	890
									125	960
									150	990

■Components

Catalog No. Type	D	L	①Spring case	U/Price Q'ty：1～19	②Stopper plate	U/Price Q'ty：1～19	③Washer for spring case	U/Price Q'ty：1～19
SPRC	18	75	SPRCA18— 75	460	SPRSP18	110	SPRW18	90
		100	SPRCA18—100	610				
		125	SPRCA18—125	700				
		150	SPRCA18—150	760				
	22	75	SPRCA22— 75	470	SPRSP22	130	SPRW22	90
		100	SPRCA22—100	620				
		125	SPRCA22—125	710				
		150	SPRCA22—150	760				
	28	75	SPRCA28— 75	500	SPRSP28	140	SPRW28	90
		100	SPRCA28—100	660				
		125	SPRCA28—125	730				
		150	SPRCA28—150	760				

Order Catalog No. — L
SPRC 18 — 75
SPRCA 18 — 100

Delivery 1 Day

Price

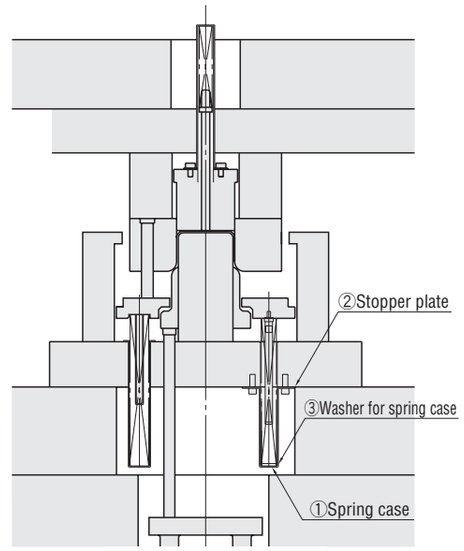
■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example

■Features
1. A long spring which is not influenced by plate thickness can be set and long stroke can be obtained easily.
2. These are deep drawing press products, so compared to cut parts of the same shape, their cost is extremely low.
3. By using a spring case, the spring is built into the die and assembly man-hours and setup time can be saved.



＊The washsers for the spring case are for the purpose of keeping the dimension spring's contact surface uniform and preventing floating of spring case when its inner diameter R≦1.

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

SPECIAL SHAPED PUNCHES & DIES

SPECIAL SHAPED PUNCHES & DIES

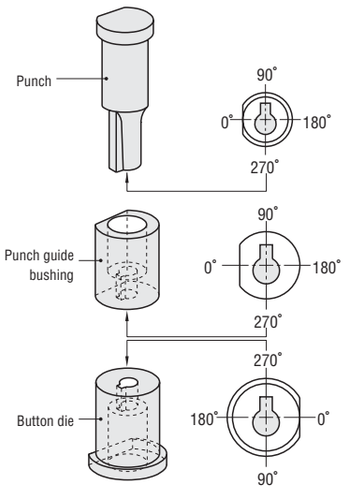
Add. WPC® HW coating Oval shaped tip

Add. Oval shaped hole

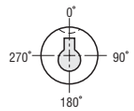
Add. Oval shaped hole

Name / Catalog No.	SPECIAL SHAPED PUNCHES	SPECIAL SHAPED PUNCH GUIDE BUSHINGS/BUTTON DIES	SPECIAL SHAPED BLOCK DIES
Delivery	⑤Ⓑ·⑧Ⓒ·⑫	③Ⓐ	③Ⓐ
Page	639～648	649	651

■Standard key flat location

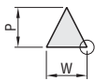


Standard ball seat location.



■Fillets and sharp corners

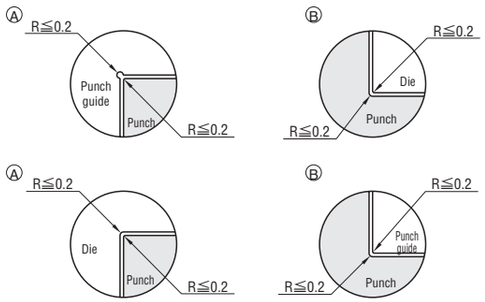
External angle



●Generally, R is processed within 0.2.

Ⓡ R=0 can be also specified.

Fillets and sharp corners of punch, punch guide bushings and button die



SPECIAL SHAPED PUNCHES & DIES
—GUIDE—

■Special shaped punches & dies

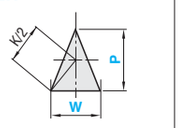
Printed in red are additional spec.

Drawings of shapes										Page
									51 variations	P637
Category	Products name		Normal	TiCN coating	WPC®	HW coating	Shank	Length		Page
Punch	・Shoulder punch	SKD11 or equivalent	SP		W—SP		D4～25	L40～100		P.639
		SKH51	SH	H—SH	W—SH	HW—SH	D4～25	L40～100		
		Powdered high-speed steel	PH	H—PH	W—PH	HW—PH	D4～25	L40～100		
	・Punch with dowel		SP—C		W—SP—C		D10～45	L40～120		
	・Punch for heavy load	SKH51	AP	H—AP	W—AP	HW—AP	D5～25	L50～100		
		Powdered high-speed steel	APH	H—APH	W—APH	HW—APH	D5～25	L50～100		
	・Punch with tap hole		MP		W—MP		D5～25	L40～100		
	・Jector punch	SKD11 or equivalent	SJ		W—SJ		D5～25	L40～100		P.641
		Powdered high-speed steel	PJ	H—PJ	W—PJ	HW—PJ	D5～25	L40～100		
	・Jector punch with dowel		SJ—C		W—SJ—C		D10～45	L60～120		
	・Ball-lock punch	Light-load	ELP KLP				D10～32	L63～90		P.643
		Heavy load	EBP KBP				D10～32	L71～100		
	・Block punch (Straight/Tapped/with Key groove/Single flanged/Double flanged)	SKD11 or equivalent	H□				V3～50	L40～80		P.645
		SKH51		H—HS□			V3～30	L40～80		
		Powdered high-speed steel	PH□	H—PH□			V3～30	L40～80		
	・Straight punches (Straight/Tapped/with Key groove)	SKD11 or equivalent	H□C				P2.00～30.00	L40～80		P.647
		SKH51		H—HS□C			P2.00～30.00	L40～80		
		Powdered high-speed steel	PH□C	H—PH□C			P2.00～30.00	L40～80		
Punch guide bushing	・Punch guide bushing	Headed	HG				D8～16	L10～25		P.649
		Straight	SG				D8～16	L10～25		
Button die	・Button die	Headed	HD				D6～56	L16～35		
		Straight	SD				D8～56	L16～35		
		Dowel slot	KD				D10～56	L16～35		
	・Tilting button die	Headed	HDS				D10～56	L40		
		Straight	SDS				D10～56	L16～40		
		Dowel slot	KDS				D10～56	L16～40		
Block die	・Straight	SKD11 or equivalent	BL				V・H6～25	L16～35		P.651
		Powdered high-speed steel	PBL							
	・Single flanged	SKD11 or equivalent	BLF							
		Powdered high-speed steel	PBLF							
	・Configurable size	SKD11 or equivalent	FBL							
		Powdered high-speed steel	FPBL							

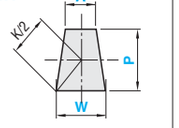
PRESS ADD.SPEC. Printed in Red

SPECIAL SHAPED PUNCHES AND DIES
—SELECTABLE SHAPES—

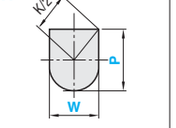
The center point of each shape is where dimensions P and W are divided in two parts, not the center of gravity. However the shapes **12H, 17J, 23K, 25K, 2L** and **3L** are exceptional.)

2H Ⓢ


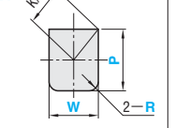
● K=$\sqrt{P^2+W^2}$
Machining limit ❹ ❺ ❻

4H Ⓢ


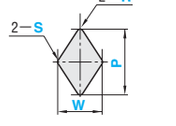
● W＞A≧0.5 ● K=$\sqrt{P^2+W^2}$
Machining limit ❸ ❹ ❺ ❻

5H Ⓢ


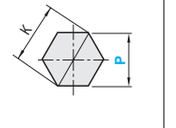
● P＞W/2 ● K=$\sqrt{P^2+W^2}$
Machining limit ❹ ❺

6H Ⓢ


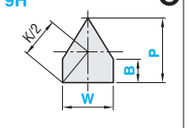
●W＞2R ● K=$\sqrt{P^2+W^2}$
Machining limit ❹ ❺

7H Ⓢ


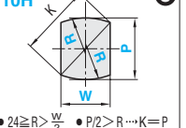
● K=P
Machining limit ❹ ❺

8H Ⓢ


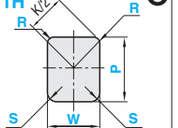
● K=1.1547×P
Machining limit ❹ ❺

9H Ⓢ


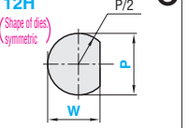
● P＞B
● K=$\sqrt{P^2+W^2}$
Machining limit ❷ ❹ ❺ ❻

10H Ⓢ


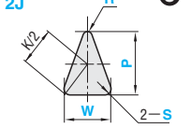
● 24≧R＞$\frac{W}{2}$ ● P/2＞R┈K=P
● P/2＜R┈K=$\sqrt{4(Y-X)^2+W^2}$
X=R−P/2, Y=$\sqrt{R^2-(W/2)^2}$
Machining limit ❹ ❺

11H Ⓢ


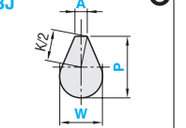
●W＞2S ●R＜S
● K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❹ ❺

12H Ⓢ


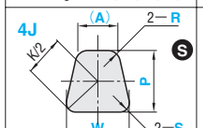
●P＞W≧P/2+0.2
●K=P
Machining limit ❹ ❺

2J Ⓢ


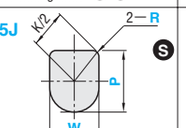
●W＞2S
● K=$\sqrt{(P-2S)^2+(W-2S)^2}+2S$
Machining limit ❹ ❺

3J Ⓢ


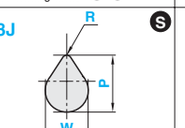
●P＞W ●W＞A≧0.5
● K= $\sqrt{P^2+A^2}$
Machining limit ❸ ❹ ❺

4J Ⓢ


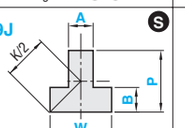
●P＞R+S ●A≧2R+0.5 ●W≧2S+0.5
●W＞A≧0.5 ●(A) Ref.Dim.
●K=$\sqrt{(P-2S)^2+(W-2S)^2}+2S$
Machining limit ❷ ❸ ❹ ❺

5J Ⓢ


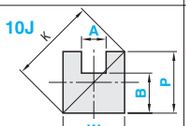
●P≧W/2+R+0.5
●W≧2R+0.5
●K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❹ ❺

8J Ⓢ


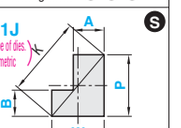
●P＞W
●W＞2R
●K=P
Machining limit ❹ ❺

9J Ⓢ


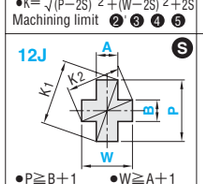
●P≧B+0.5
●W≧A+1
●K=$\sqrt{P^2+W^2}$
Machining limit ❶ ❸ ❹ ❺ ❼

10J Ⓢ


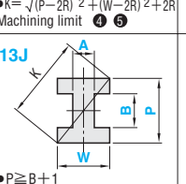
●W≧A+1
●P≧B+0.5
●K=$\sqrt{P^2+W^2}$
Machining limit ❷ ❸ ❹ ❺ ❼

11J Ⓢ


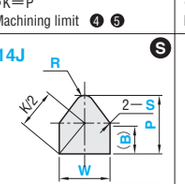
●W≧A+0.5
●P≧B+0.5
●K=$\sqrt{P^2+W^2}$
Machining limit ❶ ❸ ❹ ❺ ❼

12J Ⓢ


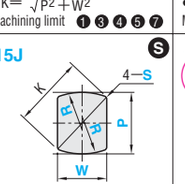
●P≧B+1 ●W≧A+1
●$K_1=\sqrt{P^2+A^2}$ ●$K_2=\sqrt{W^2+B^2}$
$K_1>K_2$┈K=K_1, $K_1<K_2$┈K=K_2
Machining limit ❶ ❸ ❹ ❺ ❼

13J Ⓢ


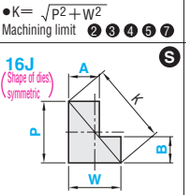
●P≧B+1
●W≧A+1
●K=$\sqrt{P^2+W^2}$
Machining limit ❷ ❸ ❹ ❺ ❼

14J Ⓢ


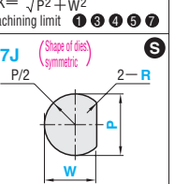
● P＞B≧0.5 ● K=$\sqrt{P^2+W^2}$
● (B)：Ref.Dim.
Machining limit ❹ ❺

15J Ⓢ


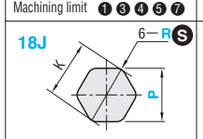
●24≧R＞$\frac{W}{2}$
● K ┈※ Refer to the right-hand page.
Machining limit ❹ ❺

16J Ⓢ


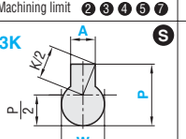
●W≧A+0.5 ●P≧B+0.5
●K=$\sqrt{P^2+W^2}$
Machining limit ❶ ❸ ❹ ❺ ❼

17J Ⓢ


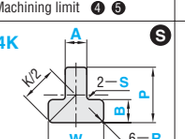
●P＞W≧P/2+R+0.2
●K=P ●R=0：Not available
Machining limit ❹ ❺

18J Ⓢ


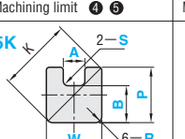
●K=1.1547(P−2R)+2R
Machining limit ❹ ❺

3K Ⓢ


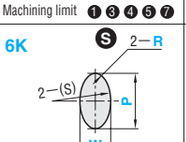
●P＞W
●W＞A≧0.5 ●(W−A)/2≧0.5
●K= $\sqrt{P^2+A^2}$
Machining limit ❶ ❸ ❹ ❺ ❼

4K Ⓢ


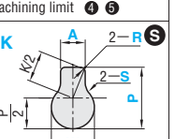
●W≧A+2(R+S)+1
●P≧B+R+S+0.5
● K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❶ ❷ ❸ ❹ ❺ ❼

5K Ⓢ


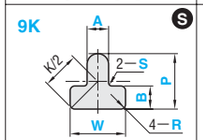
●W≧A+4R+1 ●A≧2S+0.5
●P≧B+R+S+0.5
● K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❷ ❸ ❹ ❺ ❼

6K Ⓢ


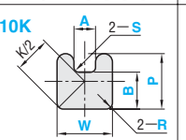
●S=$\frac{P^2-4PR+W^2}{4(W-2R)}$≦24
●K=P
Machining limit ❹ ❺

8K Ⓢ


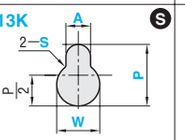
●P≧$\sqrt{(W/2+S)^2-(A/2+S)^2}$+R+W/2+0.5
●A≧2R+0.5 ●(W−A)/2≧0.5
●K=$\sqrt{(P-2R)^2+(A-2R)^2}+2R$
Machining limit ❶ ❸ ❹ ❺ ❼

9K Ⓢ


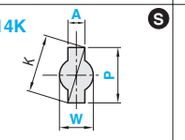
●W≧A+2(R+S)+1
●P≧B+S+A/2+0.5
●K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❶ ❸ ❹ ❺ ❼

10K Ⓢ


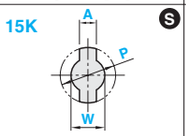
● P≧B+$\frac{W-A}{4}$+S+0.5 ● A≧2S+0.5
● K ┈※ Refer to the right-hand page.
Machining limit ❷ ❸ ❹ ❺ ❼

13K Ⓢ


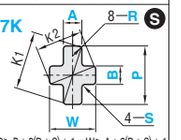
● (W−A)/2≧0.5
● P≧$\sqrt{(W/2+S)^2-(A/2+S)^2}$+A/2+W/2+0.5
●K=P
Machining limit ❶ ❸ ❹ ❺ ❼

14K Ⓢ


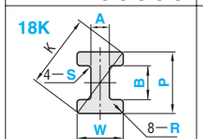
●W＞A≧0.5
●P＞W ●(W−A)/2≧0.5
●K=$\sqrt{P^2+A^2}$
Machining limit ❶ ❸ ❹ ❺ ❼

15K Ⓢ


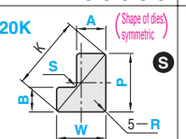
●P＞W
●W＞A
●K=P ●(W−A)/2≧0.5
Machining limit ❶ ❸ ❹ ❺ ❼

17K Ⓢ


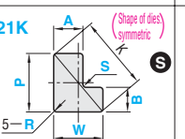
● P≧B+2(R+S)+1 ●W≧A+2(R+S)+1
● $K_1=\sqrt{(P-2R)^2+(A-2R)^2}+2R$
● $K_2=\sqrt{(W-2R)^2+(B-2R)^2}+2R$
$K_1>K_2$┈K=K_1, $K_1>K_2$┈K=K_2
Machining limit ❶ ❸ ❹ ❺ ❼

18K Ⓢ


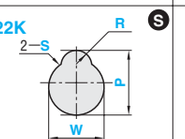
●P≧B+4R+1
●W≧A+2(R+S)+1
●K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❷ ❸ ❹ ❺ ❼

20K Ⓢ


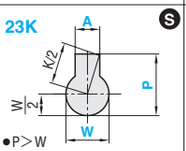
●P≧B+R+S+0.5
●W≧A+R+S+0.5
●K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❶ ❸ ❹ ❺ ❼

21K Ⓢ


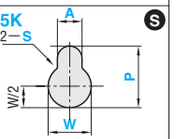
●P≧B+R+S+0.5
●W≧A+R+S+0.5
●K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❶ ❸ ❹ ❺ ❼

22K Ⓢ


● P≦$\sqrt{(W/2+S)^2-(R+S)^2}$+R+W/2
●K=P ●R＜W/2
Machining limit ❹ ❺ ❼

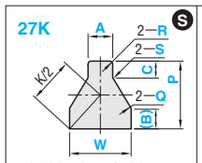
23K Ⓢ


●P＞W
●W＞A≧0.5 ●(W−A)/2≧0.5
●K=2$\sqrt{(P-W/2)^2+(A/2)^2}$
Machining limit ❶ ❸ ❹ ❺ ❼

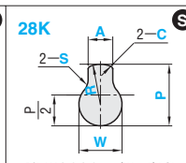
25K Ⓢ


●(W−A)/2≧0.5
● P≧$\sqrt{(W/2+S)^2-(A/2+S)^2}$+A/2+W/2+0.5
●K=2(P−W/2)
Machining limit ❶ ❸ ❹ ❺ ❼

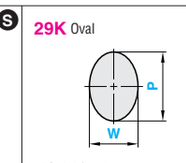
TiCN, WPC®, and HW coating is available for the punches with Ⓢ marked shapes. P.639～642, P.645～648

27K Ⓢ


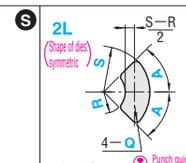
● P＞B+C ● W＞A ● A≧2R+0.5 ● B＞Q
● B≧0.5(B)：Ref.Dim. ●C＞R+S
●K=$\sqrt{P^2+W^2}$ Machining limit ❷ ❸ ❹ ❺ ❼

28K Ⓢ


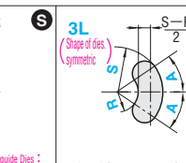
●P＞W+C+S ●(W−A)/2≧0.5
●K ┈※ See below.
Machining limit ❸ ❹ ❺ ❼

29K Oval Ⓢ


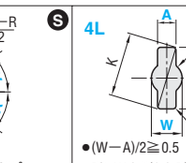
●P＞W+0.1
●K=P
Machining limit ❹

2L Ⓢ


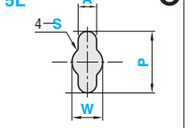
●S−R≧2 Punch guide Dies：Refer to working limit
●S，R≦50 ●A≦90°
Machining limit ❸ (S−R) ❹ ❺ ❼

3L Ⓢ


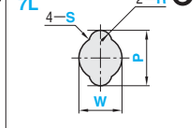
●S−R≧2 ●A≦90°
●S，R≦50
Machining limit ❸ (S−R) ❹ ❺ ❼

4L Ⓢ


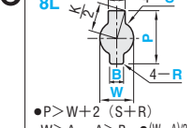
●(W−A)/2≧0.5
●P＞W+2(S+R) ●W＞A
● K=$\sqrt{(P-2R)^2+(A-2R)^2}+2R$
Machining limit ❷ ❸ ❹ ❺ ❼

5L Ⓢ


● P≧2$\sqrt{(W/2+S)^2-(A/2+S)^2}$+A+1
●K=P ●(W−A)/2≧0.5
Machining limit ❷ ❸ ❹ ❺ ❼

7L Ⓢ


● P≦2$\sqrt{(W/2+S)^2-(R+S)^2}$+2R
●K=P
Machining limit ❹ ❺ ❼

8L Ⓢ


●P＞W+2(S+R)
W＞A A＞B ●(W−A)/2≧0.5
● K=$\frac{\sqrt{(P-2R)^2+(A-2R)^2}+2R}{2}$
Machining limit ❷ ❸ ❹ ❺ ❼

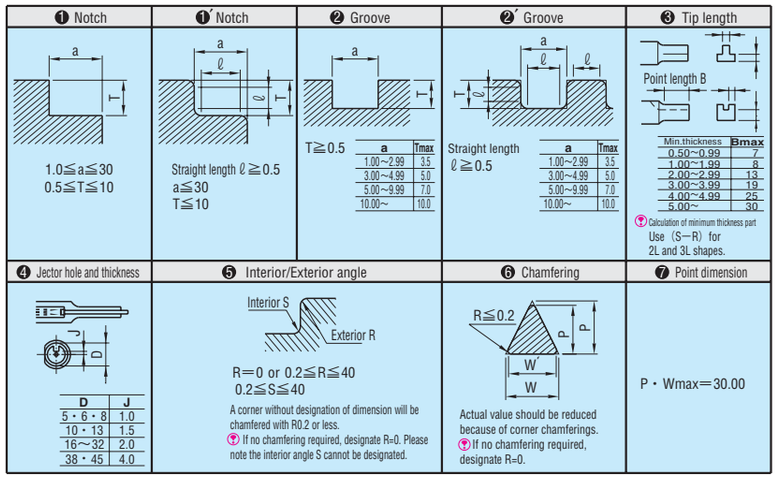
※**8L** is applicable to **SP—C·SJ—C·KLP·KD·KDS.**
※**29K** : Not available for straight punches.

※**15J**
When P/2＜R
K=$2\sqrt{(Y-X)^2+(W/2-S)^2}+2S$
X=R−P/2
Y=$\sqrt{(R-S)^2-(W/2-S)^2}$
When P/2≧R
K=P

※**10K**
When R≦ {(W−A)/4}
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$
When R＞ {(W−A)/4}
K=$\sqrt{(P-2\{(W-A)/4\})^2+(W-2\{(W-A)/4\})^2}+2\{(W-A)/4\}$

※**28K**
When P/2＜R K=$2\sqrt{(Y-X)^2+(A/2-C)^2}+2C$
X=R−P/2
Y=$\sqrt{(R-C)^2-(A/2-C)^2}$
When P/2≧R K=P/2

■Machining limit/Specifying unit of punches

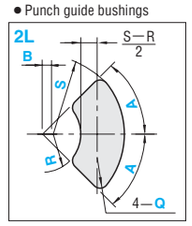


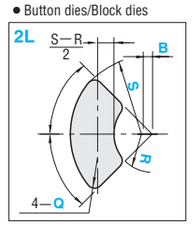
■Unit designation

T	Unit designation
W±0.01	0.01mm increments
P ±0.01	0.01mm increments
A ±0.01	0.01mm increments
B ±0.01	0.01mm increments
C ±0.01	0.01mm increments
Q	0.01mm increments
R	0.01mm increments
S	0.01mm increments
C (Corner radius)	0.01mm increments
A° (Degrees)	0.1° increments

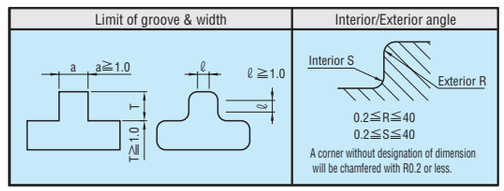
■Machining limit of punch bushings, button dies and block dies

Symmetrical shape to the illustration will be provided for button dies and block dies with shape of **12H·11J·16J·17J·20K·21K·2L** and **3L**.
For **2L**, designate reference point B of angle A in order to have clearance of a punch. (Refer to the figure below.)

● Punch guide bushings


● Button dies/Block dies


$B=\frac{\text{Clearance (one side)}}{\sin A}$ 0≦B≦2.00 0.01mm increments



■Unit designation

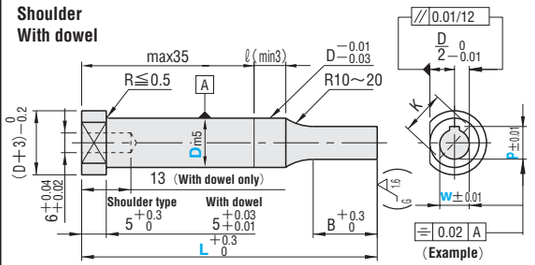
T	Unit designation
W±0.01	0.01mm increments
P ±0.01	0.01mm increments
A ±0.01	0.01mm increments
B ±0.01	0.01mm increments
C ±0.01	0.01mm increments
Q	0.01mm increments
R	0.01mm increments
S	0.01mm increments
C (Corner radius)	0.01mm increments
A° (Degrees)	0.1° increments

PRESS ADD.SPEC. Printed in Red

SPECIAL SHAPED PUNCHES

RoHS Type	Shank diameter	M	H	Catalog No. Normal	TiCN coating Surface 3000HV	WPC® Surface 1000~1100HV	HW coating Surface 3000HV
Shoulder type	4~25	SKD11 or equivalent	60~63HRC	SP	—	W—SP	—
		SKH51	61~64HRC	SH	H—SH	W—SH	HW—SH
		Powdered high-speed steel	64~67HRC	PH	H—PH	W—PH	HW—PH
With dowel	10~45	SKD11 or equivalent	60~63HRC	SP—C	—	W—SP—C	—
Punch for heavy load	5~25	SKH51	61~64HRC	AP	H—AP	W—AP	HW—AP
		Powdered high-speed steel	64~67HRC	APH	H—APH	W—APH	HW—APH
With tap hole	5~25	SKD11 or equivalent	60~63HRC	MP	—	W—MP	—

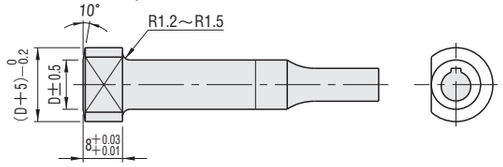
Shoulder
With dowel



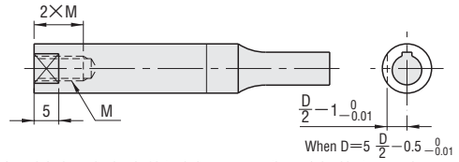
A Dowel pin MS6-25 (With dowel only)

(Example)

Punch for heavy load



With tap hole



Special shapes P.637

The unspecified dimensions of punch for heavy load and with tap hole are same as those of shoulder type punch.
WPC®, HW coating : The edge of the tip will be slightly rounded.
TiCN coating : The tip surface is ground before the coating is applied.

Catalog No. Type	Shape	D	L	P·K max.	P·W min.	B	With tapping type M
—Normal— —TiCN coating— —WPC®— —HW coating—		4	(40) 50 60 70 80	3.90	2.00	8	—
		5		4.90	2.00		3
	2H~12H	6		5.90	2.00		
D 4~25 SP — W—SP —	2J~18J	8	(40) (50) 60 70 80 90 100	7.90	2.00	13	4
D 4~25 SH H—SH W—SH HW—SH	3K~29K	10		9.90	2.50		5
D 4~25 PH H—PH W—PH HW—PH	2L~ 7L	13		12.90	3.00		6
D10~45 SP—C — W—SP—C —	8L (SP—C / W—SP—C only)	16		15.90	4.00	19	
D 5~25 AP H—AP W—AP HW—AP	Special shapes P.637	20		19.90	5.00		
D 5~25 APH H—APH W—APH HW—APH		25		24.90	6.00		
D 5~25 MP — W—MP —		32	70 80 90 100 110 120	31.90	7.00		—
		38	80 90 100 110 120	37.90	8.00		
		45		44.90	9.00		

L(40)··· · In case of punch for heavy load, the full length = (40) is not applicable.
· Except punch for heavy load, when the full length is (40), tip length B is fixed to 6mm.
L(50)··· · When the full length of punch for heavy load is (50), tip length B is fixed to 8mm.
· Except punch for heavy load, when the full length is (50), tip length B is fixed to 13mm.
TiCN coating, WPC®, HW coating type : Not applicable to **10J·13J·5K·10K·18K**

Order

Catalog No. — L — P · W · A · B · C · Q · R · S···0.01mm increments

SP3K 25 — 80 — P18.00 — W16.00 — A8.00
W—SP29K 10 — 80 — P7.00 — W5.00

Delivery

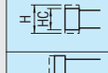
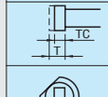
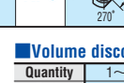
● Normal type (SP · SH · PH · SP—C · AP · APH · MP)
5 Days — Express B 1,500/1Pc. P.38
A flat charge of 4,050 Yen for 3 pieces or more of the same size.

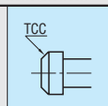
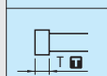
● TiCN coating, WPC®,HW coating type (H— · W— · HW—)
8 Days — Express C 1,500/1Pc. P.38
A flat charge of 4,050 Yen for 3 pieces or more of the same size.

The volume discount rate is also applicable to alteration cost. P.39

Alterations

Catalog No. — L(LC) — P · W · A · B · C · Q··· — (HC · TC···etc.)
SP3K 25 — LC75 — P18.00 — W16.00 — A8.00 — BC13 — KFC225

Alterations		Code	Spec.	¥/1Code
Tip		BC	Changes tip length B. 2≦BC≦Bmax 0.1mm increments P·W / Bmax: 2.00~2.99 / 13; 3.00~3.99 / 19; 4.00~4.99 / 25; 5.00~ / 30 Full length L (LC) requires BC+37mm (+42mm for punch for heavy load) or more. When D≧32 and 9J~13J·16J·K·L, max. length of B is as per the table in the right. L(LC) / Bmax D32 / D38·45: 50.0~59.9 / 6 / —; 60.0~69.9 / 13 / 4; 70.0~79.9 / 19 / 11; 80.0~ / 19 / 19	200
		PKC	Changes P·W tolerance P·W±0.01 ⇨ +0.01 0 ⊗D≧32 : Not applicable Ⓨ Applicable to normal type	400
Full length		LC	Changes full length 37+B(BC)≦LC<L 0.1mm increments When LC−B (or BC) is 37mm or less, B (or BC) is LC−37mm. When D≧32 and 9J~13J·16J·K·L, max. length of B is as per the table in the right. L(LC) / Bmax D32 / D38·45: 50.0~59.9 / 6 / —; 60.0~69.9 / 13 / 4; 70.0~79.9 / 19 / 11; 80.0~ / 19 / 19	200
		LKC	Changes tolerance L +0.3 0 ⇨ +0.05 0	400
		LKZ	Changes tolerance L +0.3 0 ⇨ +0.01 0 ⊗D>25 : Not applicable Ⓨ Applicable to normal type	600
Head		HC	Changes head diameter H. D≦HC<D+3 0.1mm increments ⊗ Heavy load type : Not applicable	200
		TC	Changes head thickness T 2≦TC<5 0.1mm increments Ⓨ L is shortened by (5−TC) When LC is applied, L is equal to LC. ⊗ Heavy load type : Not applicable	200
		KC	 Changes key flat location ⊗MP Type D=5 : Not applicable	200
		WKC	 Adds double key flats in parallel To change angle, add KC. ⊗MP Type D=5 : Not applicable	200
		KFC	 Adds one key flat at 0° and the other at another angle 1° increments ⊗KC·WKC : Not applicable ⊗MP : Not applicable	400

Alterations		Code	Spec.	¥/1Code
Head		TCC	Adds chamfering to the head (it enables to improve intensity) P.1223 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓨ When H≦5, TCC 0.5 ⊗SRC : Not applicable ⊗Heavy load type : Not applicable	200
		RC	 Reduces head thickness by −0.04~0 from retainer surface ⊗With dowel · heavy load type : Not applicable	200
		SRC	Modifies head to fit select retainer (SLS) Ⓨ For details, refer to P.673. Ⓨ D10~25 : Available	300
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0 ⊗MP : Not applicable	200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02 ⊗MP : Not applicable	200
Shank		SKC	 Adds key flat on the shank Ⓨ Applicable for normal type ⊗D>25 : Not applicable ⊗MP type D=5 : Not applicable ⊗2L, 3L : Not applicable ⊗KC · WKC · KFC : Not applicable Except 8H, 18J, 2L, 3L Ⓨ D4~6 (Machining width 0.5) W≦D−1.2 Ⓨ D8~ (Machining width 1) W≦D−2.2 8H,18J Ⓨ D4~6 (Machining width 0.5) K≦D−1.2 Ⓨ D8~ (Machining width 1) K≦D−2.2	600

Price

Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

Ⓨ To be quoted on price & lead time above Max. Q'ty.

Type	Shape D	2~12H	2~18J	3~29K	2~8L
SP SH	4~10	4,250	5,890	13,190	15,220
	13~16	5,540	7,190		
	20~25	7,010	8,410		
PH	4~10	5,650	7,360	15,430	17,450
	13~16	6,980	8,900		
	20~25	10,570	12,070	17,280	19,480
AP	5~10	6,670	8,580	17,020	19,330
	13~16	8,170	9,720		
	20~25	9,290	10,770	15,840	17,970
APH	5~10	9,670	11,600	20,700	23,050
	13~16	11,180	13,320		
	20~25	16,240	17,960	23,850	26,300
SP—C MP	5~10	5,190	6,760	14,170	16,030
	13~16	6,410	8,170		
	20~25	7,970	9,310		
	32	12,460	15,220	23,240	28,500
	38	13,920	16,510	25,180	34,660
	45	14,730	17,320	26,880	36,440

Type	Shape D	2~12H	2~18J	3~29K	2~8L
H—SH	4	5,440	7,080	14,390	16,420
	5	5,500	7,140	14,440	16,470
	6	5,620	7,260	14,570	16,600
	8	5,770	7,410	14,710	16,740
	10	5,920	7,560	14,860	16,890
	13	7,370	9,020	15,020	17,050
	16	7,550	9,200	15,200	17,230
	20	9,220	10,620	15,400	17,430
	25	9,310	10,710	15,490	17,520
H—PH	4	6,950	8,660	16,730	18,750
	5	7,010	8,720	16,790	18,810
	6	7,150	8,860	16,920	18,950
	8	7,310	9,020	17,080	19,110
	10	7,470	9,180	17,250	19,270
	13	8,970	10,890	17,410	19,440
	16	9,160	11,080	17,610	19,640
	20	12,980	14,480	19,690	21,890
	25	13,080	14,550	19,790	21,990
H—AP	5	8,110	10,030	18,460	20,780
	6	8,260	10,170	18,620	20,930
	8	8,440	10,350	18,780	21,100
	10	8,660	10,570	19,010	21,320
	13	10,350	12,270	19,200	21,510
	16	10,040	11,800	18,160	20,290
	20	11,880	13,350	18,430	20,560
	25	12,030	13,510	18,580	20,710
H—APH	5	11,210	13,150	22,250	24,590
	6	11,380	13,320	22,400	24,760
	8	11,570	13,500	22,590	24,950
	10	11,840	13,770	22,870	25,220
	13	13,550	15,690	23,060	25,420
	16	13,780	15,910	23,300	25,660
	20	18,370	20,090	25,980	28,430
	25	19,230	20,910	26,840	29,290

Type	Shape D	2~12H	2~18J	3~29K	2~8L
W—SP W—SH	4~10	5,280	6,920	14,220	16,250
	13~16	6,570	8,220		
	20~25	8,040	9,440		
W—PH	4~10	6,680	8,390	16,460	18,480
	13~16	8,010	9,930		
	20~25	11,600	13,100	18,310	20,510
W—AP	5~10	7,700	9,610	18,050	20,360
	13~16	9,200	10,750	18,050	20,360
	20~25	10,320	11,800	16,870	19,000
W—APH	5~10	10,700	12,630	21,730	24,080
	13~16	12,210	14,350		
	20~25	17,270	18,990	24,880	27,330
W—SP—C W—MP	5~10	6,220	7,790	15,200	17,060
	13~16	7,440	9,200		
	20~25	9,000	10,340		
	32	13,490	16,250	24,270	29,530
	38	14,950	17,540	26,210	35,690
	45	15,760	18,350	27,910	37,470
HW—SH	4	6,000	7,740	15,520	17,680
	5	6,060	7,810	15,570	17,730
	6	6,190	7,930	15,710	17,870
	8	6,350	8,090	15,860	18,020
	10	6,510	8,250	16,020	18,180
	13	8,050	9,810	16,190	18,350
	16	8,240	10,000	16,380	18,540
	20	10,020	11,510	16,600	18,750
	25	10,120	11,610	16,690	18,850
HW—PH	4	7,610	9,420	18,010	20,160
	5	7,670	9,490	18,070	20,220
	6	7,820	9,640	18,210	20,370
	8	7,990	9,810	18,380	20,540
	10	8,160	9,980	18,560	20,710
	13	9,750	11,800	18,730	20,890
	16	9,960	12,000	18,950	21,110
	20	14,020	15,620	21,160	23,500
	25	14,130	15,690	21,270	23,610
HW—AP	5	8,840	10,880	19,850	22,320
	6	9,000	11,030	20,020	22,480
	8	9,190	11,220	20,190	22,660
	10	9,420	11,460	20,440	22,890
	13	11,220	13,270	20,640	23,100
	16	10,890	12,770	19,530	21,800
	20	12,850	14,410	19,820	22,080
	25	13,010	14,580	19,980	22,240
HW—APH	5	12,140	14,200	23,880	26,370
	6	12,320	14,380	24,040	26,550
	8	12,520	14,570	24,240	26,760
	10	12,810	14,860	24,540	27,040
	13	14,630	16,900	24,740	27,260
	16	14,870	17,140	25,000	27,510
	20	19,750	21,580	27,850	30,460
	25	20,670	22,460	28,770	31,370

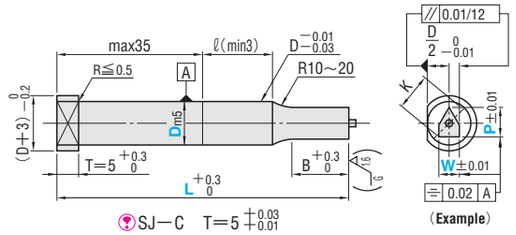
PRESS ADD.SPEC. Printed in Red

SPECIAL SHAPED JECTOR PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

RoHS Type	Shank diameter	M	H	Catalog No. Normal	TiCN coating Surface 3000HV	WPC® Surface 1000～1100HV	HW coating Surface 3000HV
—Shoulder type—	5～25	(D5～6) SKH51 (D8～25) SKD11 or equivalent	(D5～6) 61～64HRC (D8～25) 60～63HRC	SJ	—	W—SJ	—
		Powdered high-speed steel	64～67HRC	PJ	H—PJ	W—PJ	HW—PJ
—With dowel—	10～45 (L≧60)	SKD11 or equivalent	60～63HRC	SJ—C	—	W—SJ—C	—

Special shapes P.637



SJ—C T=5 +0.03 +0.01

A Dowel pin MS6-25 (With dowel only)

WPC®, HW coating : The edge of the tip will be slightly rounded.

TiCN coating : The tip surface is ground before the coating is applied.

Catalog No. Type	Shape	D	L	P·K max.	P·W min.	B
—Normal— —TiCN coating— —WPC®— —HW coating—	2H～12H	5	(40) 50 60 70 80	4.90	2.00	8
		6		5.90	2.00	
D 5～25 SJ — — W—SJ —	2J～18J	8	(40) (50) (60) 70 80 90 100	7.90	3.00	13
	3K～29K	10		9.90	3.00	
D 5～25 PJ H—PJ W—PJ HW—PJ		13		12.90	6.00	
	2L～7L	16		15.90	6.00	19
D10～45 L≧60 SJ—C — W—SJ—C —	8L (SJ—C W—SJ—C only)	20		19.90	6.00	
	Special shapes P.637	25		24.90	6.00	
		32	70 80 90 100 110 120	31.90	7.00	
		38	80 90 100 110 120	37.90	8.00	
		45		44.90	9.00	

L(40)⋯▸ B=6 When the full length is (40), tip length B is fixed to 6mm.

L(50)⋯▸ B=13 When the full length is (50), tip length B is fixed to 13mm.

SJ—C⋯▸ L≧60 No standard for L<60. When full length is (60), tip length B is fixed to 13mm.

Jector hole and machining limit

D	J
5～8	1.0
10・13	1.5
16～32	2.0
38・45	4.0

TiCN coating, WPC®, HW coating type : Not applicable to **10J・13J・5K・10K・18K**

Order

Catalog No. — L — P・W・A・B・C・Q・R・S⋯0.01mm increments

SJ3K 25 — 80 — P18.00 — W16.00 — A8.00

W—SJ29K10 — 80 — P 7.00 — W 5.00

Delivery

● Normal type (SJ・PJ・SJ—C)

5 Days | Express B 1,500/1Pc. P.38

A flat charge of 4,050 Yen for 3 pieces or more of the same size.

● TiCN coating, WPC®, HW coating type (H—・W—・HW—)

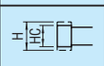
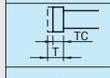
8 Days | Express C 1,500/1Pc. P.38

A flat charge of 4,050 Yen for 3 pieces or more of the same size.

Alterations

Catalog No. — L(LC) — P・W・A・B・C・Q⋯ —(BC・HC・TC⋯etc.)

SJ3K 25 — LC75 — P18.00 — W16.00 — A8.00 — BC13 — KFC225

Alterations		Code	Spec.	¥/1Code
Tip		BC	Changes tip length B. 2≦BC<B 0.1mm increments When D≧32 and 9J～13J・16J・K・L, max. length of B is as per the table in the right. L: 50.0～59.9 / 60.0～69.9 / 70.0～79.9 / 80.0～; Bmax D32: 6 / 13 / 19 / 19; Bmax D38・45: — / 4 / 11 / 19	200
		PKC	Changes P・W tolerance P・W ±0.01 ⇨ +0.01 0 Not applicable: D≧32 Applicable for normal type	400
Full length		LC	Changes full length LC<L 0.1mm increments B is shortened by (L—LC) When D≧32 and 9J～13J・16J・K・L, max. length of B is as per the table in the right. L: 50.0～59.9 / 60.0～69.9 / 70.0～79.9 / 80.0～; Bmax D32: 6 / 13 / 19 / 19; Bmax D38・45: — / 4 / 11 / 19	200
		LKC	Changes tolerance L L +0.3 0 ⇨ +0.05 0	400
		LKZ	Changes tolerance L L +0.3 0 ⇨ +0.01 0 Not available: D>25 Available for normal type	600
Head		HC	Changes head diameter H. D≦HC<D+3 0.1mm increments	200
		TC	Changes head thickness T 3.5≦TC<5 0.1mm increments L is shortened according to (5—TC), When LC is applied, L is equal to LC.	200
		KC	Changes key flat location 1° increments	200

Alterations		Code	Spec.	¥/1Code
Head		WKC	Adds double key flats in parallel	200
		KFC	Adds one key flat at 0° and the other at another angle 90° 0° 180° 270° KC・WKC : Not applicable	400
		TCC	Adds chamfering to the head (it enables to improve intensity) 0.1mm increments 0.5≦TCC≦(H—D)/2 When H≦5, TCC0.5 SRC : Not applicable P.1223	200
		RC	Reduces head thickness by 0 −0.04 ~0 from retainer surface With dowel : Not applicable	200
		SRC	Modifies head to fit select retainer (SLS) For details, refer to P.673. D10～25 : Applicable	300
		TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0	200
		TKM	Changes head thickness tolerance T +0.3 0 ⇨ 0 −0.02	200
Others		AC	Removes the jector pin, and plug up the side vent to make the jector hole as through air hole	−100
		NC	Removes the jector pin AC : Not applicable	−200
Shank		SKC	D5・6 D/2 −0.5 0 −0.01 D8～ D/2 −1 0 −0.01 Adds key flat on the shank Available for normal type D≦25 : Not available 2L, 3L : Not available KC・WKC・KFC : Not available Except 8H, 18J, 2L, 3L D5・6 (Machining width 0.5) W≦D−1.2 D8～ (Machining width 1) W≦D−2.2 8H,18J D5・6 (Machining width 0.5) K≦D−1.2 D8～ (Machining width 1) K≦D−2.2	600

Price

Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Type	Shape / D	2～12H	2～18J	3～29K	2～8L
SJ	5～10	5,190	6,760	14,170	16,030
	13～16	6,410	8,170	14,170	16,030
	20～25	7,970	9,310	14,170	16,030
PJ	5～10	7,450	9,070	17,100	19,220
	13～16	10,040	11,900	18,420	20,630
	20～25	14,190	16,040	20,890	23,010
SJ—C	10	5,890	7,450	14,730	16,760
	13～16	7,010	8,740	14,730	16,760
	20～25	9,550	11,010	15,790	17,730
	32	13,360	16,030	24,130	29,390
	38	14,730	17,320	25,990	35,550
	45	16,510	19,110	28,660	38,140
H—PJ	5	8,810	10,430	18,460	20,580
	6	8,950	10,570	18,600	20,720
	8	9,100	10,730	18,760	20,870
	10	9,270	10,890	18,920	21,040
	13	12,030	13,890	20,410	22,620
	16	12,230	14,080	20,610	22,810
	20	16,600	18,450	23,300	25,420
	25	16,700	18,550	23,400	25,520

Type	Shape / D	2～12H	2～18J	3～29K	2～8L
W—SJ	5～10	6,220	7,790	15,200	17,060
	13～16	7,440	9,200	15,200	17,060
	20～25	9,000	10,340	15,200	17,060
W—PJ	5～10	8,480	10,100	18,130	20,250
	13～16	11,070	12,930	19,450	21,660
	20～25	15,220	17,070	21,920	24,040
W—SJ—C	10	6,920	8,480	15,760	17,790
	13～16	8,040	9,770	15,760	17,790
	20～25	10,580	12,040	16,820	18,760
	32	14,390	17,060	25,160	30,420
	38	15,760	18,350	27,020	36,580
	45	17,540	20,140	29,690	39,170
HW—PJ	5	9,580	11,310	19,850	22,110
	6	9,730	11,460	20,000	22,260
	8	9,890	11,630	20,170	22,410
	10	10,070	11,800	20,340	22,600
	13	13,010	14,990	21,930	24,280
	16	13,220	15,190	22,140	24,480
	20	17,870	19,840	25,000	27,260
	25	17,980	19,950	25,110	27,360

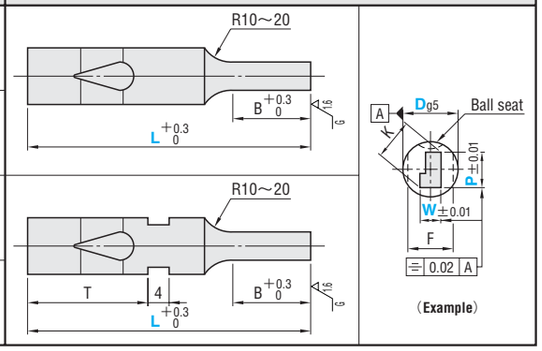
PRESS ADD.SPEC. Printed in Red

SPECIAL SHAPED BALL LOCK PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank diameter	M	H	Type
	Light-load	SKD11 or equivalent	60～63HRC	ELP
	Heavy load	SKH51	61～64HRC	EBP
—With spanner groove—	Light-load	SKD11 or equivalent	60～63HRC	KLP
	Heavy load	SKH51	61～64HRC	KBP

Select Shape from P.637 RoHS



(Example)

Catalog No. Type	Shape	D	L	P・K max.	P・W min.	B	T	F
Light-load With spanner groove ELP KLP	2H～12H	10	63 71 74 80 90	9.90	2.50	13	27	8
	2J～18J	13		12.90	3.00			10
	3K～29K	16		15.90	4.00	19		13
	2L～7L	20		19.90	5.00			17
		25		24.90	6.00			22
		32		31.90	7.00			29
Heavy load With spanner groove EBP KBP	8L(KLP only)	10	71 80 90 100	9.90	2.50	13	36	8
	Special shapes P.637	13		12.90	3.00			10
		16		15.90	4.00	19		13
		20		19.90	5.00			17
		25		24.90	6.00			22
		32		31.90	7.00			29

The spanner groove is for checking if the punch is locked securely. P.709

Order

Catalog No.	L	P・W・A・B・C・Q・R・S···0.01mm increments
ELP3K 25	80	P18.00 — W16.00 — A8.00

Delivery

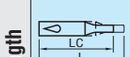
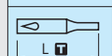
5 Days | Express B 1,500/1Pc. P.38

A flat charge of 4,050 Yen for 3 pieces or more of the same size.

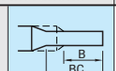
Alterations

Catalog No. — L(LC) — P・W・A・B・C・Q··· —(BC・KC···etc.)

ELP3K 25 — LC73 — P18.00 — W16.00 — A8.00 — BC13

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length 50+B(BC)≦LC<L 0.1mm increments When LC—B (or BC) is 50mm or less B (or BC) is LC—50mm. (—45mm for light-load) When D=32 and 9J～13J・16J・K・L, max. length of B is as per the table in the right.	200
		LKC	Changes tolerance L $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$	400

L(LC)	Bmax D32
50.0～59.9	6
60.0～69.9	13
70.0～79.9	19
80.0～	19

Alterations		Code	Spec.	¥/1Code
Tip		BC	Changes tip length B. 2≦BC≦Bmax 0.1mm increments Full length L (LC) requires BC+50mm Full length L requires BC+50mm (+45mm for light-load) or more.	200
		PKC	Changes P・W tolerance $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$ ⊗(D32): Not available	400
Others		KC	0° 90° 180° 270° Changes ball seat location 1° increments	200

P・W	Bmax
2.50～2.99	13
3.00～3.99	19
4.00～4.99	25
5.00～	30

Price

Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Type	Shape / D	2～12H	2～18J	3～29K	2～8L
ELP EBP KLP KBP	10～16	7,990	10,190	17,590	22,190
	20～25	9,990	11,690	17,490	22,090
	32	14,790	17,990	27,690	34,090

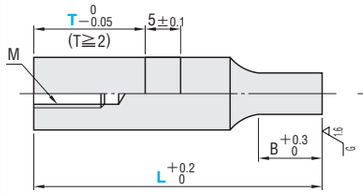
SPECIAL SHAPED BLOCK PUNCHES

PRESS ADD.SPEC. Printed in Red

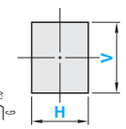
RoHS

M	H	Surface treatment	Type: Straight	Tapped	With key groove	Single flanged	Double flanged
H3～5 SKH51 H6～30 SKD11 or equivalent	H3～5 61～64HRC H6～30 60～63HRC	—	HP	HM	HK	HF	HW
Powdered high-speed steel	64～67HRC	—	PHP	PHM	PHK	PHF	PHW
SKH51	61～64HRC	TiCN Surface 3000HV	H—HSP	H—HSM	H—HSK	H—HSF	H—HSW
Powdered high-speed steel	64～67HRC	TiCN Surface 3000HV	H—PHP	H—PHM	H—PHK	H—PHF	H—PHW

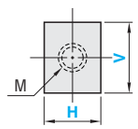
Type



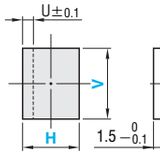
Straight



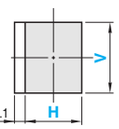
Tapped



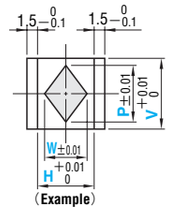
With key groove



Single flanged



Double flanged



(Example)

Flange thickness is $5^{+0.2}_{0}$mm.

Catalog No. Type	Shape	V / H / W min / P min	3	4	5	6	8	10	13	16	20	22	25	28	30	40	50	L	B	M	U
			1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0	16.0	20.0				
V3～V50 HP HM HK HF HW	2～12H 2～18J 3～29K 2～7L	(3)	1.0	○	○	○	○	○	○	○	○	○	○						8	—	1.0
		(4)	1.0		○	○	○	○	○	○	○	○	○								
		5	1.2			○	○	○	○	○	○	○	○	○	○	○				3	
		6	1.5				○	○	○	○	○	○	○	○	○	○		(40)		4	
		8	2.0					○	○	○	○	○	○	○	○	○	○	50		5	1.5
V3～V30 HP PHP HM PHM HK PHK HF PHF HW PHW		10	2.5						○	○	○	○	○	○	○	○	○	60	13	6	
		13	3.0							○	○	○	○	○	○	○	○	70		8	
		16	4.0								○	○	○	○	○	○	○	80			
V3～V30 H—HSP H—HSM H—HSK H—HSF H—HSW	Special shapes P.637	20	5.0									○	○	○	○	○	○		(19)		
V3～V30 H—PHP H—PHM H—PHK H—PHF H—PHW		22	6.0										○	○	○	○	○				
		25	6.5											○	○	○	○				
		28	7.0												○	○	○				
		30	7.5													○	○				

H=(3),(4)⋯▸L=40～70 When the dimension H is（3）or（4）, the full length L is within the range from 40 to 70. L80 is not applicable.

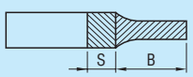
H=10～30，L=(40)⋯▸B=8 When the dimension H is from 10 to 30 and the dimension L is 40, tip length B is fixed to 8mm.

9J～13J・16J・K・L Type ⋯▸Pmax=30.00

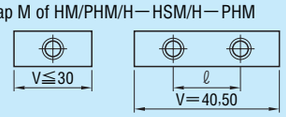
29K 13≦H・V≦25, P≦V-0.4, W≦H-0.4, B=13

TiCN coating punches：Not applicable to **10J・13J・5K・10K・18K・29K**

The coating is applied to tip B part, however it may extend to S part（apx 10mm）which will have a very thin coating layer.



Tap M of HM/PHM/H—HSM/H—PHM



V	40	50
ℓ	20	24

Key groove section details

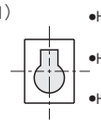
Flange section details

The volume discount rate is also applicable to alteration cost. P.39

Order

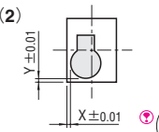
H	(No.)
3～10	1
13～22	2
25～30	3

(1)



	Catalog No.	—	(No.)	—	Catalog No.	V	H	—	L	—	0.01mm increments P・W・A・B・C・R・S⋯⋯	— (T・K・F・WF)
●H3～10	HP 4J	—	1	—	HP 4J	06	05	—	50	—	P5.25 — W3.83 — A3.50 — R1.50 — S1.50	
●H13～22	HP 4J	—	2	—	HP 4J	20	16	—	60	—	P16.32 — W14.23 — A8.00 — R3.50 — S4.00	
●H25～30	HP 4J	—	3	—	HP 4J	40	30	—	70	—	P35.88 — W28.45 — A8.00 — R3.90 — S6.50	

(2)

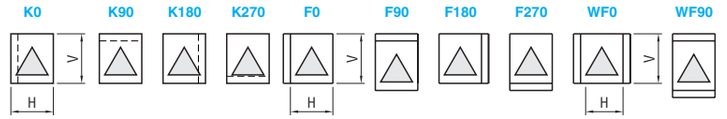


Catalog No.	—	(No.)	—	Catalog No.	V	H	—	L	—	0.01mm increments P・W・A・B・C・R・S⋯⋯	— (T・K・F・WF)
HP 4J	—	2	—	HP 4J	13	13	—	70	—	P8.44 — W6.23 — A2.50 — R1.22 — S2.10 — X1.00 — Y1.00	

Designation X and Y must be 0.0.02 or more, Tolerance±0.01

29K can not designate X and Y.

■Specification of key groove/flange position



Delivery

● BLOCK PUNCHES

5 Days | Express B | 1,500/1Pc. P.38

A flat charge of 4,050 Yen for 3 pieces or more of the same size.

29K：Express service is not available.

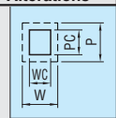
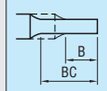
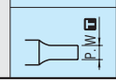
● COATING BLOCK PUNCHES

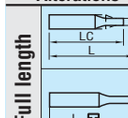
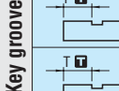
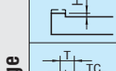
12 Days

Alterations

Catalog No. — (No.) — Catalog No. V H — L(LC) — P(PC)・W(WC)・A⋯ — (T・K・F・WF) — (BC・HC⋯etc.)

H—HSP 7H — 1 — H—HSP 7H 13 10 — LC65.0 — P10.00 — WC2.00 — R0.50 — S2.00 — BC8.00

Alterations	Code	Spec.	¥/1Code
Tip 	PC WC	Changes dimension P・W 1.00≦V×0.3≦PC 0.50≦H×0.15≦WC Not applicable to 29K	200
Tip 	BC	Changes tip length B. 2≦BC≦Bmax 0.1mm increments Full length L(or LC) requires BC+30mm or more The conditions of the machining limit ❸ have a priority. P.638 29K⋯▸ 2≦BC≦Bmax≦13 P(PC)・W(WC) / Bmax: 0.50～0.99 / 7; 1.00～1.99 / 8; 2.00～2.99 / 13; 3.00～3.99 / 19; 4.00～4.99 / 25; 5.00～ / 30	400
Tip 	PKC	Changes P・W tolerance P・W±0.01 ⇨ $^{+0.01}_{0}$ Not applicable to coating punches Not applicable to 29K	400

Alterations	Code	Spec.	¥/1Code
Full length 	LC	Changes full length 30+B(BC)≦LC＜L 0.1mm increments When LC-B(or BC)is 30mm or less, B=L−30.	200
Full length	LKC	Changes tolerance L $L^{+0.2}_{0}$ ⇨ $^{+0.05}_{0}$	400
	LKZ	Changes tolerance L $L^{+0.2}_{0}$ ⇨ $^{+0.01}_{0}$ Not applicable to coating punches	600
Key groove 	RTC	Changes dimension T tolerance $T^{0}_{-0.05}$ ⇨ $^{+0.05}_{0}$	0
Key groove	TKC	Changes dimension T tolerance $T^{0}_{-0.05}$ ⇨ $^{0}_{-0.02}$	200
Flange 	HC	Changes flange height 0≦HC＜1.5 0.1mm increments	200
Flange	TC	Changes flange thickness 2≦TC＜5 0.1mm increments L is shortened by (5−TC), When LC is applied, L is equal to LC.	200
Flange	TKC	Changes flange thickness tolerance $T^{+0.2}_{0}$ ⇨ $^{+0.02}_{0}$	200
	TKM	Changes flange thickness tolerance $T^{+0.2}_{0}$ ⇨ $^{0}_{-0.02}$	200

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No.	(No.)	H \ Shape	2～12H	2～18J	3～29K	2～7L
HP・HM	1	3～10	4,840	5,370	11,110	12,720
HK・HF	2	13～22	6,330	6,630	11,110	12,720
HW	3	25～30	7,370	7,580	11,110	12,720
PHP	1	3～10	6,720	7,250	16,430	18,610
PHM	2	13～22	11,110	11,390	18,420	20,700
PHK	3	25～30	14,810	15,000	20,420	22,890
PHF PHW	1	3～10	8,730	9,260	18,520	20,610
	2	13～22	13,100	13,390	20,420	22,790
	3	25～30	16,810	17,000	22,410	24,880

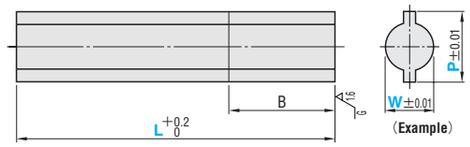
Catalog No.	(No.)	H \ Shape	2～12H	2～18J	3～28K	2～7L
H—HSP	1	3～10	7,430	7,960	13,700	15,310
H—HSM	2	13～22	10,670	10,970	15,450	17,060
H—HSK	3	25～30	12,880	13,090	16,620	18,230
H—HSF H—HSW	1	3～10	7,700	8,230	13,970	15,580
	2	13～22	11,190	11,490	15,970	17,580
	3	25～30	13,500	13,710	17,240	18,850
H—PHP	1	3～10	9,470	10,020	19,480	21,740
H—PHM	2	13～22	15,710	16,000	23,260	25,610
H—PHK	3	25～30	20,680	20,870	26,460	29,010
H—PHF H—PHW	1	3～10	9,730	12,360	21,900	24,060
	2	13～22	16,220	18,570	25,820	28,270
	3	25～30	21,290	23,540	29,130	31,670

SPECIAL SHAPED STRAIGHT PUNCHES

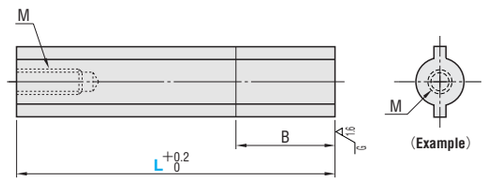
note) For HPC, HMC and HKC, the material is determined by the maximum width of the shape which does not have exact specifiable W dimension such as **2L**, **3L**, etc.

M	H	Surface treatment	Type: Straight	Tapped	With key groove
W2.00～5.00 note) SKH51	61～64HRC	—	HPC	HMC	HKC
W5.01～30.00 note) SKD11 or equivalent	60～63HRC				
Powdered high-speed steel	64～67HRC	—	PHPC	PHMC	PHKC
SKH51	61～64HRC	TiCN Surface 3000HV	H—HSPC	H—HSMC	H—HSKC
Powdered high-speed steel	64～67HRC	TiCN Surface 3000HV	H—PHPC	H—PHMC	H—PHKC

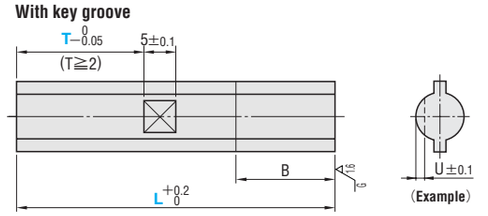
Straight



Tapped



With key groove

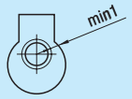


Catalog No. Type: Straight	Tapped	With key groove	Shape	L	W \ P	2.00～5.00	5.01～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00	M	U	B
SKH51 (W2.00～5.00) SKD11 or equivalent (W5.01～30.00)			2～12H	40	2.00～3.00	○	○	○				—	1.0	15
					3.01～4.00	○	○	○	○					
Powdered high-speed steel			2～18J	50	4.01～5.00	○	○	○	○	○	○	3		
					5.01～6.00		○	○	○	○	○	4		
			3～28K	60	6.01～8.00		○	○	○	○	○	5		
SKH51 coating			2～7L		8.01～10.00		○	○	○	○	○	6	1.5	
			Special shapes P.637	70	10.01～15.00			○	○	○	○	8		
Powdered high-speed steel TiCN coating				80	15.01～20.00				○	○	○			
					20.01～25.00					○	○			
					25.01～30.00						○			

⊗TiCN coating punches：Not applicable to **10J · 13J · 5K · 10K · 18K**

note)The coating is applied to tip B part, however it may extend to S part (apx 10mm) which will have a very thin coating layer.
Dimension P and W of non-coating part should be reduced by 6—10 μ (thickness of coating).

note)**HMC · PHMC · H—HMC · H—PHMC** type：Machining limit
①Shape **23K · 25K** cannot be machined.
②Machining limit of tap and point



③Dimension P(W) · Tap M

	P (W)	M
P≦W (P>W)	4.01 ～ 5.00	3
	5.01 ～ 6.00	4
	6.01 ～ 8.00	5
	8.01 ～10.00	6
	10.01 ～30.00	8

note)P or W＜8 ⋯› L≦50 When the dimension P or W is less than 8.00, the full length is from 40 to 50.

note)Key groove section details

note)Tap M applies to shorter dimension either P or W
note)The tap M of the Shape **8H** or Shape **18J** corresponds to dimension P.
note)The center position of the tap M is the same as the center position of each tip shape. (excludes the shape **2L** and **3L**.)
note)The center position of the tap M of the shape **2L** and **3L** is the center position of the maximum width of tip.

The volume discount rate is also applicable to alteration cost. P.39

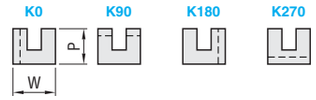
Order

W	No.
2.00～10.00	1
10.01～20.00	2
20.01～30.00	3

Catalog No. — No. — Catalog No. — L — 0.01mm increments (P · W · A · B · C · R · S⋯⋯) — (T · K)

- W2.00～10.00 HPC 8J — 1 — HPC 8J — 50 — P10.55 — W8.85 — R2.50
- W10.01～20.00 HPC 8J — 2 — HPC 8J — 60 — P19.62 — W16.35 — R4.50
- W20.01～30.00 HPC 8J — 3 — HPC 8J — 70 — P28.25 — W25.68 — R6.20

■Key groove position specification



Delivery
- STRAIGHT PUNCHES: 8 Days
- COATING PUNCHES: 12 Days

Alterations
Catalog No. — No. — Catalog No. — L(LC) — P · W · A · B⋯⋯ — (PKC · LC · LKC · TKC · RTC)
H—HSPC 8J — 1 — H—HSPC 8J — LC58.0 — P12.40 —W10.00 —R2.00 — LKC

Alterations	Code	Spec.	¥/1Code
Tip	PKC	Changes P · W tolerance. P · W±0.01 ⇨ +0.01 0. ⊗TiCN coating punches：Not available	400
Full length	LC	Changes full length. 30≦LC＜L 0.1mm increments	200
Full length	LKC	Changes tolerance L. L +0.3 0 ⇨ +0.05 0	400

Alterations	Code	Spec.	¥/1Code
Key groove	TKC	Changes dimension T tolerance. T 0 −0.05 ⇨ 0 −0.02	200
Key groove	RTC	Changes dimension T tolerance. T 0 −0.05 ⇨ +0.05 0	0

Price

Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

note)To be quoted on price & lead time above Max. Q'ty.

Catalog No.	No.	W \ Shape	2～12H	2～18J	3～28K	2～7L
HPC	1	2.00～10.00	3,090	4,090	10,520	11,510
HMC	2	10.01～20.00	3,590	4,590	10,520	11,510
HKC	3	20.01～30.00	4,000	5,690	10,520	11,510
PHPC	1	2.00～10.00	5,190	6,200	16,520	18,140
PHMC	2	10.01～20.00	8,530	9,590	18,420	20,230
PHKC	3	20.01～30.00	11,580	13,390	20,420	22,320

Catalog No.	No.	W \ Shape	2～12H	2～18J	3～28K	2～7L
H—HSPC	1	2.00～10.00	5,320	6,330	12,750	13,740
H—HSMC	2	10.01～20.00	7,550	8,550	14,480	15,470
H—HSKC	3	20.01～30.00	8,860	10,550	15,380	16,370
H—PHPC	1	2.00～10.00	7,780	8,830	19,470	21,140
H—PHMC	2	10.01～20.00	13,110	14,200	23,310	25,180
H—PHKC	3	20.01～30.00	17,240	19,100	26,350	28,310

note) In the case of the 8H and 18J profiles, P corresponds to W in the price table, and in the case of the 2L and 3L profiles, S—R corresponds to W.

PRESS ADD.SPEC. Printed in Red

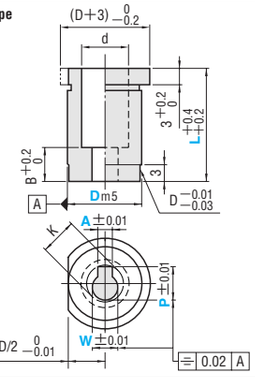
SPECIAL SHAPED PUNCH GUIDE BUSHINGS & BUTTON DIES

The volume discount rate is also applicable to alteration cost. P.39

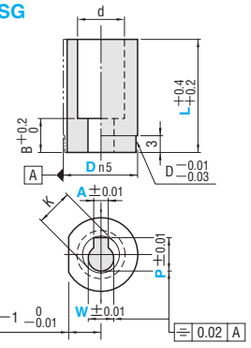
Punch guide bushing

RoHS

Headed type **HG**



Straight type **SG**



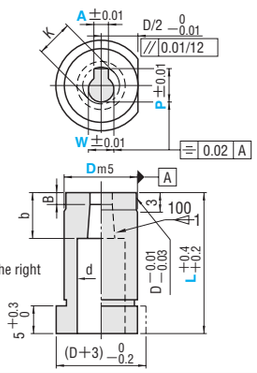
The shape shown on the right is an example.

M SKD11 or equivalent
H 60～63HRC

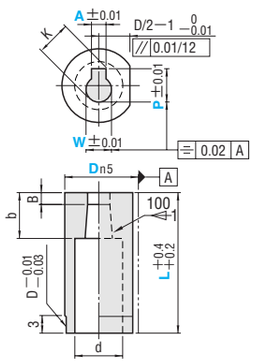
Button die

RoHS

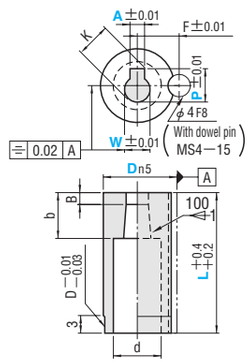
Headed type **HD** (L=16～35) **HDS** (L=40only)



Straight type **SD** (L=16～35) **SDS** (L=16～40)



Dowel slot type **KD** (L=16～35) **KDS** (L=16～40)



The shape shown on the right is an example.

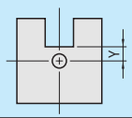
M SKD11 or equivalent
H 60～63HRC

Catalog No. Type	Shape	D	L	P・K max.	P・W min.	Punch guide HG・SG B	Button die HD・SD・KD b	Button die HD・SD・KD B	Tilting button dies HDS・SDS・KDS b	Tilting button dies HDS・SDS・KDS B	d	F
Punch guide HG	2H～12H	8	10 13 16	4.00	2.00	4	—		—		4.4	—
Punch guide HG	2J～18J	10		6.00	2.00						6.4	
Punch guide SG	3K～29K	13	20 22 25	8.00	3.00	6					8.4	
Punch guide SG	2L～7L	16		10.00	3.00						10.6	
Button die HD		6		3.00	2.00		3		—	—	3.4	—
Button die HD・SD		8		4.00	2.00		4				4.4	
Button die HD	2H～12H	10	(16)	6.00	2.00		6		10	6	6.4	6
Button die HD	2J～18J	13	20	8.00	2.00		8	2			8.4	7.5
Button die HD	3K～29K	16	22	10.00	2.50						10.6	8
Button die HDS	2L～7L	20	25	12.00	3.00	—			12	8	12.6	10
Button die SD	8L (KD・KDSonly)	25		16.00	4.00						16.6	12.5
Button die SDS	Special shapes P.637	32	30	20.00	5.00				15	10	20.6	16
Button die KD		38	35	26.00	6.00						26.6	19
Button die KDS		45	(40)	35.00	6.00				20	14	36.0	22.5
		50		40.00	7.00						41.0	25
		56		45.00	8.00						46.0	28

Applicable D and button die for L = (16) or (40).

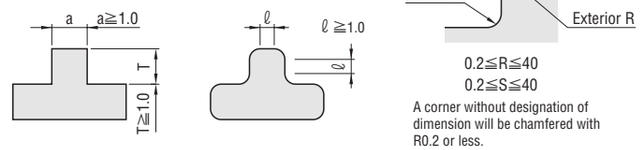
L	D	Type
(16)	6 ～ 38	HD SD SDS KD KDS
(40)	10 ～ 56	HDS SDS KDS

If the Y dimension is smaller than minY, it is not possible to use a button die blank that has a pilot hole (preparatory hole made prior to machining), so express delivery cannot be applied.



D	minY
6～16	0.7
20	0.8
25	1.2
32～56	1.7

■Machining limit



A corner without designation of dimension will be chamfered with R0.2 or less.

■Specifiable unit

T	Unit designation
W±0.01	0.01mm increments
P±0.01	0.01mm increments
A±0.01	0.01mm increments
B±0.01	0.01mm increments
C±0.01	0.01mm increments
Q	0.01mm increments
R	0.01mm increments
S	0.01mm increments
C (Corner radius)	0.01mm increments
A° (Degrees)	0.1° increments

Order Catalog No. — L — P・W・A・B・C・Q・R・S···0.01mm increments

HD8J 25 — 25 — P14.00—W11.00—R4.00

Delivery 3 Days | Express A 1,500/1Pc. ⊗ If Y<minY, Express service is not available. P.38

A flat charge of 4,050 Yen for 3 pieces or more of the same size.

Alterations Catalog No. — L(LC) — P(PC)・W(WC)・A・B・C・Q・R・S — (BC・HC・TC···etc.)

HD8J 25 — 25 — P14.00—W11.00—R4.00 — BC4—KFC225

Alterations	Code	Spec.	¥/1Code
Shaped hole	PC WC	Changes dimension P・W min: P/W > PC/WC ≧ (P・Wmin)/2 ≧1.00 0.01mm increments max: P/W < PC/WC ≦P・Kmax+0.2 0.01mm increments	200
Shaped hole	BC	Changes dimension B (shaped hole depth) 1≦BC≦b 0.1mm increments ⊗ HG and SG are not applicable.	200
Full length	LC	Changes full length 10≦L−(b−1)≦LC<L 0.1mm increments Changes full length 10≦LC<L 0.1mm increments	200
Full length	LKC	Changes tolerance L L +0.4 +0.2 ⇨ +0.05 0	400
Full length	LKZ	Changes tolerance L L +0.4 +0.2 ⇨ +0.01 0 ⊗L<16：Not applicable ⊗D>25：Not applicable	600

Alterations	Code	Spec.	¥/1Code
Head	HC	Changes head diameter H. D≦HC<D+3 0.1mm increments	200
Head	TC	Changes head thickness T 2≦TC<5 0.1mm increments L is shortened according to (5−TC), When LC is applied, L is equal to LC.	200
Head	KC	• Guide 0°/90°/180°/270° • Die 180°/270°/0°/90° Changes key flat location 1° incr.	200
Head	WKC	Adds double key flats in parallel To change angle add KC.	200
Head	KFC	• Guide 0°/90°/180°/270° Adds one key flat at 0° and the other at another angle 1° increments ⊗KC・WKC：Not available ⊗D>25：Not available • Die 180°/270°/0°/90° Adds one key flat at 0° and the other at another angle 1° increments ⊗KC・WKC：Not available ⊗D>25：Not available	200
Head	RC	Reduces head thickness by 0 −0.04 from retainer surface ⊗L<30：Not available	200
Head	TKC	Changes head thickness tolerance T +0.2 0 ⇨ +0.02 0 ⊗L<16：Not applicable	200
Head	TKM	Changes head thickness tolerance T +0.2 0 ⇨ 0 −0.02 ⊗L<16：Not applicable	200

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Punch guide bushing

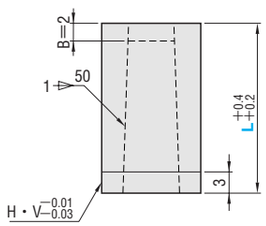
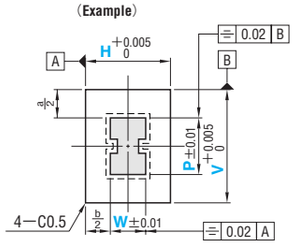
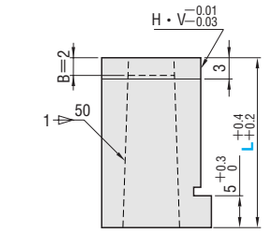
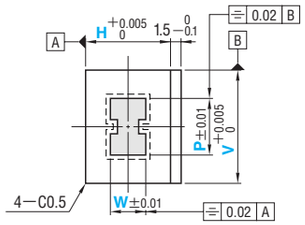
D	HG SG
8	5,650
10	5,650
13	5,890
16	6,380

■Button dies

D	HD SD	HDS SDS	KD	KDS
6	5,620	—	—	—
8	5,620	—	—	—
10	5,620	6,450	6,610	7,090
13	5,850	6,720	6,800	7,400
16	6,350	7,240	7,330	7,870
20	6,680	7,640	7,730	8,270
25	7,190	8,130	8,200	8,740
32	7,620	8,680	8,740	9,270
38	8,790	9,880	9,940	10,610
45	12,750	14,480	14,020	15,040
50	14,330	16,420	15,670	16,900
56	15,890	18,290	17,280	18,690

SPECIAL SHAPED BLOCK DIES

PRESS ADD.SPEC. Printed in Red

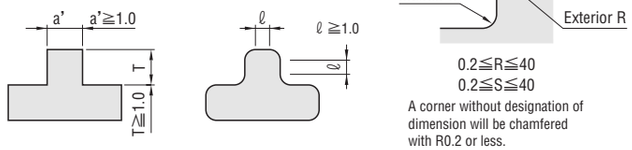
Type	V・H	M H	Catalog No.	View
—Straight type—	Standard size	SKD11 or equivalent 60～63HRC	BL	— Straight type Configurable type —   (Example)
		Powdered high-speed steel 64～67HRC	PBL	
—Single flanged—		SKD11 or equivalent 60～63HRC	BLF	
		Powdered high-speed steel 64～67HRC	PBLF	—Single flange—  
—Configurable straight type—	V・H 6.0～25.0 Free designation	SKD11 or equivalent 60～63HRC	FBL	
		Powdered high-speed steel 64～67HRC	FPBL	

Catalog No. / Type	Shape	H	W	P	V 6 (1.00～3.00)	8 (1.00～4.00)	10 (1.00～6.00)	13 (1.00～8.00)	16 (1.00～10.00)	20 (1.50～12.00)	25 (1.50～16.00)	L
Straight type BL PBL Single flanged BLF PBLF	2H～12H 2J～18J 3K～29K 2L～7L Special shapes P.637	6	1.00～ 3.00		○	○	○	○	○	○	○	16
		8	1.00～ 4.00			○	○	○	○	○	○	20
		10	1.00～ 6.00				○	○	○	○	○	22
		13	1.00～ 8.00					○	○	○	○	25
		16	1.00～10.00						○	○	○	30
		20	1.50～12.00							○	○	35
		25	1.50～16.00								○	

Catalog No. / Type	Shape	H	W	b	a	V 6.0～8.0 (1.00～4.00)	8.1～10.0 (1.00～6.00)	10.1～13.0 (1.00～8.00)	13.1～16.0 (1.00～10.00)	16.1～20.0 (1.50～12.00)	20.1～25.0 (1.50～16.00)	L
						P 4	4	5	6	8	9	
Configurable straight type FBL FPBL	2H～12H 2J～18J 3K～29K 2L～7L Special shapes P.637	6.0～ 8.0	1.00～ 4.00	4		○	○	○	○	○	○	16
		8.1～10.0	1.00～ 6.00	4			○	○	○	○	○	20
		10.1～13.0	1.00～ 8.00	5				○	○	○	○	22
		13.1～16.0	1.00～10.00	6					○	○	○	25
		16.1～20.0	1.50～12.00	8						○	○	30
		20.1～25.0	1.50～16.00	9							○	35

V・H⋯0.1mm increments　V−P≧a　H−W≧b

■Machining limit



■Specifiable unit

T	Unit designation
W±0.01	0.01mm increments
P±0.01	0.01mm increments
A±0.01	0.01mm increments
B±0.01	0.01mm increments
C±0.01	0.01mm increments
Q	0.01mm increments
R	0.01mm increments
S	0.01mm increments
C (Corner radius)	0.01mm increments
A° (Degrees)	0.1° increments

The volume discount rate is also applicable to alteration cost. P.39

Order

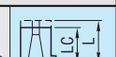
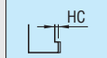
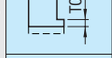
Catalog No.	V	H	L	P・W・A・B・C・Q・R・S⋯0.01mm increments
BL 4J	13	10	20	P8.00—W6.00—A4.50—R1.00—S2.00
FBL 5J	V14.6	H13.1	20	P9.00—W7.00—R1.00

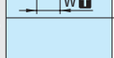
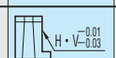
Delivery 3 Days | Express A 800/1Pc. P.38

A flat charge of 2,160 Yen for 3 pieces or more of the same size.

Alterations

Catalog No.	V	H	L(LC)	P・W・A・B・C・Q・R・S⋯	—(BC・HC・TC⋯etc.)
BL4J	13	10	20	—P8.00—W6.00—A5.5—R2.00—S2.00	BC4

Alterations		Code	Spec.	¥/1Code
Full length		LC	Changes full length 10≦LC＜L 0.1mm increments Single flanged type : When LC≦12,press-in lead is not available.	200
		LKC	Changes tolerance L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$	400
		LKZ	Changes tolerance L $^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$	600
Flange		HC	Changes flange height 0≦HC＜1.5 0.1mm increments	200
		TC	Changes flange thickness 2≦TC＜5 0.1mm increments (P)L is shortened by (5—TC), When LC is applied, L is equal to LC.	200
		TKC	Changes flange thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	200
		TKM	Changes flange thickness tolerance T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	200

Alterations		Code	Spec.	¥/1Code
Shaped hole		BC	Changes dimension B (shaped hole depth) 0≦BC≦4 0.1mm increments	200
		PKC	Changes P・W tolerance P・W ±0.01 ⇨ $^{+0.01}_{0}$	400
		HVC	Reverses the direction of P・W. Machining P for H, and W for V. (P)P→min W max Dimension P should be specified in the range of dimension W on the standard table below. (P)The flange position of BLF and PBLF are as shown below.	0
Others		NDC	No press in lead.	0

Price

Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

(P)To be quoted on price & lead time above Max. Q'ty.

■Straight type

Type / H \ V	6	8	10	13	16	20	25
(SKD11) BL	6,360	6,580	6,900	8,410	9,930	11,440	12,520
		6,580	7,010	8,520	10,040	11,440	12,630
			7,010	8,520	10,040	11,440	12,630
				8,630	10,250	11,870	12,840
					10,250	11,870	12,840
						11,980	13,060
							13,060
(Powdered high-speed steel) PBL	7,230	7,440	7,880	9,820	11,330	13,060	14,680
		7,980	8,310	10,360	11,980	13,920	15,760
			8,310	10,360	11,980	13,920	15,760
				11,660	13,170	15,440	17,490
					13,170	15,440	17,490
						15,760	17,590
							17,590

■Single flanged type

Type / H \ V	6	8	10	13	16	20	25
(SKD11) BLF	7,230	7,550	7,980	9,710	11,440	13,170	14,350
		7,550	8,090	9,820	11,550	13,170	14,460
			8,090	9,820	11,550	13,170	14,460
				9,930	11,760	13,710	14,790
					11,760	13,710	14,790
						13,810	14,890
							14,890
(Powdered high-speed steel) PBLF	8,310	8,630	9,060	11,220	13,060	14,890	16,840
		9,170	9,600	11,980	13,810	16,090	18,140
			9,600	11,980	13,810	16,090	18,140
				13,380	15,220	17,700	20,080
					15,220	17,700	20,080
						18,140	20,190
							20,190

■Configurable straight type

Type / H \ V	6.0～8.0	8.1～10.0	10.1～13.0	13.1～16.0	16.1～20.0	20.1～25.0
(SKD11) FBL	8,270	8,550	8,970	10,990	12,990	14,890
		8,550	8,970	10,990	12,990	14,890
			9,120	11,090	13,190	14,890
				11,090	13,190	14,890
					13,290	14,990
						14,990
(Powdered high-speed steel) FPBL	9,400	9,880	10,490	12,770	15,140	16,980
		9,880	10,490	12,770	15,140	16,980
			11,010	13,470	16,270	18,100
				13,470	16,270	18,100
					16,880	18,540
						18,540

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

RETAINERS

RETAINERS

New

Name	DURABLE FOR HIGH TENSILE STRENGTH END RETAINER SETS FOR NC PROCESS HDP—A□ HDP—F□	DURABLE FOR HIGH TENSILE STRENGTH END RETAINER SETS FOR NC PROCESS —For heavy load punch—	DURABLE FOR HIGH TENSILE STRENGTH END RETAINER SETS HSR—□□ HSA—□□
Catalog No.	③Ⓣ④	③Ⓣ④	③Ⓣ④
Page	660	661	662

New

New

Price Cut Up to 5%

Price Cut Up to 5%

END RETAINER SETS FOR NC PROCESS—25mm thickness type— —Single bolt type—	END RETAINER SETS FOR MANUAL PROCESS—25mm thickness type— —Single bolt type—	END RETAINER SETS FOR NC PROCESS DP—A□ DP—F□	END RETAINER SETS FOR MANUAL PROCESS CP—A□ CP—F□
③④	③④	③Ⓣ④ ③Ⓣ④	③Ⓣ④ ③Ⓣ④
663	664	665	666

Price Cut Up to 5%

END RETAINER SETS FOR NC PROCESS —Use for heavy load punch—	END RETAINER SETS FOR MANUAL PROCESS —Use for heavy load punch—	END RETAINER SETS FOR NC PROCESS—25mm thickness type— —Triangle type—	END RETAINER SETS FOR NC PROCESS—32mm thickness type— —Triangle type—
③Ⓣ④	③Ⓣ④	③④	③④
667	668	669	670

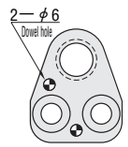
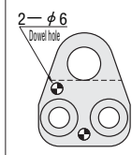
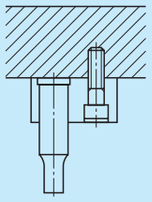
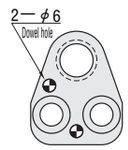
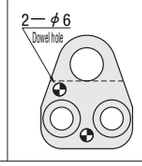
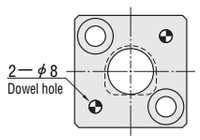
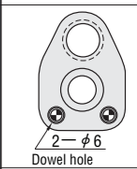
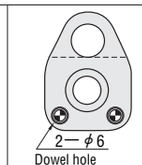
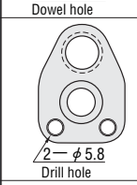
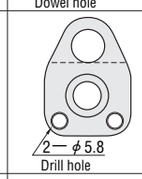
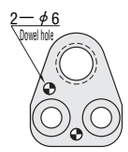
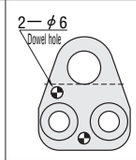
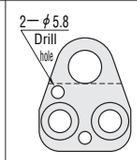
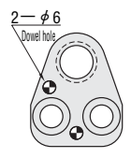
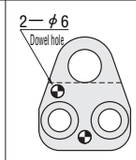
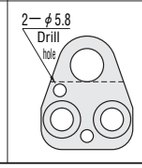
SQUARE RETAINER SETS SR—□□ SA—□□	RETAINER BACKING PLATES BPC	SELECT RETAINER SETS —Compact·air type—	SELECT RETAINER SETS —Standard·air type—
③Ⓣ④ ③Ⓣ④	③Ⓣ④	③④	③④
671	672	675	676

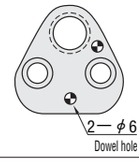
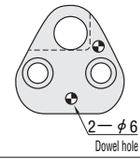
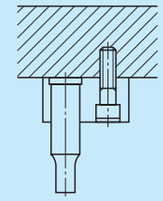
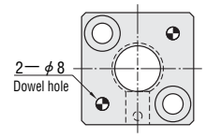
SELECT RETAINER SETS —Standard·manual type—	SELECT RETAINER SETS —Punch for heavy load·air type—	SPECIAL RETAINER SETS —Plate size selectable type—	SPECIAL RETAINER SETS —Plate size configurable type—
③④	③④	⑤Ⓐ⑧	⑤Ⓑ⑧
677	678	679	681

BUSHING FOR ADJUSTING PUNCH HOLE PCWB	URETHANE STRIPPER UNITS PQSP USPP USQP	URETHANE STRIPPERS FOR ANTI-DROPPING UNITS US	PROTECTION RINGS FOR URETHANE STRIPPER USR	URETHANE STRIPPERS TUS	URETHANE STRIPPERS USN
①	①	①	①	①	①
683	684	685	685	687	688

RETAINERS
—GUIDE —

Printed in red：New products

Type		External shape: For round	External shape: For shaped	Thickness of the retainer body	Positioning	How to fix
Durable for high-tensile strength end retainer type	End retainers for NC process			30	Positioning of punch is done by 2 dowel holes of retainer.	Tighten a bolt from the tip side of punch and fix to die. 
	End retainers for NC process —For heavy load—			**35**	Positioning of punch is done by 2 dowel holes of retainer.	
	Square retainers			30	Positioning of punch is done by 2 dowel holes of retainer.	
	Square retainers for punch —For heavy load—			**35**		
Single-bolt type	End retainers for NC process			25	Positioning of punch is done by 2 dowel holes of retainer.	
	End retainers for manual process			25	Positioning of punch is done by boring a dowel hole of retainer (note 1) after aligning punch and die.	
Double-bolts type	End retainers for NC process			30	Positioning of punch is done by 2 dowel holes of retainer.	
	End retainers for manual process			30	Positioning of punch is done by boring a dowel hole of retainer (note 1) after aligning punch and die.	
	End retainers for NC process —For heavy load—			30	Positioning of punch is done by 2 dowel holes of retainer.	
	End retainers for manual process —For heavy load—			30	Positioning of punch is done by boring a dowel hole of retainer (note 1) after aligning punch and die.	

Type		External shape: For round	External shape: For shaped	Thickness of the retainer body	Positioning	How to fix
Triangle	End retainers for NC process			25 32	Positioning of punch is done by 2 dowel holes of retainer.	Tighten bolt from the tip side of punch and fix it to die. 
Square	Square retainers			30		
	Square retainers for punch —For heavy load—					

(Note 1) Dowel hole machining without using NC is processed by; mount retainer with punch to upper die and make sure the shape of punch and die matches. Then drill holes while the retainer is attached, and machines the retainer and the upper die by ream at the same time.

(Note 2) End retainer/Square retainer
Square retainer is superior in balance since the punch is inserted into the center of the shape of the retainer. However there are cases that are not able to use square retainer since the position of the holes are located too close. End retainer is suitable for such cases when there is no room for mounting.

	Compact-air type	Standard-air type	Standard-manual type	Punch for heavy load-air type
Select retainer sets				
Stroke	ST=8mm	ST=10mm		
Shaft Dia	D=10・13・16・20	D=10・13・16・20・25・32		D=10・13・16・20

	Plate size selectable type	Plate size configurable type
Special retainer sets		

PUNCH & RETAINER SETS

PRESS ADD.SPEC. Printed in Red

Punch & Retainer Set Available

■Features

- Able to order the punch and the retainer with one ordering code.
- The punch is set to the retainer and delivered.
- The types of punch and retainer which can be delivered as a set are greatly increased.
- Able to save time of setting the punch to the retainer at the time of die assembly.
- Prevents forgetting ordering or assembly errors when using multiple punches/retainers for one die.

■Comparison（example）

Example	Set order	Separate order
Catalog No.	SPAS13—60—P10—RC—DA1	・SPAS13—60—P10—RC ・DP—AP13
Package	The retainer and punch are packed in one box.	The retainer and punch are packed separately.
Components	The punch is already set in the retainer.	

Order

Punch size	—	Retainers No.
H—SHAL13—80—P10.00—RC	—	SA1
SPAS—C16—80—P13.00	—	CA3
SPES—C16—80—P13.00—W8.00	—	CF3

For the applicable punch, retainer and retainer No., see the right page.
Punch requires alteration RC.（No alteration required for punches with dowel or punches for heavy load.）

Please note that the order method has changed.

Old ordering method	New ordering method
R07—SPAS—C16—80—P13.00	SPAS—C16—80—P13.00—CA1
R40—SPES—C16—80—P13.00—W8.00	SPES—C16—80—P13.00—W8.00—NF1

Delivery: 3 Days

Price

Addition charge
+100

The price of the retainer set is
the price of the punch ＋ price of retainer ＋ setting fee ＝ Set price
￥910 ＋ ￥1,590 ＋ ￥100 ＝￥2,600 （Ex.）SPAS—C16—80—P13.00—CA1

■Applicable shoulder punches, punches with dowel, and retainers

Applicable punch	Standard Catalog No.	Page	Dicoat® Catalog No.	Page	TiCN Coating Catalog No.	Page	WPC® HW coating (Upper) (Lower) Catalog No.	Page	Lapping Catalog No.	Page	Note
Shoulder	SPA□＊	P.53	T—SP□□	P.55		P.57	W—SP□□	P.59	L—SP□□	P.61	Alteration RC is required. Only SPA□ and SHA□ (shape Ⓐ) can be applied. Shaped punches (shapes D R E and G) are not applicable.
	SHA□＊				H—SH□□		W—SH□□ HW—SH□□		L—SH□□		
	PH□□		T—PH□□		H—PH□□		W—PH□□ HW—PH□□		L—PH□□		
Shoulder jector	SJ□□	P.63	T—SJ□□	P.65			W—SJ□□	P.69	L—SJ□□	P.71	Alteration RC is required.
	PJ□□		T—PJ□□		H—PJ□□	P.67	W—PJ□□ HW—PJ□□		L—PJ□□		
Shoulder jector (spring reinforced type)	SJV□□	P.63	T—SJV□□	P.65			W—SJV□□	P.69	L—SJV□□	P.71	Alteration RC is required.
	PJV□□		T—PJV□□		H—PJV□□	P.67	W—PJV□□ HW—PJV□□		L—PJV□□		
Shoulder jector (B dimension fixed type)	LFSJ□□	P.73					W—LFSJ□□	P.73	Alteration SC	P.74	Alteration RC is required.
Two-step shoulder	SPTW□ SHTW□ PHTW□	P.81							Alteration SC	P.82	Alteration RC is required.
With dowel	SP□□—C	P.93	T—SP□□—C	P.95	H—SP□□—C	P.97	W—SP□□—C HW—SP□□—C	P.99	Alteration SC	P.94	
With dowel jector	SJ□□—C	P.101	T—SJ□□—C	P.103	H—SJ□□—C	P.105	W—SJ□□—C HW—SJ□□—C	P.107	Alteration SC	P.102	
With dowel jector (spring reinforced type)	SJV□□—C	P.101	T—SJV□□—C	P.103	H—SJV□□—C	P.105	W—SJV□□—C HW—SJV□□—C	P.107	Alteration SC	P.102	

Applicable retainer	Page	For round punch Catalog No.	Retainers No.	For shaped punch Catalog No.	Retainers No.
Durable for HTNSL strength・For NC process	P.660	HDP—AP	HA1	HDP—FP	HF1
		HDPAR	HA2	HDPFR	HF2
		HDP—AN	HA3	HDP—FN	HF3
Durable for HTNSL strength・Square retainer	P.662	HSR—AP	MA1	HSR—FP	MF1
		HMPSR	MA2	HMPDR	MF2
		HSR—AN	MA3	HSR—FN	MF3
For 25mm thickness NC process (Single bolt)	P.663	SP—APS	SA1	SP—FPS	SF1
		SPARS	SA2	SPFRS	SF2
		SP—ASN	SA3	SP—FSN	SF3
For NC process	P.665	DP—AP	DA1	DP—FP	DF1
		DPAR	DA2	DPFR	DF2
		DP—AN	DA3	DP—FN	DF3
For Manual process	P.666	CP—AP	CA1	CP—FP	CF1
		CPAR	CA2	CPFR	CF2
		CP—AN	CA3	CP—FN	CF3
For 25mm thickness NC process (Triangle type)	P.669	25CRN—AP	NA1	25CRN-FP	NF1
		25CRNAR	NA2	25CRNFR	NF2
		25CRN—A	NA3	25CRN—F	NF3
Square retainer	P.671	SR—AP	RA1	SR—FP	RF1
		MPSR	RA2	MPDR	RF2

MA□, MF□ will be on Sale from July 1, 2007.

■Applicable punches for heavy load, punches with dowel for heavy load, and retainers

Applicable punch	Standard Catalog No.	Page	Dicoat® Catalog No.	Page	TiCN Coating Catalog No.	Page	WPC® HW coating (Upper) (Lower) Catalog No.	Page	Lapping Catalog No.	Page
For heavy load	AP□□	P.109			H—AP□□	P.113	W—AP□□ HW—AP□□	P.115	L—AP□□	P.117
	APH□□		T—APH□□	P.111	H—APH□□		W—APH□□ HW—APH□□		L—APH□□	
For heavy load jector	APJ□□	P.119	T—APJ□□	P.121	H—APJ□□	P.123	W—APJ□□ HW—APJ□□	P.125	L—APJ□□	P.127
For heavy load jector (B dimension fixed type)	LFAPJ□□	P.129			H—LFAPJ□□	P.131	W—LFAPJ□□ HW—LFAPJ□□	P.133		
For heavy load with dowel	AP□□—C	P.139			H—AP□□—C	P.141	W—AP□□—C HW—AP□□—C	P.143	Alteration SC	P.140
	APH□□—C				H—APH□□—C		W—APH□□—C HW—APH□□—C			
For heavy load with dowel jector	AHJ□□—C	P.145			H—AHJ□□—C	P.147	W—AHJ□□—C HW—AHJ□□—C	P.149	Alteration SC	P.146
Two-step shoulder for heavy load	APTW□ APHTW□	P.151							Alteration SC	P.152

Applicable retainer	Page	For round punch Catalog No.	Retainers No.	For shaped punch Catalog No.	Retainers No.
Durable type・For NC process For heavy load	P.661	HAP—AP	JA1	HAP—FP	JF1
		HAPAR	JA2	HAPFR	JF2
		HAP—AN	JA3	HAP—FN	JF3
Durable type・Square retainer For heavy load	P.662	HSA—AP	LA1	HSA—FP	LF1
		HASAR	LA2	HASFR	LF2
		HSA—AN	LA3	HSA—FN	LF3
For NC process For heavy load	P.667	AP—AP	AA1	AP—FP	AF1
		APAR	AA2	APFR	AF2
		AP—AN	AA3	AP—FN	AF3
For Manual process For heavy load	P.668	FP—AP	FA1	FP—FP	FF1
		FPAR	FA2	FPFR	FF2
		FP—AN	FA3	FP—FN	FF3
Square retainer For heavy load	P.671	SA—AP	YA1	SA—FP	YF1
		ASAR	YA2	ASFR	YF2
		SA—AN	YA3	SA—FN	YF3

LA□, LF□ will be on Sale from July 1, 2007.

GUIDE FOR DURABLE FOR HIGH TENSILE STRENGTH RETAINER SETS

PRESS NEW

DURABLE FOR HIGH TENSILE STRENGTH END RETAINER SETS FOR NC PROCESS —For punch with dowel—

Detail P.657

■Durable retainer for high tensile material

A durable retainer for high tensile material is a product developed for punching of high tensile material or thick plate. When high tensile material or thick plate is being punched, the retainer sometimes deformes, causing the punch to become loose and its longevity to be shortened. By using high strength material, durable retainer for high tensile material prevents deformation of the retainer.

■Deformation of the retainer during punching of high tensile material or thick plate

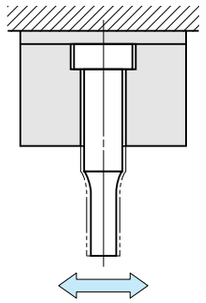
When punching high tensile material or thick plate, problems such as early wear, chipping, or breakage of the blade tip occur which may result in shortening the punch longevity. One of the reasons for this is "retainer deformation". Once the retainer's punch hole deforms, support strength of the punch becomes inadequate and causes loosening of the blade tip. This results in clearance discrepancy of punch and die, which leads to blade tip's uneven wear or chipping and shortening of its longevity. (Fig.1)
Followings are two major reasons of retainer deformation

1. Excessive punching load

When punching high tensile material or thick plate, high level of stress would be loaded to the punch. The punch repeats expansion and constriction and this would cause the retainer deformation. (Fig.2) Also, thrust loading such as uneven clearance and skew punching causes retainer deformation.

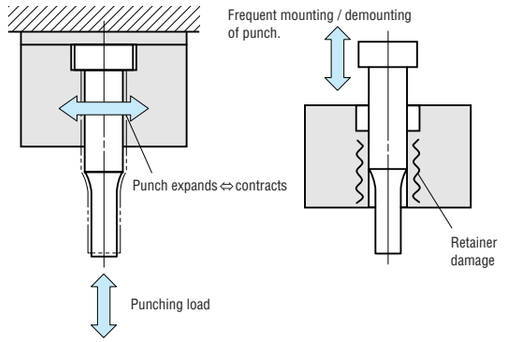
2. Frequent mounting / demounting of punch

Punching high tensile material or thick plate makes blade tip worn out faster and it requires frequent maintenance. Frequent mounting/demounting of the punch for maintenance may result in damaging and deformation of the retainer, which hardness is lower than the punch.



Retainer punch hole deformation
↓
Inadequate punch support
↓
Loose punch tip
↓
Punch and die clearance discrepancy
↓
Uneven wear or chipping of tip

[Fig.1] Shortening punch longevity due to the retainer deformation



[Fig.2] Deformation of the retainer due to excessive punching load

[Fig.3] Deformation of the retainer due to repeated taking out / putting in of the punch

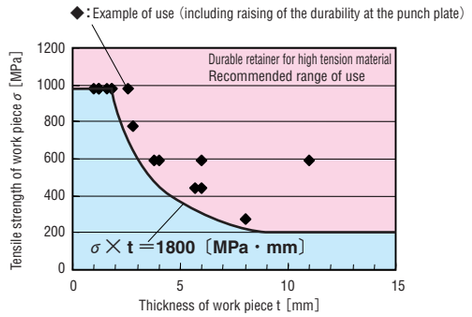
■Features of durable for high tensile strength retainer

The materials of durable for high tensile strength retainer have been changed to SCM 440 or equivalent (hardness 36~44HRC) from S45C (raw material) in order to solve problems shown above. Comparing the mechanical feature of S45C and SCM440 (Table 1.), SCM is apparently superior in all of hardness, yield stress, tensile strength, wear resistance, breakage resistance and is hard to deform. With these features, durable for high tensile strength retainer would prevent deformation of retainer and extend the punch longevity.

[Table 1] Mechanical features of S45C (raw material) and SCM440

Material	Hardness [HRC]	Yield stress [MPa]	Tensile Strength [MPa]
S45C (Raw material)	21below	345over	570over
SCM440	36~44	835over	980over

Partially excerpts from old JIS G4051 and G4105 (1979).



[Fig.4] Recommended range of use for durable for high tensile strength retainer, and usage example

■Usage

1. Punching high tensile material and thick plate

The durable for high tensile strength retainer is highly effective in cases when the stress at the punch shank during punching exceeds about 500 MPa.
Use the following working conditions as a rough guide.
Tensile strength of work piece σ × Plate thickness t ≧ 1800 [MPa-mm] (Fig.4)

Example
If the tensile strength of the work piece is 590 MPA and the plate thickness is t3.2, it will be 590×3.2=1888 [MPa-mm], which exceeds 1800 [MPa-mm]. This indicates that the durable for high tensile strength retainer is appropriate.

2. Die for mass production

The durable for high tensile strength retainer is suitable for the case, when the maintenance cost reduction is required by improving the durability of die parts for mass production over 1 million shots.

The punch is delivered already set in the retainer. (+100yen) For details, P.657

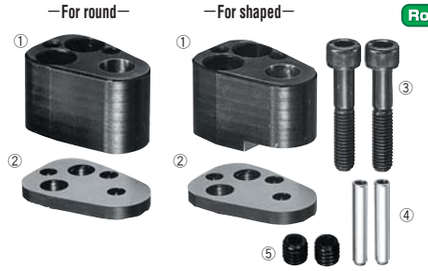
For round punch Ⓐ

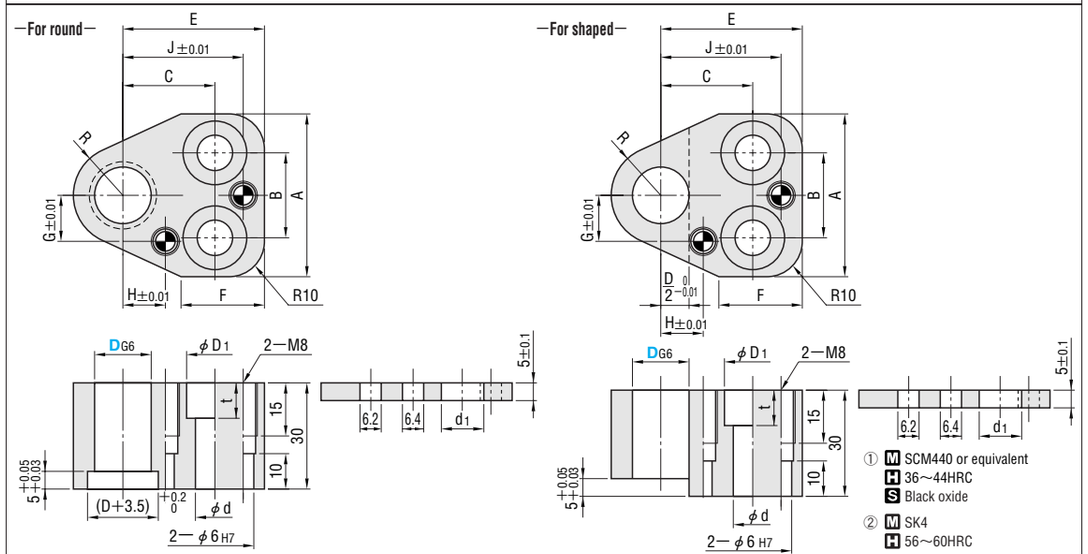
Catalog No.	Retainers No.	Components ①	②	③	④	⑤
HDP—AP	HA1	○	○	○	○	○
HDPAR	HA2	○		○	○	○
BPC	—		○			
HDP—AN	HA3	○				

For shaped punch D R E G

Catalog No.	Retainers No.	Components ①	②	③	④	⑤
HDP—FP	HF1	○	○	○	○	○
HDPFR	HF2	○		○	○	○
BPC	—		○			
HDP—FN	HF3	○				

RoHS





Catalog No. Type	D	DG6	A	B	C	E	F	G	H	J	R	D1	d	t	d1	A ③④⑤
—For round— —For shaped—	10	+0.014 +0.005	37	20	21	35	20	10	9	29	9.5	14	9	10	10	③M8—40 ④MSTM6—30 ⑤MSW8
HDP—AP (①②③④⑤) HDP—FP (①②③④⑤)	13	+0.017 +0.006	43	26	23	38		13	11	32	12					
HDPAR (①③④⑤) HDPFR (①③④⑤)	16		44	24	26	40			12	34	14	17	11	12	12	③M10—40 ④MSTM6—30 ⑤MSW8
BPC (②) BPC (②)	20	+0.020 +0.007	48	28	27	42		16	14	36	17					
HDP—AN (①) HDP—FN (①)	25		50	30	30	46		18	17	39	19.5					

Order Catalog No. HDP—AP 25

Delivery 3 Days
Express T 400/1Pc.
Express A 200/1Pc. P.38
A flat charge of 540 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

Quantity	1~9 sets	10~29 sets	30~49 sets	50~100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■1~9 sets U/Price

D	For round HDP—AN ①	HDPAR ①③④⑤	HDP—AP ①②③④⑤	For shaped HDP—FN ①	HDPFR ①③④⑤	HDP—FP ①②③④⑤	Common BPC ②
10	1,480	1,550	1,990	1,610	1,680	2,120	500
13	1,540	1,620	2,060	1,660	1,740	2,180	500
16	1,590	1,670	2,110	1,730	1,810	2,250	500
20	1,690	1,770	2,250	1,800	1,880	2,360	580
25	1,790	1,880	2,360	1,920	2,010	2,490	580

PRESS NEW DURABLE FOR HIGH TENSILE STRENGTH END RETAINER SETS —FOR NC PROCESS·HEAVY LOAD PUNCH—

Punch & Retainer Set Available

Detail P.657

The punch is delivered already set in the retainer. (+100yen) For details, P.657

For round punch Ⓐ

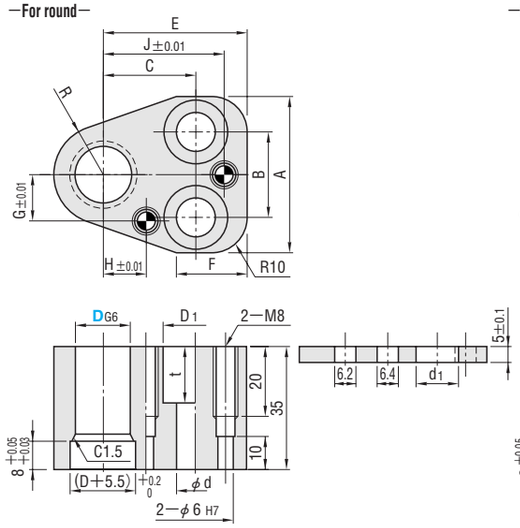
Catalog No.	Retainers No.	Components ①	②	③	④	⑤
HAP—AP	JA1	○	○	○	○	○
HAPAR	JA2	○		○	○	○
BPC	—		○			
HAP—AN	JA3	○				

For shaped punch Ⓓ Ⓡ Ⓔ Ⓖ

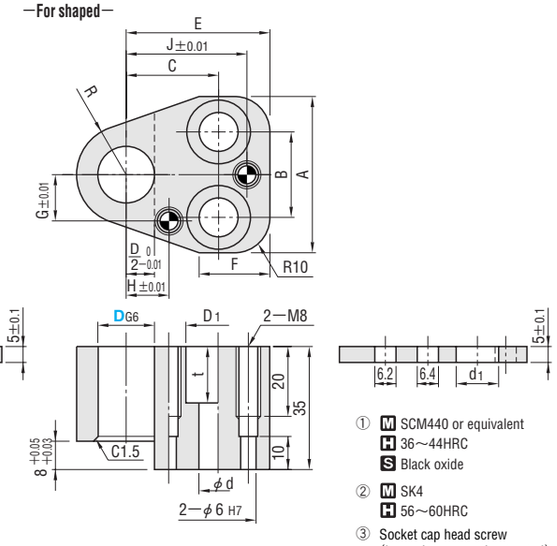
Catalog No.	Retainers No.	Components ①	②	③	④	⑤
HAP—FP	JF1	○	○	○	○	○
HAPFR	JF2	○		○	○	○
BPC	—		○			
HAP—FN	JF3	○				

—For round— —For shaped— RoHS

—For round—



—For shaped—



① M SCM440 or equivalent H 36~44HRC S Black oxide
② M SK4 H 56~60HRC
③ Socket cap head screw (loosening prevention treated)

Catalog No. Type	D	DG6	A	B	C	E	F	G	H	J	R	D1	d	d1	t	Ⓐ ③④⑤
—For round— HAP—AP (①②③④⑤) HAPAR (①③④⑤) BPC (②) HAP—AN (①) —For shaped— HAP—FP (①②③④⑤) HAPFR (①③④⑤) BPC (②) HAP—FN (①)	10	+0.014 +0.005	37	20	21	35	20	10	9	29	9.5	14	9	10	15	③M8—40 ④MSTM6—30 ⑤MSW8
	13	+0.017 +0.006	43	26	23	38		13	11	32	12					
	16		44	24	26	40			12	34	14	17	11	12	19	③M10—40 ④MSTM6—30 ⑤MSW8
	20	+0.020 +0.007	48	28	27	42		16	14	36	17					
	25		50	30	30	46		18	17	39	19.5					

Order Catalog No. HAP—AP 10

Delivery 3 Days

Express	T	400/1Pc.
Express	A	200/1Pc.

P.38

A flat charge of 540 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

Quantity	1~9 sets	10~29 sets	30~49 sets	50~100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■1~9 sets U/Price

D	For round HAP—AN ①	HAPAR ①③④⑤	HAP—AP ①②③④⑤	For shaped HAP—FN ①	HAPFR ①③④⑤	HAP—FP ①②③④⑤	Common BPC ②
10	1,850	1,920	2,360	2,150	2,220	2,660	500
13	1,920	2,000	2,440	2,210	2,290	2,730	500
16	1,990	2,070	2,510	2,290	2,370	2,810	500
20	2,100	2,180	2,660	2,390	2,470	2,950	580
25	2,240	2,330	2,810	2,530	2,620	3,100	580

PRESS NEW DURABLE FOR HIGH TENSILE STRENGTH SQUARE RETAINER SETS

Punch & Retainer Set Available

Detail P.657

This products will be on sale from July 1, 2007.

The punch is delivered already set in the retainer. (+100yen) For details, P.657

Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ

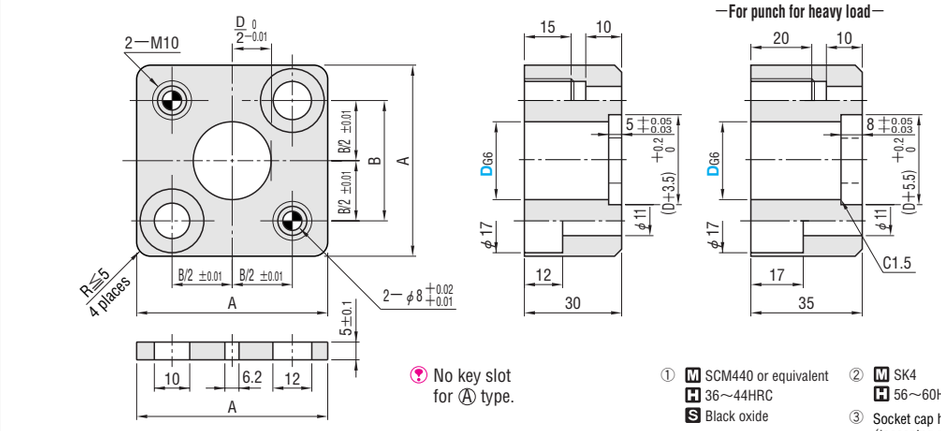
Type	Catalog No.	Retainers No.	Components ①	②	③	④	⑤
Ⓐ	HSR—AP	MA1	○	○	○	○	○
	HMPSR	MA2	○		○	○	○
	MPSP	—		○			
	HSR—AN	MA3	○				
Ⓓ Ⓡ Ⓔ Ⓖ	HSR—FP	MF1	○	○	○	○	○
	HMPDR	MF2	○		○	○	○
	MPSP	—		○			
	HSR—FN	MF3	○				

—For punch for heavy load— Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ

Type	Catalog No.	Retainers No.	Components ①	②	③	④	⑤
Ⓐ	HSA—AP	LA1	○	○	○	○	○
	HASAR	LA2	○		○	○	○
	MPSP	—		○			
	HSA—AN	LA3	○				
Ⓓ Ⓡ Ⓔ Ⓖ	HSA—FP	LF1	○	○	○	○	○
	HASFR	LF2	○		○	○	○
	MPSP	—		○			
	HSA—FN	LF3	○				

RoHS

—For punch for heavy load—



No key slot for Ⓐ type.

① M SCM440 or equivalent H 36~44HRC S Black oxide
② M SK4 H 56~60HRC
③ Socket cap head screw (loosening prevention treated)

Catalog No. Type	D	DG6	A	B	Ⓐ ③④⑤
—For punch for heavy load— HSR—AP (①②③④⑤) HSR—FP (①②③④⑤) HMPSR (①③④⑤) HMPDR (①③④⑤) MPSP (②) HSR—AN (①) HSR—FN (①) HSA—AP (①②③④⑤) HSA—FP (①②③④⑤) HASAR (①③④⑤) HASFR (①③④⑤) MPSP (②) HSA—AN (①) HSA—FN (①)	10	+0.014 +0.005	45	23	③M10—40 ④MSTM8—30 ⑤MSW10
	13	+0.017 +0.006			
	16		52	30	
	20	+0.020 +0.007			
	25		56	34	

■1~9 sets U/Price

D	For round HSR—AN ①	HMPSR ①③④⑤	HSR—AP ①②③④⑤	For shaped HSR—FN ①	HMPDR ①③④⑤	HSR—FP ①②③④⑤	Common MPSP ②
10	1,500	1,580	2,150	1,950	2,030	2,600	570
13	1,500	1,580	2,150	1,950	2,030	2,600	570
16	1,650	1,730	2,300	2,090	2,170	2,740	570
20	1,650	1,730	2,390	2,090	2,170	2,830	660
25	1,940	2,020	2,680	2,390	2,470	3,130	660

Order Catalog No. HSR—AP 25

Delivery 3 Days

Express	T	400/1Pc.
Express	A	200/1Pc.

P.38

A flat charge of 540 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

Quantity	1~9 sets	10~29 sets	30~49 sets	50~100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■1~9 sets U/Price

D	For round HSA—AN ①	HASAR ①③④⑤	HSA—AP ①②③④⑤	For shaped HSA—FN ①	HASFR ①③④⑤	HSA—FP ①②③④⑤	Common MPSP ②
10	2,050	2,130	2,700	2,720	2,800	3,370	570
13	2,050	2,130	2,700	2,720	2,800	3,370	570
16	2,260	2,340	2,910	2,930	3,010	3,580	570
20	2,260	2,340	3,000	2,930	3,010	3,670	660
25	2,710	2,790	3,450	3,340	3,420	4,080	660

Price Cut Up to 5%

: Reduced Price

END RETAINER SETS FOR NC PROCESS
—25mm thickness type—

The punch is delivered already set in the retainer. (+100yen) For details, P.657

For round punch Ⓐ

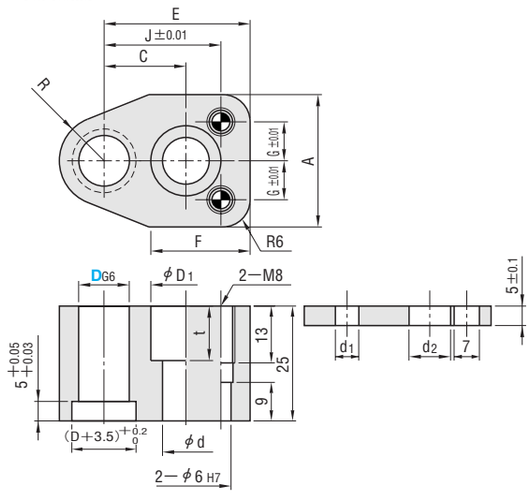
Catalog No.	Retainers No.	Components ①	②	③	④	⑤
SP—APS	SA1	○	○	○	○	○
SPARS	SA2	○		○	○	○
BPST	—		○			
SP—ASN	SA3	○				

For shaped punch Ⓓ Ⓡ Ⓔ Ⓖ

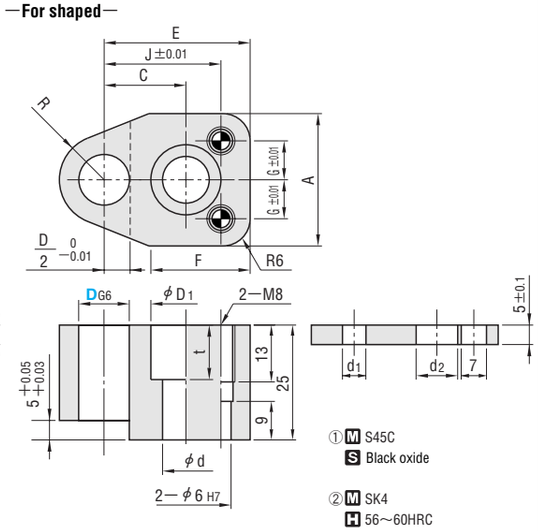
Catalog No.	Retainers No.	Components ①	②	③	④	⑤
SP—FPS	SF1	○	○	○	○	○
SPFRS	SF2	○		○	○	○
BPST	—		○			
SP—FSN	SF3	○				

—For round— —For shaped— RoHS

—For round—



—For shaped—



① M S45C
S Black oxide

② M SK4
H 56~60HRC

③ Socket cap head screw
(loosening prevention treated)

Catalog No. Type	D	DG6	A	C	E	F	G	J	R	D1	d	t	d2	d1	For round Ⓐ ③④⑤	For shaped Ⓐ ③④⑤
—For round— SP—APS (①②③④⑤) SPARS (①③④⑤) BPST (②) SP—ASN (①)	10	+0.014 +0.005	34	22	38	26	12	31.5	11.5	19	13	13	14	6.2	③M12—35 ④MSTM6—30 ⑤MSW8	③M12—35 ④MSTM6—30 ⑤MSW8
	13	+0.017 +0.006														
—For shaped— SP—FPS (①②③④⑤) SPFRS (①③④⑤) BPST (②) SP—FSN (①)	16		36	26	45	33		39	14	25	17	17	18		③M16—35 ④MSTM6—30 ⑤MSW8	③M16—35 ④MSTM6—30 ⑤MSW8

Order — Catalog No. — SP—APS 13

Delivery — 3 Days — Express A 200/1Pc. P.38

A flat charge of 540 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1~9 sets	10~29 sets	30~49 sets	50~100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■1~9 sets U/Price

D	For round SP—ASN ①	For round SPARS ①③④⑤	For round SP—APS ①②③④⑤	For shaped SP—FSN ①	For shaped SPFRS ①③④⑤	For shaped SP—FPS ①②③④⑤	Common BPST ②
10	1,010	1,130	1,560	1,140	1,260	1,690	530
13	1,060	1,180	1,610	1,190	1,310	1,740	530
16	1,110	1,260	1,690	1,240	1,390	1,820	530

END RETAINER SETS FOR MANUAL PROCESS
—25mm thickness type—

For round punch Ⓐ

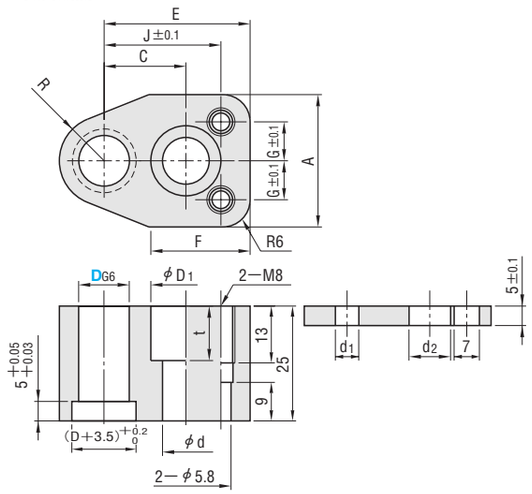
Catalog No.	Components ①	②	③	④	⑤
TP—APS	○	○	○	○	○
TPARS	○		○	○	○
BPST		○			
TP—ASN	○				

For shaped punch Ⓓ Ⓡ Ⓔ Ⓖ

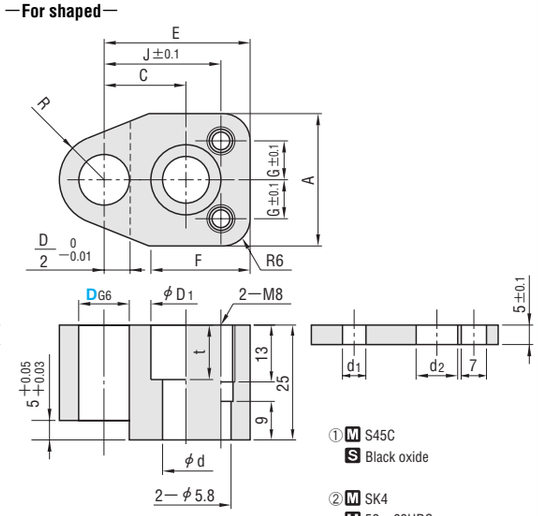
Catalog No.	Components ①	②	③	④	⑤
TP—FPS	○	○	○	○	○
TPFRS	○		○	○	○
BPST		○			
TP—FSN	○				

—For round— —For shaped— RoHS

—For round—



—For shaped—



① M S45C
S Black oxide

② M SK4
H 56~60HRC

③ Socket cap head screw
(loosening prevention treated)

Catalog No. Type	D	DG6	A	C	E	F	G	J	R	D1	d	t	d2	d1	For round Ⓐ ③④⑤	For shaped Ⓐ ③④⑤
—For round— TP—APS (①②③④⑤) TPARS (①③④⑤) BPST (②) TP—ASN (①)	10	+0.014 +0.005	34	22	38	26	12	31.5	11.5	19	13	13	14	6.2	③M12—35 ④MSTM6—30 ⑤MSW8	③M12—35 ④MSTM6—30 ⑤MSW8
	13	+0.017 +0.006														
—For shaped— TP—FPS (①②③④⑤) TPFRS (①③④⑤) BPST (②) TP—FSN (①)	16		36	26	45	33		39	14	25	17	17	18		③M16—35 ④MSTM6—30 ⑤MSW8	③M16—35 ④MSTM6—30 ⑤MSW8

Order — Catalog No. — TPARS 16

Delivery — 3 Days — Express A 200/1Pc. P.38

A flat charge of 540 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1~9 sets	10~29 sets	30~49 sets	50~100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■1~9 sets U/Price

D	For round TP—ASN ①	For round TPARS ①③④⑤	For round TP—APS ①②③④⑤	For shaped TP—FSN ①	For shaped TPFRS ①③④⑤	For shaped TP—FPS ①②③④⑤	Common BPST ②
10	830	940	1,370	960	1,060	1,490	530
13	890	1,010	1,440	1,010	1,130	1,560	530
16	960	1,100	1,530	1,080	1,220	1,650	530

END RETAINER SETS FOR NC PROCESS

Price Cut Up to 5%

: Reduced Price

END RETAINER SETS FOR MANUAL PROCESS

The punch is delivered already set in the retainer. (+100yen) For details, P.657

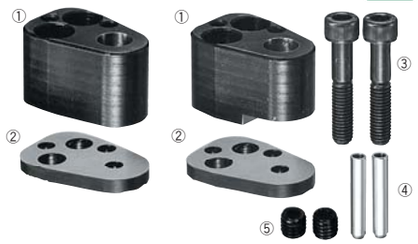
For round punch/round button die Ⓐ

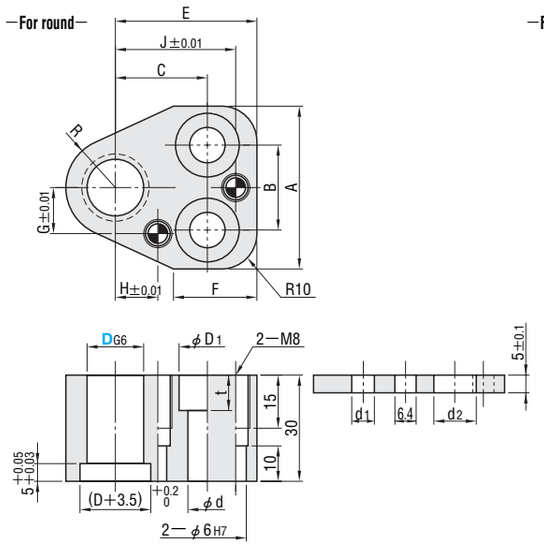
For round	Retainers No.	Catalog No.	Components ①	②	③	④	⑤
For punch	DA1	DP—AP	○	○	○	○	○
	DA2	DPAR	○		○	○	○
	—	BPC		○			
For button die	—	DP—AD	○	○	○	○	○
	—	BDC		○			
Body only	DA3	DP—AN	○				

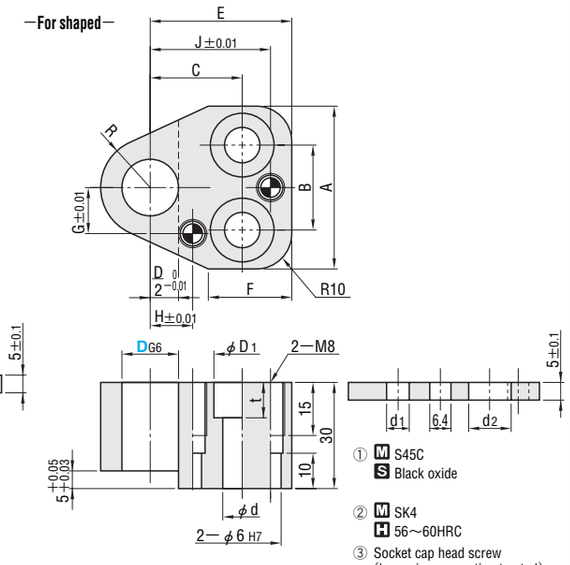
For shaped punch/shaped button die ⒹⓇⒺⒼ

For shaped	Retainers No.	Catalog No.	Components ①	②	③	④	⑤
For punch	DF1	DP—FP	○	○	○	○	○
	DF2	DPFR	○		○	○	○
	—	BPC		○			
For button die	—	DP—FD	○	○	○	○	○
	—	BDC		○			
Body only	DF3	DP—FN	○				

—For round— —For shaped— RoHS







① M S45C S Black oxide
② M SK4 H 56~60HRC
③ Socket cap head screw (loosening prevention treated)

Catalog No. Type —For round—	—For shaped—	D	DG6	A	B	C	E	F	G	H	J	R	D1	d	t	d2	d1 BPC	d1 BDC	A ③④⑤
DP—AP (①②③④⑤) DP—AD (①②③④⑤)	DP—FP (①②③④⑤) DP—FD (①②③④⑤)	10	+0.014 +0.005	37	20	21	35	20	10	9	29	9.5	14	9	10	10	6.2	7.4	③M8—40 ④MSTM6—30 ⑤MSW8
		13	+0.017 +0.006	43	26	23	38		13	11	32	12						9.4	
		16		44	24	26	40			12	34	14						11.6	③M10—40
DPAR (①③④⑤)	DPFR (①③④⑤)	20	+0.020 +0.007	48	28	27	42		16	14	36	17	17	11	12	12		13.6	④MSTM6—30
		25		50	30		46		18	17	39	19.5						17.6	⑤MSW8
BPC BDC (②)	BPC BDC (②)	32	+0.025 +0.009	54	30	33	48		21	20	42	23	19	13	14	14		21.6	③M12—40
DP—AN (①)	DP—FN (①)	38		58		35	52		23	23	46	26					10.2	27.6	④MSTM6—30
		45		64	34	38	56		26	27	50	29.5						37.0	⑤MSW8

Order — Catalog No. DP—AP 25

Delivery — 3 Days; Express T 400/1Pc.; Express A 200/1Pc. P.38

A flat charge of 540 yen for 3 pieces or more of the same size (excluding Express T).

Price — Volume discount rate P.37

Quantity	1~9 sets	10~29 sets	30~49 sets	50~100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■1~9 sets U/Price

D	For round DP—AN ①	DPAR ①③④⑤	DP—AP DP—AD ①②③④⑤	For shaped DP—FN ①	DPFR ①③④⑤	DP—FP DP—FD ①②③④⑤	Common BPC BDC ②
10	1,130	1,200	1,640	1,190	1,260	1,700	500
13	1,190	1,270	1,710	1,250	1,330	1,770	500
16	1,240	1,320	1,760	1,310	1,390	1,830	500
20	1,310	1,390	1,870	1,380	1,460	1,940	580
25	1,420	1,510	1,990	1,490	1,580	2,060	580
32	1,590	1,690	2,240	1,670	1,770	2,320	660
38	1,810	1,910	2,460	1,920	2,020	2,570	660
45	2,040	2,140	2,810	2,160	2,260	2,930	810

The punch is delivered already set in the retainer. (+100yen) For details, P.657

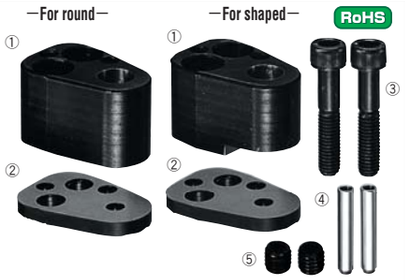
For round punch/round button die Ⓐ

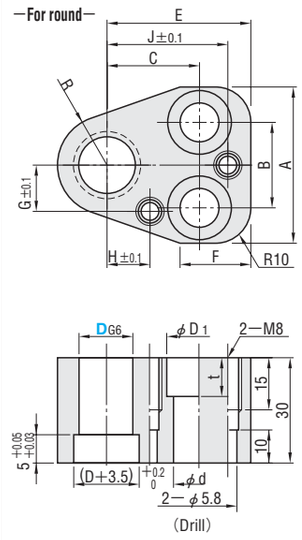
For round	Retainers No.	Catalog No.	Components ①	②	③	④	⑤
For punch	CA1	CP—AP	○	○	○	○	○
	CA2	CPAR	○		○	○	○
	—	BPC		○			
For button die	—	CP—AD	○	○	○	○	○
	—	BDC		○			
Body only	CA3	CP—AN	○				

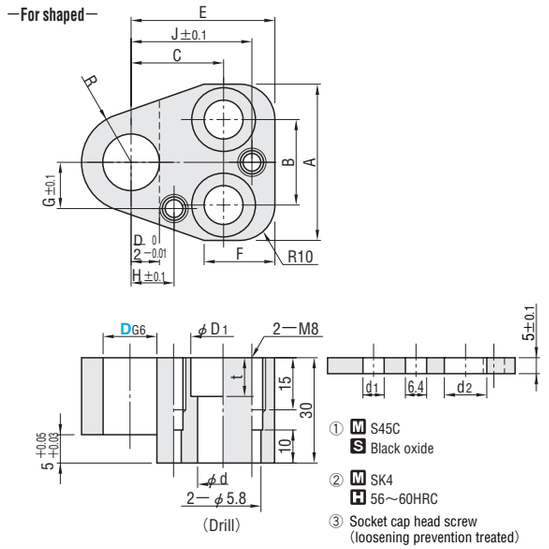
For shaped punch/shaped button die ⒹⓇⒺⒼ

For shaped	Retainers No.	Catalog No.	Components ①	②	③	④	⑤
For punch	CF1	CP—FP	○	○	○	○	○
	CF2	CPFR	○		○	○	○
	—	BPC		○			
For button die	—	CP—FD	○	○	○	○	○
	—	BDC		○			
Body only	CF3	CP—FN	○				

—For round— —For shaped— RoHS







① M S45C S Black oxide
② M SK4 H 56~60HRC
③ Socket cap head screw (loosening prevention treated)

Catalog No. Type —For round—	—For shaped—	D	DG6	A	B	C	E	F	G	H	J	R	D1	d	t	d2	d1 BPC	d1 BDC	A ③④⑤
CP—AP (①②③④⑤) CP—AD (①②③④⑤)	CP—FP (①②③④⑤) CP—FD (①②③④⑤)	10	+0.014 +0.005	37	20	21	35	20	10	9	29	9.5	14	9	10	10	6.2	7.4	③M8—40 ④MSTM6—30 ⑤MSW8
		13	+0.017 +0.006	43	26	23	38		13	11	32	12						9.4	
		16		44	24	26	40			12	34	14						11.6	③M10—40
CPAR (①③④⑤)	CPFR (①③④⑤)	20	+0.020 +0.007	48	28	27	42		16	14	36	17	17	11	12	12		13.6	④MSTM6—30
		25		50	30		46		18	17	39	19.5						17.6	⑤MSW8
BPC BDC (②)	BPC BDC (②)	32	+0.025 +0.009	54	30	33	48		21	20	42	23	19	13	14	14		21.6	③M12—40
CP—AN (①)	CP—FN (①)	38		58		35	52		23	23	46	26					10.2	27.6	④MSTM6—30
		45		64	34	38	56		26	27	50	29.5						37.0	⑤MSW8

Order — Catalog No. CP—AP 25

Delivery — 3 Days; Express T 400/1Pc.; Express A 200/1Pc. P.38

A flat charge of 540 yen for 3 pieces or more of the same size (excluding Express T).

Price — Volume discount rate P.37

Quantity	1~9 sets	10~29 sets	30~49 sets	50~100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■1~9 sets U/Price

D	For round CP—AN ①	CPAR ①③④⑤	CP—AP CP—AD ①②③④⑤	For shaped CP—FN ①	CPFR ①③④⑤	CP—FP CP—FD ①②③④⑤	Common BPC BDC ②
10	850	930	1,450	990	1,060	1,590	500
13	920	1,000	1,520	1,040	1,120	1,640	500
16	980	1,060	1,590	1,110	1,190	1,720	500
20	1,040	1,120	1,720	1,170	1,250	1,840	580
25	1,170	1,250	1,840	1,300	1,380	1,980	580
32	1,340	1,440	2,110	1,460	1,570	2,230	660
38	1,600	1,690	2,370	1,720	1,810	2,490	660
45	1,840	1,950	2,750	1,980	2,070	2,890	810

Price Cut Up to 5%

: Reduced Price

END RETAINER SETS FOR NC PROCESS
—FOR HEAVY LOAD PUNCH—

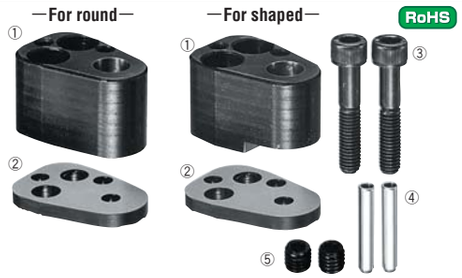
The punch is delivered already set in the retainer. (+100yen) For details, P.657

For round punch Ⓐ

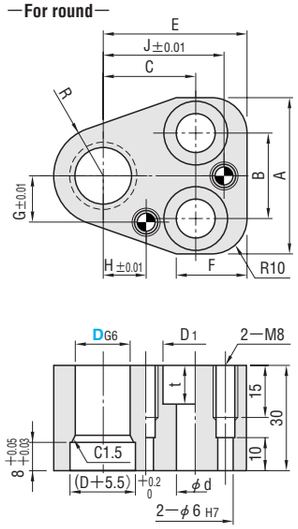
Catalog No.	Retainers No.	Components ①	②	③	④	⑤
AP—AP	AA1	○	○	○	○	○
APAR	AA2	○		○	○	○
BPC	—		○			
AP—AN	AA3	○				

For shaped punch Ⓓ Ⓔ Ⓖ

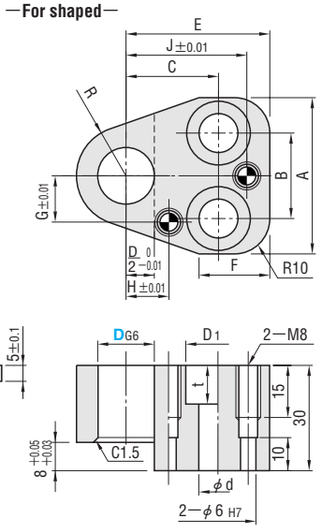
Catalog No.	Retainers No.	Components ①	②	③	④	⑤
AP—FP	AF1	○	○	○	○	○
APFR	AF2	○		○	○	○
BPC	—		○			
AP—FN	AF3	○				



—For round—



—For shaped—



① M S45C
S Black oxide

② M SK4
H 56~60HRC

③ Socket cap head screw
(loosening prevention treated)

Catalog No. Type	D	D_{G6}	A	B	C	E	F	G	H	J	R	D_1	d	d_1	t	A ③④⑤
—For round— AP—AP (①②③④⑤) APAR (①③④⑤) BPC (②) AP—AN (①) —For shaped— AP—FP (①②③④⑤) APFR (①③④⑤) BPC (②) AP—FN (①)	10	+0.014 +0.005	37	20	21	35	20	10	9	29	9.5	14	9	10	10	③M8—40 ④MSTM6—30 ⑤MSW8
	13	+0.017 +0.006	43	26	23	38		13	11	32	12					
	16		44	24	26	40			12	34	14	17	11	12	14	③M10—40 ④MSTM6—30 ⑤MSW8
	20	+0.020 +0.007	48	28	27	42		16	14	36	17					
	25		50	30	30	46		18	17	39	19.5					

Order Catalog No. AP—AP 10

Delivery 3 Days

Express	T	400/1Pc.
Express	A	200/1Pc.

P.38

A flat charge of 540 yen for 3 pieces or more of the same size (excluding Express T)

Price

■Volume discount rate P.37

Quantity	1~9 sets	10~29 sets	30~49 sets	50~100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■1~9 sets U/Price

D	For round AP—AN ①	For round APAR ①③④⑤	For round AP—AP ①②③④⑤	For shaped AP—FN ①	For shaped APFR ①③④⑤	For shaped AP—FP ①②③④⑤	Common BPC ②
10	1,380	1,450	1,940	1,670	1,740	2,230	500
13	1,450	1,530	2,020	1,740	1,820	2,310	500
16	1,520	1,600	2,090	1,800	1,880	2,370	500
20	1,590	1,670	2,240	1,870	1,950	2,520	580
25	1,720	1,810	2,380	2,000	2,090	2,660	580

END RETAINER SETS FOR MANUAL PROCESS
—FOR HEAVY LOAD PUNCH—

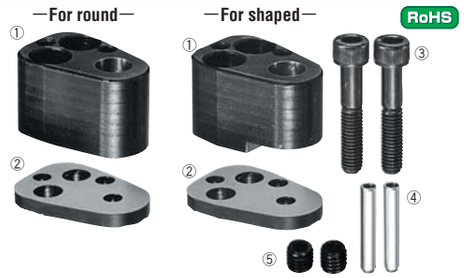
The punch is delivered already set in the retainer. (+100yen) For details, P.657

For round punch Ⓐ

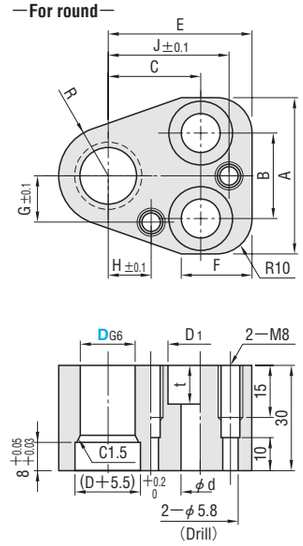
Catalog No.	Retainers No.	Components ①	②	③	④	⑤
FP—AP	FA1	○	○	○	○	○
FPAR	FA2	○		○	○	○
BPC	—		○			
FP—AN	FA3	○				

For shaped punch Ⓓ Ⓔ Ⓖ

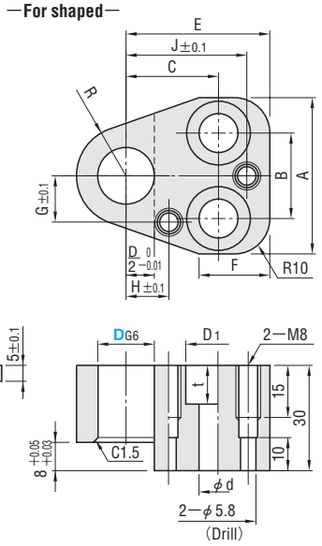
Catalog No.	Retainers No.	Components ①	②	③	④	⑤
FP—FP	FF1	○	○	○	○	○
FPFR	FF2	○		○	○	○
BPC	—		○			
FP—FN	FF3	○				



—For round—



—For shaped—



① M S45C
S Black oxide

② M SK4
H 56~60HRC

③ Socket cap head screw
(loosening prevention treated)

Catalog No. Type	D	D_{G6}	A	B	C	E	F	G	H	J	R	D_1	d	d_1	t	A ③④⑤
—For round— FP—AP (①②③④⑤) FPAR (①③④⑤) BPC (②) FP—AN (①) —For shaped— FP—FP (①②③④⑤) FPFR (①③④⑤) BPC (②) FP—FN (①)	10	+0.014 +0.005	37	20	21	35	20	10	9	29	9.5	14	9	10	10	③M8—40 ④MSTM6—30 ⑤MSW8
	13	+0.017 +0.006	43	26	23	38		13	11	32	12					
	16		44	24	26	40			12	34	14	17	11	12	14	③M10—40 ④MSTM6—30 ⑤MSW8
	20	+0.020 +0.007	48	28	27	42		16	14	36	17					
	25		50	30	30	46		18	17	39	19.5					

Order Catalog No. FP—AP 10

Delivery 3 Days

Express	T	400/1Pc.
Express	A	200/1Pc.

P.38

A flat charge of 540 yen for 3 pieces or more of the same size (excluding Express T)

Price

■Volume discount rate P.37

Quantity	1~9 sets	10~29 sets	30~49 sets	50~100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■1~9 sets U/Price

D	For round FP—AN ①	For round FPAR ①③④⑤	For round FP—AP ①②③④⑤	For shaped FP—FN ①	For shaped FPFR ①③④⑤	For shaped FP—FP ①②③④⑤	Common BPC ②
10	1,110	1,210	1,810	1,500	1,560	2,130	500
13	1,200	1,280	1,890	1,550	1,630	2,190	500
16	1,270	1,350	1,990	1,620	1,720	2,280	500
20	1,330	1,430	2,130	1,700	1,780	2,430	580
25	1,490	1,580	2,290	1,840	1,940	2,590	580

END RETAINER SETS FOR NC PROCESS
—25mm thickness type—

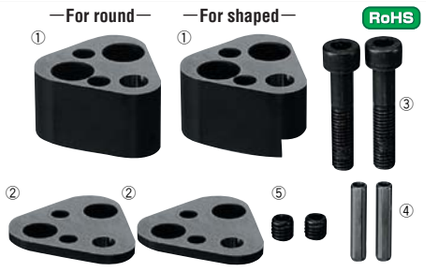
The punch is delivered already set in the retainer. (+100yen) For details, P.657

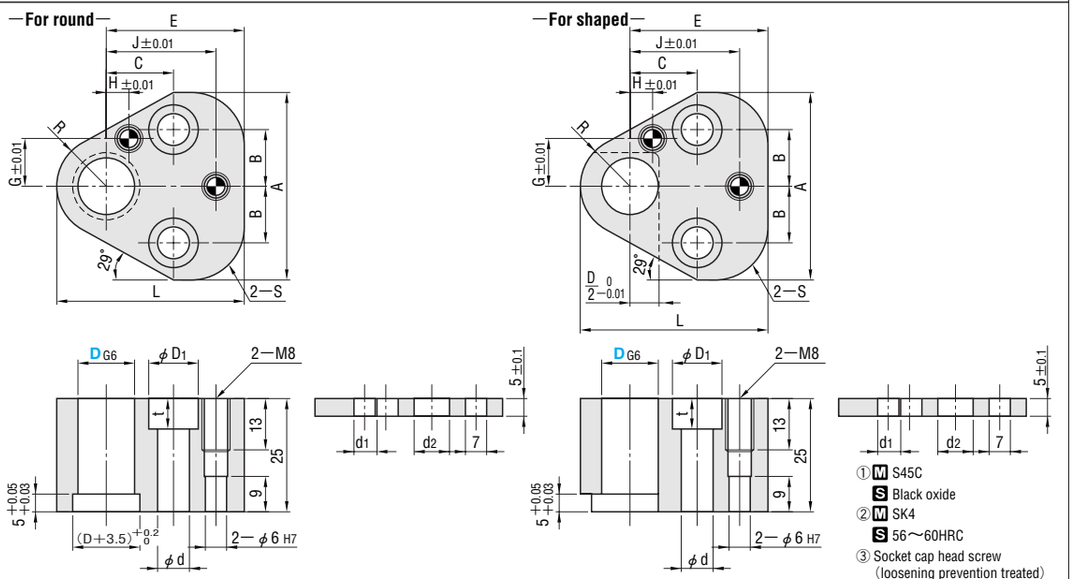
For round punch/round button die Ⓐ

For round	Retainers No.	Catalog No.	Components ①	②	③	④	⑤
For punch	NA1	25CRN—AP	○	○	○	○	○
	NA2	25CRNAR	○		○	○	○
	—	CRNBP		○			
For button die	—	25CRN—AD	○	○	○	○	○
	—	CRNBD		○			
Body only	NA3	25CRN—A	○				

For shaped punch/shaped button die Ⓓ Ⓡ Ⓔ Ⓖ

For shaped	Retainers No.	Catalog No.	Components ①	②	③	④	⑤
For punch	NF1	25CRN—FP	○	○	○	○	○
	NF2	25CRNFR	○		○	○	○
	—	CRNBP		○			
For button die	—	25CRN—FD	○	○	○	○	○
	—	CRNBD		○			
Body only	NF3	25CRN—F	○				





Catalog No. Type	D	DG6	A	B	C	E	G	H	J	L	R	S	D1	d	t	d2	d1 CRNBP	d1 CRNBD	A ③④⑤
—For round— 25CRN—AP; 25CRN—AD (①②③④⑤); 25CRNAR (①③④⑤); CRNBP; CRNBD (②); 25CRN—A (①) —For shaped— 25CRN—FP; 25CRN—FD (①②③④⑤); 25CRNFR (①③④⑤); CRNBP; CRNBD (②); 25CRN—F (①)	10	+0.014 +0.005	43.7	11.12	19.05	35.0	9.0	7.5	26.925	44.5	9.5	12.0	14	9	9	10	6.2	7.4	③ M8—35 ④ MSTM6—30 ⑤ MSW8
	13	+0.017 +0.006	50.0	14.27		38.1	12.0	6.5	29.970	50.8	12.7	15.2						9.4	
	16		53.2	15.87		39.7	13.5	6.0	31.750	54.0	14.3	16.8						11.6	
	20	+0.020 +0.007	59.5	17.47		42.8	16.5	5.0	33.530	60.3	17.5	20.0	17	11	11	12		13.6	③ M10—35 ⑤ MSW8 ④ MSTM6—30
	25		69.1	19.84	23.82	47.7	22.0	7.0	40.640	69.9	22.2	24.7	19	13	14	14		17.6	③ M12—35 ⑤ MSW8 ④ MSTM6—30

Order Catalog No. 25CRN—AP 16

Delivery 3 Days

Express A 200/1Pc. P.38

A flat charge of 540 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9 sets	10～29 sets	30～49 sets	50～100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■1～9 sets U/Price

D	For round 25CRN—A ①	25CRNAR ①③④⑤	25CRN—AP 25CRN—AD ①②③④⑤	For shaped 25CRN—F ①	25CRNFR ①③④⑤	25CRN—FP 25CRN—FD ①②③④⑤	Common CRNBP CRNBD ②
10	1,190	1,260	1,700	1,310	1,400	1,820	530
13	1,240	1,330	1,770	1,380	1,460	1,880	530
16	1,300	1,400	1,810	1,420	1,510	1,950	530
20	1,380	1,460	1,950	1,490	1,580	2,060	530
25	1,490	1,580	2,060	1,610	1,700	2,190	530

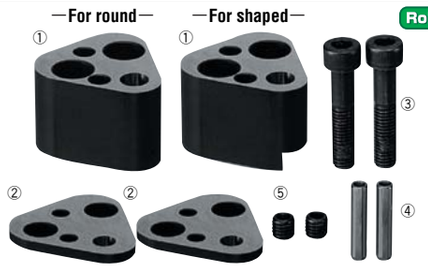
END RETAINER SETS FOR NC PROCESS
—32mm thickness type—

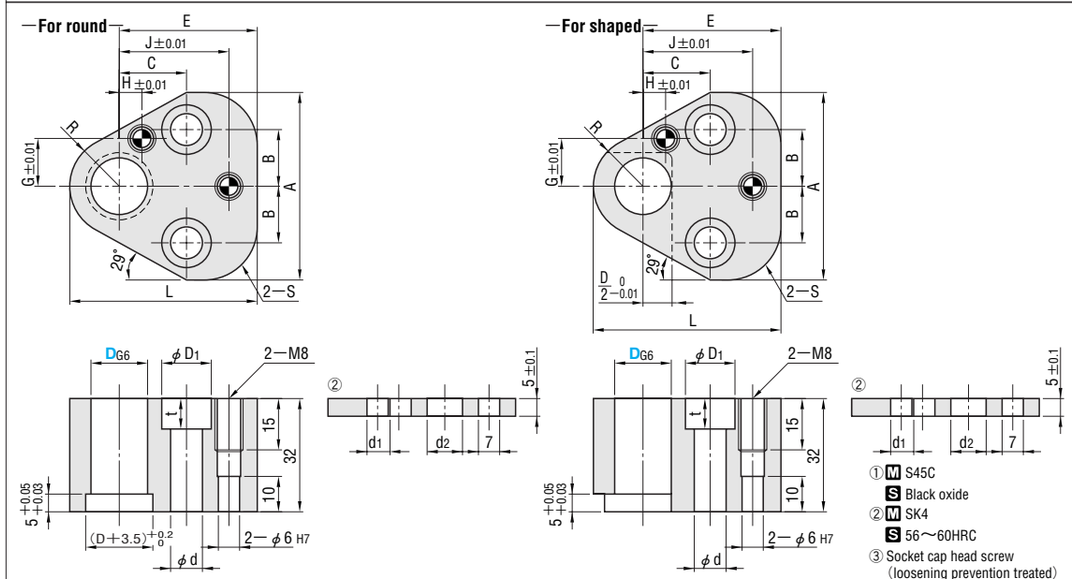
For round punch/round button die Ⓐ

For round	Catalog No.	Components ①	②	③	④	⑤
For punch	CRN—AP	○	○	○	○	○
	CRNAR	○		○	○	○
	CRNBP		○			
For button die	CRN—AD	○	○	○	○	○
	CRNBD		○			
Body only	CRN—A	○				

For shaped punch/shaped button die Ⓓ Ⓡ Ⓔ Ⓖ

For shaped	Catalog No.	Components ①	②	③	④	⑤
For punch	CRN—FP	○	○	○	○	○
	CRNFR	○		○	○	○
	CRNBP		○			
For button die	CRN—FD	○	○	○	○	○
	CRNBD		○			
Body only	CRN—F	○				





Catalog No. Type	D	DG6	A	B	C	E	G	H	J	L	R	S	D1	d	t	d2	d1 CRNBP	d1 CRNBD	A ③④⑤
—For round— CRN—AP; CRN—AD (①②③④⑤); CRNAR (①③④⑤); CRNBP; CRNBD (②); CRN—A (①) —For shaped— CRN—FP; CRN—FD (①②③④⑤); CRNFR (①③④⑤); CRNBP; CRNBD (②); CRN—F (①)	10	+0.014 +0.005	43.7	11.12	19.05	35.0	9.0	7.5	26.925	44.5	9.5	12.0	14	9	9	10	6.2	7.4	③ M8—40 ④ MSTM6—30 ⑤ MSW8
	13	+0.017 +0.006	50.0	14.27		38.1	12.0	6.5	29.970	50.8	12.7	15.2						9.4	
	16		53.2	15.87		39.7	13.5	6.0	31.750	54.0	14.3	16.8						11.6	
	20	+0.020 +0.007	59.5	17.47		42.8	16.5	5.0	33.530	60.3	17.5	20.0	17	11	11	12		13.6	③ M10—40 ⑤ MSW8 ④ MSTM6—30
	25		69.1	19.84	23.82	47.7	22.0	7.0	40.640	69.9	22.2	24.7	19	13	14	14		17.6	③ M12—40 ⑤ MSW8 ④ MSTM6—30

Order Catalog No. CRN—AP 16

Delivery 3 Days

Express A 200/1Pc. P.38

A flat charge of 540 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9 sets	10～29 sets	30～49 sets	50～100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■1～9 sets U/Price

D	For round CRN—A ①	CRNAR ①③④⑤	CRN—AP CRN—AD ①②③④⑤	For shaped CRN—F ①	CRNFR ①③④⑤	CRN—FP CRN—FD ①②③④⑤	Common CRNBP CRNBD ②
10	1,250	1,330	1,790	1,380	1,470	1,920	530
13	1,310	1,400	1,860	1,450	1,540	1,980	530
16	1,370	1,470	1,910	1,490	1,590	2,050	530
20	1,450	1,540	2,050	1,570	1,660	2,170	530
25	1,570	1,660	2,170	1,690	1,790	2,310	530

SQUARE RETAINER SETS

The punch is delivered already set in the retainer. (+100yen) For details, P.657

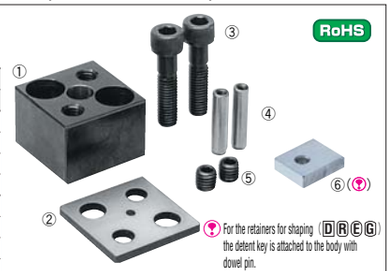
Ⓐ D R E G

Type	Catalog No. For punch	Catalog No. For die	Retainers No. (For punch)	Components ①	②	③	④	⑤	⑥
Ⓐ	SR—AP	SR—AD	RA1	○	○	○	○	○	
	MPSR		RA2	○		○	○	○	
	MPSP	MDSP	—		○				
	SR—AN		—	○					
D R E G	SR—FP	SR—FD	RF1	○	○	○	○	○	○
	MPDR		RF2	○		○	○	○	○
	MPSP	MDSP	—		○				
	SR—FN		—	○					○

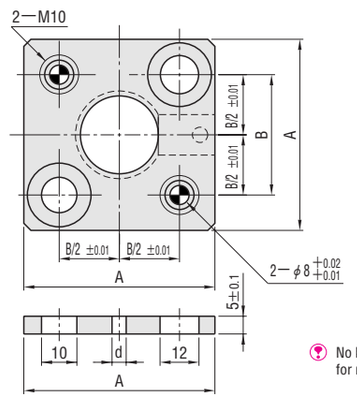
—For punch for heavy load— (Applicable D10~25)

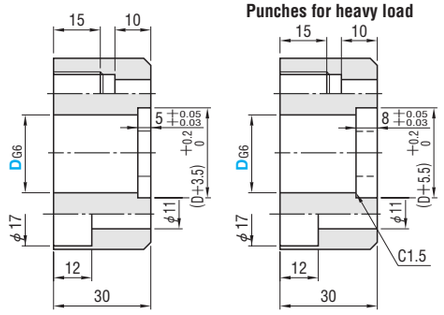
Ⓐ D R E G

Type	Catalog No. For punch	Retainers No.	Components ①	②	③	④	⑤	⑥
Ⓐ	SA—AP	YA1	○	○	○	○	○	
	ASAR	YA2	○		○	○	○	
	MPSP	—		○				
	SA—AN	YA3	○					
D R E G	SA—FP	YF1	○	○	○	○	○	○
	ASFR	YF2	○		○	○	○	○
	MPSP	—		○				
	SA—FN	YF3	○					○



Ⓟ For the retainers for shaping (D R E G) the detent key is attached to the body with dowel pin.





Punches for heavy load

Ⓟ No key slot for round Ⓐ.

① M S45C
S Black oxide

② M SK4
H 56~60HRC

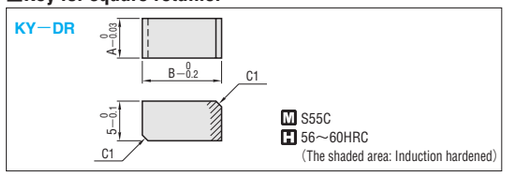
③ Socket cap head screw (loosening prevention treated)

Catalog No. Type	D	D_{G6}	A	B	d MPSP	d MDSP	Ⓐ ③④⑤
SR—AP SR—AD (①②③④⑤)	10	+0.014 +0.005	45	23	6.2	7.4	③M10—40 ④MSTM8—30 ⑤MSW10
SR—FP SR—FD (①②③④⑤⑥)	13	+0.017 +0.006				9.4	
MPSR (①③④⑤)	16		52	30		11.6	
MPDR (①③④⑤⑥)	20	+0.020 +0.007				13.6	
MPSP MDSP (②)	25		56	34		17.6	
SR—AN (①)	(32)	+0.025 +0.009	65	43		21.6	
SR—FN (①⑥)	(38)				10.2	27.6	

For heavy load: SA—AP (①②③④⑤), SA—FP (①②③④⑤⑥), ASAR (①③④⑤), SA—AN (①), SA—FN (①⑥), MPSP (②)

Ⓟ No standard for heavy load of (32) and (38) (Heavy load type is from D10 to D25)

■Key for square retainer



M S55C
H 56~60HRC
(The shaded area: Induction hardened)

Applicable retainer	A	B	Catalog No. Type	D	Q'ty : 1~9 U/Price
SR—FP	10.1	17.5	KY—DR	10	480
SR—FD		16.0		13	
MPDR	11.1	18.0		16	
SA—FP	12.3	16.0		20	590
ASFR	13.6	15.5		25	
	15.3	16.5		32	
	16.6	13.5		38	

Ⓟ D indicates the punch diameter of the applicable retainer.
Ⓟ No dowel hole machined for positioning.

Order Catalog No.
SR—AP 25
KY—DR 20

Delivery 3 Days

Express	T	400/1Pc.
Express	A	200/1Pc.

P.38

Ⓟ A flat charge of 540 yen for 3 pieces or more of the same size (excluding Express T).

Price ■Volume discount rate P.37

Quantity	1~9 sets	10~29 sets	30~49 sets	50~100 sets
Rate	—	5%	10%	15%

Ⓟ Vol. discount rate is also applicable to KY—DR.
Ⓟ To be quoted on price & lead time above Max. Q'ty.

■1~9 sets U/Price

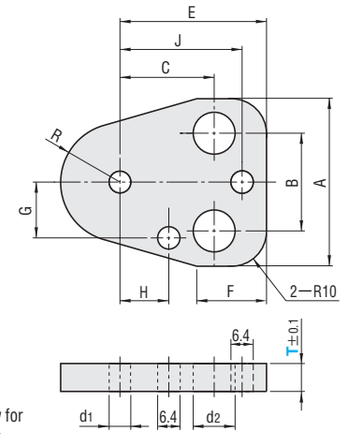
D	For round SR—AN (①)	MPSR (①③④⑤)	SR—AP SR—AD (①②③④⑤)	For shaped SR—FN (①⑥)	MPDR (①③④⑤⑥)	SR—FP SR—FD (①②③④⑤⑥)	Common MPSP MDSP (②)
10	1,150	1,270	1,850	1,600	1,720	2,300	570
13	1,150	1,270	1,850	1,600	1,720	2,300	570
16	1,290	1,420	2,000	1,740	1,860	2,440	570
20	1,290	1,420	2,090	1,740	1,860	2,530	660
25	1,600	1,720	2,380	2,040	2,170	2,830	660
32	2,040	2,170	2,950	2,490	2,610	3,410	790
38	2,040	2,170	2,950	2,490	2,610	3,410	790

D	For round SA—AN (①)	ASAR (①③④⑤)	SA—AP (①②③④⑤)	For shaped SA—FN (①⑥)	ASFR (①③④⑤⑥)	SA—FP (①②③④⑤⑥)	Common MPSP (②)
10	1,700	1,820	2,400	2,370	2,490	3,070	570
13	1,700	1,820	2,400	2,370	2,490	3,070	570
16	1,910	2,030	2,610	2,570	2,700	3,290	570
20	1,910	2,030	2,700	2,570	2,700	3,370	660
25	2,370	2,490	3,150	2,990	3,120	3,780	660

RETAINER BACKING PLATES

RoHS

BPC (For punch) Ⓟ This cannot be applied for the retainer for a button die.



* See the table below for applicable retainers.

M S45C
H 56~60HRC (Depth 1mm)

A	B	C	E	F	G	H	J	R	d_1	d_2	Catalog No. Type	Catalog No. No.	T	U/Price Q'ty : 1~9
37	20	21	35	20	10	9	29	9.5	6.2	10	BPC	10	6 7 8 9 10	890
43	26	23	38		13	11	32	12				13		890
44	24	26	40			12	34	14		12		16		890
48	28	27	42		16	14	36	17				20		1,020
50	30	30	46		18	17	39	19.5				25		1,030
54		33	48		21	20	42	23				32		1,080
58		35	52		23	23	46	26	10.2	14		38		1,110
64	34	38	56		26	27	50	29.5				45		1,360

Order Catalog No. — T
BPC 10 — 10

Delivery 3 Days

Express	T	400/1Pc.
Express	A	200/1Pc.

P.38

Ⓟ A flat charge of 540 yen for 3 pieces or more of the same size (excluding Express T)

Price ■Volume discount rate P.37

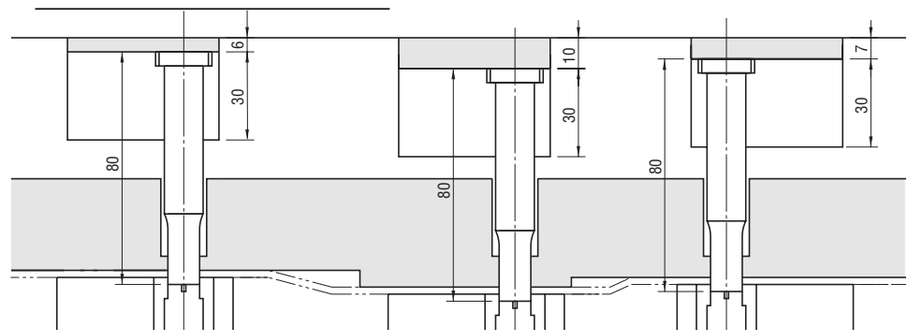
Quantity	1~9	10~29	30~49	50~100
Rate	—	5%	10%	15%

Ⓟ To be quoted on price & lead time above Max. Q'ty.

*

Applicable retainer	Order code (Main body of retainer)
For NC machining	HDP—AN
	HDP—FN
For NC machining Punches for heavy load	HAP—AN
	HAP—FN
For NC machining	DP—AN
	DP—FN
For blade matching machining	CP—AN
	CP—FN
For NC machining Punches for heavy load	AP—AN
	AP—FN
For blade matching machining Punches for heavy load	FP—AN
	FP—FN

Example



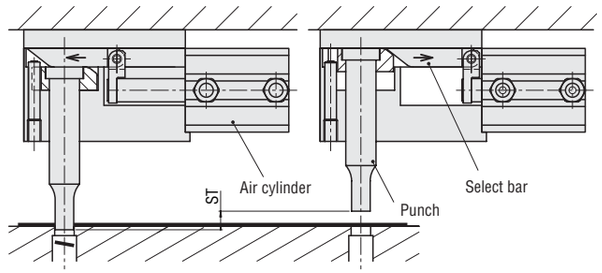
■Features
①Able to have the punch length the same and reduce maintenance costs.
②Able to adjust the height at the time of adjustment of die and after the punch regrinding.

SELECT RETAINER SETS
—GUIDE—

PATENTED

Select retainer sets	Compact·air type	Standard·air type	Standard·manual type	Punch for heavy load·air type
Stroke	ST=8mm	ST=10mm		
Shaft Dia	D=10・13・16・20	D=10・13・16・20・25・32		D=10・13・16・20

Select retainer is a device which changes the height of punch at the bottom dead center by driving the select bar and select to punch/not to punch the workpiece.



To punch out
Pushing the select bar lowers the punch to the punching position.

Not to punch out
Pulling the select bar makes the punch come up to the standby position.

■Features

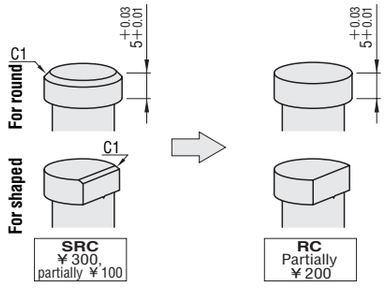
(1) Wide selection of types
- Compact type: The stroke of punch is 8mm and reduced the projection area by 20% compared to SLS series.
- Standard type: 2 types are available; air type and manual type. The punch stroke is 10mm for both types.
- Heavy load type: Able to use with high-strength punch such as punch for heavy load or with tapered head. 4 types are available.

(2) Punch specification
Standard punch can be used with alteration RC. It needs to have the alteration ordering code of RC. (No alteration RC is required for punch with dowel, punch for heavy load and engraving punch.)

(3) High durability
The body is carburized to 55~58HRC and prevents problems such as seizure or uneven wear.

(4) The opening on the high rigid body is less and it prevents malfunction by deformation or incoming dusts.

(5) High maintainability
Special spring and select bar with hinge prevent parts scattering and make punch replacement easier.

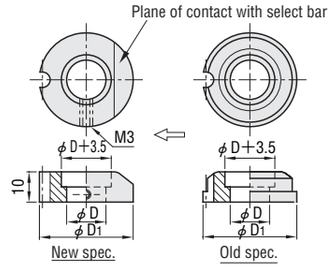


Punch alteration code is changed from SRC to RC.
Purchase
By March, 2006 → SRC
After April, 2006 → RC
Ⓨ Alteration code RC is not required for punch with tolerance $^{+0.03}_{+0.01}$ (finished for retainer)

■Notes
- Select retainer is developed for punching of steel plates for automobile and is not suitable for punching materials with small clearance such as papers or films. Tightening mounting bolt of select retainer with more than appropriate tightening torque may cause elastic variation of punch's sliding hole and result in malfunction. (Refer to P.1254 for recommended tightening torque)
- Since the thickness of backing plate is different between SLS series and SLC series, make sure of the punch length selection.
- Alteration code RC (changes head thickness tolerance to $5^{+0.03}_{+0.01}$) is required for the punch which will be used. Failure to specifying the code may result in malfunction.
- Select bar must be operated when the punch is inserted. Without inserting punch, the spring will be bent and cause malfunction.
- Use piping tube with outer diameter 6mm and inner diameter 4mm for air type.
- Do not decompress while stamping operation. Select bar may be moved by the vibration and may cause malfunction. (air type)

■Select ring standard change

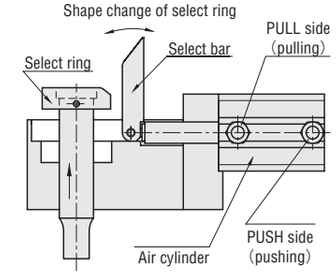
Spec. change of Select ring (Available from April, 2006)
The specification of select ring has been changed in order to improve the convenience and workability.
① Tap hole added. (For round and shaped type)
② Changed the contact with select bar from line contact to plane contact.
These two improvements allow the usage of the punch with alteration RC.
(Applied to all types of select retainer. When using select ring without the tap hole, which was available before April 2006, please use the punch with alteration SRC.)



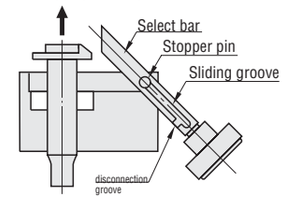
■Punch replacement

(1) Air type
- The punch can be replaced easily by removing the backing plate and lifting up the select bar.
- After inserting the punch, clamp it with the attached screw plug.

[Note] To change the joint position, remove the mounting bolts of the air cylinder, and rotate the cylinder by 90° at a time. Make sure to check the movement before beginning punching.

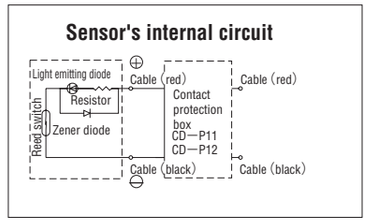


(2) Manual type
- The punch can be replaced easily by removing the backing plate and lifting up the select bar.
- After inserting the punch, clamp it with the attached screw plug.
- Easy to disconnect select bar by using disconnection groove.
- Select bar is fixed to the body unit with stopper pin.
- Ball plunger is to lock the select bar, however, when the body is placed vertically, vibration caused by the punching may lower the select bar and cause malfunction.



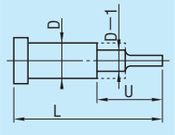
Manual type punch replacement

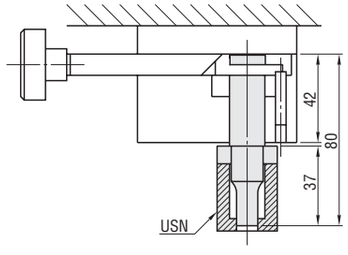
■Switch sensor
- When using more than two units of cylinder type with sensor in parallel, separate each unit by 40mm or more. There may be the risk of switch malfunction due to the magnetic interference of each unit.
- Select retainer with sensor is developed for preventing punching error but is generally used with press controller. Please contact the manufacturer of the controller for the details.
- Contact point protection circuit is not built-in in the sensor. Contact point protection box should be used for the following cases since they may shorten the contact point longevity.
  ①Used load is induced load.
  ②Wiring length to the load is over 5m.
  ③Load voltage is AC100V.



■How to order punches for USN urethane strippers

・Please add the alteration code **RC / UC** to the code of standard punch.
・For a select retainer punch, always use USN urethane strippers (P.688).
⊗The alteration codes (UC) is not applicable to jector punches.

Alteration	Code	Spec.	￥/1Code
	UC	Modifies to suit an urethane stripper (USN). Code / U / L / L of applicable USN UC40 / 37 / L≧80 / USN L40 UC50 / 47 / L≧90 / USN L50 Ⓨ P・Kmax.=D−1.1 Ⓨ Applicable to L≧80, L≧90 Ⓨ Alteration RC is required for use with a select retainer.	400



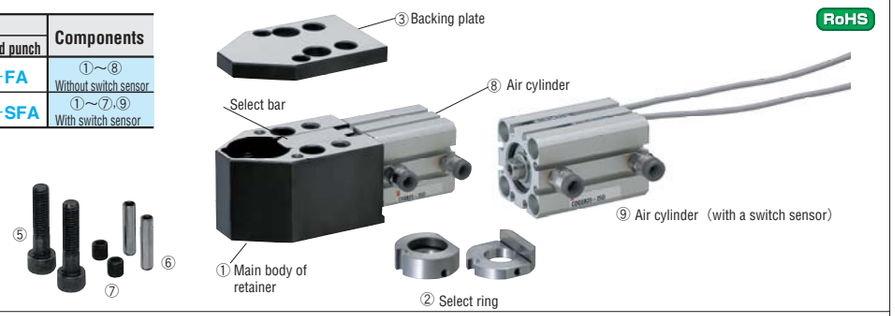
SELECT RETAINER SETS ST=8mm
—COMPACT · AIR TYPE—

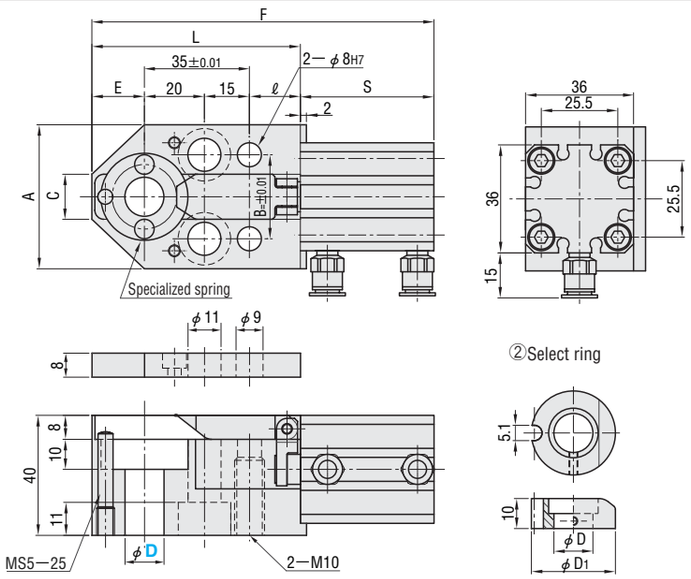
PATENTED

The volume discount rate is also applicable to alteration cost. P.39

Catalog No. For round punch	Catalog No. For shaped punch	Components
SLC—EA	SLC—FA	①～⑧ Without switch sensor
SLC—SEA	SLC—SFA	①～⑦,⑨ With switch sensor

RoHS





① M SCM415
H 55～58HRC
（Depth 1mm）
S Black oxide
②③④ M SK4
H 56～60HRC
⑧⑨ Specifications of air cylinder（SMC:CQS series）

Operation method	Double-action
Operating pressure	0.4～1.0MPa{4.1～10.2kgf/cm²}
Cylinder inner diameter	φ20

⑨ 2-line type contact switch

Type	D—A93L（SMC）
Voltage range	DC24V AC100V
Lead wire length	3m

Catalog No. Type	D	A	B	C	E	L	ℓ	D1	Without sensor S	Without sensor F	With sensor S	With sensor F	A	U/Price Q'ty：1～9Sets SLC—EA	SLC—FA	SLC—SEA	SLC—SFA
—Without switch sensor— Round punch SLC—EA Shaped punch SLC—FA	10	44	24	12	17	67	15	25	44.5	111.5	54.5	121.5	⑤CB10—55 ⑥MSTM8—40 ⑦MSW10	24,270	26,320	29,270	31,320
	13	48	28	15	17.5	69.5	17	31	44.5	114	54.5	124		25,210	27,260	30,210	32,260
—With switch sensor— Round punch SLC—SEA Shaped punch SLC—SFA	16				20	78	23	31	49.5	127.5	59.5	137.5		25,210	27,260	30,210	32,260
	20	50	30	20	22	87	30	35	54.5	141.5	64.5	151.5		27,520	29,630	32,520	34,630

Order Catalog No. SLC—EA10

Delivery 3 Days — Express A 200/1Pc. P.38

A flat charge of 540 yen for 3 pieces or more of the same size.

Price ■Volume discount rate P.37

Quantity	1～9 sets	10～29 sets	30～49 sets	50～100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — (JLC・JNC・TLC・BPC)
SLC—EA10 — JLC

Alterations	Code	Spec.	¥/1Code
	JLC	Replaces a quick joint to L (elbow) type.	500
—	JNC	No coupling. The air cylinder tapping：(M5×0.8)	—200
	TLC	Changes joint position (cylinder direction). Standard position / TLC90 / TLC180 / TLC270	0
	BPC	Install the ball plunger on the select bar, and form a recess on the backing plate. Ball plunger (Type BSJT6 MISUMI plastic die standard components P.846)	1,200

■Featurs
- Compact type: The stroke of punch is 8mm and reduced the projection area by 20% compared to SLS series.
- The body is carburized to 55~58HRC and prevents problems such as seizure or uneven wear.
- The opening on the high rigid body is less and it prevents malfunction by deformation.

■Notes
- Although the mounting pitch is as same as SLS series, the thickness of backing plate is different. Make sure when selecting the punch length.
- See Notes on P.673.

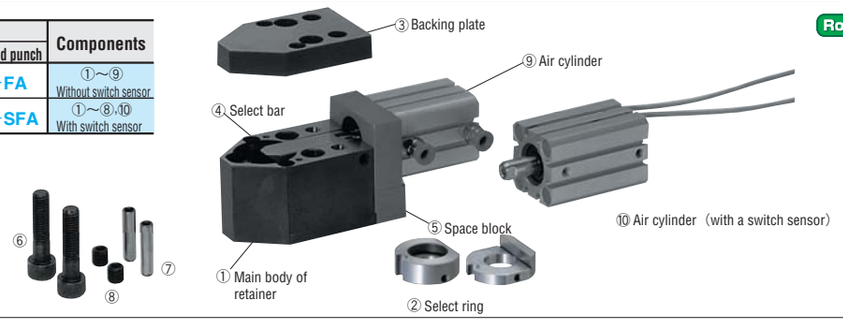
SELECT RETAINER SETS ST=10mm
—STANDARD · AIR TYPE—

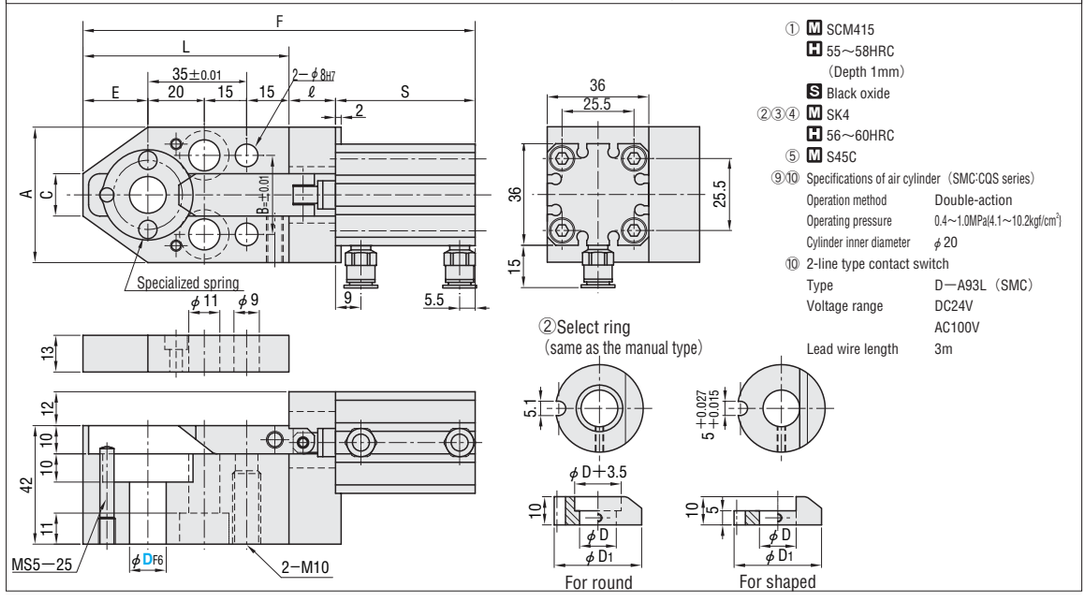
PATENTED

The volume discount rate is also applicable to alteration cost. P.39

Catalog No. For round punch	Catalog No. For shaped punch	Components
SLS—EA	SLS—FA	①～⑨ Without switch sensor
SLS—SEA	SLS—SFA	①～⑧,⑩ With switch sensor

RoHS





① M SCM415
H 55～58HRC
（Depth 1mm）
S Black oxide
②③④ M SK4
H 56～60HRC
⑤ M S45C
⑨⑩ Specifications of air cylinder（SMC:CQS series）

Operation method	Double-action
Operating pressure	0.4～1.0MPa{4.1～10.2kgf/cm²}
Cylinder inner diameter	φ20

⑩ 2-line type contact switch

Type	D—A93L（SMC）
Voltage range	DC24V AC100V
Lead wire length	3m

Catalog No. Type	D	A	B	C	E	L	ℓ	D1	Without sensor S	Without sensor F	With sensor S	With sensor F	A	U/Price Q'ty：1～9Sets SLS—EA	SLS—FA	SLS—SEA	SLS—SFA
—Without switch sensor— Round punch SLS—EA Shaped punch SLS—FA	10	44	24	12	20	70	13.5	25	49.5	133	59.5	143	⑥CB10—60 ⑦MSTM8—45 ⑧MSW10	25,550	27,710	30,550	32,710
	13	48	28	15	23	73	16.5	31		139		149		26,540	28,700	31,510	33,760
	16						21.5		54.5	149	64.5	159		26,540	28,700	31,870	34,120
—With switch sensor— Round punch SLS—SEA Shaped punch SLS—SFA	20	50	30	20	25	75	28.5	35	59.5	163	69.5	173		28,970	31,940	35,210	37,730
	25	58	38	25	27	77	31.5	40		168		178		31,580	34,010	37,810	40,330
	32	68	48	32	31	81	44.5	47	69.5	195	79.5	205		36,440	38,420	41,410	43,930

Order Catalog No. SLS—EA 10

Delivery 3 Days — Express A 200/1Pc. P.38

A flat charge of 540 yen for 3 pieces or more of the same size.

Price ■Volume discount rate P.37

Quantity	1～9 sets	10～29 sets	30～49 sets	50～100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — (JLC・JNC・TLC・BPC)
SLS—EA10 — JLC

Alterations	Code	Spec.	¥/1Code
	JLC	Replaces a quick joint to L (elbow) type.	500
—	JNC	No coupling. The air cylinder tapping：(M5×0.8)	—200
	TLC	Changes joint position (cylinder direction). Standard position / TLC90 / TLC180 / TLC270	0
	BPC	Install the ball plunger on the select bar, and form a recess on the backing plate. Ball plunger (Type BSJT6 MISUMI plastic die standard components P.846)	1,200

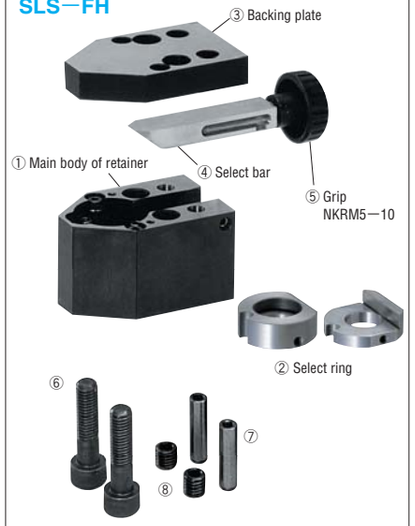
■Featurs
- Stroke：10 mm
- The body is carburized to 55~58HRC and prevents problems such as seizure or uneven wear.
- The opening on the high rigid body is less and it prevents malfunction by deformation.

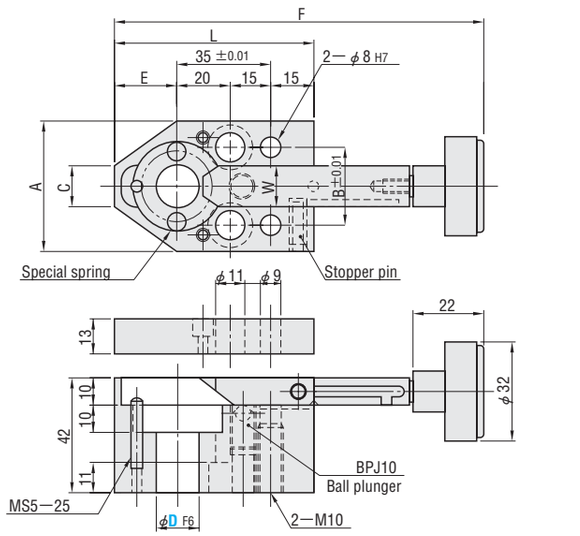
■Notes
- See Notes on P.673.

SELECT RETAINER SETS ST=10mm
—STANDARD · MANUAL TYPE—

PATENTED

For round punch Ⓐ RoHS
SLS—EH
For shaped punch D R E G
SLS—FH





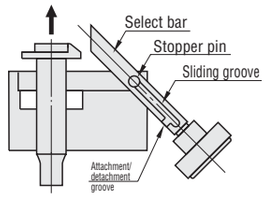
① M SCM415
H 55～58HRC（Depth 1mm）
S Black oxide
②③④ M SK4
H 56～60HRC

Catalog No. Type	D	A	B	C	E	L	W	D1※	F	A	U/Price Q'ty：1～9Sets SLS—EH	SLS—FH
Round punch SLS—EH / Shaped punch SLS—FH	10	44	24	12	20	70	11	25	94～124	⑥CB10—60 ⑦MSTM8—45 ⑧MSW10	18,440	20,600
	13	48	28	15	23	73	15	31	97～127		19,250	21,500
	16								97～132		19,250	21,500
	20	50	30	20	25	75	17	35	99～139		22,580	25,100
	25	58	38	25	27	77	23	40	101～141		25,190	27,710
	32	68	48	32	31	81	30	47	105～155		28,160	30,680

※Dimension D1 is the dimension of ② select ring. See P.675 for details.

Order Catalog No. SLS—EH10

Example



Delivery 3 Days | Express A 200/1Pc. P.38
A flat charge of 540 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9 sets	10～29 sets	30～49 sets	50～100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Features
- When punching, ball plunger is set in the depression of select bar and prevents the bar being moved by the vibration.
- Select bar is fixed to the body unit with stopper pin.

■Punch replacement
- The punch can be replaced easily by removing the backing plate and lifting up the select bar.
- Easy to disconnect select bar by using disconnection groove.

■Notes
- Ball plunger is to lock the select bar, however, when the body is placed vertically, vibration caused by the pressing may lower the select bar and cause malfunction.
- See Notes on P.673.

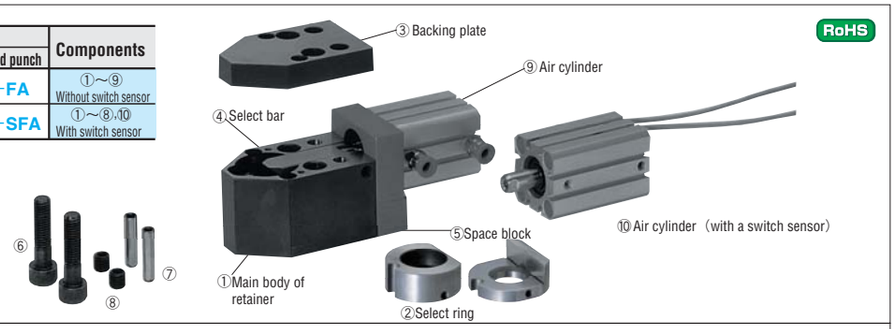
SELECT RETAINER SETS ST=10mm
—PUNCH FOR HEAVY LOAD · AIR TYPE—

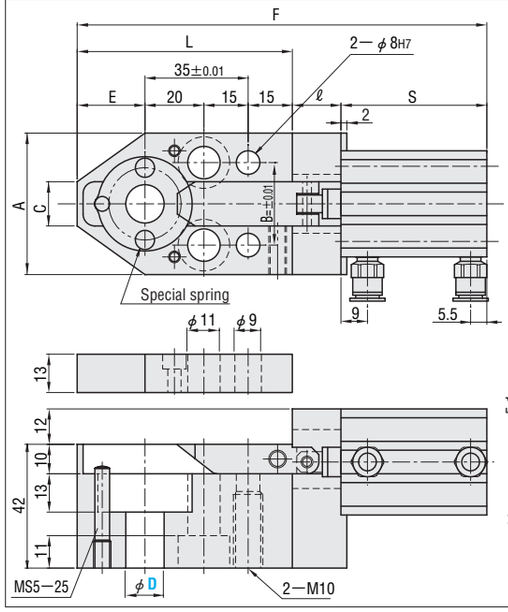
PATENTED

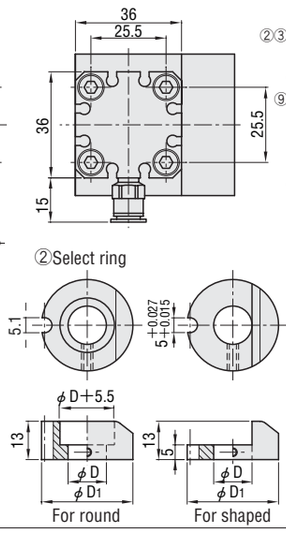
The volume discount rate is also applicable to alteration cost. P.39

Catalog No. For round punch	Catalog No. For shaped punch	Components
SLA—EA	SLA—FA	①～⑨ Without switch sensor
SLA—SEA	SLA—SFA	①～⑧,⑩ With switch sensor

RoHS







① M SCM415
H 55～58HRC
（Depth 1mm）
S Black oxide
②③④ M SK4
H 56～60HRC
⑤ M S45C
⑨⑩ Specifications of air cylinder（SMC:CQS series）

Operation method	Double-action
Operating pressure	0.4～1.0MPa{4.1～10.2kgf/cm²}
Cylinder inner diameter	φ20

⑩ 2-line type contact switch

Type	D—A93L（SMC）
Voltage range	DC24V AC100V
Lead wire length	3m

Catalog No. Type	D	A	B	C	E	L	ℓ	D1	Without sensor S	Without sensor F	With sensor S	With sensor F	A	U/Price Q'ty：1～9Sets SLA—EA	SLA—FA	SLA—SEA	SLA—SFA
—Without switch sensor— Round punch SLA—EA / Shaped punch SLA—FA	10	44	24	12	20	70	13.5	25	49.5	133	59.5	143	⑥CB10-60 ⑦MSTM8—45 ⑧MSW10	29,150	31,310	34,150	36,310
	13	48	28	15	23	73	16.5	31		139		149		30,140	32,300	35,110	37,300
—With switch sensor— Round punch SLA—SEA / Shaped punch SLA—SFA	16						21.5	31	54.5	149	64.5	159		30,140	32,300	35,470	37,720
	20	50	30	20	25	75	28.5	35	59.5	163	69.5	173		32,570	35,540	38,810	41,330

Order Catalog No. SLA—EA10

Delivery 3 Days | Express A 200/1Pc. P.38
A flat charge of 540 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9 sets	10～29 sets	30～49 sets	50～100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Features
- Select retainer allows punch for heavy load to be used.
- The body is carburized to 55~58HRC and prevents problems such as seizure or uneven wear.
- The opening on the high rigid body is less and it prevents malfunction by deformation.

■Notes
- See Notes on P.673.

Alteration Catalog No. — (JLC · JNC · TLC · BPC)
SLA—EA10 — JLC

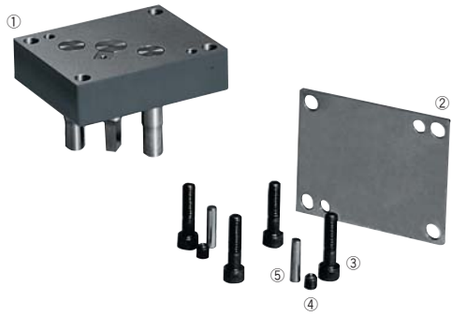
Alterations	Code	Spec.	¥/1Code
	JLC	Replaces the attached one-step coupling (joint) to an L (elbow) type.	500
—	JNC	No coupling. The air cylinder tapping：(M5×0.8)	—200
	TLC	Changes joint position (cylinder direction). Standard position / TLC90 / TLC180 / TLC270	0
	BPC	Install the ball plunger on the select bar, and form a recess on the backing plate. Ball plunger (Type BSJT6 MISUMI plastic die standard components P.846)	1,200

SPECIAL RETAINER SETS
—PLATE SIZE SELECTABLE TYPE—

RoHS

Dowel hole	Backing plate	Left hand type	Right hand type
Finished	Available	SRGD—LP	SRGD—RP
d=ϕ8 dowel hole	N/A	SRGD—L	SRGD—R
Pilot hole	Available	SRND—LP	SRND—RP
d=ϕ7.8 drill	N/A	SRND—L	SRND—R

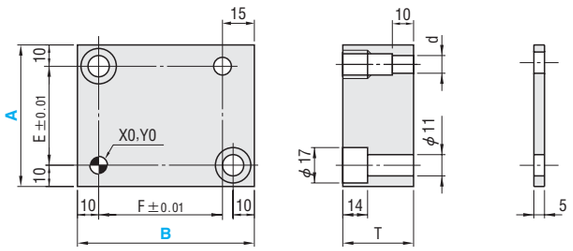
In case of ϕ8 dowel hole, the tolerance is ϕ8H7.



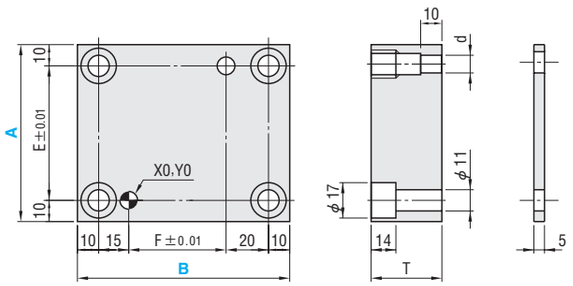
① M S45C
② M SK4
H 56～60HRC

Retainer size

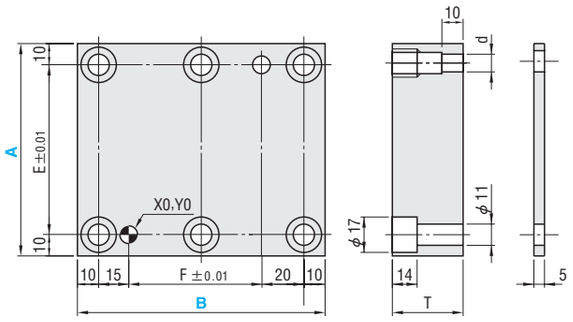
A	B	E	F	T	A
50	60	30	35	32	③Socket cap head screw (Loosening prevention treated) M10—40 2Pcs. ④MSW10 2Pcs. ⑤MSTM8—30 2Pcs.
	80		55		
60	80	40	55		
	100		75		



A	B	E	F	T	A
80	80	60	25	32	③Socket cap head screw (Loosening prevention treated) M10—40 4Pcs. ④MSW10 2Pcs. ⑤MSTM8—30 2Pcs.
	100		45		
	125		70		
100	100	80	45		
	125		70		
	150		95		

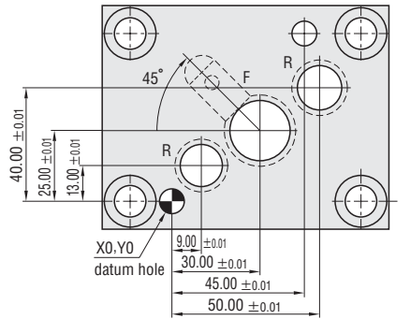


A	B	E	F	T	A
125	150	105	95	32	③Socket cap head screw (Loosening prevention treated) M10—40 6Pcs. ④MSW10 2Pcs. ⑤MSTM8—30 2Pcs.
	175		120		
150	175	130	120		
	200		145		



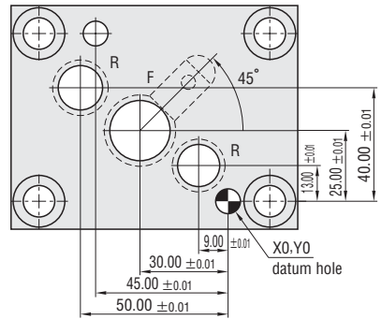
EX.1 Left hand type

d= ϕ 8 dowel hole SRGD—L
d= ϕ 7.8 pilot hole SRND—L

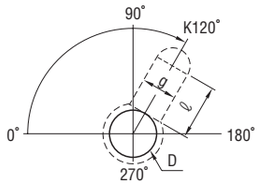


EX.2 Right hand type

d= ϕ 8 dowel hole SRGD—R
d= ϕ 7.8 pilot hole SRND—R



Location of key slot (left hand type)

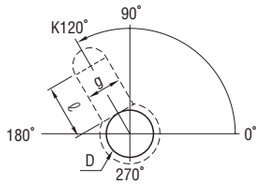


Dimension of key mm

D	g	ℓ
6	7.0	16.0
8	7.0	16.0
10	10.1	17.5
13	10.1	16.0
16	13.6	18.0
20	13.6	16.0
25	16.6	15.5
32	16.6	16.5
38	16.6	13.5
45	16.6	22.5

*Dimension ℓ may be changed depending on the position of holes.

Location of key slot (right hand type)



The key is set to the body with dowel pin.

Order

(1) Selection of retainer type (left hand type, right hand type, dowel hole, backing plate)
(2) Selection of the plate size from the standard detail on the left page
(3) Selection the types of punch (round type or shaped type) and the diameter
For round type, D (punch diameter) is indicated after the mark R.
For shaped type, D (punch diameter) is indicated after the mark F.
(4) Selection the position of punch hole T X±0.01 Y±0.01
For round type, X and Y are indicated in unit of 0.01mm from the center of datum hole.
For shaped type, X and Y are indicated in unit of 0.01mm from the center of datum hole and the angle on the key slot is indicated in unit of one degree.
Distance between both punching holes requires 2mm or more in order to prevent interference.

	(1) RETAINER Type	(2) A B		(3) R・F		(4) X — Y — K
Left hand type	SRGD—L(P)	80 100	—	R13	—	X 9.00—Y13.00
			—	F20	—	X30.00—Y25.00—K45
			—	R16	—	X50.00—Y40.00
Right hand type	SRGD—R(P)	80 100	—	R13	—	X 9.00—Y13.00
			—	F20	—	X30.00—Y25.00—K45
			—	R16	—	X50.00—Y40.00

Delivery

5 Days

Express	A	1,500/1Pc.
Express	B	1,000/1Pc.

P.38

A flat charge of A：4,050 yen, B：2,700 yen for 3 pieces or more of the same size.

Price

Retainer size A	Retainer ¥ U/Price SRGD—L SRGD—R	SRGD—LP SRGD—RP	SRND—L SRND—R	SRND—LP SRND—RP	Alteration cost/1 Hole For round R	For shaped F
50・60	9,710	13,130	6,830	10,250	3,950	4,850
80・100	10,700	14,570	7,820	11,690		
125・150	12,680	17,000	9,710	14,120		

SPECIAL RETAINER SETS
—PLATE SIZE CONFIGURABLE TYPE—

RoHS

Dowel hole	Backing plate	Left hand type	Right hand type
Finished	Available	SRGT—LP	SRGT—RP
d=φ8 dowel hole	N/A	SRGT—L	SRGT—R
Pilot hole	Available	SRNT—LP	SRNT—RP
d=φ7.8 drill	N/A	SRNT—L	SRNT—R

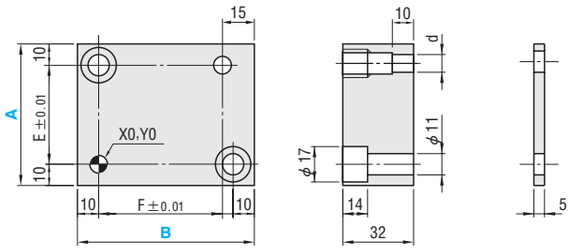
In case of φ8 dowel hole, the tolerance is φ8H7.

① M S45C
② M SK4
H 56～60HRC

Retainer size

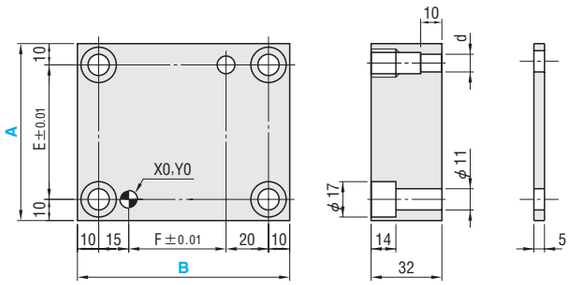
NO.	1mm increments A	1mm increments B	A
2H	35～60	40～100	③Socket cap head screw (Loosening prevention treated) M10—40 2Pcs. ④MSW10 2Pcs. ⑤MSTM8—30 2Pcs.

E=A—20
F=B—25



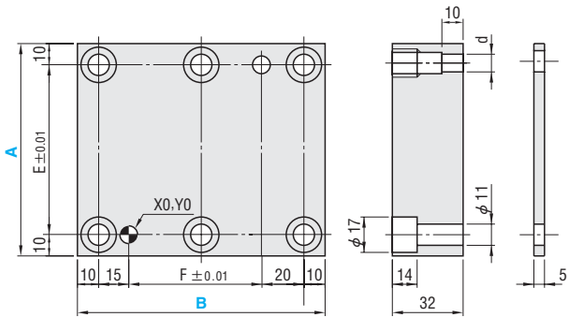
NO.	1mm increments A	1mm increments B	A
4H	40～100	55～150	③Socket cap head screw (Loosening prevention treated) M10—40 4Pcs. ④MSW10 2Pcs. ⑤MSTM8—30 2Pcs.

E=A—20
F=B—55



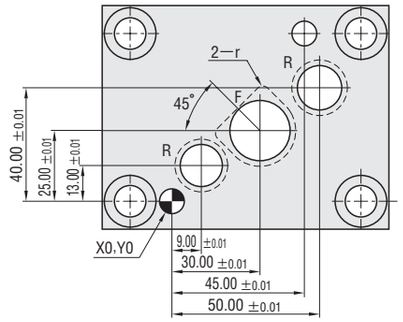
NO.	1mm increments A	1mm increments B	A
6H	40～150	85～200	③Socket cap head screw (Loosening prevention treated) M10—40 6Pcs. ④MSW10 2Pcs. ⑤MSTM8—30 2Pcs.

E=A—20
F=B—55



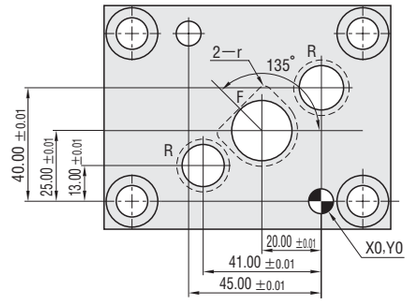
EX.1 Left hand type

d= φ8 dowel hole SRGT—L
d= φ7.8 pilot hole SRNT—L

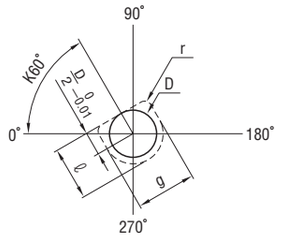


EX.2 Right hand type

d= φ8 dowel hole SRGT—R
d= φ7.8 pilot hole SRNT—R



Location of key slot (left hand type)

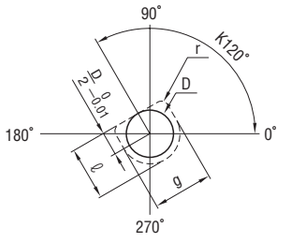


Dimension of key mm

D	g	ℓ	r
6	11.3	8.7	2
8	12.2	10.1	2
10	14.9	12.5	3
13	16.5	14.8	3
16	20.9	18.5	5
20	23.5	21.8	5
25	28.5	26.8	5
32	35.5	33.8	5
38	41.5	39.8	5
45	48.5	46.8	5

*Dimension g, ℓ may be changed depending on the position of holes.

Location of key slot (right hand type)



Order

(1) Selection of retainer type (left hand type, right hand type, dowel hole, backing plate)
(2) Selection of the bolt No. from the standard detail on the left page.
(3) Selection of the plate size from the detail standard on the left page
(4) Selection of the types of punch (round type or shaped type) and the diameter
For round type, D (punch diameter) is indicated after the mark R.
For shaped type, D (punch diameter) is indicated after the mark F.
(5) Selection of the position of punch hole T X±0.01 Y±0.01
For round type, X and Y are indicated in unit of 0.01mm from the center of datum hole.
For shaped type, X and Y are indicated in unit of 0.01mm from the center of datum hole and the angle on the key slot is indicated in unit of one degree.
Distance between both punching holes requires 2mm or more in order to prevent interference.

	(1) RETAINER Type	(2) No.	(3) A	(3) B	(4) R・F	(5) X — Y — K°
Left hand type	SRGT—L(P)	4H	A80	B100	R13	X 9.00—Y13.00
					F20	X30.00—Y25.00—K45
					R16	X50.00—Y40.00
Right hand type	SRGT—R(P)	4H	A80	B100	R13	X41.00—Y13.00
					F20	X20.00—Y25.00—K135
					R16	X 0.00—Y40.00

Delivery

• Without backing plate: 5 Days — Express B 1,000/1Pc. P.38
• With backing plate: 8 Days
A flat charge of 2,700 yen for 3 pieces or more of the same size.

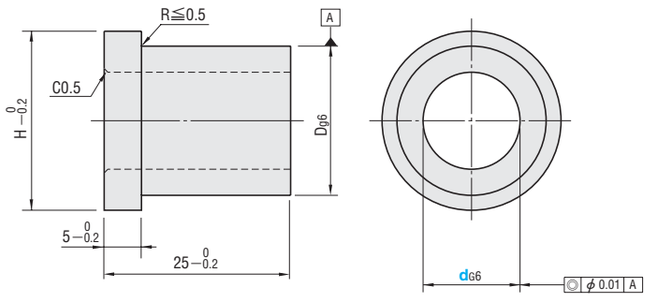
Price

No.	Retainer ¥ U/Price SRGT—L SRGT—R	SRGT—LP SRGT—RP	SRNT—L SRNT—R	SRNT—LP SRNT—RP	Alteration cost/1 Hole For round R	For shaped F
2H	9,710	13,130	6,830	10,250	3,950	4,540
4H	10,700	14,570	7,820	11,690		
6H	12,680	17,000	9,710	14,120		

BUSHINGS FOR ADJUSTING PUNCH HOLE

RoHS

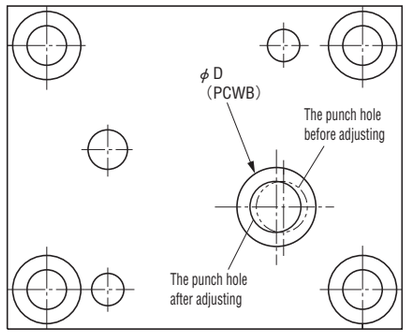
PCWB

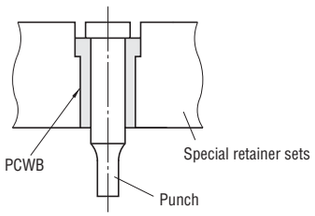


M S45C

D	H	Catalog No. Type	d	U/Price Q'ty : 1~9
16	19	PCWB	10	550
			13	550
20	24		16	590
25	29		20	630
30	34		25	650

Example It is used for fine adjustment of the punch hole position at the time of mounting the special retainer set as shown below. It reduces the costs of remanufacturing of punches and retainers.





Order Catalog No.: PCWB 16

Delivery 1 Day

Price

■Volume discount rate P.37

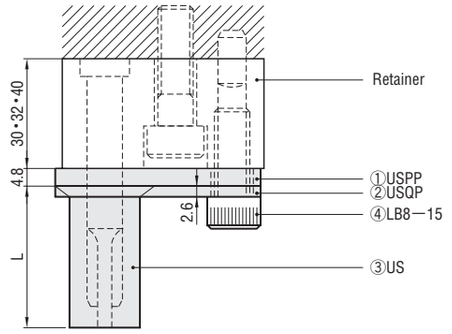
Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

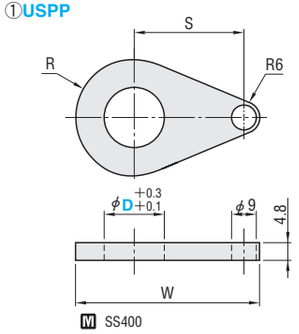
URETHANE STRIPPER UNITS

RoHS

Catalog No.	Components ①	②	③	④
PQSP	○	○	○	○

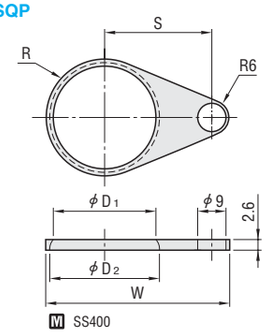


①USPP



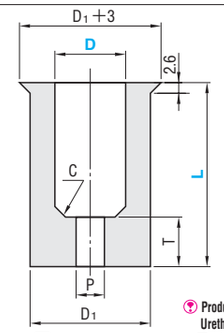
M SS400

②USQP



M SS400

③US



H Shore A95

Product guide for Urethanes P.1119

■PQSP (①USPP・②USQP・③US・④LB8—15)

Catalog No. Type	D	L	U/Price Q'ty : 1~19Sets
PQSP (①②③④)	10	27 29 32 34 37 39 42 44 47 49 52 54	1,190
	13	27 29 32 34 37 39 42 44 47 49 52 54	1,230
	16	37 39 42 44 47 49 52 54 57 59 62 64	1,330
	20	48 50 53 55 58 60 63 65 68 70 73 75	1,590
	25	48 50 53 55 58 60 63 65 68 70 73 75	2,150
	32	48 50 53 55 58 60 63 65 68 70 73 75	2,560
	38	49 51 54 56 59 61 64 66 69 71 74 76	3,280

D	D1	D2	①USPP・②USQP S	R	W
10	19	21	29	12	47
13	24	26	32	14.5	52.5
16	29	31	34	17	57
20	34	36	36	19.5	61.5
25	41	43	39	23	68
32	51	53	42	28	76
38	61	63	46	33	85

③US D	D1	P	T	C
10	18	3.5	6	2.0
13	23			
16 (−0.2 −0.4)	28	4.0	7	
20	33			
25	40			
32 (−0.3 −0.5)	50	5.0	8	
38	60			

■①USPP

Catalog No.		U/Price Q'ty : 1~19
①USPP	10	300
	13	
	16	
	20	
	25	410
	32	
	38	500

■②USQP

Catalog No.		U/Price Q'ty : 1~19
②USQP	10	500
	13	
	16	
	20	
	25	610
	32	
	38	710

■③US

P.685

■④LB8—15

P.723

■PQSP applicable retainer

・HDP—AP ・HDPAR ・HDP—FP ・HDPFR	P.660
・HAP—AP ・HAPAR ・HAP—FP ・HAPFR	P.661
・DP—AP ・DPAR ・DP—FP ・DPFR	P.665
・CP—AP ・CPAR ・CP—FP ・CPFR	P.666
・AP—AP ・APAR ・AP—FP ・APFR	P.667
・FP—AP ・FPAR ・FP—FP ・FPFR	P.668
・CLN—P	P.703
・CBN—P	P.704

Order Catalog No. — L

PQSP 13 — 52

USPP 20

Delivery 1 Day

Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

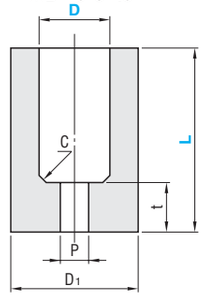
To be quoted on price & lead time above Max. Q'ty.

URETHANE STRIPPERS FOR ANTI-DROPPING UNITS

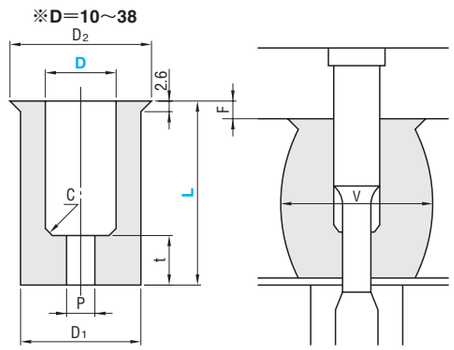
RoHS

US (Urethane strippers for PQSP)

※D=6·8·45



※D=10～38



※Shapes are different depending on D.

Product guide for Urethanes P.1119 H Shore A95

D		D_1	D_2	P	t	C	Catalog No. Type	Catalog No. D	L	U/Price Q'ty : 1～19
6	−0.2 −0.4	13	—	1.5	5	1.5	US	(6)	27 32 37 42 47 52	320
8		16		2.5				(8)	27 32 37 42 47 52	340
10		18	21	3.5	6	2.0		10	27 29 32 34 37 39 42 44 47 49 52 54	360
13		23	26					13	27 29 32 34 37 39 42 44 47 49 52 54	410
16		28	31	4				16	37 39 42 44 47 49 52 54 57 59 62 64	500
20		33	36		7			20	48 50 53 55 58 60 63 65 68 70 73 75	760
25		40	43					25	48 50 53 55 58 60 63 65 68 70 73 75	1,120
32	−0.3 −0.5	50	53	5				32	48 50 53 55 58 60 63 65 68 70 73 75	1,530
38		60	63		8			38	49 51 54 56 59 61 64 66 69 71 74 76	2,040
45		70	—					(45)	49 51 54 56 59 61 64 66 69 71 74 76	2,560

The type is different among D (6) (8) and (45). See the drawing above.

Order Catalog No. — L

US 13 — 42

Delivery 1 Day

Price

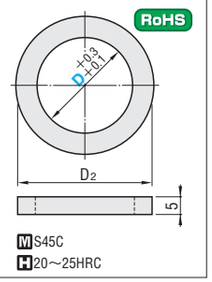
Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Protection rings for urethane stripper

RoHS



M S45C
H 20～25HRC

D	D_2	Catalog No.		U/Price Q'ty : 1～19
10	22	USR	10	180
13	27		13	
16	32		16	
20	37		20	
25	44		25	280
32	54		32	
38	64		38	370
45	74		45	

Order Catalog No.

USR 13

Delivery 1 Day

Price

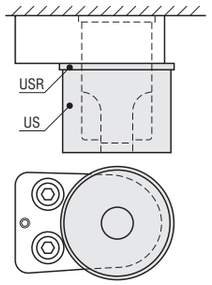
Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

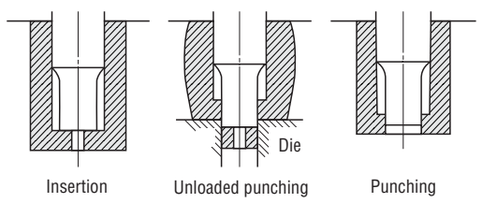
To be quoted on price & lead time above Max. Q'ty.

Example

The ring USR prevents the urethane stripper from damages by hitting the retainer surface or by interfering with the bolt holes.



At the time of die adjustment, prepare the urethane stripper by performing unloaded punching to make its shape match with the punch tip. (Can also be used for shaped punches.)



Catalog No. Type D— L	F=L×10% Fmm	F=L×10% N {kgf} Load	F=L×15% Fmm	F=L×15% N {kgf} Load	F=L×20% Fmm	F=L×20% N {kgf} Load	V
US 6—27	2.7		4.1		5.4		15.0
32	3.2		4.8		6.4		
37	3.7	637	5.6	834	7.4	981	
42	4.2	{65}	6.3	{85}	8.4	{100}	
47	4.7		7.1		9.4		
52	5.2		7.8		10.4		
US 8—27	2.7		4.1		5.4		18.5
32	3.2		4.8		6.4		
37	3.7	981	5.6	1275	7.4	1569	
42	4.2	{100}	6.3	{130}	8.4	{160}	
47	4.7		7.1		9.4		
52	5.2		7.8		10.4		
US 10—27	2.7		4.1		5.4		20.7
29	2.9		4.4		5.8		
32	3.2		4.8		6.4		
34	3.4		5.1		6.8		
37	3.7		5.6		7.4		
39	3.9	1226	5.9	1569	7.8	1863	
42	4.2	{125}	6.3	{160}	8.4	{190}	
44	4.4		6.6		8.8		
47	4.7		7.1		9.4		
49	4.9		7.4		9.8		
52	5.2		7.8		10.4		
54	5.4		8.1		10.8		
US 13—27	2.7		4.1		5.4		26.5
29	2.9		4.4		5.8		
32	3.2		4.8		6.4		
34	3.4		5.1		6.8		
37	3.7		5.6		7.4		
39	3.9	1961	5.9	2452	7.8	2942	
42	4.2	{200}	6.3	{250}	8.4	{300}	
44	4.4		6.6		8.8		
47	4.7		7.1		9.4		
49	4.9		7.4		9.8		
52	5.2		7.8		10.4		
54	5.4		8.1		10.8		
US 16—37	3.7		5.6		7.4		32.0
39	3.9		5.9		7.8		
42	4.2		6.3		8.4		
44	4.4		6.6		8.8		
47	4.7		7.1		9.4		
49	4.9	2746	7.4	3530	9.8	4217	
52	5.2	{280}	7.8	{360}	10.4	{430}	
54	5.4		8.1		10.8		
57	5.7		8.6		11.4		
59	5.9		8.9		11.8		
62	6.2		9.3		12.4		
64	6.4		9.6		12.8		
US 20—48	4.8		7.2		9.6		38.0
50	5.0		7.5		10.0		
53	5.3	3334	8.0	4217	10.6	5001	
55	5.5	{340}	8.3	{430}	11.0	{510}	
58	5.8		8.7		11.6		
60	6.0		9.0		12.0		

Catalog No. Type D— L	F=L×10% Fmm	F=L×10% N {kgf} Load	F=L×15% Fmm	F=L×15% N {kgf} Load	F=L×20% Fmm	F=L×20% N {kgf} Load	V
US 20—63	6.3		9.5		12.6		38.0
65	6.5		9.8		13.0		
68	6.8	3334	10.2	4217	13.6	5001	
70	7.0	{340}	10.5	{430}	14.0	{510}	
73	7.3		11.0		14.6		
75	7.5		11.3		15.0		
US 25—48	4.8		7.2		9.6		46.0
50	5.0		7.5		10.0		
53	5.3		8.0		10.6		
55	5.5		8.3		11.0		
58	5.8		8.7		11.6		
60	6.0	5099	9.0	6472	12.0	7453	
63	6.3	{520}	9.5	{660}	12.6	{760}	
65	6.5		9.8		13.0		
68	6.8		10.2		13.6		
70	7.0		10.5		14.0		
73	7.3		11.0		14.6		
75	7.5		11.3		15.0		
US 32—48	4.8		7.2		9.6		57.5
50	5.0		7.5		10.0		
53	5.3		8.0		10.6		
55	5.5		8.3		11.0		
58	5.8		8.7		11.6		
60	6.0	7845	9.0	9807	12.0	11278	
63	6.3	{800}	9.5	{1000}	12.6	{1150}	
65	6.5		9.8		13.0		
68	6.8		10.2		13.6		
70	7.0		10.5		14.0		
73	7.3		11.0		14.6		
75	7.5		11.3		15.0		
US 38—49	4.9		7.4		9.8		69.0
51	5.1		7.7		10.2		
54	5.4		8.1		10.8		
56	5.6		8.4		11.2		
59	5.9		8.9		11.8		
61	6.1	11278	9.2	14220	12.2	16181	
64	6.4	{1150}	9.6	{1450}	12.8	{1650}	
66	6.6		9.9		13.2		
69	6.9		10.4		13.8		
71	7.1		10.7		14.2		
74	7.4		11.1		14.8		
76	7.6		11.4		15.2		
US 45—49	4.9		7.4		9.8		80.5
51	5.1		7.7		10.2		
54	5.4		8.1		10.8		
56	5.6		8.4		11.2		
59	5.9		8.9		11.8		
61	6.1	15200	9.2	19123	12.2	21575	
64	6.4	{1550}	9.6	{1950}	12.8	{2200}	
66	6.6		9.9		13.2		
69	6.9		10.4		13.8		
71	7.1		10.7		14.2		
74	7.4		11.1		14.8		
76	7.6		11.4		15.2		

● kgf=N×0.101972

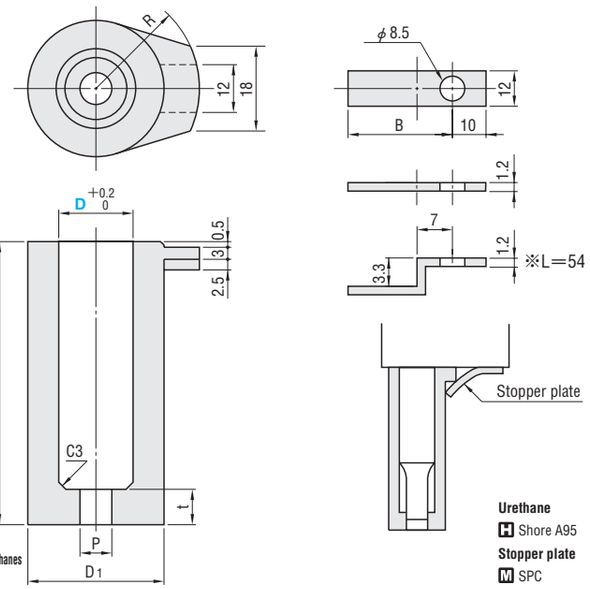
Express service system P.38 MISUMI Press 2007 http://misumi.jp/press/ For inquiry, ordering and other information, refer to P.1269

URETHANE STRIPPERS

URETHANE STRIPPERS

RoHS

TUS



Product guide for Urethanes P.1119

D	D1	R	P	t	B	Applicable retainer	N{kgf} F=L×10%	N{kgf} F=L×15%	Catalog No. Type	Catalog No. D − L	U/Price Q'ty : 1~19
10	18	13	3.5	6	16	—	981{100}	1373{140}	TUS	10−54	420
					17.5	②				10−59	
					24.5	①				10−61	440
					17.5	②				10−66A	
					24.5	①				10−66B	
13	23	15.5	3.5	6	17.5	②	1569{160}	1961{200}		13−59	470
					22.0	①				13−61	500
					17.5	②				13−66A	
					22.0	①				13−66B	
15	25	16.5	4	6	12.5	—	1863{190}	2256{230}		15−54	550
16	28	18	4	6	17.5	②	2452{250}	2942{300}		16−59	580
						②				16−66	630
20	33	20.5	4	7	12.5	—	3040{310}	3727{380}		20−54	890
					17.5	②				20−59	
						②				20−66	940
25	40	24	4	7	20.5	②	4119{420}	5099{520}		25−59	1,300
						②				25−66	1,360

Applicable retainer type : ①Single bolt type P.663 · P.664 ②Triangle type P.669 · P.670

{kgf} =N×0.101972

Order Catalog No. TUS 10−59

Delivery 1 Day

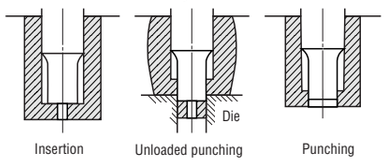
Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

At the time of die adjustment, prepare the urethane stripper by performing unloaded punching to make its shape match with the punch tip.
(Can also be used for shaped punches.)

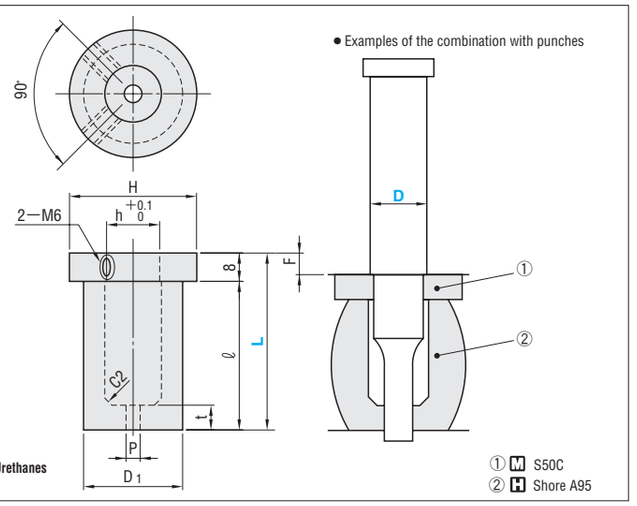


■TUS applicable retainer

Type	Applicable retainer	
①	· SP−APS · SP−FPS · SPARS · SPFRS	P.663
	· TP−APS · TP−FPS · TPARS · TPFRS	P.664
②	· 25CRN−AP · 25CRN−FP · 25CRNAR · 25CRNFR	P.669
	· CRN−AP · CRN−FP · CRNAR · CRNFR	P.670

RoHS

USN



Product guide for Urethanes P.1119

F=ℓ×10% Fmm	F=ℓ×10% N{kgf} Load	F=ℓ×15% Fmm	F=ℓ×15% N{kgf} Load	F=ℓ×20% Fmm	F=ℓ×20% N{kgf} Load	Applicable punch diameter D	D1	P	t	h	H	L	Catalog No. Type	Catalog No. Nominal	L	U/Price Q'ty : 1~19
3.2	1226 {125}	4.8	1569 {160}	6.4	1863 {190}	10	18	3.5	6	9.2	23	40	USN	10	40	1,290
4.2		6.3		8.4								50				
3.2	1961 {200}	4.8	2452 {250}	6.4	2942 {300}	13	23			12.2	23	40		13		1,290
4.2		6.3		8.4								50				
3.2	2746 {280}	4.8	3530 {360}	6.4	4217 {430}	16	28	4		15.2	28	40		16		1,290
4.2		6.3		8.4								50				
3.2	3334 {340}	4.8	4217 {430}	6.4	5001 {510}	20	33		7	19.2	33	40		20		1,400
4.2		6.3		8.4								50				
3.2	5099 {520}	4.8	6472 {660}	6.4	7453 {760}	25	40			24.2	40	40		25		1,610
4.2		6.3		8.4								50				
3.2	7845 {800}	4.8	9807 {1000}	6.4	11278 {1150}	32	50	5		31.2	50	40		32		2,050
4.2		6.3		8.4								50				

kgf =N×0.101972

Order Catalog No. USN 16 − L 50

Delivery 1 Day

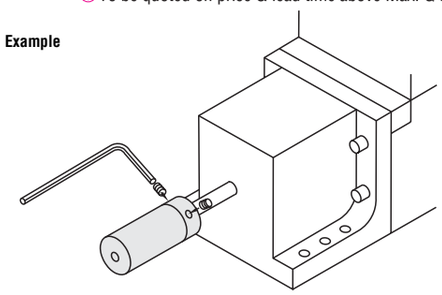
Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

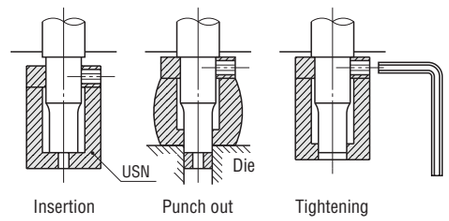
To be quoted on price & lead time above Max. Q'ty.

Example



At the time of die adjustment, prepare the urethane stripper by performing unloaded punching to make its shape match with the punch tip.
(Can also be used for shaped punches.)

The punch requires additional machining for attachment of Urethane stripper (Alteration code UC).



■Compact cams P.1053
Select retainer P.673

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

BALL-LOCK PUNCHES & DIES · RETAINERS

BALL LOCK PUNCHES & DIES · RETAINERS

Name / Catalog No.	BALL-LOCK PUNCHES—Economy type— —Light load type—	 —Heavy load type—	BALL-LOCK JECTOR PUNCHES—Economy type— —Light load type—	 —Heavy load type—	BALL-LOCK PUNCHES—With spanner groove— —Light load type—	 —Heavy load type—
Delivery	③TA	③TA	③TA	③TA	③A	③A
Page	691	692	693	694	695	696

BALL-LOCK JECTOR PUNCHES—With spanner groove— —Light load type—	 —Heavy load type—	BALL-LOCK PUNCH BLANKS—Economy type— —Light load type—	 —Heavy load type—	BALL-LOCK PUNCH BLANKS—With spanner groove— —Light load type—	 —Heavy load type—	BALL-LOCK BUTTON DIES ELD□	 LD□
③A	③A	③TA	③TA	③A	③A	③TA	③TA
697	698	699	699	700	700	701	

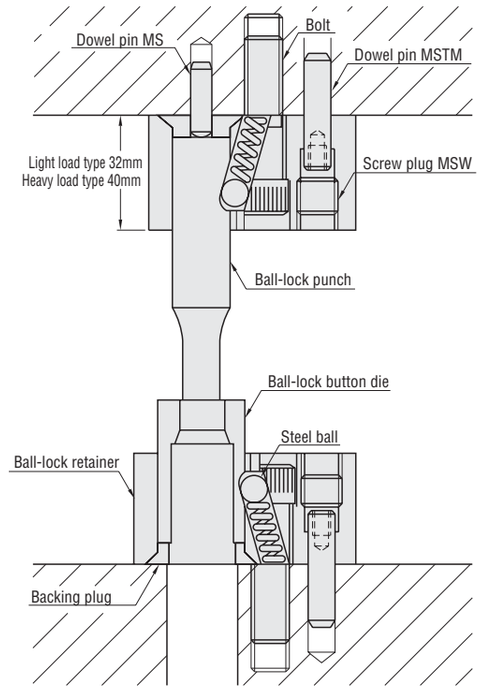
BALL-LOCK RETAINERS—Compact type— —Light load type—	 —Heavy load type—	BALL-LOCK RETAINERS—Triangle type— —Light load type—	 —Heavy load type—	BALL-LOCK RETAINERS —Light load·Triangle compact type-
③TA	③TA	③A	③A	③A
703	704	705	706	707

BALL-LOCK RETAINERS —Light load single bolt type—	SPECIAL RETAINER SETS —For ball-lock punch—
③A	⑫
708	711

BALL-LOCK PUNCHES & DIES RETAINERS
—GUIDE—

■ Ball-lock punches & dies structure

The ball lock punches and dies are fixed by a steel ball bearing consisted in a specially designed ball-lock retainer.
The steel ball is placed onto the ball seat (tear drop groove) by spring and holds the punches and dies firmly.
When dismounting, simply push the steel ball without removing the retainers.

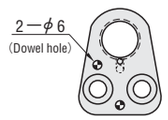
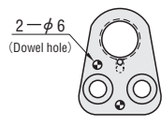


■ Punches

- Depending on the condition of use, select the heavy or the light load type.
- Use the heavy load type if the material thickness is 3mm or more.
- Both types have jector for scrap retention.

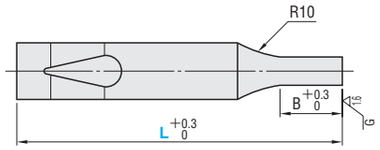
■ Retainers

- Depending on the type of punch being used, both light and heavy load types are available.
- Use a light load retainer with a light load punch, and a heavy load retainer with a heavy load punch.

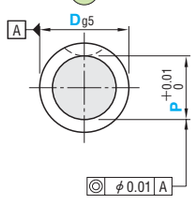
External shape	Positioning
Light load type 	● Positioning by NC process Locate the punch by the dowel of the baking plug and the dowel of retainer.
Heavy load type 	● Positioning without using NC machining Make sure the shape of punch and die matches, align the two dowel holes of the retainer and process.

BALL-LOCK PUNCHES
—LIGHT LOAD—

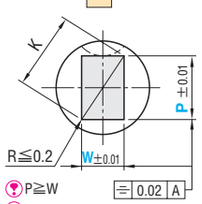
The volume discount rate is also applicable to alteration cost. P.39

Type	M / H	Catalog No. Type	Shape	B Tip length	Select tip shape from Shape A～G shown below.
RoHS	SKD11 or equivalent 60～63HRC	ELP	A D R E G	S L	

Shape A

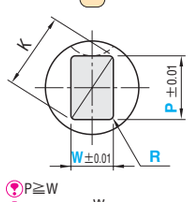


Shape D



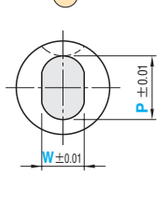
P≧W
R=0 : Also available
K= $\sqrt{P^2+W^2}$

Shape R



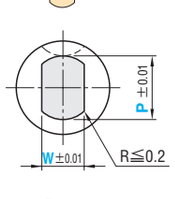
P≧W
0.15≦ R< $\frac{W}{2}$
K= $\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	Ⓐ P·Kmax.	Ⓐ P·Wmin.	D R E G R	B
S	10	63 71 74 80 90	3.00 ～ 9.97	9.90	2.50	0.15≦R< $\frac{W}{2}$ (Ⓡonly)	13
Ⓐ ELPAS	13		6.00 ～12.97	12.90	3.00		
Ⓓ ELPDS	16		10.00 ～15.97	15.90	4.00		19
Ⓡ ELPRS	20		13.00 ～19.97	19.90	5.00		
Ⓔ ELPES	25		18.00 ～24.97	24.90	6.00		
Ⓖ ELPGS	32		22.00 ～31.97	31.90	7.00		
L	10	71 74 80 90	3.00 ～ 9.97	9.90	2.50		19
Ⓐ ELPAL	13		6.00 ～12.97	12.90	3.00		
Ⓓ ELPDL	16		10.00 ～15.97	15.90	4.00		25
Ⓡ ELPRL	20		13.00 ～19.97	19.90	5.00		
Ⓔ ELPEL	25		18.00 ～24.97	24.90	6.00		
Ⓖ ELPGL	32		22.00 ～31.97	31.90	7.00		

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Light load · Economy type U/Price (Q'ty：1～9)

D	ELPAS ELPAL	ELPDS ELPDL	ELPRS ELPRL	ELPES ELPEL	ELPGS ELPGL
10	470	1,380	2,050	1,640	1,280
13	520	1,560	2,300	1,840	1,440
16	620	1,860	2,750	2,200	1,730
20	800	2,330	3,420	2,730	2,150
25	1,010	3,050	4,220	3,560	2,810
32	2,110	4,090	5,030	4,650	3,820

Order

Catalog No.	—	L	—	P	—	W	—	R (Ⓡonly)
ELPRS 16	—	74	—	P12.00	—	W10.00	—	R3.00

Delivery

• Ⓐ	3 Days	Express T	1,000/1Pc.	P.38
		Express A	500/1Pc.	A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
• D R E G	3 Days	Express T	1,600/1Pc.	P.38
		Express A	800/1Pc.	A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC···etc.)

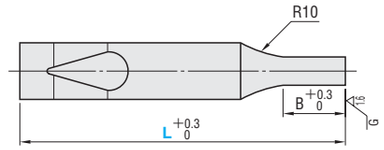
ELPRS 16 — LC70.5 — P12.00 — W10.00 — R3.00 — BC15.5

Alterations	Code	Ⓐ	D R E G	¥/1Code
Tip	PC WC	Changes diameter P PC≧ $\frac{Pmin}{2}$ 0.01mm increments (P 1.50～1.99 Bmax 20; 2.00～3.99 35; 4.00～ 45)	Changes dimension P·W WC≧ $\frac{P \cdot Wmin}{2}$ 0.01mm increments (P·W 1.25～1.49 Bmax 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30)	200
	BC	Changes blade length B 2≦BC≦Bmax 0.1mm increments Ⓟ L(LC) requires BC +45mm or more.		200
	PKC	Changes dimension P tolerance P +0.01 0 ⇨ +0.005 0	Changes dimension P·W tolerance P·W±0.01 ⇨ +0.01 0	400

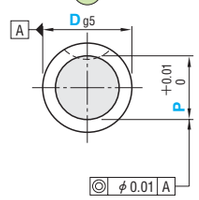
Alterations	Code	Ⓐ	D R E G	¥/1Code
Tip	PRC	Adds radius to blade tip 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−0.2)/2 Ⓧ PCC:Not applicable	———	400
	PCC	Adds chamfering to blade tip 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−0.2)/2 Ⓧ PRC:Not applicable	———	200
Full length	LC	Changes full length 45+B(BC)≦LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) Ⓟ When LC−B(BC) is 45mm or less, B(BC) is LC−45mm.		200
	LKC	Changes full length tolerance L +0.3 0 ⇨ +0.05 0		400
Others	KC	———	0°, 90°, 180°, 270° Changes ball seat position angle 1° increments	200

BALL-LOCK PUNCHES
—HEAVY LOAD—

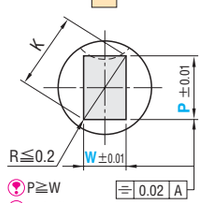
The volume discount rate is also applicable to alteration cost. P.39

Type	M / H	Catalog No. Type	Shape	B Tip length	Select tip shape from Shape A～G shown below.
RoHS	SKH51 61～64HRC	EBP	A D R E G	S L	

Shape A

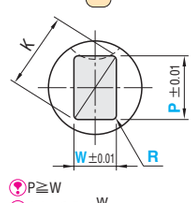


Shape D



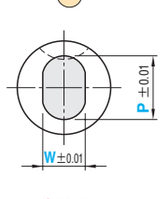
P≧W
R=0 : Also available
K= $\sqrt{P^2+W^2}$

Shape R



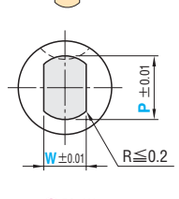
P≧W
0.15≦ R< $\frac{W}{2}$
K= $\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	Ⓐ P·Kmax.	Ⓐ P·Wmin.	D R E G R	B
S	10	71 80 90 100	3.00 ～ 9.97	9.90	2.50	0.15≦R< $\frac{W}{2}$ (Ⓡonly)	13
Ⓐ EBPAS	13		6.00 ～12.97	12.90	3.00		
Ⓓ EBPDS	16		10.00 ～15.97	15.90	4.00		19
Ⓡ EBPRS	20		13.00 ～19.97	19.90	5.00		
Ⓔ EBPES	25		18.00 ～24.97	24.90	6.00		
Ⓖ EBPGS	32		22.00 ～31.97	31.90	7.00		
L	10	80 90 100	3.00 ～ 9.97	9.90	2.50		19
Ⓐ EBPAL	13		6.00 ～12.97	12.90	3.00		
Ⓓ EBPDL	16		10.00 ～15.97	15.90	4.00		25
Ⓡ EBPRL	20		13.00 ～19.97	19.90	5.00		
Ⓔ EBPEL	25		18.00 ～24.97	24.90	6.00		
Ⓖ EBPGL	32		22.00 ～31.97	31.90	7.00		

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Heavy load · Economy type U/Price (Q'ty：1～9)

D	EBPAS EBPAL	EBPDS EBPDL	EBPRS EBPRL	EBPES EBPEL	EBPGS EBPGL
10	740	1,980	2,700	2,160	1,730
13	940	2,330	3,190	2,550	2,070
16	1,130	2,750	3,830	3,060	2,490
20	1,700	3,680	5,050	4,040	3,370
25	2,450	4,760	6,020	5,570	4,690
32	3,620	5,960	7,340	6,770	5,820

Order

Catalog No.	—	L	—	P	—	W	—	R (Ⓡonly)
EBPRL 32	—	100	—	P26.20	—	W14.00	—	R3.00

Delivery

• Ⓐ	3 Days	Express T	1,000/1Pc.	P.38
		Express A	500/1Pc.	A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
• D R E G	3 Days	Express T	1,600/1Pc.	P.38
		Express A	800/1Pc.	A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC···etc.)

EBPDS 32 — 100 — P26.20 — W14.00 — KC90

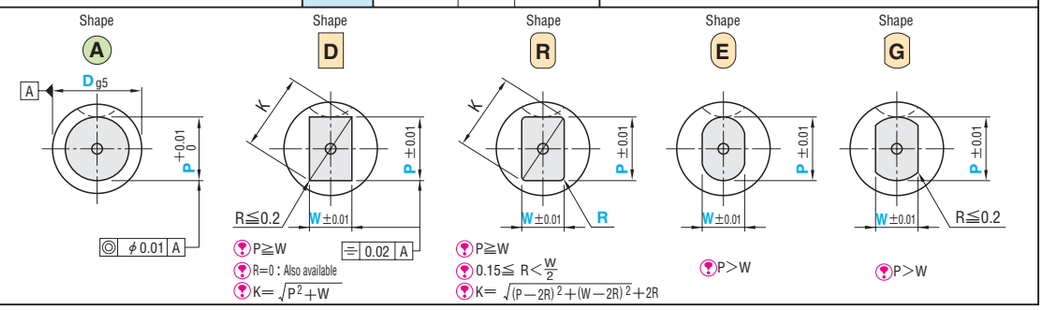
Alterations	Code	Ⓐ	D R E G	¥/1Code
Tip	PC WC	Changes diameter P PC≧ $\frac{Pmin}{2}$ 0.01mm increments (P 1.50～1.99 Bmax 20; 2.00～3.99 35; 4.00～5.99 45; 6.00～ 50)	Changes dimension P·W WC≧ $\frac{P \cdot Wmin}{2}$ 0.01mm increments (P·W 1.25～1.49 Bmax 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30)	200
	BC	Changes blade length B 2≦BC≦Bmax 0.1mm increments Ⓟ L(LC) requires BC +50mm or more.		200
	PKC	Changes dimension P tolerance P +0.01 0 ⇨ +0.005 0	Changes dimension P·W tolerance P·W±0.01 ⇨ +0.01 0	400

Alterations	Code	Ⓐ	D R E G	¥/1Code
Tip	PRC	Adds radius to blade tip 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−0.2)/2 Ⓧ PCC:Not applicable	———	400
	PCC	Adds chamfering to blade tip 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−0.2)/2 Ⓧ PRC:Not applicable	———	200
Full length	LC	Changes full length 50+B(BC)≦LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) Ⓟ When LC−B(BC) is 50mm or less, B(BC) is LC−50mm.		200
	LKC	Changes full length tolerance L +0.3 0 ⇨ +0.05 0		400
Others	KC	———	0°, 90°, 180°, 270° Changes ball seat position angle 1° increments	200

BALL-LOCK JECTOR PUNCHES
—LIGHT LOAD—

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No. Type	Shape	B Tip length	Select tip shape from Shape A~G shown below.
RoHS	SKD11 or equivalent 60~63HRC	ELJ	A D R E G	S L	



Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P·Kmax.	Ⓓ Ⓡ Ⓔ Ⓖ P·Wmin.	R	B	d (Hole diameter)
S Ⓐ ELJAS	10	63 71 74 80 90	3.00 ~ 9.97	9.90	3.00	0.15≦R<W/2 (Ⓡonly)	13	1.5
	13		6.00 ~12.97	12.90	6.00			1.8
Ⓓ ELJDS	16		10.00 ~15.97	15.90	6.00		19	2.8
Ⓡ ELJRS	20		13.00 ~19.97	19.90	6.00			
Ⓔ ELJES	25		18.00 ~24.97	24.90	6.00		25	
Ⓖ ELJGS	32		22.00 ~31.97	31.90	6.00			
L Ⓐ ELJAL	10	71 74 80 90	3.00 ~ 9.97	9.90	3.00		19	1.5
	13		6.00 ~12.97	12.90	6.00			1.8
Ⓓ ELJDL	16		10.00 ~15.97	15.90	6.00		25	2.8
Ⓡ ELJRL	20		13.00 ~19.97	19.90	6.00			
Ⓔ ELJEL	25		18.00 ~24.97	24.90	6.00			
Ⓖ ELJGL	32		22.00 ~31.97	31.90	6.00			

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Light load · Economy type U/Price (Q'ty:1~9)

D	ELJAS ELJAL	ELJDS ELJDL	ELJRS ELJRL	ELJES ELJEL	ELJGS ELJGL
10	1,340	2,110	2,980	2,380	2,020
13	1,490	2,380	3,330	2,660	2,260
16	1,770	2,810	3,930	3,140	2,670
20	2,200	3,410	4,660	3,810	3,230
25	2,730	4,310	5,480	4,820	4,070
32	4,190	5,370	6,360	5,930	5,090

Order: Catalog No. — L — P — W — R(Ⓡonly)
ELJEL 25 — 80 — P21.00 — W12.40

Delivery
- Ⓐ: 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38
  A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
- Ⓓ Ⓡ Ⓔ Ⓖ: 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. P.38
  A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC · KC···etc.)
ELJEL 25 — 80 — P21.00 — W12.40 — — PKC

Alterations	Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Tip	PC WC	Changes diameter P PC≧PCmin 0.01mm increments	Changes dimension P·W PC·WC≧PC·WCmin 0.01mm increments	200
	BC	Changes blade length B 2≦BC<B 0.1mm increments		200
	PKC	Changes dimension P tolerance P +0.01 0 ⇨ +0.005 0	Changes dimension P·W tolerance P·W±0.01 ⇨ +0.01 0	400

D	PCmin
10	2.80
13	5.00
16	8.00
20	9.00
25	9.00
32	15.00

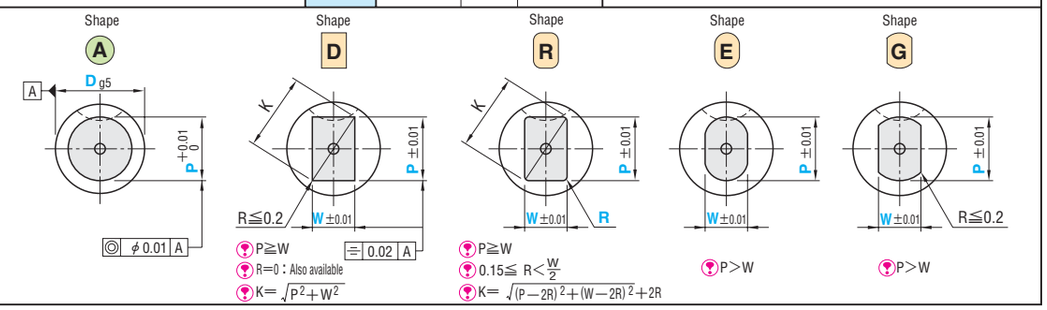
D	PC·WCmin
10	2.80
13	5.00
16	5.00
20	5.00
25	5.00
32	5.00

Alterations	Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Tip	PRC	Adds radius to blade tip 0.3≦PRC≦1 0.1mm increments PRC≦(P−d−0.5)/2 ⊗PCC : Not applicable	—	400
	PCC	Adds chamfering to blade tip 0.3≦PCC≦1 0.1mm increments PCC≦(P−d−0.5)/2 ⊗PRC : Not applicable	—	200
Full length	LC	Changes full length L−(B−2)≦LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) B is shortened by (L−LC).		200
	LKC	Changes full length tolerance L +0.3 0 ⇨ +0.05 0		400
Others	KC	—	0° 90° 180° 270° Changes ball seat position angle 1° increments	200

BALL-LOCK JECTOR PUNCHES
—HEAVY LOAD—

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No. Type	Shape	B Tip length	Select tip shape from Shape A~G shown below.
RoHS	SKH51 61~64HRC	EBJ	A D R E G	S L	



Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P·Kmax.	Ⓓ Ⓡ Ⓔ Ⓖ P·Wmin.	R	B	d (Hole diameter)
S Ⓐ EBJAS	10	71 80 90 100	3.00 ~ 9.97	9.90	3.00	0.15≦R<W/2 (Ⓡonly)	13	1.5
	13		6.00 ~12.97	12.90	6.00			1.8
Ⓓ EBJDS	16		10.00 ~15.97	15.90	6.00		19	2.8
Ⓡ EBJRS	20		13.00 ~19.97	19.90	6.00			
Ⓔ EBJES	25		18.00 ~24.97	24.90	6.00		25	
Ⓖ EBJGS	32		22.00 ~31.97	31.90	6.00			
L Ⓐ EBJAL	10	80 90 100	3.00 ~ 9.97	9.90	3.00		19	1.5
	13		6.00 ~12.97	12.90	6.00			1.8
Ⓓ EBJDL	16		10.00 ~15.97	15.90	6.00		25	2.8
Ⓡ EBJRL	20		13.00 ~19.97	19.90	6.00			
Ⓔ EBJEL	25		18.00 ~24.97	24.90	6.00			
Ⓖ EBJGL	32		22.00 ~31.97	31.90	6.00			

Price

Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Heavy load · Economy type U/Price (Q'ty:1~9)

D	EBJAS EBJAL	EBJDS EBJDL	EBJRS EBJRL	EBJES EBJEL	EBJGS EBJGL
10	1,870	3,190	4,180	3,540	3,020
13	2,030	3,540	4,640	3,950	3,380
16	2,290	4,130	5,350	4,680	4,000
20	3,010	4,960	6,260	5,720	4,920
25	4,100	6,210	7,610	7,160	6,260
32	6,110	8,190	9,670	9,630	8,190

Order: Catalog No. — L — P — W — R(Ⓡonly)
EBJAS 13 — 71 — P12.56

Delivery
- Ⓐ: 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38
  A flat charge of 1,350 yen for 3 pieces or more of the same siz (excluding Express T).
- Ⓓ Ⓡ Ⓔ Ⓖ: 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. P.38
  A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC · KC···etc.)
EBJAS 13 — LC78.5 — P12.56

Alterations	Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Tip	PC WC	Changes diameter P PC≧PCmin 0.01mm increments	Changes dimension P·W PC·WC≧PC·WCmin 0.01mm increments	200
	BC	Changes blade length B 2≦BC<B 0.1mm increments		200
	PKC	Changes dimension P tolerance P +0.01 0 ⇨ +0.005 0	Changes dimension P·W tolerance P·W±0.01 ⇨ +0.01 0	400

D	PCmin
10	2.80
13	5.00
16	8.00
20	9.00
25	9.00
32	15.00

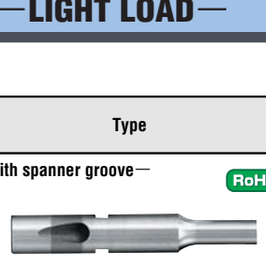
D	PC·WCmin
10	2.80
13	5.00
16	5.00
20	5.00
25	5.00
32	5.00

Alterations	Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	¥/1Code
Tip	PRC	Adds radius to blade tip 0.3≦PRC≦1 0.1mm increments PRC≦(P−d−0.5)/2 ⊗PCC : Not applicable	—	400
	PCC	Adds chamfering to blade tip 0.3≦PCC≦1 0.1mm increments PCC≦(P−d−0.5)/2 ⊗PRC : Not applicable	—	200
Full length	LC	Changes full length L−(B−2)≦LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) B is shortened by (L−LC).		200
	LKC	Changes full length tolerance L +0.3 0 ⇨ +0.05 0		400
Others	KC	—	0° 90° 180° 270° Changes ball seat position angle 1° increments	200

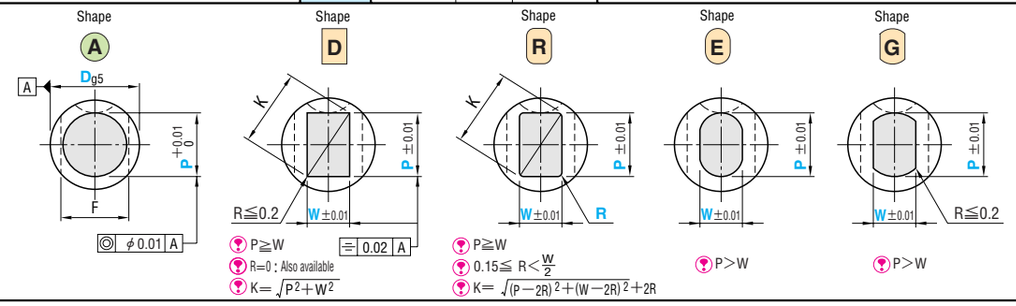
BALL-LOCK PUNCHES
—LIGHT LOAD—

The volume discount rate is also applicable to alteration cost. P.39

Type	M / H	Catalog No. Type	Shape	B Tip length	Select tip shape from Shape A~G shown below.
—With spanner groove— RoHS	SKD11 or equivalent 60~63HRC	KLP	A D R E G	S L	



The spanner groove is to check if the punch is locked firmly. P.709



Catalog No. Type	D	L	Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	F
S	10	63 71 74 80 90	3.00 ~ 9.97	9.90	2.50	0.15≦R< W/2 (Ⓡonly)	13	8
Ⓐ KLPAS	13		6.00 ~12.97	12.90	3.00			10
Ⓓ KLPDS	16		10.00 ~15.97	15.90	4.00		19	13
Ⓡ KLPRS	20		13.00 ~19.97	19.90	5.00			17
Ⓔ KLPES	25		18.00 ~24.97	24.90	6.00			22
Ⓖ KLPGS	32		22.00 ~31.97	31.90	7.00			29
L	10	71 74 80 90	3.00 ~ 9.97	9.90	2.50		19	8
Ⓐ KLPAL	13		6.00 ~12.97	12.90	3.00			10
Ⓓ KLPDL	16		10.00 ~15.97	15.90	4.00		25	13
Ⓡ KLPRL	20		13.00 ~19.97	19.90	5.00			17
Ⓔ KLPEL	25		18.00 ~24.97	24.90	6.00			22
Ⓖ KLPGL	32		22.00 ~31.97	31.90	7.00			29

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Light load · With spanner groove U/Price (Q'ty:1~9)

D	KLPAS KLPAL	KLPDS KLPDL	KLPRS KLPRL	KLPES KLPEL	KLPGS KLPGL
10	570	1,580	2,340	1,870	1,470
13	640	1,790	2,640	2,110	1,660
16	760	2,140	3,140	2,510	1,990
20	970	2,670	3,890	3,110	2,470
25	1,210	3,480	4,780	4,050	3,210
32	2,450	4,650	5,750	5,270	4,340

Order

Catalog No.	L	P	W	R (Ⓡonly)
KLPDL 16	80	P10.33	W8.64	

Delivery

• Ⓐ	3 Days	Express A	500/1Pc.	P.38 A flat charge of 1,350 yen for 3 pieces or more of the same size.
• D R E G	3 Days	Express A	800/1Pc.	P.38 A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC · KC···etc.)
KLPRS 16 — LC70.5 — P12.00 — W10.00 — R3.00 — BC15.5

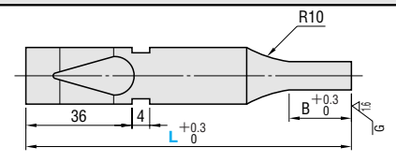
Alterations	Code	Ⓐ	D R E G	¥/1Code
Tip	PC WC	Changes diameter P PC≧ Pmin/2 0.01mm increments (P: 1.50~1.99 Bmax 20; 2.00~3.99 35; 4.00~ 45)	Changes dimension P·W PC≧ P·Wmin/2 0.01mm increments (P·W: 1.25~1.49 Bmax 8; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30)	200
	BC	Changes blade length B 2≦BC≦Bmax 0.1mm increments (L(LC) requires BC+45mm or more.)		200
	PKC	Changes dimension P tolerance P +0.01 0 ⇨ +0.005 0	Changes dimension P·W tolerance P·W±0.01 ⇨ +0.01 0	400
Tip	PRC	Adds radius to blade tip 0.3≦PRC≦1 0.1mm increments (PRC≦(P−0.2)/2 ⊗PCC:Not applicable)	——	400
	PCC	Adds chamfering to blade tip 0.3≦PCC≦1 0.1mm increments (PCC≦(P−0.2)/2 ⊗PRC:Not applicable)	——	200
Full length	LC	Changes full length 45+B(BC)≦LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) (When LC−B(BC) is 45mm or less, B(BC) is LC−45mm.)		200
	LKC	Changes full length tolerance L +0.3 0 ⇨ +0.05 0		400
Others	KC	——	0°/90°/180°/270° Changes ball seat position angle 1° increments	200

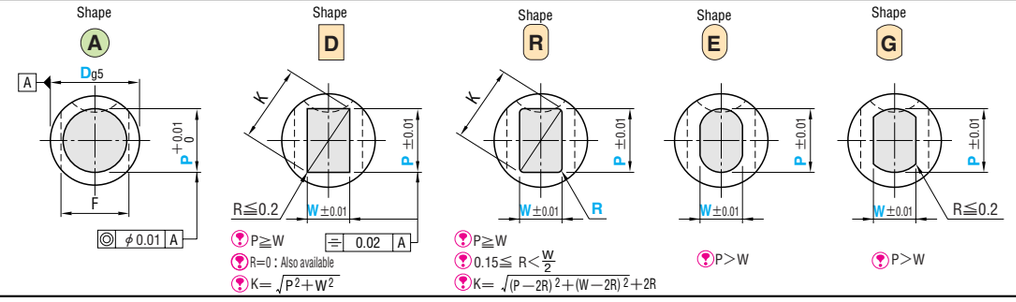
BALL-LOCK PUNCHES
—HEAVY LOAD—

The volume discount rate is also applicable to alteration cost. P.39

Type	M / H	Catalog No. Type	Shape	B Tip length	Select tip shape from Shape A~G shown below.
—With spanner groove— RoHS	SKH51 61~64HRC	KBP	A D R E G	S L	

The spanner groove is to check if the punch is locked firmly. P.709





Catalog No. Type	D	L	Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	F
S	10	71 80 90 100	3.00 ~ 9.97	9.90	2.50	0.15≦R< W/2 (Ⓡonly)	13	8
Ⓐ KBPAS	13		6.00 ~12.97	12.90	3.00			10
Ⓓ KBPDS	16		10.00 ~15.97	15.90	4.00		19	13
Ⓡ KBPRS	20		13.00 ~19.97	19.90	5.00			17
Ⓔ KBPES	25		18.00 ~24.97	24.90	6.00			22
Ⓖ KBPGS	32		22.00 ~31.97	31.90	7.00			29
L	10	80 90 100	3.00 ~ 9.97	9.90	2.50		19	8
Ⓐ KBPAL	13		6.00 ~12.97	12.90	3.00			10
Ⓓ KBPDL	16		10.00 ~15.97	15.90	4.00		25	13
Ⓡ KBPRL	20		13.00 ~19.97	19.90	5.00			17
Ⓔ KBPEL	25		18.00 ~24.97	24.90	6.00			22
Ⓖ KBPGL	32		22.00 ~31.97	31.90	7.00			29

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Heavy load · With spanner groove U/Price (Q'ty:1~9)

D	KBPAS KBPAL	KBPDS KBPDL	KBPRS KBPRL	KBPES KBPEL	KBPGS KBPGL
10	920	2,300	3,130	2,500	2,020
13	1,160	2,710	3,690	2,950	2,420
16	1,400	3,200	4,430	3,540	2,910
20	2,050	4,250	5,800	4,650	3,910
25	2,900	5,470	6,870	6,370	5,390
32	4,220	6,820	8,360	7,720	6,670

Order

Catalog No.	L	P	W	R (Ⓡonly)
KBPRL 32	100	P26.20	W14.00	R3.00

Delivery

• Ⓐ	3 Days	Express A	500/1Pc.	P.38 A flat charge of 1,350 yen for 3 pieces or more of the same size.
• D R E G	3 Days	Express A	800/1Pc.	P.38 A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC · KC···etc.)
KBPDS 32 — 100 — P26.20 — W14.00 — KC90

Alterations	Code	Ⓐ	D R E G	¥/1Code
Tip	PC WC	Changes diameter P PC≧ Pmin/2 0.01mm increments (P: 1.50~1.99 Bmax 20; 2.00~3.99 35; 4.00~5.99 45; 6.00~ 50)	Changes dimension P·W PC≧ P·Wmin/2 0.01mm increments (P·W: 1.25~1.49 Bmax 8; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30)	200
	BC	Changes blade length B 2≦BC≦Bmax 0.1mm increments (L(LC) requires BC+50mm or more.)		200
	PKC	Changes dimension P tolerance P +0.01 0 ⇨ +0.005 0	Changes dimension P·W tolerance P·W±0.01 ⇨ +0.01 0	400
Tip	PRC	Adds radius to blade tip 0.3≦PRC≦1 0.1mm increments (PRC≦(P−0.2)/2 ⊗PCC:Not applicable)	——	400
	PCC	Adds chamfering to blade tip 0.3≦PCC≦1 0.1mm increments (PCC≦(P−0.2)/2 ⊗PRC:Not applicable)	——	200
Full length	LC	Changes full length 50+B(BC)≦LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) (When LC−B(BC) is 50mm or less, B(BC) is LC−50mm.)		200
	LKC	Changes full length tolerance L +0.3 0 ⇨ +0.05 0		400
Others	KC	——	0°/90°/180°/270° Changes ball seat position angle 1° increments	200

BALL-LOCK JECTOR PUNCHES
—LIGHT LOAD—

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No. Type	Shape	B Tip length	Select tip shape from Shape A~G shown below.
—With spanner groove— RoHS	SKD11 or equivalent 60~63HRC	KLJ	A D R E G	S L	R10, 27, 4, $L^{+0.3}_{0}$, $B^{+0.3}_{0}$, d, G 1.6

The spanner groove is to check if the punch is locked firmly. P.709

Shape A: D_{g5}, A, $P^{+0.01}_{0}$, F, ◎ φ0.01 A
Shape D: K, $P^{\pm0.01}$, R≦0.2, W±0.01, ⏥ 0.02 A
Shape R: K, $P^{\pm0.01}$, W±0.01, R
Shape E: $P^{\pm0.01}$, W±0.01
Shape G: $P^{\pm0.01}$, W±0.01, R≦0.2

- P≧W
- R=0 : Also available
- $K=\sqrt{P^2+W^2}$
- 0.15≦ $R<\frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
- P>W

Catalog No. Type	D	L	min. P max. (Ⓐ)	P·Kmax. (D R E G)	P·Wmin. (D R E G)	R	B	F	d (Hole diameter)
S Ⓐ KLJAS	10	63 71 74 80 90	3.00~ 9.97	9.90	3.00	0.15≦R< W/2 (Ⓡonly)	13	8	1.5
	13		6.00~12.97	12.90	6.00			10	1.8
Ⓓ KLJDS	16		10.00~15.97	15.90	6.00		19	13	2.8
Ⓡ KLJRS	20		13.00~19.97	19.90	6.00			17	
Ⓔ KLJES	25		18.00~24.97	24.90	6.00			22	
Ⓖ KLJGS	32		22.00~31.97	31.90	6.00			29	
L Ⓐ KLJAL	10	71 74 80 90	3.00~ 9.97	9.90	3.00		19	8	1.5
	13		6.00~12.97	12.90	6.00			10	1.8
Ⓓ KLJDL	16		10.00~15.97	15.90	6.00		25	13	2.8
Ⓡ KLJRL	20		13.00~19.97	19.90	6.00			17	
Ⓔ KLJEL	25		18.00~24.97	24.90	6.00			22	
Ⓖ KLJGL	32		22.00~31.97	31.90	6.00			29	

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Light Load · With spanner groove U/Price (Q'ty:1~9)

D	KLJAS KLJAL	KLJDS KLJDL	KLJRS KLJRL	KLJES KLJEL	KLJGS KLJGL
10	1,540	2,400	3,370	2,690	2,290
13	1,720	2,700	3,780	3,020	2,570
16	2,040	3,190	4,450	3,560	3,040
20	2,530	3,870	5,260	4,310	3,670
25	3,120	4,880	6,180	5,450	4,610
32	4,760	6,070	7,170	6,690	5,760

Order: Catalog No. — L — P — W — R (Ⓡonly)
KLJDS 20 — 71 — P16.00 — W10.00

Delivery
- Ⓐ: 3 Days, Express A 500/1Pc. P.38 A flat charge of 1,350 yen for 3 pieces or more of the same size.
- D R E G: 3 Days, Express A 800/1Pc. P.38 A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC…etc.)
KLJDS 20 — 71 — P16.00 — W10.00 — — PKC

Alterations	Code	Ⓐ	D R E G	¥/1Code
Tip	PC WC	Changes diameter P PC≧PCmin 0.01mm increments (D: PCmin: 10 2.80, 13 5.00, 16 8.00, 20 9.00, 25 9.00, 32 15.00)	Changes dimension P·W PC·WC≧PC·WCmin 0.01mm increments (D: PC·WCmin: 10 2.80, 13 5.00, 16 5.00, 20 5.00, 25 5.00, 32 5.00)	200
	BC	Changes blade length B 2≦BC<B 0.1mm increments		200
	PKC	Changes dimension P tolerance $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Changes dimension P·W tolerance P·W±0.01 ⇨ $^{+0.01}_{0}$	400

Alterations	Code	Ⓐ	D R E G	¥/1Code
Tip	PRC	Adds radius to blade tip 0.3≦PRC≦1 0.1mm increments (PRC≦(P−d−0.5)/2 ⊗PCC:Not applicable)	———	400
	PCC	Adds chamfering to blade tip 0.3≦PCC≦1 0.1mm increments (PCC≦(P−d−0.5)/2 ⊗PRC:Not applicable)	———	200
Full length	LC	Changes full length L−(B−2)≦LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) (B is shortened by (L−LC).)		200
	LKC	Changes full length tolerance L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
Other	KC	———	0°, 90°, 180°, 270°, Changes ball seat position angle 1° increments	200

BALL-LOCK JECTOR PUNCHES
—HEAVY LOAD—

The volume discount rate is also applicable to alteration cost. P.39

Type	M H	Catalog No. Type	Shape	B Tip length	Select tip shape from Shape A~G shown below.
—With spanner groove— RoHS	SKH51 61~64HRC	KBJ	A D R E G	S L	R10, 36, 4, $L^{+0.3}_{0}$, $B^{+0.3}_{0}$, d, G 1.6

The spanner groove is to check if the punch is locked firmly. P.709

Shape A: D_{g5}, A, $P^{+0.01}_{0}$, F, ◎ φ0.01 A
Shape D: K, $P^{\pm0.01}$, R≦0.2, W±0.01, ⏥ 0.02 A
Shape R: K, $P^{\pm0.01}$, W±0.01, R
Shape E: $P^{\pm0.01}$, W±0.01
Shape G: $P^{\pm0.01}$, W±0.01, R≦0.2

- P≧W
- R=0 : Also available
- $K=\sqrt{P^2+W^2}$
- 0.15≦ $R<\frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
- P>W

Catalog No. Type	D	L	min. P max. (Ⓐ)	P·Kmax. (D R E G)	P·Wmin. (D R E G)	R	B	F	d (Hole diameter)
S Ⓐ KBJAS	10	71 80 90 100	3.00~ 9.97	9.90	3.00	0.15≦R< W/2 (Ⓡonly)	13	8	1.5
	13		6.00~12.97	12.90	6.00			10	1.8
Ⓓ KBJDS	16		10.00~15.97	15.90	6.00		19	13	2.8
Ⓡ KBJRS	20		13.00~19.97	19.90	6.00			17	
Ⓔ KBJES	25		18.00~24.97	24.90	6.00			22	
Ⓖ KBJGS	32		22.00~31.97	31.90	6.00			29	
L Ⓐ KBJAL	10	80 90 100	3.00~ 9.97	9.90	3.00		19	8	1.5
	13		6.00~12.97	12.90	6.00			10	1.8
Ⓓ KBJDL	16		10.00~15.97	15.90	6.00		25	13	2.8
Ⓡ KBJRL	20		13.00~19.97	19.90	6.00			17	
Ⓔ KBJEL	25		18.00~24.97	24.90	6.00			22	
Ⓖ KBJGL	32		22.00~31.97	31.90	6.00			29	

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Heavy load · With spanner groove U/Price (Q'ty:1~9)

D	KBJAS KBJAL	KBJDS KBJDL	KBJRS KBJRL	KBJES KBJEL	KBJGS KBJGL
10	2,180	3,640	4,750	4,030	3,460
13	2,380	4,050	5,280	4,510	3,880
16	2,680	4,730	6,080	5,340	4,590
20	3,510	5,670	7,120	6,520	5,630
25	4,740	7,080	8,640	8,140	7,140
32	6,990	9,300	10,940	10,900	9,300

Order: Catalog No. — L — P — W — R (Ⓡonly)
KBJDL 20 — 80 — P16.00 — W10.00

Delivery
- Ⓐ: 3 Days, Express A 500/1Pc. P.38 A flat charge of 1,350 yen for 3 pieces or more of the same size.
- D R E G: 3 Days, Express A 800/1Pc. P.38 A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC…etc.)
KBJDL 20 — 80 — P16.00 — W10.00 — — LKC

Alterations	Code	Ⓐ	D R E G	¥/1Code
Tip	PC WC	Changes diameter P PC≧PCmin 0.01mm increments (D: PCmin: 10 2.80, 13 5.00, 16 8.00, 20 9.00, 25 9.00, 32 15.00)	Changes dimension P·W PC·WC≧PC·WCmin 0.01mm increments (D: PC·WCmin: 10 2.80, 13 5.00, 16 5.00, 20 5.00, 25 5.00, 32 5.00)	200
	BC	Changes blade length B 2≦BC<B 0.1mm increments		200
	PKC	Changes dimension P tolerance $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Changes dimension P·W tolerance P·W±0.01 ⇨ $^{+0.01}_{0}$	400

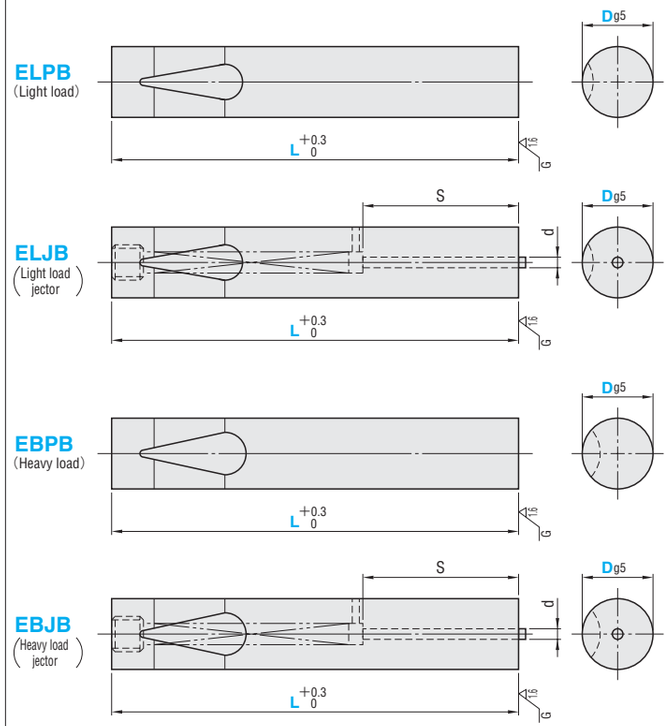
Alterations	Code	Ⓐ	D R E G	¥/1Code
Tip	PRC	Adds radius to blade tip 0.3≦PRC≦1 0.1mm increments (PRC≦(P−d−0.5)/2 ⊗PCC:Not applicable)	———	400
	PCC	Adds chamfering to blade tip 0.3≦PCC≦1 0.1mm increments (PCC≦(P−d−0.5)/2 ⊗PRC:Not applicable)	———	200
Full length	LC	Changes full length L−(B−2)≦LC<L 0.1mm incr. (combination with LKC→0.01mm incr.) (B is shortened by (L−LC).)		200
	LKC	Changes full length tolerance L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		400
Other	KC	———	0°, 90°, 180°, 270°, Changes ball seat position angle 1° increments	200

BALL-LOCK PUNCH BLANKS
—ECONOMY TYPE—

The volume discount rate is also applicable to alteration cost. P.39

L	Type	Catalog No.	M H
63・71・74・80・90	Light load	ELPB	SKD11 or equivalent 60~63HRC
	Light load jector	ELJB	
71・80・90・100	Heavy load	EBPB	SKH51 61~64HRC
	Heavy load jector	EBJB	

RoHS



Catalog No. Type		D	L Light load	L Heavy load	d (Hole diameter)	S
		10	63 71 74 80 90	71 80 90 100	1.5	28
(Light load)	ELPB	13			1.8	
(Light load jector)	ELJB	16			2.8	36
(Heavy load)	EBPB	20				
(Heavy load jector)	EBJB	25				
		32				

Order Catalog No. — L
ELPB 16 — 71

Delivery 3 Days
Express T 1,000/1Pc.
Express A 500/1Pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Alteration Catalog No. — L(LC) — (LKC)
ELPB 16 — LC72.5 — LKC

Alterations		Code	Spec.	¥/1Code
Full length	LC L	LC	Changes full length tolerance 0.1mm increments Light load 50≦LC<90 Heavy load 60≦LC<100 Dimension S is shortened by (L−LC).	200
	L T	LKC	Changes ball seat position L +0.3 0 ⇨ +0.05 0	400

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Economy type U/Price (Q'ty : 1~9)

D	(Light load) ELPB	(Light load jector) ELJB	(Heavy load) EBPB	(Heavy load jector) EBJB
10	400	1,210	560	1,620
13	430	1,370	850	1,780
16	560	1,530	970	2,190
20	680	2,270	1,460	3,010
25	850	2,590	2,350	4,020
32	1,940	3,320	3,410	5,770

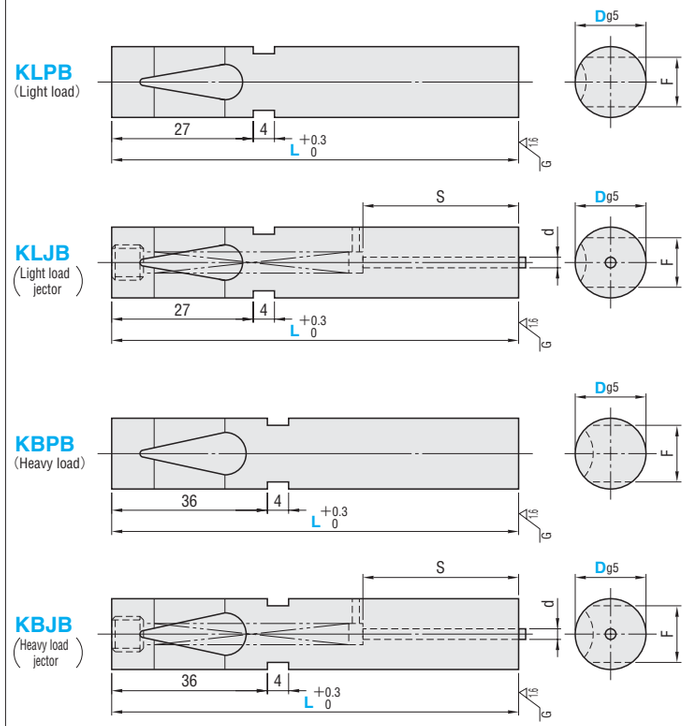
BALL-LOCK PUNCH BLANKS
—WITH SPANNER GROOVE—

The volume discount rate is also applicable to alteration cost. P.39

L	Type	Catalog No.	M H
63・71・74・80・90	Light load	KLPB	SKD11 or equivalent 60~63HRC
	Light load jector	KLJB	
71・80・90・100	Heavy load	KBPB	SKH51 61~64HRC
	Heavy load jector	KBJB	

RoHS

The spanner groove is to check if the punch is locked firmly. P.709



Catalog No. Type		D	L Light load	L Heavy load	F	d (Hole diameter)	S
		10	63 71 74 80 90	71 80 90 100	8	1.5	28
(Light load)	KLPB	13			10	1.8	
(Light load jector)	KLJB	16			13	2.8	36
(Heavy load)	KBPB	20			17		
(Heavy load jector)	KBJB	25			22		
		32			29		

Order Catalog No. — L
KLPB 16 — 71

Delivery 3 Days
Express A 500/1Pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(LC) — (LKC)
KLPB 16 — LC72.5
KBJB 25 — 90 — LKC

Alterations		Code	Spec.	¥/1Code
Full length	LC L	LC	Changes full length tolerance 0.1mm increments Light load 50≦LC<90 Heavy load 60≦LC<100 Dimension S is shortened by (L−LC).	200
	L T	LKC	Changes ball seat position L +0.3 0 ⇨ +0.05 0	400

Price

■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■With spanner groove type U/Price (Q'ty : 1~9)

D	(Light load) KLPB	(Light load jector) KLJB	(Heavy load) KBPB	(Heavy load jector) KBJB
10	490	1,390	720	1,900
13	540	1,580	1,060	2,100
16	690	1,770	1,220	2,570
20	840	2,600	1,780	3,500
25	1,030	2,970	2,790	4,650
32	2,260	3,790	3,990	6,610

BALL-LOCK BUTTON DIES

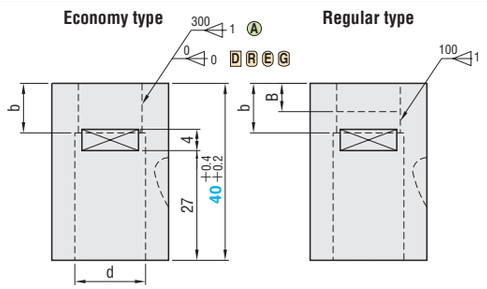
The volume discount rate is also applicable to alteration cost. P.39

RoHS

M H	Type	Catalog No. Type	Shape
SKD11 or equivalent 60～63HRC	Economy type	ELD	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ
	Regular type	LD	

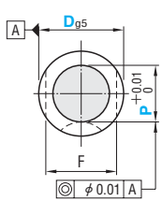
The spanner groove is to check if the button die is locked firmly. P.709

Select hole shape from Shape A～G shown below.

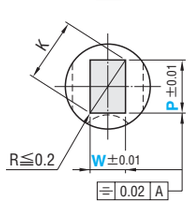


Use retainer for light load. Not apply retainer for heavy load.

Shape Ⓐ

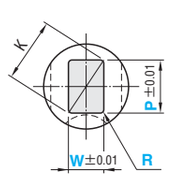


Shape Ⓓ



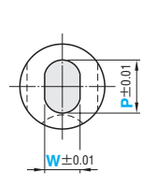
P≧W
K= $\sqrt{P^2+W^2}$

Shape Ⓡ



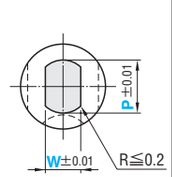
P≧W
0.15≦ R< $\frac{W}{2}$
K= $\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Shape Ⓔ



P>W

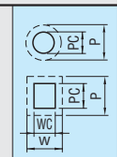
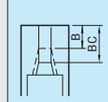
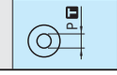
Shape Ⓖ



P>W

Alteration

Catalog No. – L(LC) – P(PC) – W(WC) – R – (BC・KC…etc.)
ELDR 32 – 40 – P16.00 – W10.00 – R4.00 – KC45

Alterations		Code	Ⓐ	D R E G	¥/1Code
Hole		PC WC	Changes dimension P・W min : $\frac{P \cdot Wmin}{2} \leqq \frac{PC}{WC} < \frac{P}{W}$ 0.01mm increments When PC is 1.25～1.99, B and b are 4 max : $\frac{P}{W} < \frac{PC}{WC} \leqq P \cdot Kmax + 0.2$ 0.01mm increments		200
		BC	Changes shaped hole depth B 1≦BC≦b 0.1mm increments Applicable for regular type only. Economy type : Not applicable		200
		PKC	Changes dimension P tolerance $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ Economy type : Not applicable	——	400

Alterations		Code	Ⓐ	D R E G	¥/1Code
Full length		LC	Changes full length 33≦LC<40 0.1mm increments b is shortened according to (L—LC). Regular type When L—LC>b—B, B is b—(L—LC).		200
		LKC	Changes full length tolerance $L^{-0.4}_{-0.2} \Rightarrow {}^{+0.05}_{0}$		400
Others		KC	——	180° 90° 270° 0° Changes ball seat position angle 1° increments	200

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P	max.	D R E G P・Kmax.	P・Wmin.	Ⓡ R	B	b	d	F	U/Price Q'ty : 1～9 ELDA	ELDD・ELDR ELDE・ELDG	LDA	LDD・LDR LDE・LDG
Economy type / Regular type	13	40	3.00～	5.00	5.00	2.50	0.15≦R< $\frac{W}{2}$ (Ⓡ only)	6	10	5.4	10	960	5,400	1,120	5,630
Ⓐ ELDA LDA	16		3.50～	8.00	8.00	3.00				8.4	13	960	5,590	1,120	5,680
Ⓓ ELDD LDD	20		7.00～	11.00	11.00	3.00		8	12	11.4	17	1,080	5,780	1,240	6,090
Ⓡ ELDR LDR	25		10.00～	16.00	16.00	4.00				16.6	22	1,480	6,280	1,640	6,600
Ⓔ ELDE LDE	32		15.00～	20.00	20.00	5.00		10	15	20.6	29	1,950	6,630	2,110	7,030
Ⓖ ELDG LDG	38		19.00～	26.00	26.00	5.00				26.6	35	2,770	7,450	2,920	7,850

Order

Catalog No. – L – P – W – R (Ⓡ only)
ELDR 32 – 40 – P16.00 – W10.00 – R4.90

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery

3 Days

Express service system	Express T	1,600/1Pc.
	Express A	800/1Pc.

P.38

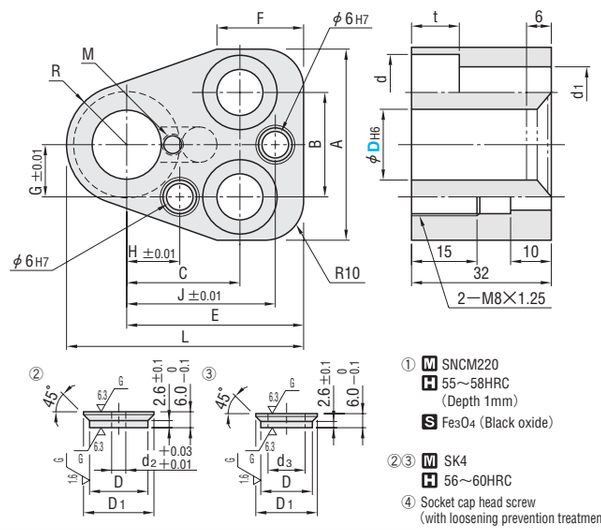
A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

BALL-LOCK RETAINERS
—LIGHT LOAD—

Type	Catalog No.	①	②	③	④	⑤	⑥	⑦	D
For punch	CLN—P	○	○		○	○	○	○	10～32
For die	CLN—D	○		○	○	○	○	○	13～38
Retainer body for punch+plug	CLN—PP	○	○						10～32
Retainer body for die+plug	CLN—DN	○		○					13～38

RoHS

Use punch for light load. Not apply punch for heavy load.



① M SNCM220
H 55～58HRC
(Depth 1mm)
S Fe3O4 (Black oxide)

②③ M SK4
H 56～60HRC

④ Socket cap head screw
(with loosening prevention treatment)

Catalog No. / Type	D	DH6	A	B	C	E	F	G	H	J	L	R	D1	d	d1	t	d2	M	d3	A
(For punch)	(10)	+0.009 0	37	20	21	35		10	9	29	44.5	9.5	16	14	9	10			—	④M8—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
①②④⑤⑥⑦ CLN—P ①② CLN—PP	13	+0.011 0	43	26	23	38		13	11	32	50	12	19						6.2	
	16		44	24	26	40			12	34	54	14	22						9	④M10—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
(For die)	20	+0.013 0	48	28	27	42	20	16	14	36	59	17	26	17	11	12	6	4	12	
①③④⑤⑥⑦ CLN—D ①③ CLN—DN	25		50	30	30	46		18	17	39	65.5	19.5	31						17	
	32	+0.016 0	54		33	48		21	20	42	71	23	38	19	13	14			21	④M12—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
	(38)		58		35	52		23	23	46	78	26	44						27	

D10 is available only for punch ; D38 is available only for die.

Order — Catalog No.: CLN—P 16

Delivery — 3 Days

Express T	400/1Pc.
Express A	200/1Pc.

P.38

A flat charge of 540 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

Quantity	1～9 sets	10～29 sets	30～49 sets	50～100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■U/Price (1～9 sets)

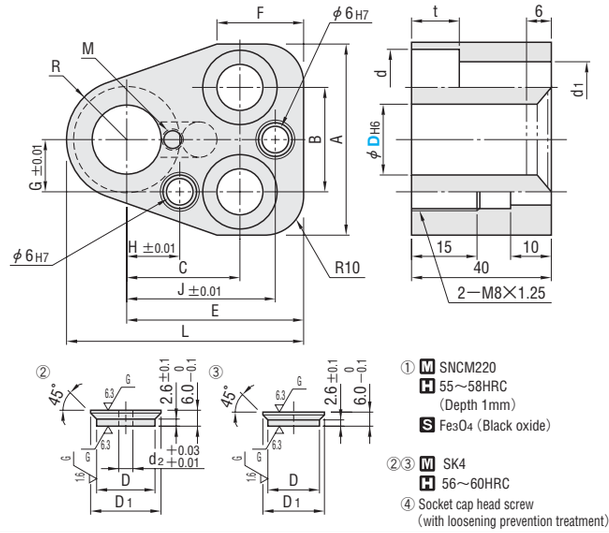
D	CLN—P	CLN—PP	CLN—D	CLN—DN
10	2,700	2,590	—	—
13	2,880	2,770	2,880	2,770
16	3,050	2,930	3,050	2,930
20	3,230	3,110	3,230	3,110
25	3,480	3,360	3,480	3,360
32	3,840	3,710	3,840	3,710
38	—	—	4,100	3,970

BALL-LOCK RETAINERS
—HEAVY LOAD—

Type	Catalog No.	①	②	③	④	⑤	⑥	⑦	D
For punch	CBN—P	○	○		○	○	○	○	10～32
	CBN—PN	○		○	○	○	○	○	
Retainer body +plug	CBN—PP	○	○						
	CBN—PNP	○		○					

RoHS

Use punch for heavy load. Not apply punch for light load.



① M SNCM220
H 55～58HRC
(Depth 1mm)
S Fe3O4 (Black oxide)

②③ M SK4
H 56～60HRC

④ Socket cap head screw
(with loosening prevention treatment)

Catalog No. / Type	D	DH6	A	B	C	E	F	G	H	J	L	R	D1	d	d1	t	d2	M	A
(For punch)	10	+0.009 0	37	20	21	35		10	9	29	44.5	9.5	16	14	9	10			④M8—45 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
①②④⑤⑥⑦ CBN—P ①② CBN—PP	13	+0.011 0	43	26	23	38		13	11	32	50	12	19						
	16		44	24	26	40			12	34	54	14	22						④M10—50 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
①③④⑤⑥⑦ CBN—PN ①③ CBN—PNP	20	+0.013 0	48	28	27	42	20	16	14	36	59	17	26	17	11	12	6	4	
	25		50	30	30	46		18	17	39	65.5	19.5	31						
	32	+0.016 0	54		33	48		21	20	42	71	23	38	19	13	14			④M12—50 ⑥MSW8 ⑤MSTM6—30 ⑦MS6—20

Order — Catalog No.: CBN—P 10

Delivery — 3 Days

Express T	400/1Pc.
Express A	200/1Pc.

P.38

A flat charge of 540 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

Quantity	1～9 sets	10～29 sets	30～49 sets	50～100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■U/Price (1～9 sets)

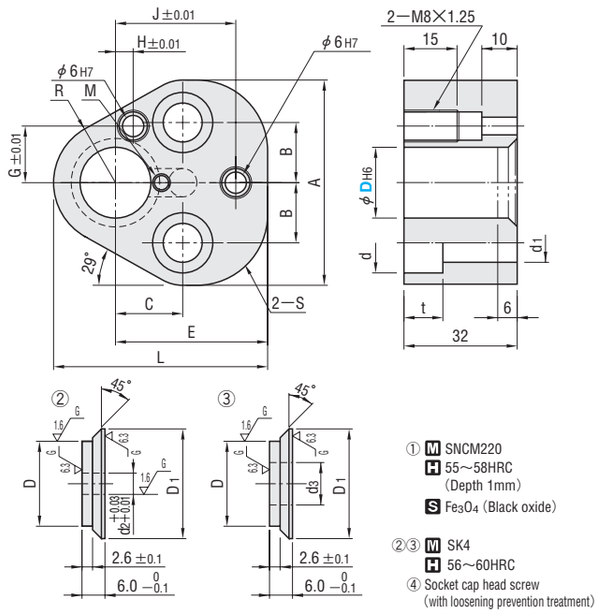
D	CBN—P CBN—PN	CBN—PP CBN—PNP
10	3,140	3,030
13	3,310	3,200
16	3,480	3,360
20	3,660	3,540
25	3,920	3,800
32	4,280	4,150

BALL-LOCK RETAINERS
—LIGHT LOAD—

Type	Catalog No.	①	②	③	④	⑤	⑥	⑦	D
For punch	CRN—P	○	○		○	○	○	○	10～32
For die	CRN—D	○		○	○	○	○	○	13～38
Retainer body for punch+plug	CRN—PP	○	○						10～32
Retainer body for die+plug	CRN—DN	○		○					13～38

RoHS

Use punch for light load. Not apply punch for heavy load.



① M SNCM220
H 55～58HRC
(Depth 1mm)
S Fe_3O_4 (Black oxide)

②③ M SK4
H 56～60HRC

④ Socket cap head screw
(with loosening prevention treatment)

Catalog No. / Type	D	D_{H6}	A	B	C	E	G	H	J	L	R	S	D_1	d	d_1	t	d_2	d_3	M	A
(For punch)	(10)	+0.009 0	43.7	11.12		35.0	9.0	7.5	26.925	44.5	9.5	12.0	16					—		④M8—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
①②④⑤⑥⑦ CRN—P	13	+0.011 0	50.0	14.27		38.1	12.0	6.5	29.970	50.8	12.7	15.2	19	14	9	9		6.2		
①② CRN—PP	16		53.2	15.87	19.05	39.7	13.5	6.0	31.750	54.0	14.3	16.8	22					9		
(For die)	20	+0.013 0	59.5	17.47		42.8	16.5	5.0	33.530	60.3	17.5	20.0	26	17	11	11	6	12	4	④M10—40 ⑥MSW8 ⑤MSTM6—30 ⑦MS6—20
①③④⑤⑥⑦ CRN—D	25		69.1	19.84	23.82	47.7	22.0	7.0	40.640	69.9	22.2	24.7	31					17		
①③ CRN—DN	32	+0.016 0											38	19	13	14		21		④M12—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
	(38)		76.6	24.00	27.00	51.4	26.0	10.0	43.993	77.4	26.0	28.5	44					—		

D10 is available only for punch ; D38 is available only for die.

Order — Catalog No.
CRN—P 16

Delivery — 3 Days | Express A 200/1Pc. P.38
A flat charge of 540 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9 sets	10～29 sets	30～49 sets	50～100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■U/Price (1～9 sets)

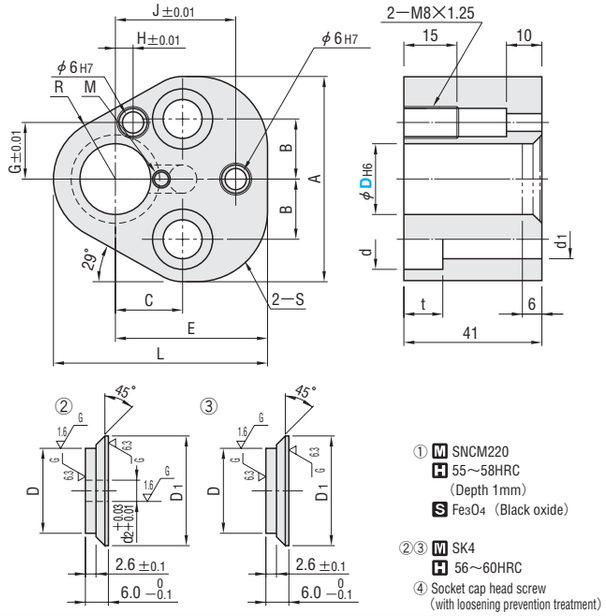
D	CRN—P	CRN—PP	CRN—D	CRN—DN
10	2,900	2,790	—	—
13	2,900	2,790	2,900	2,790
16	3,050	2,930	3,050	2,930
20	3,280	3,160	3,280	3,160
25	3,640	3,520	3,640	3,520
32	4,320	4,180	4,320	4,180
38	—	—	4,320	4,180

BALL-LOCK RETAINERS
—HEAVY LOAD—

Type	Catalog No.	①	②	③	④	⑤	⑥	⑦	D
For punch	BRN—P	○	○		○	○	○	○	10～32
	BRN—PN	○		○	○	○	○	○	
Retainer body +plug	BRN—PP	○	○						
	BRN—PNP	○		○					

RoHS

Use punch for heavy load. Not apply punch for light load.



① M SNCM220
H 55～58HRC
(Depth 1mm)
S Fe_3O_4 (Black oxide)

②③ M SK4
H 56～60HRC

④ Socket cap head screw
(with loosening prevention treatment)

Catalog No. / Type	D	D_{H6}	A	B	C	E	G	H	J	L	R	S	d	d_1	t	D_1	d_2	M	A
(For punch)	10	+0.009 0	43.7	11.12		35.0	9.0	7.5	26.925	44.5	9.5	12.0				16			④M8—45 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
①②④⑤⑥⑦ BRN—P	13	+0.011 0	50.0	14.27		38.1	12.0	6.5	29.970	50.8	12.7	15.2	14	9	9	19			
①② BRN—PP	16		53.2	15.87	19.05	39.7	13.5	6.0	31.750	54.0	14.3	16.8				22			
①③④⑤⑥⑦ BRN—PN	20	+0.013 0	59.5	17.47		42.8	16.5	5.0	33.530	60.3	17.5	20.0	17	11	11	26	6	4	④M10—50 ⑥MSW8 ⑤MSTM6—30 ⑦MS6—20
①③ BRN—PNP	25		69.1	19.84	23.82	47.7	22.0	7.0	40.640	69.9	22.2	24.7	19	13	14	31			④M12—50 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
	32	+0.016 0														38			

Order — Catalog No.
BRN—P 20

Delivery — 3 Days | Express A 200/1Pc. P.38
A flat charge of 540 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9 sets	10～29 sets	30～49 sets	50～100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■U/Price (1～9 sets)

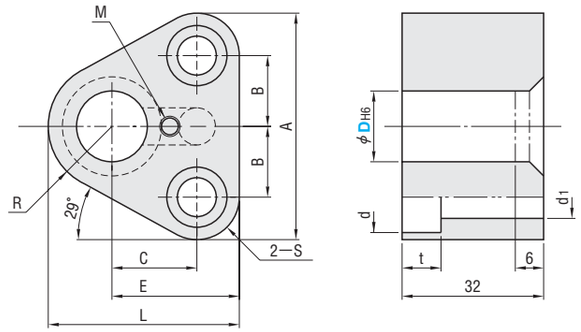
D	BRN—P BRN—PN	BRN—PP BRN—PNP
10	3,500	3,390
13	3,500	3,390
16	3,730	3,610
20	3,730	3,610
25	4,020	3,900
32	4,470	4,340

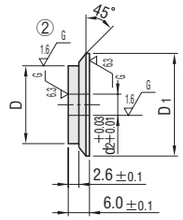
BALL-LOCK RETAINERS
—LIGHT LOAD—

Type	Catalog No.	①	②	③	④	D
For punch	CCRN	○	○	○	○	10～25
Retainer body +plug	CCRN-N	○	○			

RoHS

Use punch for light load. Not apply punch for heavy load.





① M SNCM220
H 55～58HRC (Depth 1mm)
S Fe3O4 (Black oxide)
② M SK4
H 56～60HRC
③ Socket cap head screw (with loosening prevention treatment)

Catalog No. Type	D	DH6	A	B	C	E	L	R	S	d	d1	t	d2	M	A
(For punch) ①②③④ CCRN	10	+0.009 0	41.2	11.12	19.05	29	38.5	9.5	10	14	9	9	6	4	③M 8—40 ④MS6—20
	13	+0.011 0	47.5	14.27			41.7	12.7							
	16		50.7	15.87			43.3	14.3							
①② CCRN—N	20	+0.013 0	56.9	17.47		30	47.5	17.5	11	17	11	11			③M10—40 ④MS6—20
	25		69.1	19.84	23.82	37	59.2	22.2	15	19	13	14			③M12—40 ④MS6—20

Order — Catalog No. CCRN 16

Delivery — 3 Days | Express A 200/1Pc. P.38

A flat charge of 540 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9 sets	10～29 sets	30～49 sets	50～100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■U/Price (1～9 sets)

D	CCRN	CCRN—N
10	3,120	3,080
13	3,420	3,380
16	3,980	3,940
20	4,380	4,320
25	4,910	4,840

BALL-LOCK RETAINERS
—LIGHT LOAD—

For round punch Ⓐ

RoHS

Type	Catalog No.	Components ①	②	③	④	⑦
For round punch	CLN—PS	○	○		○	○
Retainer body +plug	CLN—PN	○	○			

The end retainer sets for round punch do not include ⑤MSTM and ⑥MSW.

For shaped punch and shaped button die D R E G

Type	Catalog No.	Components ①	②	③	④	⑤	⑥	⑦
For shaped punch	CLN—FS	○	○		○	○	○	○
For shaped button die	CLN—DS	○		○	○	○	○	○
Retainer body for shaped punch+plug	CLN—FSN	○	○					
Retainer body for shaped button die+plug	CLN—DSN	○		○				

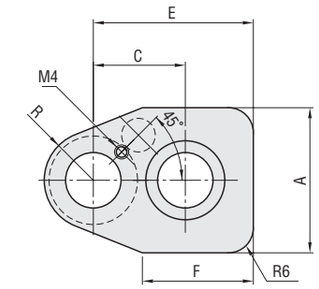
Only D13 and D16 are available for button dies

For round punch

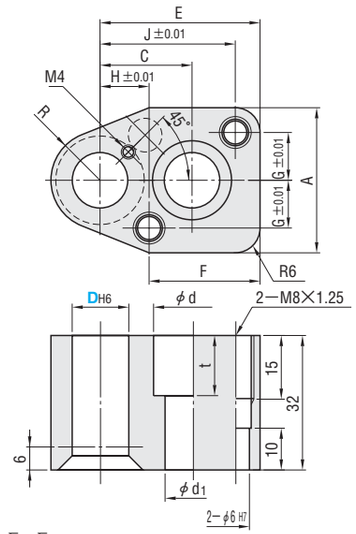
For shaped punch and shaped button die

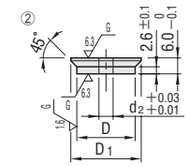
Use punch for light load. Not apply punch for heavy load.

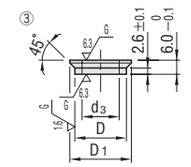
—For round punch—



—For shaped punch and button die—







① M SNCM220
H 55～58HRC (Depth 1mm)
S Fe3O4 (Black oxide)
②③ M SK4
H 56～60HRC
④ Socket cap head screw (with loosening prevention treatment)

Catalog No. Type	D	DH6	A	C	E	F	G	H	J	R	D1	d	d1	t	d2	d3	For round A ④ ⑦	For shaped A ④ ⑤ ⑥ ⑦
(For round punch) ①②④⑦ CLN—PS ①② CLN—PN (For shaped punch and shaped button die) ①②④⑤⑥⑦ CLN—FS ①③④⑤⑥⑦ CLN—DS ①② CLN—FSN ①③ CLN—DSN	10	+0.009 0	34	22	38	26	11	12	32	11.5	16	19	13	14	6	—	④M12—40 ⑦MS6—20	④M12—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
	13	+0.011 0									19					6.2		
	16		36	26	45	33	12		39	13	22	25	17	18		9	④M16—40 ⑦MS6—20	④M16—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20

Order — Catalog No. CLN—PS 10

Delivery — 3 Days | Express A 200/1Pc. P.38

A flat charge of 540 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9 sets	10～29 sets	30～49 sets	50～100 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

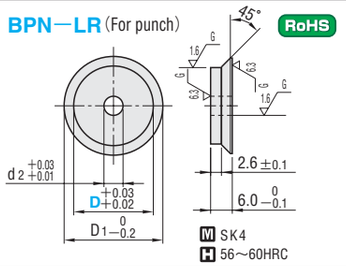
■U/Price (1～9 sets)

D	CLN—PS	CLN—PN	CLN—FS	CLN—DS	CLN—FSN	CLN—DSN
10	2,210	1,880	2,490	—	2,160	—
13	2,370	2,050	2,680	2,680	2,360	2,360
16	2,560	2,200	2,880	2,880	2,520	2,520

BALL-LOCK RETAINERS
—COMPONENTS—

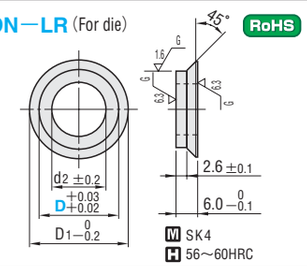
■Backing plugs for ball-lock retainer

BPN—LR (For punch) RoHS



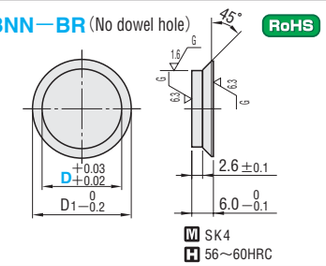
M SK4
H 56～60HRC

BDN—LR (For die) RoHS



M SK4
H 56～60HRC

BNN—BR (No dowel hole) RoHS



M SK4
H 56～60HRC

Applicable retainer	D1	d2	Catalog No. Type	Catalog No. D	U/Price Q'ty : 1～4	5～9	10～19	20～50
CRN—P BRN—P CLN—P CBN—P CCRN CLN—PS CLN—FS LRGD—L/R BRGD—L/R	16	6	BPN—LR	10	570	540	510	480
	19			13				
	22			16				
	26			20				
	31			25	640	610	580	540
	38			32				
CRN—D CLN—D	19	6.2	BDN—LR	13	430	410	390	360
	22	9		16				
	26	12		20				
	31	17		25	510	480	460	430
	38	21		32				
	44	27		38	640	610	580	540
BRN—P CBN—PN	16	—	BNN—BR	10	400	380	360	340
	19			13				
	22			16				
	26			20				
	31			25	480	470	430	410
	38			32				

To be quoted on price & lead time above Max. Q'ty.

■Balls for ball-lock retainer

Applicable retainer	D	Catalog No.	U/Price Q'ty : 1～4	5～9	10～19	20～50
Light load CLN—P CRN—P CCRN CLN—PS CLN—FS CLN—D CRN—D	10～38	BB 8	260	150	80	50
Heavy load CBN—P CRN—P CBN—PN BRN—PN	10	BB 10				
	13～32	BB 13				

■Springs for ball-lock retainer

Applicable retainer	D	Catalog No.	U/Price Q'ty : 1～4	5～9	10～19	20～50
Light load CLN—P CRN—P CCRN CLN—PS CLN—FS CLN—D CRN—D	10～38	BF 8	350	240	130	90
Heavy load CBN—P CRN—P CBN—PN BRN—PN	10	BF 10				
	13～32	BF 13				

Order — Catalog No. BPN—LR25

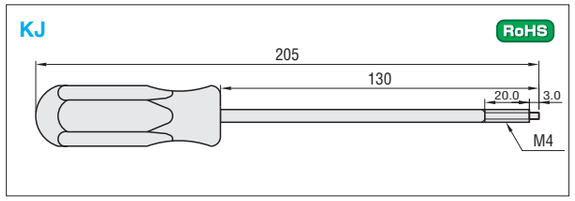
Delivery — 3 Days — Express A 200/1Pc.

A flat charge of 540 yen for 3 pieces or more of the same size.

P.38

■Jig for demounting punch

KJ RoHS

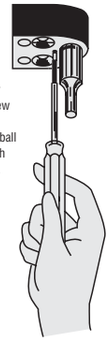


Catalog No.	U/Price Q'ty : 1～4	5～9	10～19	20～50
KJ	300	280	270	250

To be quoted on price & lead time above Max. Q'ty.

Order — Catalog No. KJ

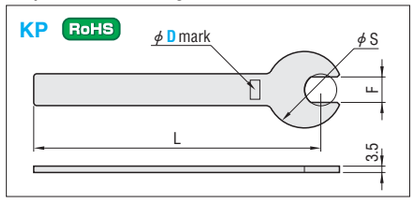
Delivery — 1 Day



- Push in the screw tip of the jig. This makes the ball go up, the punch will be released.

■Spanners for checking lock

KP RoHS



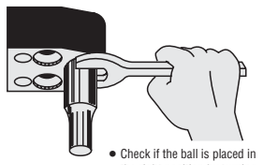
D	F	S	L	Catalog No. Type	Catalog No. D	U/Price Q'ty : 1～4	5～9	10～19	20～50
10	8	20	83	KP	10	1,590	1,510	1,430	1,350
13	10	25	84		13				
16	13	30	85		16				
20	17	36	105		20				
25	22	45	106		25				
32	29	52	125		32				
38	35	58	124		38				

To be quoted on price & lead time above Max. Q'ty.

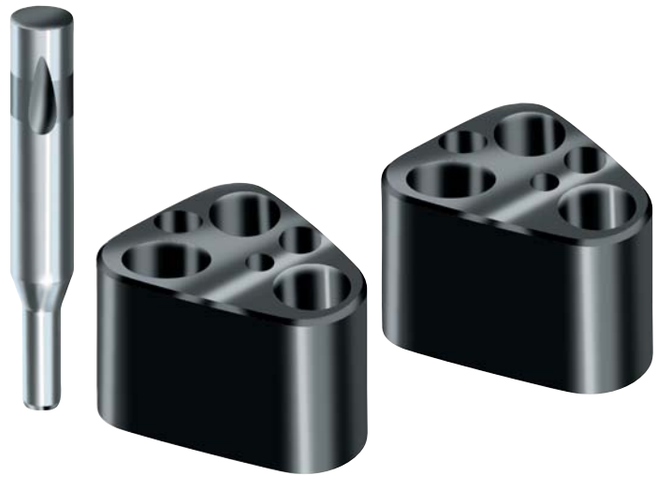
Order — Catalog No. KP 32

Delivery — 1 Day

Example



- Check if the ball is placed in the right position by turning spanner in the groove of the punch to the right and left.

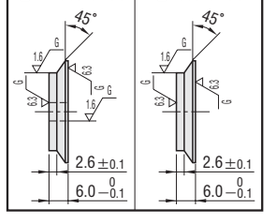


SPECIAL RETAINER SETS
—FOR BALL-LOCK PUNCH—

RoHS

Backing plug

A type	B type
⑤With a dowel hole	⑥No dowel hole

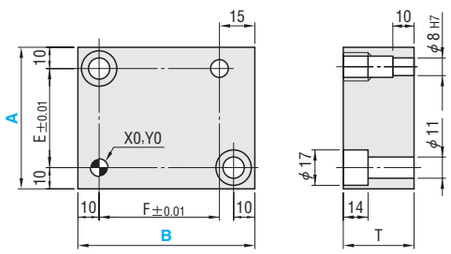


Backing plugs of A type (with dowel hole) are attached unless specified.
If Backing plugs of B type are required, add the letter B after the indication of punch shape (either R or F)
(ex.LRGD—L80100—RB13···)
・Backing Plugs P.709

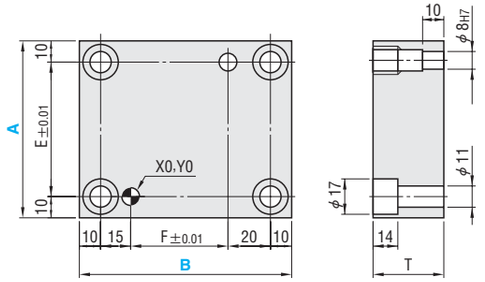
① M SNCM220
H 55~58HRC Depth 1mm
② Socket cap head screw (with loosening prevention treatment)
⑤⑥ M SK4
H 56~60HRC

Retainer size

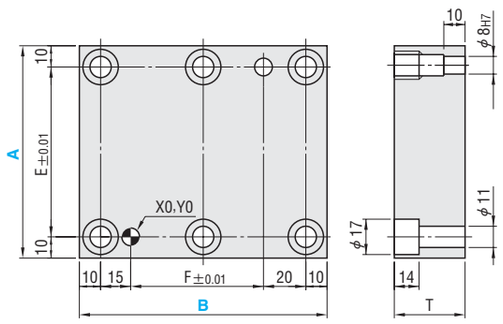
A	B	E	F	T	A
50	60	30	35	LRGD 32	②M10—40 2P ③MSW10 2P ④MSTM8×30 2P
	80		55		
60	80	40	55	BRGD 40	
	100		75		



A	B	E	F	T	A
80	80	60	25	LRGD 32	②M10—40 4P ③MSW10 2P ④MSTM8×30 2P
	100		45		
	125		70		
100	100	80	45	BRGD 40	
	125		70		
	150		95		

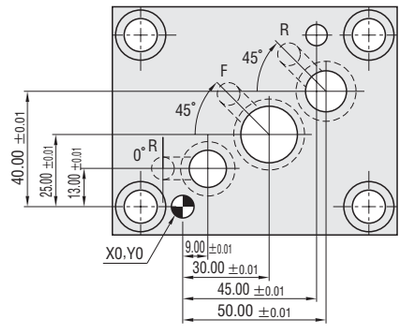


A	B	E	F	T	A
125	150	105	95	LRGD 32	②M10—40 6P ③MSW10 2P ④MSTM8×30 2P
	175		120		
150	175	130	120	BRGD 40	
	200		145		



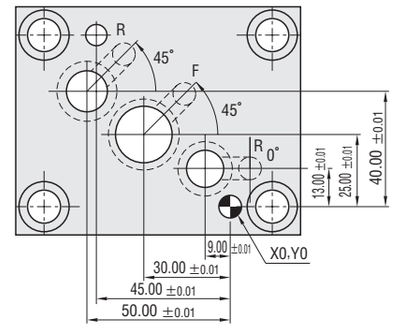
EX.1 Left type

Light load type LRGD—L
Heavy load type BRGD—L

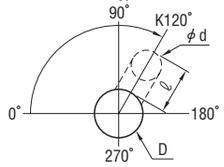


EX.2 Right type

Light load type LRGD—R
Heavy load type BRGD—R



Ball location (left type)



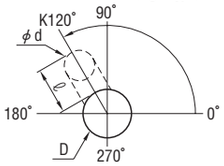
Space for ball hole

Catalog No.		D	φd	ℓ
Light load	LRGD—L LRGD—R	φ10~32	8	13
Heavy load	BRGD—L	φ10	10	15
	BRGD—R	φ13~32	12	17

Tolerance for ball location

R	F
±30' Machining	±5' Grinding

Ball location (right type)



Order

(1) Selection of the retainer type (left type, right type)
(2) Selection of the retainer plate from the detail standard on the left page
(3) Selection of the type of punch (round type or shaped type) and the diameter
Backing pulg A type < For round, D is indicated after the mark R. / For shaped, D is indicated after the mark F.
Backing plug B type < For round, D is indicated after the mark RB. / For shaped, D is indicated after the mark FB.
(4) Selection of the position of punch hole T X±0.01 Y±0.01
Position is indicated by X and Y axis from the center of datum hole.
Distance between both punching holes requires 2mm or more in order to prevent interference.
(5) Selection of the position of ball
Angle K is indicated in 1° increments.

	(1) Plate Type	(2) A B	(3) R(B)・F(B)・D	(4) X — Y	(5) K
EX.1 Left	LRGD—L	80 100	R13	X 9.00 — Y13.00	K 0
			F20	X30.00 — Y25.00	K45
			R16	X50.00 — Y40.00	K45
EX.2 Right	BRGD—R	80 100	RB13	X 9.00 — Y13.00	K 0
			FB20	X30.00 — Y25.00	K45
			RB16	X50.00 — Y40.00	K45

Delivery 12 Days

Price

A	Retainer plate U/Price Light load LRGD—L LRGD—R	Alteration cost/1Hole (For round) R	(For shaped) F
50・60	16,640	6,110	11,420
80・100	18,440		
125・150	22,760		

A	Retainer plate U/Price Heavy load BRGD—L BRGD—R	Alteration cost/1Hole (For round) R	(For shaped) F
50・60	20,150	7,910	14,030
80・100	21,860		
125・150	26,270		

Express service system P.38 | MISUMI Press 2007 | http://misumi.jp/press/ | For inquiry, ordering and other information, refer to P.1269

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

COMPONENTS

COMPONENTS

Name	DOWEL PINS	PINS—High precision type—	—Precision type with tapping—	—p6 type with tapping / m6 type with tapping—	—Tapered type with tapping—	—h7 straight type—
Catalog No.	MS	MSV	MSTP	MST MSTM	MTT	MSSH
Delivery	①	①	①	①	①	①
Page	715	715	715	715 716	716	716

Add.

—h7 type with tapping—	DOWEL PINS ECONOMY PACK	SPRING PLUGS FOR DOWEL PINS	STEPPED DOWEL PINS	DOWEL PIN EXTRACTOR	DOWEL RINGS
MSTH	100PACK-MSTH 200PACK-MSTH	SWA SWAL	MSFW MSFWM	KNHN KNHN-B KNHN-M	DAS DASP
①	⑤	①	①	③Ⓐ	①
716	717	717	718	718	719

Add. New

DOWEL PIN BUSHINGS		HEXAGON SOCKET HEAD CAP SCREWS	SPRING WASHERS	HEXAGON SOCKET HEAD CAP SCREWS		HEXAGON SOCKET HEAD FLAT BOLTS		LOW HEAD CAP SCREWS			LOOSENING PREVENTION WASHERS
KNLB	KNLBB	CB	CBW	LB	SCB	FB	FBJ	CBS	CBSST	CBSS	NLDP NLDP-B
①	③ⓉⒶ	①	①	①	①	①	①	①	①	①	①
720		721	722	723		724		725			726

Delivery Shortened New

WASHERS / SPACERS											FREE WASHERS —Tapped type—		—Counterbore type—		LOOSENING PREVENTION SCREW PLUGS	SCREW PLUGS		
MSRB	SW	K	W	T	R	J	LRB	SRW	SBW	WSS	FWSS	FWSK	FWMS	FWMK	FWZS FWZK	LMSW	MSW	MSWA MSWZ
①							①		①		③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ ③Ⓐ	①	①	① ①
727							728		728		729		729		729	730	731	

SCREW PLUGS—Short type—			—Through hole type—	—Hole/Short type—		STRIPPER BOLTS		—Outside screw dimension L precision type—	STROKE EXTENSION RETAINERS FOR STRIPPER BOLT
MSWS	MSWAS	MSWZS	MSWH MSWZH	MSWSH	MSWZSH	MSB	SMSB	MSBL	MSBE
①	①	①	①			①	①	⑤Ⓑ	③Ⓐ
731			732			735		736	736

STRIPPER BOLTS—Female screw type—								—Bushing / semi-finished type—		—Bushing / thick type—	PRESSURE PINS FOR STRIPPER	PRESSURE PINS FOR STRIPPER
SBT	SBTN	SBTC	SBTCN	SBTL	SBTLN	SBTK	SBTKN	SBTH	SBRH SBJH SB	SBWH	HSPP HSPPH	PWP
①					③ⓉⒶ			③ⓉⒶ		③ⓉⒶ	③Ⓐ	③ⓉⒶ
737								739		740	741	741

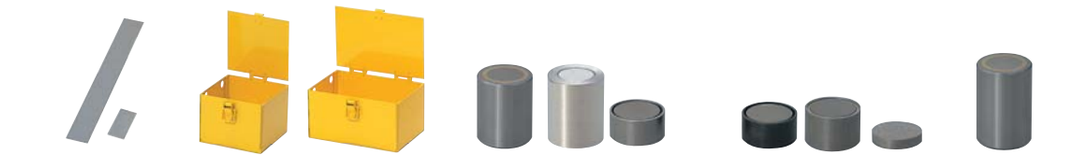
PRESSURE PINS FOR STRIPPER		HANG COLLARS FOR STRIPPER		ADJUST PINS			PRESSURE PINS	STROKE END BLOCKS—Quenched type—	
SBKP	SBKS	SBKT	SBK	PIN	PIN-N PINH PINH-N		PRPS PRP	SBV	SBVH
③Ⓐ	③ⓉⒶ	③Ⓐ	③ⓉⒶ		③Ⓐ		③	③ⓉⒶ	③Ⓐ
742		742		743			744	745	

Add.

—Quenched type tapped—	STROKE END BLOCKS	—Quenched / square type—	CHAINS FOR END BLOCK	AIR JET COOLERS FOR DIE
SBVM	SBS SBN SEC	SBVK	RSC	PAJC
③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	①
746	747	748	748	749

New

COUPLINGS FOR FLUORORESIN TUBES	FLUORORESIN TUBES	TUBES FOR AIR PIPING	ADJUSTING HOSES	LAYERED PLATES FOR SPACER		SHIM TAPES		
MCPT	PUTF · PUTFL	M—UB	HOSAJ	LHP	LHP-H LHP-SET	FGSM	FGSMW	FGSML
①	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③Ⓐ		①	①	①
750	750	750	750	751		752		



PRECISION UTILITY PLATES		SPARE PUNCH BOXES		MAGNETS			MAGNETS			MAGNETS
UTPB	UTPL	PBX100Y	PBX150Y	MG	MGN	HX	HXH	HXU	HXMB	MLG
⑤Ⓑ	⑤	①	①		①			①		③Ⓐ
753		754			755			755		756

Delivery Shortened Delivery Shortened

MAGNET—Press-fit type—		NAME PLATES FOR DIE	NAME STICKERS FOR DIE	ADHESIVE CEMENT		ADHESIVE CEMENT—Stick type—		CLEANER
MGATA	MGATB	KNP	KNS	LOC638	LOC242	LOC268	LOC248	METACL
③Ⓐ	③Ⓐ	①	①	①		①		①
756	756	757	757	758		758		758

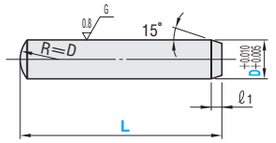
MOLD CHECKS—Shinmyotan—		VOLATILE CORROSION INHIBITOR FILMS
N-RED	SP-RED	RSHT□ RBAG□ PBAG□ PBOX□
①		③⑤
758		759

DOWEL PINS

PRESS ADD.SPEC. Printed in Red

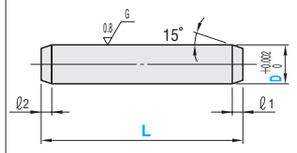
RoHS

MS (Straight type)



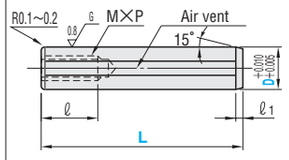
M SUJ2
H 58HRC～

MSV (High precision type)



M SUJ2
H 58HRC～

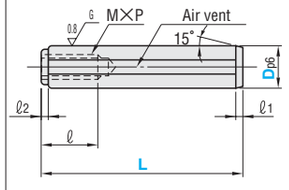
MSTP (Precision type with tapping)



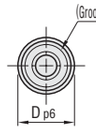
If L is 10 with a D5 and 6, the pilot hole may go through.

M SUJ2
H 58HRC～

MST (p6 type with tapping)



If L is 10 with a D5 and 6, the pilot hole may go through.



M SUJ2
H 45～50HRC

Dimension ℓ1 and ℓ2 are reference values. They may sometimes become greater depending on the results of grinding of outer diameter.

ℓ1	Catalog No. Type	D	L	U/Price 0～299	300～499	500～1999	2000～4000
0.4	MS	1	6 8 10	28	26	25	24
0.6		1.5	6 8 10	20	19	18	17
1.0		2	10 15 6 8 20	14 20	12 19	11 18	11 17
		2.5	8 10 15 20 6 25 30	14 20	12 19	11 18	11 17
		3	10 15 20 6 8 25 30 35 40	8 20	7 19	6 18	6 17
1.5		4	10 15 20 8 25 30 35 40 45 50	10 20	9 19	8 18	8 17
		5	10 15 20 25 30 8 35 40 45 50	14 20	12 19	11 18	11 17
2.0		6	15 20 25 30 8 10 35 40 45 50 55 60	16 28	14 26	12 25	12 24
2.5		8	30 40 50 10 15 20 25 35 45 55 60 65 70 80	27 38	24 34	21 30	20 30
3.0		10	40 50 60 15 20 25 30 35 45 55 65 70 80	38 68	34 64	30 61	30 58
3.5		12	40 50 60 20 25 30 35 45 55 70 80	55 70	49 66	44 63	43 60
		13	40 50 60 30 70 80	70 80	67 76	63 72	60 68

ℓ1	ℓ2	Catalog No. Type	D	L	U/Price 0～299	300～499	500～1999	2000～4000
1.0	0.2	MSV	2	6 8 10	80	76	72	68
	0.5		3	8 10 15 20 25 30	60	57	54	51
1.5			4	10 15 20 25 30	60	57	54	51
			5	10 15 20 25 30	80	76	72	68
2.0			6	10 15 20 25 30	80	76	72	68
2.5			8	20 30 40	100	95	90	85
3.0			10	30 40 50 60	140	133	126	119

The high precision dowel pins are measured in a thermostatic chamber.

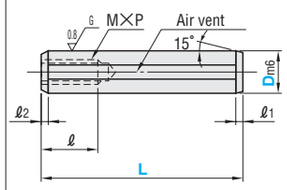
ℓ1	M×P	ℓ	D	Catalog No. Type	D	L	U/Price 0～299	300～499	500～1999	2000～4000
1.5	3×0.5	*6	+0.010 +0.005	MSTP	5	10 15 20 25 30	60	57	54	51
2.0	4×0.7	*8			6	20 30 10 15 25 35 40 50	40 45	38 42	36 40	34 38
	5×0.8				8	30 15 20 25 35 40 45 50 60 70 80	40 50 100	38 47 95	36 45 90	34 43 85
2.5	6×1.0	10			10	40 15 20 25 30 35 45 50 60 70 80	45 55 100	42 52 95	40 49 90	38 47 85
					12	20 30 40 50 60 70 80	70 100	66 95	63 90	60 85
	8×1.25	15			13	50 40 60 70 80	70 80	66 76	63 72	60 68
3.0					16	40 50 60 70	100	95	90	85

*ℓ=6 is a reference value when D=5. *Only when D=6 and L=10, ℓ=6.

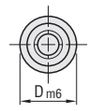
ℓ1	ℓ2	M×P	ℓ	Dp6	Catalog No. Type	D	L	U/Price 0～299	300～499	500～1999	2000～4000
1.5	0.5	3×0.5	*6	+0.020 +0.012	MST	5	10 15 20 25 30	60	57	54	51
2.0	0.7	4×0.7	*8			6	20 30 10 15 25 35 40 50	40 45	38 42	36 40	34 38
		5×0.8		+0.024 +0.015		8	30 15 20 25 35 40 45 50 60 70 80	40 50 100	38 47 95	36 45 90	34 43 85
2.5		6×1.0	10			10	40 15 20 25 30 35 45 50 60 70 80	45 55 100	42 52 95	40 49 90	38 47 85
						12	20 30 40 50 60 70 80	70 100	66 95	63 90	60 85
	1.0	8×1.25	15	+0.029 +0.018		13	50 40 60 70 80	70 80	66 76	63 72	60 68
3.0						16	60 40 50 70 80	90 100	85 95	81 90	77 85
		10×1.5	18	+0.035 +0.022		20	50 60 70 80	140	133	126	119

*ℓ=6 is a reference value when D=5. *Only when D=6 and L=10, ℓ=6.

MSTM (m6 type with tapping)

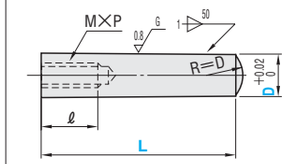


If L is 10 with a D5 and 6, the pilot hole may go through.



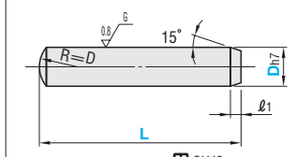
M SUJ2
H 45～50HRC

MTT (Tapered type with tapping)



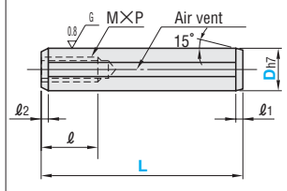
M SK4
H 45～50HRC

MSSH (h7 straight type)



M SUJ2
H 58HRC～

MSTH (h7 type with tapping)



If L is 10 with a D5 and 6, the pilot hole may go through.

M SUJ2
H 45～50HRC

Dimension ℓ1 and ℓ2 are reference values. They may sometimes become greater depending on the results of grinding of outer diameter.

ℓ1	ℓ2	M×P	ℓ	Dm6	Catalog No. Type	D	L	U/Price 0～299	300～499	500～1999	2000～4000
1.5	0.3	M3×0.5	*6	+0.012 +0.004	MSTM	5	10 15 20 25 30	60	57	54	51
2.0		M4×0.7	*8			6	20 30 10 15 25 35 40 50	40 45	38 42	36 40	34 38
	0.5	M5×0.8		+0.015 +0.006		8	30 15 20 25 35 40 45 50 60 70 80	40 50 100	38 47 95	36 45 90	34 43 85
2.5		M6×1.0	10			10	40 15 20 25 30 35 45 50 60 70 80	45 55 100	42 52 95	40 49 90	38 47 85
	1.0					12	20 30 40 50 60 70 80	70 100	66 95	63 90	60 85
		M8×1.25	15	+0.018 +0.007		13	50 40 60 70 80	70 80	66 76	63 72	60 68
3.0	1.5					16	60 40 50 70 80	90 100	85 95	81 90	77 85
		M10×1.5	18	+0.021 +0.008		20	50 60 70 80	140	133	126	119

*ℓ=6 is a reference value when D=5. *Only when D=6 and L=10, ℓ=6.

M×P	ℓ	Catalog No. Type	D	L	U/Price 0～299	300～499	500～1999	2000～4000
M5×0.8	9	MTT	8	30 40	80	76	72	68
M6×1.0	10		10	40 50	110	105	99	94
			12	40 50	150	143	135	128
M8×1.25	14		13	50 60	150	143	135	128
M10×1.5	16		16	60 70	280	266	252	238

ℓ1	Dh7	Catalog No. Type	D	L	U/Price 0～299	300～499	500～1999	2000～4000
1.0	0 −0.010	MSSH	2	6 8 10 15	160	152	144	136
			3	8 10 15 20	150	143	135	128
1.5	0 −0.012		4	10 15 20	150	143	135	128

ℓ1	ℓ2	M×P	ℓ	Dh7	Catalog No. Type	D	L	U/Price 0～299	300～499	500～1999	2000～4000
1.5	0.3	M3×0.5	*6	0 −0.012	MSTH	5	10 15 20 25 30	60	57	54	51
2.0		M4×0.7	*8			6	10 15 20 25 30 35 40 50	40 80	38 76	36 72	34 68
	0.5	M5×0.8		0 −0.015		8	15 20 25 30 35 40 45 50 60 70 80	50 85 150	47 80 142	45 76 135	43 72 127
2.5		M6×1.0	10			10	15 20 25 30 35 40 45 50 60 70 80 100 120	45 90 160 240	42 85 152 228	40 81 144 216	38 76 136 204
	1.0					12	20 30 40 50 60 70 80 100 120	65 100 180 280	62 95 171 266	59 90 162 252	55 85 153 238
		M8×1.25	15	0 −0.018		13	40 50 60 70 80 100 120	70 120 220 330	66 114 209 313	63 108 198 297	60 102 187 280
3.0	1.5					16	40 50 60 70 80 100 120 150	90 140 300 350 490	85 133 285 332 465	81 126 270 315 441	77 119 255 297 416
		M10×1.5	18	0 −0.021		20	60 70 80 100	210 420 490	199 399 465	189 378 441	178 357 416

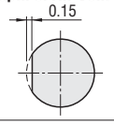
*ℓ=6 is a reference value when D=5. *Only when D=6 and L=10, ℓ=6. MSTH economy pack P.717

Order — Catalog No. — L — MS2 — 20

Delivery — 1 Day

Price — To be quoted on price & lead time above Max. Q'ty.

Depth of Air Vent



Since these products are finished by barrel finishing,this value is for reference only. Same depth is applied to all dimension D.

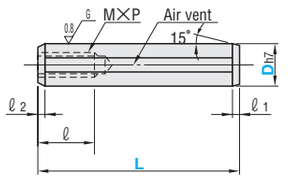
Subject item :MSTP
MST
MSTM
MSTH

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

DOWEL PINS / SPRING PLUGS FOR DOWEL PINS

■Dowel pins h7 type with tapping RoHS

100PACK—MSTH(100 Pieces)
200PACK—MSTH(200 Pieces)



If L is 10 with a D5 and 6, the pilot hole may go through.

M SUJ2
H 45～50HRC

ℓ1	ℓ2	M×P	ℓ	Dh7	Catalog No. PACK	Type	D	L
1.5	0.3	3×0.5	6	0 −0.012	100PACK (100 Pieces) 200PACK (200 Pieces)	MSTH	5	10 15
2.0	0.3	4×0.7	6	0 −0.012			6	10
			8					15 20 25 30
2.0	0.5	5×0.8	8	0 −0.015			8	20 30 40
2.5	0.5	6×1.0	10	0 −0.015			10	30 40

Order

Catalog No. PACK	Type	D	—	L
(When 100 Pieces) 100 PACK—MSTH		6	—	20
(When 200 Pieces) 200 PACK—MSTH		6	—	20

Delivery 5 Days

Pack products are shipped on the 5th from receipt of order. Please order the conventional products (MSTH) for your immediate need. P.716

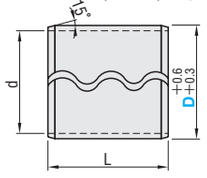
Price

Catalog No. Type	D-L	U/Price 100 PACK (100 Pieces)
100 PACK—MSTH (100 Pieces)	5-10	5,500 (55 yen per piece)
	5-15	5,500 (55 yen per piece)
	6-10	3,700 (37 yen per piece)
	6-15	3,700 (37 yen per piece)
	6-20	3,700 (37 yen per piece)
	6-25	3,700 (37 yen per piece)
	6-30	3,700 (37 yen per piece)
	8-20	4,600 (46 yen per piece)
	8-30	4,600 (46 yen per piece)
	8-40	4,600 (46 yen per piece)
	10-30	4,100 (41 yen per piece)
	10-40	4,100 (41 yen per piece)

Catalog No. Type	D-L	U/Price 200 PACK (200 Pieces)
200 PACK—MSTH (200 Pieces)	5-10	10,400 (52 yen per piece)
	5-15	10,400 (52 yen per piece)
	6-10	7,000 (35 yen per piece)
	6-15	7,000 (35 yen per piece)
	6-20	7,000 (35 yen per piece)
	6-25	7,000 (35 yen per piece)
	6-30	7,000 (35 yen per piece)
	8-20	8,800 (44 yen per piece)
	8-30	8,800 (44 yen per piece)
	8-40	8,800 (44 yen per piece)
	10-30	7,800 (39 yen per piece)
	10-40	7,800 (39 yen per piece)

■Spring plugs for dowel pins RoHS

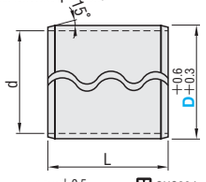
SWA (For plates like FC250, SS400, etc.)



Tolerance of D6 +0.5 +0.3 — M SAE1065

■Spring plugs for dowel pins RoHS

SWAL (For hardened plates)



Tolerance of D6 +0.5 +0.3 — M SUS304—CSP—H
No spec. available for D20

SWA ※Pullout strength N(kgf)	SWA d	SWAL ※Pullout strength N(kgf)	SWAL d	L	Catalog No. Type	D (Dowel pins)	U/Price Q'ty:1～49 SWA	SWAL
392 {40}	4.4	245 {25}	4.8	6	SWA SWAL	6	65	80
1373 {140}	5.6	785 {80}	6.4	8		8	75	90
2354 {240}	6.4	1275 {130}	7.5	12		10	85	105
1765 {180}	8.0	981 {100}	9.2			12	95	115
1716 {175}	9.0	981 {100}	10.2			13	100	120
1422 {145}	11.0	785 {80}	12.5			16	120	140
1471 {150}	15.0	—			SWA	20	145	—

※Pullout strength is the average value of repeating ten times pullout from the H7 hole.The pullout strength will vary depending on the dimension D tolerance of spring plugs, surface roughness of press fit holes, tolerances, etc.

Order Catalog No. SWA 12

Delivery 1 Day

Price

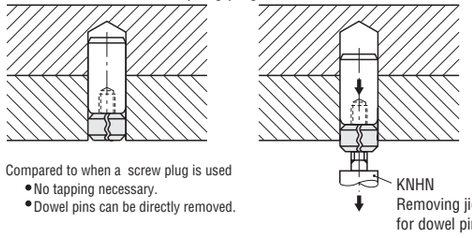
■Volume discount rate P.37

Quantity	1～49	50～199	200～499	500～1000
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example

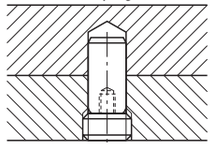
〈If a spring plug is used〉



Compared to when a screw plug is used
- No tapping necessary.
- Dowel pins can be directly removed.

KNHN Removing jig for dowel pin

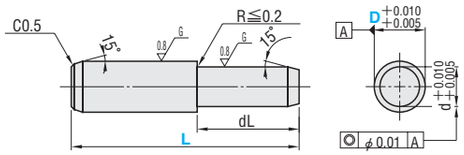
〈If a screw plug is used〉



STEPPED DOWEL PINS / DOWEL PIN EXTRACTOR

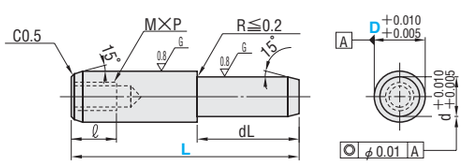
■Stepped dowel pins RoHS

MSFW



M SUJ2
H 58HRC～

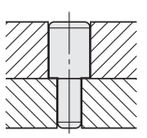
MSFWM (Tapped)



M SUJ2
H 58HRC～

MSFWM only M×P	MSFWM only ℓ	d	dL	Catalog No. Type	Catalog No. D	L	U/Price Q'ty:1～49 MSFW	U/Price Q'ty:1～49 MSFWM
—	—	4	5	MSFW MSFWM (Tapped)	5	15	430	—
			10			25		
—	—	5	10		6	20	470	—
3×0.5	6		15			30		530
4×0.7	8	6	10		8	25	570	630
			15			35		
5×0.8		8	15		10	35	790	860
			15			40		
6×1.0	10	10	20		13	45	1,140	1,220
			25			55		
			30			70		

Example



Useful for drop-prevention and correction.

Order Catalog No. MSFW 10 — 35

Delivery 1 Day

Price

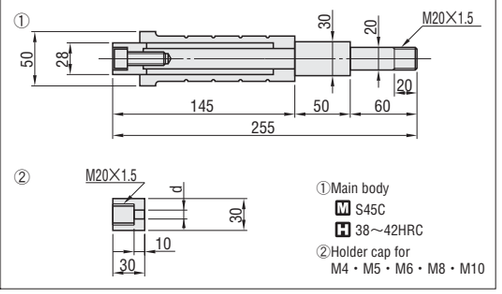
■Volume discount rate P.37

Quantity	1～49	50～99	100～299	300～500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Dowel pin extractor RoHS

KNHN (①Main body 1pc.+②Holder caps 1pc.)
KNHN—B (①only)
KNHN—M (②only)



①Main body
M S45C
H 38～42HRC
②Holder cap for M4・M5・M6・M8・M10

Catalog No.	U/Price Q'ty:1～9Sets	U/Price 10～20
KNHN (①+②)	10,000	9,500

Catalog No.	U/Price Q'ty:1～9	U/Price 10～20
KNHN—B (①only)	7,200	6,840

d	Catalog No. Type	Catalog No. No.	U/Price Q'ty:1～9	U/Price 10～20
4.2	KNHN—M (②only)	4	1,000	950
5.2		5		
6.3		6		
8.5		8		
10.5		10		

Order Catalog No. KNHN / KNHN—M 5 / KNHN—B

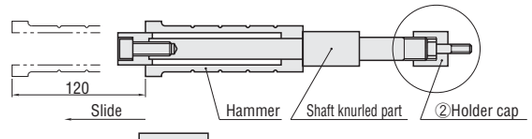
Delivery 3 Days

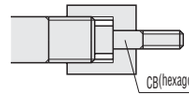
Express A 300/1pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size.

Price To be quoted on price & lead time above Max. Q'ty.

■How to use
1.Insert a hexagon socket head cap screw into a holder cap.
2.Install a ②holder cap on the tip of the main body.
3.Install the top of a screw to a dowel pin by rotating a shaft knurled part.
4.Slide the hammer and pull the dowel pin.





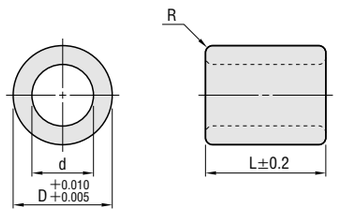
P.721

PRESS NEW

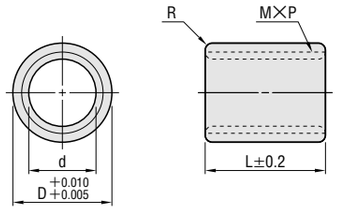
DOWEL RINGS

RoHS

DAS



DASP (With tapping)



M SUJ2 H 55HRC～

D	L	d	R	M×P (Extraction tapping)	Catalog No. Type	Catalog No. No.	U/Price DAS Q'ty:1～49	U/Price DASP Q'ty:1～49
6	8	4.2	0.4	—	DAS DASP	※4	125	—
8	10	5.2	0.4	6×1.0		5	135	160
10	12	6.3	0.6	8×1.25		6	145	170
12	16	8.4	0.7	10×1.5		8	155	180
14	20	10.4	0.8	12×1.75		10	165	190
18	24	12.5	0.8	14×2.0		12	175	220

※No.4 is available only as DAS.
DASP is thinner than DAS. Consequently, use DAS or DASP that is one size larger in places where rigidity is required.

Order Catalog No. DAS 6

Delivery 1 Day

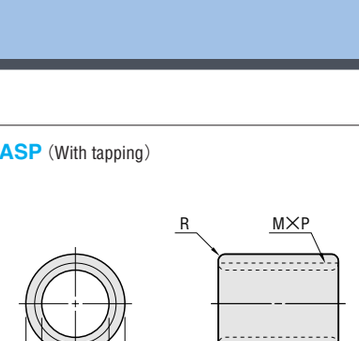
Price

■Volume discount rate P.37

Quantity	1～49	50～99	100～199	200～299
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example



：Dowel rings

■Features

- It enables the positioning to the same degree of that of the dowel pin.
- Positioning and clamping can be done in a single operation, saving space.
- Only end milling is enough. Reaming is unnecessary.
- Defects of positioning accuracy are absorbed due to the elastic deformation of the dowel ring.

■How to mount the dowel ring

(1) Dimensions for machining holes on plates

Hole on fixed plate (press fit)

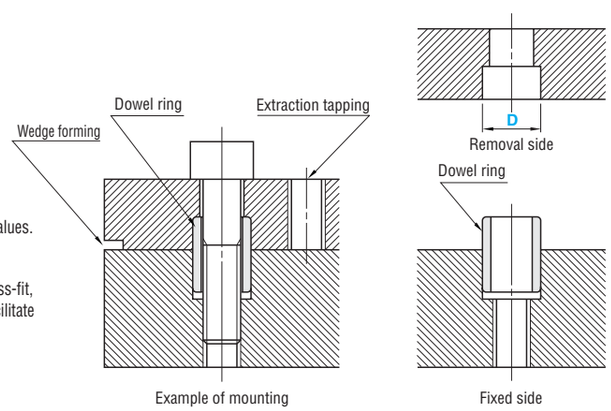
Actual O.D. of dowel ring $^{+0.015}_{0}$

Hole on removal plate (clearance fit or transion fit)

Actual O.D. of dowel ring $^{0}_{-0.015}$

The hole machining dimensions vary with the plate material, hardness, application, etc. so use the values here as reference values.

(2) If positioning accuracy is necessary and both ends are to be press-fit, form an extraction tapping or a wedge in the plate in order to facilitate removal.

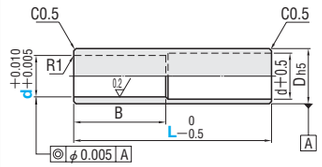


DOWEL PIN BUSHINGS / DOWEL PIN BUSHING BLANKS

The volume discount rate is also applicable to alteration cost. P.39

RoHS

KNLB (Dowel pin bushings)

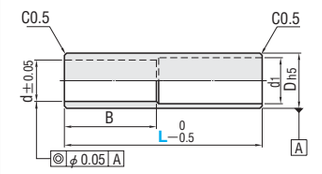


M SUJ2
H 58～62HRC

Dh5		B	Catalog No. Type	Catalog No. d	L	U/Price Q'ty:1～9
10	0 −0.006	13	KNLB	6	10 15 20 25	1,000
					30 35 40 45	1,130
					50 55 60	1,280
12	0 −0.008	15		8	15 20 25 30	1,090
					35 40 45 50 55	1,250
					60 65 70 75 80	1,400
14		20		10	20 25 30	1,190
					35 40 45 50 55	1,340
					60 65 70 75 80	1,490
16		25		12	25 30	1,280
					35 40 45 50 55	1,430
					60 65 70 75 80	1,580
18				13	30	1,390
					35 40 45 50 55	1,550
					60 65 70 75 80	1,690

When L≦B →L =B
■Method of adhesion:Loctite adhesive No.638 made by Henkel Japan

KNLBB (Dowel pin bushing blanks)



M SUJ2
H 58～62HRC

Dh5		d	d1	B	Catalog No. Type	Catalog No. No.	L 0.5 mm increments	U/Price Q'ty:1～9
10	0 −0.006	5.8	6.5	13	KNLBB (No finishing treatment on the inner surface)	6	10～60	970
12	0 −0.008	7.8	8.5	15		8	10～80	1,010
14		9.8	10.5	20		10		1,050
16		11.8	12.5	25		12		1,130
18		12.8	13.5			13		1,220

When L≦B →L =B
■How to use:Use Loctite adhesive or press fit, then finish the inner diameter by jig grinding.

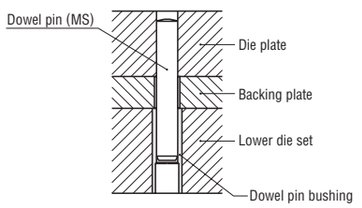
Order Catalog No. — L
KNLB 10 — 50

Delivery
- KNLB: 1 Day
- KNLBB: 3 Days

Express T 600/1pc. / Express A 300/1pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Example



The recommended clearance when applying Loctite is 0.01～0.03mm on one side. If you are using it with nearly zero clearance in order to achieve positional accuracy, apply alteration DRC.

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

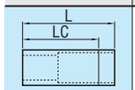
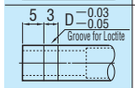
To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. — L(LC) — (DRC)
KNLB8 — LC50.5 — DRC

3 Days / Express T 600/1pc. / Express A 300/1pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Alteration	Code	Spec.	¥/1Code
	LC	Changes dimension L 10≦LC＜Lmax 0.5 mm increments Applicable to KNLB	200
	DRC	Adds groove for Loctite	200

HEXAGON SOCKET HEAD CAP SCREWS / SPRING WASHERS

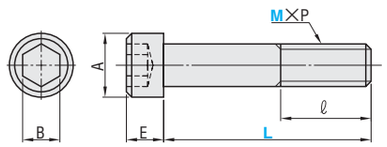
Price revision
The price revision of CBW will come into effect from October 1, 2007. Until the end of September, please refer to the prices in the old catalog. We apologize for the inconvenience.

Price Revised

: New Price : Reduced Price

RoHS

CB



Detailed dimensions Right Page

M SCM435(M3～M20) SCM440(M24)
H 38～43HRC(M3～M20) 32～37HRC(M24)
Threaded part：JIS B 0205 grade 2
S Black oxide (Fe_3O_4)
(Precision of bolts JIS B 1176 Strength class 12.9（M3～M20） 10.9(M24))

ℓ	Catalog No. Type M — L	U/Price Less※	U/Price Over※	※ Q'ty
Full thread	CB 3— 5	4	3	800
	6			
	8			600
	10			
	12			
	14			
	15			
	16			
	18			
	20			
	22	5	4	
	25			
18	30	7	6	200
	35			
	40	8	7	
	45	13	12	500
	50	20	19	
	55			
	60	60	59	
	65	65	64	
Full thread	CB 4— 5	4	3	600
	6			
	8			
	10			400
	12			
	14			
	15			
	16			
	18			200
	20			
	22			
	25			
20	30	5	4	
	35	6	5	100
	40	7	6	
	45	8	7	
	50	9	8	
	55	18	17	400
	60	20	19	
	65	40	39	300
	70	45	44	
	75	50	49	
Full thread	CB 5— 5	10	9	1000
	6			400
	8	4	3	600
	10			
	12			
	14			400
	15			
	16			
	18			
	20			
	22			
	25			200
22	30	5	4	
	35	6	5	
	40	7	6	
	45	8	7	100
	50	9	8	
	55	10	9	
	60	12	11	

ℓ	Catalog No. Type M — L	U/Price Less※	U/Price Over※	※ Q'ty
22	CB 5— 65	13	12	100
	70	14	13	
	75	16	15	
	80	19	18	
	85	30	29	
	90			
	95	50	49	
	100			
	110	65	64	
	120	75	74	
	130	85	84	
	140	95	94	
Full thread	CB 6— 6	15	14	500
	8	5	4	400
	10	4	3	300
	12			
	14			200
	15			
	16			
	18			
	20	5	4	
	22			
	25			
	30	6	5	
24	35	7	6	100
	40	8	7	
	45	9	8	
	50	10	9	
	55	11	10	
	60	12	11	
	65	14	13	
	70	15	14	
	75	16	15	
	80	19	18	
	85	20	19	
	90	21	20	
	95	25	24	
	100	28	27	
	110	40	38	
	120	80	78	
	130	100	98	
	140	130	128	
	150	150	148	
Full thread	CB 8— 8	15	14	200
	10	8	7	
	12			
	15			
	16			
	18			
	20			
	22			
	25			
	30			
	35	9	8	
28	40	10	9	100
	45	11	10	
	50	12	11	
	55	14	13	
	60	16	15	
	65	17	16	
	70	19	18	

ℓ	Catalog No. Type M — L	U/Price Less※	U/Price Over※	※ Q'ty
28	CB 8— 75	21	20	100
	80	25	24	
	85	30	29	
	90	32	31	
	95	36	34	
	100			
	110	44	42	
	120	51	49	
	130	71	69	
	140	78	76	50
	150	90	88	
	160	120	118	
	200	245	243	
Full thread	CB10— 10	16	15	100
	12			
	15	13	12	
	20	11	10	
	25	12	11	
	30	13	12	
	35	14	13	
	40	15	14	
	45	16	15	
	50	18	17	
32	55	20	19	100
	60	23	22	
	65	25	24	
	70	26	25	50
	75	30	29	
	80	33	32	
	85	37	35	
	90	39	37	
	95	43	41	
	100			
	110	51	49	
	120	60	58	
	130	71	69	
	140	79	77	
	150	88	86	
	160	154	152	20
	170	174	172	
	180	193	191	
	190	225	223	
	200	238	236	
	210	282	280	
Full thread	CB12— 15	25	24	100
	20	20	19	
	25			
	30	21	20	
	35	22	21	
	40	23	22	
	45	25	24	
	50	27	26	50
	55	30	29	
	60	33	32	
	65	35	33	
36	70	38	36	
	75	40	38	
	80	44	42	
	85	54	52	
	90	57	55	40
	95	59	57	
	100			

ℓ	Catalog No. Type M — L	U/Price Less※	U/Price Over※	※ Q'ty
36	CB 12— 110	69	67	40
	120	76	74	
	130	87	85	
	140	96	94	30
	150	104	102	
	160	121	119	
	170	132	130	20
	180	144	142	
	190	154	152	
	200	168	166	
	210	190	188	
	220	206	204	
	230	222	220	
	240	235	233	
	250	250	248	
	260	266	264	
	270	710	700	
	280	760	750	
	290	810	800	
Full thread	CB 16— 20	56	54	50
	25			
	30	47	45	
	35			
	40	48	46	
	45	50	48	40
	50	54	52	
	55	59	57	
	60	63	61	
	65	67	65	
	70	72	70	30
	75	76	74	
	80	80	78	
	85	85	83	25
	90	89	87	
	95	95	93	
	100			
	110	108	106	
	120	121	119	20
	130	133	131	
	140	145	143	
	150	157	155	
	160	176	174	
	170	206	204	10
44	180	224	222	
	190	240	238	
	200	254	252	
	210	288	286	
	220	310	307	
	230	330	327	
	240	353	350	
	250	374	371	
	260	390	387	
	270	710	700	
	280	760	750	
	290	810	800	
	300	820	810	
	310	840	830	
	320	860	850	

ℓ	Catalog No. Type M — L	U/Price Less※	U/Price Over※	※ Q'ty
Full thread	CB 20— 40	98	96	30
	45	100	98	
	50	103	101	
	55	109	107	25
	60	115	113	
	65	121	119	20
	70	126	124	
	75	132	130	
	80	138	136	
	85	148	146	
	90	155	153	
52	95	163	161	15
	100			
	110	181	179	
	120	199	197	
	130	220	218	
	140	240	238	10
	150	266	264	
	160	301	298	
	170	324	321	
	180	346	343	
	190	380	377	
	200	400	396	
	210	450	446	
	220	465	461	
	230	490	486	
	240	514	509	
	250	536	531	
Full thread	CB 24— 50	208	206	20
	60	218	216	
	70	233	231	15
	80	246	243	
	90	262	259	
60	100	284	281	
	110	307	303	
	120	328	324	10
	130	350	347	
	140	364	361	
	150	392	389	

Order — Catalog No. CB 8 — 40

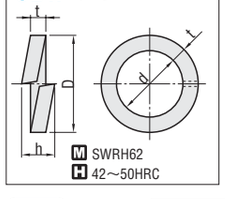
Delivery — 1 Day

CB M×P	A	E	B
3×0.5	5.5	3	2.5
4×0.7	7	4	3
5×0.8	8.5	5	4
6×1.0	10	6	5
8×1.25	13	8	6
10×1.5	16	10	8
12×1.75	18	12	10
16×2.0	24	16	14
20×2.5	30	20	17
24×3.0	36	24	19

Reference：Dimensions of counterboring and bolt hole for the hexagon socket head cap screws
P.1251

RoHS

CBW (Spring washer)



M SWRH62
H 42～50HRC

d	(D)	(h)	t	Catalog No. Type	No.	Price Q'ty:1～49	50～199	200～499	500～1000
3.1	5.6	2.0	1	CBW	3	14	12	11	9
4.1	7	2.4	1.2		4				
5.1	8.8	3.2	1.6		5				
6.1	9.9	3.2	1.6		6				
8.1	12.7	4	2		8	17	15	13	11
10.2	16	5	2.5		10	20	18	16	14
12.2	18	5	2.5		12	22	19	17	15
16.2	24.4	7	3.5		16	31	27	24	21
20.2	30.6	9	4.5		20	46	41	36	32
24.5	35.9	10	5		24	54	48	43	37

(D)：Max. (h)：Min.

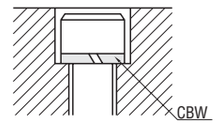
Order — Catalog No. CBW 10

Delivery — 1 Day

Price — To be quoted on price & lead time above Max. Q'ty.

Example

Can be used without enlarging the bolt head counterbore.



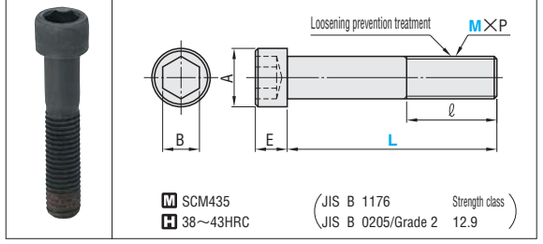
Reference:Dimensions of counterboring and bolt hole for the hexagon socket head cap screws
P.1251

Strength class details P.723

HEXAGON SOCKET HEAD CAP SCREWS

RoHS

LB (Loosening prevention treatment type)



M SCM435
H 38～43HRC
(JIS B 1176 / JIS B 0205/Grade 2 Strength class 12.9)

ℓ New JIS	Catalog No. Type M— L	U/Price Q'ty:1～99	U/Price 100～200
Full thread	LB 4— 8	14	13
	10		
	12		
	15		
	20		
	25		
20	30	15	14
Full thread	LB 5—10	15	14
	12		
	15		
	20		
	25		
22	30	16	15
	35	17	16
Full thread	LB 6—10	15	14
	15		
	20	16	15
	25		
	30	17	16
24	35	18	17
	40	20	19
	45	21	19
	50	22	20

To be quoted on price & lead time above Max. Q'ty.

ℓ New JIS	Catalog No. Type M— L	U/Price Q'ty:1～99	U/Price 100～200
Full thread	LB 8—15	21	19
	20		
	25		
	30		
28	35	22	20
	40	24	22
	45	26	24
	50	27	25
	55	34	32
	60	40	38
Full thread	LB 10—20	28	26
	25	29	27
	30	30	28
	35	31	29
32	40	32	30
	45	35	33
	50	36	34
	55	40	38
	60	45	42
Full thread	LB 12—25	43	40
	30	45	42
	35	46	43
36	40	47	44
	45	49	46
	50	53	50
	55	58	55
	60	63	59

To be quoted on price & lead time above Max. Q'ty.

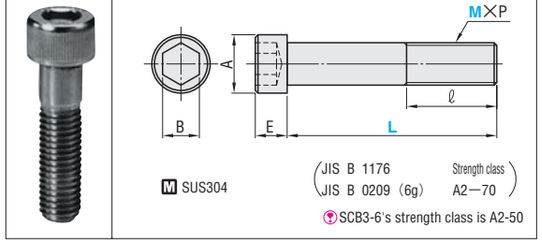
LB・SCB			
M×P	A	E	B
2.5×0.45	4.5	2.5	2
2.6×0.45	4.5	2.5	2
3×0.5	5.5	3	2.5
4×0.7	7	4	3
5×0.8	8.5	5	4
6×1.0	10	6	5
8×1.25	13	8	6
10×1.5	16	10	8
12×1.75	18	12	10

Reference:Dimensions of counterboring and bolt hole for the hexagon socket head cap screws. P.1251

Reference: Shearing strength data of threads P.1255

RoHS

SCB (Stainless steel)



M SUS304
(JIS B 1176 / JIS B 0209 (6g) Strength class A2—70)
SCB3-6's strength class is A2-50

ℓ	Catalog No. Type M— L	U/Price Less※	U/Price Over※	※ Q'ty
Full thread	SCB2.5— 5	75	28	100
	8	75	28	
	10	88	33	
Full thread	SCB2.6— 5	63	23	100
	8	75	28	
	10	88	32	
	12			
	15			
Full thread	SCB 3— 6	20	6	100
	8	25	8	
	10			
	12			
	15			
	20			
18	25	28	9	
	30	33	11	
Full thread	SCB 4— 6	25	8	100
	8			
	10	30	10	
	12			
	15			
	20			
20	25			
	30	35	12	
	35	38	13	
	40	45	16	
Full thread	SCB 5— 8	25	8	100
	10			
	12	30	10	
	15			
	20			
22	25			
	30	38	13	
	35	45	16	
	40	50	18	
	45	55	20	
	50	60	22	

ℓ	Catalog No. Type M— L	U/Price Less※	U/Price Over※	※ Q'ty
Full thread	SCB 6—10	25	8	100
	12			
	15	30	10	
	20			
	25			
	30	38	13	
	35	45	16	
24	40	50	18	
	45	58	21	
	50	63	23	
Full thread	SCB 8—15	45	16	100
	20			
	25	50	18	
	30			
	35	63	23	
28	40	70	26	
	45	75	28	
	50	100	37	
	55	125	47	
	60	150	57	
Full thread	SCB10—15	75	28	100
	20			
	25			
	30	88	32	
	35	100	37	
32	40	113	42	
	45	125	47	
	50	150	57	
	55	175	66	
	60	200	75	
Full thread	SCB12—25	125	47	100
	30	150	56	
	35	175	66	
	40	200	75	
	45	225	85	
	50	250	94	
36	55	275	104	
	60	300	113	

※The term "strength class" signifies the screw's tensile strength.

(Example)12.9 (CB3～20．LB)
- 12: Indicates that the minimum value of tensile strength is 1220N/mm² {124kgf/mm²}.
- .9: Indicates that the yield point or the minimum proof strength is 90% of the tensile strength.

10.9 (CB24)
- 10: Indicates that the minimum value of tensile strength is 980N/mm² {100kgf/mm²}.
- .9: Indicates that the yield point or the minimum proof strength is 90% of the tensile strength.

A2—70 (SCB)
- 70: Indicates that the minimum value of tensile strength is 700N/mm² {71.4kgf/mm²}.
- A2: The steel class is A2 (Austenitic stainless steel).

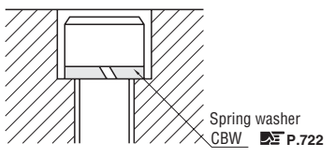
About "Loosening Prevention Treatment"
The screw grooves are treated by application of a special type of resin which has outstanding elasticity, wear resistance and oil resistance. The effectiveness of the treatment is at maximum from the initial through the fourth run, after which it gradually diminishes.

Loosening prevention treatment will be applied to only LB.

Order — Catalog No.
LB 10 — 20
SCB 5 — 25

Delivery — 1 Day

Example

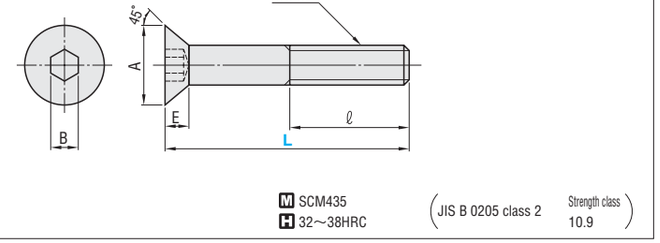


P.722

HEXAGON SOCKET HEAD FLAT BOLT

RoHS

FB (Conventional type) / FBJ (JIS type)



M SCM435
H 32～38HRC
(JIS B 0205 class 2 Strength class 10.9)

■Conventional type (Dimension E space saving standard)

M×P	A min.	A max.	E min.	E max.	B	ℓ	Catalog No. Type M—L	U/Price Less※	U/Price Over※	※ Q'ty
4X0.7	7.64	8.00	2.16	2.30	2.5	Full thread	FB 4—10	5	4	200
							15			
							20			
							25	6	5	100
						14	30	7	6	
							35	11	10	
5X0.8	9.64	10.00	2.66	2.80	3.0	Full thread	FB 5—10	5	4	100
							12			
							15			
							16			
							20			
							25	6	5	
							30	7	6	
						16	35	11	10	
							40	12	11	
6X1.0	11.57	12.00	3.12	3.30	4.0	Full thread	FB 6—10	5	4	100
							12			
							15			
							16			
							20			
							25	6	5	
							30	7	6	
							35	11	10	
							40	12	11	
						18	45	13	12	
8X1.25	15.57	16.00	4.22	4.40	5.0	Full thread	FB 8—15	8	7	100
							20			
							25	9	8	
							30			
							35	11	10	
							40	12	11	
							45	13	12	
						22	50	14	13	
10X1.5	19.48	20.00	5.32	5.50	6.0	Full thread	FB 10—20	12	11	100

FB is in conformity with SSS (Japan Socket Screw Industry Cooperative Society) standards.
Since there used to be no standard for hexagon socket head flat bolts, Japan Socket Screw Industry Cooperative Society standardized it in their own right.

Dimension E is shorter than the JIS standard. Therefore, this type is space saving.

■JIS type

M×P	A min.	A max.	E min.	E max.	B	ℓ	Catalog No. Type M—L	U/Price Less※	U/Price Over※	※ Q'ty
4X0.7	7.53	8.96	2.23	2.48	2.5	Full thread	FBJ 4—10	5	4	200
							15			
							20			100
							25	6	5	
						20	30	7	6	
							35	11	10	
5X0.8	9.43	11.20	2.80	3.10	3.0	Full thread	FBJ 5—10	5	4	100
							12			
							15			
							16			
							20			
							25	6	5	
							30	7	6	
						22	35	11	10	
							40	12	11	
6X1.0	11.34	13.44	3.30	3.72	4.0	Full thread	FBJ 6—10	5	4	100
							12			
							15			
							16			
							20			
							25	6	5	
							30	7	6	
						24	35	11	10	
							40	12	11	
							45	13	12	
8X1.25	15.24	17.92	4.40	4.96	5.0	Full thread	FBJ 8—15	8	7	100
							20			
							25	9	8	
							30			
							35	11	10	
							40	12	11	
							45	13	12	
						28	50	14	13	
10X1.5	19.22	22.40	5.50	6.20	6.0	Full thread	FBJ 10—20	12	11	100

FBJ is in conformity with JIS standards B1194 (2000).
In JIS standard table, only max. values of dimension E are indicated.

Order — Catalog No.
FB 5 — 10
FBJ 8 — 20

Delivery — 1 Day

Express service system P.38 | MISUMI Press 2007 | http://misumi.jp/press/ | For inquiry, ordering and other information, refer to P.1269

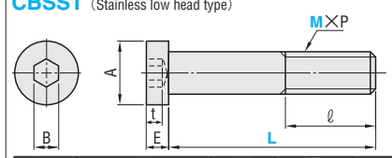
LOW HEAD CAP SCREWS / EXTRA LOW HEAD CAP SCREWS

PRESS ADD.SPEC. Printed in Red

LOOSENING PREVENTION WASHERS

RoHS

CBS (Low head type)
CBSST (Stainless low head type)

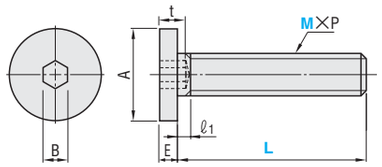


Type	M	H	S	Strength class
CBS	S45C (M3～8・M12) SCM435 (M10)	22～32HRC	Black oxide	8.8
CBSST	SUSXM7	—	—	A2-50

M×P	A	E	B	t max.	ℓ CBS	ℓ CBSST	Catalog No. Type M—L	Price CBS Q'ty 1～99	Price CBS 100～300	Price CBSST Q'ty 1～99	Price CBSST 100～300
3×0.5	5.5	2	2	1.5	Full thread	Full thread	CBS 3—6	12	11	27	14
							CBSST 8				
							10	14	13	32	16
							12	16	15	36	19
					12		16				
							20				
4×0.7	7	2.8	2.5	2.3	Full thread	Full thread	CBS 4—6	15	14	33	17
							CBSST 8				
							10				
							12				
							16	17	16	38	20
							20	19	18	42	23
							25	20	19	45	25
5×0.8	8.5	3.5	3	2.7	Full thread	Full thread	CBS 5—8	19	18	42	23
							CBSST 10				
							12	17	16	38	20
							16				
							20				
							25	21	19	48	27
					16	24	30	24	22	54	31
6×1.0	10	4	4	3	Full thread	Full thread	CBS 6—8	21	19	48	27
							CBSST 10				
							12	19	18	42	23
							16				
							20				
							25	21	19	48	27
							30	24	22	54	31
					18	26	35	27	25	60	35
							40	31	29	68	39
							45	38	36	86	51
8×1.25	13	5	5	3.8	Full thread	Full thread	CBS 8—10	34	32	77	45
							CBSST 12				
							16				
							20	33	31	75	44
							25				
							30	35	33	78	46
							35	39	37	87	52
					22	30	40	42	39	95	56
							45	49	46	110	66
							50	54	51	120	73
10×1.5	16	6	6	4.5	Full thread	Full thread	CBS 10—16	47	44	105	63
							CBSST 20	51	48	113	68
							25	56	53	126	76
							30	59	56	132	80
							35	64	60	144	88
							40	68	64	153	93
					32	36	45	73	69	165	101
							50	76	72	171	108
12×1.75	18	7	8	5	Full thread	Full thread	CBS 12—20	79	75	177	109
							CBSST 25	70	66	158	96
							30	74	70	165	101
							35	93	88	210	130
							40	95	90	218	134
							45	100	95	225	139
					30	40	50	123	116	270	168

RoHS

CBSS (Extra low head type)



M SCM435
H 32～39HRC
S Black oxide

(Strength class 10.9
Head strength class : M3～M8 5.8
M10 4.8)

M×P	A	E	B	t max.	ℓ1 max.	Catalog No. Type M—L	Price Q'ty 1～99	Price 100～300
3×0.5	6	1.3	1.5	2	1.6	CBSS 3—6	30	28
						8	30	28
						10	31	29
4×0.7	8	1.5	2	2.5	1.6	CBSS 4—6	25	23
						8	26	24
						10	27	25
5×0.8	9	1.5	3	3	1.6	CBSS 5—8	28	26
						10	29	27
						12	30	28
						16	31	29
						20	32	30
6×1.0	10	1.5	3	4	2.0	CBSS 6—8	31	29
						10	33	31
						12	34	32
						16	36	34
						20	38	36
						25	39	37
8×1.25	13	1.5	4	5	2.5	CBSS 8—8	76	72
						10	71	67
						12	52	49
						16	54	51
						20	56	53
						25	59	56
						30	59	56
10×1.5	16	1.5	5	5	3.0	CBSS 10—10	95	90
						12	81	76
						16	65	61
						20	67	63
						25	68	64
						30	76	72

※The term "strength class" signifies the screw's tensile strength.

(Example) 8 . 8
- Indicates that the minimum value of yielding point or proof strength is 80% of tensile strength.
- Indicates that the minimum value of tensile strength is 800N/mm² {81.6kgf/mm²}

A2-50
- Indicates that the minimum value of tensile strength is 500N/mm² {51kgf/mm²}
- The steel class is A2 (Austenitic stainless steel).

Order — Catalog No. CBS 4—10 / CBSS5—12

To be quoted on price & lead time above Max. Q'ty.

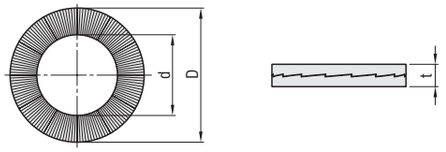
Delivery — 1 Day

■Features

- **Low head type**
  - It can be used in places where conventional hex socket head cap screw's head is obstructive.
- **Extra low head type**
  - Developed to minimize the space required for the screw head.
  - Unlike flat head bolts, there is no need for countersinking.

RoHS

NLDP



M S20C or equivalent
H 48HRC
S Zinc coating (chrome-free) thin strip

Use two of these products as a pair.

Applicable Bolts	D	d	t	Catalog No. Type	Catalog No. No.	U/Price 1～19 pairs	U/Price 20～199 pairs
M 3	7.0	3.4	1.8	NLDP	3	120	84
M 4	7.6	4.4	1.8		4	120	84
M 5	9.0	5.4	1.8		5	120	84
M 6	10.8	6.5	1.8		6	120	84
M 8	13.5	8.7	2.5		8	140	98
M10	16.6	10.7	2.5		10	150	105
M12	19.5	13.0	2.5		12	210	147
M16	25.4	17.0	3.4		16	300	＊210
M20	30.7	21.4	3.4		20	380	＊260

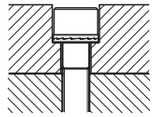
Use two of these products as a pair.

Order — Catalog No. NLDP6

Delivery — 1 Day

The unit prices with the mark are 20～99 sets of case.

Example — Can be used without enlarging the spot—facing diameter of the bolt head.



■Sold as a set

Catalog No. Type	Catalog No. No.	Price of set	Number of pairs in a set
NLDP-B	3	6,000 (￥ 30 per pair)	200 pairs
	4	6,000 (￥ 30 per pair)	
	5	6,000 (￥ 30 per pair)	
	6	6,000 (￥ 30 per pair)	
	8	8,000 (￥ 40 per pair)	
	10	10,000 (￥ 50 per pair)	
	12	18,000 (￥ 90 per pair)	
	16	18,000 (￥180 per pair)	100 pairs
	20	21,000 (￥210 per pair)	

Order — Catalog No. NLDP-B6

Make sure quantity when ordering.
(Ex.) If you order one NLDP—B6, you will receive 200 pairs.

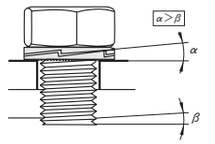
Delivery — 1 Day

■Principle of loosening prevention washers

On the inside of the loosening prevention washers are wedge-shaped cams, and on the outside are radial ribs. Two of these washers form a pair.
The cam angle (α) is set larger than the screw lead angle (β).
If the bolt becomes loose, the cam of one of the washers pushes up the cam of the other washer, and a force that tries to separate the washers is generated. However, because of the wedge effect, the washers do not separate more than screw pitch.

■Correct setting method

We ship two washers pasted together as a pair.
Before reusing these washers, check to ensure that the wedged-shaped cams are not flattened or cracked, and then use them according to the correct setting method shown in the figure at right.
Remove any other washers before setting NLDP.



Correct — Wrong — Wrong

■Precautions for using washers repeatedly

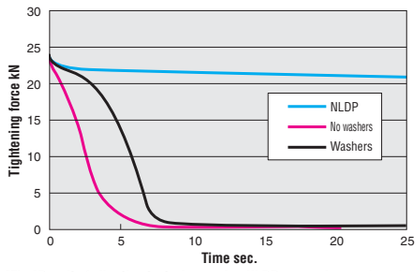
NLDP can be used repeatebly.In this case, use lubricating oil.

■Operating temperature limit

Operating temperature limit of NLDP is 200℃.
Do not use these washers above this limit.

■Results of vibration test (for reference)

Test machine: Yanker type vibration tester
Amplitude : ±0.5 mm
Vibration frequency : 40 Hz
Loosening prevention washers used: NLDP8
Bolts used : M8 (Strength class 12.9)
Clamped material : S20C or equivalent (28HRC)



[Fig.]Result of vibration test where using NLDP, no washer, and washer

■Clamped material

Please note that the trace of the ribs on the outside of the washer remains on the clamped material. Also, ensure that the material to be clamped has the hardness of no more than that of the loosening prevention washers.

■Recommended tightening torque and recommended tightening force

When tightening a bolt using loosening prevention washers, refer to the recommended values shown in the table below.
If the actual tightening torque or tightening force is remarkably lower than the recommended value, the loosening prevention effect will not work.
Conversely, if value is larger than the recommended value, it may become difficult to remove the bolts, or the loosening prevention washer may split.

〔Table〕 Recommended bolt tightening torque and bolt tightening force when loosening prevention washers are used

NLDP	Applicable Bolts M×P	Strength class 12.9 of bolt μT=0.12 GF=0.75 Torque Nm	Strength class 12.9 of bolt Tightening force kN	Strength class 10.9 of bolt μT=0.14 GF=0.71 Torque Nm	Strength class 10.9 of bolt Tightening force kN	Strength class 8.8 of bolt μT=0.14 GF=0.71 Torque Nm	Strength class 8.8 of bolt Tightening force kN
3	3×0.5	2	3.9	1.7	3.2	1.3	2.4
4	4×0.7	4.6	6.7	3.8	5.6	3	4.2
5	5×0.8	9	10.9	7.5	9.1	5.9	6.8
6	6×1.0	15.7	15.4	13.1	12.9	10.3	9.7
8	8×1.3	37.6	28.1	31.3	23 .4	24.8	17.6
10	10×1.5	74	44	62	37	49	28
12	12×1.8	127	65	106	54	84	40
16	16×2.0	310	120	258	100	203	75
20	20×2.5	607	188	506	156	398	118

μT : Screw coefficient of friction
GF : Yield point ratio

WASHERS / SPACERS

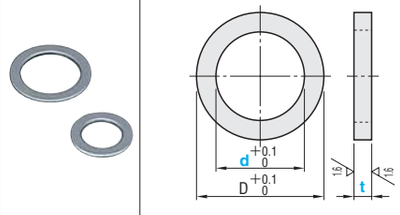
Price revision
The price revision of MSRB and LRB will come into effect from October 1, 2007. Until the end of September, please refer to the prices in the old catalog. We apologize for the inconvenience.

Price Revised

: New Price : Reduced Price

RoHS

MSRB (Spacers for MSB)



M SK5

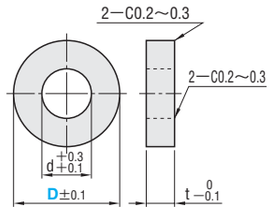
t T	
0.1	±0.020
0.2	±0.020
0.3	±0.030
0.5	±0.030
1.0	±0.040
2.0	±0.090

D	d	Catalog No.	t	U/Price Q'ty:1~49	50~99	100~499	500~1000
6.5	4	MSRB ＊4		18	16	6	6
7	4.5	4.5		18	16	6	6
8	5	＊5		20	18	6	6
9	5.5	5.5	0.1	20	18	6	6
9	6	＊6	0.2	20	18	6	6
10	6.5	6.5	0.3	20	18	6	6
13	8	8	0.5	22	19	7	7
16	10	10	1.0	25	22	8	7
17	12	＊12	2.0	34	30	10	9
18	13	13		34	30	11	9
24	16	16		40	36	13	11
27	20	20		52	46	18	16

t=2.0 is not available for the sizes with ＊

RoHS

SW (Washers for stripper bolt/coil spring)

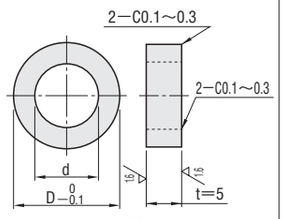


M S45C
H 48~52HRC

D	d	t	Catalog No.	U/Price Q'ty:1~19	20~49	50~99	100~200
10	4.5	3	SW 10	140	133	126	119
12	5.5		12				
	6		12—6	150	142	135	127
16	6.5	4	16	170	161	153	144
20	8	5	20				
22	10		22	180	171	162	153
25			25				
	12		25—12	190	180	171	161
27	13	8	27	220	209	198	187
30			30				
35	16		35	270	256	243	229
40			40				
50	20	10	50	320	304	288	272

RoHS

K・W (Spacers for female screw type stripper bolt)

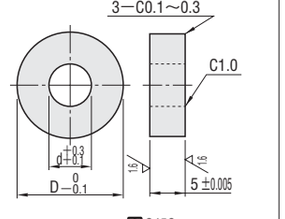


M S45C
H 48~52HRC

t T	D	d T		Catalog No.		U/Price Q'ty:1~49	50~199	200~499	500~1000
±0.005	10	6	+0.3 +0.1	K	10	60	57	54	51
	13	8			13	70	66	63	59
	16	10			16	80	76	72	68
	20	12			20	90	85	81	76
±0.01	8	5	+0.2 +0.1	W	10	60	57	54	51
	11	6			13	70	66	63	59
	14	8			16	80	76	72	68
	17	10			20	90	85	81	76

RoHS

T・R (Spacer for Stripper bolts—bushing type—)



M S45C
H 48~52HRC

D	d	Catalog No.		U/Price Q'ty:1~49	50~199	200~499	500~1000
11.5	4	T	6.5	70	66	63	59
13	5		8	70	66	63	59
15	6		10	70	66	63	59
18	8		13	80	76	72	68
21	10		16	90	85	81	76
23	12		20	120	114	108	102
16	4	R	6.5—16	100	95	90	85
18			6.5—18	100	95	90	85
18	5		8—18	100	95	90	85
20			8—20	100	95	90	85
22			8—22	100	95	90	85
20	6		10—20	100	95	90	85
22			10—22	100	95	90	85
25			10—25	100	95	90	85
27			10—27	100	95	90	85
25	8		13—25	130	123	117	110
27			13—27	130	123	117	110
30			13—30	130	123	117	110
30	10		16—30	160	152	144	136
35			16—35	160	152	144	136
40			16—40	160	152	144	136
35	12		20—35	260	247	234	221
40			20—40	260	247	234	221

Order

●MSRB Catalog No. — t
MSRB 10 — 0.1

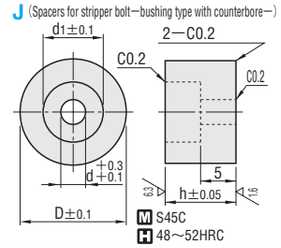
●SW・K・W・T・R Catalog No.
SW 25
K 10
W 16
T 10
R 10—20

Delivery 1 Day

Price To be quoted on price & lead time above Max. Q'ty.

RoHS

J (Spacers for stripper bolt—bushing type with counterbore—)

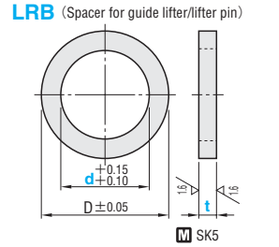


M S45C
H 48~52HRC

D	d1	d	h	Catalog No.		U/Price Q'ty:1~49	50~199	200~499	500~1000
12	8	4	9	J	6.5	100	95	90	85
14	10	5	10		8	100	95	90	85
18	11	6	11		10	120	114	108	102
24	14	8	13		13	160	152	144	136
27	17.5	10	15		16	190	180	171	161
32	19.5	12	17		20	330	313	297	280

RoHS

LRB (Spacer for guide lifter/lifter pin)



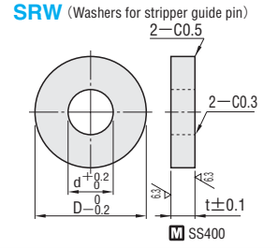
M SK5

t T	
0.1	±0.020
0.2	±0.020
0.3	±0.030
0.5	±0.030
1.0	±0.040

D	d	Catalog No.		t	U/Price Q'ty:1~49	50~99	100~499	500~1000
6	4	LRB	4	0.1	20	18	4	4
7	5		5	0.2	23	20	5	5
8	6		6	0.3	25	22	6	6
10	8		8	0.5	27	24	8	8
13	10		10	1.0	33	29	10	8
16	13		13		36	32	13	10
19	16		16		42	37	16	12
23	20		20		53	47	20	15

RoHS

SRW (Washers for stripper guide pin)

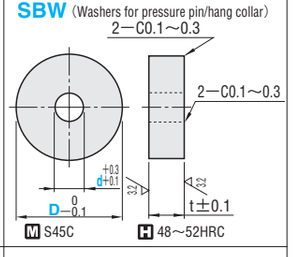


M SS400

D	d	t	Catalog No.		U/Price Q'ty:1~49	50~199	200~499	500~1000
12	5.3	3	SRW	8	100	95	90	85
15				10				
19	6.4	4		13	120	114	108	102
22				16				
26	8.4	5		20	150	142	135	127
30				25				

RoHS

SBW (Washers for pressure pin/hang collar)

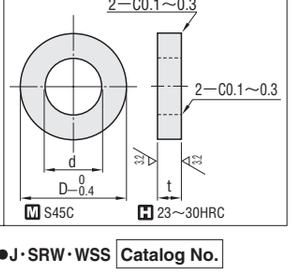


M S45C H 48~52HRC

t	Catalog No. Type	D	d	U/Price Q'ty:1~49	50~199	200~499	500~1000
5	SBW	20	5	80	76	72	68
		22	5	90	85	81	76
		25	6	100	95	90	85
7		27	5	110	104	99	93
		30	6	120	114	108	102
		35	8	170	161	153	144

RoHS

WSS (Washers for ellipse hole)



M S45C H 23~30HRC

D	d T		t T		Catalog No.		U/Price Q'ty:1~49	50~199	200~499	500~1000
12.5	6.4	+0.25 0	2.5	±0.25	WSS	6	45	42	40	38
17	8.4					8	55	52	49	46
21	10.5	+0.3 0	3	±0.3		10	70	66	63	59
24	13		4	±0.4		12	85	80	76	72
30	17		5	±0.5		16	110	104	99	93
37	21					20	160	152	144	136

Order

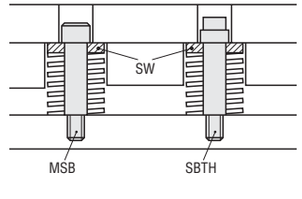
●J・SRW・WSS Catalog No.
J 16
SRW 20
WSS 8

●LRB・SBW Catalog No. — t・d
LRB 8 — 0.5
SBW 27 — 8

Delivery 1 Day

Price To be quoted on price & lead time above Max. Q'ty.

Example



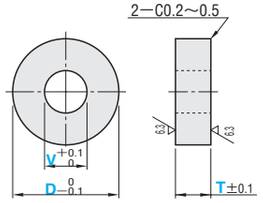
FREE WASHERS

DELIVERY SHORTENED

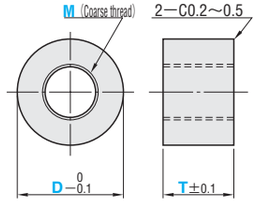
The volume discount rate is also applicable to alteration cost. P.39

RoHS

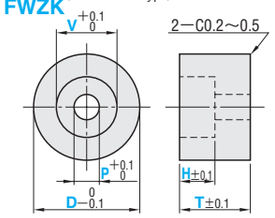
FWSS
FWSK



FWMS (Tapped type)
FWMK



FWZS (Counterbore type)
FWZK



FW□S M SS400 FW□K M SKS3 H 56～60HRC

Catalog No.	D	V 0.1 mm increments	T 0.1 mm increments	U/Price FWSS Q'ty : 1～9	U/Price FWSK Q'ty : 1～9
FWSS (SS400)	7～10 (0.5mm increments)	2.5～55	1.0～ 5	240	290
			5.1～10	380	460
			10.1～20	460	560
			20.1～30	560	680
			30.1～40	730	1,270
			40.1～50	770	1,450
	10.5～20 (0.5mm increments)		1.0～ 5	380	460
			5.1～10	500	600
			10.1～20	600	720
			20.1～30	720	870
			30.1～40	750	1,020
			40.1～50	800	1,170
	21～30 (1mm increments)		1.0～ 5	450	540
			5.1～10	680	820
			10.1～20	820	990
			20.1～30	990	1,190
			30.1～40	1,050	1,300
			40.1～50	1,100	1,640
FWSK (SKS3)	31～40 (1mm increments)		1.0～ 5	580	700
			5.1～10	850	1,020
			10.1～20	1,020	1,230
			20.1～30	1,230	1,480
			30.1～40	1,280	2,050
			40.1～50	1,340	2,370
	41～50 (1mm increments)		1.0～ 5	850	1,020
			5.1～10	980	1,180
			10.1～20	1,180	1,420
			20.1～30	1,420	1,710
			30.1～40	1,500	2,510
			40.1～50	1,600	3,010
	51～60 (1mm increments)		1.0～ 5	990	1,320
			5.1～10	1,130	1,490
			10.1～20	1,280	1,920
			20.1～30	1,580	2,540
			30.1～40	1,690	3,090
			40.1～50	1,810	3,620

(D−V)/2≧2 : Wall thickness of 2mm or more is necessary for each side.

Catalog No.	D	M Selection	T 0.1 mm increments	U/Price FWMS Q'ty : 1～9	U/Price FWMK Q'ty : 1～9
(Tapped type) FWMS (SS400) FWMK (SKS3)	8～20 (0.5mm increments)	3 (T≧3) 4 (T≧3) 5 (T≧3) 6 (T≧3) 8 (T≧4) 10 (T≧5) 12 (T≧6) 16 (T≧6) 20 (T≧8)	3.0～ 5	540	640
			5.1～10	730	850
			10.1～20	840	980
			20.1～30	980	1,170
			30.1～40	1,010	1,230
			40.1～50	1,050	1,400
	21～30 (1mm increments)		3.0～ 5	650	750
			5.1～10	1,010	1,140
			10.1～20	1,220	1,340
			20.1～30	1,470	1,480
			30.1～40	1,490	1,530
			40.1～50	1,550	1,950
	31～40 (1mm increments)		3.0～ 5	850	950
			5.1～10	1,090	1,190
			10.1～20	1,510	1,650
			20.1～30	1,840	1,900
			30.1～40	1,870	2,420
			40.1～50	1,930	2,780
	41～50 (1mm increments)		3.0～ 5	1,240	1,350
			5.1～10	1,430	1,540
			10.1～20	1,750	2,020
			20.1～30	2,070	2,530
			30.1～40	2,100	2,880
			40.1～50	2,150	3,440

(D−M)/2≧2 ···· Wall thickness of 2mm or more is necessary for each side.
T≦M×8 ···· The maximum thickness is 8 times the tap diameter or less.

Catalog No.	D	V 0.1mm increments	P 0.1mm increments	H 0.1mm increments	T 0.1mm increments	U/Price FWZS Q'ty : 1～9	U/Price FWZK Q'ty : 1～9
(Counterbore type) FWZS (SS400) FWZK (SKS3)	9～20 (0.5mm increments)	5～45	3～43	1～48	3.0～ 5	540	640
					5.1～10	730	850
					10.1～20	870	1,010
					20.1～30	1,040	1,220
					30.1～40	1,090	1,300
					40.1～50	1,150	1,500
	21～30 (1mm increments)				3.0～ 5	650	750
					5.1～10	1,010	1,140
					10.1～20	1,250	1,340
					20.1～30	1,550	1,530
					30.1～40	1,590	1,600
					40.1～50	1,670	2,040
	31～40 (1mm increments)				3.0～ 5	850	950
					5.1～10	1,090	1,190
					10.1～20	1,550	1,670
					20.1～30	1,920	1,950
					30.1～40	1,970	2,490
					40.1～50	2,060	2,880
	41～50 (1mm increments)				3.0～ 5	1,240	1,350
					5.1～10	1,430	1,540
					10.1～20	1,780	2,040
					20.1～30	2,140	2,570
					30.1～40	2,190	2,950
					40.1～50	2,260	3,520

(D−V)/2≧2 ···· Wall thickness of 2mm or more is necessary for each side.
(V−P)≧2 ···· A drop of 1mm or more is necessary for each side.
P×8≧(T−H)≧2 ···· The bearing bore length (T−H) is between 2mm and P×8.

Order

Catalog No. − D − V − M − P − H − T

FWSS − D20 − V5 − T2.0
FWMS − D15 − M3 − T3.5
FWZS − D20 − V10 − P5 − H10 − T20

Delivery 3 Days

Express A 300/1pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size.

Price

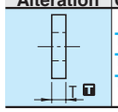
Volume discount rate P.37

Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. − D − V − T − (TKC)
FWSS − D20 − V5 − T2.0 − TKC2

Alteration	Code	Spec.	¥/1Code
	TKC1 TKC2 TKC3	Changes thickness tolerance	

Code	Tolerance
TKC1	±0.05
TKC2	±0.01
TKC3	±0.005

Code	¥/1Code
TKC1	200
TKC2	200
TKC3	300

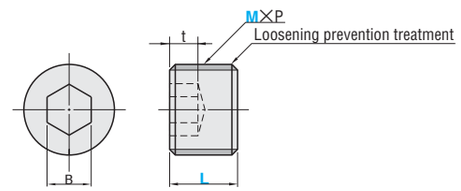
PRESS NEW

SCREW PLUGS WITH LOOSENING PREVENTION

M4～M10 is coarse thread, and M12～M20 is fine thread (P1.5).

RoHS

LMSW



M SCM435 (M4～10)
S45C (M12～20)
H 34～43HRC
S Black oxide
Loosening prevention Nylon resin (red)

M×P		L	B	t	Catalog No. Type	Catalog No. M	U/Price Q'ty : 1～19	U/Price 20～49	U/Price 50～99	U/Price 100～500
4	0.7	4	2	1.5	LMSW	4	90	81	63	45
5	0.8	5	2.5	2		5	100	90	70	50
6	1.0	6	3	3.5		6	100	90	70	50
8	1.25	8	4	5		8	100	90	70	50
10	1.5	10	5	6		10	120	108	84	60
12	1.5 (Fine pitch)		6	5		12	130	117	91	65
16			8			16	150	135	105	75
20		12	10	6		20	200	180	140	100

Order Catalog No. LMSW 10

Price To be quoted on price & lead time above Max. Q'ty.

Delivery 1 Day

■Outline

- The screw plug has been coated with water-based type loosening prevention agent whose main component is nylon.

■Features

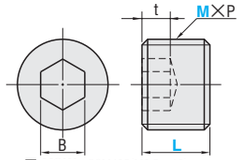
- Is highly suitable for repetitive use.
- A double nut is unnecessary, enabling the number of man-hours for machining the die, etc. to be reduced.
- Tightening up adjustment can be done at any time.
- Has excellent chemical resistance

SCREW PLUGS

M2.5～M10 is coarse thread, and M12～M45 is fine thread (P1.5).

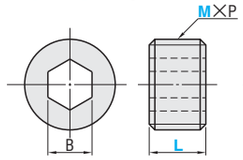
RoHS

MSW (Short type)
MSWS



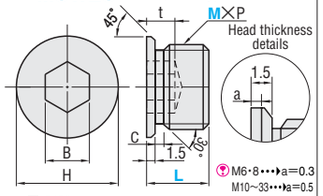
M MSW SCM435(M2.5～10) S45C(M12～45)
MSWS S45C
H 34～43HRC
S Black oxide (JIS B 0207/Grade 2)

MSWA (Through hole type)
MSWAS (Through hole, short type)



M S45C
H 34～43HRC
S Black oxide (JIS B 0207/Grade 2)

MSWZ (Washer type)
MSWZS (Washer, short type)



M6·8···a=0.3
M10～33···a=0.5

M S45C
H 33～38HRC
S Black oxide (JIS B 0207/Grade 2)

■Standard type

M×P		L	B	t	Catalog No. Type	M	U/Price Q'ty:1～299	300～499	500～999	1000～2000
2.5	0.45	3	1.3	1.2	MSW	2.5	10	9	9	8
3	0.5	3	1.5			3＊	10	9	9	8
4	0.7	4	2	1.5		4＊	10	9	9	8
5	0.8	5	2.5	2		5＊	15	13	12	12
6	1.0	6	3	3.5		6	15	13	12	12
8	1.25	8	4	5		8	20	18	18	17
10	1.5	10	5	6		10	25	22	21	20
12	1.5 (Fine pitch)	10	6	5		12	35	31	30	29
14						14	40	36	35	34
16			8			16	50	45	44	42
18			10			18	55	49	48	47
20						20	60	54	53	51
22		12	12	6		22	70	63	62	60
24			14			24	80	72	71	68
25						25	90	81	80	77
26						26	100	90	89	85
27						27	110	99	98	94
28						28	120	108	106	102
30			17			30	125	112	110	106
33						33	140	126	124	119
36		18		10		36	260	234	230	221
38						38	340	306	303	289
40						40	440	396	392	374
42						42	580	522	517	493
45						45	700	630	623	595

Tips of MSW3・4・5 are the "dimple type". (Right page)

M×P		L	B	Catalog No. Type	M	U/Price Q'ty:1～99	100～199	200～299	300～500
8	1.25	8	4	MSWA (Through hole type)	8	45	41	40	38
10	1.5	10	5		10	45	41	40	38
12	1.5 (Fine pitch)		6		12	50	45	44	43
14					14	55	50	49	47
16			8		16	60	54	53	51
18			10		18	70	63	62	60
20					20	75	68	67	64
22		12	12		22	80	72	71	68
24			14		24	95	86	85	81
25					25	100	90	89	85
26					26	105	95	93	89
27					27	110	99	98	94
28					28	120	108	107	102
30			17		30	125	112	111	106
33					33	140	126	125	119

M×P		L	B	H	t	C	Catalog No. Type	M	U/Price Q'ty:1～99	100～199	200～299	300～500
6	1.0	8	3	9	5	2.5	MSWZ (Washer type)	6	100	95	90	85
8	1.25	10	4	11				8	100	95	90	85
10	1.5 (Fine pitch)	12	5	13				10	110	105	99	93
12			6	15				12	120	114	108	102
14				17				14	130	124	117	110
16			8	19				16	140	133	126	119
18			10	21				18	150	143	135	127
20				23				20	160	152	144	136
22			12	25				22	180	171	162	153
24		15	14	27				24	200	190	180	170
25				28				25	230	219	207	195
26				29				26	250	238	225	212
27				30				27	270	257	243	229
28				31				28	290	276	261	246
30			17	33				30	310	295	279	263
33				36				33	330	314	297	280

■Short type

M×P		L	B	t	Catalog No. Type	M—L	U/Price Q'ty:1～299	300～499	500～999	1000～2000
8	1.25	6 (1.5 (Fine pitch))	4	3	MSWS (Short type)	8—6	50	45	44	42
10	1.5		5			10—6	55	50	49	47
12			6			12—6	65	59	58	55
14						14—6	70	63	62	60
16			8			16—6	80	72	71	68
18			10			18—6	85	77	76	72
20		8 (1.5 (Fine pitch))				20—8	90	81	80	77
22			12	4		22—8	100	90	89	85
24			14			24—8	110	99	98	94
25						25—8	120	108	106	102
26						26—8	130	117	116	111
27						27—8	140	126	124	119
28						28—8	150	135	134	128
30			17			30—8	155	140	138	132
33						33—8	170	153	151	145

M×P		L	B	Catalog No. Type	M—L	U/Price Q'ty:1～299	300～499	500～999	1000～2000
8	1.25	6	4	MSWAS (Through hole, short type)	8—6	75	68	67	64
10	1.5		5		10—6	75	68	67	64
12	1.5 (Fine pitch)		6		12—6	80	72	71	68
14					14—6	85	77	76	72
16			8		16—6	90	81	80	77
18			10		18—6	100	90	89	85
20		8			20—8	105	95	93	89
22			12		22—8	110	99	98	94
24			14		24—8	125	112	111	106
25					25—8	130	117	116	111
26					26—8	135	122	120	115
27					27—8	140	126	125	119
28					28—8	150	135	134	128
30			17		30—8	155	140	138	132
33					33—8	170	153	151	145

M×P		L	B	H	t	C	Catalog No. Type	M—L	U/Price Q'ty:1～99	100～199	200～299	300～500
10	1.5	10	5	13	4	2.0	MSWZS (Washer, short type)	10—10	140	133	126	119
12	1.5 (Fine pitch)		6	15				12—10	150	143	135	127
14				17				14—10	160	152	144	136
16			8	19				16—10	170	162	153	144
18			10	21				18—10	180	171	162	153
20				23				20—10	190	181	171	161
22			12	25				22—10	210	200	189	178
24		14		27				24—10	230	219	207	195
25				28				25—10	260	247	234	221
26				29				26—10	280	266	252	238
27				30				27—10	300	285	270	255
28				31				28—10	320	304	288	272
30			14	33	5			30—12	340	323	306	289
33		12	17	36				33—12	360	342	324	306

Compared with the standard type (**MSW / MSWA / MSWZ**), the short type screw plugs have a shorter dimension L and less threads.
Before use, check the load that applies to the screw plug, and the material of the plate to be tapped.

Order Catalog No.
MSW 18
MSWS 18—6

Delivery 1 Day

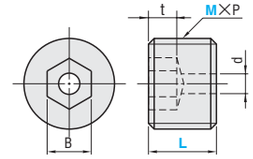
To be quoted on price & lead time above Max. Q'ty.

Right page

SCREW PLUGS —HOLE TYPE—

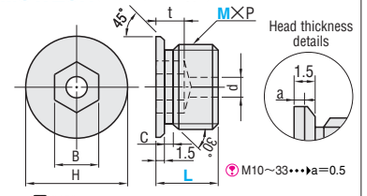
RoHS

MSWH
MSWSH (Short type)



M S45C
H 34～43HRC
S Black oxide (JIS B 0207/Grade 2)

MSWZH (Washer type)
MSWZSH (Washer, short type)



M10～33···a=0.5

M S45C
H 33～38HRC
S Black oxide (JIS B 0207/Grade 2)

■Standard type

M×P	L	B	d	t	Catalog No. Type	M	U/Price Q'ty:1～299	300～499	500～999	1000～2000
12	1.5	10	6	3	5	MSWH	12	80	72	71	68
14							14	85	77	76	72
16			8				16	95	86	85	81
18			10				18	100	90	89	85
20							20	105	95	93	89
22		12	12				22	115	104	102	98
24			14	5	6		24	125	113	111	106
25							25	135	122	120	115
26							26	140	126	125	119
27							27	150	135	134	128
28							28	160	144	142	136
30			17				30	165	149	147	140
33							33	180	162	160	153

M×P	L	B	H	d	t	C	Catalog No. Type	M	U/Price Q'ty:1～99	100～200
10	1.5	12	5	13	3	5	2.5	MSWZH (Washer type)	10	150	143
12			6	15					12	160	152
14				17					14	170	162
16			8	19					16	180	171
18			10	21					18	190	181
20				23					20	200	190
22			12	25					22	220	209
24		15	14	27					24	240	228
25				28					25	265	252
26				29					26	285	271
27				30	5				27	305	290
28				31					28	325	309
30			17	33					30	340	323
33				36					33	360	342

■Short type

M×P	L	B	d	t	C	Catalog No. Type	M—L	U/Price Q'ty:1～299	300～499	500～999	1000～2000
12	1.5	6	3	3	2.5	MSWSH (Short type)	12—6	110	99	98	94
14							14—6	115	104	102	98
16		8					16—6	125	113	111	106
18		10					18—6	130	117	116	111
20							20—8	135	122	120	115
22		12					22—8	145	131	129	123
24				4			24—8	150	135	134	128
25		14					25—8	160	144	142	136
26	8						26—8	170	153	151	145
27				5			27—8	180	162	160	153
28							28—8	190	171	169	162
30		17					30—8	195	176	174	166
33							33—8	210	189	187	179

M×P	L	B	H	d	t	C	Catalog No. Type	M—L	U/Price Q'ty:1～99	100～200
10	1.5	10	5	13	3	4	2.0	MSWZSH (Washer, short type)	10—10	180	171
12			6	15					12—10	190	181
14				17					14—10	200	190
16			8	19					16—10	210	200
18			10	21					18—10	220	209
20				23					20—10	230	219
22			12	25					22—10	245	233
24			14	27	5				24—10	265	252
25				28					25—10	295	280
26				29					26—10	315	299
27				30					27—10	335	318
28				31					28—10	350	333
30	12	17		33	5				30—12	370	352
33				36					33—12	390	371

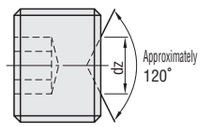
Order Catalog No.
MSWZH 30
MSWSH 18—6

Delivery 1 Day

Price To be quoted on price & lead time above Max. Q'ty.

Example

■MSW : Shape and Dimension of Dimple type



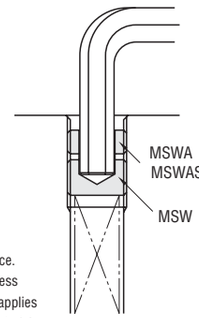
Catalog No.	dz max.
MSW3	1.4
MSW4	2.0
MSW5	2.5

Tips of MSW3・4・5 are the "dimple type".

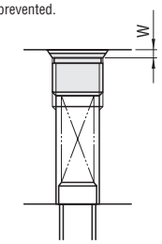
■MSW
- The tightening position can be adjusted easily.

■Through hole type
- It is possible to tighten it with the MSW and it can be used as a double nut.

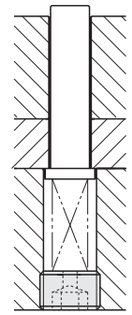
■Short type
- Since the dimension L is short, it is possible to use it in cases which have less space.
- The short screw plugs have less threads. Check the load that applies to the screw plug, and the material of the plate to be tapped.



■Washer type
- The washer part has loosening prevention effect.
- By adjusting the chamfering depth W, over-fastening of the spring can be prevented.



■Through hole type
- Drains air and oil from the hole and prevents faulty pin operation.



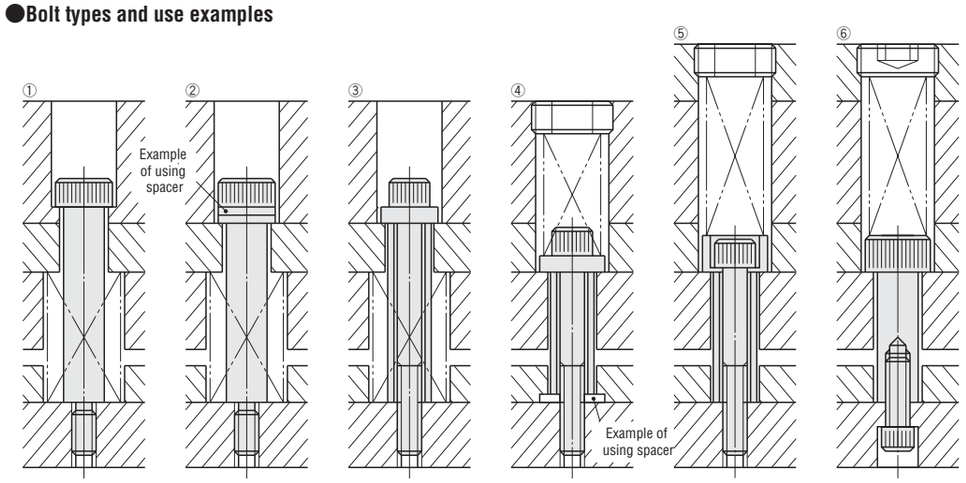
Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

STRIPPER BOLTS
—GUIDE—

■Stripper bolts

Stripper bolts are usually used to retain stripper plates（or stripper pads）.
The stripper plates must keep the degree of parallelization in order to guide the punch blade. Therefore, the structure of stripper bolts is required to be maintained with the tolerance of full length. Besides, dies with a structure that required no disassembly is needed for easier maintenance. MISUMI responds to such customers' needs by preparing a variety of products.

●Bolt types and use examples



Stripper bolts—outside screw type—

MSB P.735

Stripper bolts—bushing type—

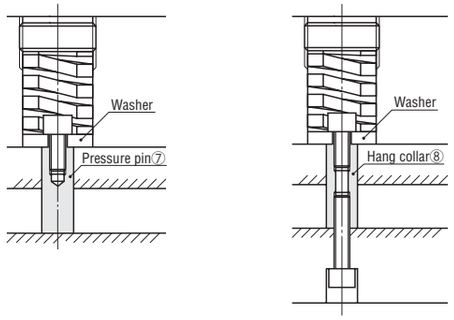
SBTH P.739 SBRH P.739 SBJH P.739
SBWH P.740
CSR P.909
CSRH P.911

Stripper bolts—inside screw type—

SBT P.737
SBTC P.737
SBTL P.737
SBTK P.737

■Figures ① and ② show use examples of outside screw type stripper bolts. ① is in our alteration options. Change of dimension L in 0.1mm increments is available.
② shows the example of use of spacer（**MSRB P.735**）at the under head for regrinding.
■Figures ③, ④ and ⑤ show a variation of use of bushing type stripper bolts.
Figures ④ and ⑤ show examples in which coil springs are mounted in the upper die set.
Stripper bolts ④ and ⑤ can be used in the same manner as ③.
Figure ④ shows an example in which spacers are used to adjust the height after regrinding.
■Figure ⑥ shows use example of inside screw type stripper bolts. The stripper plates can be easily removed.

■Example of use of pressure pin / suspension collar for stripper



■**Features**
- Allow larger springs to be used compared to standard inside screw type stripper bolts.
- Make it easy to remove the stripper plate.

⑦ SBKP P.742
SBKS P.742
⑧ SBKT P.742
SBK P.742

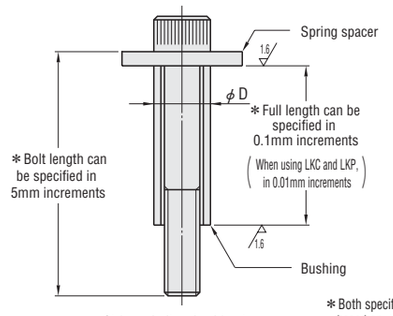
■Semi-finished standard items

●Bushing type stripper bolts

For all types of bolt, full length can be specified in 0.1mm increments and the bolt length can be selected according to design specifications. Please order by specifying the number of pieces used for a die. Grinding is done to specified dimension by the lot, eliminating height adjustment when assembling.

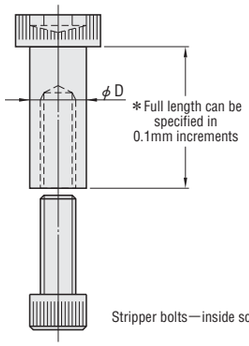
●Stripper bolts —Inside screw type—

Full length can be specified in 0.1mm increments. If order is placed specifying the number of pieces necessary for a die（like a bushing type）, grinding can also be done before delivery.
By using inside screw type stripper bolts, stripper plate can be removed without disassembling the die, making maintenance, such as regrinding, easy.



Stripper bolts—bushing type—

＊Both specification ranges are set based on ϕD.They can be specified within the ranges.



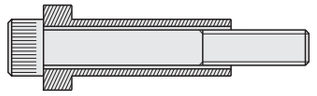
Stripper bolts—inside screw type—

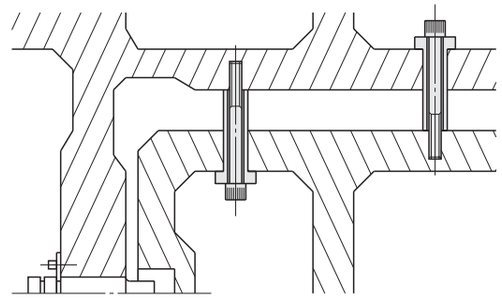
●Full length tolerance

Full length tolerance is ±0.05mm to the specified dimension. However, the difference in length can be minimized by lot grinding（40 pieces or less）.
（Difference max. 0.01mm）

■Other types of stripper bolts

Illustrated are spool retainers（**CSR P.909**）used for fixing stripper pads on dies for automobile bodies.





STRIPPER BOLTS
—MALE SCREW TYPE—

Price revision
The price revision of MSRB will come into effect from October 1, 2007. Until the end of September, please refer to the prices in the old catalog. We apologize for the inconvenience.

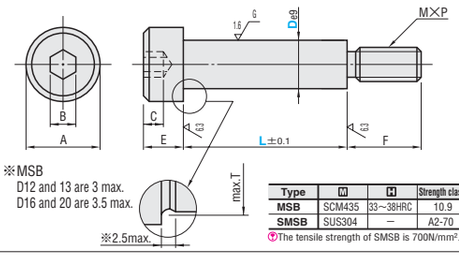
Price Revised

: New Price : Reduced Price

The volume discount rate is also applicable to alteration cost. P.39

RoHS

MSB
SMSB (Stainless steel)



Type	M	H	Strength class
MSB	SCM435	33～38HRC	10.9
SMSB	SUS304	—	A2-70

The tensile strength of SMSB is 700N/mm².

De9	A	B	C	E	F	M×P	T
4	6.5	2.5	1.6	3	5	2.5×0.45	4.5
4.5 (−0.020 −0.050)	7	2.5	1.6	3	6	3×0.5	5
5 (−0.020 −0.050)	8	2.5	1.6	3.5	6	3×0.5	5.5
5.5 (−0.020 −0.050)	9	3	2.2	4	7	4×0.7	6
6 (−0.020 −0.050)	9	3	2	4	7	4×0.7	6.5
6.5 (−0.025 −0.061)	10	4	2.5	5	9	5×0.8	7
8 (−0.025 −0.061)	13	5	3	6	9	6×1.0	8.7
10 (−0.025 −0.061)	16	6	4	8	12	8×1.25	10.8
12 (−0.032 −0.075)	17	6	4	8	12	8×1.25	12.8
13 (−0.032 −0.075)	18	8	5	10	16	10×1.5	14
16 (−0.032 −0.075)	24	10	7	14	18	12×1.75	17
20 (−0.040 −0.092)	27	14	9	18	24	16×2.0	21

Catalog No. Type	D	L (Only the sizes with ＊ is available for SMSB.)	U/Price Q'ty:1～19 MSB	SMSB
MSB / SMSB (Stainless steel)	4	10 15 20 25 30 35 40 45	55	—
			70	
	4.5	＊10 ＊15 ＊20 ＊25 ＊30 ＊35 ＊40 45 50	55	120
			70	
	5	10 15 20 25 30 35 40 45 50	60	—
			75	
	5.5	＊10 ＊15 ＊20 ＊25 ＊30 ＊35 ＊40 45 50 55	55	130
			70	
	6	10 15 20 25 30 35 40 45 50 55 60 65 70	75	—
			95	
	6.5	＊10 ＊15 ＊20 ＊25 ＊30 ＊35 ＊40 ＊45 ＊50 55 60 65 70 75 80	55	140
			65	
	8	＊10 ＊15 ＊20 ＊25 ＊30 ＊35 ＊40 ＊45 ＊50 ＊55 ＊60 ＊65 ＊70 ＊75 ＊80 85 90 95 100 110 120	65	140
			80	150
			100	—
	10	＊10 ＊15 ＊20 ＊25 ＊30 ＊35 ＊40 ＊45 ＊50 ＊55 ＊60 ＊65 ＊70 ＊75 ＊80 ＊85 ＊90 95 100 110 120	85	180
			95	210
			120	240
	12	10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100	115	—
			140	
			180	
	13	10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 110 120 130	120	—
			160	
			215	
	16	15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 110 120 130 140 150	225	—
			245	
			330	
	20	40 50 60 70 80 90 100 110 120 130 140 150	350	—
			435	

Order: Catalog No. — L
MSB 10 — 50

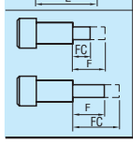
Delivery: 1 Day

Price: Volume discount rate P.37

Quantity	1～19	20～49	50～199	200～500
Rate	—	5%	10%	15%

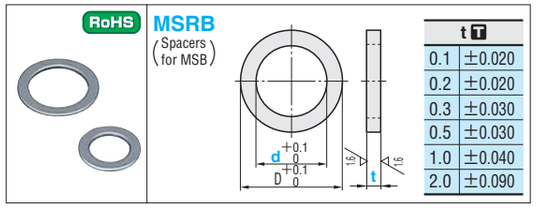
To be quoted on price & lead time above Max. Q'ty.

Alteration: Catalog No. — L(LC) — (FC)
MSB 10 — LC50.1 — FC10.5
Delivery: 3 Days
⊗SMSB:Not applicable

Alteration	Code	Spec.	¥/1Code	
	LC	Changes dimension L (Cutting) Full length tolerance (LC): ±0.05 Lmin≦LC≦Lmax 0.1mm increments This alteration does not change the dimension F. For the alteration of dimension F, apply FC below.	D 4～10	300
			D12～16	400
			D20	500
	FC	Changes dimension F M≦FC≦M×3 0.5mm increments When D=4, 3≦FC≦7.5 FC is applicable when LC is specified.	FC<F	0
			FC>F	60

RoHS

MSRB
(Spacers for MSB)



t	
0.1	±0.020
0.2	±0.020
0.3	±0.030
0.5	±0.030
1.0	±0.040
2.0	±0.090

D	d	Catalog No.	t	U/Price Q'ty:1～49	50～99	100～499	500～1000
6.5	4	MSRB	＊4	18	16	6	6
7	4.5		4.5	18	16	6	6
8	5		＊5	20	18	6	6
9	5.5		5.5	20	18	6	6
9	6		＊6	20	18	6	6
10	6.5		6.5	20	18	6	6
13	8		8	22	19	7	7
16	10		10	25	22	8	7
17	12		＊12	34	30	10	9
18	13		13	34	30	11	9
24	16		16	40	36	13	11
27	20		20	52	46	18	16

t=0.1 / 0.2 / 0.3 / 0.5 / 1.0 / 2.0

t=2.0 is not available for the sizes with ＊ mark.

Order: Catalog No. — t
MSRB 10 — 0.1

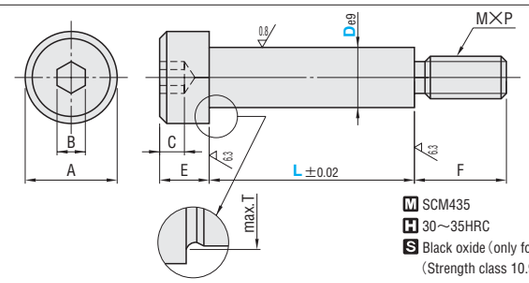
To be quoted on price & lead time above Max. Q'ty.

Delivery: 1 Day

STRIPPER BOLTS / STROKE EXTENSION RETAINERS FOR STRIPPER BOLT
—OUTSIDE SCREW DIMENSION L PRECISION TYPE—

Stripper bolts—outside screw type— RoHS

MSBL



M SCM435
H 30～35HRC
S Black oxide (only for head)
(Strength class 10.9)

De9	A	B	C	E	F	M×P	T	Catalog No. Type	D	1mm increments L	U/Price Q'ty:1～19
6.5 (−0.025 −0.061)	10	4	2.5	5	9	M 5×0.8	7	MSBL	6.5	10～ 70	330
8 (−0.025 −0.061)	13	5	3	6	9	M 6×1.0	8.7		8	10～ 90	350
10 (−0.025 −0.061)	16	6	4	8	12	M 8×1.25	10.8		10	10～120	390
13 (−0.032 −0.075)	18	8	5	10	16	M10×1.5	14		13	10～130	530
16 (−0.032 −0.075)	24	10	7	14	18	M12×1.75	17		16	15～150	670
20 (−0.040 −0.092)	27	14	9	18	24	M16×2.0	21		20	15～150	890
25 (−0.040 −0.092)	33	17	11	19	30	M20×2.5	26		25	30～160	1,260

No knurling on the head.

Order: Catalog No. — L
MSBL 10 — 53

Price: Volume discount rate P.37

Quantity	1～19	20～49	50～199	200～500
Rate	—	5%	10%	15%

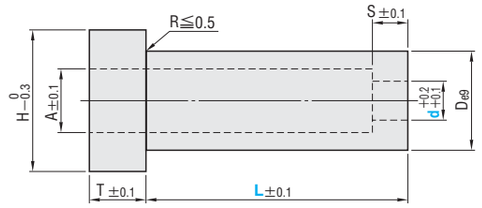
To be quoted on price & lead time above Max. Q'ty.

Delivery: 5 Days | Express B 300/1pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size.

Stroke Extension Retainer RoHS

MSBE



M SK4
H 53～58HRC

Applicable MSB Size	Shaft diameter (D)	Head diameter (A)	Head thickness (E)	Thread (M)	H	T	A	S	De9	Catalog No. Type	d	L (Selection)
MSB 8	8	13	6	M 6	25	6	14	8	18 (−0.032 −0.075)	MSBE	8	50 60 70 80 90
MSB10	10	16	8	M 8	27	8	17	10	22 (−0.04 −0.092)		10	
MSB13	13	18	10	M10	30	10	19	13	25 (−0.05 −0.112)		13	
MSB16	16	24	14	M12	37	15	25	16	32 (−0.05 −0.112)		16	

Order: Catalog No. — L
MSBE 8 — 50

Price: Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

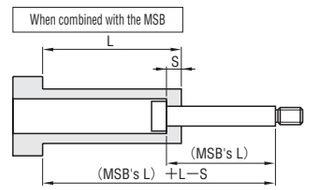
To be quoted on price & lead time above Max. Q'ty.

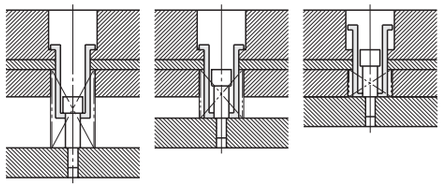
Delivery: 3 Days | Express A 500/1pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Catalog No. Type	d	U/Price Q'ty:1～9 L50	L60	L70	L80	L90
MSBE	8	1,380	1,440	1,530	1,640	1,770
	10	1,450	1,510	1,600	1,710	1,840
	13	1,880	1,940	2,030	2,140	2,270
	16	2,000	2,060	2,150	2,260	2,390

Example





●Even if the die height is short, long stripper stroke can be set with MSBE.

STRIPPER BOLTS
—FEMALE SCREW TYPE—

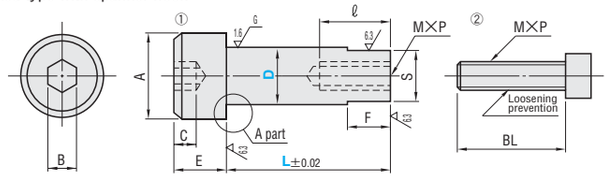
Type	Spanner Hook	Set	Catalog No.
Fixed dimension type	Available	set of①and②	SBT
		①only	SBTN
	None	set of①and②	SBTC
		①only	SBTCN
Dimension L specifiable type	Available	set of①and②	SBTL
		①only	SBTLN
	None	set of①and②	SBTK
		①only	SBTKN

RoHS

(?)About "Loosening Prevention Treatment"
The screw grooves are treated by application of a special type of resin which has outstanding elasticity, wear resistance and oil resistance.
The effectiveness of the treatment is at maximum from the initial through the fourth run, after which it gradually diminishes.

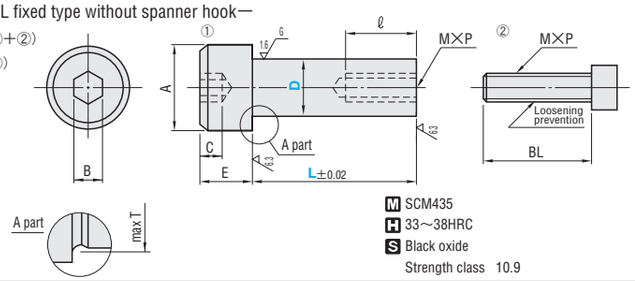
—Dimension L fixed type with spanner hook—

SBT (①+②)
SBTN (①)



—Dimension L fixed type without spanner hook—

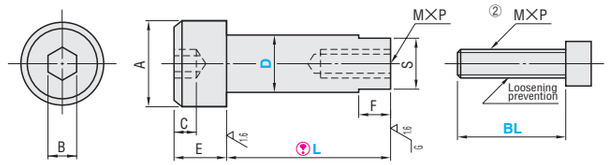
SBTC (①+②)
SBTCN (①)



M SCM435
H 33～38HRC
S Black oxide
Strength class 10.9

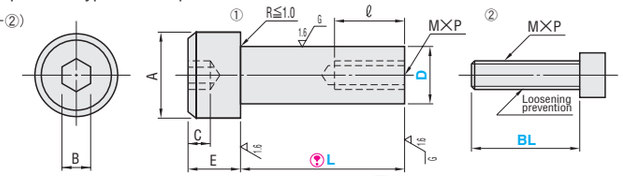
—Dimension L specifiable type with spanner hook—

SBTL (①+②)
SBTLN (①)



—Dimension L specifiable type without spanner hook—

SBTK (①+②)
SBTKN (①)



For a block order of the same type (of 40 items or less), we will grind the entire order to specifications.
(?)While dimension L tolerance is set at ±0.05, we will guarantee dimension L accuracy of 0.01 or less for the block order.

M SCM435
H 33～38HRC
S Black oxide
Strength class 10.9

D	A	B	C	E	T	ℓ	BL	SBTC・SBTCN M×P	SBT・SBTN M×P	F	S
10 —0.025 —0.061	16	6	3	6	10.8	15	25	6×1.0	5×0.8	8	8
13 —0.032 —0.075	18	8		7	14			8×1.25	6×1.0	10	11
16	24	10		9	17	20	30	10×1.5	8×1.25	12	14
20 —0.220 —0.270	27	14		11	21			12×1.75	10×1.5	14	17

Catalog No.	Type	D	L	U/Price Q'ty:1～49 SBT	SBTN	SBTC	SBTCN
	SBT	10	20 25 30 35 40 45 50 55 60	270	260	260	250
	SBTN	13	20 25 30 35 40 45 50 55 60	300	290	290	280
	SBTC	16	25 30 35 40 45 50 55 60	400	390	390	380
	SBTCN	20	25 30 35 40 45 50 55 60	560	540	550	530

Catalog No. — L
SBT 16 — 50
SBTC 16 — 50

1 Day

■Volume discount rate (?) P.37

Quantity	1～49	50～99	100～199	200～500
Rate	—	5%	10%	15%

(?)To be quoted on price & lead time above Max. Q'ty.

D	A	B	C	E	ℓ	SBTK・SBTKN M×P	SBTL・SBTLN M×P	F	S
10 —0.025 —0.061	16	6	3	6	17(1)	6×1.0	5×0.8	8	8
13 —0.032 —0.075	18	8		7		8×1.25	6×1.0	10	11
16	24	10		9	22(2)	10×1.5	8×1.25	12	14
20 —0.220 —0.270	27	14		11		12×1.75	10×1.5	14	17

Catalog No.	Type	D	(?)L 0.1mm increments	(Only for SBTL・SBTK) BL 5mm increments	U/Price Q'ty:1～19 SBTL	SBTLN	SBTK	SBTKN
	SBTL	10	20.0～65.0	15～35	970	960	590	580
	SBTLN	13	20.0～65.0	15～45	1,070	1,050	690	670
	SBTK	16	25.0～65.0	20～45	1,200	1,180	820	800
	SBTKN	20	25.0～65.0	20～45	1,450	1,430	1,070	1,050

(?)(1) φ10・φ13 When L<25, ℓ=17−(25−L)
(?)(2) φ16・φ20 When L<30, ℓ=20−(30−L)

Catalog No. — L — BL
SBTK 13 — 31.5 — 25
SBTL 13 — 31.5 — 25

3 Days

Express	T	600/1pc.
Express	A	300/1pc.

P.38

■Volume discount rate (?) P.37

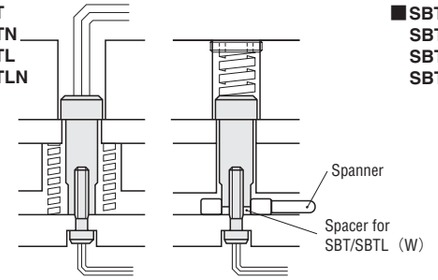
Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

(?)To be quoted on price & lead time above Max. Q'ty.

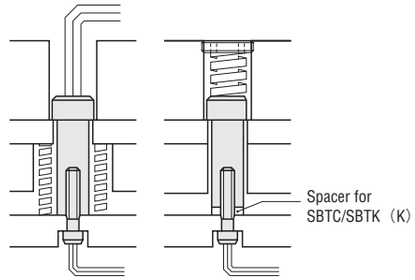
(?)A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

ex Example

■SBT
SBTN
SBTL
SBTLN



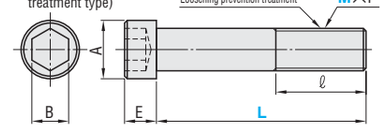
■SBTC
SBTCN
SBTK
SBTKN



■Hexagon socket head cap screws for female screw type stripper bolts (with Loosening Prevention)

RoHS

LB (Loosening prevention treatment type)



M SCM435
H 38～43HRC
(JIS B 1176 / JIS B 0205/Grade 2 / Strength class 12.9)

Order — Catalog No.
LB 10 — 20

Delivery — 1 Day

Price — (?)To be quoted on price & lead time above Max. Q'ty.

ℓ New JIS	Catalog No. Type M—L	U/Price Q'ty:1～99	100～200
Full thread	LB 4— 8	14	13
	10		
	12		
	15		
	20		
	25		
20	30	15	14
Full thread	LB 5—10	15	14
	12		
	15		
	20		
	25		
22	30	16	15
	35	17	16
Full thread	LB 6—10	15	14
	15		
	20	16	15
	25		
	30	17	16
24	35	18	17
	40	20	19
	45	21	19
	50	22	20

ℓ New JIS	Catalog No. Type M—L	U/Price Q'ty:1～99	100～200
Full thread	LB 8—15	21	19
	20		
	25		
	30		
28	35	22	20
	40	24	22
	45	26	24
	50	27	25
	55	34	32
	60	40	38
Full thread	LB 10—20	28	26
	25	29	27
	30	30	28
	35	31	29
	40	32	30
32	45	35	33
	50	36	34
	55	40	38
	60	45	42
Full thread	LB 12—25	43	40
	30	45	42
	35	46	43
	40	47	44
	45	49	46
	50	53	50
36	55	58	55
	60	63	59

LB M×P	A	E	B
4×0.7	7	4	3
5×0.8	8.5	5	4
6×1.0	10	6	5
8×1.25	13	8	6
10×1.5	16	10	8
12×1.75	18	12	10

Reference:Dimensions of counterboring and bolt hole of the hexagon socket head cap screws. P.1251

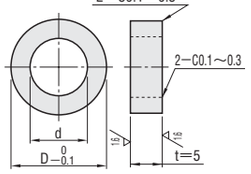
※The term "strength class" signifies the screw's tensile strength.
(Example)12.9 (LB)
Indicates that the yield point or the minimum proof strength is 90% of the tensile strength.
Indicates that the minimum value of tensile strength is 1220N/mm²{124kgf/mm²}

(?)About "Loosening Prevention Treatment"
The screw grooves are treated by application of a special type of resin which has outstanding elasticity, wear resistance and oil resistance.
The effectiveness of the treatment is at maximum from the initial through the fourth run, after which it gradually diminishes.

■Spacers for female screw type stripper bolt

RoHS

K・W



M S45C H 48～52HRC

t T	D	d T	Catalog No.		U/Price Q'ty:1～49	50～199	200～499	500～1000
±0.005	10	+ 0.3 + 0.1	K	10	60	57	54	51
	13			13	70	66	63	59
	16			16	80	76	72	68
	20	12		20	90	85	81	76
±0.01	8	+ 0.2 + 0.1	W	10	60	57	54	51
	11	6		13	70	66	63	59
	14	8		16	80	76	72	68
	17	10		20	90	85	81	76

Order — Catalog No.
K 10
W 16

Delivery — 1 Day

Price — (?)To be quoted on price & lead time above Max. Q'ty.

STRIPPER BOLTS
—BUSHING TYPE—

The volume discount rate is also applicable to alteration cost. P.39

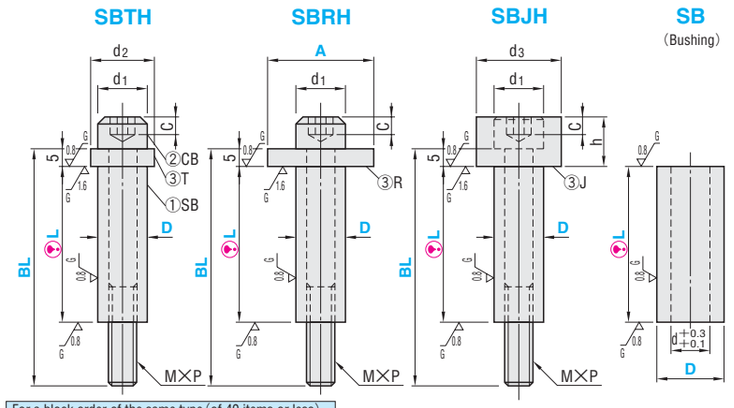
RoHS

SBTH, SBRH, and SBJH are the combined products of ① a main body of bushing, ② a bolt and ③ a spacer.

①　②　③

■Combination of stripper bolts —bushing semi-finished type—

Set name	Bushing	Hexagon socket head cap screw	Spacer
①②③	①	②	③
SBTH	SB	CB (P.721)	T (P.728)
SBRH			R (P.728)
SBJH			J (P.728)



For a block order of the same type (of 40 items or less), we will grind the entire order to specifications.
While dimension L tolerance is set at ±0.05, we will guarantee dimension L accuracy of 0.01 or less for the block order.

② M SCM435 (Strength class 12.9)

①③ M S45C　H 48～52HRC

De9		d1	SBTH d2	SBRH A	SBJH h	SBJH d3	SB d	M×P	C Minimum depth	Catalog No. Type	D	L 0.1mm increments	BL 5mm increments	BL 10mm increments	(Only for SBRH) A	U/Price Q'ty:1～19 SBTH	SBRH	SBJH	SB
6.5	−0.025 −0.061	7	11.5	16・18	9	12	4	4×0.7	2	SBTH SBRH SBJH SB	6.5	10.0～70.0	20～95	—	16・18	500	500	530	440
												70.1～80.0				640	640	680	520
8		8.5	13	18・20・22	10	14	5	5×0.8	2.5		8	10.0～70.0	20～95	—	18・20・22	550	550	580	480
												70.1～80.0				680	680	730	580
10		10	15	20・22・25・27	11	18	6	6×1.0	3		10	10.0～100.0	20～95	100～170	20*・22・25・27	630	630	670	560
												100.1～150.0				1,030	1,030	1,120	760
13	−0.032 −0.075	13	18	25・27・30	13	24	8	8×1.25	4		13	10.0～100.0	20～95	100～170	25*・27・30	720	720	760	650
												100.1～150.0				1,200	1,200	1,280	860
16		16	21	30・35・40	15	27	10	10×1.5	5		16	10.0～100.0	20～95	100～180	30*・35・40	870	870	920	790
												100.1～150.0				1,320	1,320	1,380	1,140
20	−0.040 −0.092	18	23	35・40	17	32	12	12×1.75	6		20	10.0～100.0	20～95	100～180	35*・40	1,110	1,110	1,240	990
												100.1～150.0				1,690	1,690	1,760	1,280

The head diameter d1 of bolts with ＊ are trimmed so that there will be no interference with the inner diameter of the spring.

Order

Catalog No.	—	L	—	BL	—	A
SBTH 13	—	34.5	—	50		
SBRH 10	—	27.8	—	45	—	22
SB 13	—	34.5				

Delivery 3 Days

Express T 600/1pc.
Express A 300/1pc.
P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

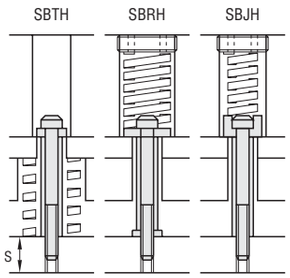
Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

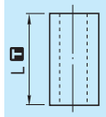
Example



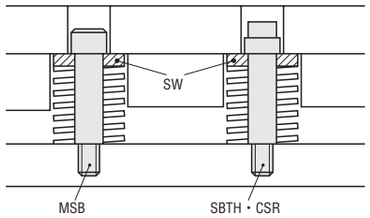
BL＜S+L+5

Alteration

Catalog No.	—	L	—	BL	—	A	— (LKC・LKP)
SBRH 10	—	27.8	—	45	—	22	— LKC
SBTH 16	—	55.85	—	90			— LKP

Alteration	Code	Spec.	¥/1Code
	LKC	Changes tolerance on L L ±0.05 ⇨ L +0.02 0 When using LKC, dimension L can be specified in 0.01mm increments	300
	LKP	Changes tolerance on L L ±0.05 ⇨ L +0.01 0 When using LKP, dimension L can be specified in 0.01mm increments.	500

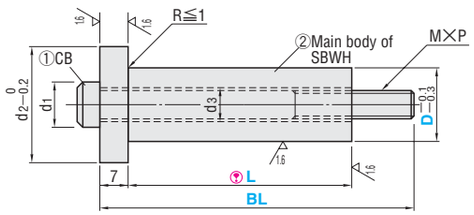
Using spacer



STRIPPER BOLTS
—BUSHING / THICK TYPE—

RoHS

SBWH



For a block order of the same type (of 40 items or less), we will grind the entire order to specifications.
While dimension L tolerance is set at ±0.05, we will guarantee dimension L accuracy of 0.01 or less for the block order.

② M SK4
H 53～58HRC

d1	d2	d3	M×P	Catalog No. Type	D	L 0.1mm increments	BL 5mm increments	U/Price Q'ty:1～19
8.5	21	5.5	5×0.8	SBWH	13	15.0～65.0	30～80	960
10	25	6.5	6×1.0		16	15.0～65.0	30～90	1,100
13	30	8.5	8×1.25		20	20.0～70.0	35～90・100	1,400

Order

Catalog No.	—	L	—	BL
SBWH 13	—	30.0	—	50

Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery 3 Days

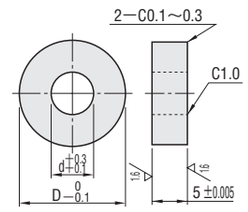
Express T 600/1pc.
Express A 300/1pc.
P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

■Spacers and washers for bushing type stripper bolt

RoHS

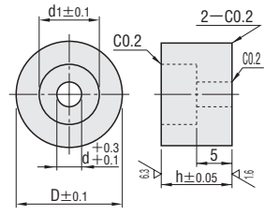
T・R (Spacer for Stripper bolts—bushing type—)



M S45C　H 48～52HRC

D	d	Catalog No.	U/Price Q'ty:1～49	50～199	200～499	500～1000
11.5	4	T 6.5	70	66	63	59
13	5	T 8	70	66	63	59
15	6	T 10	70	66	63	59
18	8	T 13	80	76	72	68
21	10	T 16	90	85	81	76
23	12	T 20	120	114	108	102
16	4	R 6.5—16	100	95	90	85
18		R 6.5—18	100	95	90	85
18	5	R 8—18	100	95	90	85
20		R 8—20	100	95	90	85
22		R 8—22	100	95	90	85
20	6	R 10—20	100	95	90	85
22		R 10—22	100	95	90	85
25		R 10—25	100	95	90	85
27		R 10—27	100	95	90	85
25	8	R 13—25	130	123	117	110
27		R 13—27	130	123	117	110
30		R 13—30	130	123	117	110
30	10	R 16—30	160	152	144	136
35		R 16—35	160	152	144	136
40		R 16—40	160	152	144	136
35	12	R 20—35	260	247	234	221
40		R 20—40	260	247	234	221

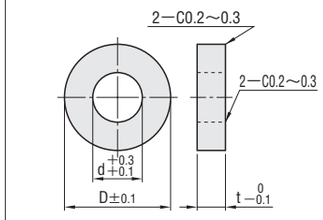
J (Spacers for bushing type stripper bolt with counterbore)



M S45C　H 48～52HRC

D	d1	d	h	Catalog No.	U/Price Q'ty:1～49	50～199	200～499	500～1000
12	8	4	9	J 6.5	100	95	90	85
14	10	5	10	J 8	100	95	90	85
18	11	6	11	J 10	120	114	108	102
24	14	8	13	J 13	160	152	144	136
27	17.5	10	15	J 16	190	180	171	161
32	19.5	12	17	J 20	330	313	297	280

SW (Washers for bushing type stripper bolt/coil spring)



M S45C　H 48～52HRC

D	d	t	Catalog No.	U/Price Q'ty:1～19	20～49	50～99	100～200
10	4.5	3	SW 10	140	133	126	119
12	5.5		SW 12				
	6		SW 12—6	150	142	135	127
16	6.5	4	SW 16	170	161	153	144
20	8	5	SW 20				
22	10		SW 22	180	171	162	153
25			SW 25				
	12		SW 25—12	190	180	171	161
27	13	8	SW 27	220	209	198	187
30			SW 30				
35	16		SW 35	270	256	243	229
40			SW 40				
50	20	10	SW 50	320	304	288	272

Order

Catalog No.
SW 25

Delivery 1 Day

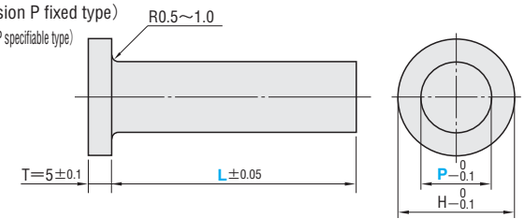
Price To be quoted on price & lead time above Max. Q'ty.

PRESSURE PINS FOR STRIPPER

The volume discount rate is also applicable to alteration cost. P.39

RoHS

HSPP (Dimension P fixed type)
HSPPH (Dimension P specifiable type)



M SKS3
H 53～58HRC

H	Catalog No. Type	P	L 0.1mm increments	Price Q'ty:1～19 L10.0～40.0	L40.1～60.0
20	HSPP	8	10.0～60.0	350	460
22		10		400	510
25		13		480	620
27		16		520	690
30		20		620	820
35		25		780	1,050

H	Catalog No. Type	No.	L 0.1mm increments	P 0.5 mm increments	Price Q'ty:1～19 L10.0～40.0	L40.1～60.0
10	HSPPH	10	10.0～60.0	＊5.0～ 6.0	470	600
16		16		7.0～12.0	470	600
20		20		7.0～16.0	480	620
22		22		8.0～18.0	530	690
25		25		9.0～21.0	670	870
27		27		9.0～23.0	730	970
30		30		10.0～26.0	880	1,180
35		35		16.0～30.0	1,110	1,490

＊When the P dimension is 5.0, the L dimension is within the range of 10.0 to 30.0.

Order

Catalog No.	—	L	—	P
HSPP 10	—	31.5		
HSPPH 25	—	35.8	—	P16.5

Delivery

3 Days | Express A 300/1pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size.

Price

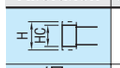
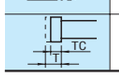
Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

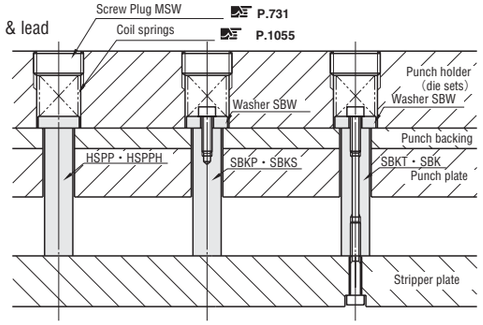
Alteration

Catalog No.	—	L	—	P	— (HC・TC)
HSPPH 25	—	35.8	—	P16.5	— HC19 — TC3

Alteration	Code	Spec.	¥/1Code
	HC	Changes head diameter (P+2)≦HC<H 0.1mm increments	200
	TC	Changes head thickness 2≦TC<5 0.1mm increments	200

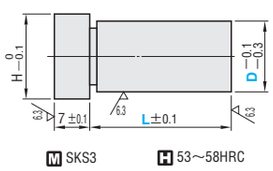
Features

1. Since the R on the bottom of the head is 0.5～1, impact resistance is outstanding.
2. The head diameter matches the coil spring diameter.
3. The shaft diameter dimension (P) can be specified, so it can be used even in a narrow space. (HSPPH)



RoHS

PWP



M SKS3 H 53～58HRC

H	Catalog No. Type	D	L 0.1mm increments	U/Price Q'ty:1～19
13	PWP	8	15.0～ 70.0	560
16		10	15.0～100.0	600
21		13		790
25		16		860
30		20		1,170

Order

Catalog No.	—	L
PWP 16	—	50.0

Delivery

3 Days

Express T 600/1pc.
Express A 300/1pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

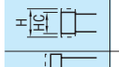
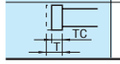
Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

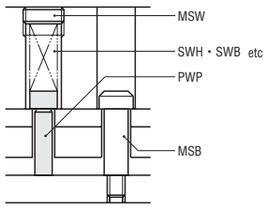
To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No.	—	L	— (HC・TC)
PWP 8	—	50.5	— HC10 — TC5

Alteration	Code	Spec.	¥/1Code
	HC	Changes head diameter D≦HC<H 0.1mm increments	200
	TC	Changes head thickness 2≦TC<7 0.1mm increments	200

Example

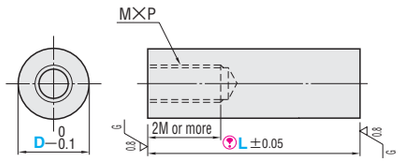


PRESSURE PINS / HANG COLLARS FOR STRIPPER

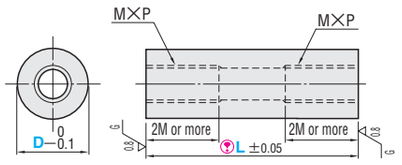
The volume discount rate is also applicable to alteration cost. P.39

RoHS

SBKP (Pressure pins)



SBKT (Hang collars)



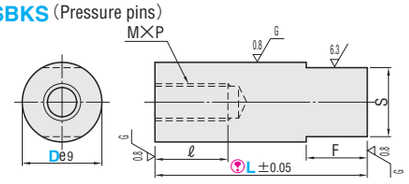
For a block order of the same type (of 40 items or less), we will grind the entire order to specifications.
While dimension L tolerance is set at ±0.05, we will guarantee dimension L accuracy of 0.01 or less for the block order.

In the case of SBKT, the pilot hole for tapping may sometimes completely go through the collar depending on the L dimension.
When 4M>L, tap is through. (SBKT only)

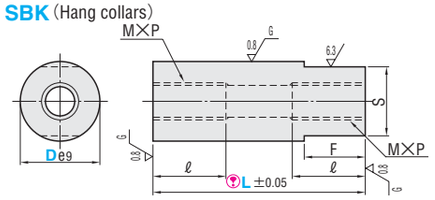
M SKS3
H 53～58HRC

RoHS

SBKS (Pressure pins)



SBK (Hang collars)



For a block order of the same type (of 40 items or less), we will grind the entire order to specifications.
While dimension L tolerance is set at ±0.05, we will guarantee dimension L accuracy of 0.01 or less for the block order.

In the case of SBK, the pilot hole for tapping may sometimes completely go through the collar depending on the L dimension.
When 2×ℓ >L, ℓ is a through tap. (SBK only)

M SCM435
H 33～38HRC

M×P	Catalog No. Type	D	L 0.1mm increments	U/Price Q'ty:1～19 SBKP	SBKT
5×0.8	SBKP SBKT	8	20.0～60.0	470	580
		10		480	610
6×1.0		13		540	660
8×1.25		16		600	710
		20		750	860

De9		F	ℓ	S	M×P	Catalog No. Type	D	L 0.1mm increments	U/Price Q'ty:1～19 SBKS	SBK
10	−0.025 −0.061	8	15	8	5×0.8	SBKS SBK	10	20.0～60.0	670	750
13	−0.032 −0.075	10		11	6×1.0		13		740	820
16		12	20	14	8×1.25		16		840	920

Order

Catalog No.	—	L
SBKP 16	—	50.0

Delivery

●SBKP・SBKT

3 Days | Express A 300/1pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size.

●SBKS・SBK

3 Days

Express T 600/1pc.
Express A 300/1pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

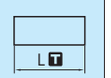
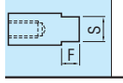
Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

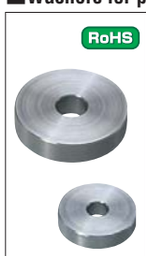
Alteration

Catalog No.	—	L	— (LKC・SC)
SBKT 13	—	45.0	— LKC

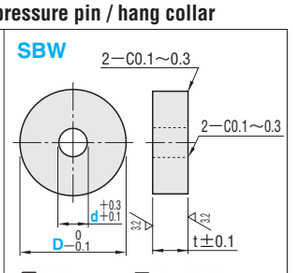
Alteration	Code	Spec.	¥/1Code
	LKC	Changes tolerance on L L±0.05 ⇨ L +0.02 0 When using LKC, dimension L can be specifiable in 0.01mm increments.	300
	SC	Adds spanner groove. Applicable to SBKP / SBKT. ⊗ SBKT8:Not applicable. D 8 10 13 16 20 / F 6 7 8 9 11 / S 7 8 11 14 18	300

■Washers for pressure pin / hang collar

RoHS



SBW



M S45C H 48～52HRC

t	Catalog No. Type	D	d	U/Price Q'ty:1～49	50～199	200～499	500～1000
5	SBW	20	5	80	76	72	68
		22	5	90	85	81	76
		25	6	100	95	90	85
7		27	5	110	104	99	93
		30	6	120	114	108	102
		35	8	170	161	153	144

Delivery

1 Day

Order

Catalog No.	—	d
SBW 27	—	8

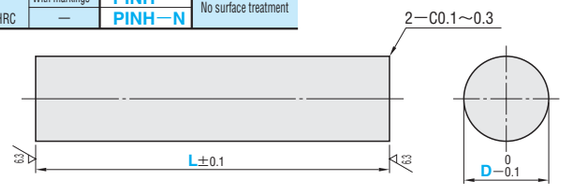
To be quoted on price & lead time above Max. Q'ty.

ADJUST PINS

The volume discount rate is also applicable to alteration cost. P.39

RoHS

M · H	Font	Catalog No.	S
S45C	With markings	PIN	Black oxide
40～50HRC	—	PIN—N	
SKS3	With markings	PINH	No surface treatment
58～60HRC	—	PINH—N	



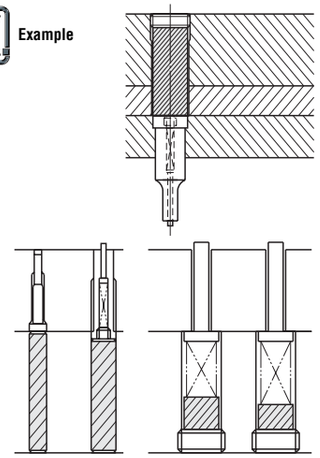
Catalog No. Type	D	L 0.1mm increments	(Only for PIN and PINH) CHR(Character)
(With markings D5～30) PIN	3	10.0～250.0	
	4		
	5		
	6		
	7		
(Without markings D3～30) PIN—N	8		
	9		
	10		
	11		
	12		
	13		
High-hardness type	14		
	15		
(With markings D5～30) PINH	16		
	18		
	20		
(Without markings D5～30) PINH—N	22		
	25		
	27		
	30		

Discriminative markings can be indicated on side face.

Characters	Number of characters
· Alphabet · Number	1～8 characters (If L<30.0, the number of characters is 1～3.)

The characters are in Gothic.
⊗"—" (hyphen) and "/" (virgule) cannot be specified.

ex Example



Order: Catalog No. — L — CHR
PIN 10 — 60.5 — 53218A
PINH—N 8 — 156.2

Delivery: 3 Days | Express A 500/1pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.

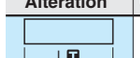
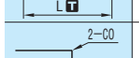
Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration: Catalog No. — L — CHR — (LKC · NC)
PINH 8 — 105.5 — A10 — LKC
PINH—N 20 — 125.5 — NC

Alteration	Code	Spec.	¥/1Code
	LKC	Changes tolerance on full length L±0.1 ⇨ +0.05 0	400
	NC	No chamfering	0

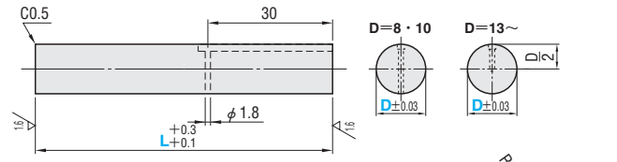
D	PIN Price Q'ty:1～19				PIN—N Price Q'ty:1～19				PINH Price Q'ty:1～19				PINH—N Price Q'ty:1～19			
	L10.0～100.0	L100.1～150.0	L150.1～200.0	L200.1～250.0	L10.0～100.0	L100.1～150.0	L150.1～200.0	L200.1～250.0	L10.0～100.0	L100.1～150.0	L150.1～200.0	L200.1～250.0	L10.0～100.0	L100.1～150.0	L150.1～200.0	L200.1～250.0
3	—	—	—	—	210	260	310	400	—	—	—	—	—	—	—	—
4	—	—	—	—	220	270	330	420	—	—	—	—	—	—	—	—
5	270	310	370	470	250	290	360	450	540	640	750	890	480	570	680	830
6	280	330	400	490	260	310	380	480	570	670	790	940	500	600	720	870
7	300	360	440	540	270	330	410	510	610	710	850	1,010	540	650	780	940
8	320	390	470	580	300	370	450	560	670	780	920	1,090	600	710	860	1,030
9	370	450	540	670	340	420	510	650	710	850	1,010	1,200	650	780	940	1,130
10	420	500	600	740	400	480	580	730	820	970	1,150	1,370	750	900	1,080	1,300
11	460	550	670	830	430	520	640	800	860	1,010	1,200	1,430	790	940	1,130	1,360
12	490	590	710	890	460	560	680	860	900	1,060	1,260	1,510	840	1,000	1,200	1,440
13	520	630	750	940	490	590	720	910	1,020	1,210	1,430	1,710	950	1,140	1,370	1,640
14	560	670	820	1,030	530	650	790	990	1,250	1,490	1,780	2,120	1,190	1,430	1,710	2,050
15	600	720	860	1,080	560	680	840	1,050	1,280	1,530	1,820	2,180	1,220	1,460	1,760	2,110
16	630	750	900	1,120	590	720	860	1,090	1,430	1,700	2,030	2,430	1,360	1,630	1,970	2,370
18	720	860	1,040	1,290	690	840	1,010	1,260	1,630	1,950	2,330	2,780	1,570	1,880	2,260	2,720
20	770	930	1,110	1,400	740	900	1,080	1,370	1,770	2,110	2,520	3,010	1,700	2,040	2,450	2,950
22	1,070	1,280	1,550	1,940	1,030	1,240	1,500	1,890	2,420	2,900	3,470	4,150	2,360	2,830	3,400	4,090
25	1,220	1,460	1,750	2,190	1,170	1,420	1,710	2,150	2,730	3,260	3,900	4,670	2,660	3,190	3,840	4,610
27	1,290	1,550	1,860	2,340	1,240	1,510	1,820	2,290	2,920	3,490	4,170	5,000	2,850	3,420	4,100	4,930
30	1,340	1,610	1,920	2,410	1,290	1,560	1,880	2,370	2,990	3,580	4,280	5,130	2,930	3,520	4,220	5,060

PRESSURE PINS
—FOR OIL HYDRAULIC PRESS—

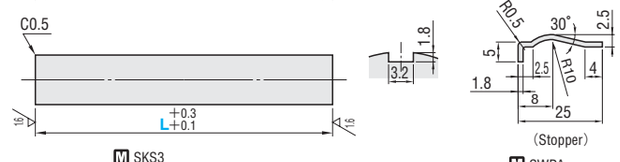
The volume discount rate is also applicable to alteration cost. P.39

RoHS

PRPS (With stopper)



PRP



(Stopper)

M SKS3
H 58～60HRC

M SWPA
Attached to PRPS only

Catalog No. Type	D	L 1mm increments	PRPS Price Q'ty:1～9 L40.0～100.0	PRPS Price Q'ty:1～9 L100.1～150.0	PRPS Price Q'ty:1～9 L150.1～200.0	PRP Price Q'ty:1～9 L20.0～100.0	PRP Price Q'ty:1～9 L100.1～150.0	PRP Price Q'ty:1～9 L150.1～200.0
PRPS (L≧40)	8	20～150	1,250	1,520	—	710	870	—
	10		1,330	1,620	—	800	980	—
	13	20～200	1,350	1,700	1,790	830	1,000	1,080
	16		1,400	1,730	1,950	850	1,030	1,250
PRP	20		1,430	1,750	2,110	920	1,100	1,350
	25		1,540	1,880	2,270	1,070	1,290	1,570
	28		1,690	2,060	2,490	1,220	1,470	1,790

Order: Catalog No. — L
PRPS 20 — 130

Delivery: 3 Days

Price

■Volume discount rate P.37

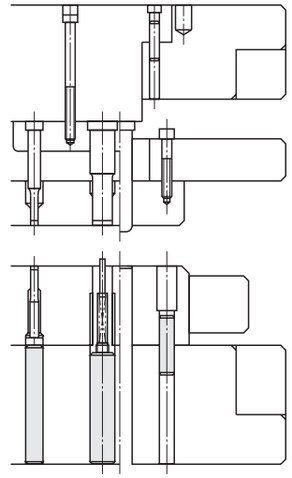
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration: Catalog No. — L — (LKC)
PRPS 20 — 130 — LKC

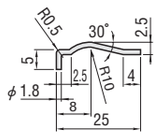
Alteration	Code	Spec.	¥/1Code
	LKC	Changes tolerance on full length +0.3 +0.1 ⇨ L20.0～100.0 : +0.03 0 L100.1～150.0 : +0.04 0 L150.1～200.0 : +0.05 0 ※When using LKC, dimension L can be specified in 0.1mm increments.	400

ex Example



■Stopper

PRPS—K RoHS



M SWPA

Catalog No.	U/Price Q'ty:1～9	10～19	20～49	50～100
PRPS—K	200	190	180	170

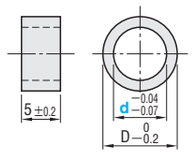
Order: Catalog No.
PRPS—K

Delivery: 1 Day

Price: To be quoted on price & lead time above Max. Q'ty.

■Collars for pressure pins

PRPCC RoHS



M SS400

D	Catalog No. Type	d	U/Price Q'ty:1～9
11	PRPCC	8	170
13		10	270
16		13	
19		16	
24		20	
29		25	380
32		28	

Order: Catalog No.
PRPCC 13

Delivery: 1 Day

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example

Press fit
(Shininkage)

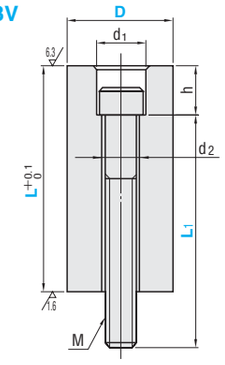
PRESS ADD.SPEC Printed in Red

STROKE END BLOCKS —QUENCHED TYPE—

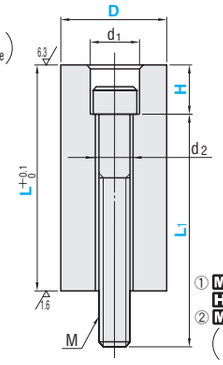
¥ The volume discount rate is also applicable to alteration cost. P.39

RoHS

SBV



SBVH (Counterbore depth specified type)



① M SKS93
H 54～58HRC
② M SCM435
(Strength class 12.9 JIS B 0205 / Grade 2)

M×P	d1	d2	h	Catalog No. Type	D	① L 0.1mm increments	Color	② L1 5mm increments	U/Price Q'ty:1～9 ～L50.0	L50.1～70.0	L70.1～100.0	L100.1～
M 3×0.5	6	4	5	SBV	10	10.0～ 40.0	R (Red) Y (Yellow) N (Normal)	10～ 40	570	—	—	—
					12				630	—	—	—
M 4×0.7	8	5	8		14	15.0～ 50.0		10～ 50	680	—	—	—
					16				740	—	—	—
M 5×0.8	9.5	6	10		18	20.0～ 70.0		15～ 70	780	830	—	—
M 6×1.0	11	7	13		20	20.0～ 80.0		15～ 85	810	900	1,000	—
M 8×1.25	14	9	15		25	22.0～100.0		15～100	950	1,090	1,240	—
					32	22.0～120.0		15～120	1,140	1,380	1,620	2,080
M10×1.5	17	11	18		38	25.0～120.0		20～120	1,430	1,810	2,190	2,830
					50				2,000	2,470	3,140	3,850
M12×1.75	20	13	21		60	30.0～150.0		25～150	2,850	3,420	3,990	3,990

N(Normal) ···▸S Black oxide

M×P	d1	d2	Catalog No. Type	D	① L 0.1mm increments	H 1mm increments	Color	② L1 5mm increments	U/Price Q'ty:1～9 ～L50.0	L50.1～70.0	L70.1～
M 6×1.0	11	7	SBVH	20	15.0～100.0	10～40	R (Red) Y (Yellow) N (Normal)	15～ 85	1,090	1,190	1,280
M 8×1.25	14	9		25	15.0～120.0	10～40		15～120	1,240	1,380	1,520
				32					1,430	1,660	1,900
M10×1.5	17	11		38	20.0～120.0	15～40		20～120	1,710	2,090	2,470
				50					2,280	2,850	3,420

N(Normal) ···▸S Black oxide

L−H≧5 Total length minus counterbore depth must be 5mm or more.

Order

Catalog No.	—	①	—	②
Type	D	— L — H	— R·Y·N	— L1
SBV	38	— 100.0	— Y	— 100
SBVH	38	— 80.0 — 40	— Y	— 60

Delivery

• SBV: 3 Days — Express T 600/1pc. / Express A 300/1pc. P.38
A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

• SBVH: 3 Days — Express A 300/1pc. P.38
A flat charge of 810 yen for 3 pieces or more of the same size.

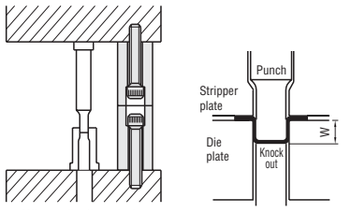
Price

Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

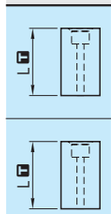
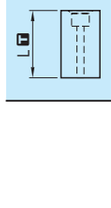
Example



When adjusting stroke

Catalog No. — ① — ② — (LKC · LKP)

Type	D	L	H	R·Y·N	L1	
SBV	38	—100.00	—	Y	— 100 —	LKC
SBVH	38	— 80.00 — 40	—	Y	— 60 —	LKP

Alteration	Code	Spec.	¥/1Code
	LKC	Changes tolerance on L $L^{+0.1}_{0}$ ⇨ ±0.01 When using LKC, the dimension L can be specified in 0.01mm increments. For orders of 8 pieces or less, we will guarantee dimension L accuracy of 0.005 or less by lot grinding.	600
	LKP	Changes tolerance on L $L^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$ When using LKP, the dimension L can be specified in 0.01mm increments. For orders of 8 pieces or less, we will guarantee dimension L accuracy of 0.005 or less by lot grinding.	1,000

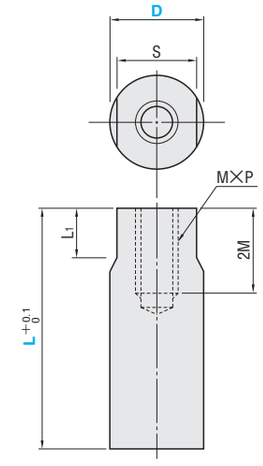
●Because these are quenched products, they are best suited for precision dies which require slight contact of stroke end blocks in order to keep the bending depth (W) properly.

STROKE END BLOCKS —QUENCHED TYPE TAPPED—

¥ The volume discount rate is also applicable to alteration cost. P.39

RoHS

SBVM



If dimension L is short, the pilot hole for tapping may penetrate.

M SKS93
H 54～58HRC

M×P	S	L1	Catalog No. Type	D	L 0.1mm increments	Color	U/Price Q'ty:1～9 ～L50.0	L50.1～70.0	L70.1～
M 6×1.0	17	12	SBVM	20	20.0～ 80.0	R (Red) Y (Yellow) N (Normal)	850	950	1,050
M 8×1.25	22			25	22.0～ 90.0		1,000	1,150	1,300
	27	16		32	22.0～100.0		1,200	1,450	1,700
M10×1.5	32			38	25.0～100.0		1,500	1,900	2,300

N(Normal) ···▸S Black oxide
When using SBVM, tighten it 1.5 times the bolt diameter.

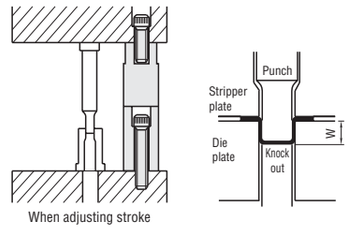
Order

Catalog No. — L — R·Y·N
SBVM 25 — 50.0 — Y

Delivery

3 Days — Express T 600/1pc. / Express A 300/1pc. P.38
A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Example



When adjusting stroke

●Because these are quenched products, they are best suited for precision dies which require slight contact of stroke end blocks in order to keep the bending depth (W) properly.

Price

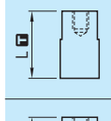
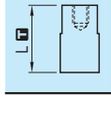
Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. — L — R·Y·N — (LKC · LKP)
SBVM 32 — 60.00 — R — LKC

Alteration	Code	Spec.	¥/1Code
	LKC	Changes tolerance on L $L^{+0.1}_{0}$ ⇨ ±0.01 When using LKC, the dimension L can be specified in 0.01mm increments. For orders of 8 pieces or less, we will guarantee dimension L accuracy of 0.005 or less by lot grinding.	600
	LKP	Changes tolerance on L $L^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$ When using LKP, the dimension L can be specified in 0.01mm increments. For orders of 8 pieces or less, we will guarantee dimension L accuracy of 0.005 or less by lot grinding.	1,000

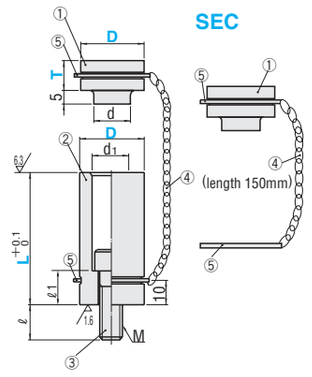
STROKE END BLOCKS

The volume discount rate is also applicable to alteration cost. P.39

Catalog No.	Components ①	②	③	④	⑤
SBS	○	○	○	○	○
SBN		○	○		
SEC	○			○	○

①② M SS400
③ M SCM435 (Strength class 12.9 JIS B 0205/Grade 2)
④Chain
⑤C Ring JIS B 2804

SEC

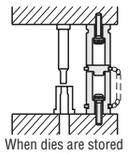


Catalog No. Type	D	② L 0.1mm increments	② Color	① T 5mm increments	① Color	U/Price Q'ty:1～9 ～L80.0	L80.1～L120.0	L120.1～
SBS ①②③④⑤	14	22.0～100.0	R (Red) Y (Yellow) N (Normal)	10～ 50	R (Red) Y (Yellow) N (Normal)	610	860	—
	16					630	880	—
	18					650	900	—
	20	22.0～120.0				670	930	—
	25	22.0～170.0				730	990	1,050
	32					880	1,140	1,200
	38	25.0～200.0				1,040	1,350	1,410
	50			10～ 50		1,550	1,970	2,080
				55～100		1,640	2,060	2,180
	60			10～ 50		1,970	2,480	2,610
				55～100		2,140	2,660	2,780
SBN ②③	14	22.0～100.0	R (Red) Y (Yellow) N (Normal)	—	—	330	570	—
	16					350	590	—
	18					370	610	—
	20	22.0～120.0				380	620	—
	25	22.0～170.0				430	670	710
	32					570	810	860
	38	25.0～200.0				710	1,000	1,050
	50					950	1,330	1,430
	60					1,240	1,710	1,810

③Table of bolt sizes

D	d	d1	M×P	ℓ	ℓ1	L	③
14	7	8	M4×0.7	10	10	22.0～ 80.0	M 4× 20
					35	80.1～100.0	M 4× 45
16	7	8	M4×0.7	10	10	22.0～ 80.0	M 4× 20
					35	80.1～100.0	M 4× 45
18	8.5	9.5	M5×0.8	10	10	22.0～ 80.0	M 5× 20
					35	80.1～100.0	M 5× 45
20	10	11	M6×P1.0	11	9	22.0～ 80.0	M 6× 20
					34	80.1～100.0	M 6× 45
					54	100.1～120.0	M 6× 65
25	13	14	M8×P1.25	12	8	22.0～ 80.0	M 8× 20
				14	31	80.1～100.0	M 8× 45
					51	100.1～120.0	M 8× 65
					76	120.1～170.0	M 8× 90
32	13	14	M8×P1.25	12	8	22.0～ 80.0	M 8× 20
				14	31	80.1～100.0	M 8× 45
					51	100.1～120.0	M 8× 65
					76	120.1～170.0	M 8× 90
38	16	17	M10×P1.5	16	9	25.0～ 80.0	M10× 25
				17	33	80.1～100.0	M10× 50
					53	100.1～120.0	M10× 70
					83	120.1～200.0	M10×100
50	18	20	M12×P1.75	18	7	25.0～ 80.0	M12× 25
				20	30	80.1～100.0	M12× 50
					50	100.1～120.0	M12× 70
					80	120.1～200.0	M12×100
60	18	20	M12×P1.75	18	7	25.0～ 80.0	M12× 25
				20	30	80.1～100.0	M12× 50
					50	100.1～120.0	M12× 70
					80	120.1～200.0	M12×100

Catalog No. Type	D	① T 5mm increments	① Color	U/Price Q'ty:1～9
SEC ①④⑤	14	10～ 50	R (Red) Y (Yellow) N (Normal)	410
	16			430
	18			450
	20			470
	25			470
	32			550
	38			600
	50	10～ 50		740
		55～100		860
	60	10～ 50		920
		55～100		1,120



N(Normal) ····▸S Black oxide

●To prevent the spacer cap from being left, colors of the main body and spacer cap can be selected respectively.
Note) Do not forget to specify the colors even if the color of the body and that of the spacer cap are the same.
●In case (B) and when the main body of SBS is 30mm or less, the bolt heads and spacer cap may interfere. Be sure to set the spacer cap upward.

Order — Catalog No. — L — ②R·Y·N — T — ①R·Y·N

Catalog No.	L	②R·Y·N	T	①R·Y·N
SBS 20	80.0	Y	20	R
SBN 20	100.0	R		
SEC 20			10	Y

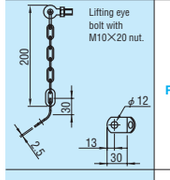
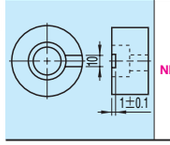
Delivery: 3 Days — Express T 600/1pc. / Express A 300/1pc. P.38
A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price — Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration — Catalog No. — L — ②R·Y·N — T — ①R·Y·N — (LKC･･･etc.)
SBS 20 — 80.00 — Y — 20 — R — LKC·RS·CHC100
Express T service is not available

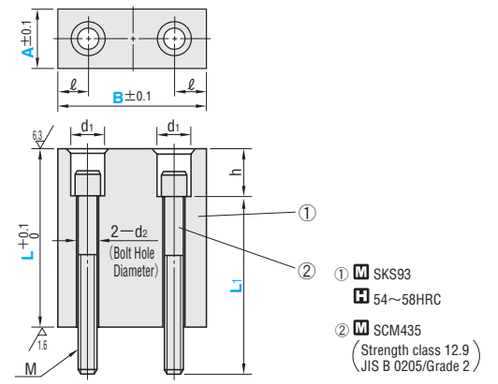
Alteration	Code	Spec.	¥/1Code
	LKC	Changes tolerance on L $L^{+0.1}_{0}$ ⇨ ±0.01 When using LKC, the dimension L can be specified in 0.01mm increments. For orders of 8 pieces or less, we will guarantee dimension L accuracy of 0.005 or less by lot grinding. Applicable to SBS/SBN.	●D14～32 400 ●D38～60 500
	CHC	Changes standard chain length. L: 22.0～49.9 / 50.0～99.9 / 100.0～200.0; CHC (selection): 50 100 200 / 100 200 / 200. Combination with RS: Not available	0
	RS	Lifting eye bolt with M10×20 nut. Changes the standard chain to reinforced chain. Applicable to SBS20～60, SEC20～60. Applicable to T≧20 of SBS/SEC. Length is 150 only. Combination with CHC: Not available	700
	NMC	Adds lead groove for height adjustment. Applicable to D≧32 of SBS/SBN.	500

STROKE END BLOCKS / CHAINS FOR END BLOCK
—QUENCHED / SQUARE TYPE—

The volume discount rate is also applicable to alteration cost. P.39

Stroke end blocks

SBVK



M×P	ℓ	d1	d2	h	Catalog No. Type	A	B	① L 0.1mm increments	① Color	② L1 5mm increments	U/Price Q'ty:1～9 L20.0 ～40.0	L40.1 ～70.0	L70.1 ～100.0
M4×0.7	8	8	5	13	SBVK	13	32	20.0～ 50.0	R (Red) Y (Yellow) N (Normal)	15～ 50	1,680	1,920	—
	12						50				1,850	2,220	—
M5×0.8	10	9.5	6			16	38	20.0～ 80.0		15～ 80	1,850	2,220	2,610
	14						65				2,100	2,660	3,210
M6×1.0	12	11	7			19	50	20.0～100.0		15～100	2,100	2,660	3,210
	16						75				2,510	3,210	4,190

N(Normal) ····▸S Black oxide

Order — Catalog No. — B — ① L — ① R·Y·N — ② L1

Catalog No. Type	A	B	① L	① R·Y·N	② L1
SBVK	16	38	50.0	Y	50

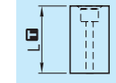
Delivery: 3 Days — Express T 600/1pc. / Express A 300/1pc. P.38
A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

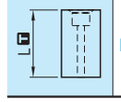
Price — Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

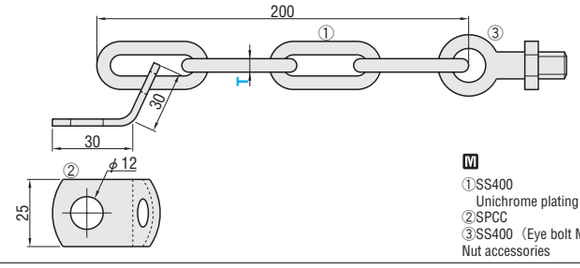
Alteration — Catalog No. — B — ① — ② — (LKC・LKP)
Type A — L — ① R·Y·N — ② L1
SBVK 16 — 38 — 50.00 — Y — 50 — LKC

Alteration	Code	Spec.	¥/1Code
	LKC	Changes tolerance on L $L^{+0.1}_{0}$ ⇨ ±0.01 When using LKC, the dimension L can be specified in 0.01mm increments. For orders of 8 pieces or less, we will guarantee dimension L accuracy of 0.005 or less by lot grinding.	800

Alteration	Code	Spec.	¥/1Code
	LKP	Changes tolerance on L $L^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$ When using LKP, the dimension L can be specified in 0.01mm increments. For orders of 8 pieces or less, we will guarantee dimension L accuracy of 0.005 or less by lot grinding.	1,200

Chains for end block — RoHS

RSC



M
①SS400 Unichrome plating
②SPCC
③SS400 (Eye bolt M10×20) Nut accessories

Catalog No. Type	T	U/Price Q'ty：1～9
RSC	3	650
	5	680

This product RSC3 is identical to the chain of the alteration RS (P.747). (However, it does not include the cap section attached to the alteration RS.)

Order — Catalog No. — RSC 3

Delivery: 3 Days — Express T 600/1pc. / Express A 300/1pc. P.38
A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price — Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

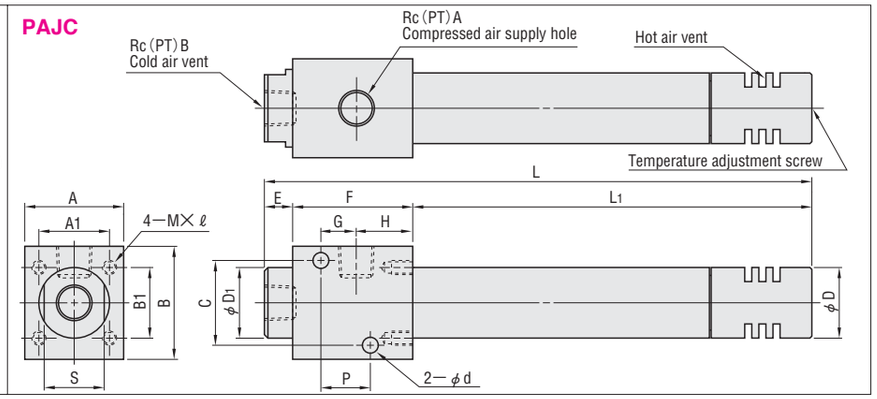
To be quoted on price & lead time above Max. Q'ty.

Example

※This is an example of combination of RSC and a stroke end block (**P.883**).

PRESS NEW Printed in Red

AIR JET COOLERS FOR DIE



Catalog No. Type	No.	L	E	F	L1	G	H	C	D	D1	P	d	A	A1	B	B1	M× ℓ	S	Rc(PT)A	Rc(PT)B	U/Price Q'ty：1～4
PAJC	150	156	8	34	114	11	15	24	20	20	14	4.5	28	20	32	20	4×6	17	1/8	1/8	26,800
	600	218	12	52	154	19	23	36	32	30	24	6.6	40	30	46	30	5×8	26	3/8	3/8	45,800

Order Catalog No. PAJC150

Delivery 1 Day

Price

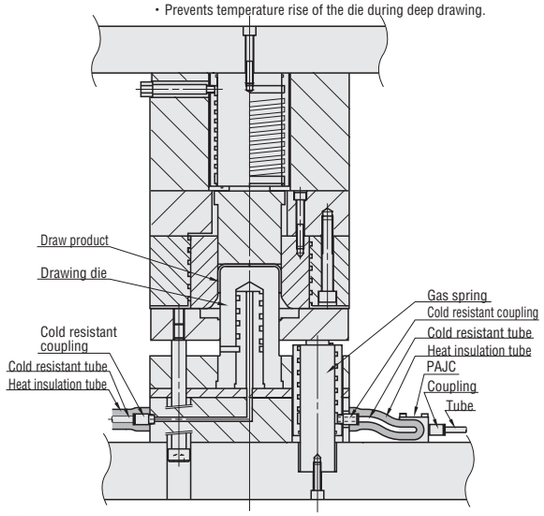
Volume discount rate P.37

Quantity	1～4	5～9
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

Example

Prevents reduction of the life of the die due to temperature rise.
- Prevents reduction of the life of the pressure resistant seal due to temperature rise of the gas spring.
- Prevents temperature rise of the die during deep drawing.



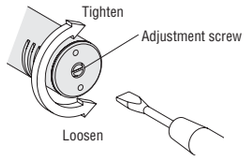
■Precautions for use

- Do not use this cooler beyond its intended application or working range.
- Do not use any gas other than air.
- While the cooler is being used, hot air is discharged, so the temperature around the air vent will rise high. Be careful not to get burned.
- If the die is cooled to an excessive degree, the cool air may build up condensation on the die, so provide a water drainage channel.
- When connecting a hose, for example, to the cold air vent, use heat insulating hose or tape to prevent condensation.

■Features

- By simply supplying compressed air, cold air that is 70℃ (at maximum) lower than the input air is generated.
- Effective for localized cooling.
- Mounting and adjusting cold air temperature can be done easily.
- The adoption of special structure resulted in an extremely compact cooler body, enabling the cooler to be used in a confined space.

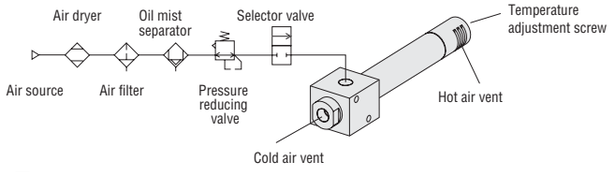
■How to adjust cold air temperature



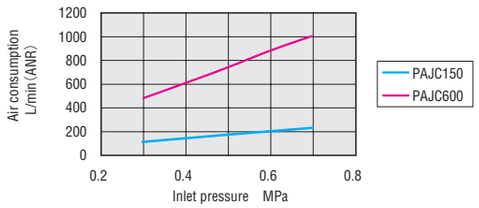
To adjust the cold air temperature, turn the adjustment screw on the end of the cooler body. Loosening the adjustment screw causes the cold air temperature to fall and the amount of cold air to decrease. Conversely, tightening the adjustment screw causes the cold air temperature to rise and the amount of cold air to increase.

■How to use

- Use the cooler within the pressure range of 0.3 to 0.7 MPa.
- Supply dehumidified air using an air dryer.
- Be sure to set an air filter (one that filters 40μm or less) and an oil mist separator in front of the air cooler to prevent the interfusion of foreign bodies.



■Air consumption



■Breakdown and repair

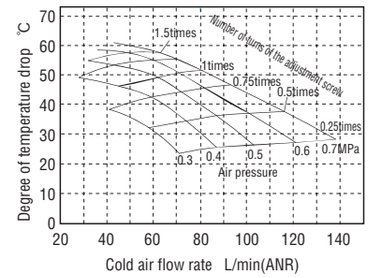
- If the cooling effect deteriorates, check the cooler as follows:

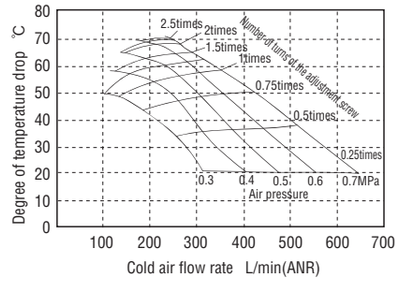
①Readjust the temperature adjustment screw.
②Check to see if the filter and mist separator are clogged, causing the feed pressure to be reduced.
③Check to see if the amount of air equal to the air consumption in the above graph is being adequately supplied.

- Please note that we will not take responsibilities disassembled product.

■Temperature characteristics

※The degree of temperature drop is the drop of temperature at the inlet port.
※The value of the number of turns of the adjustment screw is 0 when the adjustment screw is fully tightened.
※These graphs indicate the characteristics of the air jet cooler by itself.



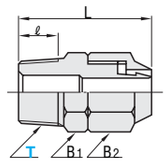


■Components of air jet coolers

■Couplings for fluororesin tubes (straight)

RoHS

Type	M	Normal pressure
MCPT	SUS316	0.7MPa≒7kgf/cm²or less



Catalog No. Type	Applicable tube outer dia.(mm)	T R(PT) Selection	T R(PT)	Applicable tube inner dia.(mm)	L	ℓ	B1 (Width across flats)	B2 (Width across flats)	U/Price Q'ty：1～4
MCPT	6	1	1/8	4	27	8	10	12	1,080
		2	1/4		30	10	14		1,450
		3	3/8		30	10	17		1,780
	10	2	1/4	8	36	10	17	17	2,040
		3	3/8		36	10	17		2,140
		4	1/2		40	14	22		2,450

Order Catalog No. MCPT6 — T — 1

Delivery 1 Day

Price

Volume discount rate P.37

Quantity	1～4	5～19	20～49	50～99
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Specifications

Applicable fluid	Compressed air, water, some chemicals
Operating temperature range	(Air)－65～260℃・(Water)0～100℃
Max. operating pressure	Depends on maximum operating pressure for tube.
Operating vacuum	－100kPa

■Fluororesin tubes

PUTF
PUTFL

RoHS
M Fluororesin
Use temperature range－65～260℃

Tubes for air piping M－UB

RoHS

M Polyurethane
Applicable fluid: compressed air Use temperature range 0～60℃

Catalog No. Type	O.D.(mm)	Length fixed type Length(m)	Length specified type Length(0.1mm incr.)	I.D. (mm)	Min. bend radius (mm)	O.D. accuracy (mm)	Max. operating pressure (MPa)	Burst pressure (MPa)	Mass (Kg/m)	Length fixed type U/Price(m) Q'ty:1～4	5～9	Length specified type U/Price(m) Q'ty:1～4	5～9
PUTF (Length fixed type)	6	10	0.5～20	4	25	±0.1	1.7	7	0.034	9,070	8,620	2,970	2,670
		20								15,540	14,760		
PUTFL (Length specified type)	10	10		8	60	+0.1 −0.15	0.8	3.5	0.061	12,230	11,620	4,540	4,090
		20								24,470	23,250		

Maximum operating pressure and burst pressure shown are based on use at normal temperature.

Outer diameter of tube	Inner diameter of tube	Minimum bending radius	Operating pressure range	Catalog No. Type	No.	Full length L (Meter)	Color	U/Price Q'ty：1～9 L5	L10	L20
6	4	15	0～700 kPa (0～7kgf/cm²)	M－UB	0640	5	B(Black)	650	1,220	2,070
10	6.5	27			1065	10 20	C(Colorless)	1,820	3,560	6,750

Total length L is measured by the meter

Order Catalog No. M－UB 0640 — L 5 — Color B

Delivery 3 Days

Express T 600/1pc.
Express A 300/1pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

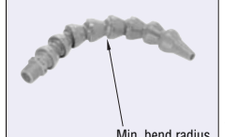
Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

Applicable for M－UB
To be quoted on price & lead time above Max. Q'ty.

Adjusting hoses

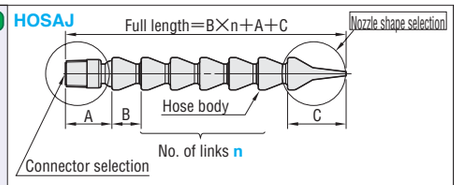
RoHS



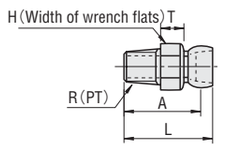
Min. bend radius
No.2 33.5mm
No.4 45.0mm

M Polyacetal (Gray)
■Operating temperature limit：80℃
■Operating pressure limit：0.59MPa (6Kgf/cm²)

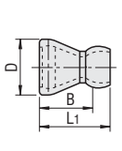
HOSAJ



■Connector

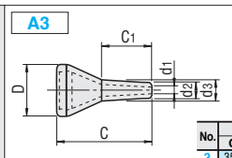


■Hose body



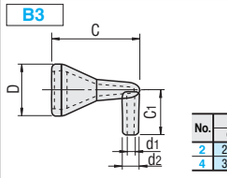
Nozzle shape selection

A3



No.	Nozzle shape A3 C	C1	D	d1	d2	d3
2	35.0	25.5	16.0	6.3	9.6	11.0
4	37.5	24.5	24.5	12.5	17.0	19.0

B3



No.	Nozzle shape B3 C	C1	D	d1	d2
2	26.3	12.0	16.0	6.3	9.0
4	39.0	19.5	24.5	12.4	15.4

Hose I.D. (inch)	Catalog No. Type	No.	No.of links n	Connector selection	Nozzle shape	Hose body D	B	L1	Connector A	L	H	T
1/4	HOSAJ	2	0～30	1(R1/8)	A3	16	14.5	20.7	23	26.3	14	7
1/2		4		3(R3/8)	B3	24.5	17	30	28	38.3	20.8	7.5

No.	Link U/Price	Connector U/Price	Nozzle shape U/Price A3 Shape	B3 Shape
2	70	230	230	650
4	150	270	270	370

Order Catalog No. HOSAJ2 — No. of links n 30 — Connector (PT) 1 — Nozzle shape A3

Delivery 3 Days

Express T 1,000/1pc.
Express A 500/1pc.

A flat charge of 1,350yen for 3 pieces or more of the same size (excluding Express T).

〈Example of price calucuration〉
(Ex.) HOSAJ2－30－1－A3
70Yen × 30 + 230Yen + 230Yen =2,560Yen
(Link U/Price)×(No. of links)+(Connector U/Price)+(Nozzle shape U/Price)

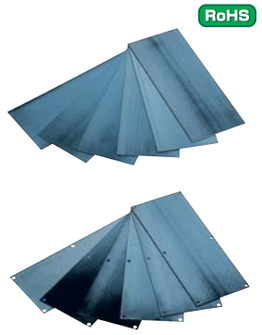
Volume discount rate P.37

Quantity	1～4	5～19	20～49	50～99
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.
Volume discount rate applies to link unit price only.

LAYERED PLATES FOR SPACER

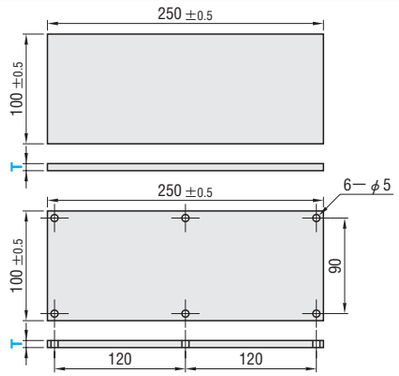
The volume discount rate is also applicable to alteration cost. P.39



The surface may look blue due to heat treatment.

LHP
(No hole type)

LHP—H
(Hole type)



T	T	M	H
0.05	±0.005	SK2	51～54HRC
0.1	±0.01	SK4	
0.2	±0.015	SK5	48～52HRC
0.3	±0.025		
0.4	±0.03		
0.5			
0.6	±0.04		47～51HRC
0.7			
0.8			
0.9	±0.05		
1.0			
1.6	±0.06		43～47HRC

When inserting a bolt into the hole of 6— φ5, use M4 bolt.

Catalog No. Type	T (Thickness)	U/Price Q'ty：1～19 LHP	LHP—H
LHP (No hole type) / LHP—H (Hole type)	0.05	1,000	1,450
	0.1	550	1,000
	0.2	400	850
	0.3	400	850
	0.4	400	850
	0.5	400	850
	0.6	400	850
	0.7	450	900
	0.8	500	950
	0.9	550	1,000
	1.0	550	1,000
	1.6	1,000	1,450

Order — Catalog No.
LHP 0.7
LHP—H1.0

Delivery — 3 Days | Express A 500/1pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price

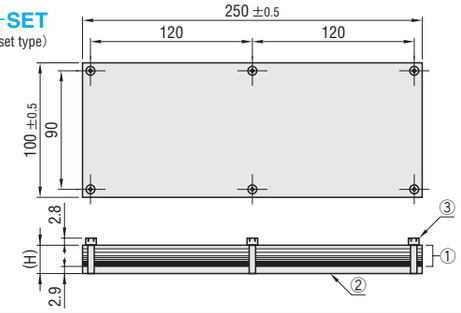
■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The surface may look blue due to heat treatment.

LHP—SET
(Layered set type)



■Components
①Layered plates
The specified type of LHP—H plates are layered in decreasing order of thickness from the top.
②Base plate
M SPCC
To fix the layered plates, M4 tapping has been added.
③Mounting bolt
3low head bolt（CBS4）6 pcs.

The full length of the bolt is cut not to penetrate the bottom of mounting plate.

(H)	Catalog No.	①Combination of thickness T of layered plates 0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.6	U/Price Q'ty：1～9Sets
4.4	LHP—SET 5	—	○	○	○	○	○	—	—	—	—	—	—	5,550
8.4	LHP—SET10	—	○	○	○	○	○	○	○	○	○	○	—	8,000
10.1	LHP—SET12	○	○	○	○	○	○	○	○	○	○	○	○	10,000

Order — Catalog No.
LHP—SET10

Delivery — 3 Days P.38 | Express A 500/1pc.
A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price

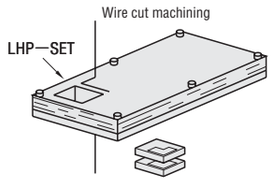
■Volume discount rate P.37

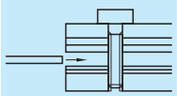
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration — Catalog No. —(PPA～PPG)
LHP—SET5 — PPA—PPF

Example
By layering the plates, spacers that have the same shape but different thickness can be manufactured by wire cutting beforehand. That eliminates need for manufacturing spacer every time dies are regrinded.



Alteration	Code	T (Thickness)	Spec.	¥/1Code
	PPA	0.05	Adds specified LHP—H to be layered.	1,000
	PPB	0.6	LHP—SET5 ⋯PPA～PPG can be specified.	400
	PPC	0.7	LHP—SET10⋯Only PPA・PPG can be specified.	450
	PPD	0.8	⊗LHP—SET12⋯Not applicable	500
	PPE	0.9	Multiple specifications are available, but more than two same plates cannot be added.	550
	PPF	1.0		550
	PPG	1.6		1,000

SHIM TAPES

—Standard type length 1m—
FGSM (W width=12.7mm)
FGSMW (W width=45.0mm)

—Long type length 5m—
FGSML (W width=12.7mm)

Type	W
FGSM・FGSML	12.7
FGSMW	45.0

M T=0.005／0.015 SUS304H
T=0.01～0.5 SK material
H T=0.01～0.5 45～52HRC

■Standard type（Length 1m）

L	Catalog No. Type	T (Thickness)	T	U/Price Q'ty:1～5 FGSM	FGSMW
1m	FGSM (W=12.7mm) / FGSMW (W=45.0mm)	0.005	±0.0005	4,990	9,480
		0.01	±0.003	1,430	6,050
		0.015		2,960	7,580
		0.02		1,020	4,830
		0.03	±0.005	880	4,430
		0.04		740	3,830
		0.05		740	3,630
		0.06		680	3,230
		0.07		680	3,230
		0.08		680	3,030
		0.09		680	3,030
		0.1		630	2,620
		0.15		630	2,230
		0.2	±0.015	620	2,230
		0.25		620	2,230
		0.3		620	2,420
		0.35		620	2,420
		0.4		830	2,820
		0.45		830	2,820
		0.5		830	2,820

■Long type（Length 5m）

L	Catalog No. Type	T (Thickness)	T	U/Price Q'ty:1～5
5m	FGSML (W=12.7mm)	0.005	±0.0005	20,800
		0.01	±0.003	5,800
		0.015		10,500
		0.02		4,130
		0.03	±0.005	4,000
		0.04		2,980
		0.05		2,980
		0.06		2,980
		0.07		2,780
		0.08		2,780
		0.09		2,780
		0.1		2,600
		0.15		2,600
		0.2	±0.015	2,600

Long type is economical about 1m.

Order — Catalog No.
FGSM 0.01
FGSML 0.1

Delivery — 1 Day

Price

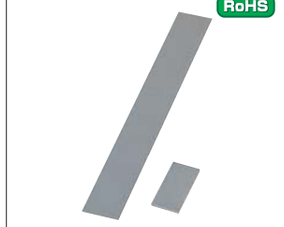
■Volume discount rate P.37

Quantity	1～5	6～10	11～20	21～30
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

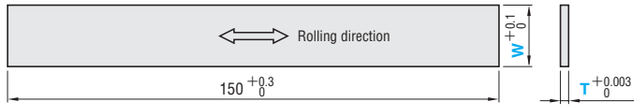
PRECISION UTILITY PLATES

The volume discount rate is also applicable to alteration cost. P.39

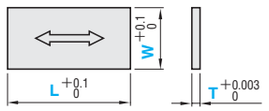


RoHS

UTPB



UTPL



Dimension W tolerance alteration
When you want to change from W +0.1 0 to W −0.1 0, please use WKC1 alteration.

M SKH51
H 61～64HRC

Catalog No. Type	T	W	U/Price Q'ty：1～19
UTPB	0.3	10 13 16	7,900
	0.4	10 13 16	5,330
	0.5	10 13 16	4,830
		20 25	5,930
	1	10 13 16	4,520
		20 25	5,550
	2	10 13 16	3,880
		20 25	4,940
	3	10 13 16	4,020
		20 25	5,150
	5	10 13 16	4,360
		20 25	5,700

Catalog No. Type	T	W	0.1mm increments L	U/Price Q'ty：1～19 L10.0～19.9	L20.0～49.9	L50.0～79.9	L80.0～99.9	L100.0～124.9	L125.0～150.0
UTPL	0.3	10 13 16	10.0～150.0	2,430	3,730	5,030	6,420	7,800	8,670
	0.4	10 13 16		1,630	2,500	3,370	4,290	5,210	5,800
	0.5	10 13 16		1,500	2,310	3,130	4,000	4,870	5,400
		20 25		1,670	2,660	3,640	4,680	5,730	6,500
	1	10 13 16		1,400	2,160	2,930	3,740	4,550	5,070
		20 25		1,560	2,490	3,410	4,380	5,360	6,100
	2	10 13 16		1,300	1,940	2,590	3,290	4,000	4,430
		20 25		1,470	2,990	3,120	4,000	4,880	5,490
	3	10 13 16		1,320	1,980	2,660	3,380	4,100	4,550
		20 25		1,500	2,360	3,210	4,130	5,040	5,680
	5	10 13 16		1,370	2,100	2,830	3,610	4,390	4,900
		20 25		1,600	2,540	3,490	4,490	5,500	6,240

Order Catalog No. — W — L

UTPB 2 — 16
UTPL 3 — 20 — 50.8

Price

■Volume discount rate P.37

Quantity	1～19	20～50
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

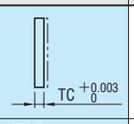
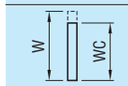
Alteration Catalog No. — W(WC) — L — (TC・WKC1・DNC・WHC)

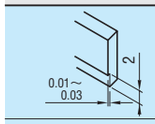
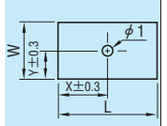
UTPL 2 — 20 — 50.8 — TC2.002
UTPL 3 — 25 — 45.6 — WHC — X20.5 — Y10.2

Delivery

●UTPB
5 Days
Express B 500/1pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.

●UTPL
5 Days

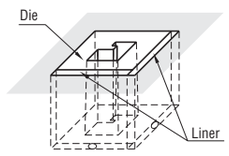
Alteration	Code	Spec.	¥/1Code
	TC	Changes of plate thickness T T−0.02≦TC≦T+0.02 0.001mm increments 8 Days Clearance is adjustable without using shims. T0.3,T0.4：Not applicable	1,000
	WC	Changes dimension W 8≦WC＜W 0.1mm increments T0.3,T0.4：Not applicable	300
	WKC1	Changes tolerance on W Changes tolerance from W +0.1 0 to 0 −0.1. T0.3,T0.4：Not applicable	0

Alteration	Code	Spec.	¥/1Code
	DNC	Adds lead-in part Cut a groove with width of 2mm and depth of 0.01～0.03. T0.3,T0.4：Not applicable	200
	WHC	Adds a start hole φ1 for W/EDM. 2≦X≦L−2 2≦Y≦W−2 0.1mm increments The perimeter of the hole will be discolored by electrical discharge machining. T0.3,T0.4：Not available	400

Example

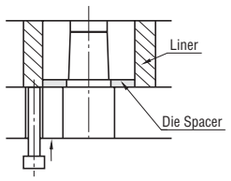
●Liner：Block dies can be easily removed. Clearance can be adjusted by using shim tapes.

●Die Spacer：This can be used as an adjustment plate when regrinding.

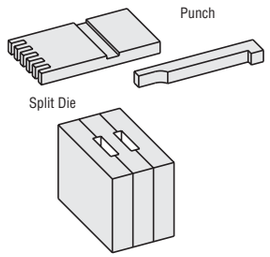


By changing the plate thickness (TC) of right and left liners, clearance can be adjusted without using shim tapes.

By pushing up the liners with pins, the liners can be removed without causing damage to the die.



●Punches & Dies：Since these plates are made of, SKH51 (61～64HRC), they can be used for punches & dies.

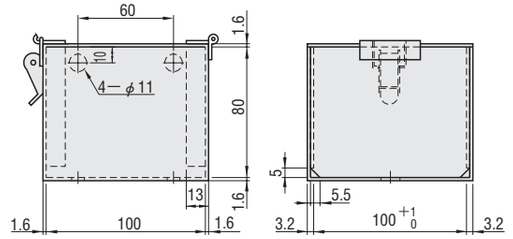


SPARE PUNCH BOXES

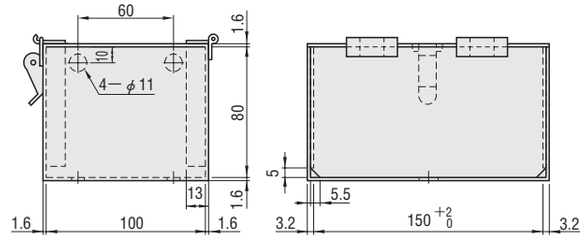
RoHS

PBX100Y

●Having bolt holes on side and bottom, PBX can be fixed in 2ways.



PBX150Y



M SPCC
S Baking finish (yellow)

Catalog No.	U/Price Q'ty:1～9
PBX100Y	1,200
PBX150Y	1,800

Order Catalog No.
PBX100Y

Delivery 1 Day

Price

■Volume discount rate P.37

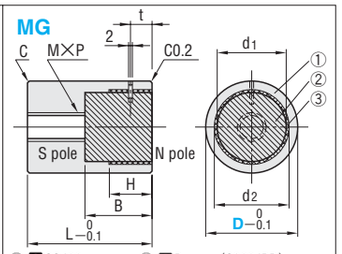
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

MAGNETS

MG

RoHS



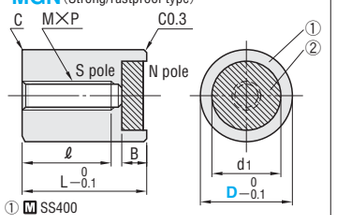
① M SS400 ③ M Brass (C3604BD)
② M Alnico magnet Allowable temperature limit 80℃

L	M×P	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	d1	d2	B	C	H	t	Catalog No. Type	D	U/Price Q'ty:1~19
15	5X0.8	5.9 {0.6}	1100~1300	6	8	7	0.5	5	2.5	MG	10	600
15	5X0.8	11.8 {1.2}		8	10.5		1.0				13	730
20	6X1.0	15.7 {1.6}	1200~1400	10	13	10		6	3.5		16	850
25	8X1.25	29.4 {3.0}	1200~1500	13	16	12					20	950
30	8X1.25	44.1 {4.5}	1300~1700	15.5	18	13	1.5	9	6.5		25	1,300
30	8X1.25	78.5 {8.0}	1400~1700	20	23.5	15					28	1,350

kgf=N×0.101972 ＊Adsorption: See the right page (the figure below)
Since magnets are broken easily, do not alter them.
The end face is ground.

MGN (Strong/rustproof type)

RoHS



① M SS400
S Electroless nickel plating
② M Neodymium magnet Allowable temperature limit 80℃

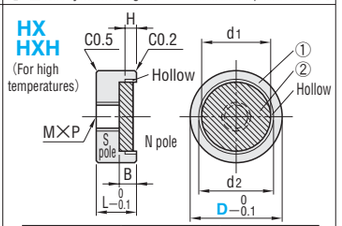
L	M×P	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	d1	B	C	ℓ	Catalog No. Type	D	U/Price Q'ty:1~19
10	3X0.5	2.9 {0.3}	3000~3200	4.0	2.0	0.3	6	MGN	6	960
		5.8 {0.6}	3500~3700	5.0					8	900
15	5X0.8	9.8 {1.0}	3400~3600	6.0		0.5	10		10	790
		15.6 {1.6}	3200~3400	7.0	1.5				13	880
20	6X1.0	36.2 {3.7}	3500~3700	9.5	2.0	1.0	12		16	1,000
25	8X1.25	58.8 {6.0}	3100~3300	12.5			16		20	1,180
30		112.7 {11.5}	3500~3700	16.5	3.0	1.5	18		25	1,520
		196.1 {20.0}	3300~3500	18.5					28	1,840

kgf=N×0.101972 ＊Adsorption: See the right page (the figure below)
Since magnets are broken easily, do not alter them.
The magnetic face is recessed 0.1 to 0.3 below the case.

HX / HXH

(For high temperatures)

RoHS



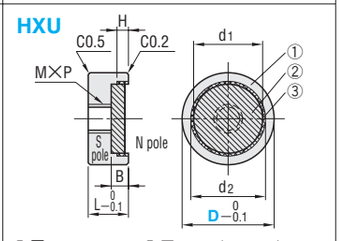
		HX	HXH
M	①	SS400	
	②	Cobalt magnet	
S		—	Raydent treatment
Allowable temperature limit		80℃	200℃

L	M×P	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	d1	d2	B	H	Catalog No. Type	D	U/Price Q'ty:1~19 HX	HXH
6	3X0.5	2.9 {0.3}	2100~2600	4	5	2.0	1.5	HX Allowable temperature limit : 80℃ HXH Allowable temperature limit : 200℃	6	1,000	1,200
		3.9 {0.4}	2200~2600	5.5	6.5				8	900	1,080
8	4X0.7	9.8 {1.0}	2100~2300	7	8	1.5	1.1		10	800	1,000
		29.4 {3.0}	2200~2400	9.5	11	2.0	1.6		13	910	1,150
	5X0.8	49.0 {5.0}	2200~2500	12.5	14				16	1,000	1,250
10		88.3 {9.0}	2300~2600	16.5	18	3.0	2.6		20	1,300	1,550
13	6X1.0	127.5 {13.0}		21.5	23				25	1,780	2,030

kgf=N×0.101972 ＊Adsorption: See the right page (the figure below)
Since magnets are broken easily, do not alter them.
The magnet is fixed to the holder using adhesive agent.
The magnetic face is recessed 0.1 to 0.3 below the case.

HXU

RoHS



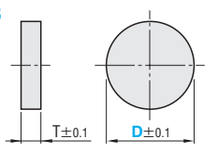
① M SS400 ③ M Brass (C3604BD)
② M Cobalt magnet Allowable temperature limit 80℃

L	M×P	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	d1	d2	B	H	Catalog No. Type	D	U/Price Q'ty:1~19
8	3X0.5	3.9 {0.4}	2100~2600	4	5	2	1.6	HXU	6	1,150
		5.9 {0.6}	2400~2600	5	6				8	1,050
10	4X0.7	14.7 {1.5}	2700~2900	7	8	3	2.1		10	980
		34.3 {3.5}	2800~3100	9.5	11	4	3.1		13	1,100
	5X0.8	58.8 {6.0}	2900~3300	12.5	14				16	1,240
13		98.1 {10.0}	2900~3400	16.5	18	6	5.1		20	1,560
15	6X1.0	137.3 {14.0}		21.5	23				25	2,200

kgf=N×0.101972 ＊Adsorption: See the right page (the figure below)
Since magnets are broken easily, do not alter them.
The magnet is fixed to the holder using adhesive agent.
The magnetic face is recessed 0.1 to 0.3 below the case.

HXMB

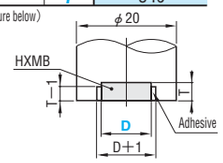
RoHS



M Cobalt magnet Allowable temperature limit 200℃

T	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	Catalog No. Type	D	U/Price Q'ty:1~19
2	1.0 {0.10}	2000~2100	HXMB (Allowable temperature limit 200℃)	3	280
	1.5 {0.15}			4	290
	3.9 {0.40}			5	310
1.5	6.9 {0.70}	2200~2400		7	340

kgf=N×0.101972 ＊Adsorption: See the right page (the figure below)
Magnets are extremely brittle and easy to destroy, so use with adequate caution when handling them.
Fix magnets with adhesive.
Magnets are easy to damage, so fix them not to protrude from the holder.



Order Catalog No.
MG 13
HX 20

Delivery 1 Day

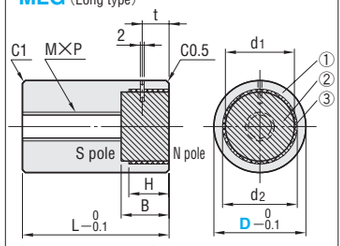
Price ■Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~400
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

MLG (Long type)

RoHS



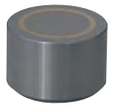
① M SS400 ③ M Brass (C3604BD)
② M Alnico magnet Allowable temperature limit 80℃

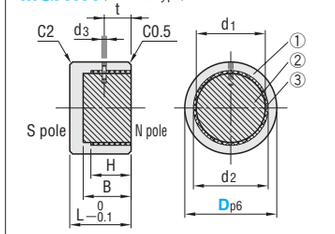
L	M×P	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	d1	d2	B	H	t	Catalog No. Type	D	U/Price Q'ty:1~9
25	6X1.0	15.7 {1.6}	1100~1300	10	13	10	6	3.5	MLG	16	1,050
30	8X1.25	29.4 {3.0}	1100~1400	13	16	12	9	6.5		20	1,160
35	8X1.25	78.5 {8.0}	1200~1500	20	23.5	15				28	1,580

kgf=N×0.101972 ＊Adsorption : See the figure below
Since magnets are broken easily, do not alter them.
The end face is ground.

MGATA (Press fit type)

RoHS





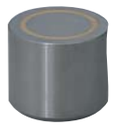
① M SS400 ③ M Brass (C3604BD)
② M Alnico magnet Allowable temperature limit 80℃

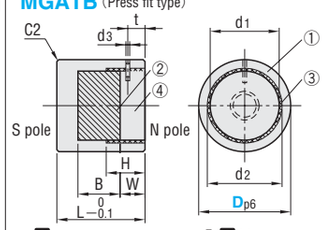
Dp6	L	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	d1	d2	d3	B	H	t	Catalog No. Type	D	U/Price Q'ty:1~9
20 +0.035 +0.022	16	25.5 {2.6}	1400~1700	13	16	2	12	8	4.0	MGATA	20	1,000
25 +0.035 +0.022	19	47.1 {4.8}	1600~1900	15.5	18.5		13	10	5.0		25	1,470
30 +0.035 +0.022	20	68.6 {7.0}		19.5	23		15				30	1,550
35 +0.042 +0.026	26	98.1 {10.0}	1900~2100	24.5	28	3	18	13	6.5		35	2,720
40 +0.042 +0.026	27	142.2 {14.5}		29.5	33		20				40	3,710

kgf=N×0.101972 ＊Adsorption : See the figure below
Since magnets are broken easily, do not alter them.
The end face is ground.

MGATB (Press fit type)

RoHS





① M SS400
② M Alnico magnet
③ M Brass (C3604BD)
④ M SS400 Allowable temperature limit 80℃

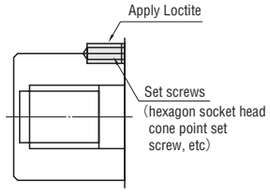
Dp6	L	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	d1	d2	d3	B	H	t	W	Catalog No. Type	D	U/Price Q'ty:1~9
20 +0.035 +0.022	18	26.5 {2.7}	900~1200	13	16	2	12	8	2.5	5	MGATB	20	1,100
25 +0.035 +0.022	20	49.0 {5.0}	1100~1400	15.5	18.5		13	10	3.0	6		25	1,600
30 +0.035 +0.022	26	73.5 {7.5}		20	23		15		3.5	7		30	1,710
35 +0.042 +0.026	28	103.0 {10.5}	1300~1600	25	28	3	18	13	4.0	8		35	2,990
40 +0.042 +0.026	30	147.1 {15.0}	1400~1600	30	33		20					40	4,070

kgf=N×0.101972 ＊Adsorption : See the figure below
Since magnets are broken easily, do not alter them.
The end face is ground.

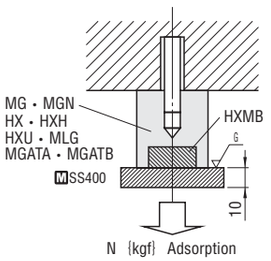
Example

■How to mount
After press fitting, mount the magnet as shown in the figure to prevent it from loosening.

Drilling (reference) D H7	
20 25 30	+0.021 0
35 40	+0.025 0



＊"Adsorption" indicates the power of lifting the material SS400 (ground surface of 10mm thick plate).



Order Catalog No.
MGATA 20
MGATB 20

Delivery 3 Days
Express A 800/1pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

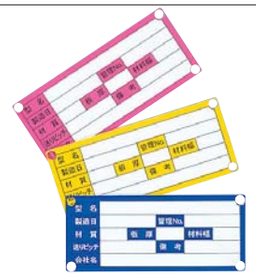
Price ■Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

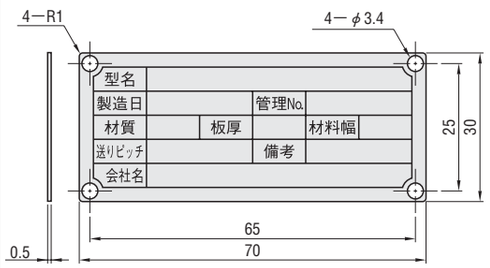
To be quoted on price & lead time above Max. Q'ty.

NAME PLATES / NAME STICKERS FOR DIE

RoHS



KNP (Name plates for die)



M A1050P
Thickness 0.5mm
S Baking finish

Catalog No.	Color	U/Price Q'ty:1～9
KNP	R (Red) B (Blue) Y (Yellow)	190

Order: Catalog No. — Color → KNP — R

Delivery: 1 Day

Price

■Volume discount rate P.37

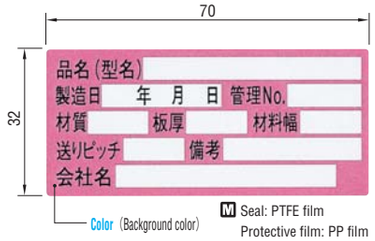
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Features
- Please use for storage and management of dies.
- Can be written on with an oil-ink marker or ball-point pen.
- Because this is made of aluminum, imprintings are available by chiseling, etc.

■Notes
- The allowable temperature limit of the surface finishing materials is 150℃.

KNS (Name sticker) RoHS



M Seal: PTFE film
Protective film: PP film

Catalog No.	Color	U/Price 1～4 sets (10pcs.per set)
KNS	R (Red) B (Blue) Y (Yellow)	700

Order: Catalog No. — Color → KNS — R

Delivery: 1 Day

Price

■Volume discount rate P.37

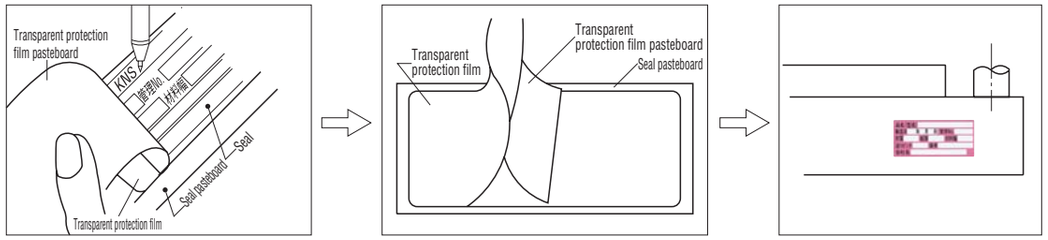
Quantity	1～4 sets	5～9 sets	10～29 sets	30～50 sets
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Features
- Can be written on with an oil-ink marker or ball-point pen.
- Strong adhesiveness; highly resistant to oil and soil.

■Notes
- Clean the surface of the die thoroughly before adhering the tape / seal.
  Use paint thinner or other solvent to completely remove any oil from the surface.
- Use at normal temperature.
- Once pealed off, the tape / seal's adhesiveness diminishes.

■How to use



Use an oil-ink marker or ball-point pen to write.

Apply the transparent protection film by pressing it over the seal.

Peal the seal off its pasteboard, and adhere it on the die.

ADHESIVE CEMENT / CLEANER / MOLD CHECK

—LOCTITE No.638・242・268・248— / —GENERAL PURPOSE QUICK-DRYING TYPE— / —SHINMYOTAN—

DELIVERY SHORTENED

For fitting (High strength) RoHS	For loosening prevention of screws (Medium strength) RoHS	For loosening prevention of screws —Stick type— RoHS	
Loctite No.638 (High strength)	Loctite No.242 (Medium strength)	Loctite No.268 (High strength)	Loctite No.248 (Medium strength)
LOC638	LOC242	LOC268	LOC248

(250mℓ) (50mℓ) (250mℓ) (50mℓ)

Fluid color	Main ingredient	Viscosity (CP)	Strength class	Strength	Maximum allowable clearance (mm)	Hardening time Note(2) Active surface	Hardening time Note(2) Inactive surface	Allwable temperature range (℃)	Material safety data sheet FAX BOX No.	Catalog No. Type	Catalog No. Amount (mℓ)	U/Price Q'ty:1～4
Green	Anaerobic resin	2500	High strength	Shearing strength 25～35 (N/mm²)	One side 0.2 max Note(1)	1～3	3～6	—55～125	1034	LOC638	250	10,450
											50	2,340
Blue		1000	Medium strength	Breakage/pullout torque 12/5N (N/m)	One side 0.25 max			—55～150	1035	LOC242	250	10,450
											50	2,340
Red		semi-solid	High strength	Return torque 40.8N.m (DIN54454)	—	—	—		1080	LOC268	19	2,450
Blue			Medium strength	Return torque 15.6N.m (DIN54454)	—				1081	LOC248		2,450

■Usage

(**LOC638**)：For fitting (high strength)
- Can be used to bond dowel bushings (KNLB and KNLBB), die set bushings (LBB and LDB), stripper guide bushings (SGBL, SGBZ, SGHZ, SGBF and SGFZ), etc.

(**LOC242**)：For loosening prevention of screws (medium strength)
- It can be used for adhesion of hex socket head capscrews (CB), screw plugs (MSW), inside screw type stripper bolts (MSB), etc.

Stick type
- This is a compact, easy-to-carry stick type. Because the adhesive is semi-solid, dripping of liquid does not occur.

(**LOC268**)：For loosening prevention of screws (high strength)
Screws can be removed by applying local heat and using tools. It prevents screws from loosening due to vibration, impact, thermal expansion, etc.

(**LOC248**)：For loosening prevention of screws (medium strength)
Screws can be removed using tools.

■Notes

(1) It is general to press fit die parts with 0.01～0.03mm clearance on one side.
(2) These values are the time taken to reach a practical use level of strength (50% hardness) at room temperature. The term "active surface" refers to steel, copper alloy, aluminum alloy, etc., and "inactive surface" refers to stainless steel, zinc, thermosetting resin, plated surfaces, etc.

Degreasing is recommended prior to application of Loctite adhesive.

■Material safety data sheet

Material safety data sheet (MSDS) can be obtained by fax.
Call FAX BOX Center and operate the fax machine according to the audio guidance (Available in Japanese only).
FAX BOX Center：(03) 4306-1009

Order: Catalog No. — Amount

Catalog No.	Amount
LOC638	50
LOC242	250
LOC268	19
LOC248	19

Delivery: 1 Day

■Volume discount rate P.37

Quantity	1～4	5～9
Rate	—	3%

To be quoted on price & lead time above Max. Q'ty.

(Cleaner : General purpose quick-drying type) RoHS

METACL

Material safety data sheet	Catalog No. Type	Catalog No. Amount (mℓ)	U/Price Q'ty:1～5	U/Price 6～11	U/Price 12～
1009	METACL	420	1,050	880	750

⊗ Cannot be exported out of Japan.

Order: Catalog No. → METACL420

Delivery: 1 Day

■Usage
- Chemical cleaning agents and high pressure gas clean off oil, grease, etc.
  The cleaner itself evaporates rapidly after use and leave no residue.

This can be used for degreasing prior to application of Loctite adhesive.

Mold check (SHINMYOTAN) RoHS

N—RED SP—RED

Fluid color	Main ingredient	Material safety data sheet FAX BOX No.	Catalog No. Type	Catalog No. Amount (mℓ)	U/Price Q'ty:1～4	U/Price 5～9	U/Price 10～
Orange	Zinc oxide	1044	N—RED	250	3,840	3,200	2,740
Red	Petroleum hydrocarbon	1043	SP—RED	250	6,720	5,600	4,800

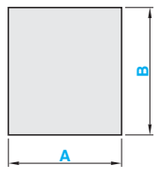
■Usage
- Use for fitting a product after it has been formed. Does not contain zinc.
  Can be used directly on products, eliminating troublesome work of mixing with oil.
- SP-RED spreads easier than N-RED, enabling it to be applied more thinly.

Order: Catalog No. → N—RED 250

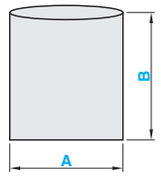
Delivery: 1 Day

VOLATILE CORROSION INHIBITOR FILMS
—SHEET TYPE / BAG TYPE / SKELETON STORAGE TYPE / BOX TYPE—

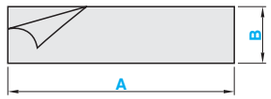
RSHT (Sheet type)



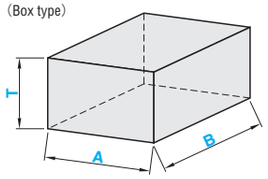
RBAG (Bag type)



PBAG (Skeleton storage type)



PBOX (Box type)



M LPDE resin・nitrous acid soda・coloring agent・others
Thickness：0.1mm

■Mechanism of corrosion inhibitor film

①The film is impregnated with a volatile corrosion inhibitor, which evaporates and surrounds the metal.

②The evaporated corrosion inhibitor gas dissolves gradually in the moisture on the surface of the metal, exhibiting corrosion inhibiting effect.

③The dissolved corrosion inhibitor gas adsorbs as molecules or ions to the surface of the metal, preventing the metal from corroding.

■Features of corrosion inhibitor film

①This film has corrosion inhibiting effect in both space (when the film surface is not touching the product) and contact state (when the film surface is touching the product).

②Even if condensation occurs inside the film, the corrosion inhibitor will dissolve in the condensed moisture and protect the surface of the metal, preventing corrosion.

③The gas resulting from evaporation reaches to the parts that anti-corrosion oil cannot be applied, thus protecting them from corrosion.

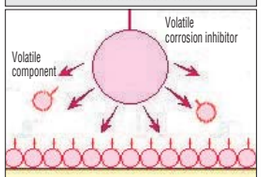
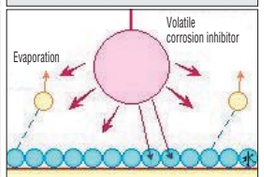
④The conventionall anti-corrosion oil application and degreasing processes are no longer necessary. This simplifies the work process and permits work to be done in a clean environment.

⑤Since the film is made of polyethylene resin, heat sealing can be easily done. Plus, things in the film can be easily identified.

■Effect of corrosion inhibitor

The corrosion prevention effectiveness has been proven to last for at least one and a half to two years. However, this cannot be guaranteed because actual lasting term would vary depending on use environment and conditions.

■Mechanism of volatile corrosion inhibitor

Corrosion inhibitor model	Model of effectiveness for condensation
	

■Applications of corrosion inhibitor films

①Steel products countermeasures against rust due to storage, and condensation.

②Press dies, automobile parts, bearings, precision machined parts, etc.

③Equipment and machines for which application of anti-corrosion oil is impossible.

④Storage of metallic materials for secondary processing.

⑤Packing of machines, parts or metals for export.

⑥Metallic products, parts, etc. to be shipped by sea.

■Instructions for use and storage

①The main raw material of the corrosion inhibitor film evaporates along with the passage of time, so store the film in a cool, dark place that is not exposed to direct sunlight, and use it as early as possible.

②Take into account the storage period and conditions of use of metals, and carry out a confirmation test in advance.

③Before using the film on metal, which is not mentioned in the above "applications", or rubber, plastic, etc., confirm the film's compatibility with the material.

④These films conform to the food sanitation law and standards covering food additives, etc. and are harmless to humans. However, after using the film, wash your hands with soap or water.

■Sheet type

Catalog No. Type	M	A	100mm increments B	U/Price Q'ty：1～9 B 100～600	700～900	1000～1200	1300～1500	1600～1800	1900～2400
RSHT	F (For iron) M (For material other than iron)	900	100～2400	250	350	450	550	650	850
		1200		350	450	550	650	850	1,100
		2400		650	850	1,100	1,300	1,700	2,200

■Bag type (set of 10)

Catalog No. Type	M	A	B	U/Price Q'ty：1～9
RBAG	F (For iron) M (For material other than iron)	150	230	1,000
		250	360	2,000
		460	620	4,000

■Skeleton storage type

Catalog No. Type	M	100mm increments A	B	U/Price Q'ty：1～9
PBAG	F (For iron) M (For material other than iron)	100～ 300	60	250
		400～ 600	120	350
		700～ 900	150	450
		1000～1200	180	550

Order — Catalog No. — A — B
RSHTF — A900 — B2100
RBAGF — A150 — B230
PBAGM — A900 — B150

Delivery
● Sheet type・Bag type: 3 Days
● Skelton storage type: 5 Days

Price

■Volume discount rate P.37

Quantity	1～9	10～29	30～49
Rate	—	5%	10%

To be quoted on price & lead time above Max. Q'ty.

■Box type

Catalog No. Type	M	T	100mm increments A	B	U/Price Q'ty：1～9 B 200～900	1000～1200	1300～1800	1900～2400
PBOX	F (For iron) M (For material other than iron)	900	200～ 900	200～2400	3,500	4,000	4,800	5,800
		1200	1000～1200		—	4,500	5,200	6,000
		2400	1300～1800		—	—	8,000	10,500
			1900～2400		—	—	—	12,500

Order — Catalog No. — T — A — B
PBOXF — T900 — A900 — B600

Delivery: 5 Days

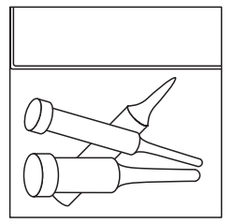
Price

■Volume discount rate P.37

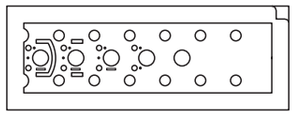
Quantity	1～9	10～29	30～49
Rate	—	5%	10%

To be quoted on price & lead time above Max. Q'ty.

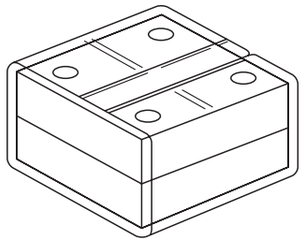
Example



■Storage of parts
Put parts, etc., in the bag and seal it with tape.



■Storage of skeleton
Put the skeleton between films.



■Storage of dies
Cover dies, etc., with the film and seal with tape.

※If the film gets torn or becomes frayed, repair it with tape, or the like.

GUIDE LIFTERS / LIFTER PIN SETS
—GUIDE—

■Variation of Guide Lifters & Lifter Pins

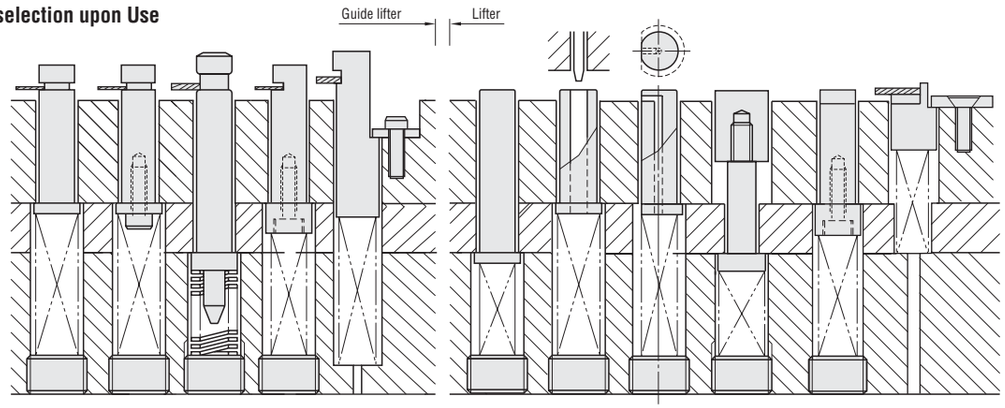
●Standard and configurable type

The full length can be specified in 0.1mm increments according to the height of the feeding line or the lower die（excluding lifter pin with air hole）. The material guide width can also be specified in 0.1mm increments according to the material thickness. The most common sizes are standardized and stocked for immediate delivery.

●Order for pin only is available

Guide lifter and lifter pin sets, as well as the lifter pin sets with pilot punch hole, include a spring and a screw plug. However, the pins can also be ordered separately.

●Wide selection upon Use



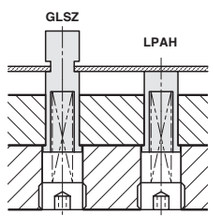
	①	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬⑭
Normal type	GLS (Set) GLP (Pin only)	—	—	—	—	LPS (Set) LP (Pin only)	—	LJS	BLS (Set) BLB (Block only)	—	BL□—□ BL□S—□ BL□X—□
Configurable type Dimension L	GLSH (Set) GLH (Pin only) GLSK (Set) GLK (Pin only)	GLR	AGL	GLB GLBF	GLBK	LPSH (Set) LPH (Pin only) JLP	LHSH (Set) LHH (Pin only) LHHV	—	—	BLR	—

①Guide lifter set P.765

This is the most popular guide lifter. For configurable dimension L type, the width of guide can also be specified in 0.1mm increments according to the thickness of materials.

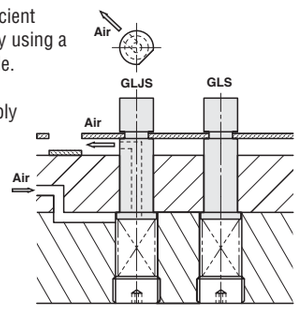
②Guide lifter with spring hole P.768

- Stroke can be lengthened by inserting a spring into the counterbore of the guide lifter.
- The die height can be reduced.



③Guide lifter with air hole P.771

- The problem of insufficient space can be solved by using a guide lifter with air hole.
- Air can be blown reliably from a close distance.

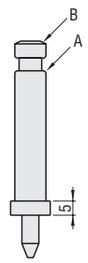


④Guide lifter—Detachable type— P.767

Detachable type guide lifters are ideal for mass-production dies which require frequent regrinding and extra allowance.
Since a washer is used instead of a flange, it is easy to detach.

⑤Guide lifter—Thick plate type— P.767

- Rounding at A eliminates the scratching and scraping of materials.
- The 5mm flange is thicker than the conventional type, remarkably reducing flange breakage.
- By performing chamfering of part B, the breakage accidents due to collision with the stripper plate are less likely to occur.



⑥Block guide lifter—Detachable type— P.770

Block guide lifters can lift the material with wide area. Therefore, they are more suitable than round type guide lifters for precision dies, particularly when the material is thin.
Configurable guiding width type can meet your needs of wide range of guiding width.

⑦Block guide lifter—Key fixed type— P.770

As this item can be key-fixed at its top, it is easy to detach for maintenance.

⑧Lifter pin set P.773

This is the most popular lifter pin. For configurable dimension L type, the full length can be specified in 0.1mm increments.

⑨Lifter pin set with pilot punch relief hole P.775

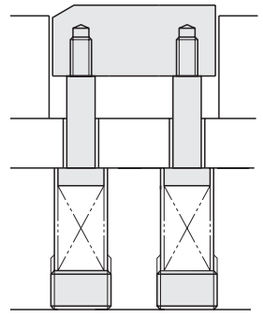
In case of lack of space for setting lifter pins, place this at pilot punch's relief hole for space saving so that the die size can be compact and reduces machining process.

⑩Lifter pin with air hole P.771

This has both lifting function and blowing function with air. It is useful for blowing away cut-off parts.

⑪Block lifter set P.772

- This type is suitable when there is a gapped hole that causes the round lifter pin to stick or when the side-cut is separated during the process.



⑫Block lifter—Detachable type— P.772

This is convenient if used for mass-production dies which require frequent regrinding and extra allowance. Since a fixing cap is used instead of a flange, it is easy to detach.

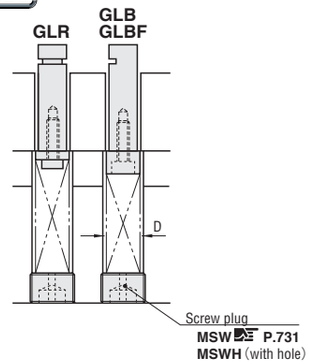
⑬Block Lifter—Key fixed type— P.779

It can be removed easily when regrinding the die plate and lift adjustment is not needed.

⑭High precision block lifter—Configurable dimension・key fixing type— P.777

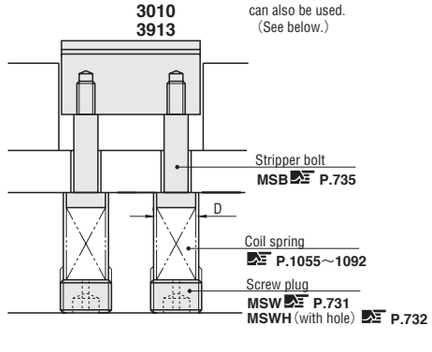
The dimensions can be specified over a wide range. Outer shape tolerance is for precision applications, it is ideal for machining thin work piece.

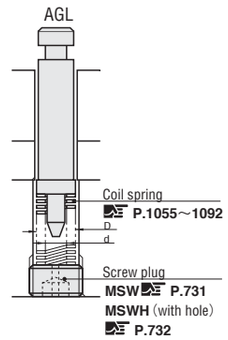
ex Example



GLB 1806
2408
3010
3913

For GLB sizes on the left, stripper bolts can also be used. (See below.)





■Suitable coil spring and screw plug

Guide lifter		Coil spring Type	Coil spring D	Screw plug
GLR6	——	WR WF WL WT WM WH	8	MSW10
GLR8	GLB 0505 GLB 0606 GLBF05□□ GLBF06□□		10	MSW12
GLR10	GLB 0808 GLBF08□□		13	MSW16
GLR13	GLB 1010 GLBF10□□		16	MSW20
——	GLB 1313 3913 GLBF13□□		18	MSW20

■Suitable coil spring, screw plug and stripper bolt

Guide lifter	Stripper bolt	Coil spring D	Screw plug
GLB1806	MSB4.5	8	MSW10
GLB2408 GLB3010	MSB5.5 MSB6	10	MSW12
GLB3913	MSB6.5	10	MSW12

■Suitable coil spring and screw plug

Guide lifter	Coil spring Type	Coil spring D	Coil spring d	Screw plug
AGL13	SWU SWR SWS	14.5	8.5	MSW20
AGL16		17	10.5	MSW22
AGL20		21	13.5	MSW27
AGL25		26	16.5	MSW33

PRESS ADD.SPEC. Printed in Red

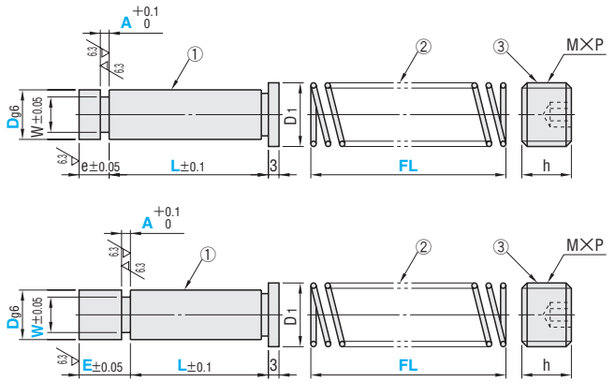
GUIDE LIFTER SETS

The volume discount rate is also applicable to alteration cost. P.39

RoHS

Type	Catalog No.	Component ① Pin	② Spring	③ Screw
Standard	GLS	○	○	○
Selectable dimension L・A	GLSH			
Standard	GLP	○		
Configurable dimension L・A	GLH			

Type	Catalog No.	Component ① Pin	② Spring	③ Screw
Configurable Dimension L・A・E・W	GLSK	○	○	○
	GLK	○		



M SK4
H 53～58HRC(Annealing of head part:Max. 45 HRC)

■Standard type

①GLP Dg6		e	W	D1	③MSW M×P	h	Catalog No. Type	D	L	A	②Spring Type	FL	U/Price Q'ty:1～19 GLS	GLP
4	−0.004 −0.012	5	2.0	6	8X1.25	8	GLS ①②③	4	10 15 20 22 25 28 30 33 35 36 40 45 50	0.5 0.8 1.0	WR	20 25	390	370
6		7	3.6	8	10X1.5	10		6	10 15 20 22 25 28 30 33 35 36 40 45 50	0.5 0.8 1.0 1.6	WF	30 35	440	420
8	−0.005 −0.014		5.0	10	12X1.5			8	10 15 20 22 25 28 30 33 35 36 40 45 50 55 60	1.0 1.6 2.0	WL	40 45	510	480
10			6.0	13	16X1.5			10	20 22 25 28 30 33 35 36 40 45 50 55 60	1.6 2.0 2.5	WT	50 55	600	560
13	−0.006 −0.017		7.0	16	20X1.5		GLP ①	13	20 22 25 28 30 33 35 36 40 45 50 55 60	2.0 2.5 3.6	WM	60 65	710	670
16		12	8.0	19	22X1.5	12		16	30 33 35 36 40 45 50 55 60 70	2.0 2.5 4.0	WH	70 80	850	780
20	−0.007 −0.020		10.0	23	27X1.5			20	33 35 36 40 45 50 55 60 70	3.6 5.0	WL・WT WM・WH	90 100	1,030	960

Spring ②is unavailable in certain types and sizes, check the"Combination of Guide Lifter Pin and Spring"table on the right page.

■Configurable dimension L・A type

①GLH Dg6		e	W	D1	③MSW M×P	h	Catalog No. Type	D	0.1mm increments L	A	②Spring Type	FL	U/Price Q'ty:1～19 GLSH	GLH
4	−0.004	5	2.0	6	8×1.25	8	GLSH ①②③	4	10.0～ 55.0	0.5～2.0	WR	20 25	680	670
6	−0.012	7	3.6	8	10×1.5	10		6	10.0～ 75.0	0.5～3.0	WF	30 35	720	700
8	−0.005		5.0	10	12×1.5			8	10.0～ 75.0	0.7～4.5	WL	40 45	810	760
10	−0.014		6.0	13	16×1.5			10	10.0～ 90.0	0.7～4.5	WT	50 55	880	850
13	−0.006		7.0	16	20×1.5	12	GLH ①	13	10.0～ 90.0	1.0～6.0	WM	60 65	1,110	1,060
16	−0.017	12	8.0	19	22×1.5			16	10.0～100.0	1.0～6.0	WH	70 80	1,280	1,230
20	−0.007		10.0	23	27×1.5			20	15.0～100.0	1.0～6.0	WL WT WM WH	90 100	1,540	1,470
25	−0.020		13.0	28	33×1.5			25	15.0～100.0	1.0～6.0			1,810	1,730

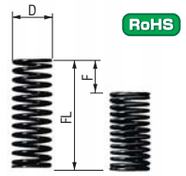
Spring ②is unavailable in certain types and sizes, check the"Combination of Guide Lifter Pin and Spring"table on the right page.

■Configurable Dimension L・A・E・W type

①GLK Dg6		D1	③MSW M×P	h	Catalog No. Type	D	0.1mm increments L	A	E	W	②Spring Type	FL	U/Price Q'ty:1～19 GLSK	GLK
4	−0.004	6	8×1.25	8	GLSK ①②③	4	15.0～45.0	0.5～2.0	5.0～10.0	1.5～02.2	WR	20 25	830	810
6	−0.012	8	10×1.5	10		6	15.0～72.0	0.5～3.0	5.0～10.0	2.5～04.6	WF	30 35	860	850
8	−0.005	10	12×1.5			8	15.0～72.0	0.7～4.5	5.0～10.0	3.5～06.0	WL	40 45	950	900
10	−0.014	13	16×1.5			10	15.0～82.0	0.7～4.5	5.0～15.0	5.0～08.0	WT	50 55	1,030	990
13	−0.006	16	20×1.5	12	GLK ①	13	20.0～82.0	1.0～6.0	5.0～15.0	6.0～11.0	WM	60 65	1,250	1,210
16	−0.017	19	22×1.5			16	20.0～82.0	1.0～6.0	10.0～20.0	6.0～14.0	WH	70 80	1,430	1,370
20	−0.007	23	27×1.5			20	20.0～82.0	1.0～6.0	10.0～20.0	10.0～18.0	WL WT WM WH	90 100	1,680	1,620
25	−0.020	28	33×1.5			25	20.0～82.0	1.0～6.0	10.0～20.0	13.0～22.0			1,950	1,870

E≧A+2
Spring ②is unavailable in certain types and sizes, check the"Combination of Guide Lifter Pin and Spring"table on the right page.

■②Coil springs For specification details, see P.1059～



D 6～D10…D$_{-0.5}^{0}$
D13～D27…D$_{-0.8}^{0}$

RoHS

M SWP-A

■Table of spring constant

①Pin Catalog No. Type	D	②Spring Type D	WR	WF	WL	WT	WM	WH
GLS GLSH GLSK	4	6	N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	N/mm 2.0 {kgf/mm} {0.2}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 5.9 {kgf/mm} {0.6}
	6	8						9.8 {1.0}
	8	10						
	10	13						
	13	16						
	16	18	0.5{0.05}	1.0{0.1}	2.9 {0.3}	3.9 {0.4}	4.9 {0.5}	14.7 {1.5}
	20	22						
	25	27						
Allowable deflection Fmax.			F=L×60%	F=L×45%	F=L×40%	F=L×40%	F=L×35%	F=L×30%

●Load calculation method Load N{kgf}=Spring constant N/mm{kgf/mm}×Deflection Fmm ●Tolerance of spring constant: ±10%

■Combination of Guide lifter pin and Spring (Combinations marked with ○ can be used.)

FL \ Type・D	GLS4・GLSH4・GLSK4 WR6	WF6	WL6	WT6	WM6	WH6	GLS6・GLSH6・GLSK6 WR8	WF8	WL8	WT8	WM8	WH8	GLS8・GLSH8・GLSK8 WR10	WF10	WL10	WT10	WM10	WH10	GLS10・GLSH10・GLSK10 WR13	WF13	WL13	WT13	WM13	WH13
20～40 (5mm increments)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
45	○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
50	○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
55	○	○	○	○*	○	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
60	○	○	○	○*	○*	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
65	○	○	○	○*	○*	○*	○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
70	○	○	○	○*	○*	○*	○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
80	○	○	○	○*	○*		○	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○	○
90																			○	○	○		○	

FL \ Type・D	GLS13・GLSH13・GLSK13 WR16	WF16	WL16	WT16	WM16	WH16	GLS16・GLSH16・GLSK16 WR18	WF18	WL18	WT18	WM18	WH18	GLS20・GLSH20・GLSK20 WL22	WT22	WM22	WH22	GLSH25・GLSK25 WL27	WT27	WM27	WH27
20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
30～70 (5mm increments)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
80	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
90	○	○	○		○				○		○	○*	○		○	○*	○		○	○
100									○		○	○*	○		○	○*	○		○	○

＊…Allowable deflection Fmax. is set smaller than values in the spring constant table above. For details, see P.1059～

Order

Catalog No.	L	A	E	W	②(Type・FL)	
GLS 8	30	2.0				WH40
GLP 6	25	1.6				
GLSH 6	25.0	2.4				WL35
GLH 13	60.0	3.0				
GLSK16	50.0	1.2	E15.0	W12.0		WM60
GLK20	45.5	1.5	E18.0	W14.0		

Price

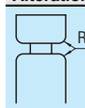
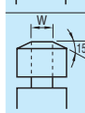
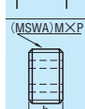
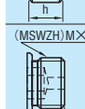
■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No.	L	A	E	W	②	(KRC…etc.)		
GLSH 8	30	2.0				WH40	KRC	GC
GLSK 10	35	0.8	E10	W7.0		WT45	KRC	WA

Alteration	Code	Spec.		¥/1Code
	KRC	Adds rounding to the parts. According to R in the table. Applicable to GLSH, GLH, GLSK and GLK	D: 4・6 R: 0.3; 8～13: 0.5; 16・20: 1.0; 25: 1.5	150
	GC	Adds chamfering to pin head. (15°) Applicable to GLSH/GLH/GLSK/GLK.		100
	WA	Replaces screw plug to MSWA (through hole type). Applicable to GLSH/GLSK. Details P.731	D=4・6	40
			D=8～16	50
			D=20・25	70
	WZH	Replaces screw plug to MSWA (through hole type). Applicable to D6～25 of GLSH/GLSK. D6～10 MSW h=10→h1=12 MSWZH h1=12; D13～25 MSW h=12→h1=15 Details P.731	D=6・8	150
			D=10～16	180
			D=20・25	250

Delivery

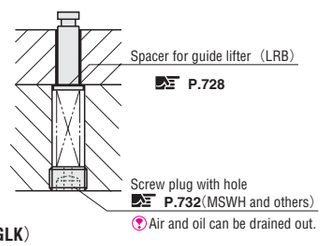
● GLS・GLP
1 Day

● GLSH・GLH・GLSK・GLK
3 Days

Express T 600/1pc.
Express A 300/1pc.
P.38

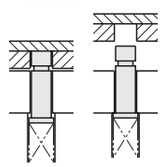
A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

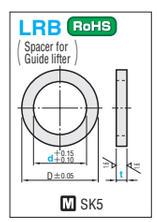
Example



■Features (GLSK/GLK)

・By adjusting dimension E, a through hole machining of the stripper plate becomes available.





D	d	Catalog No.	t
6	4	LRB 4	
7	5	5	0.1
8	6	6	0.2
10	8	8	0.3
13	10	10	0.5
16	13	13	1.0
19	16	16	
23	20	20	

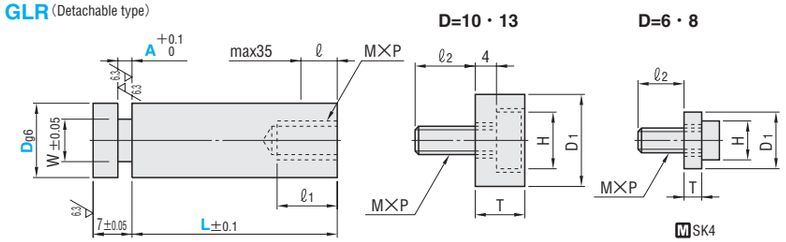
Delivery and Price P.728

GUIDE LIFTERS
—DETACHABLE TYPE / THICK PLATE TYPE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

GLR (Detachable type)



Suitable coil spring and screw plug P.764

Dg6		W	D1	T	M×P	H	ℓ1	ℓ2	ℓ max	Catalog No. Type	D	0.1mm increments L	A	U/Price Q'ty:1～19
6	−0.004 −0.012	3.6	8	3	3×0.5	5.5	15	9	6	GLR	6	20.0～60.0	0.5～3.0	840
8	−0.005 −0.014	5.0	10		4×0.7	7.0					8		0.7～4.0	900
10		6.0	13	8			21	11	10		10	26.0～70.0		1,000
13	−0.006 −0.017	7.0	16	9	5×0.8	8.5					13	26.0～80.0	1.0～6.0	1,230

Alteration

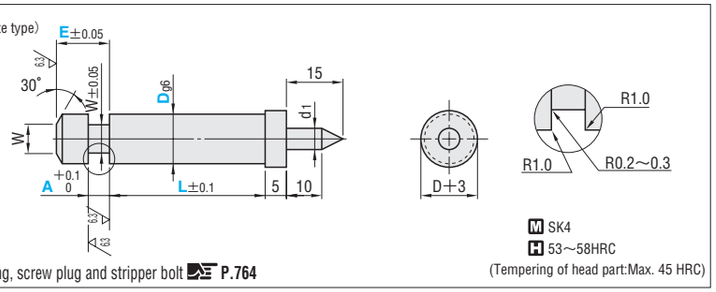
Catalog No. — L — A(AC) —(KRC・WC…etc.)
GLR 10 — 40.0 — 2.5 — KRC

Alteration	Code	Spec.	¥/1Code
R	KRC	Adds rounding to the parts as shown. D: 6 → R: 0.3; D: 8～13 → R: 0.5	150
W / WC	WC	Changes groove diameter W 0.1mm increments. D: 6 → WC: 4.0～4.0; 8 → 4.5～6.0; 10 → 5.0～8.0; 13 → 6.0～11.0	150

Alteration	Code	Spec.	¥/1Code
AC, E	AC	Changes groove width 0.1mm increments. D: 6 → AC: 3.1～6.0, E: 4.0～14.0; 8, 10 → 4.1～7.0, 4.0～15.0; 13 → 6.1～10.0, 5.0～20.0	150
W, 15°	GC	Adds pin head (15°)	100

RoHS

AGL (Thick plate type)



Suitable coil spring, screw plug and stripper bolt P.764

Dg6		W	d1	Catalog No. Type	D	0.1mm increments L	A	E	U/Price Q'ty:1～19
13	−0.006 −0.017	8	6	AGL	13	30.0～ 80.0	3.0～10.0	7.0～18.0	1,440
16		10	9.5		16		3.0～12.0	10.0～20.0	1,640
20	−0.007 −0.020	13			20	30.0～ 90.0	3.0～15.0	10.0～23.0	1,850
25		16	12		25	30.0～100.0	3.0～18.0	12.0～25.0	2,380

E−A− $\frac{(D-d)\tan 30^\circ}{2}$ ≧2

Order

Catalog No. — L — A — E
GLR 10 — 40.0 — 2.5
AGL 13 — 40.0 — A4.0 — E10.0

Delivery

3 Days

Express T 600/1pc.
Express A 300/1pc.
P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. — L — A — E —(HC・WC)
AGL 13 — 40.0 — A4.0 — E10.0 — HC14

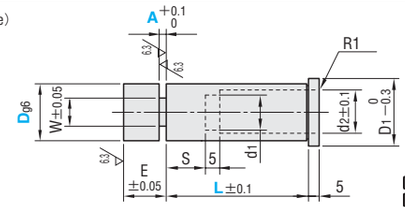
Alteration	Code	Spec.	¥/1Code
HC, H	HC	Changes head diameter D+1≦HC≦D+2 1mm increments	200
W, WC	WC	Changes groove diameter W 0.1mm increments. D: 13 → WC: 8.1～9.0; 16 → 10.1～12.0; 20 → 13.1～16.0; 25 → 16.1～20.0	150

GUIDE LIFTERS / LIFTER PINS
—WITH SPRING HOLE— —WITH SPRING HOLE / WITH SPRING HOLE AND PILOT PUNCH RELIEF HOLE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

GLSZ (With spring hole)

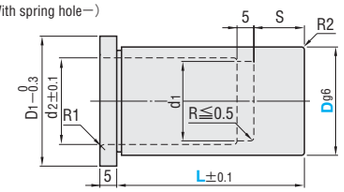


Applicable spring Outer dia.(D)	Dg6		E	W	d1	d2	S	D1	Catalog No. Type	D	L	A	U/Price Q'ty:1～29
5・6	13	−0.006 −0.017	7	7.0	6.5	8	10	16	GLSZ	13	30 35 40 45 50 55 60	2.0 2.5 3.6	1,800
8・10	16		12	8	10.5	11	10	19		16		2.0 2.5 4.0	1,900
10～13	20	−0.007 −0.020		10.0	13.5	14	12	23		20	40 45 50 55 60 65 70	3.6 4.0 5.0	
13～18	25			11.0	18.5	19	15	28		25	40 45 50 55 60 65 70 75 80	3.6 4.0 5.0	2,100
20～25	32	−0.009 −0.025	17	13.0	25.5	26	18	35		32		5.0 6.0 7.0	2,200

To be quoted on price & lead time above Max. Q'ty.

RoHS

LPAH (Lifter pin—With spring hole—)



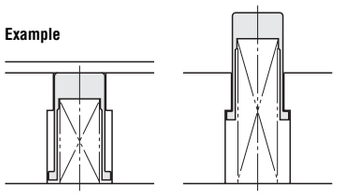
Applicable outside diameter of spring (D)	Dg6		D1	d1	d2	S	Catalog No. Type	D	L	U/Price Q'ty:1～19
5・6	13	−0.006 −0.017	16	6	8	10	LPAH	13	30 35 40 45 50 55 60	1,040
8・10	16		19	10	11	10		16		1,250
10～13	20	−0.007 −0.020	23	13	14	12		20	40 45 50 55 60 65 70	1,400
13～18	25		28	18	19	15		25		1,780
20～25	32	−0.009 −0.025	35	25	26	18		32	40 45 50 55 60 65 70 75 80	1,900

Alteration

Catalog No. — L(LC)
LPAH 20 — LC62.5

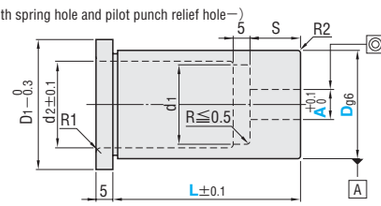
Alteration	Code	Spec.	¥/1Code
LC, L	LC	Changes dimension L. Lmin.−5≦LC＜Lmax. LC=0.1mm increments. Dimension S becomes short by (L−LC).	200

Example



RoHS

LHAH (Lifter pin—With spring hole and pilot punch relief hole—)



Applicable outside diameter of spring (D)	Dg6		D1	d1	d2	S	Catalog No. Type	D	L	A 0.1mm increments	U/Price Q'ty:1～19
8・10	16	−0.006 −0.017	19	10	11	10	LHAH	16	30 40 45 50 55 60	8.0～ 9.0	1,450
10～13	20	−0.007 −0.020	23	13	14	12		20	40 45 50 55 60 65 70	8.0～12.0	1,600
13～18	25		28	18	19	15		25	40 45 50 55 60 65 70 75 80	8.0～16.0	1,980
20～25	32	−0.009 −0.025	35	25	26	18		32		8.0～20.0	2,100

Order

Catalog No. — L — A
GLSZ 16 — 50 — 2.5
LPAH 32 — 70
LHAH 32 — 70 — 10.0

Price

Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

GLSZ is not applicable.

Delivery

■GLSZ
3 Days

■LPAH・LHAH
3 Days
Express A 300/1pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size.

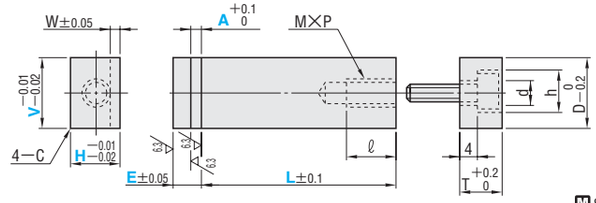
BLOCK GUIDE LIFTERS
—DETACHABLE AND CONFIGURABLE—

PRESS NEW

The volume discount rate is also applicable to alteration cost. P.39

RoHS

GLBF (Detachable and configurable)



Suitable coil spring and screw plug P.764

M SK4
H 53～58HRC

W	C	M×P	ℓ	D	d	T	h	Catalog No. Type	H	V	L	A	E
1.5	0.5	3×0.5	9	10	4	7	6.5	GLBF	5	5.0～13.0	20.0～25.0	0.5～3.6	5.0～ 9.0
									6		25.1～60.0		5.0～15.0
		4×0.7	12	14	5	8	8		8	6.0～13.0	20.0～25.0		5.0～ 6.0
									10		25.1～60.0		6.1～15.0
2.5	0.8	5×0.8	15	18	6	9	9.5		13	8.0～13.0	26.0～30.0		5.0～ 9.0
											30.1～80.0		9.1～15.0

Order: Catalog No. — V — L — A — E
GLBF 8 — V6.8 — 22.5 — 2.0 — 6.0

Delivery: 3 Days

Price

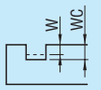
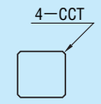
■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No. Type	H	V 5.0～7.0	7.1～9.0	9.1～11.0	11.1～13.0
GLBF	5	1,880	2,060	2,240	2,420
	6	2,090	2,200	2,370	2,550
	8	2,180	2,330	2,510	2,690
	10	2,240	2,460	2,640	2,820
	13	—	2,600	2,780	2,950

Catalog No. — V — L — A — E — (WC・CCT)
GLBF 6 — V5.3 — 32.0 — 2.0 — 6.0 — WC2.0

Alteration	Code	Spec.	¥/1Code
	WC	Changes dimension W 0.1mm increments H: 5 (WC 1.0～1.5); 6 (1.0～2.0); 8 (1.0～3.0); 10 (1.0～3.5); 13 (1.5～4.5)	300
	CCT	Adds chamfering to four corners. Chamfering dimension C is selectable. H: 5, 6, 8, 10, 13; C: 0.5 (0.8 for H13); CCT (Selectable): 1.0 1.5	300

■Features

- Configurable dimension V allows guide width in 0.1mm increments to suit the feed pitch.
- Chamfering dimension C is resizable by optional alteration CCT. It prevents interference between the parts in the lower die and also enables space saving.

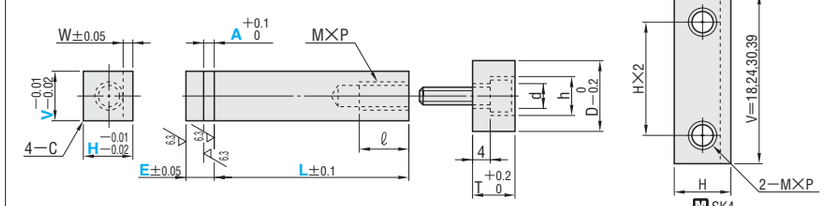
BLOCK GUIDE LIFTERS
—DETACHABLE TYPE / KEY FIXED TYPE—

PRESS ADD.SPEC Printed in Red

The volume discount rate is also applicable to alteration cost. P.39

RoHS

GLB (Detachable type)



Suitable coil spring and screw plug P.764

M SK4
H 53～58HRC

W	C	M×P	ℓ	D	d	T	h	Catalog No.	V	H	0.1mm increments L	A	E	U/Price Q'ty:1～19
1.5	0.5	3×0.5	9	10	4	7	6.5	GLB	5	5	20.0～60.0	0.5～3.6	5.0～15.0	1,500
									6	6				1,500
									18					1,850
		4×0.7	12	14	5	8	8		8	8				1,580
									24					1,910
2.0	0.8								10	10				1,740
									30					2,530
2.5		5×0.8	15	18	6	9	9.5		13	13	26.0～80.0			1,910
									39					2,740

Order: Catalog No. | V | H — L — A — E
GLB 08 08 — 40.0 — 2.0 — 6.0

Delivery: 3 Days | Express A 800/1pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

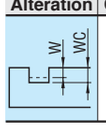
Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

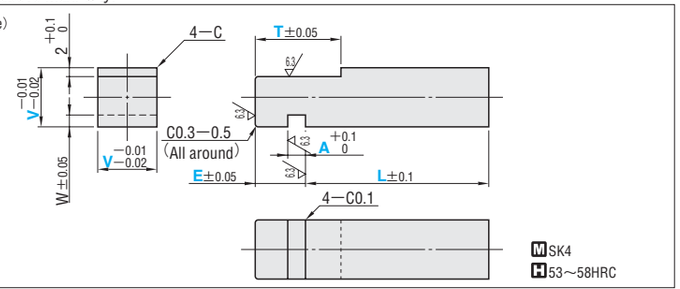
To be quoted on price & lead time above Max. Q'ty.

Catalog No. GLB 08 08 — 40.0 — 2.0 — 6.0 — (WC) WC2.0

Alteration	Code	Spec.	¥/1Code
	WC	Changes dimension W 0.1mm increments H: 5 (WC 1.0～1.5); 6 (1.0～2.0); 8 (1.0～3.0); 10 (1.0～3.5); 13 (1.5～4.5)	300

RoHS

GLBK (Key fixed type)



M SK4
H 53～58HRC

W	Catalog No. Type	V	5mm increments L	0.1mm increments A	E	T	U/Price Q'ty:1～19
1.5	GLBK	6	30～80	0.5～4.0	5.0～25.0	5.0～50.0 ※T≧E ※T≦(L+E)／2	1,060
		8					1,100
2.0		10					1,160
2.5		13					1,200

Order: Catalog No. — L — A — E — T
GLBK 8 — 35 — 2.3 — 8.6 — 20.5

Delivery: 3 Days | Express A 800/1pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

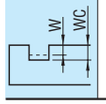
Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

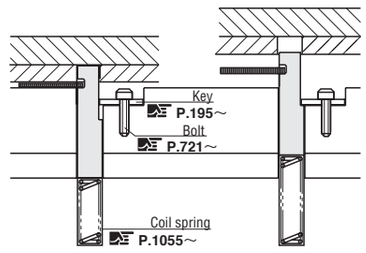
■Features

By adjusting dimension T, it becomes possible to adjust lifting amount.
And by adjusting dimension E, a through hole machining of the stripper plate becomes available.

Catalog No. — L — A — E — T — (WC)
GLBK 8 — 35 — 1.0 — 8.6 — 20.5 — WC2.0

Alteration	Code	Spec.	¥/1Code
	WC	Changes dimension W 0.1mm increments V: 6 (WC 1.0～2.0); 8 (1.0～3.0); 10 (1.0～3.5); 13 (1.5～4.5)	300

Example



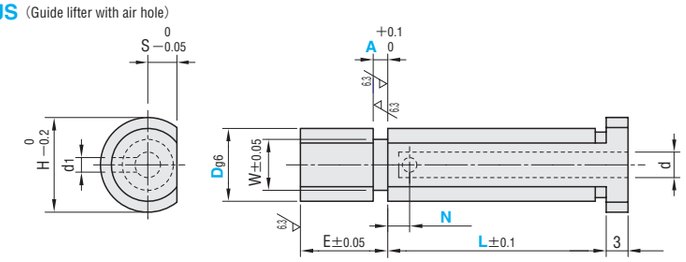
GUIDE LIFTERS WITH AIR HOLE / LIFTER PINS WITH AIR HOLE

BLOCK LIFTER SETS / BLOCK LIFTER —DETACHABLE TYPE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

GLJS (Guide lifter with air hole)



Air hole is on the opposite side of D-Cut.

M SK4
H 53～58HRC(Annealing of head part)

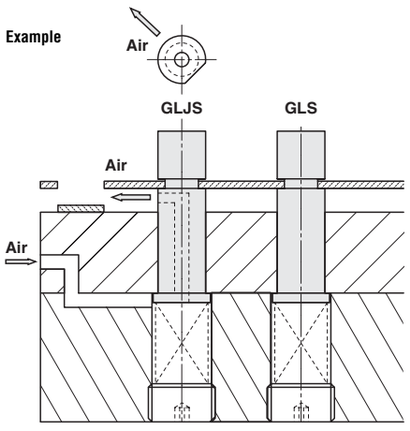
Dg6		W	H	E	d	d1	S	Catalog No. Type	D	L	N 1mm increments	A	U/Price Q'ty:1～29
4	−0.004 −0.012	2.0	6	5	2.0	1.5	1.75	GLJS	4	10 15 20 22 25 28 30 33 35 36 40 45 50	2≦N≦D−2	0.5 0.8 1.0	1,250
6		3.6	8	7	2.5		2		6			0.5 0.8 1.0 1.6	1,300
8	−0.005 −0.014	5.0	10		3.5	2.0	3		8	15 20 22 25 28 30 33 35 36 40 45 50 55		1.0 1.6 2.0	1,700
10		6.0	13				4		10	20 22 25 28 30 33 35 36 40 45 50 55		1.6 2.0 2.5	2,050
13	−0.006 −0.017	7.0	16		4.5	2.5	5		13			2.0 2.5 3.6	2,200
16		8.0	19	12			6		16	30 33 35 36 40 45 50 55 60 70		2.0 2.5 4.0	2,500

Order: Catalog No. — L — N — A
GLJS 8 — 30 — 3 — 1.6

Delivery: 3 Days

Price: To be quoted on price & lead time above Max. Q'ty.

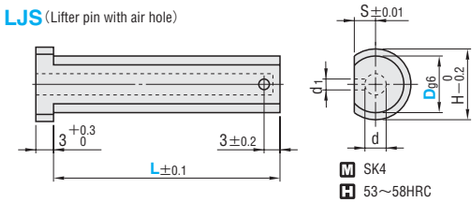
Example



- The problem of insufficient space can be solved by using a guide lifter with air hole.
- Air can be blown reliably from a close distance.

RoHS

LJS (Lifter pin with air hole)



M SK4
H 53～58HRC

Suitable coil spring and screw plug

Lifter pin	Coil spring Type	Coil spring D	Screw plug
LJS 4	WF	6	MSW 8
LJS 6	WL	8	MSW10
LJS 8	WM	10	MSW12
LJS 10	WH	13	MSW16

Dg6		H	d	d1	S	C	Catalog No. Type	D	L	U/Price Q'ty:1～19
4	−0.004 −0.012	6	2.0	1.5	1.75	0.3	LJS	4	25 28 30 34 40	980
6		8	2.5		2			6		730
8	−0.005 −0.014	10	3.5	2.0	3	0.5		8		
10		13			4			10		760

Order: Catalog No. — L
LJS 8 — 30

Delivery: 1 Day

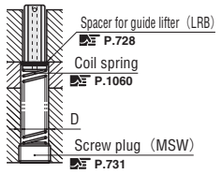
Price

Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

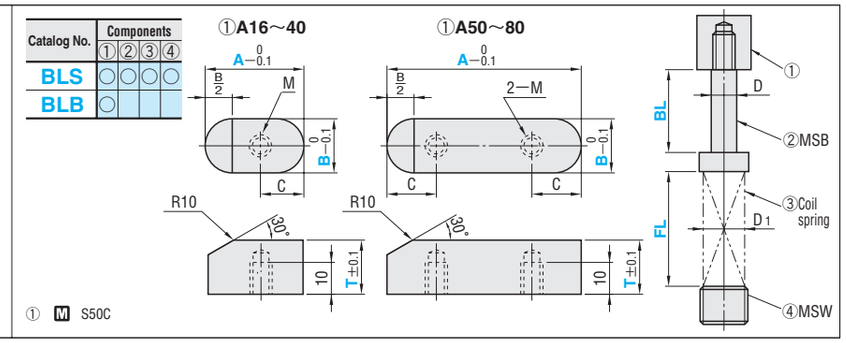
To be quoted on price & lead time above Max. Q'ty.

Example



RoHS

Catalog No.	Components ①	②	③	④
BLS	○	○	○	○
BLB	○			



① M S50C

②MSB M	D	③ D1	④MSW M	Catalog No. Type	C / A B	8 16	10 20	15 30	20 40	10 50	15 60	15 70	20 80	T	BL	③Coil spring Type	FL
5	6.5	10	12	BLS (①②③④)	8	○	○							16	15	WF	30
					10		○	○	○	○				20	20	WL	35
					13				○	○	○			22	25	WM	40
6	8	13	16	BLB (①)	16					○	○	○		25	30	WH	45
					20						○	○	○	28	35		50
															40		60
																	70

For the details of ②, refer to P. 735 of MSB. For ③, P. 1060～ of COIL SPRING. For ④, P. 731 of MSW.

Order: Catalog No. — A — T — BL — ③
BLS 16 — 60 — T20 — BL25 — WM30
BLB 13 — 50 — T22

Delivery: 3 Days | Express A 300/1pc. P.37

A flat charge of 810 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

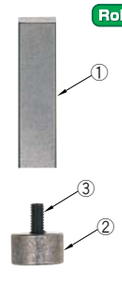
To be quoted on price & lead time above Max. Q'ty.

B	A	U/Price Q'ty:1～19 BLS	BLB
8	16	1,230	1,060
	20	1,240	1,080
10	20	1,300	1,140
	30	1,340	1,180
	40	1,480	1,320
	50	1,690	1,350
13	40	1,610	1,440
	50	1,810	1,470
	60	1,840	1,500
16	50	1,940	1,560
	60	2,060	1,680
	70	2,130	1,750
20	60	2,370	1,990
	70	2,420	2,040
	80	2,540	2,160

Alteration: Catalog No. — A — T — BL — ③ — (WC)
BLS 16 — 60 — T20 — BL25 — WM30 — WC
BLB 13 — 50 — T22 — WC

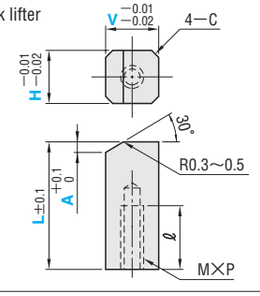
Alteration	Code	Spec.	¥/1Code
R10 R10 30° 30°	WC	Adds tapering on the other side	400

RoHS

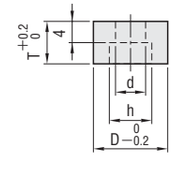


BLR (Detachable type)

①Block lifter



②Holder



①② M SK4
H 53～58HRC
③ A Bolt with hex socket (CB)

C	M×P	ℓ	D	d	T	h	③Bolt	Catalog No.	V	H	L 0.1mm increments	A 0.1mm increments	U/Price Q'ty:1～19
0.5	3×0.5	9	10	4	7	6.5	CB3−10	BLR	6	6	20.0～60.0	0.5～3.6 ※V−1.73A≧2	1,320
	4×0.7	12	14	5	8	8	CB4−12		8	8			1,400
0.8	5×0.8	15	18	6	9	9.5	CB5−15		10	10			1,480
									13	13			1,550

Order: Catalog No. V H — L — A
BLR 08 08 — 40.0 — 1.5

Delivery: 3 Days | Express A 800/1pc. P.37

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example P.763

PRESS ADD.SPEC. Printed in Red

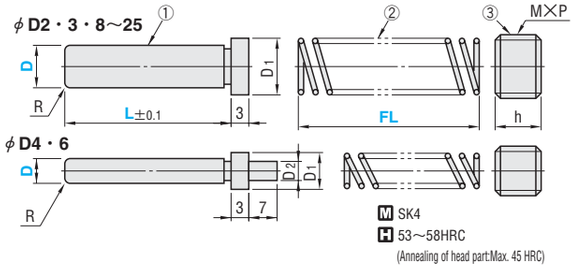
LIFTER PIN SETS / LIFTER PINS
—RESIN TYPE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

Type	Catalog No.	Components ① Pin	② Spring	③ Screw
Standard	LPS	○	○	○
Configurable dimension L	LPSH			
Standard	LP	○		
Configurable dimension L	LPH			

Each tip of LPS and LP is finished by buffing. Please make use of alteration in the case of LPSH and LPH.



■Standard type

①LP D	D1	D2	R	③MSW M×P	h	Catalog No. Type	D	L	②Spring Type	FL	U/Price Q'ty:1～19 LPS	LP
2	3	—	0.3	4×0.7	4	LPS ①②③	2	10 15	WR・WF WL・WT	20 25 30 35 40	270	250
3	4	—	0.3	5×0.8	5	LPS ①②③	3	10 15 20 22 25 28 30 33 35 36 40	WR	20 25 30 35 40 45 50 55 60 65 70 80 90 100	210	190
4	6	3	0.3	8×1.25	8	LPS ①②③	4	10 15 20 22 25 28 30 33 35 36 40 45 50	WF		210	190
6	8	4.6	0.3	10×1.5		LPS ①②③	6	10 15 20 22 25 28 30 33 35 36 40 45 50 55 60	WL		260	240
8	10	—	0.5	12×1.5	10	LPS ①②③	8	10 15 20 22 25 28 30 33 35 36 40 45 50 55 60	WT		310	280
10	13	—	0.5	16×1.5		LP ①	10	20 22 25 28 30 33 35 36 40 45 50 55 60	WM		390	350
13	16	—	2.0	20×1.5		LP ①	13	20 22 25 28 30 33 35 36 40 45 50 55 60	WH		490	440
16	19	—	2.0	22×1.5	12	LP ①	16	30 33 35 36 40 45 50 55 60 70			640	570
20	23	—	2.0	27×1.5		LP ①	20	30 33 35 36 40 45 50 55 60 70	WL・WT WM・WH		780	710

(D: 0 −0.05)

Spring ②is unavailable in certain types and sizes, check the"Combination of Guide Lifter Pin and Spring"table on the right page.

■Dimension L specified type

①LPH D_{g6}	D1	D2	R	③MSW M×P	h	Catalog No. Type	D	L 0.1mm increments	②Spring Type	FL	U/Price Q'ty:1～19 LPSH	LPH
2 −0.002 −0.008	3	—	0.3	4×0.7	4	LPSH ①②③	2	10.0 ～ 40.0	WR・WF WL・WT	20 25 30 35 40	550	530
3	4	—	0.3	5×0.8	5	LPSH ①②③	3	10.0 ～ 50.0	WR	20 25 30 35 40 45 50 55 60 65 70 80 90 100	380	360
4 −0.004 −0.012	6	3	0.5	8×1.25	8	LPSH ①②③	4	10.0 ～ 50.0	WF		380	360
6	8	4.6	0.5	10×1.5	10	LPSH ①②③	6	10.0 ～ 60.0	WL		440	420
8 −0.005 −0.014	10	—	0.5	12×1.5	10	LPSH ①②③	8	10.0 ～ 80.0	WT		490	460
10	13	—	0.5	16×1.5	10	LPH ①	10	10.0 ～ 80.0	WM		570	520
13 −0.006 −0.017	16	—	2.0	20×1.5	12	LPH ①	13	20.0 ～ 90.0	WH		670	610
16	19	—	2.0	22×1.5	12	LPH ①	16	20.0 ～ 100.0			800	720
20 −0.007 −0.020	23	—	2.0	27×1.5	12	LPH ①	20	25.0 ～ 100.0	WL WT WM WH	80 90 100	930	860
25	28	—	2.0	33×1.5	12	LPH ①	25	30.0 ～ 100.0			1,440	1,340

Spring ②is unavailable in certain types and sizes, check the"Combination of Guide Lifter Pin and Spring"table on the right page.

Order

Catalog No.	—	L	—	②Type・FL
LPS	10	— 30	—	WH 50
LP	8	— 28		
LPSH	13	— 35.0	—	WM 60
LPH	13	— 65.0		

Delivery

● LPS・LP: 1 Day

● LPSH・LPH: 3 Days

Express	T	600/1pc.
Express	A	300/1pc.

P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

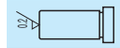
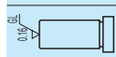
Alteration

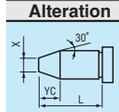
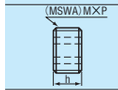
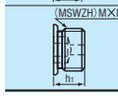
Catalog No. — L — ②Type・FL — (SC…etc.)

LPSH 13 — 35.0 — WM60 — SC

Alteration applicable only to LPSH/LPH.

Express T and A are not available.

Alteration	Code	Spec.	¥/1Code
	SC	Finishes pin tip by buffing	300
	VSC	Finishes pin tip by lapping	300
	RC	Adds spherical radius (SR) to pin top. ⊗Combination with VSC:Not available	150

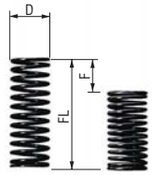
Alteration	Code	Spec.	¥/1Code
	YC	Adds tapering to pin tip YC：0.1mm increments $0.3 \leqq YC \leqq \frac{D}{2}$ Lmin≦L—YC X≒D—1.2×YC ⊗Cannot be applied to D2.3. ⊗Combination with RC not available	200
	SN	No spring guide (Dimension D2) Applicable to D4, 6	150
	WA	Replaces screw plug to MSWA (through hole type) Applicable only to D4～25 of LPSH. Detail P.731	D= 4・6 40 D= 8～16 50 D=20・25 70
	WZH	Replaces screw plug to MSWZH (washer type). Applicable only to D6～25 for LPSH. MSW MSWZH D6～10 h=10→h1=12 D13～25 h=12→h1=15 Detail P.731	D= 6・8 150 D=10～16 180 D=20・25 250

■②Coil springs For detailed standards, see P.1059～

D 3～D10 …D $^{0}_{-0.5}$

D13～D27 …D $^{0}_{-0.8}$

RoHS



M SWP-A

■Table of spring constant

①Pin Catalog No. Type	D	②Spring Type D	WR	WF	WL	WT	WM	WH
LPS LPSH	2	3	N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	1.5{0.15}	2.0{0.2}	2.9{0.3}
	3	4				N/mm 2.0 {kgf/mm} {0.2}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 5.9 {kgf/mm} {0.6}
	4	6						9.8 {1.0}
	6	8						
	8	10						
	10	13						
	13	16	0.5{0.05}	1.0{0.1}	2.9 {0.3}	3.9 {0.4}	4.9 {0.5}	14.7 {1.5}
	16	18						
	20	22						
	25	27						
Allowance deflection Fmax.			F=L×60%	F=L×45%	F=L×40%	F=L×40%	F=L×35%	F=L×30%

●Load calculation method Load N{kgf}=Spring constant N/mm{kgf/mm}×Deflection Fmm ●Tolerance of spring constant：±10%

■Combination of Guide Lifter Pin and Spring (Combinations marked with ○ can be used.)

FL \ Type・D	LPS2・LPSH2 WR3	WF3	WL3	WT3	WM3	LPS3・LPSH3 WR4	WF4	WL4	WT4	WM4	WH4	LPS4・LPSH4 WR6	WF6	WL6	WT6	WM6	WH6	LPS6・LPSH6 WR8	WF8	WL8	WT8	WM8	WH8	LPS8・LPSH8 WR10	WF10	WL10	WT10	WM10	WH10
20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
25	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
30	○	○	○			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
35	○	○	○			○	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
40	○	○	○			○	○	○	○	○*		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
45						○	○	○				○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
50						○	○	○				○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
55						○	○	○				○	○	○	○*	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
60						○	○	○				○	○	○	○*	○*	○*	○	○	○	○	○	○	○	○	○	○	○	○
65						○	○					○	○	○	○*	○*	○*	○	○	○	○	○	○	○	○	○	○	○	○
70						○	○					○	○	○	○*	○*	○*	○	○	○	○	○	○	○*	○	○	○	○	○
80												○	○	○	○*	○*		○	○	○	○	○			○	○	○	○	○

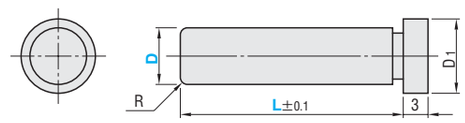
FL \ Type・D	LPS10・LPSH10 WR13	WF13	WL13	WT13	WM13	WH13	LPS13・LPSH13 WR16	WF16	WL16	WT16	WM16	WH16	LPS16・LPSH16 WR18	WF18	WL18	WT18	WM18	WH18	LPS20・LPSH20 WL22	WT22	WM22	WH22	LPSH25 WL27	WT27	WM27	WH27
20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
30～70 (5mm increments)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
80	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
90	○	○	○		○		○	○	○		○				○		○	○*	○		○	○*	○		○	○
100															○		○	○*	○		○	○*	○		○	○

＊…Allowance deflection Fmax. is set smaller than values in the spring constant table above. For details, see P.1059～

■Lifter pins —Resin type—

RoHS

JLP



M Polyacetal resin (POM)

D	D1	R	Catalog No. Type	D	L 0.1mm increments	U/Price Q'ty:1～19
2	3	0.3	JLP	2	10.0 ～ 30.0	650
3	4	0.3	JLP	3	10.0 ～ 30.0	550
4	6	0.3	JLP	4	10.0 ～ 40.0	550
6	8	0.3	JLP	6	10.0 ～ 50.0	600
8	10	0.5	JLP	8	10.0 ～ 60.0	650
10	13	0.5	JLP	10	10.0 ～ 60.0	750

(D: 0 −0.05)

Order

Catalog No.	—	L
JLP 3	—	15.5

Delivery

3 Days

Express	T	600/1pc.
Express	A	300/1pc.

P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

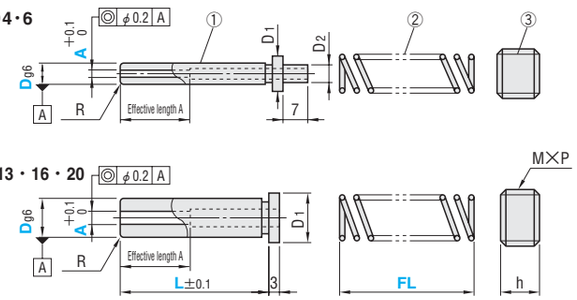
PRESS ADD.SPEC. Printed in Red

LIFTER PIN SETS
—WITH PILOT PUNCH RELIEF HOLE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

Catalog No.	Components ① Pin	② Spring	③ Screw
LHSH	○	○	○
LHH	○		



M SK4
H 53～58HRC
(Annealing of head part：Max. 45 HRC)

①LHH Dg6		D1	D2	A Effective length min.	R	③MSW M×P	h	Catalog No. Type	D	0.1mm increments L	A	② Spring Type	FL	U/Price Q'ty:1～19 LHSH	LHH
3	−0.002 −0.008	4	—	2	0.3	5×0.8	5	LHSH (①②③) LHH (①)	3	20.0～30.0	0.8～1.4 (0.1mm increments)	WR WF WL WT WM WH	20 25 30 35 40 45 50 55 60 65 70 80 90 100	590	570
4	−0.004 −0.012	6	3	2		8×1.25	8		4	20.0～50.0	1.0～2.3 (0.1mm increments)			510	490
5		7	—	3					5	20.0～50.0	1.4～3.0 (0.1mm increments)			540	500
6		8	4.6			10×1.5	10		6	20.0～50.0	1.4～3.5 (0.1mm increments)			560	520
8	−0.005 −0.014	10		4		12×1.5			8	20.0～50.0	1.4～5.3 (0.3mm increments)			600	570
10		13		5		16×1.5			10	20.0～60.0	1.4～5.3 (0.3mm increments) 5.5 5.8 6.0 6.3 6.8 (Selection)			670	630
13	−0.006 −0.017	16	—	6	0.5	20×1.5	12		13	20.0～60.0	1.8～9.3 (0.5mm increments)			860	820
16		19		8		22×1.5			16	20.0～60.0*	2.0～11.5 (0.5mm increments)			1,090	1,040
20	−0.007 −0.020	23		10		27×1.5			20	20.0～60.0*	2.0～15.5 (0.5mm increments)	WL WT WM WH		1,410	1,330

Spring② is unavailable in certain types and sizes, so check using the"Combinations of Guide Lifter Pin and Spring" table on the right page.
When D=16 or 20, and L=20.0～30.0, effective length A may become equal to dimension L.

Order Catalog No. — L — A — ②Type・FL
LHSH 6 — 22.0 — 2.3 — WM40
LHH 8 — 35.0 — 3.5

Delivery 3 Days | Express T 600/1pc. | Express A 300/1pc. P.38
A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

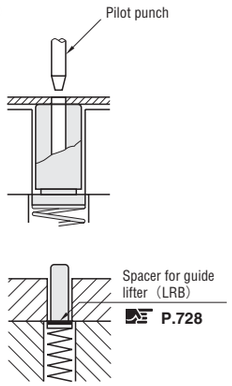
Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L — A(AC) — ② — (VSC・SN…etc.)
LHSH 13 — 50 — AC2.1 — WM60 — VSC
⊗ Express T and A are not available.

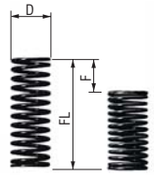
Alteration	Code	Spec.	¥/1Code	
GL 0.15	VSC	Finishes pin tip by lapping	300	
AC D	AC	Changes dimension A 0.1mm increments Amin＜AC＜Amax Applicable to D8～20	300	
	SN	No spring guide (D2=0) Applicable to D4, 5, 6	150	
(MSWA)M×P h	WA	Replaces screw plug to MSWA (through hole type) Applicable only to D4～20 of LHSH. Detail P.731	D=4・5・6	40
			D=8～16	50
			D=20	70
(MSWZH)M×P h1	WZH	Replaces screw plug to MSWZH (washer type) Applicable only to D6～20 of LHSH. MSW MSWZH D6～10 h=10→h1=12 D13～20 h=12→h1=15 Detail P.731	D=6・8	150
			D=10～16	180
			D=20	250

Example



■②Coil springs For detailed standards, see P.1059～

D 4～D10 …D 0 −0.5
D13～D22 …D 0 −0.8
RoHS



M SWP-A

■Table of spring constant

①Pin Catalog No. Type	D	②Spring Type D	WR	WF	WL	WT	WM	WH
LHSH	3	4	N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	1.5{0.15} N/mm 2.0 {kgf/mm} {0.2}	2.0{0.2} N/mm 2.9 {kgf/mm} {0.3}	2.9{0.3} N/mm 5.9 {kgf/mm} {0.6}
	4	6						
	5	6						
	6	8						9.8 {1.0}
	8	10						
	10	13						
	13	16						
	16	18	0.5{0.05}	1.0{0.1}	2.9 {0.3}	3.9 {0.4}	4.9 {0.5}	14.7 {1.5}
	20	22						
Allowable deflection Fmax.			F=L×60%	F=L×45%	F=L×40%	F=L×40%	F=L×35%	F=L×30%

●Load calculation method Load N{kgf}=Spring constant N/mm{kgf/mm}×Deflection Fmm ●Tolerance of spring constant: ±10%

■Combination of Guide Lifter Pin and Spring (Combinations marked with ○ can be used.)

FL \ Type・D	LHSH3 WR4	WF4	WL4	WT4	WM4	WH4	LHSH4・LHSH5 WR6	WF6	WL6	WT6	WM6	WH6	LHSH6 WR8	WF8	WL8	WT8	WM8	WH8	LHSH8 WR10	WF10	WL10	WT10	WM10	WH10
20・25・30	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
35	○	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
40	○	○	○	○	○*		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
45	○	○	○				○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
50	○	○	○				○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
55	○	○	○				○	○	○	○*	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
60	○	○	○				○	○	○	○*	○*	○*	○	○	○	○	○	○	○	○	○	○	○	○
65	○	○					○	○	○	○*	○*	○*	○	○	○	○	○	○*	○	○	○	○	○	○
70	○	○					○	○	○	○*	○*	○*	○	○	○	○	○	○*	○	○	○	○	○	○
80							○	○	○	○*	○*		○	○	○	○	○		○	○	○	○	○	○

FL \ Type・D	LHSH10 WR13	WF13	WL13	WT13	WM13	WH13	LHSH13 WR16	WF16	WL16	WT16	WM16	WH16	LHSH16 WR18	WF18	WL18	WT18	WM18	WH18	LHSH20 WL22	WT22	WM22	WH22
20～70 (5mm increments)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
80	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
90	○	○	○		○		○	○	○		○				○		○	○*	○		○	○*
100							○	○	○		○				○		○	○*	○		○	○*

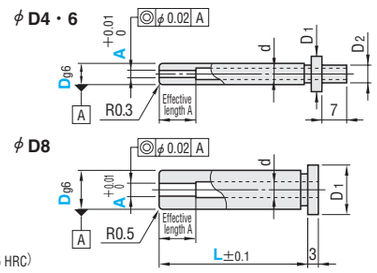
＊…Allowable deflection Fmax. is set smaller than values in the spring constant table above. For details, see P.1059～

■Lifter pins —With pilot punch relief hole (precision) type—

RoHS

LHHV

M SK4
H 53～58HRC
(Annealing of head part：Max. 45 HRC)



Dg6		D1	D2	A Effective length	d	Catalog No. Type	D	L	A 0.01mm increments	U/Price Q'ty:1～19
4	−0.004 −0.012	6	3	2	2.2	LHHV	4	20 22 25 30	1.00～1.60	1,150
6		8	4.6	3	3.4		6	25 30 33 35	1.00～3.00	1,200
8	−0.005 −0.014	10	—	4	4.4		8	30 33 35 40	1.00～4.00	1,250

Order Catalog No. — L — A
LHHV 6 — 30 — 2.50

Delivery 3 Days | Express A 300/1pc. P.38
A flat charge of 810 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

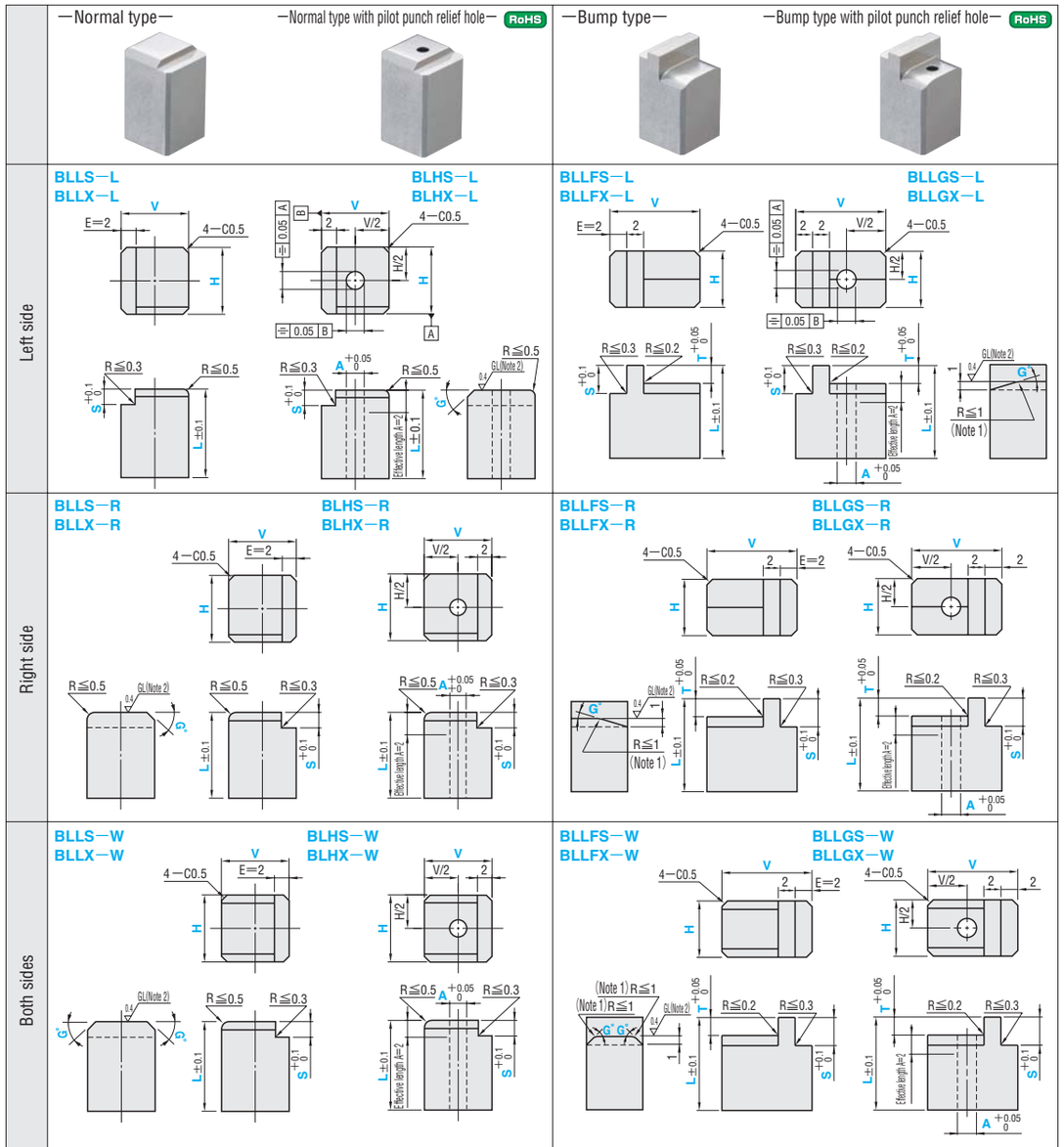
To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L — A — (VSC・SN)
LHHV 6 — 30 — 2.50 — VSC
⊗ Express A is not available.

Alteration	Code	Spec.	¥/1Code
GL 0.15	VSC	Finishes pin tip by lapping	300
	SN	No spring guide (D2=0) Applicable to D4, 6	150

PRESS NEW

HIGH PRECISION BLOCK LIFTERS
—CONFIGURABLE DIMENSION / KEY FIXED TYPE—



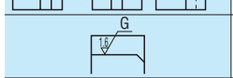
(Note 1) R≦1 ···› R≦1 is hand finished.
(Note 2) GL ···› Simple lapping.

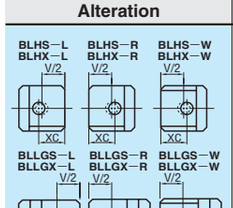
To change the position of the pilot punch relief hole of a block lifter, please use alteration XC.

M SKD11
H 60～63HRC

Alteration

Catalog No.	V(VC)	H(HC)	L(LC)	S	A	T	G	(EC · XC · NL)
BLLFS—L	08	13	LC11.0	S1.5			G45	EC3.4
BLHX—L	06	06	LC9	S1	A2.1			XC5.0—NL

Alteration	Code	Spec.	¥/1Code
	LC	Changes full length 7≦LC＜L 0.1mm increments	200
	EC	Changes dimension E 2＜EC≦V/2 0.1mm increments ⊗ Not applicable to pilot hole types	200
	NL	No simple lapping on lifting surface	—100

Alteration	Code	Spec.	¥/1Code
	XC	Changes position of pilot punch relief hole 0.1mm increments $\frac{A}{2}+2 \leqq XC \leqq V-2-\frac{A}{2}$ Applicable to pilot punch relief hole type only.	200

¥ The volume discount rate is also applicable to alteration cost. P.39

Catalog No.	1 mm increments V	1 mm increments H	1 mm increments L	0.1 mm increments S	0.1 mm increments A	0.1 mm increments T	Selection G
Normal type V·H tolerance $^{-0.01}_{-0.02}$ BLLS—L BLLS—R BLLS—W / V·H tolerance $^{-0.002}_{-0.005}$ BLLX—L BLLX—R BLLX—W	5～13	5～13	8～12	0.5～2.0	—	—	15
Normal type with pilot punch relief hole V·H tolerance $^{-0.01}_{-0.02}$ BLHS—L BLHS—R BLHS—W / V·H tolerance $^{-0.002}_{-0.005}$ BLHX—L BLHX—R BLHX—W	6	5～13	8～12	0.5～2.0	0.1～2.0	—	30
	7～13				0.1～2.5		40
Bump type V·H tolerance $^{-0.01}_{-0.02}$ BLLFS—L BLLFS—R BLLFS—W / V·H tolerance $^{-0.002}_{-0.005}$ BLLFX—L BLLFX—R BLLFX—W	8～13	5～13	8～12	0.5～2.0	—	0.1～3.5	15
Bump type with pilot punch relief hole V·H tolerance $^{-0.01}_{-0.02}$ BLLGS—L BLLGS—R BLLGS—W / V·H tolerance $^{-0.002}_{-0.005}$ BLLGX—L BLLGX—R BLLGX—W	8	5～13	8～12	0.5～2.0	0.1～2.0	0.1～3.5	30
	9～13				0.1～2.5		40

Order

Catalog No.	V	H	—	L	—	S	—	A	—	T	—	G
BLHS—L	06	05	—	10	—	S 1.2	—	A1.2			—	G15
BLLX—L	13	07	—	08	—	S 0.7						

If the V and H dimensions are less than 10mm, place "0" at the beginning when ordering.
Example : For the case of V=6 mm, H=5mm

V	H
06	05

Price

Volume discount rate P.37

Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery 5 Days

■Normal type・Bump type V·H tolerance $^{-0.01}_{-0.02}$

Catalog No. H \ V	5	6	7	8	9	10	11	12	13
Normal type BLLS—L BLLS—R BLLS—W	5	3,200	3,200	3,000	3,000	3,060	3,060	3,170	3,170	3,170
	6	—	3,200	3,000	3,000	3,060	3,060	3,170	3,170	3,340
	7	—	—	3,000	3,000	3,060	3,060	3,170	3,340	3,340
	8	—	—	—	3,000	3,340	3,340	3,340	3,340	3,460
	9	—	—	—	—	3,340	3,340	3,340	3,460	3,460
Bump type BLLFS—L BLLFS—R BLLFS—W	10	—	—	—	—	—	3,340	3,460	3,460	3,760
	11	—	—	—	—	—	—	3,460	3,760	3,760
	12	—	—	—	—	—	—	—	3,760	3,760
	13	—	—	—	—	—	—	—	—	3,760

V(5)(6)(7) ···› Applicable to normal type only

■Normal type・Bump type V·H tolerance $^{-0.002}_{-0.005}$

Catalog No. H \ V	5	6	7	8	9	10	11	12	13
Normal type BLLX—L BLLX—R BLLX—W	5	3,900	3,900	3,700	3,700	3,810	3,810	3,920	3,920	3,920
	6	—	3,900	3,700	3,700	3,810	3,810	3,920	3,920	4,090
	7	—	—	3,700	3,700	3,810	3,810	3,920	4,090	4,090
	8	—	—	—	3,700	4,090	4,090	4,090	4,090	4,260
	9	—	—	—	—	4,090	4,090	4,090	4,260	4,260
Bump type BLLFX—L BLLFX—R BLLFX—W	10	—	—	—	—	—	4,090	4,260	4,260	4,560
	11	—	—	—	—	—	—	4,260	4,560	4,560
	12	—	—	—	—	—	—	—	4,560	4,560
	13	—	—	—	—	—	—	—	—	4,560

V(5)(6)(7) ···› Applicable to normal type only

■Normal type with pilot punch relief hole・Bump type with pilot punch relief hole V·H tolerance $^{-0.01}_{-0.02}$

Catalog No. H \ V	6	7	8	9	10	11	12	13
Normal type BLHS—L BLHS—R BLHS—W	5	4,040	3,840	3,840	3,900	3,900	4,010	4,010	4,010
	6	4,040	3,840	3,840	3,900	3,900	4,010	4,010	4,180
	7	—	3,840	3,840	3,900	3,900	4,010	4,180	4,180
	8	—	—	3,840	4,180	4,180	4,180	4,180	4,300
	9	—	—	—	4,180	4,180	4,180	4,300	4,300
Bump type BLLGS—L BLLGS—R BLLGS—W	10	—	—	—	—	4,180	4,300	4,300	4,600
	11	—	—	—	—	—	4,300	4,600	4,600
	12	—	—	—	—	—	—	4,600	4,600
	13	—	—	—	—	—	—	—	4,600

V(6)(7) ···› Applicable to normal type only

■Normal type with pilot punch relief hole・Bump type with pilot punch relief hole V·H tolerance $^{-0.002}_{-0.005}$

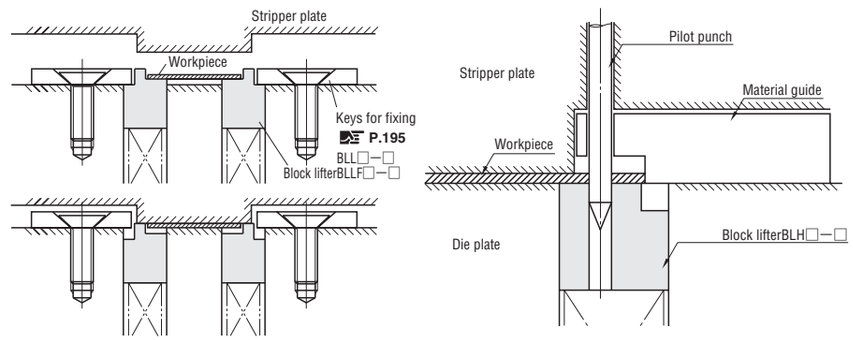
Catalog No. H \ V	6	7	8	9	10	11	12	13
Normal type BLHX—L BLHX—R BLHX—W	5	4,740	4,540	4,540	4,650	4,650	4,760	4,760	4,760
	6	4,740	4,540	4,540	4,650	4,650	4,760	4,760	4,930
	7	—	4,540	4,540	4,650	4,650	4,760	4,930	4,930
	8	—	—	4,540	4,930	4,930	4,930	4,930	5,100
	9	—	—	—	4,930	4,930	4,930	5,100	5,100
Bump type BLLGX—L BLLGX—R BLLGX—W	10	—	—	—	—	4,930	5,100	5,100	5,400
	11	—	—	—	—	—	5,100	5,400	5,400
	12	—	—	—	—	—	—	5,400	5,400
	13	—	—	—	—	—	—	—	5,400

V(6)(7) ···› Applicable to normal type only

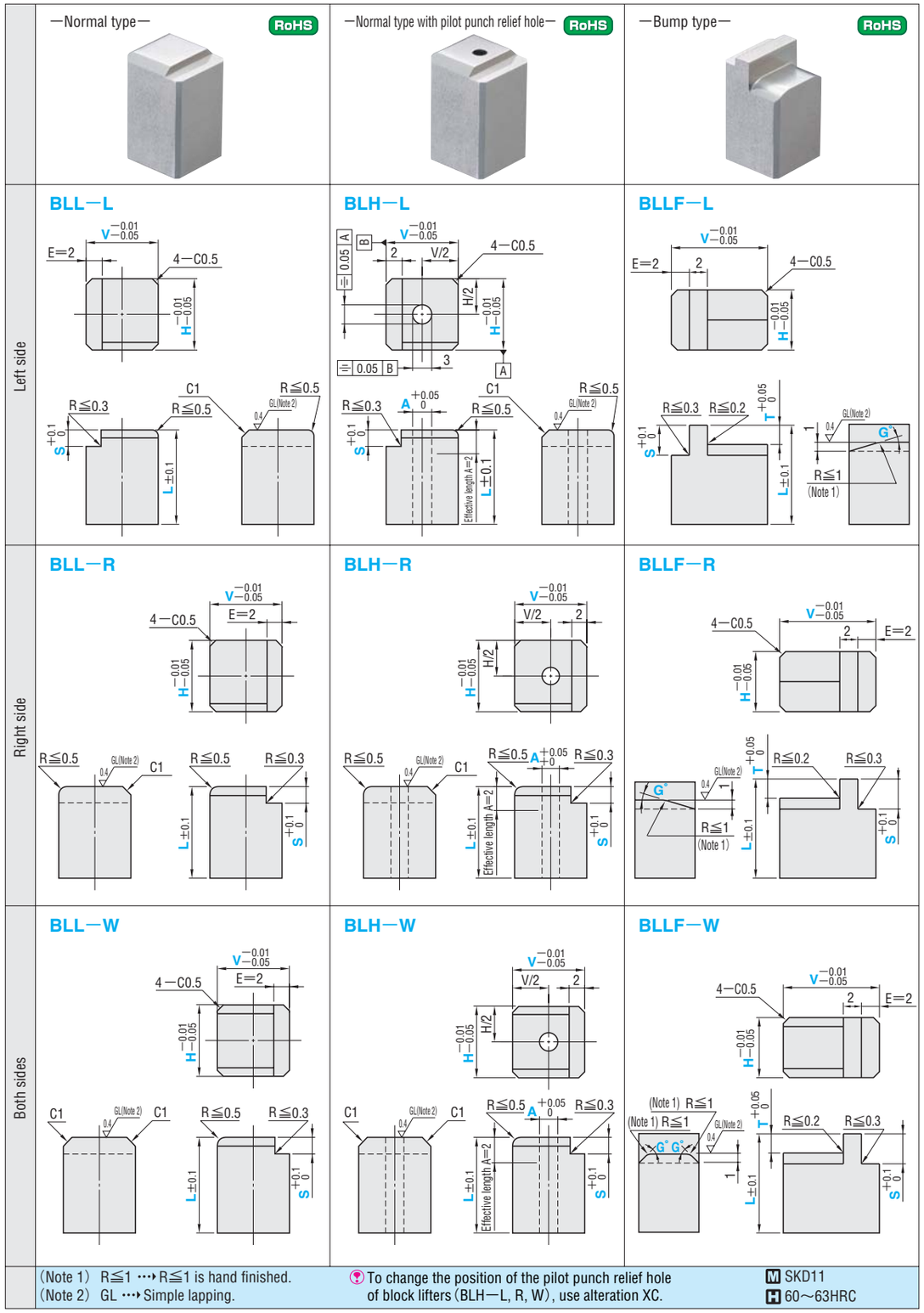
■Features

1. Outer shape tolerance is for precision applications, it is ideal for machining thin work piece.
2. The dimensions can be specified over a wide range.
3. Since the stripper plate pushes the block lifter down directly, damage to the workpiece by the stripper plate can be prevented. (Bump type)

Example



BLOCK LIFTERS
—KEY FIXED TYPE—



(Note 1) R≦1 ···▸ R≦1 is hand finished.
(Note 2) GL ···▸ Simple lapping.

To change the position of the pilot punch relief hole of block lifters (BLH—L, R, W), use alteration XC.

M SKD11
H 60～63HRC

The volume discount rate is also applicable to alteration cost. P.39

Catalog No.	V	H	L	S	Bump type only: T 0.1 mm increments	Bump type only: G°	U/Price Q'ty:1～9: BLL—□	U/Price Q'ty:1～9: BLLF—□
—Normal type— BLL—L BLL—R BLL—W / —Bump type— BLLF—L BLLF—R BLLF—W	(5)	5	10	1	—	—	1,380	—
	(6)	6		2				
	8	6	10	1	0.1～2.5	30	1,290	1,290
		8	13					
	10	6		2	0.1～3.0		1,310	1,310
		8	20			45		
	13	10	25	3	0.1～3.5		1,350	1,350

(5)(6) ···▸ Applicable to normal type (BLL-□) only

Catalog No.	V	H	L	S	A 0.1mm increments	Price Q'ty:1～9
—Normal type with pilot punch relief hole— BLH—L	6	6	8	1	0.8～1.8	2,510
BLH—R	8	8	10	2	1.0～3.5	2,760
BLH—W	10	10			1.0～5.0	2,910

Order

Catalog No.	V	H	L	S	A	T	G
BLLF—L	10	08	13	S 2		T 2.1	G45
BLH — R	08	08	10	S 1	A2.1		

Delivery 5 Days — Express B 300/1pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No.	V	H	L(LC)	S(SC)	A	T	G	(EC・XC・NL)
BLLF—L	10	08	LC11.0	SC1.5		T0.8	G45	EC3.4
BLH — R	08	08	LC9	S1	A2.1			NL

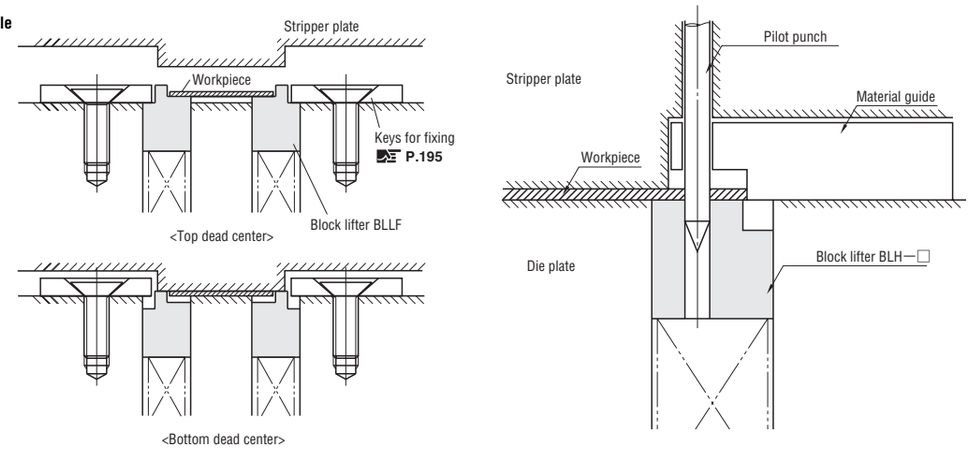
Alteration	Code	Spec.	¥/1Code
L, LC	LC	Changes full length 7≦LC＜L 0.1mm increments	200
S, SC	SC	Changes dimension S 1＜SC＜6 0.1mm increments	200
2, E=2, 2, EC, EC, E	EC	Changes dimension E 2＜EC≦V/2 0.1mm increments ⊗ Not applicable to BLH—□	200

Alteration	Code	Spec.	¥/1Code
BLH—L BLH—R BLH—W (V/2, XC)	XC	Changes position of pilot punch relief hole $\frac{A}{2}+2 \leqq XC \leqq \frac{V}{2}-2-\frac{A}{2}$ 0.1mm increments Applicable to with pilot hole only.	200
G, 1.6	NL	No simple lapping on lift surface	−100

Features

1. Since the stripper plate pushes the block lifter down directly, damage to the workpiece by the stripper plate can be prevented. (Bump type)
2. Since these block lifters are key-fixed type, they can be easily detached at the time of regrinding and no lifting amount adjustment is needed
3. Compared to round lifters, a wider area can be obtained for the lift area, so this method is effective for press machining of thin part such as lead frames, connectors, etc.

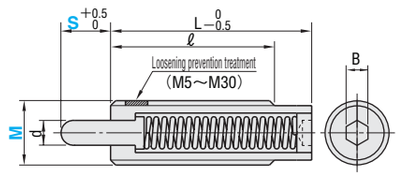
Example



SPRING PLUNGERS

Spring plungers RoHS
—steel type—

Type			Main body M	Main body H	Main body S	Pin M	Pin H	Pin S	Spring M	Allowable temperature
Steel nose	For light load	PJL	S45C	29~35HRC	Black oxide	S45C	57~63HRC (Carborizing)	Bright chromate	SWP—B	—30~80℃
	For heavy load	PJH						Black oxide		
	For extremely heavy load	PJX			Nickel plating					
Resin nose	For light load	NPJL			Black oxide	Polyacetal	—	—		
	For heavy load	NPJH								
	For extremely heavy load	NPJX			Nickel plating					



d	ℓ	L Light and heavy load	L Extremely heavy load	B	For light load (PJL・NPJL) min. N{kgf} Load	For light load (PJL・NPJL) max.	For heavy load (PJH・NPJH) min. N{kgf} Load	For heavy load (PJH・NPJH) max.	For extremely heavy load (PJX・NPJX) min. N{kgf} Load	For extremely heavy load (PJX・NPJX) max.	Catalog No. Type	M (Coarse thread)	S	U/Price Q'ty:1~19 For light load For haevy load	U/Price Q'ty:1~19 For extremely heavy load
1.1	10(15)	10	15	0.9	0.49 {0.05}	1.0 { 0.1}	0.78 {0.08}	2.9 { 0.3}	2.2 {0.2}	4.5 { 0.5}	PJL (All size) PJH (All size) PJX (Only marked with ＊) NPJL (Only marked with ＊) NPJH (Only marked with ＊) NPJX (Only marked with ＊)	3	＊＊ 1.5	330	370
1.1	15(20)	15	20	0.9	0.29 {0.03}	1.0 { 0.1}	0.78 {0.08}	2.9 { 0.3}	1.8 {0.2}	4.5 { 0.5}			＊＊ 3	380	420
1.6	15(24)	15	24	1.3	1.0 {0.1}	2.0 { 0.2}	2.9 {0.3}	8.8 { 0.9}	5.2 {0.5}	13 { 1.3}		4	＊＊ 2	330	370
1.6	24	24	24	1.3	0.59 {0.06}	2.0 { 0.2}	2.0 {0.2}	8.8 { 0.9}	5.2 {0.5}	13 { 1.3}			＊＊ 4	380	420
2.0	20(27)	20	27	1.5	2.0 {0.2}	9.8 { 1.0}	4.9 {0.5}	19.6 { 2.0}	9.1 {0.9}	24.5 { 2.5}		5	＊＊ 3	330	370
2.0	27(39)	27	39	1.5	2.0 {0.2}	9.8 { 1.0}	2.9 {0.3}	19.6 { 2.0}	8.8 {0.9}	24.8 { 2.5}			＊＊ 5	380	420
2.5	25(30)	25	30	2	5.9 {0.6}	9.8 { 1.0}	7.8 {0.8}	29.4 { 3.0}	14.2 {1.4}	39.5 { 4.0}		6	＊＊ 3	330	370
2.5	30(36)	30	36	2	2.0 {0.2}	9.8 { 1.0}	4.9 {0.5}	29.4 { 3.0}	14.1 {1.4}	39.4 { 4.0}			＊＊ 5	380	420
2.5	30	39	—	2	1.4 {0.14}	9.8 { 1.0}	5.0 {0.5}	28.0 { 3.0}	—	—			10	450	—
3.1	25(27)	25	27	2.5	5.9 {0.6}	9.8 { 1.0}	14.7 {1.5}	29.4 { 3.0}	35.3 {3.6}	41.2 { 4.2}		8	＊＊ 3	330	380
3.1	27(30)	27	35	2.5	2.9 {0.3}	9.8 { 1.0}	7.8 {0.8}	29.4 { 3.0}	14.7 {1.5}	41.2 { 4.2}			＊＊ 5	380	410
3.1	30	43	—	2.5	3.0 {0.3}	9.8 { 1.0}	7.0 {0.7}	28.8 { 3.0}	—	—			10	500	—
3.8	30	30	35	3	5.9 {0.6}	14.7 { 1.5}	8.8 {0.9}	49.0 { 5.0}	15.7 {1.6}	62.8 { 6.4}		10	＊＊ 5	350	390
3.8	30	43	53	3	2.9 {0.3}	14.7 { 1.5}	7.8 {0.8}	49.0 { 5.0}	12.7 {1.3}	62.8 { 6.4}			＊＊10	450	500
3.8	30	58	—	3	2.9 {0.3}	14.7 { 1.5}	6.2 {0.6}	48.7 { 5.0}	—	—			15	520	—
5.5	30(35)	30	43	4	5.9 {0.6}	14.7 { 1.5}	6.2 {0.6}	48.7 { 5.0}	37.2 {3.8}	98.1 {10.0}		12	＊＊ 5	380	420
5.5	35	43	58	4	2.9 {0.3}	19.6 { 2.0}	7.8 {0.8}	49.0 { 5.0}	14.7 {1.5}	98.1 {10.0}			＊＊10	500	560
5.5	35	51	78	4	2.9 {0.3}	19.6 { 2.0}	4.9 {0.5}	49.0 { 5.0}	14.9 {1.5}	98.1 {10.0}			＊＊15	570	620
5.5	35	78	—	4	3.5 {0.3}	19.6 { 2.0}	6.9 {0.7}	49.0 { 5.0}	—	—			20	760	—
8	35	60	60	5	5.9 {0.6}	39.2 { 4.0}	12.7 {1.3}	78.5 { 8.0}	23.5 {2.4}	147.2 {15.0}		16	＊＊10	640	680
8	35	60	70	5	3.9 {0.4}	39.2 { 4.0}	12.7 {1.3}	78.5 { 8.0}	21.6 {2.2}	147.2 {15.0}			＊＊15	640	700
8	35	85	90	5	4.9 {0.5}	39.2 { 4.0}	9.8 {1.0}	78.5 { 8.0}	12.7 {1.3}	147.2 {15.0}			＊＊20	800	850
8	35	125	125	5	2.9 {0.3}	39.2 { 4.0}	6.9 {0.7}	78.5 { 8.0}	19.6 {2.0}	147.2 {15.0}			＊ 30	1,140	1,190
8	35	125		5	4.9 {0.5}	39.2 { 4.0}	6.9 {0.7}	78.5 { 8.0}					40	1,900	
8	35	155		5	19.6 {2.0}	49.0 { 5.0}	29.4 {3.0}	78.5 { 8.0}					50	2,370	
8	35	159	—	5	2.9 {0.3}	49.0 { 5.0}	3.9 {0.4}	78.5 { 8.0}	—	—			60	2,940	—
8	35	185		5	3.4 {0.35}	49.0 { 5.0}	5.5 {0.56}	78.5 { 8.0}					70	3,610	
8	35	185		5	19.6 {2.0}	49.0 { 5.0}	29.4 {3.0}	93.2 { 9.5}					80	3,610	
10	45	60	80	6	12.7 {1.3}	78.5 { 8.0}	24.5 {2.5}	147.1 {15.0}	12.7 {1.3}	245.3 {25.0}			＊ 15	950	1,040
10	45	72		6	11.7 {1.2}	78.5 { 8.0}	22.6 {2.3}	147.1 {15.0}				20	20	1,140	
10	45	96	—	6	11.7 {1.2}	78.5 { 8.0}	22.6 {2.3}	147.1 {15.0}	—	—			30	1,420	—
10	45	120		6	11.7 {1.2}	78.5 { 8.0}	22.6 {2.3}	147.1 {15.0}					40	2,090	
10	45	60		10	19.6 {2.0}	98.1 {10.0}	44.1 {4.5}	196.1 {20.0}					7	1,140	
10	45	60	84	10	19.6 {2.0}	98.1 {10.0}	47.1 {4.8}	215.7 {22.0}	24.5 {2.5}	314.0 {32.0}			＊ 15	1,140	1,250
10	45	75		10	17.7 {1.8}	98.1 {10.0}	44.1 {4.5}	215.7 {22.0}				24	20	1,280	
10	45	100		10	17.7 {1.8}	98.1 {10.0}	44.1 {4.5}	215.7 {22.0}					30	1,710	
10	45	124	—	10	17.7 {1.8}	98.1 {10.0}	44.1 {4.5}	215.7 {22.0}	—	—			40	2,370	—
14	45	66		14	27.5 {2.8}	117.7 {12.0}	44.1 {4.5}	274.6 {28.0}					15	1,710	
14	45	78		14	27.5 {2.8}	117.7 {12.0}	53.0 {5.4}	274.6 {28.0}				30	20	1,990	
14	45	100		14	27.5 {2.8}	117.7 {12.0}	45.1 {4.6}	274.6 {28.0}					30	2,850	
14	45	123		14	27.5 {2.8}	117.7 {12.0}	47.1 {4.8}	274.6 (28.0)					40	3,700	

The values in brackets of dimension ℓ are for extremely heavy load.

{kgf}=N×0.101972

Order — Catalog No. PJL12—5, NPJH3—1.5

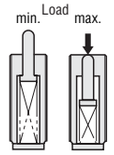
Delivery — 1 Day

Price

Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.



What is loosening prevention treatment ?

Anaerobic adhesive agent, sealed inside micro capsules, helps prevent the plunger from becoming loose. Its effect will be lost once the plunger is unscrewed.To regain the effect, apply the plunger's thread with a commercially available anaerobic adhesive agent for screws.

■Wrenches for spring plunger

PJG

RoHS

M S45C
S Black oxide

M	Catalog No.	U/Price Q'ty:1~9
5・6	PJG1	550
8・10	PJG2 PJG2A (for flanged ones)	
12	PJG3	700
16	PJG4	
20・24	PJG5	
30	PJG6	800

Order — Catalog No. PJG1

Delivery — 1 Day

Price

Volume discount rate P.37

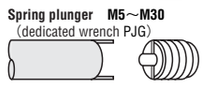
Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example

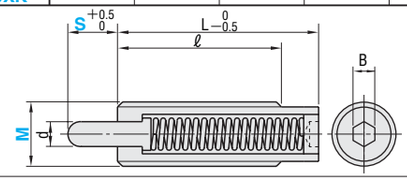
Spring plunger M3・M4 (flat-blade screwdriver)

Spring plunger M5~M30 (dedicated wrench PJG)



Spring plungers RoHS
—Stainless steel type—

Type			Main body M	Nose M	Nose H	Spring M	Allowable temperature
Stainless steel nose	For light load	PJLW	SUS304 or equivalent	SUS440C	55HRC~	SUS631	—30~260℃
	For heavy load	PJHW					
	For extremely heavy load	PJXW					
Resin nose	For light load	PJLK		Polyacetal	—		—30~80℃
	For heavy load	PJHK					
	For extremely heavy load	PJXK					



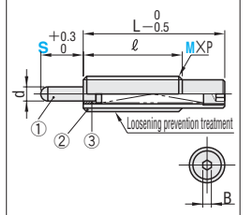
d	ℓ	L	B	For light load (PJLW・PJLK) min. N{kgf} Load	For light load (PJLW・PJLK) max.	For heavy load (PJHW・PJHK) min. N{kgf} Load	For heavy load (PJHW・PJHK) max.	For extremely heavy load (PJXW・PJXK) min. N{kgf} Load	For extremely heavy load (PJXW・PJXK) max.	Catalog No. Type	M (Coarse thread)	S	U/Price Q'ty：1~19
1.1	15	15	0.9	0.4	1.3	0.8	2.94	1.1	3.42	PJLW PJHW PJXW PJLK PJHK PJXK	3	1.5	900
	15	15		0.2	1.3	0.6	2.93	0.8	3.41			3	
1.7	15	15	1.3	0.9	2.0	2.0	8.8	6.1	13.8		4	2	
1.6	24	24		0.6	2.1	1.9	8.75	5.8	13.6			4	920
2.1	20	20	1.5	1.4	9.7	2.7	16.3	6.8	22.0		5	3	900
	27	27		1.1	10.3	1.0	17.1	5.7	21.5			5	940
2.6	25	25	2	6.0	9.8	8.0	26.4	15.8	35.6		6	3	900
	30	30		3.4	9.86	4.4	26.6	12.9	34.4			5	970
3.2	25	25	2.5	6.0	9.9	14.7	27.0	21.9	36.3		8	3	1,030
	27	27		4.0	9.83	6.7	26.6	14.7	34.5			5	1,100
3.9	30	30	3	5.7	14.7	8.2	45.7	24.5	58.6		10	5	1,170
	30	43		4.4	14.7	6.2	45.1	19.8	58.7			10	1,320
5.6	30	30	4	5.8	14.7	18.2	49.0	34.9	63.6		12	5	1,430
	35	43		5.0	14.7	8.2	49.1	25.5	63.6			10	1,480
	35	51		6.9	14.7	7.5	48.9	20.1	63.7			15	1,540
8.1	35	57	5	9.2	34.2	18.9	68.5	38.7	88.4		16	10	1,970
	35	57		8.6	34.4	14.4	68.6	33.9	88.1			15	
	35	65		7.1	34.4	4.2	68.6	25.4	88.1			20	2,310

No loosening prevention treatment. Load "min." is the initial load, and "max." is the load when the pin is sunk to the deepest.

{kgf}=N×0.101972

■Spring plunger for slanted surface. PATENT PENDING

PJHZ (for slanted surface) RoHS



① M S45C
H 50HRC~Carburizing
② M S45C
③ Special bushing

M×P (Coarse thread)	d	S	ℓ	L	B	Load W N {kgf} min.	Load W N {kgf} max.	Catalog No. Type	Catalog No. M—S	U/Price Q'ty：1~19
10×1.5	4	10	30	43	3	7.8(0.8)	49.0(5.0)	PJHZ	10—10	1,180
12×1.75	5		35	43	4	7.8(0.8)	49.0(5.0)		12—10	1,200
12×1.75		15	35	51		4.9(0.5)	49.0(5.0)		12—15	1,300
16×2.0	8	10	35	60	5	12.7(1.3)	78.5(8.0)		16—10	1,400
16×2.0		15	35	60		12.7(1.3)	78.5(8.0)		16—15	1,400
16×2.0		20	35	85		9.8(1.0)	78.5(8.0)		16—20	1,700
16×2.0		30	35	125		6.9(0.7)	78.5(8.0)		16—30	2,100

kgf=N×0.101972

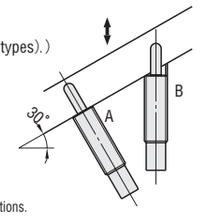
■Features of PJHZ

①Special structure improves wear resistence and seize resistence・Therefore, it can be used on slanted surfaces.
(Conventional spring plungers should be used at 0° (oil-free types) and 5° or less (lubricant types).)
②It can be used even without lubrication.
③Use angle：0~30°

Test Condition
Press Machine：20-ton crank press
Speed：130SPM
Angle of slant：30°
Oil supply：No lubrication

Type	Service life A	Service life B
PJHZ16—30	300,000 strokes or more	300,000 strokes or more
PJH 16—30	Scuffing occurs at 17,000 strokes	Scuffing occurs at 50,000 strokes

(Note)These data are limited to the above condition, and product will varies depending on use conditions.



Order — Catalog No. PJLW 12—5, PJHW 5—3

Delivery — 1 Day

Price

Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

PRESS NEW Printed in Red

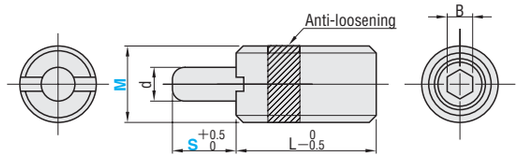
SPRING PLUNGERS
—SHORT TYPE / HEX-NOSE PIN TYPE / WRENCHES FOR HEX-NOSE PIN—

SPRING PLUNGERS WITH FLANGE / BALL PLUNGERS WITH FLANGE / BALL BUTTONS

Short type

RoHS

Type: Full length	Type: Load		Main body: M	Main body: H	Main body: S	Pin: M	Pin: H	Pin: S	Spring: M	Allowable temperature
Short	Light load	PJLS	S45C	29~35HRC	Black oxide	S45C	57~63HRC Carburizing	Bright chromate	SWP—B	—30° ~80°
Extremely short		PJFW						Black oxide		



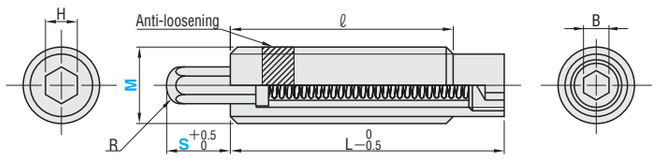
■Features of PJLS・PJFW：This plunger uses a special structure to reduce its full length.

M×P (Coarse thread)	d	S	L: PJLS	L: PJFW	B	PJLS Load: min. N{kgf}	PJLS Load: max.	PJFW Load: min. N{kgf}	PJFW Load: max.	Catalog No.: Type	Catalog No.: M — S	U/Price Q'ty:1~19: PJLS	U/Price Q'ty:1~19: PJFW
10×1.5	3.8	5	22	—	3	5.9 {0.6}	14.7 {1.5}	—		PJLS	10 — 5	400	—
		10	30			2.9 {0.3}	19.6 {2.0}				10 — 10	510	
12×1.75	5.5	5	22	19	4	5.9 {0.6}	14.7 {1.5}	5.7 {0.6}	14.7 {1.5}		12 — 5	460	560
		10	30	23		2.9 {0.3}	19.6 {2.0}	2.9 {0.3}	14.7 {1.5}		12 — 10	580	680
		15	39	30		2.9 {0.3}	19.6 {2.0}	2.4 {0.2}	14.7 {1.6}		12 — 15	650	750
16×2.0	8	10		24	5			3.0 {0.3}	19.8 {2.0}	PJFW	16 — 10		830
		15	—	33		—		3.0 {0.3}	19.7 {2.0}		16 — 15	—	830
		20		38				3.0 {0.3}	19.9 {2.0}		16 — 20		1,000

Hex-nose pin type

RoHS

Type		Main body: M	Main body: H	Main body: S	Pin: M	Pin: H	Pin: S	Spring: M	Allowable temperature
For light load	PJLR	S45C	29~35HRC	Black oxide	S45C	57~63HRC	Bright chromate	SWP—B	—30° ~80°
For heavy load	PJHR					Carburizing	Black oxide		



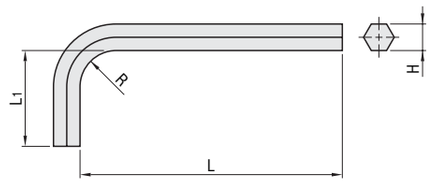
■Features of PJLR・PJHR：The hexagonal pin shape enables this plunger to be installed with a spanner. Conseguently, a dedicated wrench is not necessary.

M×P (Coarse thread)	H	R	S	ℓ	L	B	PJLR Load: min. N{kgf}	PJLR Load: max.	PJHR Load: min. N{kgf}	PJHR Load: max.	Catalog No.: Type	Catalog No.: M — S	U/Price Q'ty:1~19
10×1.5	4	2.2	5	30	30	3	5.9 {0.6}	14.7 {1.5}	8.8 {0.9}	49.0 {5.0}	PJLR	10 — 5	570
			10		43		2.9 {0.3}	14.7 {1.5}	7.8 {0.8}	49.0 {5.0}		10 — 10	680
12×1.75	5	2.9	5		30	4	5.9 {0.6}	14.7 {1.5}	18.6 {1.9}	49.0 {5.0}		12 — 5	610
			10		43		2.9 {0.3}	19.6 {2.0}	7.8 {0.8}	49.0 {5.0}		12 — 10	730
			15		51		2.9 {0.3}	19.6 {2.0}	4.9 {0.5}	49.0 {5.0}		12 — 15	800
16×2.0	7	4.1	10		60	5	5.9 {0.6}	39.2 {4.0}	12.7 {1.3}	78.5 {8.0}		16 — 10	920
			15		60		3.9 {0.4}	39.2 {4.0}	12.7 {1.3}	78.5 {8.0}		16 — 15	920
			20		85		4.9 {0.5}	39.2 {4.0}	9.8 {1.0}	78.5 {8.0}		16 — 20	1,090
			30		125		2.9 {0.3}	39.2 {4.0}	6.9 {0.7}	78.5 {8.0}		16 — 30	1,440
			50		155		19.6 {2.0}	49.0 {5.0}	29.4 {3.0}	78.5 {8.0}		16 — 50	2,740
			80		185		19.6 {2.0}	49.0 {5.0}	29.4 {3.0}	93.2 {9.5}		16 — 80	4,040
24×3.0	10	5.2	7	45	60	10	19.6 {2.0}	98.1 {10.0}	44.1 {4.5}	196.1 {20.0}		24 — 7	1,450
			15		60		19.6 {2.0}	98.1 {10.0}	47.1 {4.8}	215.7 {22.0}		24 — 15	1,450
30×3.5	13	7.6	20		78	14	27.5 {2.8}	117.7 {12.0}	53.0 {5.4}	274.6 {28.0}		30 — 20	2,430

Wrenches for hex-nose pin

RoHS

PJRW



M SNCMXV S Parkerizing

H	L	L1	R	Catalog No.: Type	Catalog No.: No.	U/Price Q'ty:1~19
7	95	34	7	PJRW	16	400
13	132	50	13		30	1,200

Order — Catalog No.: PJHR 10—10, PJRW 16

Delivery — 1 Day

Price — ■Volume discount rate P.37

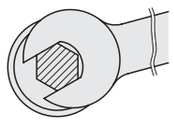
Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Features of PJLR・PJHR

1・The hexagonal pin shape enables then to be installed with a socket wrench or a spanner.

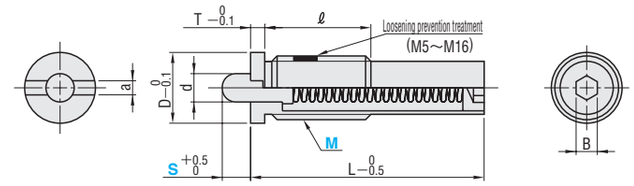
2・If the pin becomes dented due to breakage of the spring, it can be removed with a dedicated wrench (PJRW). For M10, 12 and 24, use a commercially available wrench.



Spring plungers with flange

RoHS

Type		Main body: M	Main body: H	Main body: S	Pin: M	Pin: H	Pin: S	Spring: M	Allowable temperature
For light load	FPJL	S45C	29~35HRC	Black oxide	S45C	57~63HRC Carburizing	Bright chromate	SWP—B	—30° ~80°
For heavy load	FPJH						Black oxide		



Applicable wrench	M×P (Coarse thread)	d	S	D	T	ℓ	L	B	a	FPJL Load: min. N{kgf}	FPJL Load: max.	FPJH Load: min. N{kgf}	FPJH Load: max.	Catalog No.: Type	Catalog No.: M — S	U/Price Q'ty:1~19
—	3×0.5	1.1	1.5	5	1.5	5	10	0.9	0.5	0.49 {0.05}	1.0 {0.1}	0.78 {0.08}	2.9 {0.3}	FPJL	3 — 1.5	440
	3×0.5		3				15			0.29 {0.03}	1.0 {0.1}	0.78 {0.08}	2.9 {0.3}		3 — 3	500
	4×0.7	1.6	2	6	1.8	6	15	1.3	0.7	1.0 {0.1}	2.0 {0.2}	2.9 {0.3}	8.8 {0.9}		4 — 2	440
	4×0.7		4				24			0.59 {0.06}	2.0 {0.2}	2.0 {0.2}	8.8 {0.9}		4 — 4	500
PJG1	5×0.8	2.0	3	7	2.0	8	20	1.5	1.2	2.0 {0.2}	9.8 {1.0}	4.9 {0.5}	19.6 {2.0}		5 — 3	420
	5×0.8		5				27			2.0 {0.2}	9.8 {1.0}	2.9 {0.3}	19.6 {2.0}		5 — 5	500
	6×1.0	2.5	3	8	2.5	9	25	2	1.5	5.9 {0.6}	9.8 {1.0}	7.8 {0.8}	29.4 {3.0}		6 — 3	420
	6×1.0		5				30			2.0 {0.2}	9.8 {1.0}	4.9 {0.5}	29.4 {3.0}		6 — 5	500
PJG2A	8×1.25	3.1	3	10		12	25	2.5		5.9 {0.6}	9.8 {1.0}	14.7 {1.5}	29.4 {3.0}		8 — 3	420
	8×1.25		5				27			2.9 {0.3}	9.8 {1.0}	7.8 {0.8}	29.4 {3.0}		8 — 5	500
	10×1.5	3.8	5	12		15	30	3		5.9 {0.6}	14.7 {1.5}	8.8 {0.9}	49.0 {5.0}		10 — 5	440
	10×1.5		10				43			2.9 {0.3}	14.7 {1.5}	7.8 {0.8}	49.0 {5.0}		10 — 10	580
PJG3	12×1.75	5.5	5	14	3.0	20	30	4	2.0	5.9 {0.6}	14.7 {1.5}	18.6 {1.9}	49.0 {5.0}		12 — 5	480
	12×1.75		10				43			2.9 {0.3}	19.6 {2.0}	7.8 {0.8}	49.0 {5.0}		12 — 10	570
	12×1.75		15				51			2.9 {0.3}	19.6 {2.0}	4.9 {0.5}	49.0 {5.0}		12 — 15	740
PJG4	16×2.0	8.0	10	18		25	60	5		5.9 {0.6}	39.2 {4.0}	12.7 {1.3}	78.5 {8.0}		16 — 10	800
	16×2.0		15				60			3.9 {0.4}	39.2 {4.0}	12.7 {1.3}	78.5 {8.0}		16 — 15	800
	16×2.0		20				85			4.9 {0.5}	39.2 {4.0}	9.8 {1.0}	78.5 {8.0}		16 — 20	990
	16×2.0		30				125			2.9 {0.3}	39.2 {4.0}	6.9 {0.7}	78.5 {8.0}		16 — 30	1,400
	16×2.0		40				125			4.9 {0.5}	39.2 {4.0}	6.9 {0.7}	78.5 {8.0}		16 — 40	2,480

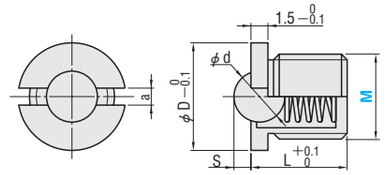
M3 and M4 are to be mounted with a flat-blade screwdriver. P.782

{kgf}=N×0.101972

Ball plungers with flange

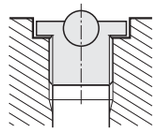
RoHS

Type	Main body: M	Main body: H	Main body: S	ball: M	ball: H	Spring: M	Allowable temperature
FBPJ	S45C	29~35HRC	Black oxide	SUS440C	55HRC~	SUS631J1	—30° ~80°
FBPJS	SUS303	—	—				—30° ~260°



■Features

Since the location of this plunger is determined by the depth of its counterbore, the adjustment of height is unnecessary. And it is hard to loosen.



Applicable wrench	d	S	D	L	a	FBPJ Load: min. N{kgf}	FBPJ Load: max.	FBPJS Load: min. N{kgf}	FBPJS Load: max.	Catalog No.: Type	Catalog No.: M (Coarse thread)	U/Price Q'ty:1~19: FBPJ	U/Price Q'ty:1~19: FBPJS
BPJG1	3	0.8	7	5	0.8	0.6	5.6	1.3	6.4	FBPJ	5	440	460
BPJG2	4	1.0	8	6	1.0	2.8	6.3	2.7	8.0		6	440	460
BPJG3	5	1.6	10	7	1.5	2.9	9.6	1.3	10.2		8	440	460
BPJG4	6.35	1.9	12	9		6.4	11.7	6.1	17.2	FBPJS	10	500	520
BPJG5	7.94	2.4	14	11.5		9.0	15.0	2.1	18.8		12	500	520
	9.53	3.2	18	16	2.0	9.9	21.5	13.0	25.5		16	840	860

{kgf}=N×0.101972

Order — Catalog No.: FPJL 10—5, FBPJ 5

Delivery — 1 Day

■Volume discount rate P.37

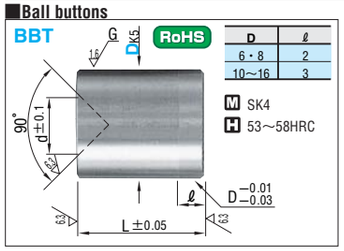
Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Ball buttons

BBT

RoHS



D	ℓ
6・8	2
10~16	3

M SK4
H 53~58HRC

DK5		L	d	Catalog No.: Type	Catalog No.: D	U/Price Q'ty:1~19	U/Price 20~49	U/Price 50~199	U/Price 200~500
6	+0.006 +0.001	8	2	BBT	6	230	220	210	200
8	+0.007	10	3		8				
10	+0.001	12	4		10	270	260	240	230
12	+0.009	14	5		12				
16	+0.001	18	8		16	300	290	270	255

When using with a ball plunger, choose the products of the same No. (M=D). (BBT6 is also applicable to M5)

Catalog No.: BBT6

1 Day

To be quoted on price & lead time above Max. Q'ty.

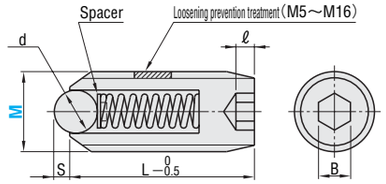
BALL PLUNGERS / WRENCHES

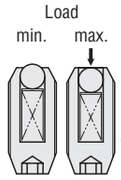
Ball plungers
—Normal type—

RoHS

Type ☐ is Not available.

Type			Main body M	Main body H	Main body S	Ball M	Ball H	Spring M	Spacer M	Allowable temperature
Metal ball	For light load	BPJ	SCM435	29~35HRC	Black oxide	SUJ2	55HRC~	SWP—B	SUS304	—30~80℃
	For heavy load	BSJ	SUS304	—	—				Brass	
	For extremely heavy load	BPW	S45C	29~35HRC	Nickel-Plating					
Resin ball	For light load	NBPJ			Black oxide	Polyacetal	—			
	For heavy load	NBSJ								
	For extremely heavy load	NBPW								





The material of the spacer of BSJ is progressively being changed over from brass to SUS304.

Metal ball d	Metal ball S	Resin ball d	Resin ball S	L	ℓ	B	For light load (BPJ · NBPJ) Load (N) min.	For light load (BPJ · NBPJ) Load (N) max.	For heavy load (BSJ · NBSJ) Load (N) min.	For heavy load (BSJ · NBSJ) Load (N) max.	For extremely heavy load (BPW) Load (N) min.	For extremely heavy load (BPW) Load (N) max.	For extremely heavy load (NBPW) Load (N) min.	For extremely heavy load (NBPW) Load (N) max.
1	0.2	—	—	5	1	0.9	0.7	1.4	1.2	2	—	—	—	—
1.5	0.5	—	—	7	1	1.5	1	2	1.5	2.9	2.2	5	—	—
2.5		2.4		9	1.5	2	2	4.9	3.9	9.8	2.5	12.6	2.5	12.5
3	0.8	3.2	0.8	12	2	2.5	2.9	9.8	4.9	19.6	11.7	25.1	11.2	24.1
3		3.2		13	2.5	3	4.9	14.7	9.8	29.4	18.7	35.3	17.7	33.4
4	1	4	1.0	15	2.5	4	6.9	19.6	12.7	39.2	24.5	46.8	21.4	45.3
5	1.2	4.8	1.2	16	3	5	8.8	24.5	18.6	49	26.7	58.7	23.5	60
7	1.8	7.1	1.8	20	3	6	9.8	29.4	19.6	58.8	26.1	62.3	24.1	63.7
9.5	2.5	9.5	2.5	25	3	8	15.7	49	29.4	98	55.4	116	43.6	116.3

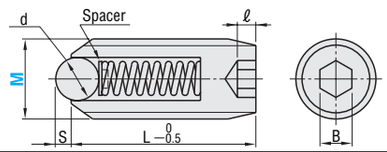
Catalog No. Type	M (Coarse thread)	U/Price Q'ty:1~19 Metal ball	Resin ball
	2	410	—
BPJ (M2~M16)	3	380	
BSJ (M2~M16)	4		380
BPW (M3~M16)	5		
NBPJ (M4~M16)	6	340	360
NBSJ (M4~M16)	8		
NBPW (M4~M16)	10	380	410
	12		
	16	680	720

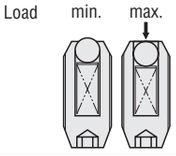
The tip of M2, M3 and M4 does not have a caulking groove. Use an Allen wrench to install.
"Min." is the initial load, and "max." is the load when the ball is sunk to the deepest.
{kgf}=N×0.101972

Ball plungers
—Stainless steel normal type—

RoHS

Type			Main body M	Ball M	Ball H	Spring M	Spacer M	Allowable temperature
Metal ball	For light load	BSM	SUS304	SUS440C	55HRC~	SUS631J1	SUS304	—30~260℃
	For heavy load	BSZ						
	For extremely heavy load	BSX						
Resin ball	For light load	NBSM		Polyacetal	—			—30~80℃
	For heavy load	NBSZ						
	For extremely heavy load	NBSX						





Metal ball d	Metal ball S	Resin ball d	Resin ball S	L	ℓ	B	For light load (BPJ · NBPJ) Load (N) min.	For light load (BPJ · NBPJ) Load (N) max.	For heavy load (BSJ · NBSJ) Load (N) min.	For heavy load (BSJ · NBSJ) Load (N) max.	For extremely heavy load (BPW) Load (N) min.	For extremely heavy load (BPW) Load (N) max.	For extremely heavy load (NBPW) Load (N) min.	For extremely heavy load (NBPW) Load (N) max.
1	0.2	—	—	5	1	0.9	0.7	1.4	—	—	1.2	2	—	—
1.5	0.5	—	—	7	1	1.5	1	2	—	—	1.5	2.9	2.2	5
2.5		2.4		9	1.5	2	1.9	4.9	2	4.9	3.9	9.8	2.5	12.5
3	0.8	3.2	0.8	12	2	2.5	3.3	9.8	2.9	9.8	4.9	19.6	11.2	24.1
3		3.2		13	2.5	3	5.1	15.3	4.9	14.7	9.8	29.4	17.7	33.4
4	1	4.0	1.0	15	2.5	4	5.5	19.1	6.9	19.6	12.7	39.2	21.4	45.3
5	1.2	4.8	1.2	16	3	5	8.9	24.1	8.8	24.5	18.6	49	23.5	60
7	1.8	7.1	1.8	20	3	6	10.5	29.3	9.8	29.4	19.6	58.8	24.1	63.7
9.5	2.5	9.5	2.5	25	3	8	14.9	48.9	15.7	49	29.4	98	43.6	116.3

Catalog No. Type	M (Coarse thread)	U/Price Q'ty:1~19 Metal ball	Resin ball
	2	460	—
BSM (M2~M16)	3	430	
BSZ (M2~M16)	4		440
BSX (M3~M16)	5		
NBSM (M4~M16)	6	400	420
NBSZ (M4~M16)	8		
NBSX (M4~M16)	10	440	470
	12		
	16	770	810

The tip of M2, M3 and M4 does not have a caulking groove. Use an Allen wrench to install.
"Min." is the initial load, and "max." is the load when the ball is sunk to the deepest.
{kgf}=N×0.101972

Order: Catalog No. — BPJ16, BSZ10

Delivery: 1 Day

Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Wrenches for ball plunger

BPJG RoHS

M S45C
H 34~43HRC
S Black oxide

M	Catalog No.	U/Price Q'ty:1~9
5・6	BPJG 1	600
8	BPJG 2	700
10	BPJG 3	
12	BPJG 4	900
16	BPJG 5	1,000

Used with M5 to M16 of ball plungers BPJ, BSJ, BSZ and BSX. Cannot be used with ball plungers BSJL and BSXL, short plungers, or ball plunger resin types.

Order: Catalog No. — BPJG2

Delivery: 1 Day

Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

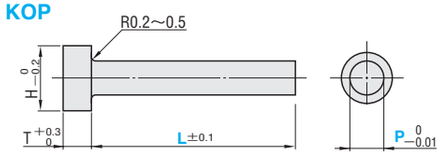
KNOCKOUT PINS / PUSH PINS

The volume discount rate is also applicable to alteration cost. P.39

Knockout pins

RoHS

KOP



Please note that dimension L does not include head thickness (T).

M SK4 or equivalent
H 53~58HRC

T	H	Catalog No. Type	No.	0.1mm increments L	0.01mm increments min. P max.	U/Price Q'ty:1~19
3	6	KOP	4	7.0~60.0	1.00~ 4.00	460
	8		6		1.00~ 6.00	490
5	10		8		2.00~ 8.00	620
	12		10		3.00~10.00	720
	14		12		4.00~12.00	1,210
	16		13		6.00~13.00	1,360

Order: Catalog No. — L — P
KOP 6 — 15.5 — P3.50

Delivery: 3 Days | Express A 300/1pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

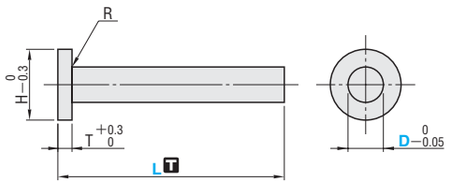
Alteration: Catalog No. — L — P — (HC・TC…etc.)
KOP 6 — 45.5 — P5.50 — VSC

Alterations	Code	Spec.	¥/1Code
H HC	HC	Changes head diameter P≦HC<H 0.1mm increments	200
TC T	TC	Changes head thickness 3.5≦TC<5 0.1mm increments Applicable to KOP 8~13	200
R0.2 ~0.3	RC	Adds R0.2~0.3 to pin tip	200
0.16	VSC	Finishes pin tip by lapping	300
	TRN	Adds undercut to the bottom of the head (Chamfering of the plate is not necessary.)	100
R0.6~1.0	TRC	Changes R of the bottom of the head Changes R0.2~0.5 to 0.6~1.0. Applicable to H—P≧3.5.	400
L T	LKC	Changes tolerance L±0.1 ···▸ ±0.02 on L	400

Push pins

RoHS

JP
JPW
JPWH



Catalog No.	L T	R
JP	L +0.3 0	R≦0.3
JPW JPWH	L±0.1	0.5≦R≦1.0

JP・JPW: M DH2F, H 40HRC~
JPWH: M SKD61, H 50HRC~

T	H	Catalog No. Type	D	L 0.1mm increments	U/Price Q'ty : 1~49 L5~29.9	L30.0	L30.1~49.9	L50.0	L50.1~69.9	L70.0
2	3	JP	1	5.0~70.0	320	240	320	240	320	240
	3		1.5		270	180	270	180	270	180
	4		2		250	170	250	170	250	170
	5		2.5		250	160	250	160	250	160
	6		3		240	180	240	180	240	180
3	8		4		260	190	260	190	260	190
	9		5		290	200	290	200	290	200

T	H	Catalog No. Type	D	L 0.1mm increments	U/Price Q'ty : 1~49 L10.0~29.9	L30.0	L30.1~49.9	L50.0	L50.1~69.9	L70.0	L70.1~99.9	L100.0
5	5	JPW	2	10.0~100.0	260	200	260	200	260	200	330	280
	8		3		300	230	300	230	300	240	390	320
	10		4		340	260	340	260	340	260	450	370
	12		5		420	270	420	270	510	360	640	490
	14		6		470	320	470	320	580	440	760	610
	16		8		580	440	640	490	800	650	1,000	860
	18		10		640	480	800	650	970	830	1,240	1,100

T	H	Catalog No. Type	D	L 0.1mm increments	U/Price Q'ty : 1~49 L10.0~29.9	L30.0	L30.1~49.9	L50.0	L50.1~69.9	L70.0	L70.1~99.9	L100.0
5	5	JPWH	2	10.0~100.0	330	250	370	290	390	300	420	340
	8		3		370	290	430	350	460	380	500	420
	10		4		510	380	560	430	610	480	670	530
	12		5		610	480	670	540	770	640	860	730
	14		6		730	600	860	720	940	810	1,060	930
	16		8		830	690	970	840	1,070	940	1,240	1,100
	18		10		940	810	1,150	1,020	1,290	1,160	1,500	1,370

Order: Catalog No. — L
JP 4 — 28.5

Delivery: 3 Days | Express A 300/1pc. P.37

A flat charge of 810 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1~49	50~99	100~199	200~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration: Catalog No. — L — (RC・HC)
JP5 — 70.0 — RC — HC8.0

Alterations	Code	Spec.	¥/1Code
R0.2~0.3	RC	Adds R0.2~0.3 to pin heads	200
H HC	HC	Changes head diameter D≦HC<H 0.1mm increments	200

MATERIAL GUIDE UNITS
—INDUCTION HARDENING TYPE—

RoHS

Die set fixing type

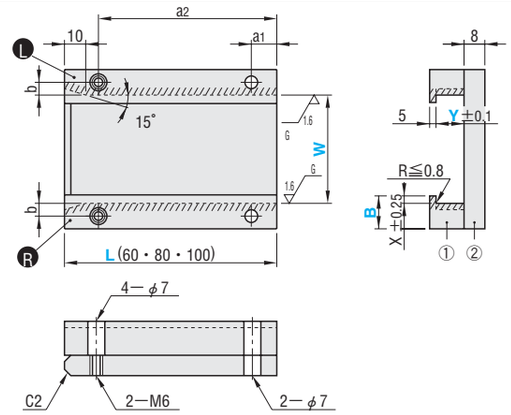
ZGUA (Unit)

ZGUA—R (Rail)

ZGUA—L (Rail)

L	a1	a2
60	10	45
80		65
100		75

M S50C
H 55HRC～
(▨ Part:Induction hardening)



RoHS

Die plate fixing type

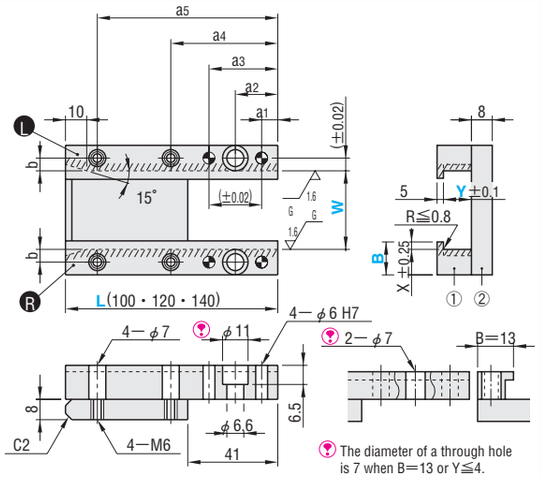
ZGUB (Unit)

ZGUB—R (Rail)

ZGUB—L (Rail)

L	a1	a2	a3	a4	a5
100	8	20	32	50	85
120					105
140					115

M S50C
H 55HRC～
(▨ Part:Induction hardening)



The diameter of a through hole is 7 when B=13 or Y≦4.

■Unit

Catalog No. Type	B	L	Y 1mm increments	W 0.1mm increments	b	X
ZGUA	13	60	1～30	10～160	5	3
	16	80			7	3
	20	100			8	5
ZGUB	13	100	1～30	10～160	5	3
	16	120			7	3
	20	140			8	5

■Rail

CatalogNo. Type	B	L	Y 1mm increments	b	X
ZGUA—R ZGUA—L	13	60	1～30	5	3
	16	80		7	3
	20	100		8	5
ZGUB—R ZGUB—L	13	100	1～30	5	3
	16	120		7	3
	20	140		8	5

Order

Catalog No.	—	L	—	Y	—	W
ZGUA 13	—	100	—	22	—	53.2
ZGUB—R20	—	140	—	15		

Delivery

■Unit: 3 Days — Express A 1,500/1set. P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

■Rail: 3 Days — Express A 500/1pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

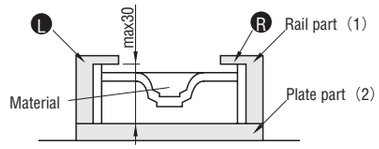
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

B	U/Price Q'ty:1～9Sets ZGUA L60	L80	L100	U/Price Q'ty:1～9Sets ZGUB L100	L120	L140
13	4,120	4,750	5,400	7,170	7,830	8,510
16	4,980	5,150	5,760	7,720	8,460	9,180
20	5,220	5,710	6,800	8,850	9,800	10,720

B	U/Price Q'ty:1～9Pcs. ZGUA—R・ZGUA—L L60	L80	L100	U/Price Q'ty:1～9Pcs. ZGUB—R・ZGUB—L L100	L120	L140
13	1,630	1,970	2,060	3,180	3,410	3,660
16	2,020	2,160	2,310	3,520	3,730	4,000
20	2,180	2,310	2,620	4,060	4,450	4,770

■Features

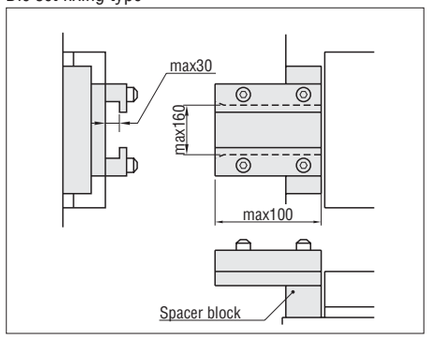


- Up to 30 mm of lift height can be taken, so it can be used for bending, drawing, etc.
- When you make a material guide in accordance with material width, the rails alone can be ordered.

Example

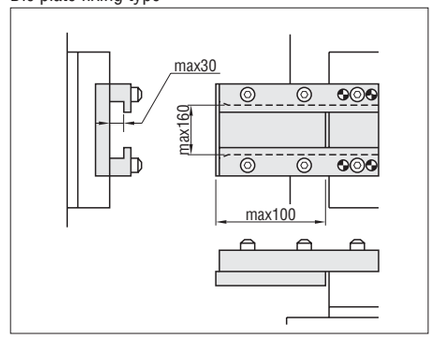
1 Selection of unit structure ·····First, select an appropriate unit type based on the die structure, production amount, regrinding frequency, etc.

Die set fixing type



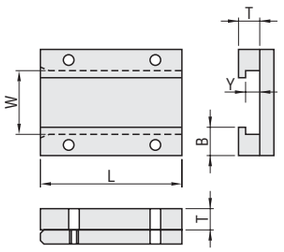
- The material guide unit is fixed with bolts on the die set. (The spacer block is placed right in front of the die plate.)
- The unit does not interfere with the layout inside the die.

Die plate fixing type



- The material guide unit is fixed with bolts and dowel pins on the die plate.
- The stripper plate requires to undercut grooves. (Use of spacer block can prevent the interference inside the die.)
- Reassembly for fixing is easily done.

2 Dimensions ····· Determine dimensions according to material width, lift height and mounting conditions.



①Determine W (guide width)
Material width+Material width tolerance+α (error in mounting accuracy)

②Determine Y (groove depth)
Lift height+Material thickness+α

③Determine T (height of the guide plate)
T is determined by Y in:T=Y+5

④Determine L (length of the material guide plate)
Calculate L according to the distance between the feeder and die plate, the material width and thickness.

- Specify the full length L on the basis of the full length of the unit for the die set fixing type, and on the basis of the length protruding from the die plate for the die plate fixing type.

⑤Determine B (width of the material guide plate)
Giving consideration to the die plate balance, the whole die balance, interference with the subguide, etc., and confirming the positions of bolts and dowel pins, determine dimension B.

●BLANK FOR FIXING INSIDE THE DIE (Material guide plate) Catalog No. SBM(HPM2T)・SBA(SKS93) P.791

- Blank for material guide plate inside the die.
- Materials can be selected according to conditions.

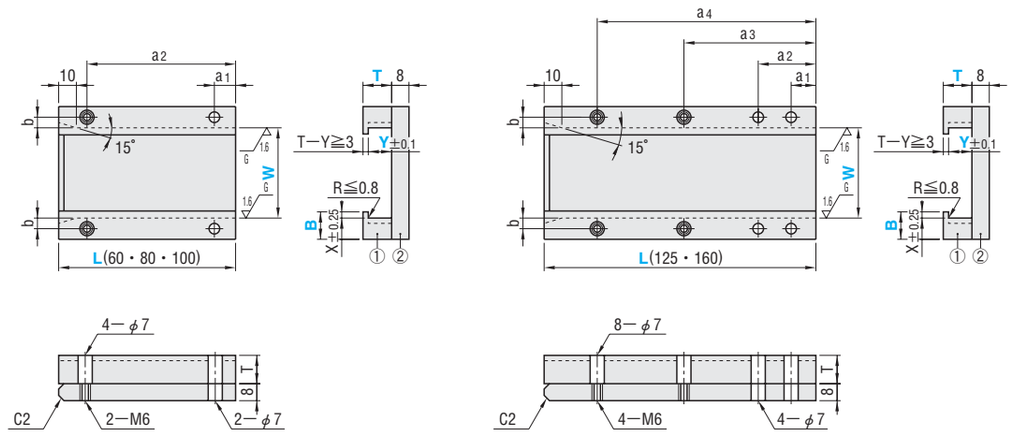
MATERIAL GUIDE UNITS

Die set fixing type

RoHS

SUK—A L 60 / L 80 / L100

SUK—A L125 / L160



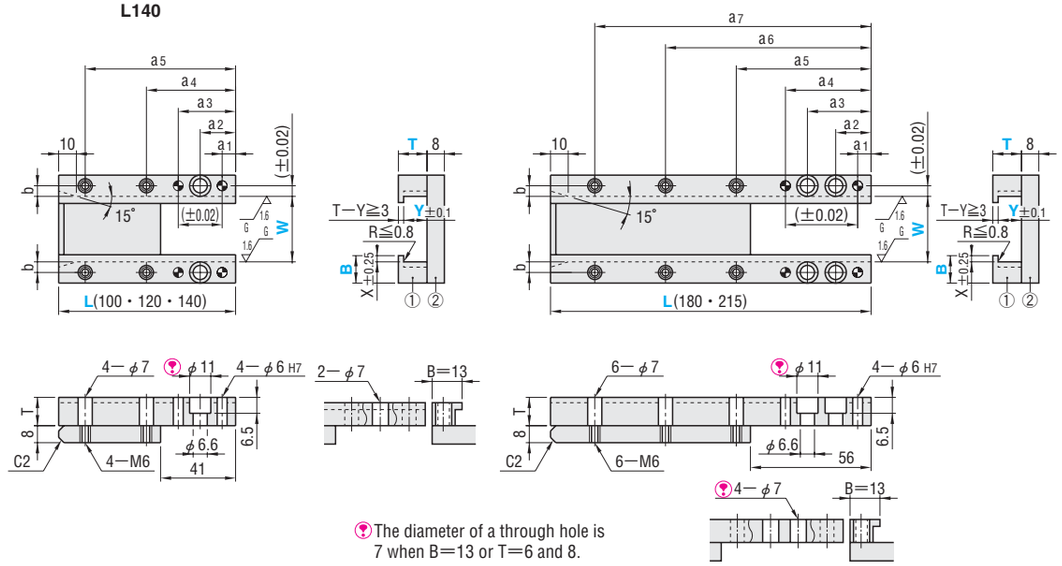
① M SKS93
② M S50C

Die plate fixing type

RoHS

SUK—B L100 / L120 / L140

SUK—B L 180 / L 215



The diameter of a through hole is 7 when B=13 or T=6 and 8.

① M SKS93
② M S50C

a1	a2	a3	a4	a5	a6	a7	b	X	Catalog No. Type	B	T	L	0.1 mm increments Y	W	U/Price Q'ty:1～9Sets
10	45	—	—	—	—	—	5	3	SUK—A	13	6 8 10	60	1.0 ≀ T—3.0	7.0 ≀ 160.0	5,340
	65											80			6,330
	75											100			6,990
	25	60	100									125			10,700
10	45	—	—				7	3		16	6 8 10 13	60			5,730
	65											80			6,700
	75											100			7,460
	25	60	100									125			11,400
10	45	—	—				8	5		20	8 10 13 16	60			6,050
	65										8 10 13 16	80			6,480
	75										8 10 13 16	100			7,160
	25	60	100								8 10 13 16	125			7,670
	25	60	135								8 10 13 16	160			8,100
10	45	—	—				10	5		25	8 10 13 16	60			8,690
	65										8 10 13 16	80			12,100
	75										8 10 13 16	100			13,100
	25	60	100								8 10 13 16	125			12,600
	25	60	135								8 10 13 16	160			13,600
8	20	32	50	85	—	—	5	3	SUK—B	13	6 8 10	100			6,620
		32	50	105								120			7,100
		32	50	115								140			7,860
		35	47	75	115	155						180			8,380
8	20	32	50	85	—	—	7	3		16	6 8 10 13	100			8,900
		32	50	105								120			9,530
		32	50	115								140			13,100
		35	47	75	115	155						180			14,000
8	20	32	50	85	—	—	8	5		20	8 10 13 16	100			14,200
		32	50	105							8 10 13 16	120			15,100
		32	50	115							8 10 13 16	140			10,080
		35	47	75	115	155					8 10 13 16	180			10,780
		35	47	75	130	190					8 10 13 16	215			12,020
8	20	32	50	85	—	—	10	5		25	8 10 13 16	100			14,330
		32	50	105							8 10 13 16	120			10,340
		32	50	115							8 10 13 16	140			11,440
		35	47	75	115	155					8 10 13 16	180			11,070
		35	47	75	130	190					8 10 13 16	215			12,170
															12,500
															13,820
															14,560
															16,420
															16,790
															17,150
															11,070
															12,330
															11,860
															12,970
															13,550
															15,030
															15,950
															17,740
															18,190
															18,650

Order

Catalog No.						
Type	B	T	L	—	Y	— W
SUK—A	13	8	100	—	Y5.0	— W120.5

Delivery 3 Days — Express A 1,500/1set. P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

Price

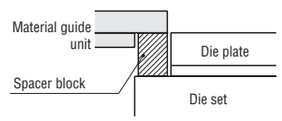
■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

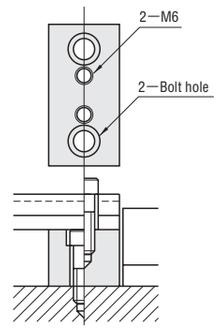
Example

● How to mount with a spacer block

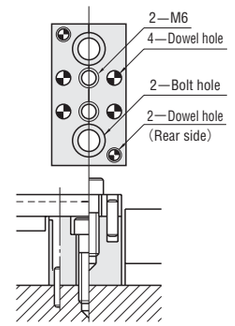


Since the spacer blocks are not provided with holes, drill holes according to your specification before use. (P.791)

●DIE SET FIXING TYPE
Example of mounting



●DIE PLATE FIXING TYPE
Example of mounting

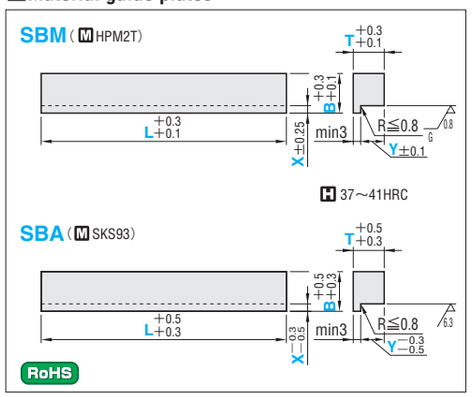


RELATED COMPONENTS OF MATERIAL GUIDE UNITS

PRESS ADD.SPEC. Printed in Red

FITTING GUIDE SETS

■Material guide plates



Catalog No.	B	T	1mm increments L	0.1mm increments X	0.1mm increments Y	U/Price Q'ty:1～9 T6	T8	T10	T13	T16
SBM (M HPM2T)	13	6	10～50	1.0 ～ 5.0	1.0 ～ T−3.0	1,240	1,280	1,300	—	—
		8	51～100			1,820	1,860	1,920		
		10	101～150			2,900	2,960	3,060		
			151～200			3,980	4,080	4,200		
	16	6	10～50			1,280	1,300	1,300	1,360	—
		8	51～100			1,860	1,920	1,920	2,010	
		10	101～150			2,960	3,060	3,060	3,210	
		13	151～200			4,080	4,200	4,200	4,410	
SBA (M SKS93)	20	8	10～50			—	1,700	1,720	1,780	1,820
		10	51～100				2,490	2,550	2,640	2,670
		13	101～150				4,020	4,110	4,260	4,320
		16	151～200				5,550	5,670	5,880	5,970
	25	8	10～50			—	1,720	1,780	1,820	1,880
		10	51～100				2,550	2,640	2,670	2,760
		13	101～150				4,110	4,260	4,320	4,470
		16	151～200				5,670	5,880	5,970	6,180

Order

Catalog No.	B・T	L	X	Y
SBM	13 6	L150	X3.2	Y2.8

Delivery

3 Days

Express A 800/1pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

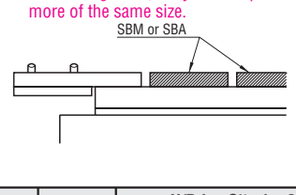
Price

■Volume discount rate P.37

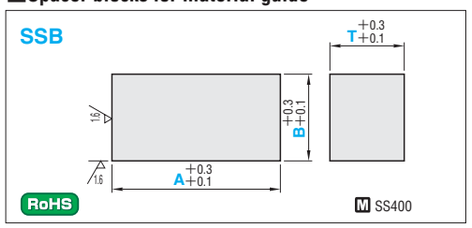
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example



■Spacer blocks for material guide



Catalog No.	A	B	T 1mm increments	U/Price Q'ty:1～9 B25	B40	B55
SSB	60	25 40 55	5～60	1,200	1,560	2,040
	80			1,320	1,680	2,400
	100			1,440	1,860	2,760
	125			1,560	2,220	3,000
	160			1,680	2,400	3,360
	200			1,920	2,520	3,600

Order

Catalog No.	A	B	T
SSB	100	40	35

Delivery

3 Days

Express A 800/1pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

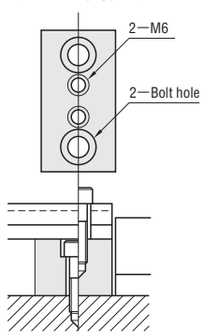
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

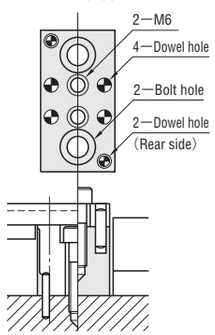
Example of mounting

Please use spacer blocks to prevent the material guide plate from interfering in the dies.
Spacer blocks are not provided with mounting holes.
Drill holes according to the examples on the right or your specification before use.

Example of mounting Die set fixing type

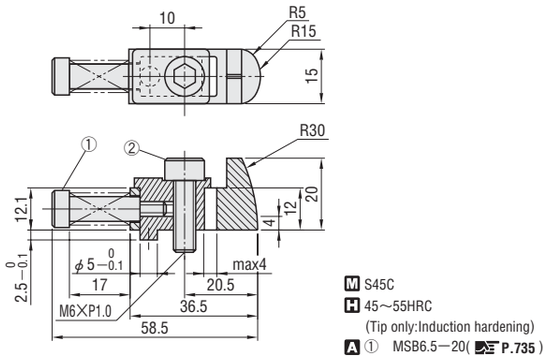


Example of mounting Die set fixing type



RoHS

FGK—F
FGK—L
FGK—M
FGK—H



M S45C
H 45～55HRC
(Tip only:Induction hardening)
A ① MSB6.5—20(P.735)
② CB 6—25(P.721)

Spring Color	Initial load N{kgf}	N/mm {kgf/mm}	Catalog No.	U/Price Q'ty:1～19
Yellow	1.47{0.15}	0.49{0.05}	FGK—F	1,080
Blue	2.9 {0.3}	1.0 {0.1}	FGK—L	
Red	5.9 {0.6}	2.9 {0.3}	FGK—M	
Green	19.6 {2.0}	6.6 {0.675}	FGK—H	

●kgf=N×0.101972

Order

Catalog No.

FGK—F

Delivery

1 Day

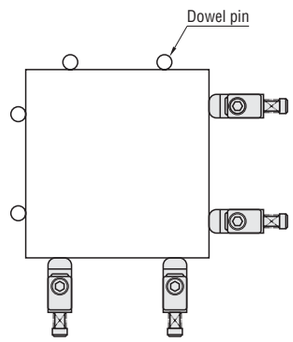
Price

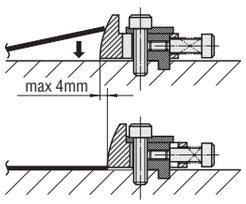
■Volume discount rate P.37

Quantity	1～19	20～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example



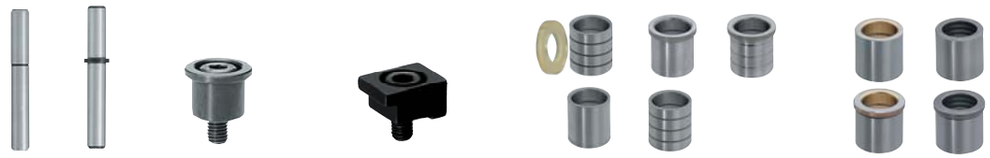


Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

STRIPPER GUIDE PINS & BUSHINGS

STRIPPER GUIDE PINS & BUSHINGS

Name	STRIPPER GUIDE PINS—Headed type—		STRIPPER GUIDE PINS—Straight type—		STRIPPER GUIDE PINS—Demountable type—		
Catalog No.	SGPH	SGOH	SGPN	SGON	SGPR	SGOR	SGPW
Delivery	①	①	①	①	①	③Ⓐ	①
Page	797	797	798	798	799	799	800

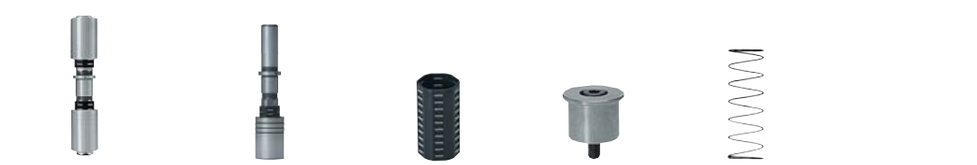


HIGH RIGIDITY STRIPPER GUIDE PINS		FIXED-TYPE STOPPERS FOR BALL BEARING GUIDE	CLAMPS FOR STRIPPER GUIDE PIN	STRIPPER GUIDE BUSHINGS—Steel—			—Copper alloy—	—Oil free—
SGPWS	SGPWH	SSTK	FCLP	SGBD	SGBA	SGBH SGBL SGBT	SGSF SGBF	SGBZ SGHZ
③	③	③Ⓐ	③Ⓐ	①			①	①
801	801	802	802・824	803			804	804

—Copper alloy—		—Sintered alloy—		STRIPPER GUIDE BUSHINGS	STRIPPER GUIDE BUSHINGS		BALL BEARING CAGES	SPRINGS
SGCZ	SGFZ	SGBM	SGHM	SGBB SGBBL SGBBF	SGBBW SGBBS SGBBH		MBSH MBJH	BSWP
①		①		①	①		①	③ⓉⒶ
805		805		806	807		808	808

STRIPPER GUIDE PINS—3 μm range—		—Demountable type—	STRIPPER GUIDE BUSHINGS—3 μm range, Steel—		—Copper alloy—		—Sintered alloy—	HIGH PRECISION CARBIDE STRIPPER GUIDE PINS	
TGPH	TGPN	TGPR	TGBL TGBT	TGBZ TGHZ	TGSF TGBF	TGCZ TGFZ	TGBM TGHM	WVGPH	WVGPN WVGPS
①		③Ⓐ	③Ⓐ	①	③Ⓐ	①	③Ⓐ	⑤Ⓑ	
810		810	811		811	812	812	814	

HIGH PRECISION STRIPPER GUIDE PINS		—Demountable type—	HIGH PRECISION STRIPPER GUIDE BUSHINGS—Steel—		—Copper alloy—		—Sintered alloy—
VGPH	VGPN VGPS	VGPR	VGBL	VGBH VGBZ VGHZ	VSGSF VSGBF	VSGCZ VSGFZ	VGBM VGHM
③ⓉⒶ		③Ⓐ	③ⓉⒶ		③Ⓐ	③Ⓐ	③Ⓐ
815		816	817		817	818	818



HIGH RIGIDITY NEEDLE ROLLER STRIPPER GUIDE PIN SETS	—Single roller type—	NEEDLE ROLLER CAGE	FIXING TYPE STOPPERS FOR NEEDLE ROLLER	SPRINGS
RSGPW	RSGPS	RBJ	RSTKH	RSWP
⑧	⑧	③ⓉⒶ	③Ⓐ	③ⓉⒶ
821	822	823	823	823

〔PRODUCT DATA〕 STRIPPER GUIDE PINS & BUSHINGS

■How to mount stripper guide bushings

Item		Plain bushing				Ball bearing bushings	
		Devcon adhesive type (SGBD)	Press fit type —Straight type— (SGBA)	Press fit type —Headed type— (SGBH)	Loctite adhesive type (SGBL, SGBT, SGBZ, SGHZ, etc.)	Press fit type (SGBB)	Loctite adhesive type (SGBBL, SGBBF, SGBBW, SGBBS, etc.)
Before press fit	Clearance between pin and bushing	2 μ～12 μ	10 μ～20 μ	5 μ～15 μ	2 μ～12 μ	0 μ～−10 μ	−10 μ～−20 μ
Inside diameter shrinkage while press fitting		—	3 μ～8 μ	1 μ～ 3 μ	—	2 μ～ 6 μ	—
Recommended press fit allowance for plate		—	8 μ～10 μ	3 μ～ 5 μ	—	6 μ～ 8 μ	—
After press fit	Clearance between pin and bushing	—	2 μ～17 μ	2 μ～14 μ	—	−2 μ～−16 μ	—
Clearance between mounting hole and outside diameter of bushing (recommended value)		outside diameter of bushing +2～+3 on one side to	—	—	outside diameter of bushing +0.01～+0.03 on one side to	—	outside diameter of bushing +0.01～+0.03 on one side to
How to mount		Devcon adhesive	Press fit	Press fit	Loctite adhesive No.638	Press fit	Loctite adhesive No.638

See page 758 for Loctite adhesives.

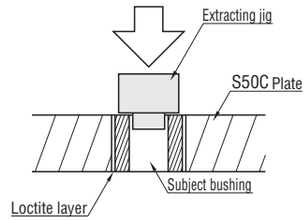
■Measurement of fixed compression shear strength of guide bushings with Loctite 638

With Loctite adhesive, shear force of 8～10 times greater than press fit (interference fit) was obtained.

Subject bushing	Type	Fitting clearance (Both sides)	Compression shear force (kgf)	Compression shear strength (kgf/mm²)
SGBL25—20	Stripper guide bushing Loctite adhesive type	0.014～0.060	4,463kgf	228kgf/mm²
VGBL25—20	Precision class stripper guide bushing Loctite adhesive type	0.003～0.006	3,382kgf	198kgf/mm²
SGBH25—20	Stripper guide bushing Press fit type	−0.004～0.008 (close fit)	420kgf	21kgf/mm²

(Curing time : Room temperature (25℃) ×72 hours Plate : S50C Guide bushing : SUJ2 Plate and bushing had been degreased.)

Compression test machine
Extracting rate : 10mm/min



■Sintered alloy oil-free bushings

Bushing that is made of special alloy and covered with fine solid lubricant, which is mainly made of graphite. The small vacancies of the alloy are impregnated with lubricating oil.

●Features

- Can be used for to subtle strokes of less than 1mm.
  The solid lubricant on the surface enables the extra short strokes. Best suited as stripper guide bushing.
- No limit in sliding direction. Can put up with reciprocating, rocking, and rotational motions.
- Have excellent friction coefficients and wear resistance to cope with high-speed strokes.
  Owing to new technologies, a large amount of solid lubricant is contained compared to other sintered bushings. That makes it possible to maintain stable performance over a long period of time.
- Though it is oil-free, its performance will be further enhanced with initial break-in grease or lubrication.

●Notes

- As the bushing is impregnated with lubricating oil, do not clean the inside of it.
- It is not possible to accurately measure the surface roughness because there are small vacancies in the material. However, the finishing method is the same as that of other types of guide bushings.

●Range of use

Lubrication : Oil-free
Operating temperature limit : −40～+120℃
Allowable maximum speed : 60m/min

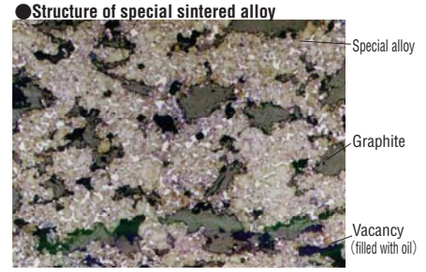
●Mechanical property

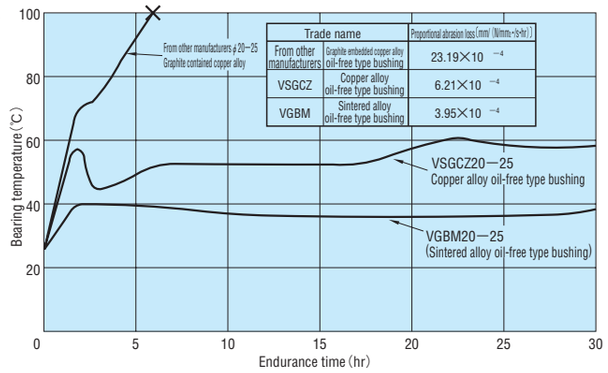
Thermal expansion coefficient : 12×10⁻⁶/℃
Density : 5.8g/cm³

●Test data

Test machine : Reciprocating motion test machine
Bushing : φ20×φ28×L25
Guide pin : VGPS20 (SKD11 58HRC～)
Bearing : 1.2N/mm² {12kgf/cm²}
Rate : 30m/min, 300spm
Stroke : 50mm
Lubrication : Application of initial breaking-in grease

●Structure of special sintered alloy



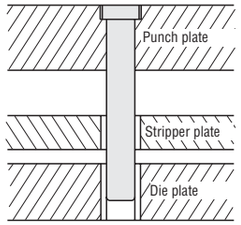


Transition of bearing temperatures in various bearing materials

STRIPER GUIDE PINS & BUSHINGS
—GUIDE—

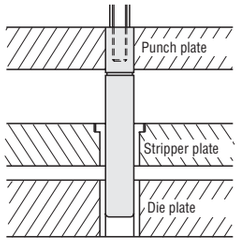
■Stripper guide pins

Headed type



Sliding part diam.tolerance	Catalog No.	Material	Type	Refer page
−0.010 −0.015	SGPH	SUJ2		P.797
	SGOH	SUJ2	Oil groove	
−0.010 −0.013	TGPH (3μm range)	SUJ2		P.810
−0.010 −0.012	VGPH (High precision)	SKD11		P.815
	WVGPH (High precision)	Carbide		P.814

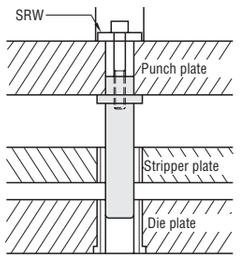
Straight type



Sliding part diam.tolerance	Catalog No.	Material	Type	Refer page
−0.010 −0.015	SGPN	SUJ2		P.798
	SGON	SUJ2	Oil groove	
−0.010 −0.013	TGPN (3μm range)	SUJ2		P.810
−0.010 −0.012	VGPN (High precision)	SKD11		P.815
	VGPS (High precision)	SKD11	Lead-in part	
	WVGPN (High precision)	Carbide		P.814
	WVGPS (High precision)	Carbide	Lead-in part	

● Lead-in part：Lead-in part is provided on the threaded side. By adjusting the mounting hole, this type can be fixed either by press fit or transition fit.

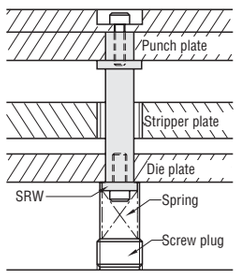
Demountable type



Sliding part diam.tolerance	Catalog No.	Material	Type	Refer page
−0.010 −0.015	SGPR	SUJ2		P.799
	SGOR	SUJ2	Oil groove	
−0.010 −0.013	TGPR (3μm range)	SUJ2		P.810
−0.010 −0.012	VGPR (High precision)	SKD11		P.816

● Straight demountable type is mounted with a bolt from the die set side. It enables demounting without disassembling the dies.
● Perpendicular can be retained by mounting it in contact with the punch plate face firmly.
SRW ring：This ring can be used to retain the pin when the hole is through without backing plate. SRW ☞ P.728

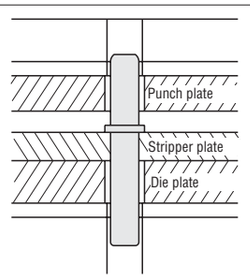
Demountable and both ends tapped type



Sliding part diam.tolerance	Catalog No.	Material	Refer page
−0.010 −0.015	SGPW	SUJ2	P.800

● This stripper guide pin is for the dies with which the upper die is pushed up from the bottom, e.g. for intermittent cutting process of progressive dies, tapping types, etc.
SRW ring···Use it as a stopper on the die plate side of the stripper guide pin. SRW ☞ P.728

Stripper plate fixing type



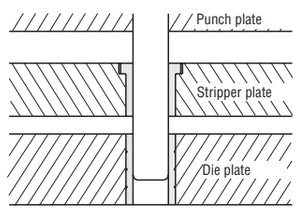
Guide type	Catalog No.	Refer page
Needle roller bearing guide	RSGPW	P.821
Ball bearing guide/Plain guide	SGPWS SGPWH	P.801

● Since the guide pin is fixed to the stripper plate, which is close to the cutting part (punch・die), the shaft rigidity can be improved compared to conventional fixing methods. Therefore, higher levels of precise punching and durability can be realized.

■Stripper guide bushings

See page 758 for Loctite adhesives.

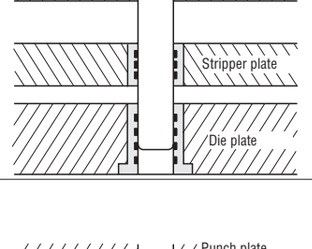
Lubricant type



Int. dia. tolerance	Catalog No.	Material	Type	How to mount	Refer page
+0.005 0 −0.005	SGBA	SUJ2	Straight	Press fit	P.803
	SGBH		Headed		
−0.003 −0.008	SGBD		Straight	Devcon adhesive	
	SGBL		Straight	Loctite adhesive	
	SGBT		Headed		
−0.010 −0.013	TGBL (3μm range)	SUJ2	Straight		P.811
	TGBT (3μm range)		Headed		
−0.003 −0.005	VGBL (High precision)	SUJ2	Straight		P.817
	VGBH (High precision)		Headed		

● Press fit type：While the precision hole is required for mounting, these stripper guide bushings enable parallel machining and assembly that results improvement in workability.
● Devcon adhesive type：2～3mm clearance on each side of the mounting hole.
● Loctite adhesive type：0.01～0.03mm clearance on each side of the mounting hole.

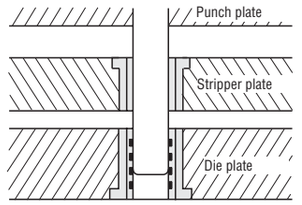
Oil-free type



Int. dia. tolerance	Catalog No.	Material	Type	How to mount	Refer page
−0.003 −0.008	SGBZ	FC250	Straight	Loctite adhesive	P.804
	SGHZ		Headed		
−0.003 −0.006	TGBZ (3μm range)		Straight		P.811
	TGHZ (3μm range)		Headed		
−0.003 −0.005	VGBZ (High precision)		Straight		P.817
	VGHZ (High precision)		Headed		

● Oil-free type···Lubrication is not needed because special solid lubricant is embedded. (Endurance will be further improved with initial breaking-in oil.)

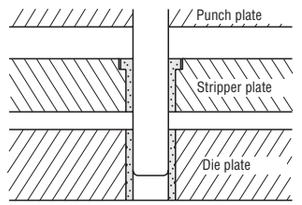
(Copper alloy internal coating) Oil type Oil-free type



Type	Int. dia. tolerance	Catalog No.	Material	Type	How to mount	Refer page
Lubricant type	−0.003 −0.008	SGSF	SUJ2+ Copper alloy	Straight	Loctite adhesive	P.804
		SGBF		Headed		
	−0.003 −0.006	TGSF (3μm range)		Straight		P.811
		TGBF (3μm range)		Headed		
	−0.003 −0.005	VSGSF (High precision)		Straight		P.817
		VSGBF (High precision)		Headed		
Oil-free type	−0.003 −0.008	SGCZ		Straight		P.805
		SGFZ		Headed		
	−0.003 −0.006	TGCZ (3μm range)		Straight		P.811
		TGFZ (3μm range)		Headed		
	−0.003 −0.005	VSGCZ (High precision)		Straight		P.818
		VSGFZ (High precision)		Headed		

● The guide's internal surface is coated with copper alloy for improved seize resistance. There are oil type and oil- free type in which special solid lubricant is embedded.

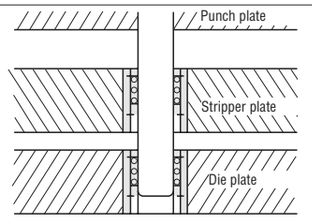
(Sintered alloy) Oil-free type



Type	Int. dia. tolerance	Catalog No.	Material	Type	How to mount	Refer page
Oil-free type	−0.003 −0.008	SGBM	Special sintered alloy	Straight	Loctite adhesive	P.805
		SGHM		Headed		
	−0.003 −0.006	TGBM (3μm range)		Straight		P.811
		TGHM (3μm range)		Headed		
	−0.003 −0.005	VGBM (High precision)		Straight		P.818
		VGHM (High precision)		Headed		

● Sintered alloy type··· A new type of oil-free bushing produced from a special alloy on which solid lubricant made mainly of graphite is dispersed and sintered. Its friction coefficient is lower than those of other cast iron and copper alloy bushings, and wear resistance is superior. Sufficient amount of solid lubricant makes its oil content high, allowing high-speed operation without losing oil film.

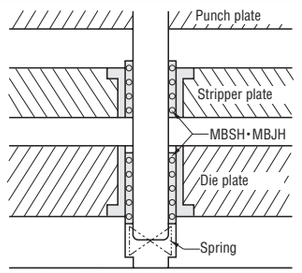
Ball bearing Cage-integrated type



Catalog No.	Material	Type	How to mount	Refer page
SGBB	SUJ2	Straight	Press fit	P.806
SGBBL			Loctite adhesive	
SGBBF		Headed		

● Using ball bearings for sliding motion enables outstanding seize resistance.
● Both ends are fastened with snap rings, so the cage cannot drop out of the bushing.
Please note that the stroke is limited.

Ball bearing Cage-separated type



Catalog No.	Material	Type	How to mount	Refer page
SGBBW	SUJ2	Thick	Loctite adhesive	P.807
SGBBS		Straight		
SGBBH		Headed		

● Using ball bearings for sliding motion enables outstanding seize resistance.
For the ball cage, use MBSH (made of aluminum) or MBJH (made of plastic). (See ☞ P.808)

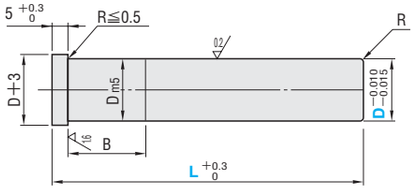
STRIPPER GUIDE PINS —HEADED TYPE—

DELIVERY SHORTENED — SGOH 3 Days → 1 Day

The volume discount rate is also applicable to alteration cost. P.39

RoHS

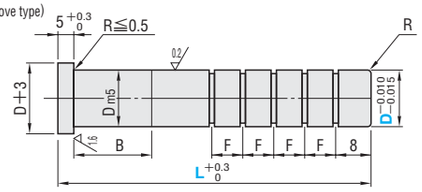
SGPH



M SUJ2
H 58HRC～

RoHS

SGOH (Oil groove type)



D \ Number of grooves (n)	40～	50～	70～	80～	90～	160～	180～
8	2	3	4	5	6	—	—
10	2	3	4	5	6	—	—
13	2	3	4	5	6	7	8
16	2	3	4	5	6	7	8
20	2	3	4	5	6	7	8
25	2	3	4	5	6	7	8

※L 40～119.5 →F= 8
L120～L(C) max.→F=10

M SUJ2 H 58HRC～

D_{m5}		R	B	Catalog No. Type	D	L	U/Price Q'ty : 1～9 SGPH	SGOH
8	+0.012 +0.006	1.0	10	SGPH SGOH	8	40 50 60 70 80	320	370
10			13		10	40 50 60 70 80 90 100	380	440
13	+0.015 +0.007	1.5	16		13	40 50 60 70 80 90 100 110 120	370	440
16			20		16	50 60 70 80 90 100 110 120 130 140	440	520
20	+0.017 +0.008	2.0	25		20	60 70 80 90 100 110 120 130 140	410	480
25			28		25	70 80 90 100 110 120 130 140	470	550
							550	640
							500	570
							590	670
							700	790
							640	740
							770	870
							930	1,040
							820	950
							960	1,100
							1,140	1,290

Order Catalog No. — L
SGPH 16 — 100

Delivery 1 Day

Price

Volume discount rate P.37

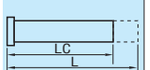
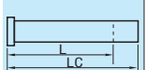
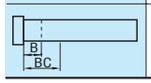
Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

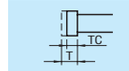
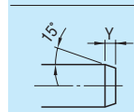
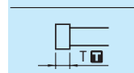
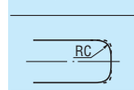
To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC) — (BC·TC·GC·TKC·RC)
SGPH 16 — LC95 — BC15

- SGPH 3 Days | Express T 1,000/1pc. | Express A 500/1pc. P.38
- SGOH 3 Days | Express A 500/1pc.

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Alteration	Code	Spec.	¥/1Code
	LC	Changes dimension L (full length) 0.5mm increments ● SGPH: 20≦LC<L ● SGOH: 40≦LC<L The B dimension conforms to the standard. When full length is reduced shorter than min. length, apply BC accordingly if needed.	●SGPH 200 ●SGOH 300
	LC	Changes dimension L (full length) (Long type LC) D / LC 0.5mm increments / ¥/1Code SGPH / SGOH 8: 80<LC≦120 / 680 / 770 10: 100<LC≦150 / 770 / 850 13: 120<LC≦180 / 940 / 1,020 16: 140<LC≦200 / 1,190 / 1,280 20: 140<LC≦200 / 1,450 / 1,530 25: 140<LC≦200 / 1,700 / 1,790	The table shows unit prices afer alteration.
	BC	Changes dimension B 1mm increments 0≦BC≦D×2 Full length L is the dimension as specified.	200

Alteration	Code	Spec.	¥/1Code
	TC	Changes dimension T (head thickness) 0.1mm increments 2≦TC<5 L becomes shorter by (5−TC). When LC is applied, the full length is equal to LC.	200
	GC	Adds taper on the tip D: 8 10 13 16 20 25 / Y: 3 / 5	200
	TKC	Changes head thickness tolerance T +0.3 0 ⇨ +0.02 0	400
	RC	Changes dimension R (radius) on the tip D / Normal type R / RC (Selection) 8·10 / 1.0 / 1.5·2.0 13·16 / 1.5 / 2.0·2.5 20·25 / 2.0 / 2.5·3.0	200

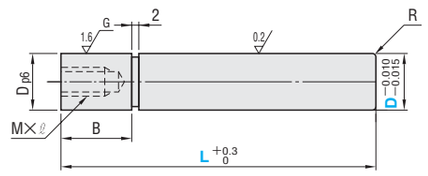
STRIPPER GUIDE PINS —STRAIGHT TYPE—

DELIVERY SHORTENED — SGON 3 Days → 1 Day

The volume discount rate is also applicable to alteration cost. P.39

RoHS

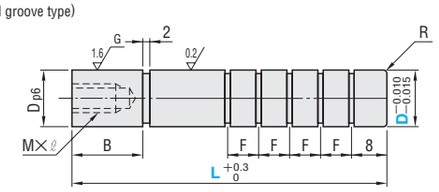
SGPN



M SUJ2
H 58HRC～

RoHS

SGON (Oil groove type)



D \ Number of grooves (n)	40～	50～	70～	80～	90～	160～	180～
8	2	3	4	5	6	—	—
10	2	3	4	5	6	—	—
13	2	3	4	5	6	7	8
16	2	3	4	5	6	7	8
20	2	3	4	5	6	7	8
25	2	3	4	5	6	7	8

※L 40～119.5 →F= 8
L120～L(C) max.→F=10

M SUJ2 H 58HRC～

D_{p6}		M×ℓ Pitch	R	B	Catalog No. Type	D	L	U/Price Q'ty : 1～9 SGPN	SGON
8	+0.024 +0.015	M5×12 P0.8	1.0	10	SGPN SGON	8	40 50 60 70 80	250	300
10				13		10	40 50 60 70 80 90 100	320	390
13	+0.029 +0.018	M6×15 P1.0	1.5	16		13	40 50 60 70 80 90 100 110 120	280	330
16				20		16	50 60 70 80 90 100 110 120 130 140	360	420
20	+0.035 +0.022	M8×20 P1.25	2.0	25		20	60 70 80 90 100 110 120 130 140	330	400
25				28		25	70 80 90 100 110 120 130 140	390	460
								470	560
								410	480
								480	560
								610	700
								520	610
								660	760
								830	940
								640	800
								780	970
								980	1,170

Order Catalog No. — L
SGPN 20 — 80

Delivery 1 Day

Price

Volume discount rate P.37

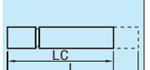
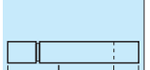
Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

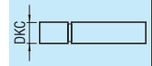
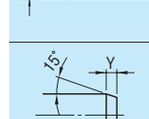
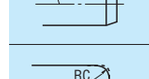
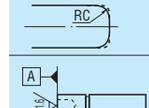
To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC) — (BC·DKC·GC·RC·TGC)
SGPN 20 — LC75 — BC20

- SGPN 3 Days | Express T 1,000/1pc. | Express A 500/1pc. P.38
- SGON 3 Days | Express A 500/1pc.

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Alteration	Code	Spec.	¥/1Code
	LC	Changes dimension L (full length) 0.5mm increments ● SGPN: 20≦LC<L ● SGON: 40≦LC<L The B dimension conforms to the standard. When full length is reduced shorter than min. length, apply BC accordingly if needed. When LC ≦25, the pilot hole for tapping may go through.	●SGPN 200 ●SGON 300
	LC	Changes dimension L (full length) (Long type LC) D / LC 0.5mm increments / ¥/1Code SGPN / SGON 8: 80<LC≦120 / 600 / 680 10: 100<LC≦150 / 680 / 770 13: 120<LC≦180 / 850 / 940 16: 120<LC≦200 / 1,110 / 1,190 20: 140<LC≦200 / 1,360 / 1,450 25: 140<LC≦200 / 1,620 / 1,700	The table shows unit prices afer alteration.
	BC	Changes dimension B 1mm increments 0≦BC≦D×2 Using BC code Full length L and tap depth are the dimensions as specified. When BC=0,2mm groove is eliminated.	200

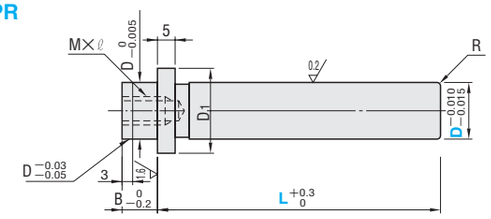
Alteration	Code	Spec.	¥/1Code
	DKC	Changes press fit tolerance Dp6 ⇨ Dm5 ⊗SGON: Not applicable Dm5: 8 +0.012 +0.006 / 10 / 13 +0.015 +0.007 / 16 / 20 +0.017 +0.008 / 25	500
	GC	Adds taper on the tip D: 8 10 13 16 20 25 / Y: 3 / 5	200
	RC	Changes dimension R (radius) on the tip D / Normal type R / RC (Selection) 8·10 / 1.0 / 1.5·2.0 13·16 / 1.5 / 2.0·2.5 20·25 / 2.0 / 2.5·3.0	200
	TGC	Modifies the tap side end Perpendicularity 0.01/Surface roughness 1.6a	100

STRIPPER GUIDE PINS
—DEMOUNTABLE TYPE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

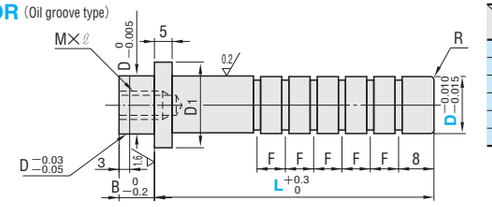
SGPR



M SUJ2
H 58HRC～

RoHS

SGOR (Oil groove type)



D \ L(C)	Number of grooves (n) 30～	40～	60～	70～	80～
8	2	3	4	5	—
10	2	3	4	5	6
13	2	3	4	5	6
16	2	3	4	5	6
20	2	3	4	5	6
25	2	3	4	5	6

※L(C) 30～119.5 →F= 8
L120～L(C) max.→F=10

M SUJ2 H 58HRC～

M×ℓ Pitch	D1	R	B	Catalog No. Type	Catalog No. D	L	U/Price Q'ty：1～9 SGPR	SGOR
M5×12 P0.8	13	1.0	8	SGPR SGOR	8	30 40 50 60 70	540	610
	16				10	30 40 50 60 70 80	610	690
M6×15 P1.0	20	1.5	10		13	40 50 60 70 80 90 100	690	780
	23						640	770
					16	40 50 60 70 80 90 100 110 120	720	850
M8×20 P1.25	27	2.0	13		20	50 60 70 80 90 100 110 120	810	960
	32		16		25	60 70 80 90 100 110 120	740	880
							860	1,100
							980	1,150
							910	1,090
							1,060	1,260
							1,250	1,450
							1,120	1,330
							1,290	1,520
							1,490	1,760

Order Catalog No. — L
SGPR 16 — 100

Delivery
- SGPR 1 Day
- SGOR 3 Days — Express A 500/1pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price ■Volume discount rate P.37

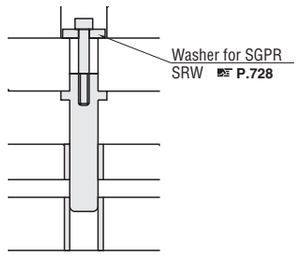
Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

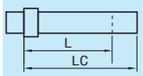
To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC) — (BC·GC·RC)
SGPR 16 — LC95
- SGPR 3 Days — Express T 1,000/1pc. — Express A 500/1pc. P.38
- SGOR 3 Days — Express A 500/1pc. P.38

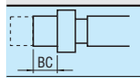
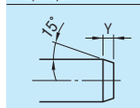
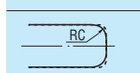
A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Example



Alteration	Code	Spec.	¥/1Code
	LC	Changes dimension L (full length) 30≦LC＜L 0.5mm increments	•SGPR 200 •SGOR 300
	LC	Changes dimension L (full length) (Long type LC)	The table shows unit prices afer alteration.

D	LC 0.5mm increments	¥/1Code SGPR	SGOR
8	70＜LC≦ 80	940	1,020
10	80＜LC≦100	1,020	1,110
13	100＜LC≦120	1,190	1,280
16	120＜LC≦140	1,450	1,530
20	120＜LC≦140	1,700	1,790
25	120＜LC≦140	1,960	2,040

Alteration	Code	Spec.	¥/1Code
	BC	Changes dimension B 1mm increments 5≦BC＜B The depth of M tap becomes shorter by (B−BC).	200
	GC	Adds taper on the tip	200
	RC	Changes dimension R (radius) on the tip	200

D	Y
8 10 13	3
16 20 25	5

D	Normal type R	RC (Selection)
8・10	1.0	1.5・2.0
13・16	1.5	2.0・2.5
20・25	2.0	2.5・3.0

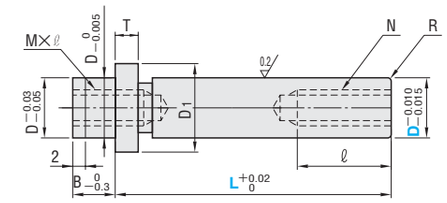
STRIPPER GUIDE PINS
—DEMOUNTABLE AND BOTH ENDS TAPPED TYPE—

The volume discount rate is also applicable to alteration cost. P.39

SGPW is a stock product in 5mm increments of dimension L. If it is to be specified in 1mm increments, use Alteration LC.

RoHS

SGPW



M SUJ2
H 58HRC～

M×ℓ Pitch	N Pitch	ℓ	D1	R	T	B	Catalog No. Type	Catalog No. D	L 5mm increments	U/Price Q'ty：1～9
M4×12 P0.7	M4 P0.7	8～13	12	1.0	3	8	SGPW	8	25～ 70	1,160
			14			10		10		1,190
M5×15 P0.8	M5 P0.8	10～15	17	1.5	5	10		13	30～ 75	1,250
M6×15 P1.0	M6 P1.0		23					16	40～100	1,330
M8×20 P1.25	M8 P1.25	16～21	27	2.0		13		20	60～120	1,630
			32			16		25		1,780

Order Catalog No. — L
SGPW 10 — 55

Delivery 1 Day

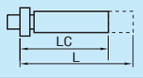
Price ■Volume discount rate P.37

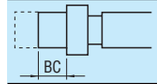
Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC) — (BC)
SGPW 10 — LC54 — BC6
3 Days — Express T 1,000/1pc. — Express A 500/1pc. P.38

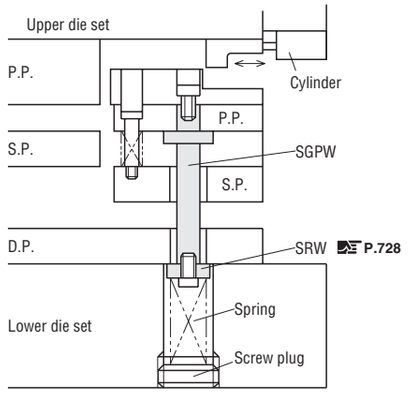
A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Alteration	Code	Spec.	¥/1Code
	LC	Changes dimension L (full length) D 8～13 25≦LC＜L D16～25 (Lmin−5)≦LC＜L 0.5mm increments	500

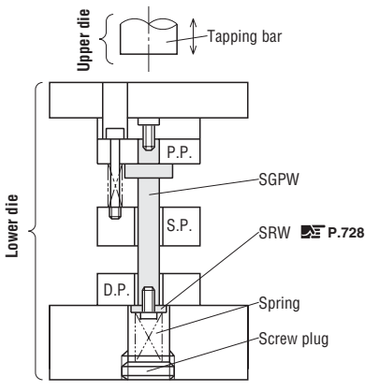
Alteration	Code	Spec.	¥/1Code
	BC	Changes dimension B 1mm increments 5≦BC＜B The depth of M tap becomes shorter by (B−BC).	200

Example

• Use this stripper guide pin for the dies with which the punch plate is pushed up from the lower die side.



Intermittent cutting process of progressive die



Movable bottom die

HIGH RIGIDITY STRIPPER GUIDE PINS
—STRIPPER PLATE FIXING TYPE—

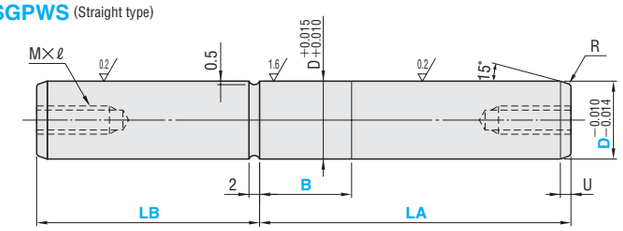
FIXED-TYPE STOPPERS FOR BALL BEARING GUIDES / CLAMPS FOR STRIPPER GUIDE PIN

The volume discount rate is also applicable to alteration cost. P.39

SGPWS and **SGPWH** can be used with any bushings listed on pages 803 to 808. Select a suitable combination according to the nature of operation.

RoHS

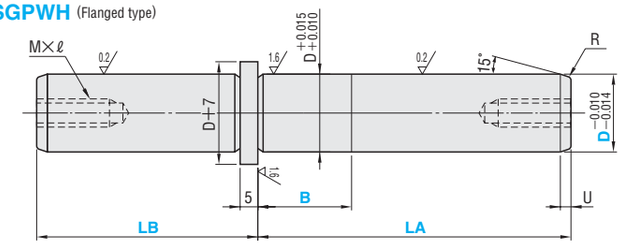
SGPWS (Straight type)



M SUJ2
H 58HRC～

RoHS

SGPWH (Flanged type)



M SUJ2
H 58HRC～

U	R	M×ℓ Pitch	Catalog No. Type	D	LA	LB 10mm increments	B 1mm increments	U/Price Q'ty : 1～9 SGPWS	SGPWH
2	1.5	M5×22 P0.8	SGPWH (Flanged type)	13	60	30～50	10～30	—	2,300
					70	30～60		—	2,410
					80	40～60		—	2,570
3	2	M6×25 P1.0	SGPWS (Straight type)	16	70	30～60		2,250	2,850
					80	30～70		2,400	3,000
					90	40～80		2,570	3,190
		M8×25 P1.25	SGPWH (Flanged type)	20	80	40～70		2,570	3,170
					90	40～70		2,740	3,360
					100	50～80		2,920	3,530
4	3			25	90	50～70		3,240	3,850
					100	50～80		3,530	4,180
					110	60～90		3,730	4,380

For the features of the stripper plate fixing guide pins and the method of mounting, refer to P.819.

Order: Catalog No. — LA — LB — B
SGPWS 25 — 100 — 60 — B30

Delivery: 3 Days

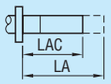
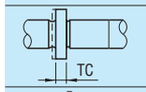
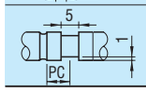
Price

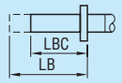
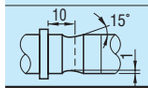
■Volume discount rate P.37

Quantity	1～9	10～20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

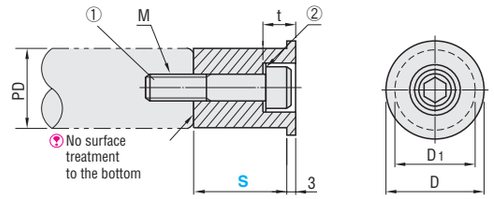
Alteration: Catalog No. — LA(LAC) — LB(LBC) — B — (TC·PC·NC)
SGPWH 20 — LAC 78 — 50 — B25 — TC4

Alteration	Code	Spec.	¥/1Code
	LAC	Dimension LA alteration D / LA / 1mm increments 13: 60 50≦LAC＜60; 70 61≦LAC＜70; 80 71≦LAC＜80 16: 70 60≦LAC＜70; 80 71≦LAC＜80; 90 81≦LAC＜90 20: 80 70≦LAC＜80; 90 81≦LAC＜90; 100 91≦LAC＜100 25: 90 80≦LAC＜90; 100 91≦LAC＜100; 110 101≦LAC＜110 The tap depth becomes shorter by (LA−LAC).	600
	TC	Changes flange thickness 3≦TC＜5 1mm increments Applicable to SGPWH	400
	PC	Adds groove for bolt fixing 1mm increments 5≦PC≦B−5 Applicable to SGPWS	300

Alteration	Code	Spec.	¥/1Code
	LBC	Changes dimension LB D / LA / 1mm increments 13: 60 20≦LBC＜50; 70 20≦LBC＜60; 80 30≦LBC＜60 16: 70 20≦LBC＜60; 80 20≦LBC＜70; 90 30≦LBC＜80 20: 80 30≦LBC＜70; 90 30≦LBC＜70; 100 40≦LBC＜80 25: 90 40≦LBC＜70; 100 40≦LBC＜80; 110 50≦LBC＜90 The tap depth becomes shorter by (LB−LBC).	600
	NC	Adds groove for bolt fixing Fixed at 10mm position (for M6) Applicable to SGPWH B≧16	300

RoHS

SSTK (Fixed-type stopper for ball bearing)



M S45C
S Black oxide (Fe_3O_4)
A ①CB ②Spring washer

D	D_1	t	M	Catalog No. Type	No.	S 1mm increments	U/Price Q'ty : 1～9
15	12	6.5	5	SSTK (Fixed-type stopper)	13	10～20	640
17.3	15	8.5	6		16	10～20	670
24	19	11	8		20	11～25	700
29	24				25	11～30	800

PD (No.)	①Bolt CB S 10～13	14～18	19～23	24～28	29～30
13	M5×15	M5×20	M5×25	—	—
16	M6×15	M6×20	M6×25	—	—
20	M8×15	M8×20	M8×25	M8×30	—
25	M8×15	M8×20	M8×25	M8×30	M8×35

Order: Catalog No. — S
SSTK 16 — 12

Delivery: 3 Days | Express A | 500/1pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

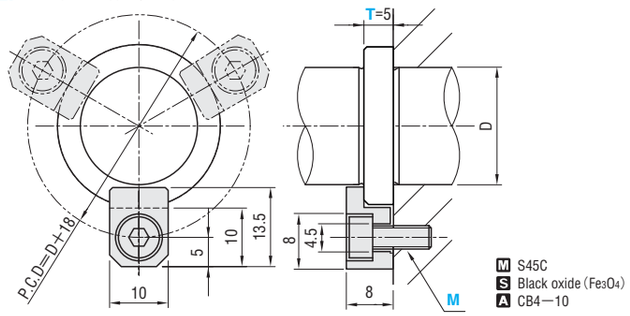
Quantity	1～9	10～20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

Use SSTK when setting a stripper guide bushing for ball cage (P.807) to SGPWS and SGPWH.

RoHS

FCLP (Clamp for stripper guide pin)



M S45C
S Black oxide (Fe_3O_4)
A CB4—10

Catalog No. Type	T	M	U/Price (1Pc.) Q'ty : 1～9
FCLP	5	4	250

FCLP can be used as a clamp for SGPWH, RSGPW and RSGPS. For D20 and below, use three clamps, and for D25 and adove, use four clamps.

Order: Catalog No. — M
FCLP 5 — 4

Delivery: 3 Days | Express A | 500/1pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

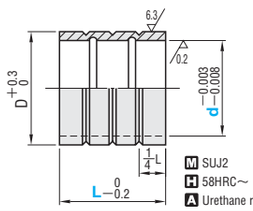
Quantity	1～9	10～20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

STRIPPER GUIDE BUSHINGS
—OIL TYPE / OIL-FREE TYPE—

■Oil type
Use the stripper guide bushings at room temperatures (40℃ or less). How to mount P.794

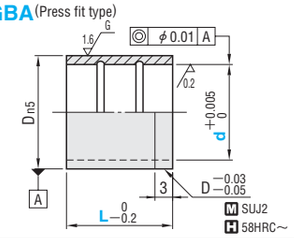
SGBD (Devcon adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
12	SGBD	8	10 13 16 20	570
14		10	10 13 16 20 25	630
18		13	13 16 20 25	670
22		16	16 20 25 30	740
25		20	20 25 30	890
32		25	25 30 35	1,090

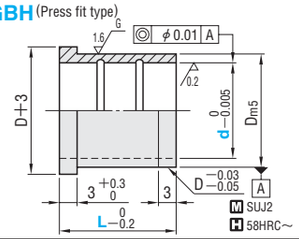
Put the attached urethane ring to guide pin to prevent Devcon from dropping when adhering
Urethane ring is not provided when LC alteration is required.

SGBA (Press fit type)



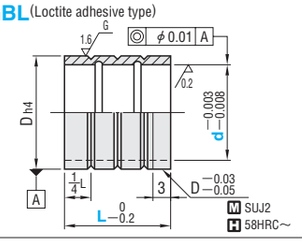
Dn5	Catalog No. Type	d	L	U/Price Q'ty : 1~9
12	SGBA	8	10 13 16 20	570
14 +0.020 +0.012		10	10 13 16 20 25	620
18		13	13 16 20 25	670
22 +0.024 +0.015		16	16 20 25 30	740
25		20	20 25 30	860
32 +0.028 +0.017		25	25 30 35	1,050

SGBH (Press fit type)



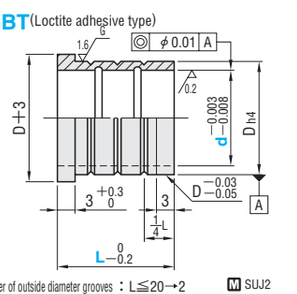
Dm5	Catalog No. Type	d	L	U/Price Q'ty : 1~9
12	SGBH	8	10 13 16 20	650
14 +0.015 +0.007		10	10 13 16 20 22 25	740
18		13	13 16 20 22 25 30 35	800
22 +0.017 +0.008		16	13 16 20 22 25 30 35	880
25		20	16 20 22 25 30 35	1,000
32 +0.020 +0.009		25	20 22 25 30 35	1,220

SGBL (Loctite adhesive type)



Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1~9
12	SGBL	8	10 13 16 20	570
14 0 −0.005		10	10 13 16 20 22 25	620
18		13	13 16 20 22 25 30 35	670
22 0 −0.006		16	13 16 20 22 25 30 35	740
25		20	16 20 22 25 30 35	860
32 0 −0.007		25	20 22 25 30 35	1,050

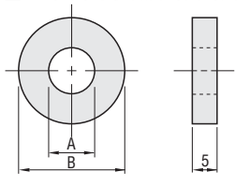
SGBT (Loctite adhesive type)



＊Number of outside diameter grooves : L≦20→2, L>20→3

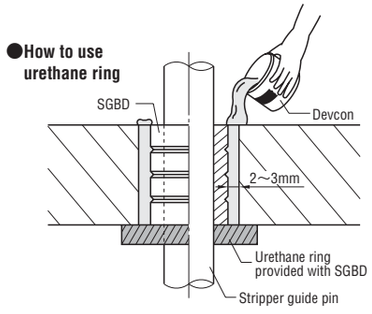
Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1~9
12	SGBT	8	10 13 16 20	650
14 0 −0.005		10	10 13 16 20 22 25	740
18		13	13 16 20 22 25 30 35	800
22 0 −0.006		16	13 16 20 22 25 30 35	880
25		20	16 20 22 25 30 35	1,000
32 0 −0.007		25	20 22 25 30 35	1,220

■Dimensions of attached urethane ring SGBD



Catalog No.	A	B
SGBD 8	8	25
SGBD10	10	
SGBD13	13	35
SGBD16	16	
SGBD20	20	
SGBD25	25	45

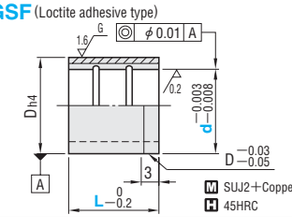
●How to use urethane ring



The volume discount rate is also applicable to alteration cost. P.39

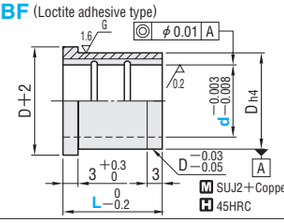
■Copper alloy oil type
Use the stripper guide bushings at room temperatures (40℃ or less). How to mount P.794

SGSF (Loctite adhesive type)



Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16 0 −0.005	SGSF	10	10 13 16 20 22 25	1,080
20		13	13 16 20 22 25 30	1,150
24 0 −0.006		16	16 20 22 25 30 35	1,280
28		20	16 20 22 25 30 35	1,440
34 0 −0.007		25	20 22 25 30 35	1,680

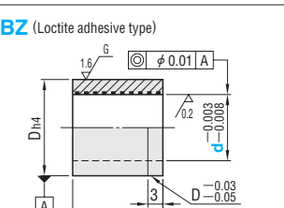
SGBF (Loctite adhesive type)



Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16 0 −0.005	SGBF	10	10 13 16 20 22 25	1,200
20		13	13 16 20 22 25 30	1,280
24 0 −0.006		16	16 20 22 25 30 35	1,360
28		20	16 20 22 25 30 35	1,610
34 0 −0.007		25	20 22 25 30 35	1,930

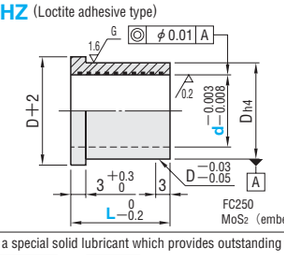
■Oil-free type

SGBZ (Loctite adhesive type)



Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1~9
13 0 −0.005	SGBZ	8	10 13 16 20	760
16		10	10 13 16 20 22 25	820
20		13	13 16 20 22 25 30	890
24 0 −0.006		16	13 16 20 22 25 30 35	980
28		20	16 20 22 25 30 35	1,130
34 0 −0.007		25	20 22 25 30 35	1,390

SGHZ (Loctite adhesive type)



Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1~9
13 0 −0.005	SGHZ	8	10 13 16 20	840
16		10	10 13 16 20 22 25	930
20		13	13 16 20 22 25 30	1,000
24 0 −0.006		16	13 16 20 22 25 30 35	1,130
28		20	16 20 22 25 30 35	1,300
34 0 −0.007		25	20 22 25 30 35	1,560

＊MoS_2 (Molybdenum disulfide) is a special solid lubricant which provides outstanding wear resistance.

Order: Catalog No. — L (e.g. SGBH 10 — 16)

Delivery: 1 Day

Price

■Volume discount rate P.37

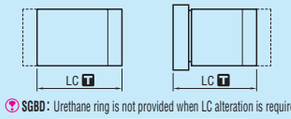
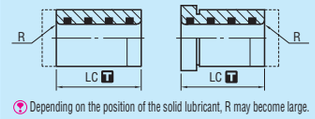
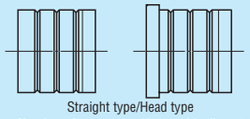
Quantity	1~9	10~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration: Catalog No. — L(LC) (e.g. SGBD 16 — LC22.0)

3 Days | Express T 1,000/1pc. | Express A 500/1pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Alteration Code	Changes dimension L (full length) LC		Machines grooves for Loctite. DLC
Spec.	●SGBD・SGBA・SGBL ●SGBH・SGBT	●SGSF・SGBZ ●SGBF・SGHZ	Grooves for Loctite are machined on the outside diameter of bushing.
			
	SGBD: Urethane ring is not provided when LC alteration is required.	Depending on the position of the solid lubricant, R may become large.	Straight type/Head type
	d: 8 10 13 16 20 25 — LC 0.1mm increments: 8.0≦LC<L, 8.0≦LC<L, 10.0≦LC<L, 13.0≦LC<L, 16.0≦LC<L, 20.0≦LC<L — T: 0 −0.2	d: 8 10 13 16 20 25 — LC 0.1mm increments: 8.0≦LC<L, 8.0≦LC<L, 10.0≦LC<L, 13.0≦LC<L, 16.0≦LC<L, 20.0≦LC<L — T: 0 −0.2	＊Number of grooves on the outside diameter. 8.0≦L (LC) ≦15.9→1 16.0≦L (LC) ≦24.9→2 25.0≦L (LC) ≦35.0→3
			⊗ Not applicable to SGBD,SGBA,SGBH,SGBL and SGBT.
¥/1Code	200	300	300

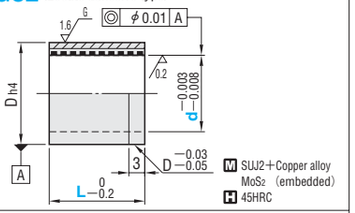
STRIPPER GUIDE BUSHINGS
—OIL-FREE TYPE—

The volume discount rate is also applicable to alteration cost. P.39

■Copper alloy oil-free type

Use the stripper guide bushings at room temperatures (40℃ or less). How to mount P.794

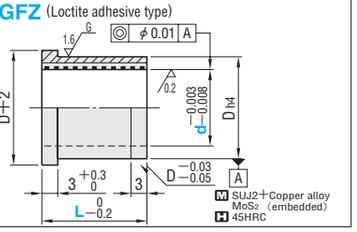
SGCZ (Loctite adhesive type)



Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16 0 −0.005	SGCZ	10	10 13 16 20 22 25	1,200
20		13	13 16 20 22 25 30	1,280
24 0 −0.006		16	16 20 22 25 30 35	1,440
28		20	16 20 22 25 30 35	1,680
34 0 −0.007		25	20 22 25 30 35	1,930

*MoS2 is a special solid lubricant which provides outstanding wear resistance.
*SUJ2 and copper alloy are coupled by sintering.

SGFZ (Loctite adhesive type)



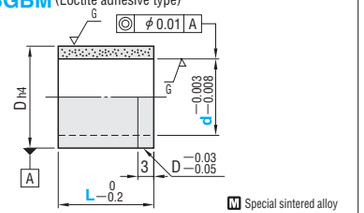
Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16 0 −0.005	SGFZ	10	10 13 16 20 22 25	1,360
20		13	13 16 20 22 25 30	1,440
24 0 −0.006		16	16 20 22 25 30 35	1,610
28		20	16 20 22 25 30 35	1,890
34 0 −0.007		25	20 22 25 30 35	2,210

*MoS2 is a special solid lubricant which provides outstanding wear resistance.
*SUJ2 and copper alloy are coupled by sintering.

■Sintered alloy (Dispersed Solid lubricant) oil-free type

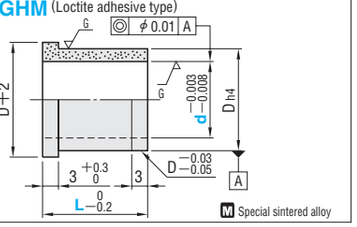
Product data P.794

SGBM (Loctite adhesive type)



Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16 0 −0.005	SGBM	10	10 13 16 20 22 25	1,410
20		13	13 16 20 22 25 30	1,510
24 0 −0.006		16	16 20 22 25 30 35	1,700
28		20	20 22 25 30 35	2,280
34 0 −0.007		25	20 22 25 30 35	2,570

SGHM (Loctite adhesive type)



Dh4	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16 0 −0.005	SGHM	10	10 13 16 20 22 25	1,600
20		13	13 16 20 22 25 30	1,700
24 0 −0.006		16	16 20 22 25 30 35	1,890
28		20	20 22 25 30 35	2,520
34 0 −0.007		25	20 22 25 30 35	2,900

Order: Catalog No. — L
SGFZ 10 — 16

Delivery: 1 Day

Price

Volume discount rate P.37

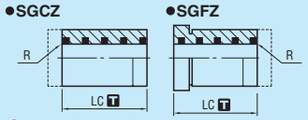
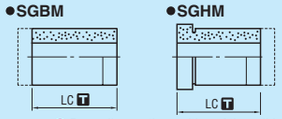
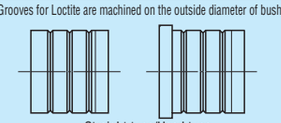
Quantity	1~9	10~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration: Catalog No. — L(LC)
SGFZ 16 —LC18.0

3 Days | Express T 1,000/1pc. | Express A 500/1pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

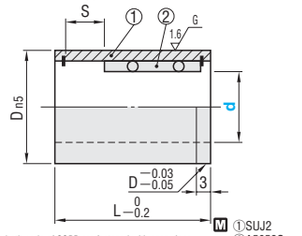
Alteration Code	Changes dimension L (full length) LC		Machines grooves for Loctite. DLC
Spec.	●SGCZ ●SGFZ	●SGBM ●SGHM	Grooves for Loctite are machined on the outside diameter of bushing.
			
	For SGCZ and SGFZ, R may become large depending on the position of the solid lubricant.	Depending on the position of the solid lubricant, R may become large.	*Number of grooves on the outer diameter. 8.0≦L (LC) ≦15.9→1 16.0≦L (LC) ≦24.9→2 25.0≦L (LC) ≦35.0→3
	d / LC 0.1mm increments / T: 10 8.0≦LC<L; 13 10.0≦LC<L; 16 13.0≦LC<L; 20 16.0≦LC<L; 25 20.0≦LC<L; T 0 −0.2	d / LC 0.1mm increments / T: 10 8.0≦LC<L; 13 10.0≦LC<L; 16 13.0≦LC<L; 20 16.0≦LC<L; 25 20.0≦LC<L; T 0 −0.2	
¥/1Code	300	200	300

STRIPPER GUIDE BUSHINGS
—BALL CAGE INTEGRATED TYPE—

The volume discount rate is also applicable to alteration cost. P.39

■Ball cage integrated type

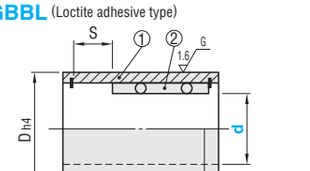
SGBB (Press fit type)



Since both ends of SGBB are fastened with snap rings, the ball cage does not come off from the main body.

Dn5	L	N Number of rows	n Number of balls	S	Maximum stroke	Catalog No. Type	d	U/Price Q'ty : 1~9
16 +0.020 +0.012	24	5	55	7.8	15.6	SGBB (Press fit type)	8	1,970
20	30			8.4	16.8		10	2,120
25 +0.024 +0.015	35	6	66	9.25	18.5		13	2,280
28	37		78	10.15	20.3		16	2,510
32 +0.028 +0.017	45		96	12.75	25.5		20	2,740
38	50	7	112	14.0	28.0		25	3,040

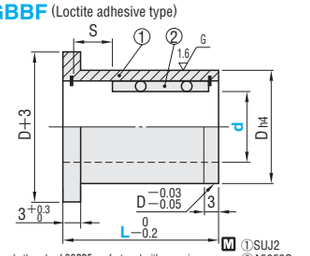
SGBBL (Loctite adhesive type)



Since both ends of SGBBL are fastened with snap rings, the ball cage does not come off from the main body.

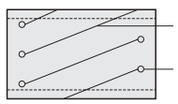
Dh4	N Number of rows	n Number of balls	S	Maximum stroke	Catalog No. Type	d	L (Selection)	U/Price Q'ty : 1~9
16 0 −0.005	5	35	5	10	SGBBL (Loctite adhesive type)	8	20	2,190
	7	49					25	
20	6	48				10	25	2,340
	8	64					30	
25 0 −0.006	6	60				13	25	2,520
	8	80					30	
28	7	77	7.5	15		16	30	2,770
	9	99					35	
32 0 −0.007	4	44				20	30	3,030
	6	66					35	
38	8	112				25	40	3,350

SGBBF (Loctite adhesive type)



Since both ends of SGBBF are fastened with snap rings, the ball cage does not come off from the main body.

Dh4	N Number of rows	n Number of balls	S	Maximum stroke	Catalog No. Type	d	L (Selection)	U/Price Q'ty : 1~9
16 0 −0.005	5	35	5	10	SGBBF (Loctite adhesive type)	8	20	2,630
	7	49					25	
20	6	48				10	25	2,790
	8	64					30	
25 0 −0.006	6	60				13	25	3,010
	8	80					30	
28	7	77	7.5	15		16	30	3,320
	9	99					35	
32 0 −0.007	4	44				20	30	3,630
	6	66					35	
38	8	112				25	40	4,030



N Number of rows (1……N)
n Number of balls (1……n)

SGBB 8 ····· Diameter of ball ϕ1.588mm (1/16in.)
SGBB 10 ····· Diameter of ball ϕ2.381mm (3/32in.)
SGBB13~25 ····· Diameter of ball ϕ3.175mm (1/8in.)
SGBBL/F 8 ····· Diameter of ball ϕ1.5mm
SGBBL/F10~16 ····· Diameter of ball ϕ2.0mm
SGBBL/F20・25 ····· Diameter of ball ϕ3.0mm

Order: Catalog No. — L
SGBB 20
SGBBL 20 — 35

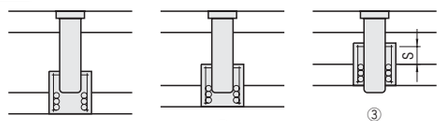
Delivery: 1 Day

Alteration: Catalog No. — L(LC)
SGBB 16.0 — LC29.5
SGBBF 13 — LC22.5

3 Days | Express T 1,000/1pc. | Express A 500/1pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Example



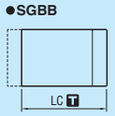
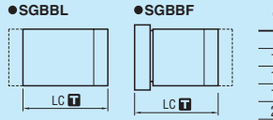
①Insert the pin in the bushing fixed in the stripper plate.
②③Push the pin down to the bottom dead center as the pin and the bushing are interference fit of 2μm to 20μm.

Price

Volume discount rate P.37

Quantity	1~9	10~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

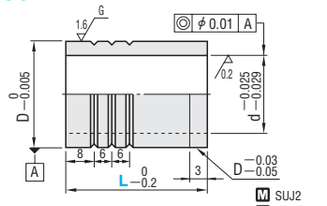
Alteration Code	Changes dimension L (full length) LC	LC
Spec.	●SGBB	●SGBBL ●SGBBF
		
	d / LC 0.1mm increments / T: 8 20.0≦LC<L; 10 25.0≦LC<L; 13 30.0≦LC<L; 16 30.0≦LC<L; 20 35.0≦LC<L; 25 40.0≦LC<L; T 0 −0.2	d / LC 0.1mm increments / T: 8 17.5≦LC<L; 10 22.5≦LC<L; 13 22.5≦LC<L; 16 25.0≦LC<L; 20 25.0≦LC<L; 25 35.0≦LC<L; T 0 −0.2
	Dimension S is {S−(L−LC)} (S≧2.5)	Dimension S is {S−(L−LC)} (S≧2.5)
¥/1Code	500	500

STRIPPER GUIDE BUSHINGS
—FOR BALL BEARING—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

SGBBW (Thick Wall, Loctite adhesive type)

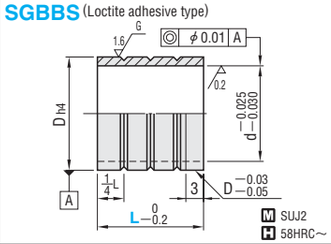


M SUJ2
H 58HRC～

d	D		Catalog No. Type	PD	L	U/Price Q'ty：1～9
17	24	−0.005	SGBBW	13	30 35	1,050
20	28			16	35 40	1,200
26	34			20	40 45 50	1,540
31	40			25	45 50 60	1,990

RoHS

SGBBS (Loctite adhesive type)

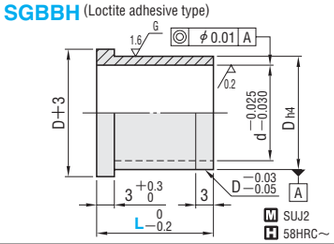


M SUJ2
H 58HRC～

d	Dh4		Catalog No. Type	PD	L	U/Price Q'ty：1～9
14	18	−0.005	SGBBS	10	20 25 30	670
17	22			13	20 25 30	740
20	26	−0.006		16	25 30 35	820
26	31			20	25 30 35 40	970
31	37	−0.007		25	35 40	1,180

RoHS

SGBBH (Loctite adhesive type)



M SUJ2
H 58HRC～

d	Dh4		Catalog No. Type	PD	L	U/Price Q'ty：1～9
14	18	−0.005	SGBBH	10	20 25 30	820
17	22			13	20 25 30	910
20	26	−0.006		16	25 30 35	1,010
26	31			20	25 30 35 40	1,150
31	37	−0.007		25	35 40	1,390

Order Catalog No. — L
SGBBW 16 — 35

Delivery 1 Day

Price

■Volume discount rate P.37

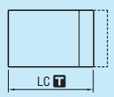
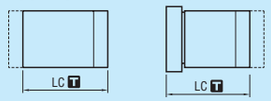
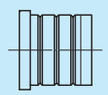
Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC)
SGBBH 16 — LC25.5

3 Days | Express T 1,000/1pc. | Express A 500/1pc. P.38

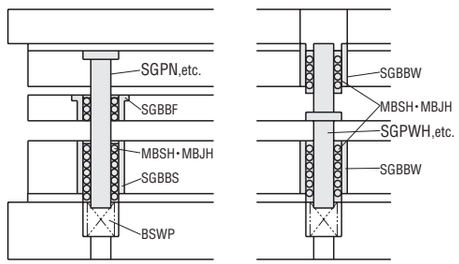
A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Alteration Code	Changes dimension L (full length) LC	LC	Machines grooves for Loctite. DLC
Spec.	●SGBBW 	●SGBBS ●SGBBH 	Grooves for Loctite are made on the outside diameter of bushing. 
	PD / LC 0.1mm increments / T: 13 25.0≦LC＜L; 16 30.0≦LC＜L; 20 35.0≦LC＜L; 25 40.0≦LC＜L; T 0 −0.2	PD / LC 0.1mm increments / T: 10 15.0≦LC＜L; 13 15.0≦LC＜L; 16 20.0≦LC＜L; 20 20.0≦LC＜L; 25 30.0≦LC＜L; T 0 −0.2	＊Number of outer diameter grooves 8.0≦L (LC) ≦15.9→1; 16.0≦L (LC) ≦24.9→2; 25.0≦L (LC) ≦35.0→3
			⊗ Not applicable to SGBBW and SGBBS.
¥/1Code	200	200	300

Example

■Features

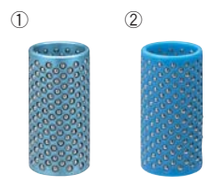
SGBBW	Thick wall results in a higher level of rigidity.
SGBBS SGBBH	All stripper guide pins can be coupled with. (Same in SGBBW.)



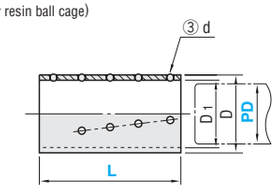
BALL CAGES / SPRINGS FOR BALL CAGE

The volume discount rate is also applicable to alteration cost. P.39

RoHS



① MBSH (High rigidity aluminum ball cage)
② MBJH (High rigidity resin ball cage)



M ①A5052S (Aluminum)
②POM (Polyacetal resin)
③SUJ2 Sphericity pressure 0.25μm
H ③62～67HRC

D	D1	Diameter of ball d	Catalog No. Type	PD	L	U/Price Q'ty：1～9 MBSH	MBJH
13.7	10.3	2	MBSH (Aluminum) MBJH (Resin)	10	25 30 35	1,070	910
16.7	13.3	2		13	25 30 35	1,180	1,030
19.7	16.3	2		16	30 35 40	1,340	1,140
25.5	20.5	3		20	30 35 40 45	1,500	1,300
30.5	25.5	3		25	35 40 45 50	1,880	1,590

Order Catalog No. — L
MBJH 20 — 45

Delivery 1 Day

Price

■Volume discount rate P.37

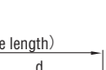
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC)
MBJH 20 — LC 42

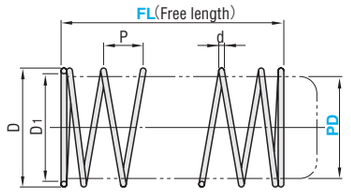
3 Days | Express A 500/1pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Alteration	Code	Spec.	¥/1Code
	LC	Changes dimension L (full length) 1mm increments 20≦LC＜L Ball holes may remain on the cut surface.	400

RoHS

BSWP (Springs for ball cage)



M SWP—B

D	D1	d	P	Catalog No. Type	PD	FL 5mm increments	U/Price Q'ty：1～9
11.7	10.5	0.6	5	BSWP (For Ball cage)	10	30～80	110
14.9	13.5	0.7	6		13	30～80	110
18.3	16.5	0.8	12		16	30～90	110
22.5	20.5	1.0	14		20	35～90	120
27.9	25.5	1.2	14		25	40～90	140

Order Catalog No. — FL
BSWP 20 — 80

Delivery 3 Days

Express T 1,000/1pc. | Express A 500/1pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

Quantity	1～9	10～20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

Spring solid height (mm) / Spring constant (g/mm)

Type	PD	FL(Free length) 30	35	40	45	50	55	60	65	70	75	80	85	90
BSWP	10	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	—	—
		16	14	12	11	9	9	8	7	7	6	6		
	13	4.9	5.4	6.1	6.6	7.2	7.8	8.4	8.9	9.6	10.1	10.7	—	—
		17	15	13	11	10	9	8	8	7	7	6		
	16	3.2	3.4	3.7	4.0	4.2	4.5	4.8	5.0	5.3	5.6	5.8	6.1	6.4
		32	26	23	22	20	19	16	15	14	13	12	12	11
	20	—	4.7	5.0	5.3	5.6	5.8	6.0	6.5	7.0	7.4	7.7	8.1	8.5
			40	35	31	28	26	23	22	20	19	18	16	15
	25	—	—	6.0	6.3	6.6	7.0	7.4	7.9	8.4	8.7	9.0	9.3	9.6
				38	34	30	28	25	24	22	20	19	18	17

Upper row : Solid height
Lower row : Spring constant

3μmRANGE —GUIDE— STRIPPER GUIDE PINS / BUSHINGS

PRESS ADD.SPEC. Printed in Red

3μmRANGE STRIPPER GUIDE PINS —HEADED TYPE / STRAIGHT TYPE / DEMOUNTABLE TYPE—

DELIVERY SHORTENED — TGPH TGPN: 3 Days → 1 Day

The volume discount rate is also applicable to alteration cost. P.39

■Features

- The stripper guides of TG series have achieved its precision to nearly high precision class level at the reasonable prices of SG series. With tolerance of 3μm range (both pins and bushings) and clearance of 2～5μm range (one side), circularity, concentricity and surface roughness have been improved compared to SG series. These stripper guide pins and bushings are suitable for medium-scale production by precision dies.

- Outer diameter finishing with absolute tolerance
  W-EDM or jig polishers are generally used for machining mounting holes of pins and bushings for precision molds. To respond to this practice, we have set the absolute tolerances of $^{+0.003}_{0}$ for the holder of pins and $_{-0.005}^{0}$ for the outer diameter of bushings.

■Comparison of precision of stripper guide pins and bushings

Series	Dimensional precision at sliding part: Range of tolerance	Tolerance of pin	Tolerance of bushing	Clearance (One side : μm)	Press fit part of pin ( ) Demountable type	Outer diameter of bushing	Circularity: Pin and bushing	Concentricity: Pin (2)	Concentricity: Bushing	Surface roughness [Ra]: Pin	Surface roughness [Ra]: Bushing	Application
Hige precision **VG** series **WG** series	2 μm	−0.010 −0.012	−0.003 −0.005	2.5～4.5	+0.002 0	+0.002 0	1.5 μm	3 μm	5 μm	0.1	0.1	High speed, high precision mass production
		−0.007 (1) −0.009		1～3 (1)	0 (−0.002)							
TG series	3 μm	−0.010 −0.013	−0.003 −0.006	2～5	+0.003 0 (−0.003)	0 −0.005	1.5 μm	3 μm	10 μm	0.15	0.2	High precision medium-scale production
SG series	5 μm	−0.010 −0.015	−0.003 −0.008	1～6	m5 0 (−0.005)	h4	2 μm	5 μm	10 μm	0.2	0.2	Ordinary class medium-scale production

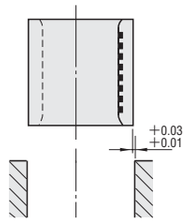
(1) For DKC alteration in diameter tolerance of stripper guide pins (2) Concentricity of press fit point and sliding part

■Stripper guide pins (3μm range)

Catalog No.	Material	Type	Features
TGPH	SUJ2	Headed	●The guide pins are finished with the perpendicularity between the holder end and guide being 0.01/100mm.
TGPN		Straight	
TGPR		Demountable	

■Stripper guide bushings (3μm range)

Catalog No.	Material	Lubrication	Type	Seize resistance Inferior 1←→5Superior
TGBL	SUJ2	Oil type	Straight	3
TGBT			Headed	
TGBZ	FC250+MoS_2	Oil-free type	Straight	4
TGHZ			Headed	
TGSF	SUJ2+Copper alloy	Oil type	Straight	4
TGBF			Headed	
TGCZ	SUJ2+Copper alloy+MoS_2	Oil-free type	Straight	5
TGFZ			Headed	
TGBM	Special sintered alloy	Oil-free type	Straight	5
TGHM			Headed	



- Recommended clearance between bushing and mounting hole (one side $^{+0.03}_{+0.01}$)
- Apply optional DLC (groove machining for Loctite) when preparing the mounting hole with a jig grinder and adhering of the bushing with no clearance.
- Use Loctite No. 638 for adhesion.
- To increase the adhesion strength, remove oil from the outer diameter of bushing and mounting hole. (Do not remove oil from the inner surface of bushing.)

●Oil type : Circular oil grooves are machined inside the bushing.

●Oil-free type : Molybdenum disulfide (MoS_2), which is known for its low friction coefficient among solid lubricants, is embedded in the sliding part. The part is also impregnated in lubricant. Thus, wear resistance and seize resistance have been highly improved. As the solid lubricant is not embedded in the outer circumference of the bushing, it is possible to degrease and easy to adhere with Loctite. Though this type can be used without lubricant, applying initial breaking-in grease or lubrication will improve the endurance. (Recommended lubricant VG68)

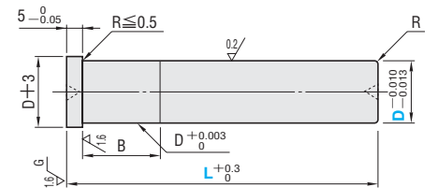
●Copper alloy type : Seize resistance is excellent because copper alloy is sintered on the internal surface of bushing.

●Sintered alloy type : A new type of oil-free bushing in which solid lubricant made mainly of graphite is dispersed and sintered. It is also impregnated with oil. Its friction coefficient is lower than those of cast iron or copper alloy bushings, and its wear resistance is superior. The solid lubricant is evenly dispersed and sintered around the bushing, allowing high-speed operation without losing oil film.

Notes Use oil-free types with stroke of 1mm or more. Do not clean the inside of the bushing because lubricant is impregnated.

RoHS

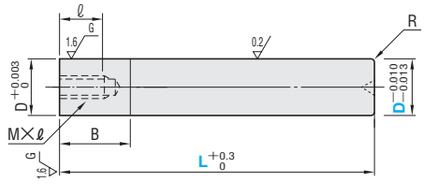
TGPH (Headed type)



M SUJ2
H 58HRC～

RoHS

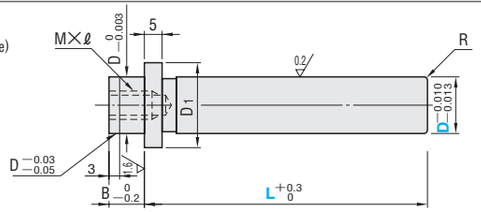
TGPN (Straight type)



M SUJ2
H 58HRC～

RoHS

TGPR (Demountable type)



M SUJ2
H 58HRC～

TGPN M×ℓ Pitch	R	B	Catalog No. Type	D	L	U/Price Q'ty 1～9 TGPH	TGPN
M5×12 P0.8	1.0	13	TGPH TGPN	10	40 50 60 70 80 100	1,320	1,150
						1,350	1,180
						1,550	1,380
M6×15 P1.0	1.5	16		13	50 60 70 80 90 100 120	1,440	1,260
						1,540	1,340
						1,780	1,560
		20		16	50 60 70 80 90 100 110 120 140	1,660	1,450
						1,820	1,560
						2,120	1,680
M8×20 P1.25	2.0	25		20	70 80 90 100 110 120 140	2,030	1,750
						2,220	1,930
						2,440	2,270
		28		25	70 80 90 100 110 120 140	2,690	2,400
						3,130	2,690
						3,710	3,290

M×ℓ Pitch	D_1	R	B	Catalog No. Type	D	L	U/Price Q'ty : 1～9
M5×12 P0.8	16	1.0	8	TGPR	10	40 50 60	1,850
							1,950
M6×15 P1.0	20	1.5	10		13	40 50 60 70	2,080
							2,290
	23				16	40 50 60 70 80 90 100	2,390
							2,740
M8×20 P1.25	27	2.0	13		20	50 60 70 80 90 100	2,910
							3,390

Order Catalog No. — L
TGPH 16 — 100

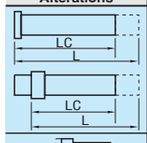
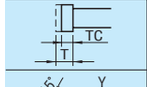
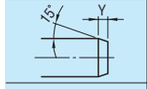
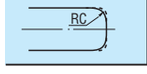
Delivery
●TGPH·TGPN: 1 Day
●TGPR: 3 Days / Express A / 500/1pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price
■Volume discount rate P.37

Quantity	1～9	10～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC) — (TC・GC・RC)
TGPH 16 — LC95.0 — TC4.0 — GC — RC2.5

Alterations	Code	Spec.	¥/1Code
	LC	Changes dimension L (full length) 0.5mm increments D: 10 / 13・16 / 20・25 LC TGPH・TGPN: 30≦LC<L / 40≦LC<L / 60≦LC<L LC TGPR: 30≦LC<L / 40≦LC<L / 50≦LC<L	500
	TC	Changes dimension T (head thickness) 0.1mm increments 2≦TC<5 L becomes shorter by (5−TC), When LC is applied, full length is equal to LC. (5−TC≦Lmax−LC) Applicable only to TGPH.	200
	GC	Adds taper on the tip D: 10 / 13 / 16 / 20・25 — Y: 3 / 5	200
	RC	Changes dimension R (radius) on the tip D: 10 / 13・16 / 20・25 — Normal type R: 1.0 / 1.5 / 2.0 — RC(Selection): 1.5・2.0 / 2.0・2.5 / 2.5・3.0	200

PRESS ADD.SPEC. Printed in Red

3μmRANGE STRIPPER GUIDE BUSHINGS

DELIVERY SHORTENED

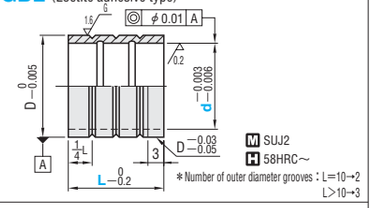
TGBZ·TGHZ
TGCZ·TGFZ
3 Days → 1 Day

The volume discount rate is also applicable to alteration cost. P.39

■Oil type

RoHS

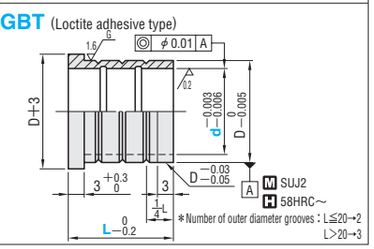
TGBL (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
14	TGBL	10	10 13 16 20 22 25	1,610
18		13	13 16 20 22 25 30	1,700
22		16	16 20 22 25 30 35	1,850
25		20	20 22 25 30 35	2,100

RoHS

TGBT (Loctite adhesive type)

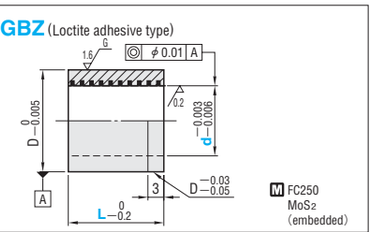


D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
14	TGBT	10	10 13 16 20 22 25	1,760
18		13	13 16 20 22 25 30	1,870
22		16	16 20 22 25 30 35	2,040
25		20	20 22 25 30 35	2,290

■Oil-free type

RoHS

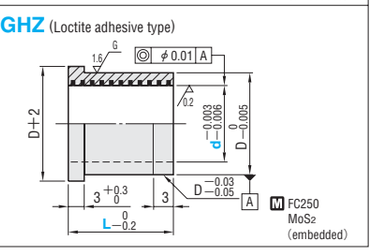
TGBZ (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16	TGBZ	10	10 13 16 20 22 25	1,980
20		13	13 16 20 22 25 30	2,130
24		16	16 20 22 25 30 35	2,340
28		20	20 22 25 30 35	2,650
34		25	20 22 25 30 35	3,200

RoHS

TGHZ (Loctite adhesive type)

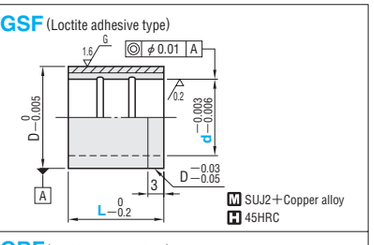


D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16	TGHZ	10	10 13 16 20 22 25	2,140
20		13	13 16 20 22 25 30	2,290
24		16	16 20 22 25 30 35	2,550
28		20	20 22 25 30 35	2,880
34		25	20 22 25 30 35	3,560

■Copper alloy oil type

RoHS

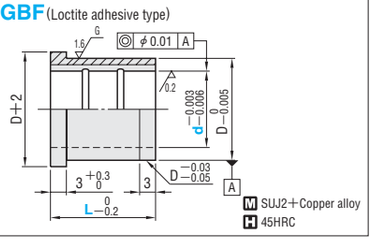
TGSF (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16	TGSF	10	10 13 16 20 22 25	2,260
20		13	13 16 20 22 25 30	2,460
24		16	16 20 22 25 30 35	2,680
28		20	20 22 25 30 35	3,000

RoHS

TGBF (Loctite adhesive type)

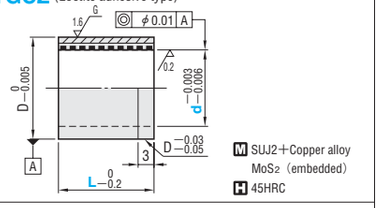


D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16	TGBF	10	10 13 16 20 22 25	2,400
20		13	13 16 20 22 25 30	2,630
24		16	16 20 22 25 30 35	2,810
28		20	20 22 25 30 35	3,210

■Copper alloy oil-free type

RoHS

TGCZ (Loctite adhesive type)

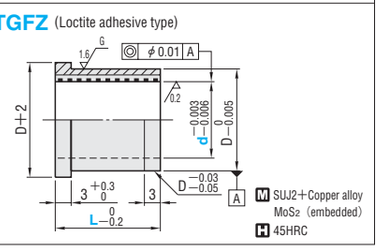


D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16	TGCZ	10	10 13 16 20 22 25	2,490
20		13	13 16 20 22 25 30	2,680
24		16	16 20 22 25 30 35	2,960
28		20	20 22 25 30 35	3,370
34		25	20 22 25 30 35	3,920

＊MoS2 is a special hard lubricant which provides outstanding wear resistance.

RoHS

TGFZ (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16	TGFZ	10	10 13 16 20 22 25	2,690
20		13	13 16 20 22 25 30	2,880
24		16	16 20 22 25 30 35	3,220
28		20	20 22 25 30 35	3,620
34		25	20 22 25 30 35	4,500

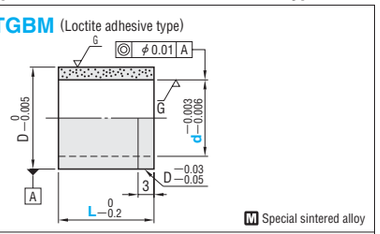
＊MoS2 is a special hard lubricant which provides outstanding wear resistance.

■Sintered alloy (Dispersed solid lubricant) oil-free type

Product data P.794

RoHS

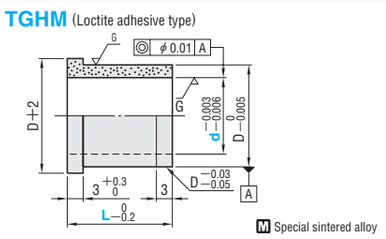
TGBM (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16	TGBM	10	10 13 16 20 22 25	2,490
20		13	13 16 20 22 25 30	2,680
24		16	16 20 22 25 30 35	2,960
28		20	20 22 25 30 35	3,670

RoHS

TGHM (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16	TGHM	10	10 13 16 20 22 25	2,690
20		13	13 16 20 22 25 30	2,880
24		16	16 20 22 25 30 35	3,220
28		20	20 22 25 30 35	3,920

●TGBZ·TGHZ·TGCZ·TGFZ
1 Day

Order — Catalog No. — L
TGBZ 16 — 20

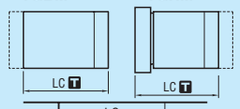
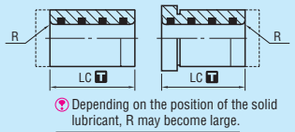
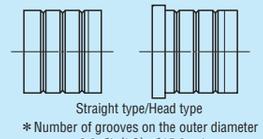
Alteration — Catalog No. — L(LC) — (DLC)
TGFZ 20 — LC28 — DLC
3 Days
Express A 500/1pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.

Delivery
●TGBL·TGBT·TGSF·TGBF·TGBM·TGHM
3 Days
Express A 500/1pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price
■Volume discount rate P.37

Quantity	1~9	10~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration	Changes dimension L (full length)		Machines grooves for Loctite.
Code	LC		DLC
Spec.	●TGBL· TGSF TGBM ●TGBT· TGBF TGHM	●TGBZ· TGCZ ●TGHZ· TGFZ	Grooves are machined on the outer diameter of bushing for Loctite.
			
	d / LC 0.1mm increments / T: 10 8.0≦LC<L; 13 10.0≦LC<L; 16 13.0≦LC<L; 20 16.0≦LC<L; T = 0 −0.2	Depending on the position of the solid lubricant, R may become large. d / LC 0.1mm increments / T: 10 8.0≦LC<L; 13 10.0≦LC<L; 16 13.0≦LC<L; 20 16.0≦LC<L; T = 0 −0.2	Straight type/Head type ＊Number of grooves on the outer diameter 8.0≦L (LC) ≦15.9→1 16.0≦L (LC) ≦24.9→2 25.0≦L (LC) ≦35.0→3 Apply this alteration to prepare the mounting hole with jig grinder, etc. and to adhere the bushing with nearly 0 clearance. ⊗ Not applicable to TGBL and TGBT.
¥/1Code	400	500	300

HIGH PRECISION STRIPPER GUIDE PINS & BUSHINGS
—GUIDE—

■High precision stripper guide pins

Type	Catalog No.	M	Refer page
Headed	VGPH	SKD11	P.815
	WVGPH	Cemented carbide (V30)	P.814
Straight	VGPN	SKD11	P.815
	VGPS (Press-in lead)	SKD11	
	WVGPN	Cemented carbide (V30)	P.814
	WVGPS (Press-in lead)	Cemented carbide (V30)	
Demountable	VGPR	SKD11	P.816

- Cemented carbide (V30) : Use of a copper alloy bushing is recommended for cemented carbide guide pins.
- Lead-in part (**VGPS and WVGPS**) : Lead-in part is provided on the thread side. By adjusting the mounting hole, these types can be fixed either by press fit or transition fit.

■High precision stripper guide bushings

Type	Catalog No.	M	Type	Refer page
Headed	VGBH	SUJ2	Oil type	P.817
	VGHZ	SUJ2	Oil-free type	
	VSGBF	SUJ2+Copper alloy	Oil type	
	VGFZ	SUJ2+Copper alloy	Oil-free type	P.818
	VGHM	Special sintered alloy	Oil-free type	
Straight	VGBL	SUJ2	Oil type	P.817
	VGBZ	SUJ2	Oil-free type	
	VSGSF	SUJ2+Copper alloy	Oil type	
	VSGCZ	SUJ2+Copper alloy	Oil-free type	P.818
	VGBM	Special sintered alloy	Oil-free type	

- Oil type : A spiral oil groove of 6mm pitch is provided on the inner surface of the sliding part.
- Oil-free type : A special solid lubricant (main component : MoS_2) is ring-like embedded by 2mm pitch in the inner surface of the sliding part. Use without lubricant. (Applying initial break-in grease enhances the durability.)
- Copper alloy type : The guide's inner surface is coated with copper alloy for improved seize resistance.
- Sintered alloy type : A new type of oil-free bushing produced from a special alloy in which solid lubricant made mainly of graphite is dispersed and sintred. Its friction coefficient is lower than those of cast iron or copper alloy bushings, and its wear resistance is superior. The solid lubricant is evenly dispersed and sintered around the bushing, allowing high-speed operation without losing oil film.

Caution
(1) Use oil-free types (including sintered alloy type) with stroke of 1mm or more. Do not clean the bushing because lubricant is impregnated.
(2) To prepare mounting holes by jig grinder and to fix the bushing in the plate with no clearance, apply alteration DRC (to add groove for Loctite, see P.818.)

HIGH PRECISION **HIGH PRECISION STRIPPER GUIDE PINS/BUSHINGS WITH TOLERANCE RANGE OF 2 μm !**

HIGH PRECISION Stripper guide pins/Bushings are standard components most suitable for high precision and ultra-precision progressive dies.
Both outer diameter of pin and inner/outer diameters of bushing are finished with tolerance range of 2μm. The clearance between the pin and bushing (one side) is kept to a level of 2.5~4.5μm.

■Precision assurance

HIGH PRECISION Stripper guide pins/Bushings are not only examined at the time of processing but also reexamined after a certain period of time, one by one, in a temperature controlled room. The high precision stripper guide pins are bushings are delivered with certificate of examination.

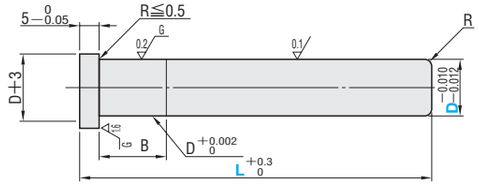
		Assured precision	
		Guide pin	Guide bushing
Measurement		Press fit part / Slide part	Inner diameter / Outer diameter
Dimension	Outer diameter / Inner diameter	Press fit part $^{+0.002}_{0}$ / Slide parts $^{-0.010}_{-0.012}$	Outer diameter $^{+0.002}_{0}$ / Inner diameter $^{-0.003}_{-0.005}$
	Concentricity	Between press fit part and sliding part within 0.003	Between outer diameter and inner diameter within 0.005
Shape	Circularity	Press fit part / Slide part within 0.0015	Between outer diameter and inner diameter within 0.0015
	Surface roughness	Press fit part within 0.2a / Sliding part within 0.1a	Outer diameter within 0.2a / Inner diameter within 0.1a

HIGH PRECISION CARBIDE STRIPPER GUIDE PINS
—HEADED TYPE / STRAIGHT TYPE—

The volume discount rate is also applicable to alteration cost. P.39

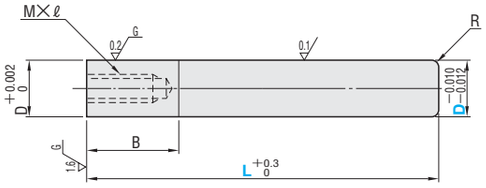
Use of copper alloy bushings (pages 817 and 818) is recommended for the carbide stripper guide pins.

RoHS **WVGPH** (Headed type)



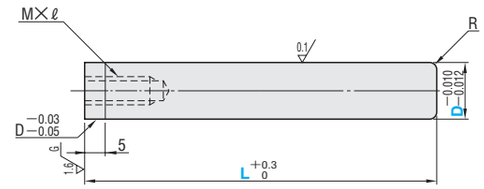
M V30 (HIP)
H 88~89HRA

RoHS **WVGPN** (Straight type)



M V30 (HIP)
H 88~89HRA

RoHS **WVGPS** (Straight type with lead-in part)



M V30 (HIP)
H 88~89HRA

M×ℓ Pitch	R	B	Catalog No. Type	Catalog No. D	L	U/Price Q'ty : 1~9 WVGPH	U/Price Q'ty : 1~9 WVGPN · WVGPS
M5×12 P0.8	1.0	13	WVGPH WVGPN WVGPS	10	50 60	12,320	12,050
					70	12,860	12,590
					100	15,650	15,290
M6×15 P1.0	1.5	16		13	60 70	12,950	12,590
					80 90	14,570	14,210
					120	18,080	17,720
		20		16	70 80	14,210	13,850
					90 100	16,190	15,830
					140	20,420	20,060
M8×20 P1.25	2.0	25		20	70 80	16,640	16,280
					90 100	19,160	18,800
					140	23,930	23,570

Order Catalog No. — L
WVGPH 13 — 60

Delivery 5 Days P.38
Express B 1,500/1pc.
A flat charge of 4,050 yen for 3 pieces or more of the same size.

Use an oil-free type bushing for the pins modified by DKC alteration. Oil type bushings may cause scuffing because oil film is hard to form on them.

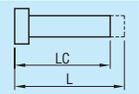
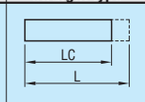
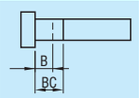
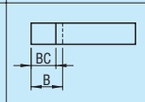
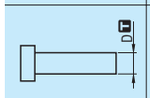
Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC) — (BC · DKC)
WVGPH 13 — LC55 — BC10
5 Days
Express service is not available.

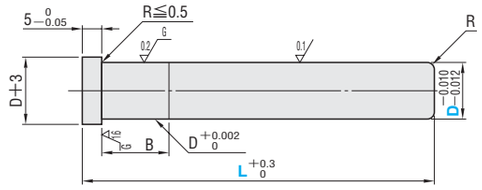
Alteration Headed type	Alteration Straight type	Code	Spec.	¥/1Code
		LC	Changes dimension L (full length) 30≦LC<L 0.5mm increments When full length is reduced shorter than min. length, apply BC accordingly if needed.	2,000
		BC	Changes dimension B ・WVGPH : 0≦BC≦D×2 ・WVGPN : 6≦BC≦D×2 0.5mm increments Not applicable to WVGPS.	2,000
		DKC	Changes outer diameter tolerance D −0.010 −0.012 ⇨ D −0.007 −0.009 The clearance between pin and bushing is 1 to 3 μm on each side. Note that **only oil-free type bushings** can be used.	3,000

HIGH PRECISION STRIPPER GUIDE PINS
—HEADED TYPE / STRAIGHT TYPE—

The volume discount rate is also applicable to alteration cost. P.39

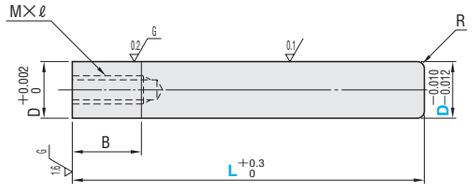
RoHS

VGPH
(Headed type)



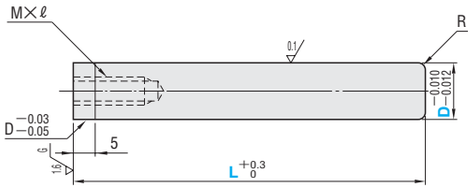
RoHS

VGPN
(Straight type)



RoHS

VGPS
(Straight type with lead-in part)



M×ℓ Pitch	R	B	Catalog No. Type	D	L	U/Price Q'ty：1～9 VGPH	VGPN·VGPS
M5×12 P0.8	1.0	10	VGPH VGPN VGPS	8	40 50 60 70 80	2,820	2,670
		13		10	40 50 60 70 80 90 100	2,920	2,770
M6×15 P1.0	1.5	16		13	50 60 70 80 90 100 110 120	2,910	2,760
		20		16	50 60 70 80 90 100 110 120 130 140	3,010	2,860
M8×20 P1.25	2.0	25		20	60 70 80 90 100 110 120 130 140	3,100	2,950
		28		25	70 80 90 100 110 120 130 140 150	3,200	3,050
						3,690	3,500
						3,490	3,320
						3,690	3,500
						4,270	4,060
						4,180	3,970
						4,360	4,160
						4,950	4,710
						5,250	4,800
						5,440	4,980
						5,820	5,530

Order Catalog No. — L
VGPH 10 — 60

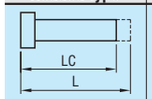
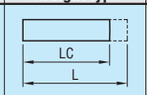
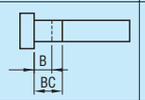
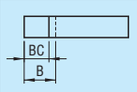
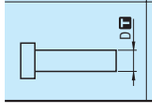
Delivery 3 Days P.38
Express T 1,600/1pc.
Express A 800/1pc.
A flat charge of 2,160 yen for 3 pieces or more of the same size. (excluding Express T)

Price ■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC) — (BC・DKC)
VGPH 10 — LC55 — BC10
The delivery schedule varies depending on the specified alteration (see the table below).

Alterations Headed type	Alterations Straight type	Code	Spec.	¥／1Code
		LC	Changes dimension L (full length) 30≦LC＜L 0.5mm increments 3 Days Express A When full length is reduced shorter than min. length, apply BC accordingly if needed.	1,000
		BC	Changes dimension B 0.5mm increments ・VGPH：0 or 3≦BC≦D×2 ・VGPN：6≦BC≦D×2 3 Days ⊗ Not applicable to VGPS.	1,000
		DKC	Changes outer diameter tolerance D −0.010 −0.012 ⇨ D −0.007 −0.009 3 Days The clearance between pin and bushing is 1 to 3 μm on each side. Note that **only oil-free type bushings** can be used.	2,000

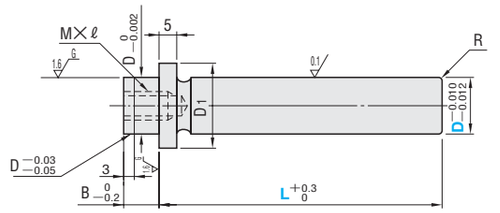
Use an oil-free type bushing for the pins modified by DKC alteration. Oil type bushings may cause scuffing because oil film is hard to form on them.

HIGH PRECISION STRIPPER GUIDE PINS
—DEMOUNTABLE TYPE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

VGPR



M×ℓ Pitch	D1	R	B	Catalog No. Type	Catalog No. D	L	U/Price Q'ty：1～9
M5×12 P0.8	16	1.0	8	VGPR	10	30 40 50 60 70 80	4,630
							4,970
M6×15 P1.0	20	1.5	10		13	40 50 60 70 80 90 100	4,670
							4,990
	23						5,090
					16	40 50 60 70 80 90 100 110 120	4,910
M8×20 P1.25	27	2.0	13				4,990
							5,640
					20	50 60 70 80 90 100 110 120	5,570
							5,660
							6,250

Order Catalog No. — L
VGPR 16 — 100

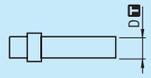
Delivery 3 Days Express A 800/1pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price ■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC) — (DKC)
VGPR 10 — LC55
The delivery schedule varies depending on the specified alteration. (See the table below.)

Alteration	Code	Spec.	¥／1Code
	LC	Changes dimension L (full length) 30≦LC＜L 0.5mm increments 3 Days Express A	1,000
	DKC	Changes outer diameter tolerance D −0.010 −0.012 ⇨ D −0.007 −0.009 3 Days The clearance between pin and bushing is 1 to 3 μm on each side. Note that **only oil-free type bushings** can be used.	2,000

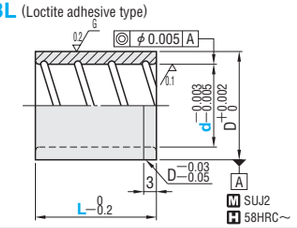
Use an oil-free type bushing for the pins modified by DKC alteration. Oil type bushings may cause scuffing because oil film is hard to form on them.

HIGH PRECISION STRIPPER GUIDE BUSHINGS
—OIL TYPE/OIL-FREE TYPE—

The volume discount rate is also applicable to alteration cost. P.39

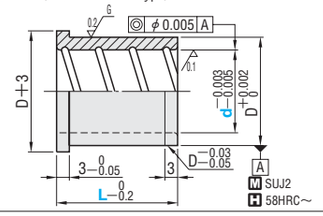
■Oil type

VGBL (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
12	VGBL	8	10 13 16 20	3,330
14		10	10 13 16 20 22 25	3,420
18		13	13 16 20 22 25 30	3,600
22		16	16 20 22 25 30 35	3,870
25		20	20 22 25 30 35	4,340
32		25	20 22 25 30 35	5,170

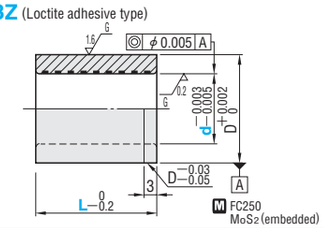
VGBH (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
12	VGBH	8	10 13 16 20	3,500
14		10	10 13 16 20 22 25	3,590
18		13	13 16 20 22 25 30	3,790
22		16	16 20 22 25 30 35	4,080
25		20	20 22 25 30 35	4,560
32		25	20 22 25 30 35	5,440

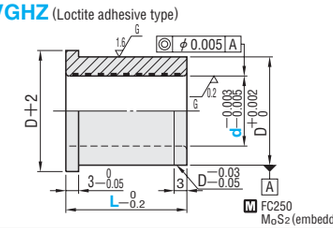
■Oil-free type

VGBZ (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
13	VGBZ	8	10 13 16 20	3,970
16		10	10 13 16 20 22 25	4,060
20		13	13 16 20 22 25 30	4,340
24		16	16 20 22 25 30 35	4,800
28		20	20 22 25 30 35	5,350
34		25	20 22 25 30 35	6,270

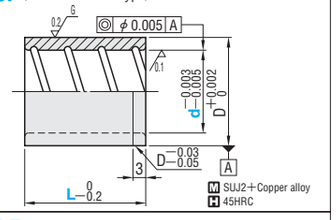
VGHZ (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
13	VGHZ	8	10 13 16 20	4,180
16		10	10 13 16 20 22 25	4,270
20		13	13 16 20 22 25 30	4,560
24		16	16 20 22 25 30 35	5,050
28		20	20 22 25 30 35	5,630
34		25	20 22 25 30 35	6,610

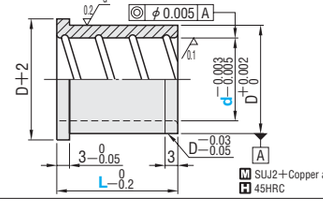
■Copper alloy oil type

VSGSF (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16	VSGSF	10	10 13 16 20	4,180
20		13	13 16 20 25	4,590
24		16	16 20 25 30	4,950
28		20	20 25 30	5,510

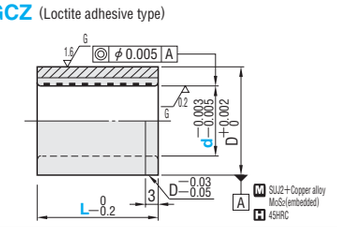
VSGBF (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16	VSGBF	10	10 13 16 20	4,280
20		13	13 16 20 25	4,780
24		16	16 20 25 30	5,160
28		20	20 25 30	5,730

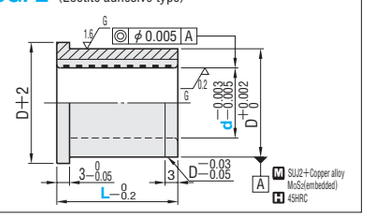
■Copper alloy oil-free type

VSGCZ (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16	VSGCZ	10	10 13 16 20	4,580
20		13	13 16 20 25	4,950
24		16	16 20 25 30	5,400
28		20	20 25 30	6,050
34		25	25 30	6,920

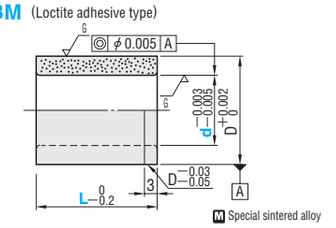
VSGFZ (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16	VSGFZ	10	10 13 16 20	4,760
20		13	13 16 20 25	5,140
24		16	16 20 25 30	5,610
28		20	20 25 30	6,270
34		25	25 30	7,100

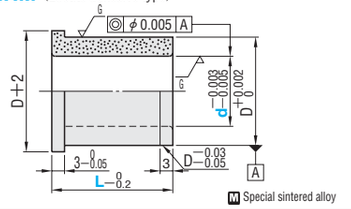
■Sintered alloy(dispersed solid lubricant) oil-free type PRODUCT DATA P.794

VGBM (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16	VGBM	10	10 13 16 20	5,090
20		13	13 16 20 25	5,500
24		16	16 20 25 30	6,000
28		20	20 25 30	7,020

VGHM (Loctite adhesive type)



D	Catalog No. Type	d	L	U/Price Q'ty : 1~9
16	VGHM	10	10 13 16 20	5,290
20		13	13 16 20 25	5,710
24		16	16 20 25 30	6,230
28		20	20 25 30	7,270

Order Catalog No. — L (VGBH 10 — 16)

Price

Delivery
- VGBL
- VGBH
- VGBZ
- VGHZ

3 Days

Express T 1,600/1pc.
Express A 800/1pc.
P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size. (excluding Express T)

- VSG□F
- VSG□Z
- VGBM
- VGHM

3 Days

Express A 800/1pc.
P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration Catalog No. — L(C) —(DRC) (VGBH 10 — LC12.5)

3 Days ⊗Express service is not available

Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

- Structure of sliding part (inner surface) of oil type bushings
  To prevent scuffing, a spiral oil groove is provided, passing through the inner surface of the bushing.
  Pitch : 6mm Width : 1.5mm Depth : 0.5mm
- How to fix : Loctite adhesive
  Loctite No. 638 P.758
- Clearance between pin and bushing (on one side) is 2.5~4.5 μm.
- Use oil-free types with stroke of 1mm or more.

Alteration	Changes dimension L(full length)	Machines groove for Loctite
Code	LC	DRC
Spec.	●VGBH・VGHM ●VGBL・VGBM (LC T L) ⊗VGHZ, VGBZ, VSG□F, and VSG□Z are not available.	●Head type ●Straight type (Groove for Loctite, 3, ℓ, L) ●Head type ……ℓ = L/2 −2 ●Straight type ……ℓ = L/2 ⊗L=10 is not applicable to VGBH, VGBL, VGHZ and VGBZ. ⊗Cannot be combined with LC.
¥/1Code	1,500	600

d	LC 0.1mm increments VGBL・VGBH	LC 0.1mm increments VGBM・VGHM	T
8	8.0~19.9	—	0 −0.2
10	8.0~24.9	8.0~19.9	
13	10.0~29.9	10.0~24.9	
16	13.0~34.9	13.0~29.9	
20	16.0~34.9	16.0~29.9	
25	20.0~34.9	—	

HIGH RIGIDITY STRIPPER GUIDE PINS & BUSHINGS —STRIPPER PLATE FIXING— —GUIDE—

■Features of High Rigidity Stripper Guide Pins

1. High levels of rigidity and precision

Since the guide pins are designed to be fixed to the stripper plate, which is close to the cutting part (punch・die), the shaft rigidity can be improved by a number of times compared to conventional fixing methods. Therefore, higher level of precision punching is realized. In addition, the guide's improved reliability helps prolong the die's life cycle.

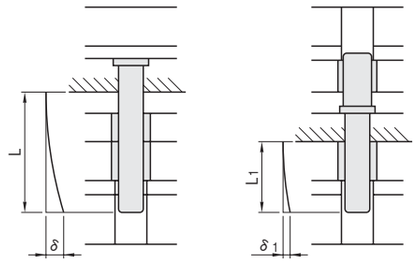
2. High level of durability

To improve durability, the guide posts are thoroughly quenched.

3. Three guide types are available

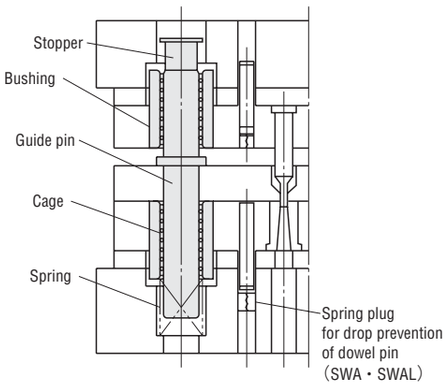
Guide type	Features
Needle roller bearing guide	The large contact area of needle roller, which is several times larger than that of ball bearings, realized the high rigidity close to plain guide. Needle roller guide provides superb rigidity and precision that is unavailable with ball bearing guide.
Ball bearing guide	The use of high rigidity ball cages (MBSH / MBJH), enables the rigidity close to plain guide and the high speed operation with low cost.
Plain guide	A wide variety of plain bushings, including SUJ2, copper alloy type, oil free types, etc. are available.

Fig.1 Punch plate fixing type **Fig.2 Stripper plate fixing type**



Deflection $\delta = WL^3 / 3EI$
As deflection is in proportion to L^3 of the pin, the stripper plate fixing type guide pins whose guide length is shorter can achieve higher level of rigidity.

Fig.3 Example



How to mount

■Preparing mounting holes for guide pins and bushings

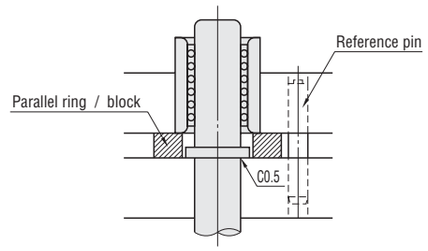
- Prepare mounting holes for post and bushing by boring, jig grinder, etc.
- In order to set the plates (punch / die / stripper) in required baseline, you may prepare a dummy hole for inserting a reference pin.
- Dowel pins are not necessary as the guide pins and bushing can perform as baseline for machining the plates (punch / die / stripper). If dowels are used for easier assembling, prepare one of the holes slightly larger (apx. 0.1mm) than the actual measurement. This is to prevent thrust load from applying to the guide pin and bushing, which may occur if the dowel pins are positioned inaccurate.

■Mounting guide pins

- Mount the guide pin either by transition fit or press fit .
- Check the perpendicularity of the guide pin (0.01mm/100mm or less).

■How to mount the guide bushing

- Insert the bushing so that its matchmark / symbol align with their counterparts on the guide pin. (For needle roller type)
- Place a parallel ring / block on the stripper plate and mount the die (punch) plate. Then slide the guide bushing to check if there is any interference.
- After cleaning any oil or soil on the contact surface, put anaerobic adhesive agent (Loctite 638 recommended) into the guide bushing's adhesive groove, and insert the bushing into the mounting hole.Keep the guide bushing the in place, and wait 3 to 6 hours (at ambient temperature) for the adhesive agent to harden.



■Criteria for positioning needle roller retainer and ball retainer

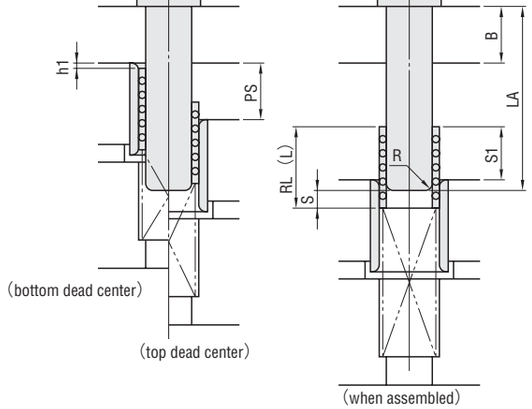
(The calculation methods explained here are reference only, as calculation results may vary depending on conditions such as pitch errors in the distribution of needle roller and ball bearings.)

Die side : Protruding length from the die plate : S1
S1= (LA−B−2R) / 2+h1
Dimension S of the stopper
S=RL−S1 (Roller)
S=L −S1 (Ball)

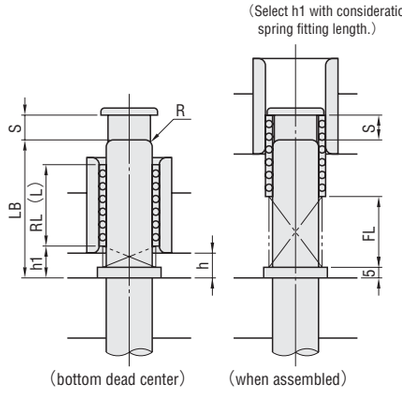
Punch side : Dimension S of the stopper
S=RL+h1−R−{(h+LB) / 2} (Roller)
S=L +h1−R−{(h+LB) / 2} (Ball)

References for selecting spring length FL
FL= (LB+S−RL−5) ×1.1～1.2…with stopper
FL= (LB+S−RL−5) …without stopper

- Guide pin length : LA, LB
- Guide pin's end face : R
- Cage length : RL (Roller) L (Ball)
- Press stroke : P.S.
- Stripper plate thickness : B
- Gap between the stripper plate and punch plate (bottom dead center) : h
- Distances between the stripper plate and roller retainer, and ball retainer (bottom dead center) : h1
(Select h1 with consideration of the spring fitting length.)



If the cage is positioned at S1 from the die plate when assembled, its bottom dead center position is h1.



If the retainer is positioned at S when assembled, its bottom dead center position is h1.

Notes :

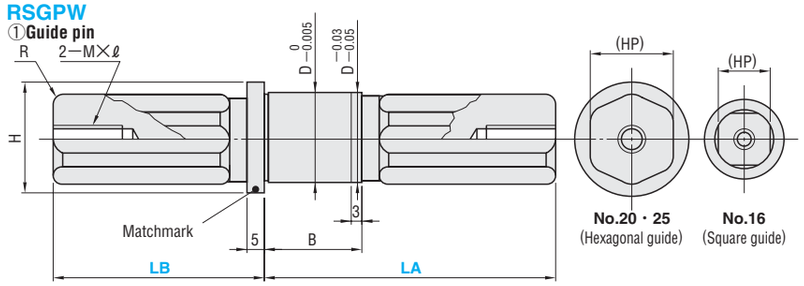
- Select an appropriate guide pin length so that the guide bushing will not leave the guide pin at the top dead center during press.
- The stripper plate thickness must be larger than the guide pin's port diameter (PD).
- Make sure to lubricate periodically.
- Assemble the die set in accordance with the accuracy standard shown in P.830.

HIGH RIGIDITY NEEDLE ROLLER STRIPPER GUIDE PIN SETS
—STRIPPER PLATE FIXING TYPE / DOUBLE ROLLER TYPE—

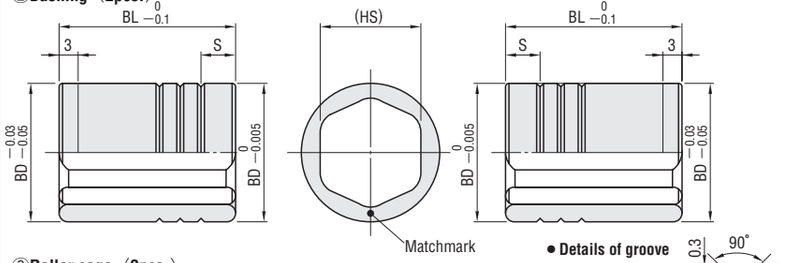
RoHS

RSGPW

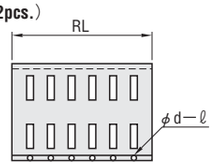
①Guide pin



②Bushing（2pcs.）



③Roller cage（2pcs.）



①Guide pin
M SKS3
H 60～62HRC

②Bushing（2pcs.）
M SKS3
H 60～62HRC

③Roller cage（2pcs.）
M SUJ2
Super engineering plastic

①Guide pin						②Bushing					③Roller cage			Catalog No.		LA	LB 10mm increments	U/Price
D	B	R	M×ℓ	H	(HP)	BD	BL	(HS)	S	Number of grooves	RL	d	ℓ	Type	No.			Q'ty：1～9
16.5	16	1.5	M6×15	23	14.5	28	40	18.5	7	3	30	2.0	6.8	RSGPW	16	70	40～60	55,800
																80	40～70	56,600
																90	50～80	57,400
20.5	20	2	M8×20	27	19	34	50	23			46				20	80	50～70	57,000
																90	50～80	57,800
																100	60～90	58,600
25.5	25	3		32	24	40	60	28	8		56		7.8		25	90	60～80	58,200
																100	60～90	59,000
																110	70～90	59,900

Order

Catalog No.	—	LA	—	LB
RSGPW 25	—	100	—	70

Price

■Volume discount rate P.37

Quantity	1～9	10～20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

Delivery 8 Days

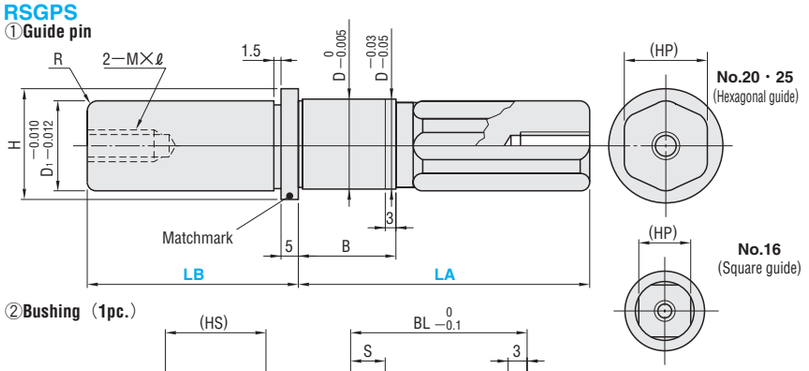
Notes：
- The roller bearing guide pin's D dimension is 0.5mm larger than the nominal diameter（No.）.
- Make sure to align the matchmarks and symbols on the guide pin head and bushing concentricity of matchmarks：within 3 μm.
- Set the bushing so that its matchmark faces with the guide pin's head.
- Select an appropriate guide pin length so that the guide bushing will not leave the guide pin at the top dead center during press processing.
- Do not modify the roller bearing guides.（It may decrease precision or performance.）
- For the features of the stripper plate fixing guide pin and the method of its mounting, refer to P.819.

HIGH RIGIDITY NEEDLE ROLLER STRIPPER GUIDE PIN SETS
—STRIPPER PLATE FIXING / SINGLE ROLLER TYPE—

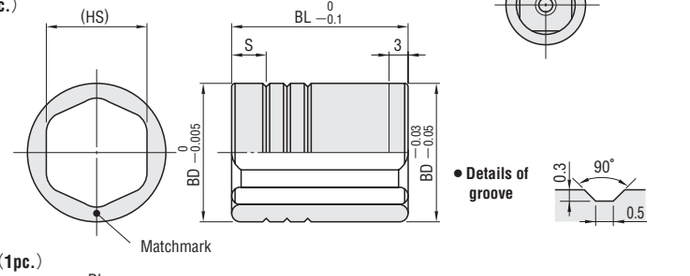
RoHS

RSGPS

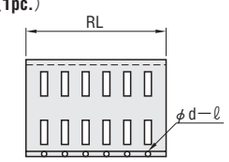
①Guide pin



②Bushing（1pc.）



③Roller cage（1pc.）



①Guide pin
M SKS3
H 60～62HRC

②Bushing（1pc.）
M SKS3
H 60～62HRC

③Roller cage（1pc.）
M SUJ2
Super engineering plastic

①Guide pin							②Bushing					③Roller cage			Catalog No.		LA	LB 10mm increments	U/Price
D	D1	B	R	M×ℓ	H	(HP)	BD	BL	(HS)	S	Number of grooves	RL	d	ℓ	Type	No.			Q'ty：1～9
16.5	16	16	1.5	M6×15	23	14.5	28	40	18.5	7	3	30	2.0	6.8	RSGPS	16	70	40～60	39,000
																	80	40～70	39,500
																	90	50～80	40,000
20.5	20	20	2	M8×20	27	19	34	50	23			46				20	80	50～70	40,200
																	90	50～80	40,700
																	100	60～90	41,200
25.5	25	25	3		32	24	40	60	28	8		56		7.8		25	90	60～80	41,400
																	100	60～90	41,900
																	110	70～90	42,400

Order

Catalog No.	—	LA	—	LB
RSGPS 25	—	100	—	70

Price

■Volume discount rate P.37

Quantity	1～9	10～20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

Delivery 8 Days

■Features

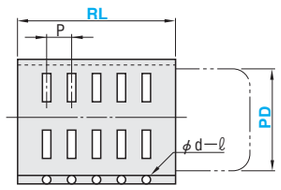
A decrease in costs by about 30%, compared with RSGPW, has been achieved by making the guide round on the punch plate side which has less movement.

Notes：
- The roller guide pin's D dimension is 0.5mm larger than the nominal diameter number（No.）.
- Make sure to align the matchmarks and symbols on the guide pin head and bushing concentricity of matchmarks：within 3 μm.
- Set the bushing so that its matchmark face with the guide pin's head.
- Select an appropriate guide pin length so that the guide bushing will not leave the guide pin at the top dead center during press processing.
- Do not modify the roller guide.（It may decrease precision or performance.）
- Use a high rigidity ball cage（MBJH：P.808）, bushing for ball bearing cage（SGBBW：P.807）or high precision oil-free bushing（P.817, P.818）on the LB side.
- For the features of the stripper plate fixing guide pin and the method of its mounting, refer to P.819.

ROLLER CAGE/FIXING TYPE STOPPERS FOR ROLLER RETAINER/SPRINGS FOR ROLLER

RBJ (Roller cage)

RoHS



M SUJ2
Super engineering plastic

d	ℓ	P	No. of rollers	Catalog No. Type	PD	RL	U/Price Q'ty：1～9
2.0	6.8	4.7	24	RBJ (Roller cage)	16	30	7,100
2.0	6.8	6	42		20	46	7,900
2.0	7.8	6.4	48		25	56	7,900

Order Catalog No. — RL
RBJ 20 — 46

Delivery 3 Days

Express	T	1,000/1pc.
Express	A	500/1pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

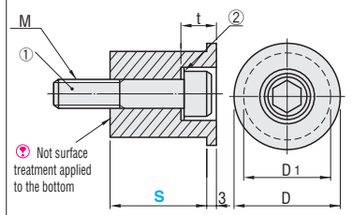
Price Volume discount rate P.37

Quantity	1～9	10～20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

RSTKH (Fixing type stopper for roller cage)

RoHS



M S45C
S Electroless nickel plating
A ①CB ②Spring washer

D	D1	t	Catalog No. Type	PD	S 1mm increments	U/Price Q'ty：1～9
17	13.5	8.5	RSTKH (Fixing type stopper)	16	11～20	830
21	18	11		20	11～25	870
26	23	11		25	11～30	980

Order Catalog No. — S
RSTKH 16 — 12

Delivery 3 Days

Express	A	500/1pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price Volume discount rate P.37

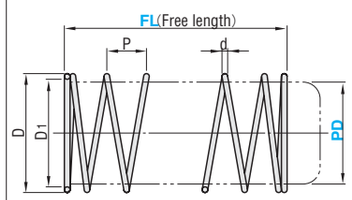
Quantity	1～9	10～20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

①Bolt CB PD (No.)	S 11～13	14～18	19～23	24～28	29～30
16	M6×15	M6×20	M6×25	—	—
20	M8×15	M8×20	M8×25	M8×30	—
25	M8×15	M8×20	M8×25	M8×30	M8×35

RSWP (Springs for roller bearing guide)

RoHS



M SWP—B

D	D1	d	P	Catalog No. Type	PD	FL 5mm increments	U/Price Q'ty：1～9
17.9	16.3	0.8	14	RSWP (Spring for roller)	16	30～80	300
22.1	20.3	0.9	14		20	35～80	350
27.2	25.4	0.9	15		25	40～80	400

Order Catalog No. — FL
RSWP 20 — 80

Delivery 3 Days

Express	T	1,000/1pc.
Express	A	500/1pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Price Volume discount rate P.37

Quantity	1～9	10～20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

Spring solid height (mm) / Spring constant (g/mm)

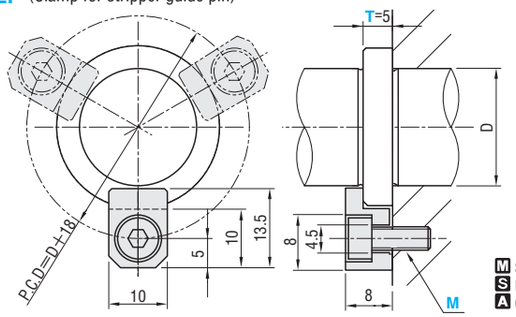
Type	PD	FL(Free length) 30	35	40	45	50	55	60	65	70	75	80
RSWP	16	3.7	4.1	4.4	4.6	5.0	5.3	5.7	5.9	6.2	6.6	6.9
		32	26	23	22	20	19	16	15	14	13	12
	20	—	4.1	4.4	4.7	5.0	5.3	5.7	5.9	6.3	6.7	6.9
			28	24	22	19	18	16	15	14	13	12
	25	—	—	4.2	4.5	4.8	5.1	5.4	5.7	6.0	6.3	6.6
				13	12	10	9	9	8	8	7	7

Upper row：Solid height
Lower row：Spring constant

CLAMPS FOR STRIPPER GUIDE PIN

FCLP (Clamp for stripper guide pin)

RoHS



M S45C
S Black oxide (Fe_3O_4)
A CB4—10

Catalog No. Type	T	M	U/Price (1Pc.) Q'ty：1～9
FCLP	5	4	250

FCLP can be used as a clamp for SGPWH, RSGPW and RSGPS. For D20 and below, use three clamps and for D25 and above, use four clamps.

Order Catalog No. — M
FCLP 5 — 4

Delivery 3 Days

Express	A	500/1pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price Volume discount rate P.37

Quantity	1～9	10～20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

GUIDE POSTS & BUSHINGS FOR DIE SET

GUIDE POSTS & BUSHINGS FOR DIE SET

Name	NEEDLE ROLLER BEARING GUIDE POST SETS			ROLLER CAGES	STOPPERS	STOPPERS	SPRINGS	ANTI-RISE RINGS FOR CAGE
Catalog No.	RGBL	RGSL	RGKL	RBJ	RSTM	RSTK	RSWP	RWR
Delivery		⑤ Ⓑ ⑧		③ Ⓣ Ⓐ	③ Ⓣ Ⓐ	③ Ⓣ Ⓐ	③ Ⓣ Ⓐ	③ Ⓣ Ⓐ
Page		831		833	833	833	834	834

BALL BEARING GUIDE POST SETS —High-rigidity, Demountable post type—			BALL BEARING GUIDE POST SETS —Demountable post type—		
RBSH QBSH	RMSH QMSH	RKSH QKSH	RB QB	RM QM	RK QK
①	①	①	①	①	①
835	835	835	835	835	835

BALL BEARING GUIDE POST SETS —High-rigidity, Press fit type—			BALL BEARING GUIDE POST SETS —Press fit post—		
PBSH GBSH	PMSH GMSH	PKSH GKSH	PB GB	PM GM	PK GK
①	①	①	①	①	①
837	837	837	837	837	837

PLAIN GUIDE POST SETS				GUIDE POSTS	
RD RF	RZ RFZ	PD PF	PZ PFZ	MRP BRPM BRPK MSP BSPM BSPK	
①	①	①	①	①	
839	839	841	841	843	843

GUIDE POSTS —Length specified type—		BALL BEARING GUIDE BUSHINGS	—Length specified type—	BALL BEARING GUIDE BUSHINGS—Demountable type—	BALL BEARING GUIDE BUSHINGS
MRP BRPM BRPK	MSP BSPM BSPK	MBB LBB	LBB	RBB	LBBS
③ Ⓣ Ⓐ ⑧	③ Ⓣ Ⓐ ⑧	①	③ Ⓣ Ⓐ	③ Ⓣ Ⓐ	③ Ⓣ Ⓐ
845	845	847	847	848	849

SPRINGS	BALL CAGES	STOPPERS	STOPPERS	SPRINGS	
SWPB	MBSH MBJH MBS MBJ	STM	STK	SWP	SWPL
③ Ⓣ Ⓐ	①	①	①	①	③ Ⓣ Ⓐ
849	850	851	851	851	

ANTI-RISE RINGS FOR CAGE	PLAIN GUIDE BUSHINGS	SHANKS FOR DIE SET	CAP SCREWS	ADHESIVE CEMENT
RWB	MDB LDB LFB LDBZ LFBZ	MSK MSKS MSKTP	CB	LOC638
①	①	①	①	①
852	853	855	855	856

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

GUIDE POST SETS FOR DIE SET
—GUIDE—

■Roller Guide, High Rigidity Ball Guide, Ball Bearing Guide and Plain Guide Comparison

(Excellent A ⟷ D Poor)

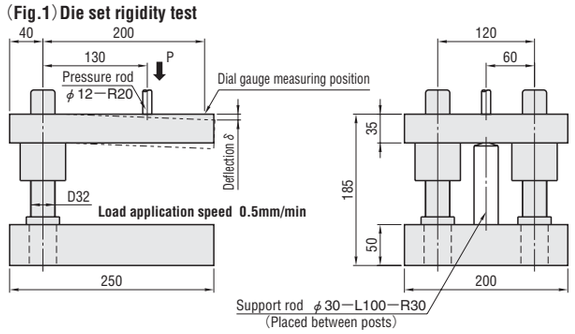
Type \ Item		Anti-seizure	Rigidity	Cost ratio※	Allowable speed		Recommended lubricant	
					Oil type	Oil-free type	Oil	Grease
Roller bearing guide		A	B	8.1	A	—	Bearing oil ISO VG68	—
High rigidity ball bearing guide post sets		A	C	1.9	A	—		—
Ball bearing guide		A	D	1.8	A	—		—
Plain guide	Copper alloy+MoS_2	B	A	1.7	B	C		Lithium type No.2
	Copper alloy	B	A	1.5	C	—		
	SUJ2+MoS_2	B	A	1.4	C	C		
	Plain	D	A	1.0	D	—		

※Cost ratio when the price of plain guide RD32—160 is 1.0.

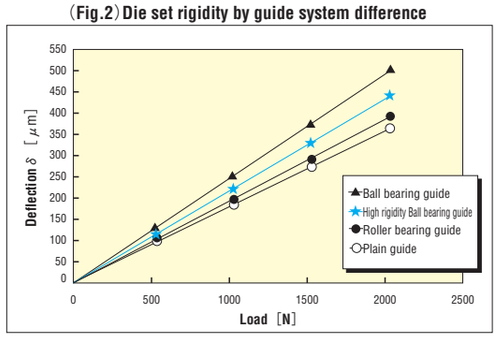
■Die set rigidity by guide system difference

Fig.2 indicates the rigidity by guide system difference using back post type die set (Fig.1). The deflection δ of die set becomes larger as follows. Plain ＜Roller＜High Rigidity Ball＜Ball

(Fig.1) Die set rigidity test



(Fig.2) Die set rigidity by guide system difference



■Ball Cage Comparison

Item	Aluminum cage [MBS・MBSH]	Resin cage [MBJ・MBJH]
Major usage	Rigid aluminum ball cages are often used for dies which require moving/inserting of guide posts or bushings or bending while pressing.	Resin cages are often used for precision dies and dies used at high speed.
Ball holding power	Large because aluminum is used.	Weaker than aluminum.
Strength of ball cage	Unbreakable but deforms when dropped.	May break when dropped.
Weight	Heavier than resin.	Can be used for high SPM due to its light weight.
Abrasion powder	Aluminum powder is seen.	Abrasion powder is hardly seen.

■Features of Ball Bearings Stopper

	No stopper	・Not suitable for the dies requiring post and bushing removal/insert. ・Difficult to adjust the ball cage position when assembling. ・Applicable for low shut height dies.
	Movable stopper (RSTM・STM)	・Easy to adjust the ball cage position when assembling. ・Applicable for low shut height dies as removable stopper lowers when pressing down.
	Fixed stopper (RSTK・STK)	・Most suitable for dies requiring post and bushing removal/insert due to the stopper intensity. ・Easy to adjust the ball cage position when assembling. ・Not suitable for low shut height dies as the stopper is fixed.

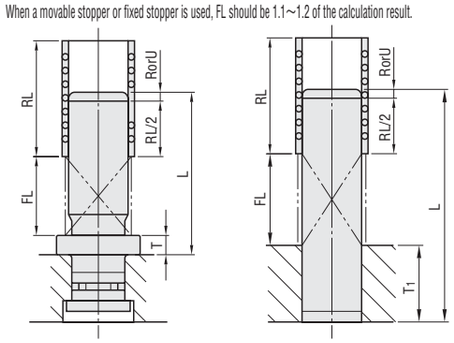
■Reference for deciding the spring length (FL)

Demountable type FL=L—(T+(RorU)+RL／2)

Pressure fit type FL=L—(T1+(RorU)+RL／2)

L：Post length T：Flange thickness T1：Die holder thickness
U：Post's U dimension R：Post's R dimension RL：Retainer length

When a movable stopper or fixed stopper is used, FL should be 1.1~1.2 of the calculation result.



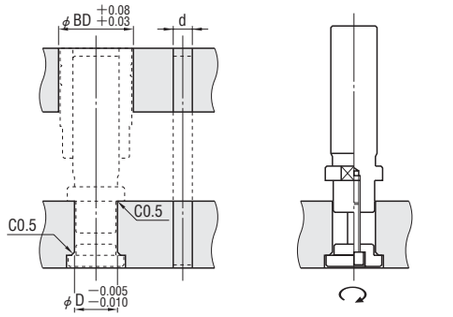
■Mounting Instructions

■Preparing guide post and bushing mounting holes

・Guide post and bushing mounting holes should be machined by boring or jig grinding, etc. after machining all the other holes and removing the deformation caused by machining (regrinding of the top and bottom surfaces, etc.)
・To set up the upper and lower dies in required measurements, you may prepare a dummy hole and insert a reference pin.

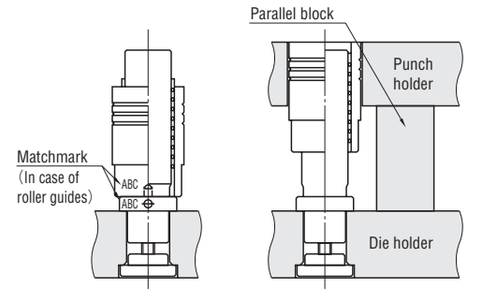
■Mounting the guide post

・After cleaning the mounting hole, fix the guide post using a bolt.
・Offsetting the reference plane of a guide post by 90° to the other posts helps preventing errors in assembling the upper and lower die sets.
・Check the perpendicularity of the post. (0.01mm/100mm or less).



■Mounting the guide bushing

・Insert the bushing (For roller guides, match the marks)
・Place parallel block on the die holder and mount the punch holder.
・Slide the guide bushing to check if there is any interference.
・After cleaning any oil or stains on the contact surface, put anaerobic adhesive agent (Loctite 638 P.856 recommended) into the guide bushing's adhesive groove, and insert it into the mounting hole. Keeping the guide bushing in place in the plate, wait 3 to 6 hours (in ambient temperature) for the adhesive agent to harden.



■Mounting the stopper

・**Movable stopper**…When the adhesive agent becomes completely hard, insert the spring and ball bearings, and tighten the movable stopper RSTM/STM's hexagon shaft using a wrench.
・**Fixed stopper**…When the adhesive agent becomes completely hard, insert the spring and ball bearings, and attach the fixed stopper RSTK/STK.

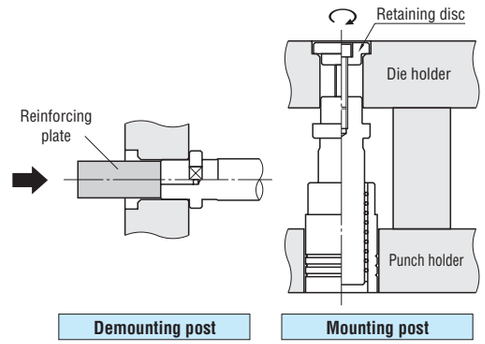
■Demounting/Mounting the guide post

Demounting

・Remove the movable stopper, ball cage and spring from the guide post.
・Loosen the bolt and remove the retaining dix.
・Using a cushion block (such as a copper alloy block), hit the block with a hammer to remove it. Make sure that the internal surface of mounting hole and tapped hole would not be damaged.

Mounting

・Mount the spring, ball cage and removable stopper to the guide post, then insert the guide post into the guide bushing.
・Place a parallel block on the punch holder, and mound the die holder on it. When mounting, make sure that the die holder does not contact with the roller guide/ball cage.
・Slide each guide post up and down to check if there is any interference with the mounting hole. If necessary, adjust the punch holder position.
・After cleaning the mounding hole fix the guide post using a bolt.



NEEDLE ROLLER BEARING GUIDE POST SETS
—GUIDE—

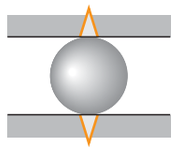
■Features

The roller bearing guide incorporates six needle rollers arranged evenly at six places.Each roller having a contact area several times larger than ball bearings, the needle roller bearing guide has a high level of rigidity close to that of plain guides as well as precision and speed performance levels that are impossible to obtain with ball bearing guides. Not only it helps improving the overall rigidity and straightness of die sets, it continues to provide smooth vertical strokes and stable precision for a long time. In addition, it is more durable than ever against vibration and exerts stable performance throughout intermittent high-speed runs.

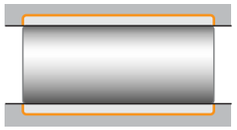
Point contact vs. linear contact

A roller's contact surface area is about 10 times larger than a ball. The roller's larger contact area results in a higher level of rigidity between the guide post and guide bushing.

In case of a ball bearing guide, a high pre-load（10 to 25 μm）is applied on each ball in order to improve rigidity. However, the ball receives a strong thrust shock that causes vibration.



In case of a needle roller bearing guide, its linear contact with only a low pre-load（4 to 12 μm）ensures smooth movements and minimizes the thrust shock.



■Names of Parts

①Guide bushing
Hardness：60～62HRC
Raceway surface：Ra0.2 μm

④Matchmark/sign
Use by matching the marks on the bottom of guide bushing and on the side of flange of guide post, and make sure the position is also in place.
（The accuracy of alignment must be within 3 μm.）

②Roller Cage
Integral construction made of oil-impregnated super engineering plastic

③Guide post
Hardness：60～62HRC
Raceway surface：Ra0.1 μm

⑤Refereence plane
Offsetting the reference plane of a guide post by 90° to the other posts helps preventing errors in assembling the upper and lower die sets.

■Usage

- ●High precision punch dies for ultra thin metal and resin materials
  Switches, relay components, lead frames, printed circuits, films, etc.
- ●Punch dies for relatively thick materials
  Motor components, connectors, fine blanking, etc.
- ●Guides for specialized machines and precision machines
  For press units, positioning control, jigs, etc.

■Precision Standards for Roller Bearing Guide and Die Sets

Item	Measurement	Tolerance
Surface roughness of the holder		Refereence plane 3.2 ▽ / Upper/lower surface 0.8 ▽ / Other surfaces 6.3 ▽
Parallelism of upper/lower surfaces of the punch/die holder		The long side length in nominal dimensions（a×b）: 100 or less / 200 or less / 300 or less / 600 or less Precision: 0.004 / 0.008 / 0.01 / 0.015
Perpendicularity between the die holder's bottom and the guide post		Less than 0.01 against 100
Parallelism after assembly		The long side length in nominal dimensions: 100 or less / 200 or less / 300 or less / 600 or less Precision: 0.008 / 0.012 / 0.02 / 0.025

【Notes】

- ● Select appropriate guide post length to have the guide bushing stay with the guide post at the top dead center when pressing.
- ● The minimum stroke of the needle roller bearing guide must be over the needle roller diameter φd×π.
  Any stroke shorter than this may cause stress to a particular part of the roller; and performance of the needle roller bearing guide may deteriorate earlier.
- ● Make sure to lubricate periodically.
- ● Depending on the usage environment, a cover may be necessary to protect the roller bearing guide from scraps or dusts.
- ● Do not modify the needle roller bearing guides.（Any modification may adversely affect their precision and performance.）

NEEDLE ROLLER BEARING GUIDE POST SETS

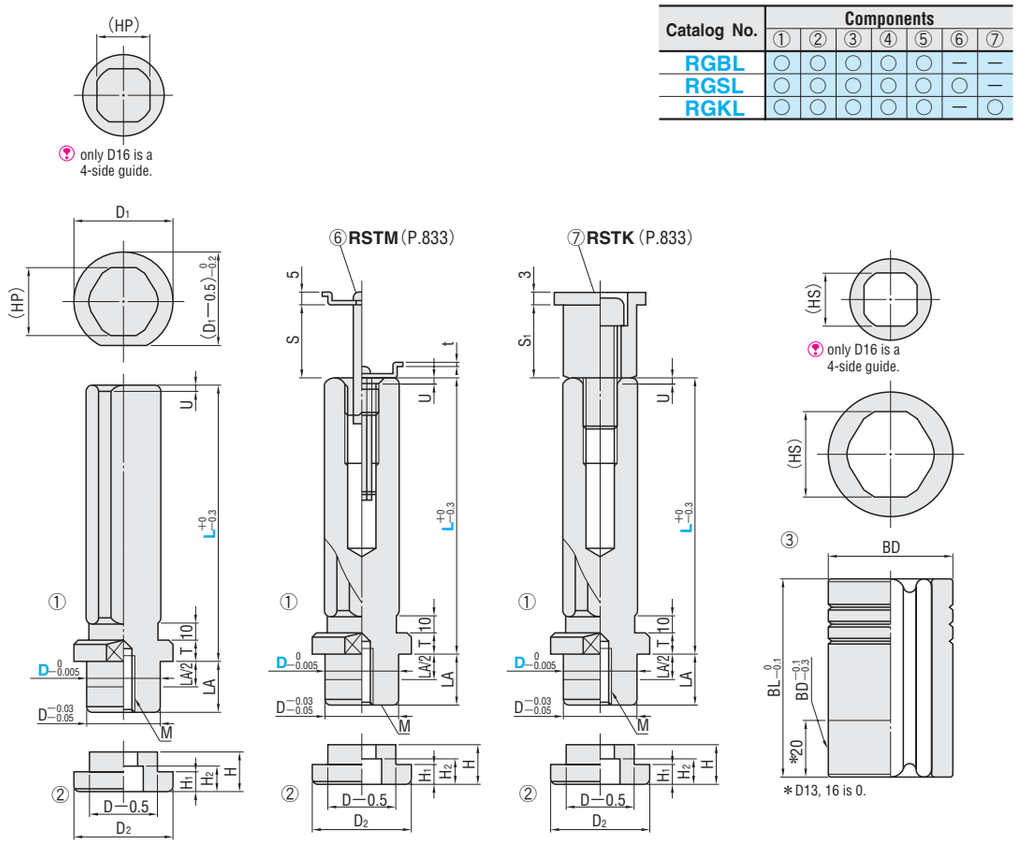
RoHS

RGBL (No stopper)

RGSL (For movable stopper)

RGKL (For fixed stopper)

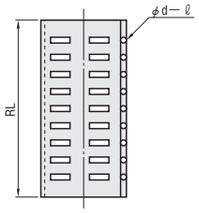
Catalog No.	Components						
	①	②	③	④	⑤	⑥	⑦
RGBL	○	○	○	○	○	—	—
RGSL	○	○	○	○	○	○	—
RGKL	○	○	○	○	○	—	○



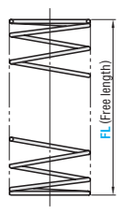
Name	M	H
① Guide post	SKS3	60～62HRC
② Retaining disc	S45C	—
③ Guide bushing	SKS3	60～62HRC
④ Roller cage	SUJ2 Super engineering plastic	—
⑤ Spring	SWP—B	
⑥ Movable stopper	S45C SPC—1	
⑦ Fixed stopper	S45C	

Roller cage④, spring⑤, movable stopper⑥ and fixed stopper⑦ can be purchased individually.
P.833

④**RBJ** (P.833)



⑤**RSWP** (P.834)



Assemble the needle roller bearing guide die sets in accordance with the precision standards on page 830.

The volume discount rate is also applicable to alteration cost. P.39

D	Post														Bushing				
	D1	D2	LA	H	H1	H2	(HP)	T	M	Bolt	U	t	S	S1	BD		BL	(HS)	Grooves
13	19	17	12	7	3	5.5	11.0	5	5× 8	CB 5×10	2.5	—	—	—	23	0 −0.006	40	15	3
16	24	22	16	10	4	6.5	14.6	6	6×10	CB 6×10	4.3	1.2	11	14	30			18.6	
20	29	28	16	14	7	8.5	19	8	8×20	CB 8×15	3.0	1.6	20	23	37	0 −0.007	60	23	
25	35	35	18				24				3.5		25	28	45		70	28	
28	37	36	20	16	8	10.5	26.7		10×20	CB10×20			27	30	47		75	31.7	
32	42	40	23				31	10	10×25				28	31	55	0 −0.008	78	36	4
40	54	50	35	18	9	12.5	39		12×30	CB12×25	4.0	2.0	33	36	68		92	45	5
50	64	60	35				48.6	12			5.0		35	38	80		96	54.6	
60	74	72	42	20	12	14.5	58.4	15	14×30	CB14×30			51	54	95		120	66.4	6

Catalog No. Type	D	5mm increments L	FL	U/Price Q'ty : 1～9Sets RGBL	RGSL · RGKL
RGBL (No stopper) RGSL (For movable stopper) RGKL (For fixed stopper)	13	70～100	30～100	31,400	—
		105～120		31,600	
	16	75～100	30～110	32,300	36,100
		105～120		32,500	36,300
		125～135		32,800	36,600
	20	75～100	40～120	33,200	37,200
		105～120		33,400	37,400
		125～140		33,700	37,700
	25	95～120	60～140	35,500	39,800
		125～140		35,700	40,000
		145～160		36,000	40,300
	28	95～120	50～140	38,300	42,700
		125～140		38,500	42,900
		145～160		38,800	43,200
	32	115～140	70～155	43,800	48,300
		145～160		44,000	48,500
		165～180		44,300	48,800

Catalog No. Type	D	10mm increments L	FL	U/Price Q'ty : 1～9Sets RGBL	RGSL · RGKL
RGBL (No stopper) RGSL (For movable stopper) RGKL (For fixed stopper)	40	120～140	70～200	58,500	63,100
		150～170		59,000	63,600
		180～200		59,400	64,000
		210～220		59,800	64,400
	50	150～170	90～230	69,900	74,600
		180～200		70,400	75,100
		210～230		70,800	75,500
		240～250		71,200	75,900
	60	150～170	70～210	86,500	91,300
		180～200		87,000	91,800
		210～230		87,500	92,300
		240～250		88,000	92,800

Order Catalog No. — L — FL
RGBL 25 — 120 — FL80

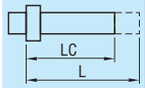
Price Volume discount rate P.37

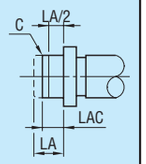
Quantity	1～9	10～20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC) — FL — (LAC)
RGBL 20 — LC78 — FL40

Delivery
- φD13～32: 5 Days
- Express B 1,500/1Pc. P.38
  A flat charge of 4,050 yen for 3 pieces or more of the same size.
- φD40～60: 8 Days

Alteration	Code	Spec.	¥/1Code
	LC	Changes post length D: 1mm increments 13: 70<LC<120 16: 75<LC<135 20: 75<LC<140 25: 95<LC<160 28: 95<LC<160 32: 115<LC<180 40: 120<LC<220 50: 150<LC<250 60: 150<LC<250	2,000

Alteration	Code	Spec.	¥/1Code
	LAC	Changes dimension LA LA/2+1≦LAC<LA 1mm increments Tapping length becomes shorter.	D≦32 1,000 — 5 Days D≧40 1,200 — 8 Days

■Guide post length specified type

Catalog No. Type	D	5mm increments LC	10mm increments FL	U/Price Q'ty : 1～9
RGBL	20	145～200	110～200	38,700
	25	165～200	120～190	40,400
	28	165～200	120～190	43,200
	32	185～240	140～230	49,000

Order Catalog No. — LC — FL
RGBL 25 — LC200 — FL160

Delivery 5 Days

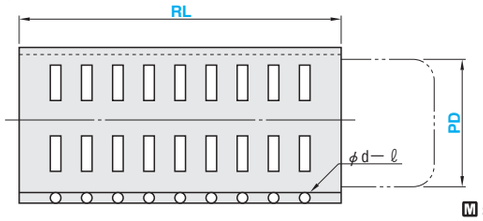
Price Volume discount rate P.37

Quantity	1～9	10～20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.
The table shows unit prices of post after alteration.

ROLLER CAGES/STOPPERS FOR NEEDLE ROLLER BEARING GUIDE POST

RBJ (Roller cage)



M SUJ2
Super engineering plastic

d	ℓ	No. of rollers	Catalog No. Type	PD	RL	U/Price Q'ty : 1~9
2.0	4.8	45	RBJ	13	30	7,100
	6.8	24		16	30	7,100
		48		20	52	7,900
	7.8	54		25	62	7,900
2.5		60		28	66	8,900
				32	68	8,900
3.0	9.8	72		40	78	10,900
	11.8	78		50	82	11,800
4.0	13.8	84		60	116	12,900

Order: Catalog No. RBJ 20 — RL 52

Price

■Volume discount rate P.37

Quantity	1~9	10~20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

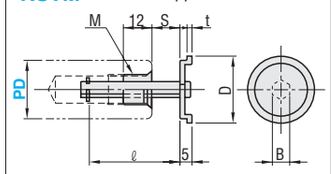
Delivery: 3 Days

Express	T	1,000/1Pc.
Express	A	500/1Pc.

P.38

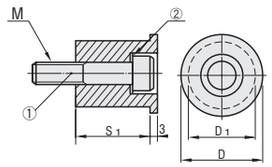
A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

RSTM (Movable stopper)



M S45C, SPC—1 (stopper cap)
S Electroless nickel plating

RSTK (Fixed stopper)



M S45C
S Electroless nickel plating
A ①CB ②Spring washer

PD Post.dia.	D	M×P	RSTM S	RSTM ℓ	RSTM t	RSTM B	RSTK D1	RSTK S1	RSTK Bolt	Catalog No. Type	PD	RL Retainer length	U/Price Q'ty : 1~9
16	17.5	8×1.25	0~ 9	21	1.2	4	14.4	14	M 8×20	RSTM (Movable stopper) / RSTK (Fixed stopper)	16	30	480
20	21	10×1.5	0~20	32	1.6	5	18	23	M10×25		20	52	590
25	26	12×1.5	0~25	37		6	23	28	M12×35		25	62	720
28	30		0~27	39			25.5	30			28	66	780
32	34		0~28	40			30	31			32	68	850
40	43	16×1.5	0~33	45	2.0	8	38	36	M16×40		40	78	940
50	52.5		0~35	47			47.5	38			50	82	1,100
60	64.5		0~51	63			57.5	54	M16×50		60	116	1,300

Order: Catalog No. RSTM 20 — RL 52

Price

■Volume discount rate P.37

Quantity	1~9	10~20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

Delivery: 3 Days

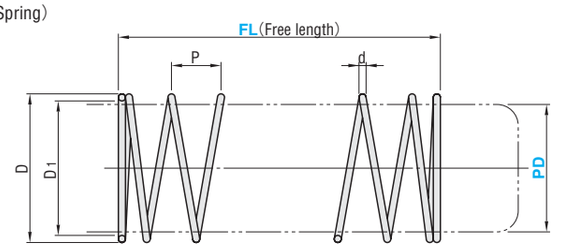
Express	T	1,000/1Pc.
Express	A	500/1Pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

SPRINGS FOR ROLLER BEARING GUIDE POST/ANTI-RISE RINGS FOR ROLLER CAGE

RSWP (Spring)



M SWP—B

D	D1	d	P	Catalog No. Type	PD	FL 5mm increments	FL 10mm increments	U/Price Q'ty : 1~9
14.1	12.5	0.8	8	RSWP	13	30 ~ 80	—	300
						85 ~ 100		350
17.9	16.3		12		16	30 ~ 80	—	300
						85 ~ 110		350
22.1	20.3	0.9	14		20	35 ~ 80	—	350
						85 ~ 120		400
						—	130 ~ 200	450
27.2	25.4		15		25	40 ~ 80	—	400
						85 ~ 140		450
						—	150 ~ 190	500
30.0	28.0	1.0	17		28	50 ~ 80	—	450
						85 ~ 140		520
						—	150 ~ 210	580
34.9	32.5	1.2	20		32	70 ~ 120	—	600
						125 ~ 155		700
						—	160 ~ 210	800
43.9	40.7	1.6	25		40	—	70 ~ 140	750
							150 ~ 210	850
53.8	50.6	1.6	25		50	—	90 ~ 140	800
							150 ~ 230	900
65.7	60.5	2.6	30		60	—	70 ~ 140	900
							150 ~ 210	1,050

Order: Catalog No. RSWP 20 — FL 90

Price

■Volume discount rate P.37

Quantity	1~9	10~20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

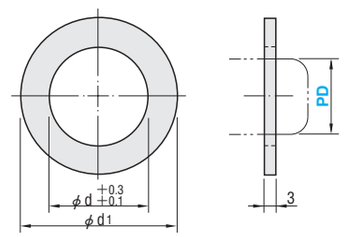
Delivery: 3 Days

Express	T	1,000/1Pc.
Express	A	500/1Pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

RWR (For roller cage)



M POM (Polyacetal resin) White

Inner diameter d	Outer diameter d1	Catalog No. Type	PD	U/Price Q'ty : 1~9
20.1	35	RWR (For roller cage)	20	450
25.2	40		25	
27.6	45		28	
32.3	50		32	540
40.2	60		40	
50.3	75		50	630
60.1	85		60	

Order: Catalog No. RWR 25

■Features P.852

Delivery: 3 Days

Express	T	1,000/1Pc.
Express	A	500/1Pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

BALL BEARING GUIDE POST SETS FOR DIE SET
—DEMOUNTABLE POST—

RELATED PRODUCTS P.845~847

※When ordering by set, only the standard dimensions are available.
When ordering other than the standards, please order by indicating alterations for each part. (P.845~847)

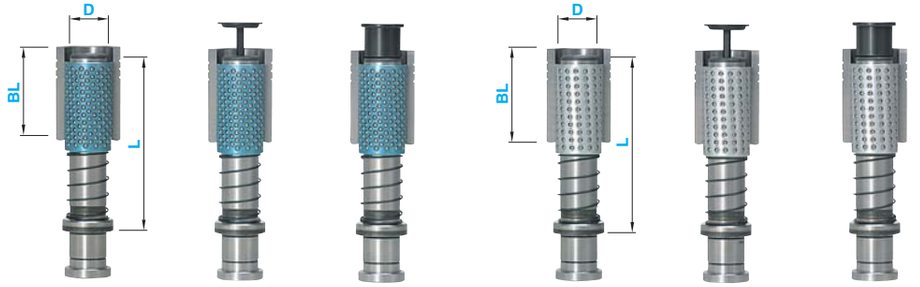
High-rigidity ball bearing guide post sets

(No stopper)	(Movable stopper)	(Fixed stopper)
RBSH (QBSH)	RMSH (QMSH)	RKSH (QKSH)

Aluminum cage (Resin cage)

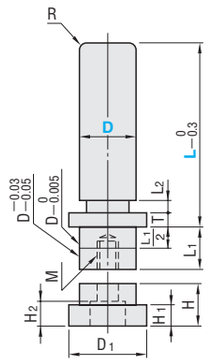
Ball bearing guide post sets RoHS

(No stopper)	(Movable stopper)	(Fixed stopper)
RB (QB)	RM (QM)	RK (QK)

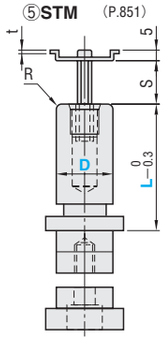


Catalog No.	Components					
	①	②	③	④	⑤	⑥
RBSH	MRP	MBB LBB	MBSH	SWP	–	–
RMSH	BRPM				STM	–
RKSH	BRPK				–	STK
QBSH	MRP		MBJH		–	–
QMSH	BRPM				STM	–
QKSH	BRPK				–	STK
RB	MRP	MBB LBB	MBS	SWP	–	–
RM	BRPM				STM	–
RK	BRPK				–	STK
QB	MRP		MBJ		–	–
QM	BRPM				STM	–
QK	BRPK				–	STK

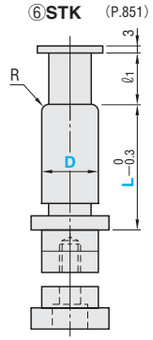
①MRP (P.843)



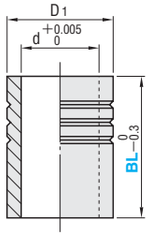
①BRPM (P.843)
⑤STM (P.851)



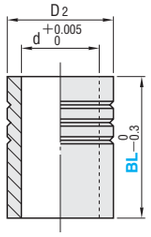
①BRPK (P.843)
⑥STK (P.851)



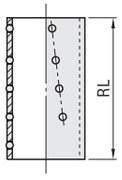
②MBB (P.847)



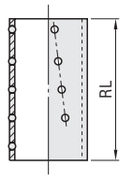
②LBB (P.847)



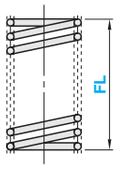
③MBSH (P.850)
MBS (P.850)



③MBJH (P.850)
MBJ (P.850)



④SWP (P.851)



MRP·BRPM·BRPK											
D		D1	L1	L2	H	H1	H2	T	t	M	R	Bolt
20	+0.020 +0.015	28	15	10	14	7	8.5	5	1.6	8 × 18	2.0	CB8–25
22		30	16					8			3.0	
25		35	18									
28	+0.025 +0.020	36	20	12	16	8	10.5	10		10 × 22	3.5	CB10–30
32		40	23									
38	+0.030 +0.025	49	27	15	18	10	12.5	12	2.0	12 × 27	4.0	CB12–35
45		55	32									
50	+0.035 +0.030	62	35		20	12	14.5	15		14 × 31	4.5	CB14–40
60		72	42									

MBB · LBB			
d	D1 · D2	D1T	D2T
26	37	+0.5 +0.3	0 −0.007
28	40		
31	45		
36	50		
40	55		0 −0.008
48	64		
55	74		
60	83		0 −0.010
70	95		

RL	S	ℓ1
50	0~19	15
60	0~23	20
75	0~30	25
90	0~37	30
110	0~47	35

■**How to mount bushing** (Adhesive P.856)

MBB	Devcon adhesive	–
LBB	Loctite adhesive	Loctite No.638 (**LOC638**)

■**About High-Rigidity Ball bearing Guide Post Sets**
The ball bearing guide sets use a high rigidity ball cage (MBSH, MBJH) with approximately 1.6 times more balls, and realized rigidity close to that of a plain guide at low cost.

Catalog No. Type	D	L							②MBB·LBB Type	BL	RL	FL 10mm increments
RBSH	20	80	90	100	110	120			M (MBB)	50	50	40~140
RMSH	22	80	90	100	110	120				50	50	40~140
RKSH										60	60	
QBSH	25	80	90	100	110	120	130			60	60	40~150
QMSH	28	100	110	120	130	140	150	160		80	75	
QKSH										60	60	50~150
RB	32	120	130	140	150	160				80	75	
RM										80	75	70~190
RK	38	140	150	160	170	180			L (LBB)	100	90	
QB										80	75	80~190
QM	45	140	150	160	170	180				100	90	
QK										100	90	80~190
	50	160	170	180	200					120	110	
										100	90	80~190
	60	160	170	180	200					120	110	

Order: Catalog No. — L — ② — ④FL
Ordering code: RM 25 — 120 — L80 — 80

Delivery: 1 Day

Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	–	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	L	U/Price Q'ty : 1~9Sets															
		High-rigidity ball bearing guide post sets								Ball bearing guide post sets							
		RBSH		RMSH · RKSH		QBSH		QMSH · QKSH		RB		RM · RK		QB		QM · QK	
		M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L
20	80~100	4,350	4,970	5,080	5,710	4,100	4,720	4,820	5,450	3,680	4,310	4,420	5,050	3,490	4,110	4,220	4,850
	110 · 120	4,470	5,100	5,210	5,840	4,220	4,850	4,960	5,590	3,820	4,450	4,550	5,180	3,620	4,250	4,360	4,990
22	80~100	4,950	5,630	5,730	6,400	4,660	5,340	5,450	6,110	4,230	4,910	5,010	5,680	3,990	4,660	4,770	5,440
	110 · 120	5,090	5,760	5,870	6,530	4,800	5,470	5,580	6,250	4,370	5,040	5,150	5,810	4,120	4,800	4,910	5,570
25	80~100	5,890	6,650	6,770	7,540	5,570	6,340	6,450	7,230	4,920	5,690	5,810	6,580	4,730	5,500	5,620	6,390
	110~130	6,010	6,780	6,940	7,710	5,700	6,460	6,620	7,400	5,050	5,810	5,980	6,750	4,860	5,630	5,790	6,560
28	100~130	6,850	7,630	7,780	8,550	6,440	7,230	7,370	8,150	5,960	6,740	6,890	7,660	5,570	6,350	6,500	7,270
	140~160	7,120	7,900	8,060	8,830	6,710	7,500	7,650	8,420	6,230	7,010	7,160	7,940	5,840	6,620	6,780	7,550
32	120~140	8,690	9,560	9,760	10,630	8,190	9,060	9,260	10,130	7,470	8,350	8,550	9,420	7,090	7,970	8,160	9,040
	150 · 160	8,960	9,840	10,040	10,910	8,460	9,340	9,540	10,410	7,750	8,630	8,830	9,700	7,360	8,240	8,440	9,320
38	140~160	10,670	11,740	11,790	12,850	10,040	11,110	11,160	12,220	9,190	10,260	10,310	11,380	8,710	9,770	9,830	10,890
	170 · 180	11,050	12,120	12,180	13,240	10,420	11,490	11,550	12,610	9,580	10,650	10,700	11,760	9,090	10,160	10,220	11,280
45	140~160	13,320	14,390	14,690	15,750	12,480	13,550	13,850	14,910	11,660	12,720	13,010	14,090	10,880	11,950	12,250	13,310
	170 · 180	13,940	15,000	15,200	16,270	13,100	14,170	14,360	15,440	12,280	13,340	13,540	14,600	11,500	12,560	12,760	13,830
50	160 · 170	17,090	18,540	18,310	19,760	16,130	17,580	17,340	18,790	14,990	16,440	16,210	17,670	14,130	15,580	15,350	16,790
	180 · 200	17,770	19,220	18,990	20,440	16,800	18,250	18,030	19,480	15,680	17,130	16,890	18,340	14,810	16,250	16,030	17,480
60	160 · 170	20,820	22,560	22,570	24,320	19,650	21,390	21,400	23,150	18,180	19,930	19,940	21,680	17,220	18,960	18,970	20,720
	180 · 200	21,430	23,180	23,090	24,830	20,260	22,010	21,920	23,660	18,790	20,540	20,450	22,190	17,830	19,580	19,490	21,230

Type	M H S
MRP BRPM BRPK	M SUJ2 M S45C (retaining disc) H 58HRC~ (Induction hardening)
STM	M S45C S Fe_3O_4 (Black oxide)
STK	M S45C S Fe_3O_4 (Black oxide) A CB

Type	M H
MBB LBB	M SUJ2 H 58HRC~
MBSH MBS	M A5052S (Aluminum)

Type	M
MBJH MBJ	M POM (Polyacetal resin)
SWP	M SWP–B

Express service system P.38 MISUMI Press 2007 http://misumi.jp/press/ For inquiry, ordering and other information, refer to P.1269

BALL BEARING GUIDE POST SETS FOR DIE SET
—PRESS FIT POST—

RELATED PRODUCTS P.845~847

※When ordering by set, only the standard dimensions are available.
When ordering other than the standards, please order by indicating alterations for each part.
（P.845～847）

RoHS

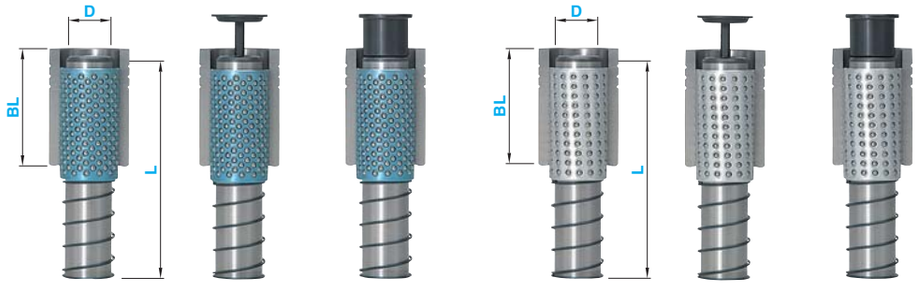
High-rigidity Ball bearing guide post sets

(No stopper)	(Movable stopper)	(Fixed stopper)
PBSH (GBSH)	PMSH (GMSH)	PKSH (GKSH)

Ball bearing guide post sets

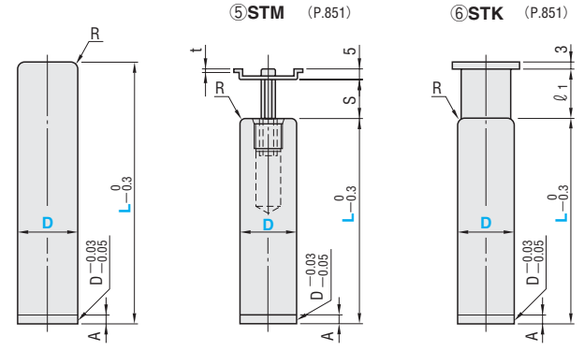
Aluminum cage / (Resin cage)

(No stopper)	(Movable stopper)	(Fixed stopper)
PB (GB)	PM (GM)	PK (GK)

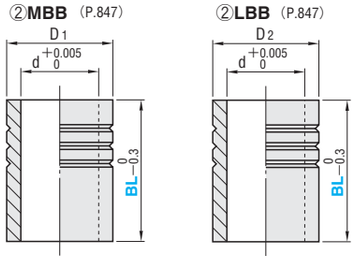


Catalog No.	Components					
	①	②	③	④	⑤	⑥
PBSH	MSP	MBB LBB	MBSH	SWP	–	–
PMSH	BSPM				STM	–
PKSH	BSPK				–	STK
GBSH	MSP		MBJH		–	–
GMSH	BSPM				STM	–
GKSH	BSPK				–	STK
PB	MSP	MBB LBB	MBS	SWP	–	–
PM	BSPM				STM	–
PK	BSPK				–	STK
GB	MSP		MBJ		–	–
GM	BSPM				STM	–
GK	BSPK				–	STK

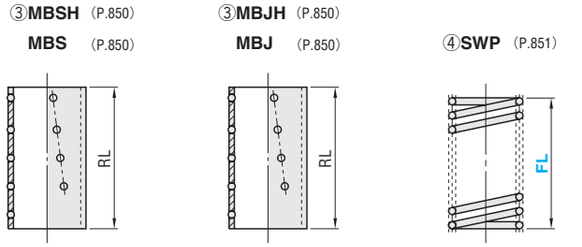
①MSP (P.843)　①BSPM (P.843)　⑤STM (P.851)　①BSPK (P.843)　⑥STK (P.851)



②MBB (P.847)　②LBB (P.847)



③MBSH (P.850)　③MBJH (P.850)
MBS (P.850)　MBJ (P.850)　④SWP (P.851)



MSP・BSPM・BSPK			
D		A	R	t
20	+0.020 +0.015	4	2.0	1.6
22			3.0	
25				
28	+0.025 +0.020	5	3.5	
32				
38	+0.030 +0.025	6	4.0	2.0
45				
50	+0.035 +0.030	7	5.0	
60				

MBB・LBB			
d	D1・D2	D1T	D2T
26	37	+0.5 +0.3	0 −0.007
28	40		
31	45		
36	50		
40	55		0 −0.008
48	64		
55	74		
60	83		0 −0.010
70	95		

RL	S	ℓ1
50	0～19	15
60	0～23	20
75	0～30	25
90	0～37	30
110	0～47	35

■How to mount bushing (Adhesive P.856)

MBB	Devcon adhesive type	—
LBB	Loctite adhesive	Loctite No.638 (LOC638)

■About High-Rigidity Ball bearing Guide Post Sets
The ball bearing guide sets use a high rigidity ball cage (MBSH, MBJH) with approximately 1.6 times more balls, and realized rigidity close to that of a plain guide at low cost.

Catalog No. Type	D	L	②MBB・LBB Type	BL	RL	FL 10mm increments
PBSH	20	100 110 120 130 140 150 160 170 180	M (MBB)	50	50	40～140
PMSH	22	120 130 140 150 160 170 180		50	50	
PKSH				60	60	40～140
GBSH	25	120 130 140 150 160 170 180		60	60	
GMSH				80	75	40～150
GKSH	28	140 150 160 170 180 190 200		60	60	
PB				80	75	50～150
PM	32	160 170 180 190 200 220 240		80	75	
PK				100	90	70～190
GB	38	180 190 200 220 240 260	L (LBB)	80	75	
GM				100	90	80～190
GK	45	180 190 200 220 240 260		100	90	
				120	110	80～190
	50	200 220 240 260		100	90	
				120	110	80～190
	60	200 220 240 260		100	90	
				120	110	80～190

Order

Catalog No.	—	L	—	②	—	④FL
GBSH 25	—	150	—	L60	—	120
Ordering code GBSH 25		15		L6	–	12

Delivery 1 Day

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	L	U/Price Q'ty：1～9Sets															
		High-rigidity ball bearing guide post sets								Ball bearing guide post sets							
		PBSH		PMSH・PKSH		GBSH		GMSH・GKSH		PB		PM・PK		GB		GM・GK	
		M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L
20	100～140	3,790	4,420	4,510	5,140	3,540	4,170	4,260	4,890	3,130	3,760	3,860	4,490	2,930	3,560	3,650	4,280
	150～180	3,890	4,530	4,620	5,260	3,640	4,280	4,370	5,000	3,230	3,860	3,960	4,590	3,030	3,670	3,760	4,400
22	120～150	4,400	5,080	5,180	5,860	4,110	4,790	4,890	5,570	3,680	4,360	4,460	5,140	3,440	4,110	4,210	4,900
	160～180	4,490	5,180	5,270	5,950	4,200	4,890	4,990	5,660	3,770	4,460	4,550	5,230	3,530	4,210	4,310	4,990
25	120～150	5,270	6,060	6,100	6,890	4,960	5,740	5,790	6,570	4,320	5,090	5,150	5,920	4,120	4,910	4,950	5,730
	160～180	5,330	6,100	6,200	6,980	5,010	5,790	5,890	6,660	4,370	5,150	5,250	6,020	4,180	4,950	5,050	5,820
28	140～170	6,060	6,830	6,980	7,760	5,650	6,430	6,570	7,350	5,170	5,940	6,080	6,870	4,780	5,550	5,700	6,480
	180～200	6,200	6,950	7,170	7,950	5,800	6,540	6,770	7,540	5,310	6,080	6,280	7,060	4,920	5,670	5,900	6,670
32	160～190	7,790	8,670	8,860	9,730	7,290	8,170	8,360	9,230	6,560	7,460	7,650	8,530	6,190	7,070	7,260	8,140
	200～240	8,030	8,910	9,050	9,930	7,530	8,420	8,560	9,430	6,830	7,700	7,850	8,720	6,440	7,320	7,460	8,330
38	180～200	9,530	10,590	10,690	11,770	8,900	9,960	10,060	11,140	8,060	9,090	9,190	10,260	7,570	8,630	8,730	9,810
	220～260	10,020	11,140	11,140	12,220	9,390	10,510	10,510	11,590	8,540	9,630	9,630	10,710	8,060	9,180	9,180	10,260
45	180～200	11,980	13,060	13,170	14,230	11,140	12,220	12,330	13,390	10,290	11,350	11,490	12,600	9,540	10,620	10,730	11,790
	220～260	12,610	13,690	13,690	14,770	11,770	12,850	12,850	13,930	10,980	11,970	12,060	13,140	10,170	11,250	11,250	12,330
50	200・220	15,020	16,430	16,280	17,730	14,060	15,460	15,320	16,770	12,880	14,330	14,190	15,640	12,060	13,460	13,320	14,770
	240・260	15,740	17,180	17,000	18,530	14,780	16,220	16,040	17,570	13,680	15,120	14,940	16,380	12,780	14,220	14,040	15,570
60	200・220	18,290	20,030	19,940	21,680	17,120	18,860	18,770	20,510	15,660	17,410	17,310	19,050	14,690	16,430	16,340	18,080
	240・260	19,170	20,880	20,610	22,410	18,000	19,710	19,440	21,240	16,560	18,270	18,000	19,710	15,570	17,280	17,010	18,810

Type	M	H	S
MSP BSPM BSPK	M SUJ2	H 58HRC～(Induction hardening)	
STM	M S45C	S Fe3O4 (Black oxide)	
STK	M S45C	S Fe3O4 (Black oxide)	A CB

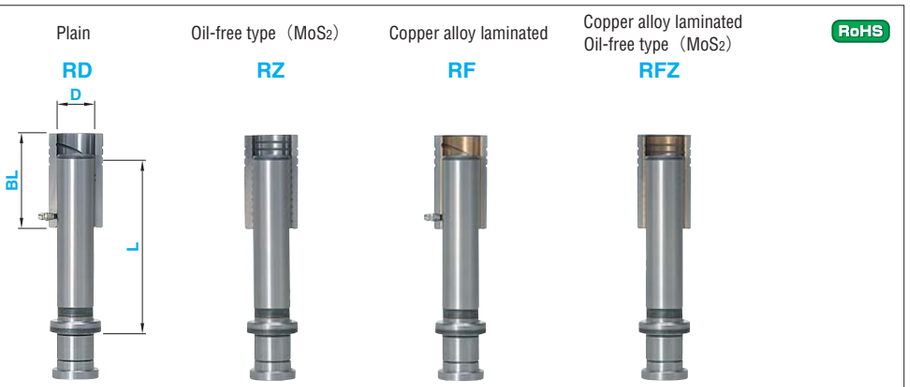
Type	M	H
MBB LBB	M SUJ2	H 58HRC～
MBSH MBS	M A5052S (Aluminum)	

Type	M
MBJH MBJ	M POM (Polyacetal resin)
SWP	M SWP—B

PLAIN GUIDE POST SETS FOR DIE SET
—DEMOUNTABLE POST—

RELATED PRODUCTS P.845~847

※When ordering by set, only the standard dimensions are available.
When ordering other than the standards, please order by indicating alterations for each part.
（P.845～847）

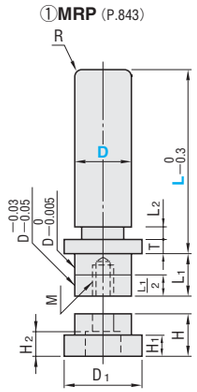


Catalog No.	Components	
	①	②
RD	MRP	MDB
		LDB
RZ		LDBZ
RF		LFB
RFZ		LFBZ

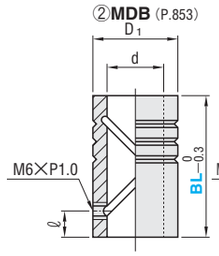
■How to mount bushing (Adhesive P.856)

MDB	Devcon adhesive type	—
LDB LDBZ LFB LFBZ	Loctite adhesive	Loctite No.638 (**LOC638**)

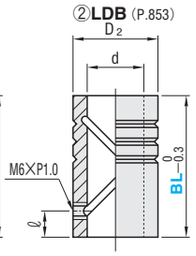
①**MRP** (P.843)



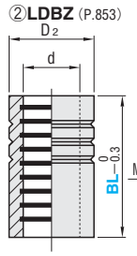
②**MDB** (P.853)



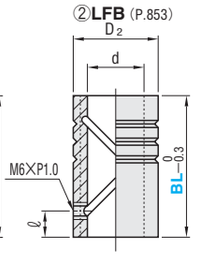
②**LDB** (P.853)



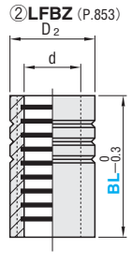
②**LDBZ** (P.853)



②**LFB** (P.853)



②**LFBZ** (P.853)



MRP											
D		D1	L1	L2	H	H1	H2	T	M	R	Bolt
20	+0.020 +0.015	28	15	10	14	7	8.5	5	8 × 18	2.0	CB 8—25
22		30	16					8		3.0	
25		35	18								
28	+0.025 +0.020	36	20		16	8	10.5	10	10 × 22	3.5	CB10—30
32		40	23	12							
38	+0.030	49	27		18	10	12.5	12	12 × 27	4.0	CB12—35
45	+0.025	55	32	15							
50	+0.035	62	35		20	12	14.5	15	14 × 31	4.5	CB14—40
60	+0.030	72	42								

ℓ	d		MDB D1		LDB · LDBZ · LFB · LFBZ D2	
10	20	+0.027 +0.022	31	+0.5 +0.3	31	0 −0.007
	22		34		34	
	25		37		37	
	28	+0.032 +0.027	42		42	
	32		46		46	
15	38	+0.037 +0.032	54		54	0 −0.008
	45	+0.040 +0.035	62		62	
	50	+0.045	70		70	
	60	+0.040	80		80	0 −0.010

Type	M H A
MRP	M SUJ2 H 58HRC～ (Induction hardening) M S45C (retaining disc) A Cap bolt CB
MDB LDB	M SUJ2 H 58HRC～ A Grease nipple GPA6A
LDBZ	M SUJ2 MoS2 (embedded) H 58HRC～
LFB	M SUJ2/Copper alloy H 45HRC～ A Grease nipple GPA6A
LFBZ	M SUJ2/Copper alloy MoS2 (embedded) H 45HRC～

Catalog No. Type	D	L	RD Type ②	BL
RD RZ RF RFZ	20	80 90 100 110 120	M (MDB)	50
	22	80 90 100 110 120		50 60
	25	80 90 100 110 120 130		60 80
	28	100 110 120 130 140 150 160		60 80
	32	120 130 140 150 160	L (LDB)	80 100
RD RZ	38	140 150 160 170 180		80 100
	45	140 150 160 170 180		100 120
	50	160 170 180 200	RD type only	100 120
RD	60	160 170 180 200		100 120

Order: Catalog No. — L — ② · BL
RD20 — 120 — M50

Ordering code			
RD 20	12	M5
RZ 20	12	5

Delivery: 1 Day

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	L	U/Price Q'ty : 1～9Sets				
		RD		RZ	RF	RFZ
		M	L			
20	80～100	2,410	3,000	3,770	4,730	5,600
	110・120	2,510	3,100	3,870	4,840	5,710
22	80～100	2,750	3,330	4,210	5,220	6,080
	110・120	2,850	3,430	4,310	5,330	6,190
25	80～100	3,240	3,830	4,650	5,710	6,620
	110～130	3,340	3,920	4,750	5,820	6,730
28	100～130	3,880	4,610	5,490	6,740	7,720
	140～160	4,120	4,850	5,730	7,010	7,990
32	120～140	4,670	5,540	6,420	7,990	8,970
	150・160	4,870	5,740	6,620	8,210	9,190
38	140～160	5,700	6,670	7,840	—	—
	170・180	5,990	6,970	8,140		
45	140～160	7,120	8,290	9,590	—	—
	170・180	7,610	8,780	10,090		
50	160・170	9,570	10,880	12,340	—	—
	180・200	10,160	11,480	12,930		
60	160・170	11,480	13,040	—	—	—
	180・200	11,980	13,540			

PLAIN GUIDE POST SETS FOR DIE SET
—PRESS FIT POST—

RELATED PRODUCTS P.845~847

※When ordering by set, only the standard dimensions are available.
When ordering other than the standards, please order by indicating alterations for each part. (P.845~847)

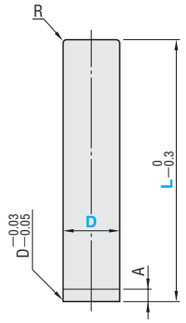
Plain **PD** | Oil-free type (MoS_2) **PZ** | Copper alloy laminated **PF** | Copper alloy laminated Oil-free type (MoS_2) **PFZ** | RoHS

Catalog No.	Components	
	①	②
PD	MSP	MDB
		LDB
PZ		LDBZ
PF		LFB
PFZ		LFBZ

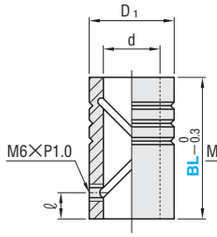
■How to mount bushing (Adhesive P.856)

MDB	Devcon adhesive	—
LDB LDBZ LFB LFBZ	Loctite adhesive	Loctite No.638 (LOC638)

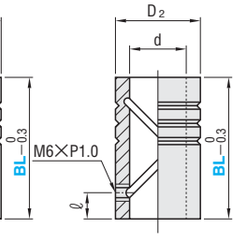
①MSP (P.843)



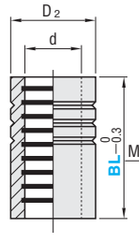
②MDB (P.853)



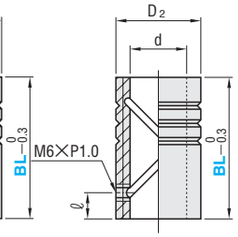
②LDB (P.853)



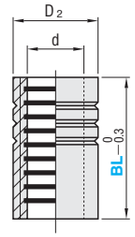
②LDBZ (P.853)



②LFB (P.853)



②LFBZ (P.853)



MSP			
D		A	R
20	+0.020 +0.015	4	2.0
22			3.0
25			
28	+0.025	5	3.5
32	+0.020		
38	+0.030	6	4.0
45	+0.025		
50	+0.035	7	4.5
60	+0.030		

ℓ	d		MDB D1		LDB·LDBZ·LFB·LFBZ D2	
10	20	+0.027	31	+0.5 +0.3	31	0 -0.007
	22	+0.022	34		34	
	25		37		37	
	28	+0.032	42		42	
15	32	+0.027	46		46	
	38	+0.037 +0.032	54		54	0 -0.008
	45	+0.040 +0.035	62		62	
	50	+0.045	70		70	
	60	+0.040	80		80	0 -0.010

Type	M H A
MSP	M SUJ2 H 58HRC~ (Induction hardening)
MDB LDB	M SUJ2 H 58HRC~ A Grease nipple GPA6A
LDBZ	M SUJ2 MoS_2 (embedded) H 58HRC~
LFB	M SUJ2/Copper alloy H 45HRC~ A Grease nipple GPA6A
LFBZ	M SUJ2/Copper alloy MoS_2 (embedded) H 45HRC~

Catalog No. Type	D	L	PD Type ②	BL
PD PZ PF PFZ	20	100 110 120 130 140 150 160 170 180	M (MDB)	50
	22	120 130 140 150 160 170 180		50 60
	25	120 130 140 150 160 170 180		60 80
	28	140 150 160 170 180 190 200		60 80
	32	160 170 180 190 200 220 240	L (LDB)	80 100
PD PZ	38	180 190 200 220 240 260		80 100
	45	180 190 200 220 240 260		100 120
	50	200 220 240 260	PD type only	100 120
PD	60	200 220 240 260		100 120

Order: Catalog No. — L — ②·BL
PD 28 — 160 — M 80

Ordering code			
	PD 28	16	M8
	PZ 28	16	8

Delivery: 1 Day

Price

■Volume discount rate (P.37)

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	L	U/Price Q'ty : 1~9Sets				
		PD		PZ	PF	PFZ
		M	L			
20	100~140	1,850	2,440	3,210	4,110	4,980
	150~180	1,950	2,540	3,310	4,220	5,090
22	120~150	2,200	2,770	3,650	4,600	5,460
	160~180	2,300	2,870	3,750	4,710	5,570
25	120~150	2,630	3,210	4,040	5,030	5,940
	160~180	2,680	3,270	4,100	5,090	6,000
28	140~170	3,070	3,800	4,680	5,840	6,820
	180~200	3,210	3,940	4,820	6,000	6,980
32	160~190	3,750	4,630	5,500	6,970	7,950
	200~240	4,000	4,870	5,740	7,240	8,220
38	180~200	4,530	5,500	6,670	—	—
	220~260	5,010	5,990	7,160		
45	180~200	5,740	6,910	8,220	—	—
	220~260	6,330	7,500	8,800		
50	200・220	7,440	8,760	9,320	—	—
	240・260	8,120	9,430	10,890		
60	200・220	8,950	10,500	—	—	—
	240・260	9,720	11,280			

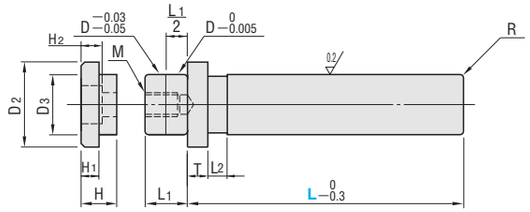
GUIDE POSTS FOR DIE SET

RoHS

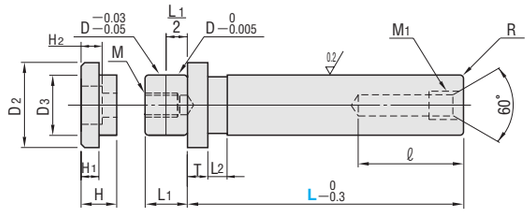
—Demountable post—

—Press fit post—

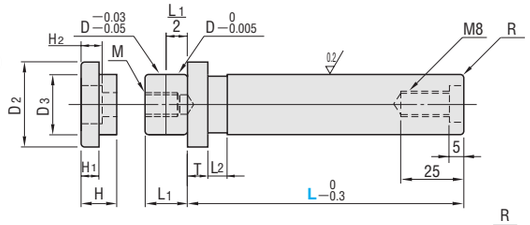
MRP



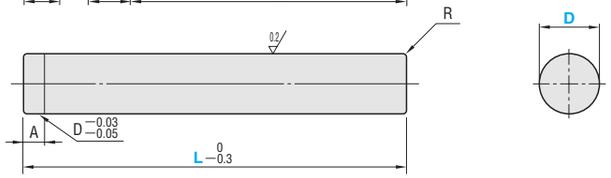
BRPM
(For movable stopper STM)



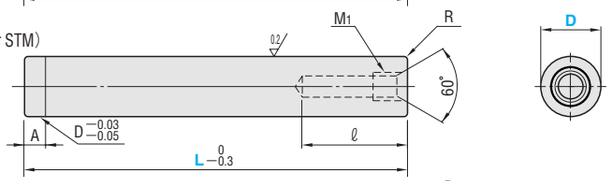
BRPK
(For fixed stopper STK)



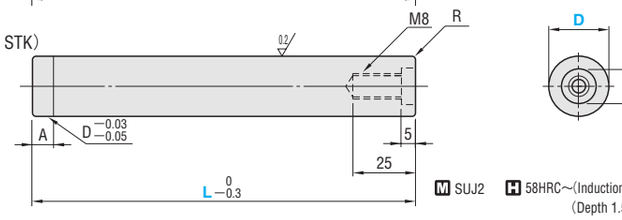
MSP



BSPM
(For movable stopper STM)



BSPK
(For fixed stopper STK)



M SUJ2 H 58HRC～(Induction hardening) (Depth 1.5～2.0mm)

D		D_1	T	L_1	L_2	ℓ	M_1×P	d	A	M	R	D_2	D_3	H	H_1	H_2	A Supplied bolts
20	+0.020 +0.015	29	5	15	10	38	M10×1.5	14	4	M8×18	2.0	28	19.5	14	7	8.5	CB 8—25
22		31	8	16		42					3.0	30	21.5				
25		36		18		50	M12×1.5					35	24.5				
28	+0.025 +0.020	39	10	20		50			5	M10×22	3.5	36	27.5	16	8	10.5	CB10—30
32		44		23	12	60						40	31.5				
38	+0.030 +0.025	53	12	27		60	M16×1.5	20	6	M12×27	4.0	49	37.5	18	10	12.5	CB12—35
45		59		32	15	70						55	44.5				
50	+0.035 +0.030	69	15	35		70			7	M14×31	5.0	62	49.5	20	12	14.5	CB14—40
60		79		42		70						72	59.5				

The volume discount rate is also applicable to alteration cost. P.39

Catalog No. Type	D	L	U/Price Q'ty：1～9 MRP	BRPM・BRPK
MRP BRPM BRPK	20	80 90 100 110 120	1,240 1,340	1,540 1,640
	22	80 90 100 110 120	1,390 1,490	1,680 1,780
	25	80 90 100 110 120 130	1,580 1,680	1,940 2,080
	28	100 110 120 130 140 150 160	1,940 2,180	2,280 2,530
	32	120 130 140 150 160	2,330 2,530	2,770 2,970
	38	140 150 160 170 180	2,930 3,220	3,370 3,660
	45	140 150 160 170 180	3,520 4,010	4,160 4,550
	50	160 170 180 200	4,950 5,540	5,350 5,940
	60	160 170 180 200	6,140 6,630	6,930 7,330

Catalog No. Type	D	L	U/Price Q'ty：1～9 MSP	BSPM・BSPK
MSP BSPM BSPK	20	100 110 120 130 140 150 160 170 180	680 780	970 1,070
	22	120 130 140 150 160 170 180	830 930	1,130 1,220
	25	120 130 140 150 160 170 180	970 1,030	1,270 1,370
	28	140 150 160 170 180 190 200	1,130 1,270	1,460 1,660
	32	160 170 180 190 200 220 240	1,410 1,660	1,850 2,040
	38	180 190 200 220 240 260	1,760 2,240	2,240 2,630
	45	180 190 200 220 240 260	2,140 2,730	2,630 3,110
	50	200 220 240 260	2,830 3,500	3,310 3,990
	60	200 220 240 260	3,600 4,370	4,280 4,860

Order Catalog No. — L
BSPM 32 — 180

Delivery 1 Day

Price

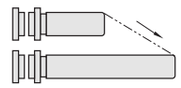
Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC)
MRP 20 — LC77
3 Days Express T 1,600/1Pc. Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Guide post (length specified type) is listed on P.845



Alteration	Code	Spec.	¥/1Code D	MRP・MSP BSPM・BSPK	BRPM BRPK
MRP・BRPM・BRPK MSP・BSPM・BSPK	LC	Changes full length 1mm increments	20～32	400	500
			38～60	600	700

D	LC MRP	LC BRPM・BRPK	LC MSP	LC BSPM・BSPK
20	60～119	70～119	70～179	80～179
22	60～119	70～119	70～179	80～179
25	60～129	80～129	70～179	80～179
28	60～159	80～159	70～199	80～199
32	60～159	100～159	70～239	80～239
38	60～179	100～179	70～259	80～259
45	60～179	120～179	70～259	90～259
50	60～199	120～199	70～259	90～259
60	60～199	120～199	70～259	90～259

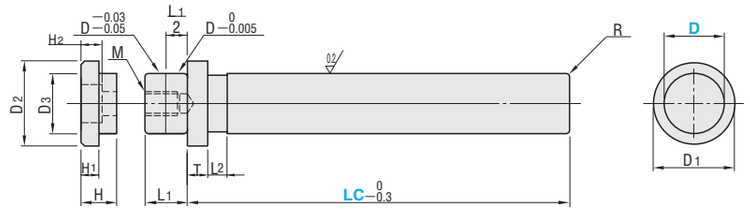
GUIDE POSTS FOR DIE SET
—FULL LENGTH LONG SPECIFIED TYPE—

RoHS

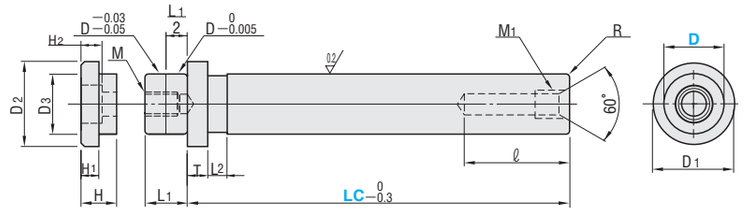
—Demountable post—

—Press fit post—

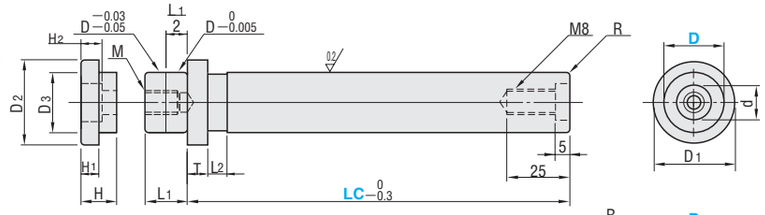
MRP



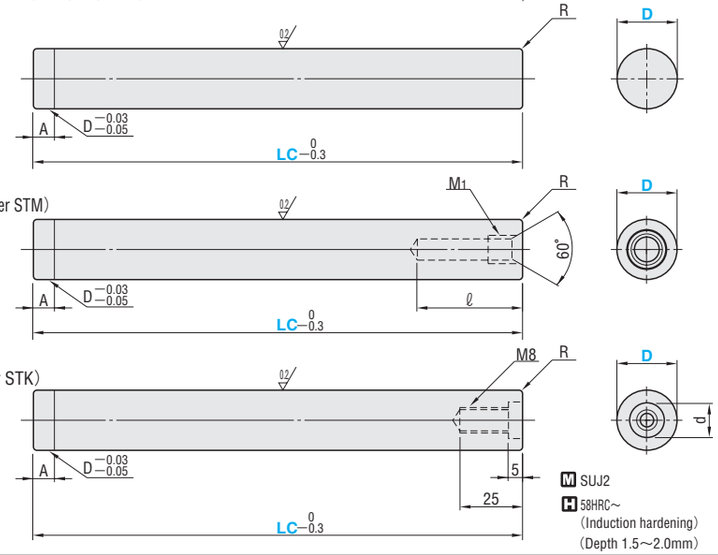
BRPM
(For movable stopper STM)



BRPK
(For fixed stopper STK)



MSP



BSPM
(For movable stopper STM)

BSPK
(For fixed stopper STK)

M SUJ2
H 58HRC～
(Induction hardening)
(Depth 1.5～2.0mm)

D		D_1	T	L_1	L_2	ℓ	M_1×P	d	A	M	R	D_2	D_3	H	H_1	H_2	A Supplied bolts
20	+0.020 +0.015	29	5	15	10	38	M10×1.5	14	4	M8×18	2.0	28	19.5	14	7	8.5	CB 8—25
22		31	8	16		42					3.0	30	21.5				
25		36		18		50	M12×1.5					35	24.5				
28	+0.025	39	10	20		50			5	M10×22	3.5	36	27.5	16	8	10.5	CB10—30
32	+0.020	44		23	12	60						40	31.5				
38	+0.030	53	12	27		60	M16×1.5	20	6	M12×27	4.0	49	37.5	18	10	12.5	CB12—35
45	+0.025	59		32	15	70						55	44.5				
50	+0.035	69	15	35		70			7	M14×31	5.0	62	49.5	20	12	14.5	CB14—40
60	+0.030	79		42		70						72	59.5				

■ Demountable post

Catalog No. Type	D	1mm increments LC	U/Price Q'ty：1～9 MRP	BRPM BRPK
MRP BRPM BRPK	20	121 ～ 160	2,160	2,430
		161 ～ 200	2,430	2,700
		＊201 ～ 250	2,970	3,420
	22	121 ～ 160	2,340	2,610
		161 ～ 200	2,610	2,880
		＊201 ～ 250	3,330	3,780
	25	131 ～ 160	2,610	2,970
		161 ～ 200	2,880	3,240
		201 ～ 240	3,150	3,600
		＊241 ～ 300	3,960	4,590
	28	161 ～ 200	3,330	3,690
		201 ～ 240	3,960	4,230
		＊241 ～ 300	5,490	6,390
	32	161 ～ 200	3,600	3,960
		201 ～ 240	3,960	4,410
		＊241 ～ 350	6,030	6,930
	38	181 ～ 200	4,500	4,950
		201 ～ 240	4,950	5,400
		241 ～ 260	5,490	5,940
		＊261 ～ 400	9,180	10,530
	45	181 ～ 260	6,120	6,570
		＊261 ～ 400	10,170	11,790
	50	201 ～ 260	7,470	8,010
		＊261 ～ 400	12,420	14,310
	60	201 ～ 260	9,360	9,900
		＊261 ～ 400	15,570	17,910

■ Press fit post

Catalog No. Type	D	1mm increments LC	U/Price Q'ty：1～9 MSP	BSPM BSPK
MSP BSPM BSPK	20	181 ～ 200	1,440	1,710
		201 ～ 240	1,530	1,800
		241 ～ 300	1,800	2,070
	22	181 ～ 200	1,530	1,800
		201 ～ 240	1,620	1,890
		241 ～ 300	1,890	2,160
	25	181 ～ 200	1,620	1,890
		201 ～ 240	1,800	2,070
		241 ～ 300	1,980	2,340
		＊301 ～ 350	2,340	2,700
	28	201 ～ 240	1,980	2,340
		241 ～ 300	2,160	2,520
		301 ～ 350	2,430	2,970
		＊351 ～ 400	2,970	3,420
	32	241 ～ 300	2,790	3,150
		301 ～ 350	3,240	3,600
		＊351 ～ 400	4,140	4,860
	38	261 ～ 300	3,330	3,600
		301 ～ 350	3,600	4,050
		351 ～ 400	4,680	5,130
		＊401 ～ 450	5,040	5,850
	45	261 ～ 300	4,140	4,500
		301 ～ 400	4,500	4,950
		＊401 ～ 450	5,850	6,840
	50	261 ～ 400	5,490	6,030
		＊401 ～ 500	7,110	8,190
	60	261 ～ 400	6,750	7,290
		＊401 ～ 500	8,730	10,080

Order

Catalog No.	—	LC
BSPM 22	—	LC205

Delivery

3 Days

Express T 1,600/1Pc.
Express A 800/1Pc.
P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size（excluding Express T）.

● ＊marked size
8 Days

Express service is not available.

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

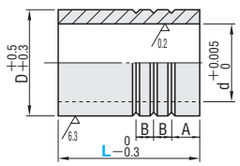
To be quoted on price & lead time above Max. Q'ty.

BALL BEARING GUIDE BUSHINGS

The volume discount rate is also applicable to alteration cost. P.39

RoHS

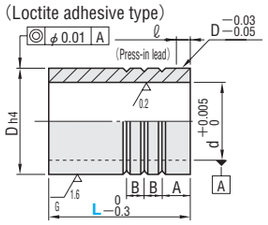
MBB (Devcon adhesive type)



M SUJ2
H 58HRC～

RoHS

LBB (Loctite adhesive type)



M SUJ2
H 58HRC～

Catalog No. Type	PD	L	U/Price Q'ty : 1～9 MBB	LBB
MBB (Devcon type) / LBB (Loctite type)	20	50	1,300	1,800
	22	50 60	1,520	2,040
	25	60 80	1,840	2,430
	28	60 80	2,160	2,730
	32	80 100	2,700	3,310
	38	80 100	3,240	3,990
	45	100 120	4,320	4,960
	50	100 120	5,400	6,320
	60	100 120	6,480	7,590

PD Post diameter		MBB · LBB d	Dh4		ℓ	A	B
20	+0.020 +0.015	26	37	0 −0.007	4	10	6
22		28	40				
25		31	45				
28	+0.025 +0.020	36	50	0 −0.008	5	12	7
32		40	55				
38	+0.030 +0.025	48	64	0 −0.008	6	15	10
45		55	74				
50	+0.035 +0.030	60	83	0 −0.010			
60		70	95				

Do not cool bushing. Cooling makes residual austenite transform into martensite as in the case of sub-zero treatment, which results expansion of both outer and inner diameter of the bushing and disables to use.

Order Catalog No. — L
MBB 50 — 120

Delivery 1 Day

Price ■Volume discount rate P.37

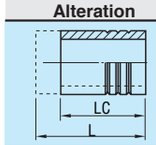
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC)
LBB 22 — LC45

3 Days | Express A 800/1Pc. P.38

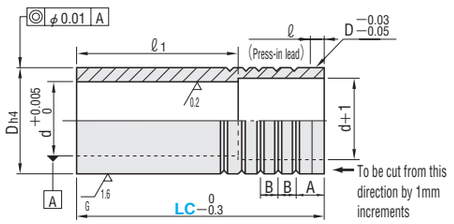
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alteration	Code	Spec.	¥/1Code PD20～32	PD38～
	LC	Changes full length L/2≦LC＜L 1mm increments	600	800

■Ball bearing guide bushings —Long type—

RoHS

LBB (Loctite adhesive type)



M SUJ2
H 58HRC～

Do not cool bushing. Cooling makes residual austenite transform into martensite as in the case of sub-zero treatment, which results expansion of both outer and inner diameter of the bushing and disables to use.

d	Dh4		ℓ	A	B	Effective slide length ℓ1	Catalog No. Type	PD	LC 1mm increments	U/Price Q'ty : 1～9
26	37	0 −0.007	4	12	7×7	60	LBB	20	51～120	3,870
28	40							22	61～120	4,050
31	45							25	81～120	4,860
36	50		5		10×5	80		28	81～150	5,490
40	55	0 −0.008						32	101～150	6,660
48	64		6	15	10×6	100		38	101～180	8,010
55	74							45	121～180	10,080
60	83	0 −0.010			10×8	120		50	121～200	12,690
70	95							60	121～200	15,210

If there is only one groove machined by cutting, add a groove to make it 2.

Order Catalog No. — LC
LBB 22 — LC100

Delivery 3 Days

Express T 1,600/1Pc.
Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Price ■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

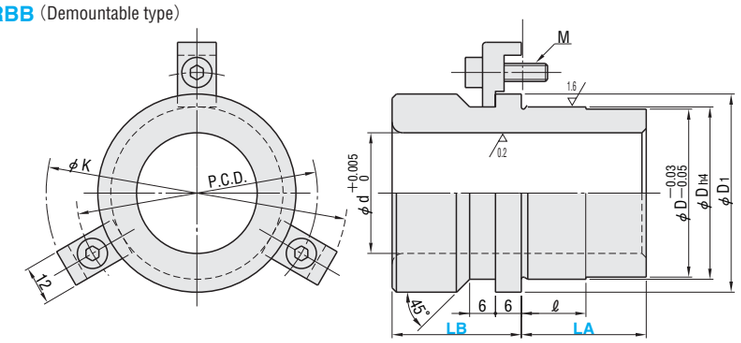
To be quoted on price & lead time above Max. Q'ty.

BALL BEARING GUIDE BUSHINGS
—DEMOUNTABLE TYPE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

RBB (Demountable type)



M SUJ2
H 58HRC～

A : Clamp, CB6—20 (PD≦32…3 pcs.; PD=38…4 pcs.)

PD Post dia.		d	Dh4		D1	ℓ	P.C.D.	K	M	Catalog No. Type	PD	LA	LB	U/Price Q'ty : 1～9
20	+0.020 +0.015	26	37	0 −0.007	43	15	55	71	6	RBB	20	30	20	3,600
												35	25	
22		28	40		46		58	74			22	30	20	4,000
												35	25	
25		31	45		51		63	79			25	35	25	4,450
												40	40	
28	+0.025 +0.020	36	50		56	18	68	84			28	35	25	4,900
												40	40	
32		40	55	0 −0.008	61		73	89			32	40	40	5,600
												50	50	
38	+0.030 +0.025	48	64		70	20	82	98			38	40	40	7,200
												50	50	

Order Catalog No. — LA — LB
RBB 25 — 40 — 40

Delivery 3 Days

Express T 1,600/1Pc.
Express A 800/1Pc. P.38

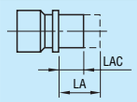
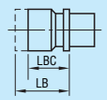
A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

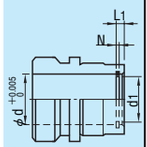
Price ■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — LA(LAC) — LB(LBC) — (SNC)
RBB 20 — LAC32 — 25

Alterations	Code	Spec.	¥/1Code PD20～32	PD38
	LAC	Changes dimension LA. ℓ +2≦LAC＜LA 1mm increments	600	800
	LBC	Changes dimension LB. 6≦LBC＜LB 1mm increments	600	800

Alterations	Code	Spec.	¥/1Code PD20～25	PD28～
	SNC	Mounts a snap ring for the bushing in the use of lower die.	500	600

PD	L1	N	d1
20	4	1.35	21.4
22			23
25			26
28	4.5	1.65	30
32		1.9	33.2
38			40

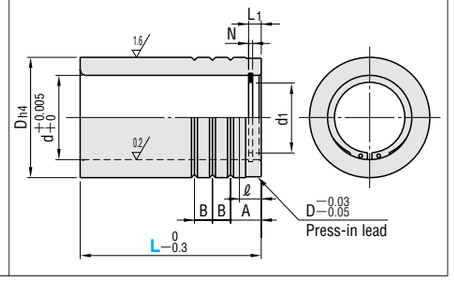
For usage, see P.849.

BALL BEARING GUIDE BUSHINGS

The volume discount rate is also applicable to alteration cost. P.39

RoHS

LBBS (With snap ring)



Order: Catalog No. — L
LBBS 50 — 120

Delivery: 3 Days

Express	T	1,600/1Pc.
Express	A	800/1Pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

M SUJ2 H 58HRC~

A Snap ring (steel 44~52 HRC for springs)

PD Post.dia.		d	Dh4		ℓ	A	B	L1	N	R	d1	Catalog No. Type	Catalog No. PD	L	U/Price Q'ty : 1~9
20	+0.020 +0.015	26	37	0 −0.007	4	10	6	4	1.35	2.5	21.4	LBBS	20	50	2,250
22		28	40								23		22	50 60	2,490
25		31	45								26		25	60 80	2,950
28	+0.025 +0.020	36	50		5	12	7	4.5	1.65	3	30		28	60 80	3,250
32		40	55	0 −0.008					1.9		33.2		32	80 100	3,920
38	+0.030 +0.025	48	64		6	15	10	5	2.2	3.5	40		38	80 100	4,590
45		55	74								46.8		45	100 120	5,710
50	+0.035 +0.030	60	83	0 −0.010							51.3		50	100 120	7,070
60		70	95					6	2.7		61		60	100 120	8,330

■Features of Ball Bearing Guide Bushings

- Guide stability···Allows shortening the distance between punch/die tip and guide (post & bushing). (A<B)
- Easy regrinding of punch & die···Due to the short distance between punch/die tip and guide post end, it is possible to regrind without demounting guide post.

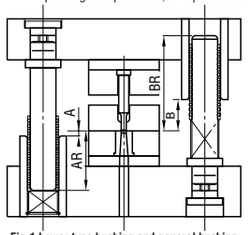


Fig.1 Lower type bushing and general bushing

Easiness of regrinding

	Bushing Lower die	Bushing Upper die
Punch	○	○
Die	○	△

Regrinding is possible if R>AR and BR.

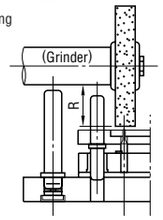
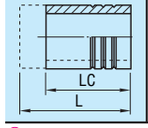


Fig.2 Regrinding of punch

Alteration

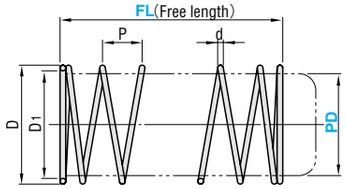
Catalog No. — L(LC)
LBBS 22 — LC45

Alteration	Code	Spec.	¥/1Code	
	LC	Changes full length L/2≦LC<L 1mm increments	PD20~32	600
			PD38~60	800

Do not cool bushing. Cooling makes residual austenite transform into martensite as in the case of sub-zero treatment, which results expansion of both outer and inner diameter of the bushing and disables to use.

RoHS

SWPB (For LBBS)



M SWP-B

Notes
SWPB is a spring exclusively designed for the LBBS (bushing standard).
For post standard springs (SWP, SWPL), see P.851

Order: Catalog No. — FL
SWPB 25 — 50

Delivery: 3 Days

Express	T	1,600/1Pc.
Express	A	800/1Pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	D1	d	P	Catalog No. Type	Catalog No. PD	FL 5mm increments	U/Price Q'ty : 1~9
25	23.2	0.9	12	SWPB	20	25~40	200
27	25.0	1.0			22	25~50	230
30	27.8	1.1	13		25	25~60	240
35	32.6	1.2	15		28	25~60	300
39	36.0	1.5			32	35~70	340
47	43.4	1.8	18		38	35~70	430
54	50.0	2.0	20		45	45~80	520
59	54.4	2.3			50	45~80	600
69	63.8	2.6			60	45~80	720

■Spring solid height

PD	FL (Free length) 25	30	35	40	45	50	55	60	65	70	75	80
20	3.7	4.0	4.4	4.8	—	—	—	—	—	—	—	—
22	4.1	4.5	4.9	5.3	5.7	6.2	—	—	—	—	—	—
25	4.3	4.7	5.2	5.6	5.9	6.4	6.8	7.3	—	—	—	—
28	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2	—	—	—	—
32	—	—	6.4	7.0	7.5	8.0	8.5	9.5	9.4	10.0	—	—
38	—	—	7.0	7.6	8.0	8.6	9.0	9.5	10.0	10.6	—	—
45	—	—	—	—	8.6	9.0	9.6	10.0	10.6	11.0	11.6	12.0
50	—	—	—	—	9.9	10.4	11.0	11.5	12.2	12.6	13.3	13.8
60	—	—	—	—	11.2	11.7	12.5	13.0	13.8	14.3	15.1	15.6

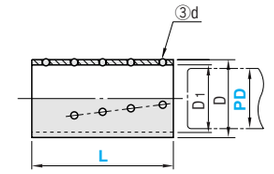
BALL CAGES FOR GUIDE BUSHING

The volume discount rate is also applicable to alteration cost. P.39

RoHS

① ②

MBSH (①High-rigidity aluminum ball cage)
MBJH (②High-rigidity resin ball cage)



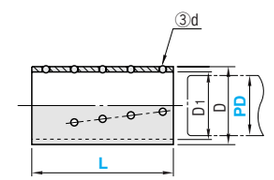
Compared to existing ball bearings (MBS, MBJ), these have 1.6 times more balls.

M ①A5052S (Aluminum) ②POM (Polyacetal resin) ③SUJ2 Sphericity 0.25 μm
H ③62~67HRC

RoHS

① ②

MBS (①Aluminum ball cage)
MBJ (②Resin ball cage)



For holder guide post P.875

M ①A5052S (Aluminum) ②POM (Polyacetal resin) ③SUJ2 Sphericity 0.25 μm
H ③62~67HRC

PD Post.dia.		Outside diameter φD	Inner diameter φD1	Ball dia. φd	Number of balls MBSH MBJH	Number of balls MBS MBJ	Number of balls Ratio	Catalog No. Type	Catalog No. PD	L	U/Price Q'ty : 1~9 MBSH	MBJH	MBS	MBJ
20	+0.020 +0.015	25.5	20.5	3	165	96	1.72	MBSH (Aluminum) MBJH (Resin) MBS (Aluminum) MBJ (Resin)	20	50	1,830	1,580	1,170	970
22		27.5	22.5		180	112	1.61		22	50	2,090	1,800	1,370	1,130
					228	140	1.63			60				
25		30.5	25.5		266	160	1.66		25	60	2,520	2,210	1,560	1,370
					350	208	1.68			75				
28	+0.025 +0.020	35.5	28.5	4	204	126	1.62		28	60	2,840	2,430	1,940	1,560
					252	154	1.64			75				
32		39.5	32.5		294	176	1.67		32	75	3,740	3,240	2,530	2,140
					350	208	1.68			90				
38	+0.030 +0.025	47.5	38.5	5	238	144	1.65		38	75	4,590	3,960	3,110	2,630
					280	176	1.67			90				
45		54.5	45.5		320	198	1.70		45	90	5,650	4,820	3,990	3,210
					400	234	1.71			110				
50	+0.035 +0.030	59.5	50.5		360	220	1.72		50	90	6,950	5,990	4,860	3,990
					450	260	1.73			110				
60		69.5	60.5		400	242	1.74		60	90	8,460	7,290	5,830	4,860
					500	286	1.75			110				

Order: Catalog No. — L
MBJ 50 — 110

Delivery: 1 Day

Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

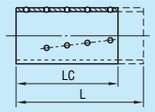
To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. — L(LC)
MBJH 22 — LC45

3 Days | Express A 500/1Pc. P.38

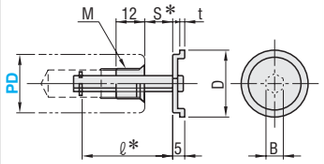
A flat charge of 1,350 yen for 3 pieces or more of the same size.

Alteration	Code	Spec.	¥/1Code	
	LC	Changes the full length 20≦LC<L 1mm increments Ball holes may remain on the cut surface.	PD20~32	400
			PD38~60	600

MBSH/MBJH are also listed on P.808. (PD10~25 for stripper guide)

STOPPERS / SPRINGS FOR BALL BEARING GUIDE

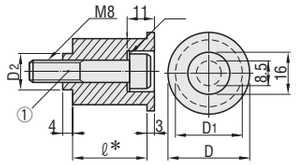
STM (Movable stopper)



*To be determined by the ball cage length.

M S45C, SPC—1 (stopper cap)
S Fe_3O_4 (Black oxide)

STK (Fixed stopper)



*To be determined by the ball cage length.

M S45C
S Fe_3O_4 (Black oxide)
A ①CB ②Spring washer

PD Post.dia.	D	M×P	B	t	D_1	D_2	②A Spring washer	Catalog No. Type	PD	L Ball cage length	U/Price Q'ty : 1~9
20	24	10×1.5	5	1.6	19	14	Conform to JIS B1251 —1984 Nominal 8	STM (Movable stopper)	20	50	440
22	26				21				22	50 60	490
25	29	12×1.5	6		24				25	60 75	540
28	33				27				28	60 75	590
32	37				31				32	75 90	640
38	44	16×1.5	8	2.0	37	20		STK (Fixed stopper)	38	75 90	680
45	51				44				45	90 110	730
50	56				49				50	90 110	830
60	66				59				60	90 110	970

L Ball retainer length	STM S	STM ℓ	STK ℓ	STK ①CB
50	0~19	31	15	8—30
60	0~23	35	20	8—35
75	0~30	42	25	8—40
90	0~37	49	30	8—45
110	0~47	59	35	8—50

Order Catalog No. STK 32 — L 90

Delivery 1 Day

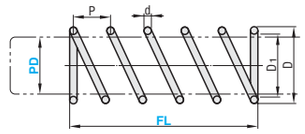
Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

SWP / SWPL (Long type)



M SWP—B

PD Post.dia.	D	$D_1{}^{+1}_{0}$	d	P
20	22.5	20.5	1.0	14
22	24.5	22.5	1.0	14
25	27.9	25.5	1.2	14
28	31.3	28.5	1.4	16
32	35.7	32.5	1.6	16
38	42.5	38.5	2.0	18
45	50.1	45.5	2.3	20
50	55.7	50.5	2.6	20
60	66.9	60.5	3.2	20

Order Catalog No. SWP 32 — FL 100

● Solid height ≒ $\frac{FL \times d}{P} + 2d$

Delivery

● SWP: 1 Day

● SWPL (Long type): 3 Days

Express service system	Express T	600/1Pc.
	Express A	300/1Pc.

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T). P.38

Catalog No. Type	PD	FL 10mm increments	U/Price Q'ty : 1~9
SWP	20	40~ 90	120
		100~140	150
	22	40~ 90	130
		100~140	160
	25	40~ 90	140
		100~150	170
	28	50~ 90	160
		100~150	190
	32	70~140	220
		150~190	300
	38	80~140	280
		150~190	370
	45	80~140	320
		150~190	440
	50	80~140	400
		150~190	490
	60	80~140	470
		150~190	590

Catalog No. Type	PD	FL 10mm increments	U/Price Q'ty : 1~9
SWPL (Long type)	20	150~190	270
		200~240	340
	22	150~190	300
		200~240	380
	25	160~200	340
		210~260	400
	28	160~200	400
		210~260	470
	32	200~220	430
		230~260	510
	38	200~240	580
		250~300	670
	45	200~240	590
		250~300	690
	50	200~240	710
		250~300	830
	60	200~240	890
		250~300	1,030

Price

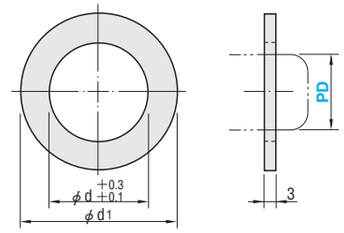
■Volume discount rate P.37

Quantity	1~9	10~29	30~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

ANTI-RISE RINGS FOR BALL CAGE

RWB (For ball cage)



M POM (Polyacetal resin) Black

Inner diameter d	Outside diameter d_1	Catalog No. Type	PD	U/Price Q'ty : 1~9
20	35	RWB (For ball cage)	20	450
22	35		22	
25	40		25	
28	45		28	
32	50		32	540
38	60		38	
45	70		45	
50	75		50	630
60	85		60	

Order Catalog No. RWB 25

Delivery 1 Day

Price

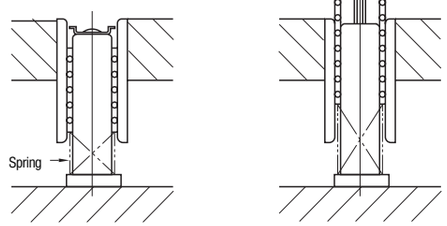
■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

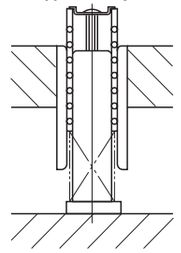
To be quoted on price & lead time above Max. Q'ty.

■**Features** To prevent ball cage rise by upward force of spring, and extend a lifetime of guide post and bushing.

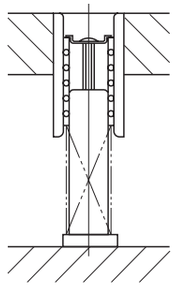
Fig.1 Cage rise and movable stpper damage



The spring's upward force becomes larger near the bottom dead point and the cage slips.

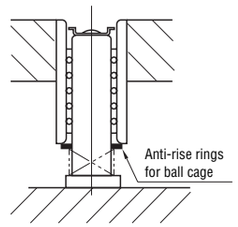


The cage has risen.



Serious rise of ball cage would impose loads to movable stopper at the top dead center and cause fatigue breakage of stopper, or upper die may be irremovable at the time of maintenance.

Fig.2 Effect of the Anti-rise rings for ball cage



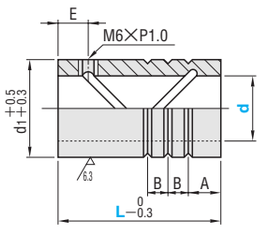
Anti-rise ring for ball cage separates spring and ball cage at the bottom dead center and prevent slip off by upward force.

PLAIN GUIDE BUSHINGS FOR DIE SET

The volume discount rate is also applicable to alteration cost. P.39

RoHS

MDB (Devcon adhesive type)

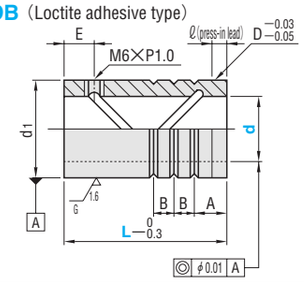


Catalog No. Type	d	L	U/Price Q'ty : 1~9
MDB	20	50	1,300
	22	50 60	1,520
	25	60 80	1,840
	28	60 80	2,160
	32	80 100	2,600
	38	80 100	3,080
	45	100 120	4,000
	50	100 120	5,130
	60	100 120	5,940

M SUJ2
H 58HRC~
A Grease nipple GPA6A

RoHS

LDB (Loctite adhesive type)

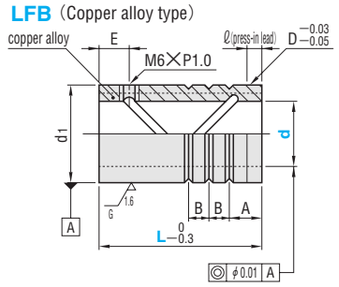


Catalog No. Type	d	L	U/Price Q'ty : 1~9
LDB	20	50	1,760
	22	50 60	1,940
	25	60 80	2,240
	28	60 80	2,670
	32	80 100	3,210
	38	80 100	3,740
	45	100 120	4,770
	50	100 120	5,930
	60	100 120	6,900

M SUJ2
H 58HRC~
A Grease nipple GPA6A

RoHS

LFB (Copper alloy type)

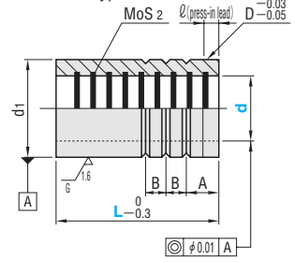


Catalog No. Type	d	L	U/Price Q'ty : 1~9
LFB	20	50	3,350
	22	50 60	3,680
	25	60 80	3,950
	28	60 80	4,590
	32	80 100	5,400

M SUJ2+copper alloy
H 45HRC~(SUJ2 part)
A Grease nipple GPA6A

RoHS

LDBZ (Oil-free type)

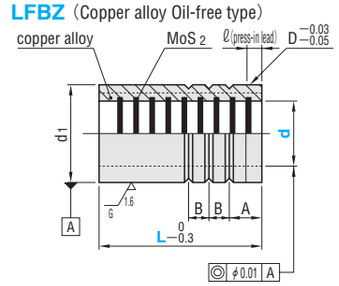


Catalog No. Type	d	L	U/Price Q'ty : 1~9
LDBZ	20	50	2,530
	22	50 60	2,830
	25	60 80	3,070
	28	60 80	3,560
	32	80 100	4,090
	38	80 100	4,910
	45	100 120	6,080
	50	100 120	7,390

M SUJ2
MoS 2 (embedded)
H 58HRC~

RoHS

LFBZ (Copper alloy Oil-free type)



Catalog No. Type	d	L	U/Price Q'ty : 1~9
LFBZ	20	50	4,220
	22	50 60	4,540
	25	60 80	4,860
	28	60 80	5,570
	32	80 100	6,380

M SUJ2+copper alloy
MoS 2 (embedded)
H 45HRC~(SUJ2 part)

Do not cool bushing. Cooling makes residual austenite transform into martensite as in the case of sub-zero treatment, which results expansion of both outer and inner diameter of the bushing and disables to use.

d		d_1	d_1 Tolerance MDB	d_1 Tolerance LDB·LFB·LDBZ·LFBZ	ℓ	A	B	E
20	+0.027 +0.022	31	+0.5 +0.3	0 −0.007	4	10	6	10
22		34						
25		37						
28	+0.032 +0.027	42			5	12	7	L 80→E10 L100→E15
32		46						
38	+0.037 +0.032	54		0 −0.008	6	15	10	
45	+0.040 +0.035	62						15
50	+0.045 +0.040	70						
60		80		0 −0.010				

How to adhere (Adhesive P.856)

Catalog No.	Adhesive
MDB	—
LDB, LDBZ, LFB, LFBZ	Loctite No.638 (LOC638)

Order Catalog No. — L
LFBZ 28 — 80

Delivery 1 Day

Price

Volume discount rate P.37

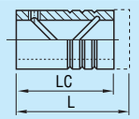
Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC)
LDB 22 — LC45

3 Days | Express T 1,600/1PC. | Express A 800/1PC. P.38

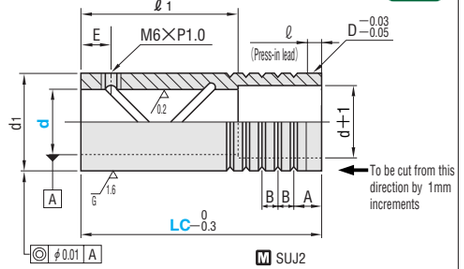
A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration	Code	Spec.	¥/1Code	
	LC	Changes full length Compatible with MDB・LDB only L/2≦LC<L 1mm increments If cut, the oil groove may be cut.	d20~32	600
			d38~	800

Plain guide bushings —Length specified type—

RoHS

LDB (Loctite adhesive type)



M SUJ2
H 58HRC~
A Grease nipple GPA6A

d		d_1	ℓ	A	B	E	Effective slide length $ℓ_1$	Catalog No. Type	Catalog No. d	LC 1mm increments	U/Price Q'ty : 1~9
20	+0.027 +0.022	31	4	12	7×7	10	60	LDB	20	51~120	4,100
22		34							22	61~120	4,400
25		37					80		25	81~120	5,000
28	+0.032 +0.027	42	5		10×5				28	81~150	6,000
32		46					100		32	101~150	7,200
38	+0.037 +0.032	54	6	15	10×6	15			38	101~180	8,400
45	+0.040 +0.035	62					120		45	121~180	10,500
50	+0.045	70			10×8				50	121~200	13,200
60	+0.040	80							60	121~200	15,400

d_1 Tolerance: 0 −0.007 (d 20~32), 0 −0.008 (d 38~45), 0 −0.010 (d 50~60)

If there is one groove left by cutting a groove is added to make it 2.

Order Catalog No. — LC
LDB 22 — LC100

Delivery 3 Days | Express T 1,600/1Pc. | Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Price

The unit price (in Yen) is the bushing unit price after alternation.

Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

SHANKS FOR DIE SET / SOCKET HEAD CAP SCREWS

ADHESIVE CEMENT

DELIVERY SHORTENED

¥ The volume discount rate is also applicable to alteration cost. P.39

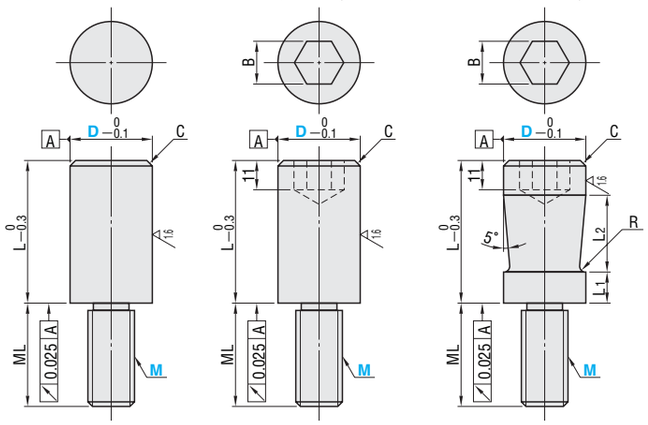
SHANKS FOR DIE SET

RoHS

MSK

MSKS (With hexagonal socket)

MSKTP (With hexagonal socket/taper)



M S45C

B	C	L	ML	M	MSKTP L1	MSKTP L2	Catalog No. Type	Catalog No. D−M	U/Price Q'ty：1～19 MSK	MSKS	MSKTP
12	2	50	40	M18×P1.5	10	28	MSK MSKS MSKTP	25−18	—	350	400
				M22×P1.5				25	340		
		55			12	30		32	440	470	540
17	3	60	60	M30×P2	13	32		38	590	610	700
		65			15			50	850	870	990

Order: Catalog No. — MSK 50

Delivery: 1 Day

Price: ■Volume discount rate P.37

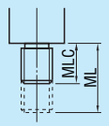
Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration: Catalog No. — (MLC) MSKTP 38 — MLC40

3 Days · Express A 500/1PC. P.38

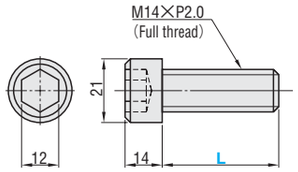
A flat charge of 1,350 yen for 3 pieces or more of the same size.

Alteration	Code	Spec.	¥/1Code
	MLC	Changes dimension ML M≦MLC＜ML 1mm increments	150

SOCKET HEAD CAP SCREWS

RoHS

CB



M SCM435
H 38～43HRC
Screw part JIS B 0205/Grade 2
(Bolt precision JIS B 1176 Strength rank 12.9)

Catalog No. Type	M−L	U/Price Less※	U/Price Over※	※ Quantity
CB	14−30	47	45	400
	14−35	50	48	400
	14−40	53	50	300

Order: Catalog No. — CB 14−40

Delivery: 1 Day

- Bolt for mounting needle roller bearing guide D60 and demountable ball bearing guide and plain guide D50 and 60. Replace this for supplied bolt loss or at the maintenance.

RoHS

LOC638-250 — LOCTITE No.638 — 250mℓ

LOC638-50 — LOCTITE No.638 — 50mℓ

Order: Catalog No. — LOC 638 — 50

Delivery: 1 Day

Price: ■Volume discount rate P.37

Quantity	1～4	5～9	10～
Rate	—	3%	5%

Liquid Color	Main ingredients	Viscosity (cP)	Use temperature range(℃)	Catalog No.	Quantity (mℓ)	U/Price Q'ty：1～4
Green	Anaerobic resin	2500	−55～150	LOC638	250	10,450
					50	2,340

■Application (LOC638)

- It can be used for adhesion of knock bushings (KNLB, KNLBB), die set bushings (LBB, LDB) and stripper guide bushings (SGBL, SGBZ, SGHZ, SGBF, SGFZ).

Strength	Recommended clearance at one side (mm)	Hardening time(2) (h) Active surface	Hardening time(2) (h) Inactive surface	Hardening method
Shearing strength 25～35 (N/mm²)	0.01～0.03(1)	1～3	3～6	Room temperature

(1) Generally, when a die part is press-fitted, it is bonded with a clearance of 0.01～0.03 mm on one side.
(2) The value is the time at which it reaches its actual strength (50% hardened) at room temperature (8−21℃). Active surfaces means steel, steel alloy, aluminium alloy, etc, and inactive surface means stainless steel, zinc, thermally hardened resins, plated surfaces.

When adhering with Loctite, it is recommended to degrease first.

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

HOLDER GUIDE POST SETS

HOLDER GUIDE POST SETS

Price Cut Up to 10%

Name / Catalog No.	PLAIN GUIDE POST SETS MY_MYP	OIL-FREE GUIDE POST SETS MYZ_MYZP	INTEGRATED TYPE PLAIN GUIDE POST SETS—Oil type— N—MYP	INTEGRATED TYPE PLAIN GUIDE POST SETS—Oil-free type— N—MYZP
Delivery	①③ⓉⒶ	①③ⓉⒶ	①	①
Page	861	861	863	863

BALL BEARING GUIDE POST SET—Movable stopper— MYA_MYAP	MYJ_MYJP	BALL BEARING GUIDE POST SETS MYAK_MYKP	—Fixed stopper— MYJK_MJKP
①	①③ⓉⒶ	①③ⓉⒶ	③ⓉⒶ
865	865	867	867

INTEGRATED TYPE PLAIN GUIDE POSTS N—MGP	BUSHINGS FOR INTEGRATED TYPE PLAIN GUIDE POST SET N—MGBP_N—MGBZP	GUIDE POST SETS WITH OIL GROOVE MGOH_MGOHP	MGO	GUIDE POSTS MGP
③Ⓐ	③Ⓐ	③ⓉⒶ		①③ⓉⒶ
869	870	871		873

Add.

GUIDE HOLDERS MGH_MGHP	PLAIN GUIDE BUSHINGS MGB_MGBP	OIL-FREE GUIDE BUSHINGS MGBZ_MGBZP	BALL BEARING GUIDE BUSHINGS MAB_MABP	BALL BEARING CAGES MBSH_MBJH_MBS_MBJ	STOPPERS STMY
①③ⓉⒶ	①③ⓉⒶ	①③ⓉⒶ	①	①③Ⓐ	①
874	874	874	875	875	876

WASHERS FOR PREVENTING FALL OF DOWEL PIN MW	SPRINGS SWMY	OIL-FREE GUIDE POST SETS GPZE_GPZ	OIL-FREE GUIDE BUSHINGS GBZE_GBZ	SPACERS FOR GUIDE POST SET MGBPS_MABPS	MGHPS
①	③ⓉⒶ	①③ⓉⒶ	①③ⓉⒶ	①	①
876	876	877	878	879	879

SPACERS FOR GUIDE POST SET MGSPS_MGLPS	STROKE END BLOCKS CEB_CSB_EBS_EBW	STROKE END BLOCKS—Flat type— CEB□_CSB□_EBYS_EBAS	CHAIN FOR END BLOCK RSC
①	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ
881	883	885	886

HOLDER GUIDE POST SETS
—GUIDE 1 —

■Outline of integrated type holder guide post set

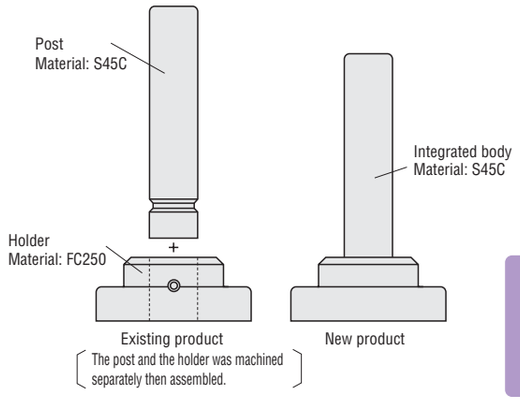
For the existing Holder guide post sets, the post part and the holder part were separately machined then assembled. This "Integrated type holder guide post set" literally has post part and holder part integrated, and is superior in strength and rigidity to the existing one due to the integration. (Patent pending)

■Features

① More strength and rigidity.
See the data from the strength test

② Replaceable from the existing product.
Dimension of outer diameter, hole diameter and hole pitch remains the same.

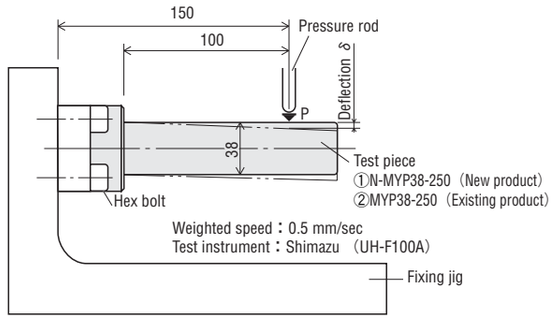
③ Tapping hole for stroke end block mounting is machined as standard specification.
No alternation M is required as before.



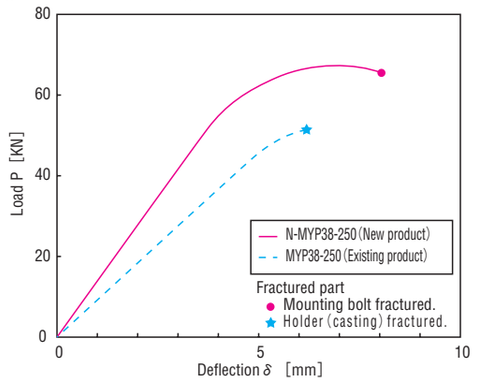
■Strength test of holder guide post set

Fig.2 indicates the result of the Holder guide post set strength/rigidity test by using the test method shown in Fig.1. As shown, the Integrated type holder guide post set is superior in the strength and the rigidity.

(Fig.1) Strength test method



(Fig.2) Results of strength test



■Comparison of holder guide post sets

Type \ Item	Strength[1)]	Rigidity[1)]	Standard range	Applicable alteration
Integrated type plain guide post set N—MYP · N—MYZP	1.3	1.5	Post diameter : φ25～60 Full length : 90～280	LC·W·B·BKC ·VHC (M·HKC is machined as standard spec.)
Plain guide post set MYP · MYZP	1	1	Post diameter : φ25～80 Full length : 80～450	LC·W·M·B·H BKC·HKC·C

Note 1 : Based on the above test results. The figures of new product are the values when that of existing product as 1.

HOLDER GUIDE POST SETS
—GUIDE 2 —

■Components

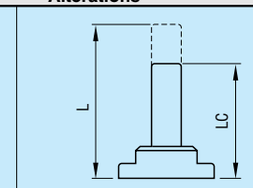
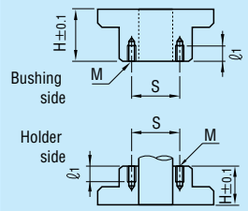
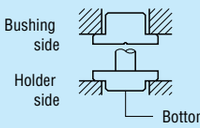
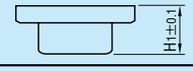
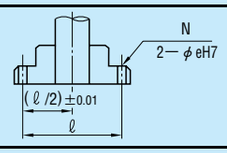
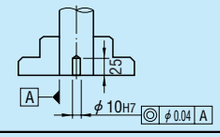
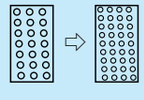
Category	set Catalog No.	Components (Catalog No./Page)					
		Post	Holder	Bushing	Ball cage	Spring	Stoppers
Plain guide post set —Oil type—	MY	MGP (P.873)	MGH (P.874)	MGB (P.874)	—	—	—
	MYP		MGHP (P.874)	MGBP (P.874)			
Plain guide post set —Oil-free type—	MYZ		MGH (P.874)	MGBZ (P.874)	—	—	—
	MYZP		MGHP (P.874)	MGBZP (P.874)			
Integrated type plain guide post set —Oil type—	N-MYP	N-MGP (P.869)		N-MGBP (P.870)	—	—	—
Integrated type plain guide post set —Oil-free type—	N-MYZP			N-MGBZP (P.870)			
Ball bearing guide post sets	MYA	N.A.	MGH (P.874)	MAB (P.875)	MBS (P.875)	SWMY (P.876)	STMY (P.876)
	MYAP		MGHP (P.874)	MABP (P.875)			
	MYJ		MGH (P.874)	MAB (P.875)	MBJ (P.875)		
	MYJP		MGHP (P.874)	MABP (P.875)			
	MYAK		MGH (P.874)	MAB (P.875)	MBS (P.875)		N.A.
	MYKP		MGHP (P.874)	MABP (P.875)			
	MYJK		MGH (P.874)	MAB (P.875)	MBJ (P.875)		
	MJKP		MGHP (P.874)	MABP (P.875)			
Guide post sets with oil groove	MGOH	MGO (P.871)	MGH (P.874)	—	—	—	—
	MGOHP		MGHP (P.874)				
	GPZE	MGP (P.873)	—	GBZE (P.878)	—	—	—
	GPZ			GBZ (P.878)			

HOLDER GUIDE POST SETS
—ALTERATIONS GUIDE / PRECISION STANDARD—

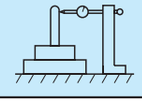
Printed in red : Added spec.

■Alterations —Guide—

Some types are not applicable. Check each page of the product.

Alterations		Code	Spec.	D	¥/1Code
Changes Post length		LC	1mm increments LCmin≦LC＜Lmax D / LCmin: 20/75, 25/75, 32/95, 38/120, 50/165, 60/170, 80/240 For ball type, when the length is shorter than the standard, check the height of bottom dead center. P.887～890	Plain type: 20・25・32 / 38・50 / 60・80 Ball type: 20・25・32 / 38・50 / 60	500 / 700 / 1,000 800 / 1,100 / 1,600
Machines tap holes for mounting stroke end block		Bushing W Holder M	Tapping for mounting stroke end block. (P.883～886 for the specification of stroke end block.) D / M / ∅1 / S: 25/4/12/37, 32/45, 38/5/15/60, 50/6/15/72, 60/8/20/92, 80/116 ⊗D20 : Not applicable ⊗For ball guide type, W is not applicable.	25・32 / 38・50 / 60・80 25～80	400 / 500 / 700 0
Reverses bushing and holder		Bushing B Holder H	Machines flange plane. Reversed type allows lowering the die height. Parallelism : within 0.02/100. Die height changeable dimension (mm) D / Plain bushing / Ball bushings / Holder side: 20/25/35/15, 25/25/30/10, 32/30/40/20, 38/35/45/25, 50/60/65/40, 60/70/70/45, 80/95/—/65 Make sure to specify when using the reversed type. The post length is measured from the holder's bottom. Alteration W and M can also be applied. In this case, tapping will be from the opposite direction. ⊗ Alteration H is not applicable for Integrated type.	20・25・32 38・50 60・80	400 600 1,000
＊Changes bushing side H_1 dimension T		BKC	Changes bushing height tolerance $H_1 \pm 0.2 \Rightarrow \pm 0.1$	25・32 38・50 60・80	300 400 500
＊Changes holder side H dimension T		HKC	Changes holder height tolerance $H \pm 0.2 \Rightarrow \pm 0.1$	25・32 38・50 60・80	300 400 500
＊Changes holder side H dimension T		VHC	Changes holder height tolerance Applicable for N-MYP,N-MYZP $H_1 \pm 0.1 \Rightarrow \pm 0.05$	25・32 38・50 60	0
Machines positioning dowel hole. (2 Holes)		N	Machines 2 positioning dowel holes on the holder. Dowel pins are not attached. Applicable for no dowel hole type only. D / ℓ / e: 20/56/6, 25/66/8, 32/76/8, 38/100/10, 50/125/10, 60/150/13, 80/190/16	20・25・32 38・50 60・80	400 500 1,000
Machines positioning dowel hole. (1 at center)		C	Machines 1 positioning dowel hole at the center of the post. Dowel pins are not attached.	20・25・32 38・50 60・80	600 800 1,000
Changes ball bearing cage		BSC	Attached Ball slider will be changed to high rigidity type. Aluminum : MBS→MBSH Resin : MBJ→MBJH	¥/1Code D / slider length / MBSH / MBSH: 20/50/660/610, 25/50/320/220, 32/60/1,210/1,100, 38/70/1,480/1,330, 50/90/2,090/2,000, 60/100/2,630/2,430	

■Precision Standard

Inspection Item	Measurement	Tolerance
Perpendicularity between the die holder's bottom and the guide post		Less than 0.02 against 100

PLAIN GUIDE POST SETS
—OIL TYPE / OIL-FREE TYPE—

Price Cut Up to 10%

: Reduced Price

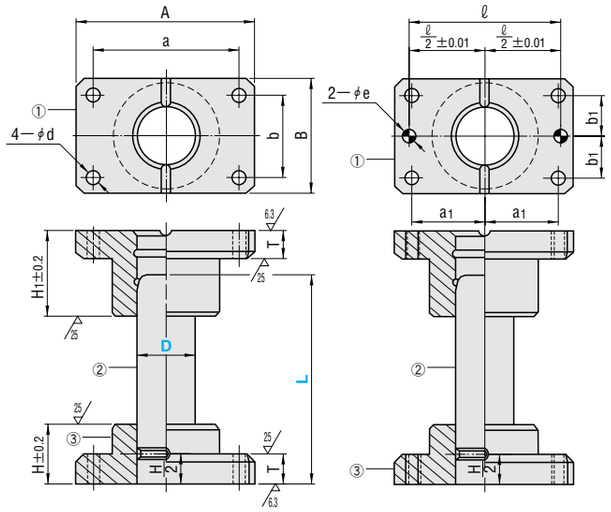
The volume discount rate is also applicable to alteration cost. P.39

RoHS

Components P.859

① M FC250
② M S45C
H 55HRC～(Induction hardening)
③ M FC250

MY(Oil type)



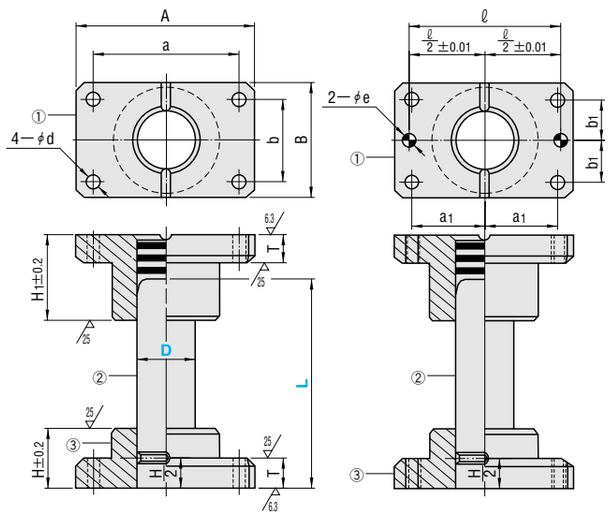
MYP(With dowel holes / Oil type)

RoHS

Components P.859

① M FC250
MoS2 (embedded)
② M S45C
H 55HRC～(Induction hardening)
③ M FC250

MYZ(Oil-free type)



MYZP(With dowel holes / Oil-free type)

Perpendicularity between the die holder's bottom and the guide post : Less than 0.02 against 100 (see P.860).

D	A	B	a	b	d	H	H1	T	ℓ	a1	b1	eH7		④Attached bolts	⑤Attached dowel pin
20	74	44	56	30	6.6	30	40	15	56	28	15	6	+0.012 0	CB 6—30	MSTM 6—20
25	84	48	66	30	9	30	45	20	66	33	15	8		CB 8—35	MSTM 8—30
32	100	58	76	36	11	40	50	20	76	38	18	8	+0.015 0	CB10—40	MSTM 8—30
38	130	75	100	44	11	50	60	25	100	50	22	10		CB10—45	MSTM10—40
50	155	90	125	60	14	65	85	25	125	62.5	30	10		CB12—50	MSTM10—40
60	190	120	150	80	18	75	100	30	150	75	40	13	+0.018 0	CB16—60	MSTM13—50
80	230	150	180	110	22	100	130	35	190	90	55	16		CB20—75	MSTM16—60

Catalog No. Type	D	L	U/Price Q'ty : 1～9 MY	MYP	MYZ	MYZP
MY MYP MYZ MYZP	20	80 90 100 110 120	1,050	1,410	1,970	2,200
		130 140 150 160	1,320	1,670	2,340	2,530
	25	80 90 100 110 120	1,100	1,470	2,040	2,290
		130 140 150 160 170 180 200	1,390	1,760	2,410	2,620
	32	90 100 110 120 130 140	1,610	2,040	2,780	3,020
		150 160 170 180 200 220 250	1,950	2,390	3,250	3,440
	38	110 120 130 140 150 160 170 180	2,320	2,830	3,900	4,110
		200 220 250 280 300	2,770	3,270	4,490	4,640
	50	160 170 180 200 220 250	4,650	5,280	7,240	7,340
		280 300 350	5,460	6,110	8,210	8,310
	60	180 200 220 250 280 300	6,740	7,680	10,630	10,730
		350 400	7,850	8,840	11,950	12,050
	80	250 280 300 350	14,030	15,470	19,780	21,470
		400 450	16,500	17,940	22,710	24,400

M12 tap hole is machined for posts of φD80 according to safety standards for heavy goods transfer. Lifting transport with Eyebolt (P.1143) is possible.

Order Catalog No. — L
MYZP 50 — 250

Price

Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

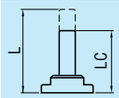
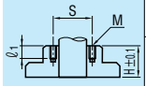
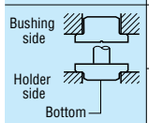
Delivery
- ●MY・MYP・MYZP φD20～60: 1 Day
- ●MYZ φD20～60: 3 Days
- ●MY・MYP・MYZ・MYZP φD80: 3 Days

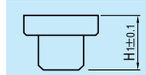
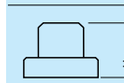
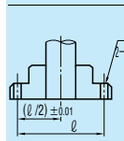
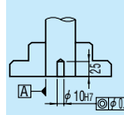
Express T 1,600/1Pc. / Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Express T 3,000/1Pc. / Express A 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size (excluding Express T).

Alteration Catalog No. — L(LC) —(M・B・H・N・C…etc.)
MYZP 50 — LC240 — B—H

- ● φD20～60: 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. P.38
  A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).
- ● φD80: 3 Days — Express T 3,000/1Pc. / Express A 1,500/1Pc. P.38
  A flat charge of 4,050 yen for 3 pieces or more of the same size (excluding Express T).

Alterations	Code	Spec.	D	¥/1Code
	LC	Changes post length 1mm increments LCmin≦LC＜Lmax Alteration details P.860	20・25・32 38・50 60・80	500 700 1,000
	Bushing W	Machines tap holes for mounting stroke end block. ⊗D20 : Not applicable Alteration details P.860	25・32 38・50 60・80	400 500 700
	Holder M		25～80	0
	Bushing B	Machines flange plane. Reversed type allows lowering the die height. Combination with alterations W and M available. The post length is measured from the holder's bottom. Alteration details P.860	20・25・32 38・50 60・80	400 600 1,000
	Holder H			

Alterations	Code	Spec.	D	¥/1Code
	BKC	Changes bushing height tolerance H1±0.2 ⇨ ±0.1	25・32 38・50 60・80	300 400 500
	HKC	Changes holder height tolerance H±0.2 ⇨ ±0.1	25・32 38・50 60・80	300 400 500
	N	Machines 2 positioning dowel holes on the holder. Applicable to MY and MYZ. Dowel pins are not attached.	20・25・32 38・50 60・80	400 500 1,000
	C	Machines 1 positioning dowel hole at the center of the post. Dowel pins are not attached.	20・25・32 38・50 60・80	600 800 1,000

D	ℓ	e
20	56	6
25	66	8
32	76	8
38	100	10
50	125	10
60	150	13
80	190	16

INTEGRATED TYPE PLAIN GUIDE POST SETS
—OIL TYPE / OIL-FREE TYPE—

Price Revised
: New Price

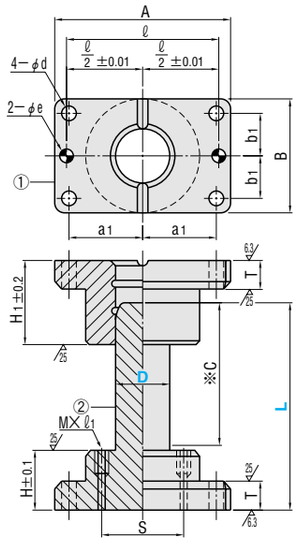
The volume discount rate is also applicable to alteration cost. P.39

RoHS

Components P.859

① M FC250
② M S45C
H C Part 55HRC～(Induction hardening)

N-MYP (Oil type)



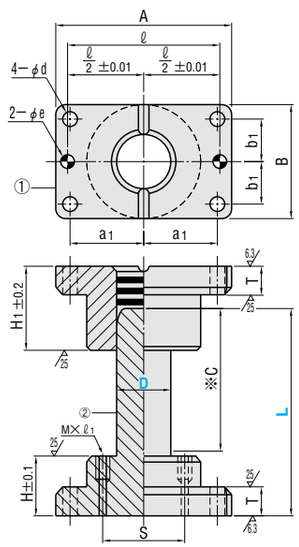
The holder and post are integrated.
The post side has tap hole for mounting the stroke end block.
Features P.858

RoHS

Components P.859

① M FC250
MoS2 (embedded)
② M S45C
H C Part 55HRC～(Induction hardening)

N-MYZP (Oil-free type)



The holder and post are integrated.
The post side has tap hole for mounting the stroke end block.
Features P.858

Perpendicularity between the die holder's bottom and the guide post : Less than 0.02 against 100 (see P.860).

D	A	B	d	H	H1	T	ℓ	a1	b1	S	M	ℓ1	eH7		③Attached bolts	④Attached dowel pin
25	84	48	9	30	45	20	66	33	15	37	4	12	8		CB 8—35	MSTM 8—30
32	100	58	11	40	50	20	76	38	18	45	4	12	8	+0.015 0	CB10—40	MSTM 8—30
38	130	75	11	50	60	25	100	50	22	60	5	15	10		CB10—45	MSTM10—40
50	155	90	14	65	85	25	125	62.5	30	72	6	15	10		CB12—50	MSTM10—40
60	190	120	18	75	100	30	150	75	40	92	8	20	13	+0.018 0	CB16—60	MSTM13—50

Catalog No. Type	D	L	U/Price Q'ty : 1～9 N-MYP	N-MYZP
N-MYP N-MYZP	25	90 100 110 120	1,440	2,340
		130 140 150 160 170 180 200	1,710	2,670
	32	100 110 120 130 140 150	2,090	3,090
		160 170 180 200	2,440	3,510
	38	120 130 140 150	2,890	4,200
		160 170 180	2,890	4,200
		200 220 250	3,340	4,730
	50	160 170 180 200	5,390	7,490
		220 250	5,390	7,490
N-MYZP	60	180 200 220 250 280	—	12,880

Order — Catalog No. — L
N-MYP 50 — 250

Price

Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery — 1 Day P.37

Alteration — Catalog No. — L(LC) — (W・B…etc.)
N-MYP 50 — LC240 — B
3 Days — Express A — 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alterations	Code	Spec.	D	¥/1Code
L LC	LC	Changes post length 1mm increments LCmin≦LC＜Lmax Alteration details P.860	25・32	500
			38・50	700
			60	1,000
H±0.1 M S	Bushing W	Machines tap holes for mounting stroke end block. Alteration details P.860	25・32	400
			38・50	500
			60	700
Bushing side	Bushing B	Machines flange plane. Reversed type allows lowering the die height. Alteration details P.860	25・32	400
			38・50	600
			60	1,000

Alterations	Code	Spec.	D	¥/1Code
H1±0.1	BKC	Changes bushing height tolerance H1±0.2 ⇨ ±0.1	25・32	300
			38・50	400
			60	500
H1±0.05	VHC	Chaenges holder height tolerance H1±0.2 ⇨ ±0.1	25・32	
			38・50	0
			60	
A ⌀3 ⌀10H7 ◎⌀0.04 A	C	Machines 1 positioning dowel hole at the center of the post. Dowel pins are not attached.	25・32	600
			38・50	800
			60	2,000

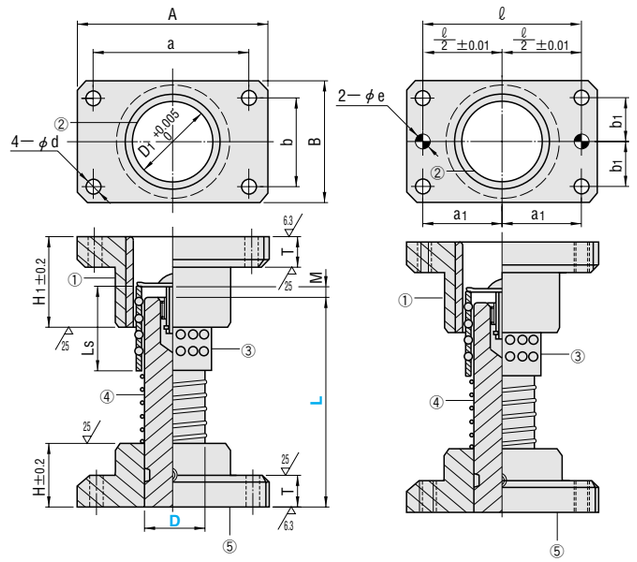
BALL BEARING GUIDE POST SETS
—MOVABLE STOPPER—

RoHS

Components P.859
Spring size P.876

①⑤ M FC250
② M SUJ2
H 58HRC～
③ M A5052S
④ M SUJ2
H 58HRC～(Induction hardening)

MYA (Aluminum ball cage type) **MYAP** (With dowel holes / Aluminum ball cage type)

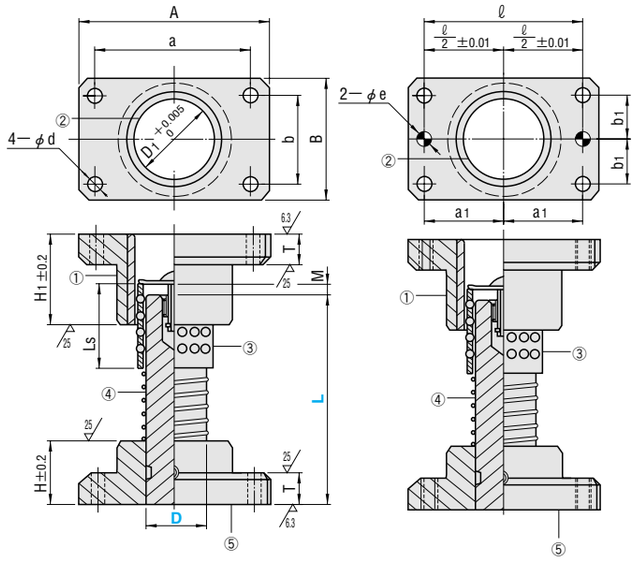


RoHS

Components P.859
Spring size P.876

①⑤ M FC250
② M SUJ2
H 58HRC～
③ M POM(Polyacetal resin)
④ M SUJ2
H 58HRC～(Induction hardening)

MYJ (Resin type) **MYJP** (With dowel holes / Resin type)



Perpendicularity between the die holder's bottom and the guide post : Less than 0.02 against 100 (see P.860).

The volume discount rate is also applicable to alteration cost. P.39

D	D_1	A	B	a	b	d	H	H_1	T	Ls	M	ℓ	a_1	b_1	e_{H7}	⑥ Attached bolts	⑦ Attached dowel pin
20	26	74	44	56	30	6.6	30	50	15	50	0～20	56	28	15	6 $^{+0.012}_{0}$	CB 6—30	MSTM 6—20
25	31	84	48	66	30	9	30	50	20	50	0～20	66	33	15	8	CB 8—35	MSTM 8—30
32	40	100	58	76	36	11	40	60	20	60	0～25	76	38	18	8 $^{+0.015}_{0}$	CB10—40	MSTM 8—30
38	48	130	75	100	44	11	50	70	25	70	0～29	100	50	22	10	CB10—45	MSTM10—40
50	60	155	90	125	60	14	65	90	25	90	0～42	125	62.5	30	10	CB12—50	MSTM10—40

Catalog No. Type	D	L	U/Price Q'ty : 1～9 MYA	MYAP	MYJ	MYJP
MYA MYAP MYJ MYJP	20	90 100 110 120	2,720	3,110	2,580	2,970
		130 140 150 160	2,850	3,230	2,720	3,110
	25	90 100 110 120	2,860	3,260	2,730	3,130
		130 140 150 160	2,990	3,380	2,860	3,260
		170 180 200	3,190	3,590	3,060	3,460
	32	110 120 130 140 150	3,660	4,120	3,380	3,870
		160 170 180 200	3,930	4,390	3,660	4,120
		220 240 260	4,260	4,720	3,990	4,460
	38	130 140 150 160	4,980	5,520	4,660	5,190
		170 180 200 220	5,390	5,920	5,050	5,590
		240 260 300	5,850	6,390	5,520	6,050
	50	170 180 200	8,850	9,540	8,250	8,930
		220 240 260	9,970	10,640	9,410	10,030
		300 350	11,320	12,010	10,710	11,390

Order Catalog No. — L
MYJ 25 — 90

Delivery
● MYA · MYAP · MYJP: 1 Day
● MYJ: 3 Days

Price

Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

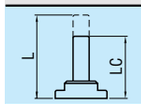
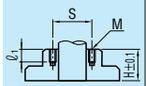
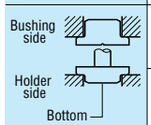
To be quoted on price & lead time above Max. Q'ty.

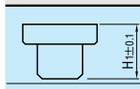
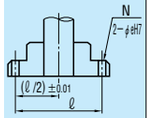
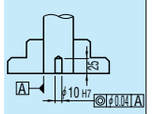
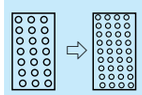
Express T 1,600/1Pc.
Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration Catalog No. — L(LC) — (M·B·H·N·C···etc.)
MYAP 50 — LC230 — B—H

3 Days Express T 1,600/1Pc. Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alterations	Code	Spec.	D	¥/1Code
	LC	Changes post length 1mm increments LCmin≦LC＜Lmax Alteration details P.860	20·25·32	800
			38·50	1,100
	Holder M	Machines tap holes for mounting stroke end block. ⊗D20 : Not available Alteration details P.860	25～50	0
	Bushing B	Machines flange plane. Reversed type allows lowering the die height. Combination with alterations W and M available. The post length is measured from the holder's bottom. Alteration details P.860	20·25·32	400
	Holder H		38·50	600

Alterations	Code	Spec.	D	¥/1Code
	BKC	Changes bushing height tolerance H1±0.2 ⇨ ±0.1	25·32	300
			38·50	400
	HKC	Changes holder height tolerance H±0.2 ⇨ ±0.1	25·32	300
			38·50	400
	N	Machines 2 positioning dowel holes on the holder. Applicable to MYA and MYJ. Dowel pins are not attached.	20·25·32	400
			38·50	500
	C	Machines 1 positioning dowel hole at the center of the post. Dowel pins are not attached.	20·25·32	600
			38·50	800
	BSC	Attached Ball bearing cage will be changed to high rigidity type. Aluminum : MBS→MBSH Resin : MBJ→MBJH		

D	Slider length	MBSH	MBJH
20	50	660	610
25	50	660	610
32	60	1,210	1,100
38	70	1,480	1,330
50	90	2,090	2,000

BALL BEARING GUIDE POST SETS
—FIXED STOPPER—

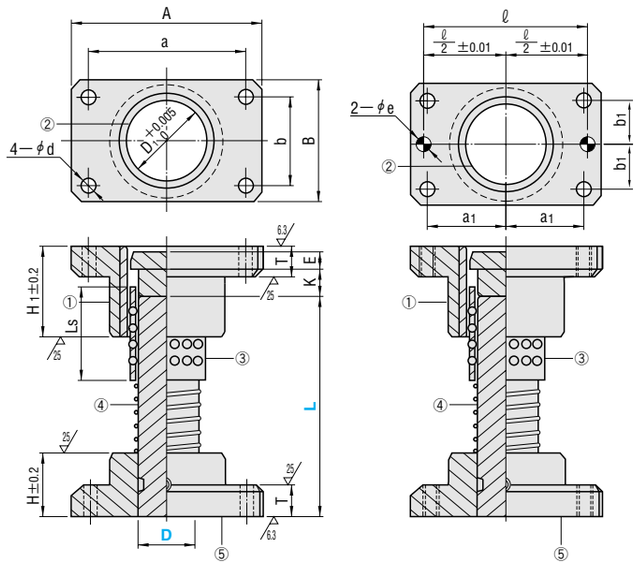
The volume discount rate is also applicable to alteration cost. P.39

RoHS

Components P.859
Spring size P.876

①⑤ M FC250
② M SUJ2
H 58HRC～
③ M A5052S
④ M SUJ2
H 58HRC～(Induction hardening)

MYAK (Aluminum ball cage type) **MYKP** (With dowel holes / Aluminum ball cage type)



D	D1	A	B	a	b	d	H	H1	T	K	E	Ls	ℓ	a1	b1	eH7	⑥Attached bolts	⑦Attached dowel pin
25	31	84	48	66	30	9	30	50	20	20	5	50	66	33	15	8	+0.015 0	CB 8—35	MSTM 8—30
32	40	100	58	76	36	11	40	60	20	25	5	60	76	38	18	8		CB10—40	MSTM 8—30
38	48	130	75	100	44	11	50	70	25	30	10	70	100	50	22	10		CB10—45	MSTM10—40
50	60	155	90	125	60	14	65	90	25	40	10	90	125	62.5	30	10		CB12—50	MSTM10—40
60	70	190	120	150	80	18	75	100	30	50	15	100	150	75	40	13	+0.018 0	CB16—60	MSTM13—50

Catalog No. Type	D	L	U/Price Q'ty : 1～9 MYAK	MYKP	MYJK	MJKP
MYAK MYKP MYJK MJKP	25	90 100 110 120	2,860	3,260	2,730	3,130
		130 140 150 160	2,990	3,380	2,860	3,260
		170 180 200	3,190	3,590	3,060	3,460
	32	110 120 130 140 150	3,660	4,120	3,380	3,870
		160 170 180 200	3,930	4,390	3,660	4,120
		220 240 260	4,260	4,720	3,990	4,460
	38	130 140 150 160	4,980	5,520	4,660	5,190
		170 180 200 220	5,390	5,920	5,050	5,590
		240 260 300	5,850	6,390	5,520	6,050
	50	170 180 200	8,850	9,540	8,250	8,930
		220 240 260	9,970	10,640	9,410	10,030
		300 350	11,320	12,010	10,710	11,390
	60	200 220	14,650	15,630	13,970	14,950
		240 260	16,000	16,990	15,320	16,310
		300 350	17,290	18,280	16,620	17,670

Order Catalog No. — L
MYKP 50 — 200

Delivery ● MYKP: 1 Day
● MYAK・MYJK・MJKP: 3 Days

Price

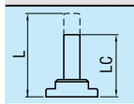
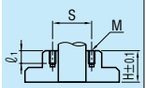
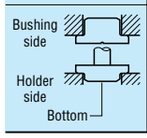
■Volume discount rate P.37

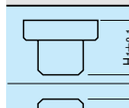
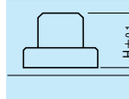
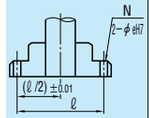
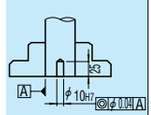
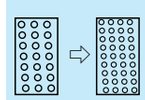
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Express T 1,600/1Pc.
Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration
Catalog No. — L(LC) —(M・B・H・N・C…etc.)
MYJK 50 — LC230 — B—H
3 Days | Express T 1,600/1Pc. | Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alterations	Code	Spec.	D	¥/1Code
	LC	Changes post length 1mm increments LCmin≦LC＜Lmax Alteration details P.860	25・32 38・50 60	800 1,100 1,600
	Holder M	Machines tap holes for mounting stroke end block. Alteration details P.860	25～60	0
	Bushing B Holder H	Machines flange plane. Reversed type allows lowering the die height. Combination with alterations W and M available. The post length is measured from the holder's bottom. Alteration details P.860	25・32 38・50 60	400 600 1,000

Alterations	Code	Spec.	D	¥/1Code
	BKC	Changes bushing height tolerance H1±0.2 ⇨ ±0.1	25・32 38・50 60	300 400 500
	HKC	Changes holder height tolerance H±0.2 ⇨ ±0.1	25・32 38・50 60	300 400 500
	N	Machines 2 positioning dowel holes on the holder. Applicable to MYAK and MYJK. Dowel pins are not attached.	25・32 38・50 60	400 500 1,000
	C	Machines 1 positioning dowel hole at the center of the post. Dowel pins are not attached.	25・32 38・50 60	600 800 1,000
	BSC	Attached Ball bearing cage will be changed to high rigidity type. Aluminum：MBS→MBSH Resin：MBJ→MBJH		

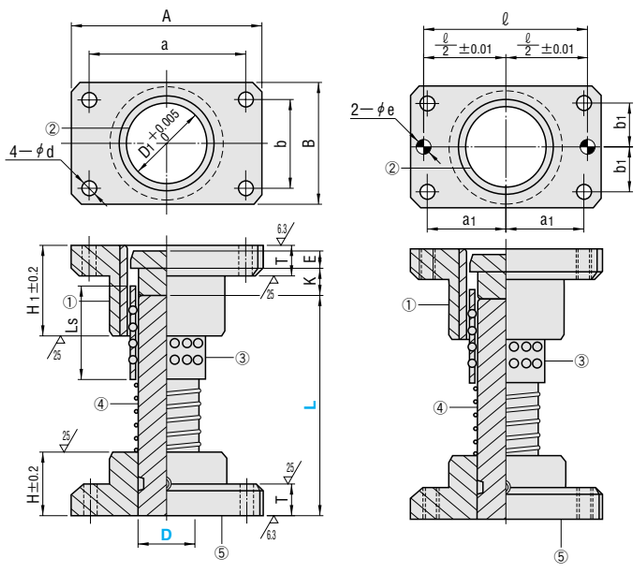
D	Slider length	MBSH	MBJH
25	50	660	610
32	60	1,210	1,100
38	70	1,480	1,330
50	90	2,090	2,000
60	100	2,630	2,430

RoHS

Components P.859
Spring size P.876

①⑤ M FC250
② M SUJ2
H 58HRC～
③ M POM(Polyacetal resin)
④ M SUJ2
H 58HRC～(Induction hardening)

MYJK (Resin ball cage type) **MJKP** (With dowel holes / Resin ball cage type)



Perpendicularity between the die holder's bottom and the guide post：Less than 0.02 against 100（see P.860）.

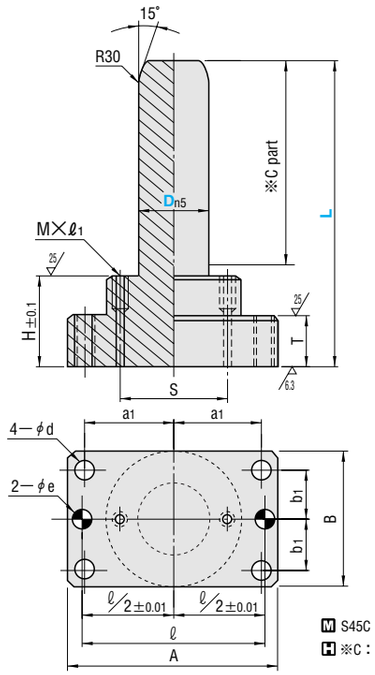
INTEGRATED TYPE PLAIN GUIDE POSTS

The volume discount rate is also applicable to alteration cost. P.39

RoHS

- The holder and post are integrated.
- The post side has tap holes for mounting the stroke and block.
- Perpendicularity between the bottom plane of the integrated post and the post : Less than 0.02 with respect to 100. P.860

N—MGP



M S45C
H ※C：55HRC～(Induction hardening)

Dn5		A	B	d	H	T	ℓ	a1	b1	S	M	ℓ1	eH7	
25	+0.024 +0.015	84	48	9	30	20	66	33	15	37	4	12	8	+0.015 0
32	+0.028 +0.017	100	58	11	40	20	76	38	18	45	4	12	8	
38		130	75	11	50	25	100	50	22	60	5	15	10	
50		155	90	14	65	25	125	62.5	30	72	6	15	10	
60	+0.033 +0.020	190	120	18	75	30	150	75	40	92	8	20	13	+0.018 0

Catalog No. Type	D	L	U/Price Q'ty：1～9
N—MGP	25	90 100 110 120	1,110
		130 140 150 160 170 180 200	1,240
	32	100 110 120 130 140 150	1,360
		160 170 180 200	1,600
	38	120 130 140 150	1,900
		160 170 180 200	2,050
		220 250	2,210
	50	160 170 180 200	3,510
		220 250	3,780
	60	180 200 220 250 280	6,750

Order Catalog No. — L
N—MGP 32 — 200

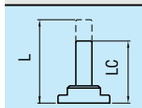
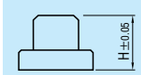
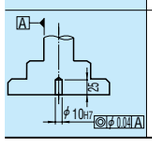
Delivery 3 Days
Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price ■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L(LC) — (C)
N—MGP 50 — LC240 — C

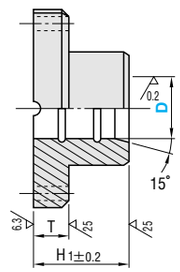
Alterations	Code	Spec.	D	¥/1Code
	LC	Changes post length 1mm increments LCmin≦LC＜Lmax Alteration details P.860	25・32 38・50 60	500 700 1,000
	VHC	Changes holder height tolerance H±0.1 ⇨ ±0.05	25・32 38・50 60	0
	C	Machines 1 positioning dowel hole at the center of the post. Dowel pins are not attached.	25・32 38・50 60	600 800 2,000

BUSHINGS FOR INTEGRATED TYPE PLAIN GUIDE POST SET

The volume discount rate is also applicable to alteration cost. P.39

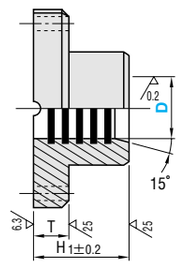
RoHS

N—MGBP (Oil type)

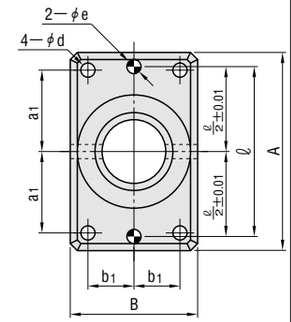


M FC250

N—MGBZP (Oil-free type)



M FC250
MoS2 (embedded)



A	B	d	H1	T	eH7		ℓ	a1	b1	Catalog No. Type	D		U/Price Q'ty：1～9 N—MGBP	U/Price Q'ty：1～9 N—MGBZP
84	48	9	45	20	8	+0.015 0	66	33	15	N—MGBP N—MGBZP	25	+0.041 +0.031	920	1,810
100	58	11	50	20			76	38	18		32	+0.047 +0.037	1,080	2,130
130	75	11	60	25	10		100	50	22		38	+0.049 +0.037	1,500	2,870
155	90	14	85	25			125	62.5	30		50	+0.052 +0.037	2,920	4,810
190	120	18	100	30	13	+0.018 0	150	75	40	N—MGBZP	60	+0.061 +0.043	—	7,310

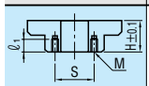
Order Catalog No.
N—MGBP 25
N—MGBZP 32

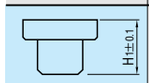
Delivery 3 Days
Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price ■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

Alteration Catalog No. — (W・B・BKC)
N—MGBP 25 — B

Alterations	Code	Spec.	D	¥/1Code
	Bushing W	Machines tap holes for mounting stroke end block. Alteration details P.860	25・32 38・50 60	400 600 700
Bushing side	Bushing B	Machines flange plane. Reversed type allows lowering the die height. Alteration details P.860	25・32 38・50 60	400 600 1,000

Alterations	Code	Spec.	D	¥/1Code
	BKC	Changes bushing height tolerance H1±0.2 ⇨ ±0.1	25・32 38・50 60	300 400 500

■Outline of INTEGRATED TYPE PLAIN GUIDE POST SET P.858
■INTEGRATED TYPE PLAIN GUIDE POST SET P.863

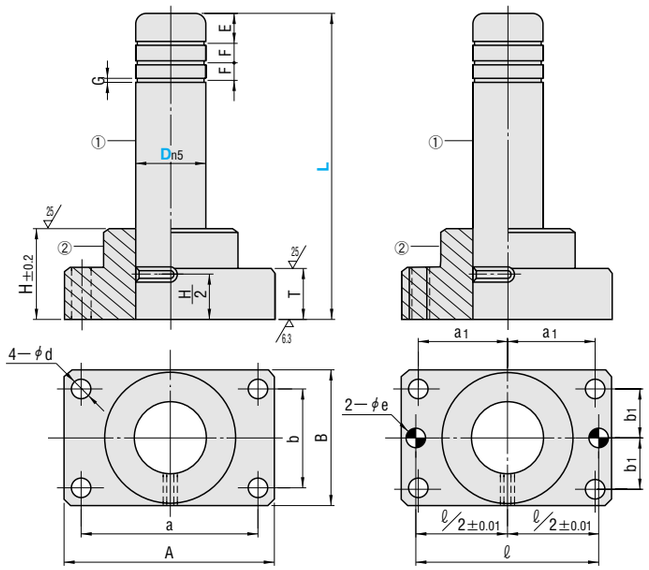
GUIDE POST SETS WITH OIL GROOVE

The volume discount rate is also applicable to alteration cost. P.39

RoHS

① M S45C
H 55HRC～(Induction hardening)
② M FC250

MGOH **MGOHP** (With dowel holes)



Perpendicularity between the die holder's bottom and the guide post : Less than 0.02 against 100 (see P.860).

Dn5		M	D	A	B	a	b	d	H	T	E	F	G	h	ℓ	a1	b1	eH7		③ Attached bolts	④ Attached dowel pin
25	+0.024 +0.015	—	25	84	48	66	30	9	30	20	13	13	3	15	66	33	15	8	+0.015 0	CB 8—35	MSTM 8—30
32	+0.028 +0.017	—	32	100	58	76	36	11	40	20	15	15		20	76	38	18	8		CB10—40	MSTM 8—30
38		—	38	130	75	100	44	11	50	25	18	18		25	100	50	22	10		CB10—45	MSTM10—40
50		—	50	155	90	125	60	14	65	25	25	20	5	32.5	125	62.5	30	10		CB12—50	MSTM10—40
60	+0.033 +0.020	—	60	190	120	150	80	18	75	30	25	20		37.5	150	75	40	13	+0.018 0	CB16—60	MSTM13—50
80		12	80	230	150	180	110	22	100	35	30	25		50	190	90	55	16		CB20—75	MSTM16—60

Catalog No. Type	D	L	U/Price Q'ty : 1～9 MGOH	MGOHP	MGO
MGOH MGOHP MGO	25	80 90 100 110 120	1,290	1,640	690
		130 140 150 160 170 180 200	1,470	1,810	860
	32	100 110 120 130 140	1,640	1,990	860
		150 160 170 180 200 220 250	1,990	2,330	1,210
	38	120 130 140 150 160 170 180	2,330	2,760	1,210
		200 220 250 280 300	2,760	3,200	1,640
	50	160 170 180 200 220 250	5,010	5,440	2,420
		280 300 350	5,530	5,960	2,940
	60	180 200 220 250 280 300	7,520	8,400	3,970
		350 400	8,400	9,280	4,840
	80	250 280 300 350	12,800	13,680	6,830
		400 450	14,640	15,520	8,640

MGOH・MGOHP : M12 tap hole is machined for posts of φD80 according to safety standards for heavy goods transfer. Lifting transport with Eyebolt (P.1143) is possible.

Order Catalog No. — L
MGOH 32 — 200

Price

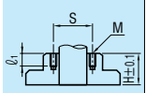
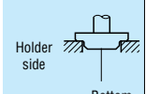
Volume discount rate P.37

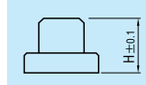
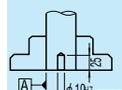
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery
● φD25～60: 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).
● φD80: 3 Days — Express T 3,000/1Pc. / Express A 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size (excluding Express T).

Alteration Catalog No. — L — (M・H・HKC…etc.)
MGOHP 50 — 250 — H
● φD25～60: 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc.
A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).
● φD80: 3 Days — Express T 3,000/1Pc. / Express A 1,500/1Pc.
A flat charge of 4,050 yen for 3 pieces or more of the same size (excluding Express T).
Alteration is not applicable for **MGO**.

Alterations	Code	Spec.	D	¥/1Code
	Holder M	Machines tap holes for mounting stroke end block. Alteration details P.860	25～80	0
	Holder H	Machines flange plane. Reversed type allows lowering the die height. The post length is measured from the holder's bottom. Alteration details P.860	25・32 38・50 60・80	400 600 1,000

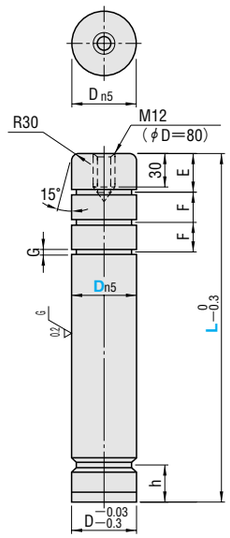
Alterations	Code	Spec.	D	¥/1Code
	HKC	Changes holder height tolerance H±0.2 ⇨ ±0.1	25・32 38・50 60・80	300 400 500
	C	Machines 1 positioning dowel hole at the center of the post. Dowel pins are not included.	25・32 38・50 60・80	600 800 1,000

RoHS

When assembling, press fit with hydraulic press.

M S45C
H 55HRC～(Induction hardening)

MGO (Guide post sets with oil groove)

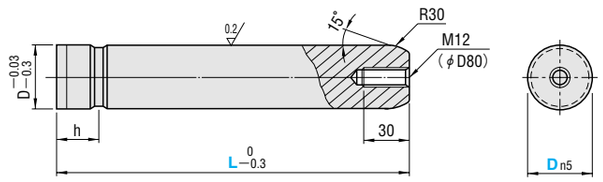


GUIDE POSTS / GUIDE HOLDERS / GUIDE BUSHINGS

¥ The volume discount rate is also applicable to alteration cost. P.39

Guide post RoHS

MGP



When assembling, press fit with hydraulic press.

M S45C
H 55HRC～ (Induction hardening)

Dn5		h	M	Catalog No. Type	D	L	U/Price Q'ty：1～9
20	+0.024 +0.015	15	—	MGP	20	80 90 100 110 120 130 140 150 160	560
							720
25		15	—		25	80 90 100 110 120 130 140 150 160 170 180 200	590
							760
32	+0.028 +0.017	20	—		32	90 100 110 120 130 140 150 160 170 180 200 220 250	760
							1,080
38		25	—		38	110 120 130 140 150 160 170 180 200 220 250 280 300	1,080
							1,500
50		32.5	—		50	160 170 180 200 220 250 280 300 350	1,840
							2,270
60	+0.033 +0.020	37.5	—		60	180 200 220 250 280 300 350 400	3,040
							3,740
80		50	12		80	250 280 300 350 400 450	5,520
							7,120

Order

Catalog No.	—	L
MGP 32	—	160
MGH 32		

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery

● φD20～60: 1 Day

● φD80: 3 Days

Express	T	3,000/1Pc.
Express	A	1,500/1Pc.

P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size (excluding Express T).

Alteration

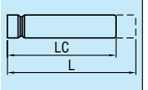
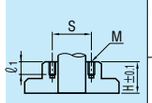
Catalog No. — L(LC)
MGP80 — LC290

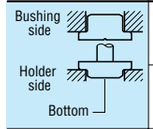
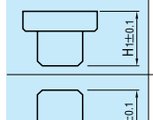
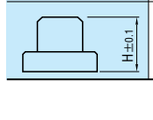
● D20～60: 3 Days — Express T 1,600/1Pc. — Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

● D80: 3 Days — Express T 3,000/1Pc. — Express A 1,500/1Pc. P.38

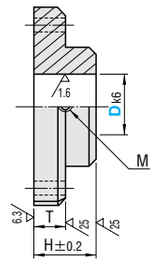
A flat charge of 4,050 yen for 3 pieces or more of the same size (excluding Express T).

Alterations	Code	Spec.	D	¥/1Code
	LC	Changes post length LC＜L 1mm increments	20・25・32	500
			38・50	700
			60・80	1,000
	Bushing W	Machines tap holes for mounting stroke end block. ⊗D20：Not applicable Alteration details P.860	25・32	400
			38・50	500
			60・80	700
	Holder M		25～80	0

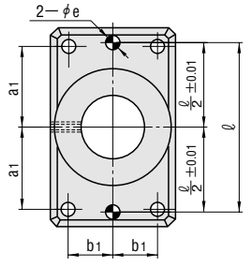
Alterations	Code	Spec.	D	¥/1Code
	Bushing B	Machines flange plane. Reversed type allows lowering the die height. Combination with alterations W and M available. The post length is measured from the holder's bottom. Alteration details P.860	20・25・32	400
	Holder H		38・50	600
			60・80	1,000
	BKC	Changes bushing height tolerance H±0.2 ⇨ ±0.1 ⊗D20：Not available	25・32	300
			38・50	400
			60・80	500
	HKC	Changes holder height tolerance H±0.2 ⇨ ±0.1 ⊗D20：Not available	25・32	300
			38・50	400
			60・80	500

Guide holder RoHS

MGH



MGHP (With dowel holes)

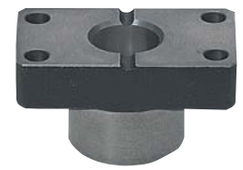


When assembling, press fit with hydraulic press.

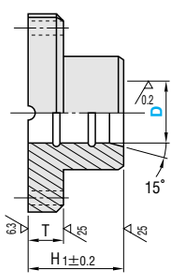
M FC250

Catalog No. Type	Dk6		A	B	a	b	d	H	T	M	eH7		ℓ	a1	b1	U/Price Q'ty：1～9 MGH	MGHP
MGH MGHP	20	+0.002 −0.011	74	44	56	30	6.6	30	15	8	6	+0.012 0	56	28	15	560	880
	25		84	48	66	30	9	30	20		8	+0.015 0	66	33	15	590	920
	32	+0.003 −0.013	100	58	76	36	11	40	20				76	38	18	760	1,080
	38		130	75	100	44	11	50	25		10		100	50	22	1,080	1,500
	50		155	90	125	60	14	65	25	12			125	62.5	30	2,500	2,920
	60	+0.004 −0.014	190	120	150	80	18	75	30		13	+0.018 0	150	75	40	3,410	4,240
	80		230	150	180	110	22	100	35		16		190	90	55	6,060	6,940

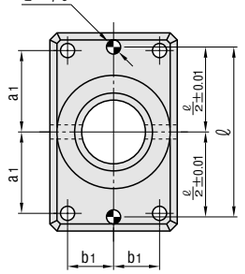
Plain guide bushing RoHS



MGB



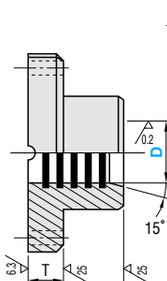
MGBP (With dowel holes)



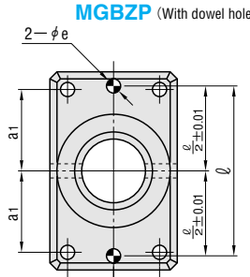
M FC250

Oil-free guide bushing RoHS

MGBZ



MGBZP (With dowel holes)



M FC250
MoS2 (embedded)

Catalog No. Type	D		A	B	a	b	d	H1	T	M	eH7		ℓ	a1	b1	U/Price Q'ty：1～9 MGB	MGBP	MGBZ	MGBZP
MGB MGBP MGBZ MGBZP	20	+0.041 +0.031	74	44	56	30	6.6	40	15	8	6	+0.012 0	56	28	15	560	900	1,380	1,750
	25		84	48	66	30	9	45	20		8	+0.015 0	66	33	15	590	920	1,430	1,810
	32	+0.047 +0.037	100	58	76	36	11	50	20				76	38	18	840	1,170	1,760	2,130
	38	+0.049 +0.037	130	75	100	44	11	60	25		10		100	50	22	1,170	1,590	2,400	2,870
	50	+0.052 +0.037	155	90	125	60	14	85	25				125	62.5	30	2,670	3,080	4,340	4,810
	60	+0.061 +0.043	190	120	150	80	18	100	30	12	13	+0.018 0	150	75	40	3,830	4,660	6,370	7,310
	80	+0.063 +0.043	230	150	180	110	22	130	35		16		190	90	55	6,760	7,640	10,860	11,800

PRESS ADD.SPEC. Printed in Red

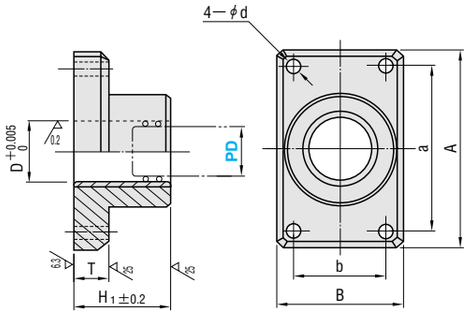
BALL BEARING GUIDE BUSHINGS / BALL BEARING CAGE

STOPPERS / WASHERS FOR PREVENTING FALL OF DOWEL PIN / SPRINGS FOR BALL BEARING GUIDE POST SETS

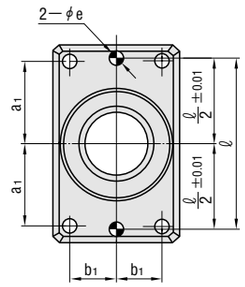
Ball guide bushing

RoHS

MAB



MABP (With dowel holes)



Built-in bushing

M FC250 M SUJ2 H 58HRC～

Catalog No. Type	PD	D		A	B	a	b	d	H1	T	eH7		ℓ	a1	b1	U/Price Q'ty：1～9 MAB	MABP
MAB MABP	20	26	+0.005 0	74	44	56	30	6.6	50	15	6	+0.012 0	56	28	15	1,590	1,910
	25	31		84	48	66	30	9	50	20	8	+0.015 0	66	33	15	1,670	2,000
	32	40		100	58	76	36	11	60	20			76	38	18	2,080	2,420
	38	48		130	75	100	44	11	70	25	10		100	50	22	2,920	3,330
	50	60		155	90	125	60	14	90	25			125	62.5	30	4,150	4,580
	60	70		190	120	150	80	18	100	30	13	+0.018 0	150	75	40	7,490	8,310

Order — Catalog No. MAB 32

Delivery — 1 Day

Price

Volume discount rate P.37

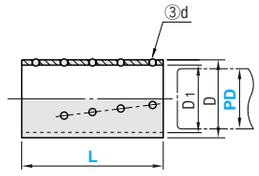
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

RoHS

MBSH (High rigidity, Aluminum ball bearing cage)
MBJH (High rigidity, Resin ball bearing cage)

① ②



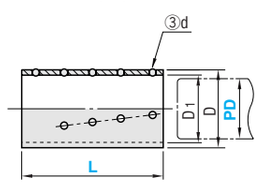
The number of balls is increased by about 1.6 times that of existing ball bearing cage (MBS or MBJ)

M ①A5052S（Aluminum）
②POM（Polyacetal resin）
④SUJ2 Sphericity0.25μm
H ③62～67HRC

RoHS

MBS (Aluminum ball bearing cage)
MBJ (Resin ball bearing cage)

① ②



M ①A5052S（Aluminum）
②POM（Polyacetal resin）
④SUJ2 Sphericity0.25μm
H ③62～67HRC

Applicable Post dia.	OD ϕD	ID ϕD1	Ball dia. ϕd	Number of balls MBSH MBJH	Number of balls MBS MBJ	Rate	Catalog No. Type		PD	L	U/Price Q'ty：1～9 MBSH	MBJH	MBS	MBJ
20	25.5	20.5	3	165	96	1.72	MBSH (Aluminum) MBJH (Resin)	MBS (Aluminum) MBJ (Resin)	20	50	1,830	1,580	1,170	970
25	30.5	25.5		224	125	1.79			25	50	1,880	1,590	1,560	1,370
32	39.5	32.5	4	238	144	1.65			32	60	＊3,740	＊2,210	2,530	2,140
38	47.5	38.5	5	210	128	1.64			38	70	＊4,590	＊3,960	3,110	2,630
50	59.5	50.5		360	220	1.64			50	90	6,950	5,990	4,860	3,990
60	69.5	60.5		460	264	1.74			60	100	＊8,460	＊7,290	5,830	4,860

＊marks：Added specifications

Order — Catalog No. MAB 32

Delivery — ●PD20·25·50 1 Day

Price — ●PD32·38·60 3 Days — Express A 500/1Pc. P.38

Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

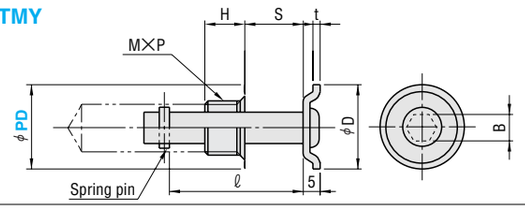
To be quoted on price & lead time above Max. Q'ty.

A flat charge of 1,350yen for 3 pieces or more of the same size.

Stopper

RoHS

STMY



MBS/MBJ Ball cage length	STMY S	STMY ℓ
50	0～20	32
60	0～25	40
70	0～29	44
90	0～42	57

Catalog No. Type	PD—L	D	M×P	H	B	t	U/Price Q'ty：1～9
STMY	20—50	24	14X1.5	12	7	1.6	440
	25—50	29	16X1.5		8		540
	32—60	37	20X1.5	15	10	2.0	640
	38—70	44					680
	50—90	56					830

Order — Catalog No. STMY 32—60

Delivery — 1 Day

Price

Volume discount rate P.37

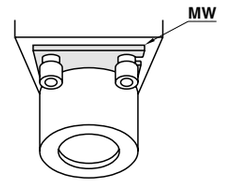
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Washer for preventing fall of dowel pin

RoHS

MW



- Thickness＝1.6mm
- How to mount：Mount by loosening the bolt after setting the guide bushing.
- Two pieces in one set

PD	Catalog No.		1 set (2 pcs.) 1～9 sets
20・25	MW	25	60
32		32	
38		38	80
50		50	
60		60	110
80		80	

Order — Catalog No. MW 38

Delivery — 1 Day

Price

Volume discount rate P.37

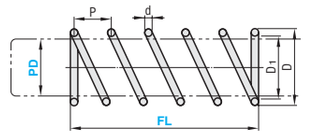
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Spring for ball guide post set

RoHS

SWMY



M SWP—B

PD Post.dia.	D	D1		d	P
20	22.5	20.5	+1.0 0	1.0	14
25	27.9	25.5		1.2	14
32	35.7	32.5	+1.5 0	1.6	16
38	42.5	38.5		2.0	18
50	55.7	50.5	+2.0 0	2.6	20
60	66.9	60.5		3.2	20

● Solid height ≒ $\frac{FL \times d}{P}$ +2d

Guide post sets D	L	Catalog No. Type	PD	FL	U/Price Q'ty：1～9
20	90	SWMY	20	40	120
	100			50	
	110			70	
	120			80	
	130			100	150
	140			110	
	150			120	
	160			140	
25	90		25	40	140
	100			50	
	110			70	
	120			80	
	130			100	170
	140			110	
	150			120	
	160			140	
	170			150	
	180			160	340
	200			180	

Guide post sets D	L	Catalog No. Type	PD	FL	U/Price Q'ty：1～9
32	110	SWMY	32	50	220
	120			60	
	130			70	
	140			90	
	150			110	
	160			120	
	170			130	
	180			140	
	200			170	300
	220			190	
	240			210	430
	260			230	510
38	130		38	60	280
	140			70	
	150			80	
	160			90	
	170			110	
	180			120	
	200			150	370
	220			170	
	240			190	
	260			210	580
	300			230	

Guide post sets D	L	Catalog No. Type	PD	FL	U/Price Q'ty：1～9
50	170	SWMY	50	70	400
	180			90	
	200			110	
	220			140	
	240			170	490
	260			190	
	300			230	710
	350			280	830
60	200		60	90	470
	220			130	
	240			150	590
	260			180	
	300			230	890
	350			250	1,030

Order — Catalog No. — FL — SWMY 32 — 190

Delivery — 3 Days — Express T 600/1Pc. Express A 300/1Pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

Volume discount rate P.37

Quantity	1～9	10～19	30～99	100～200
Rate	—	5%	10%	15%

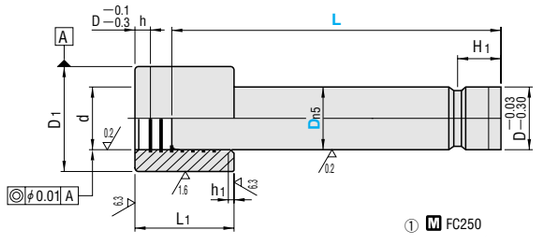
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE GUIDE POST SETS
—PRESS FIT TYPE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

GPZE
GPZ



① M FC250
MoS2 (embedded)
② M S45C
H 55HRC～(Induction hardening)

② Dn5		H1	① d		D1JS5 GPZE		D1JS5 GPZ		h	h1	L1
32	+0.028 +0.017	20	32	+0.047 +0.037	52	±0.0065	—	—	8	4	48
38		25	38	+0.049 +0.037	60		—	—	10	5	55
50		32.5	50	+0.052 +0.037	70		75	±0.0065	15	10	75
60	+0.033 +0.020	37.5	60	+0.061 +0.043	80		85	±0.0075	20		90
80		50	80	+0.063 +0.043	100	±0.0075	110		25		120

D1	Catalog No. Type	D	L	U/Price Q'ty : 1～9
52	GPZE	32	90 100 110 120 130 140 150 160 170 180 200 220 250	2,610 / 2,970
60		38	110 120 130 140 150 160 170 180 200 220 250 280 300	3,440 / 3,900
70		50	160 170 180 200 220 250 280 300 350	5,230 / 5,680
80		60	180 200 220 250 280 300 350 400	7,440 / 8,200
100		80	250 280 300 350 400 450	12,810 / 14,540
75	GPZ	50	160 170 180 200 220 250 280 300 350	5,810 / 6,300
85		60	180 200 220 250 280 300 350 400	8,570 / 9,380
110		80	250 280 300 350 400 450	14,700 / 15,680

Order — Catalog No. — L
GPZE 80 — 300

Delivery — ●ϕD32～60: 1 Day

●ϕD80: 3 Days — Express T 3,000/1Pc. / Express A 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

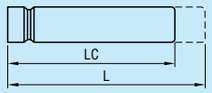
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration — Catalog No. — L(C)
GPZE 80 — LC 290

●D32～60: 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

●D80: 3 Days — Express T 3,000/1Pc. / Express A 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size (excluding Express T).

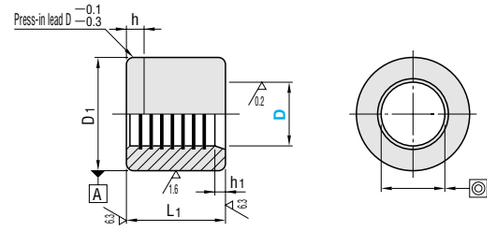
Alteration	Code	Spec.	D	¥/1Code
	LC	Changes post length LCmin≦LC＜Lmax 1mm increments	32 / 38・50 / 60・80	500 / 700 / 1,000

D	Lmin.
32	85
38	105
50	140
60	165
80	220

OIL-FREE GUIDE BUSHINGS
—PRESS FIT TYPE—

RoHS

GBZE
GBZ



M FC250
MoS2 (embedded)

Catalog No. Type	D		D1JS5 GBZE		D1JS5 GBZ		h	h1	L1	U/Price Q'ty : 1～9 GBZE	U/Price Q'ty : 1～9 GBZ
GBZE GBZ	32	+0.047 +0.037	52	±0.0065	—	—	8	4	48	1,810	—
	38	+0.049 +0.037	60		—	—	10	5	55	2,260	—
	50	+0.052 +0.037	70		75	±0.0065	15	10	75	3,290	3,780
	60	+0.061 +0.043	80		85	±0.0075	20		90	4,210	5,190
	80	+0.063 +0.043	100	±0.0075	110		25		120	6,940	8,540

Order — Catalog No.: GBZE 50

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery — ●ϕD32～60: 1 Day

●ϕD80: 3 Days — Express T 3,000/1Pc. / Express A 1,500/1Pc. P.38
A flat charge of 4,050 yen for 3 pieces or more of the same size (excluding Express T).

SPACERS FOR GUIDE POST SET
—CASTING TYPE—

RoHS

Spacer for guide bushing

MGBPS (For Plain type, with dowel holes)
MABPS (For Ball bearing type, with dowel holes)

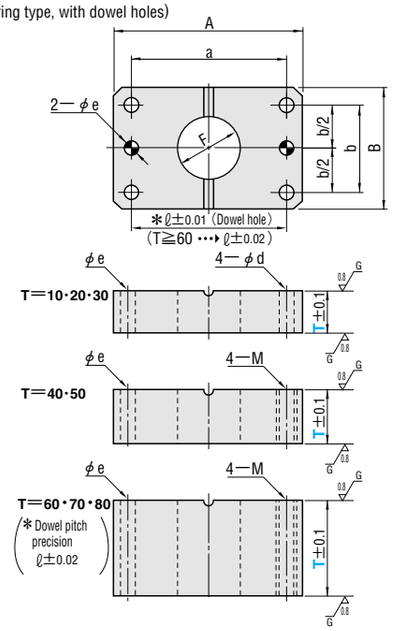


Plate flatness per thickness : 0.02 or less for a 100 mm plate
Draft angle (2~3°) of casting in the height T direction

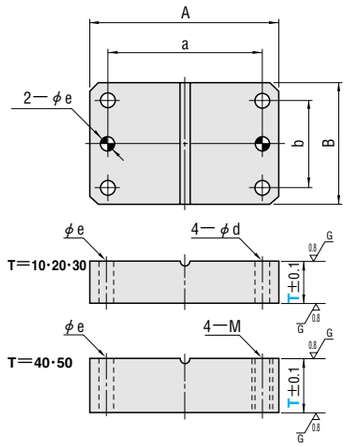
M FC250

RoHS

Spacer for guide holder

MGHPS (With dowel holes)

Applicable post diameter : 20 · 25 · 32



Applicable post diameter : 38 · 50

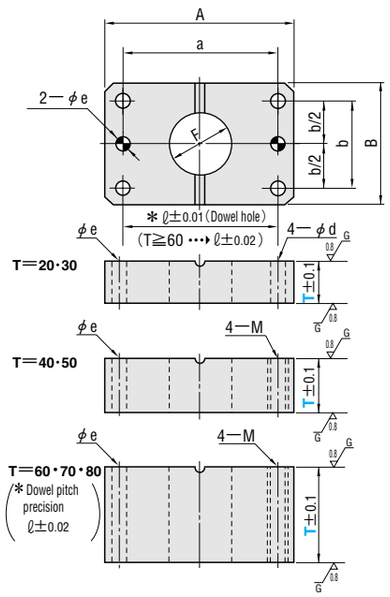


Plate flatness per thickness : 0.02 or less for a 100 mm plate
Draft angle (2~3°) of casting in the height T direction

M FC250

Post. dia.	A	B	a	b	d	M	F MGBPS	F MABPS	F MGHPS	*ℓ±0.01 (*T60, 70 and 80 are ℓ±0.02)	e_{H7}		T
20	74	44	56	30	6.6	6	22	28	—	56	6	+0.012 0	10 20 30 40
25	84	48	66	30	9	8	28	34	—	66	8		10 20 30 40 50
32	100	58	76	36	11	10	34	42	—	76	8	+0.015 0	10 20 30 40 50
38	130	75	100	44	11	10	42	52	32	100	10		20 30 40 50 60 70 80
50	155	90	125	60	14	12	52	62	45	125	10		20 30 40 50 60 70 80

Catalog No. Type		Post.dia.	T
For plain type bushing	MGBPS	20	10 20 30 40
		25	10 20 30 40 50
For ball bearing type bushing	MABPS	32	10 20 30 40 50
For holder	MGHPS	38	20 30 40 50 60 70 80
		50	20 30 40 50 60 70 80

Order Catalog No. — T
MGBPS 20 — 30

Delivery 1 Day

Price

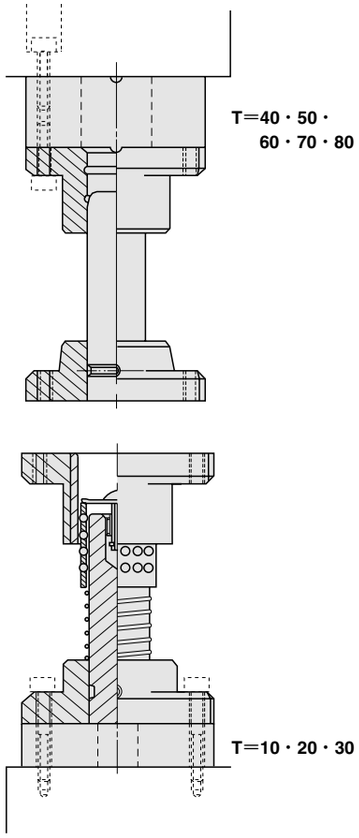
Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example

Post. dia.	T	U/Price Q'ty : 1~9 MGBPS MABPS	MGHPS
20	10	1,140	950
	20	1,200	1,010
	30	1,250	1,060
	40	1,580	1,390
25	10	1,240	1,010
	20	1,330	1,090
	30	1,420	1,180
	40	1,680	1,460
	50	2,270	1,940
32	10	1,400	1,100
	20	1,500	1,210
	30	1,610	1,310
	40	1,870	1,580
	50	2,270	2,050
38	20	1,820	1,480
	30	1,980	1,630
	40	2,310	1,970
	50	2,470	2,130
	60	3,250	2,900
	70	3,740	3,330
	80	4,980	4,390
50	20	2,550	2,190
	30	2,800	2,440
	40	3,180	2,820
	50	3,370	3,010
	60	4,420	3,950
	70	5,100	4,570
	80	6,340	5,620



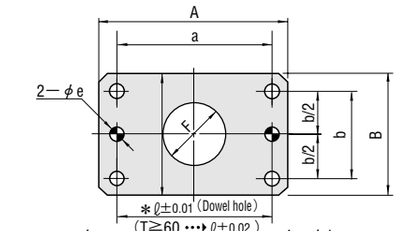
SPACERS FOR GUIDE POST SET
—STEEL TYPE—

RoHS

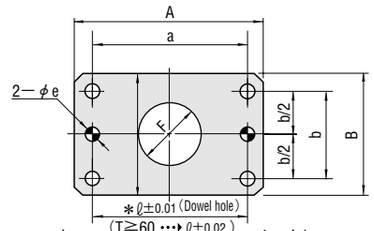
Spacer for guide bushing

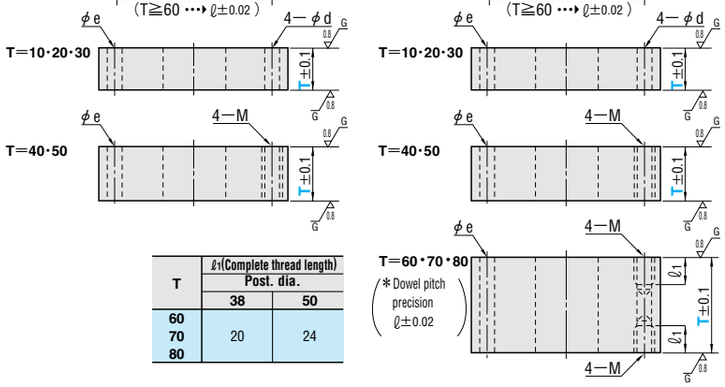
MGSPS (With dowel holes)

Applicable post diameter：20・25・32



Applicable post diameter：38・50





T	ℓ1(Complete thread length) Post. dia. 38	50
60 70 80	20	24

Plate flatness per thickness：0.02 or less for a 100 mm plate

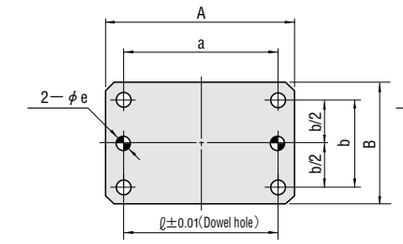
M SS400

RoHS

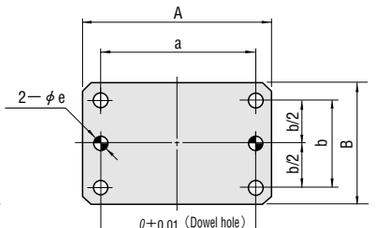
Spacer for guide holder

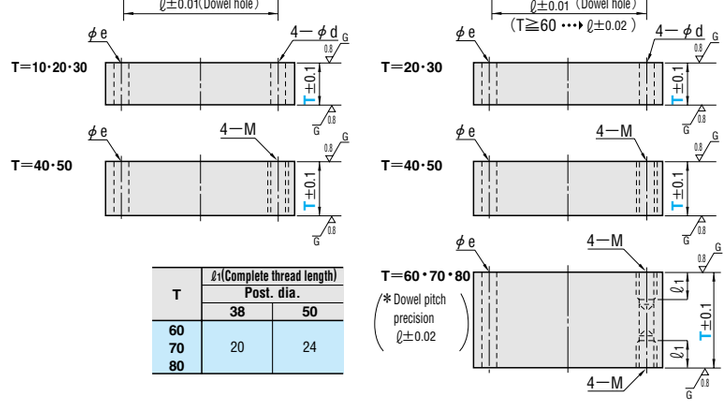
MGLPS (With dowel holes)

Applicable post diameter：20・25・32



Applicable post diameter：38・50





T	ℓ1(Complete thread length) Post. dia. 38	50
60 70 80	20	24

Plate flatness per thickness：0.02 or less for a 100 mm plate

M SS400

Post. dia.	A	B	a	b	d	M	F MGSPS	ℓ ±0.01 (*T60, 70 and 80 are ℓ ±0.02)	eH7		T
20	74	44	56	30	6.6	6	28	56	6	+0.012 0	10 20 30 40
25	84	48	66	30	9	8	34	66	8		10 20 30 40 50
32	100	58	76	36	11	10	42	76	8	+0.015 0	10 20 30 40 50
38	130	75	100	44	11	10	52	100	10		20 30 40 50 60 70 80
50	155	90	125	60	14	12	62	125	10		20 30 40 50 60 70 80

Catalog No. Type	Post.dia.	T
For bushing MGSPS / For holder MGLPS	20	10 20 30 40
	25	10 20 30 40 50
	32	10 20 30 40 50
	38	20 30 40 50 60 70 80
	50	20 30 40 50 60 70 80

Order

Catalog No.	—	T
MGSPS 20	—	30

Delivery

1 Day

Price

Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Post. dia.	T	U/Price Q'ty：1～9 MGSPS	MGLPS
20	10	1,440	1,200
	20	1,510	1,270
	30	1,580	1,340
	40	1,990	1,750
25	10	1,570	1,270
	20	1,680	1,380
	30	1,790	1,490
	40	2,120	1,850
	50	2,870	2,450
32	10	1,760	1,390
	20	1,900	1,520
	30	2,030	1,660
	40	2,360	1,990
	50	2,870	2,590
38	20	2,300	1,870
	30	2,500	2,060
	40	2,920	2,480
	50	3,120	2,690
	60	4,100	3,660
	70	4,730	4,210
	80	6,290	5,540
50	20	3,220	2,760
	30	3,540	3,080
	40	4,020	3,560
	50	4,260	3,800
	60	5,580	4,990
	70	6,440	5,770
	80	8,000	7,100

Example

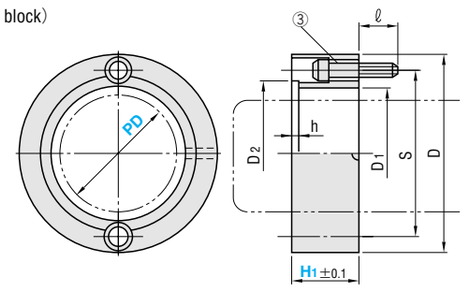
T=40・50・60・70・80

T=10・20・30

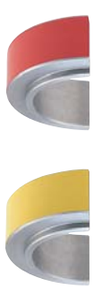
STROKE END BLOCKS

RoHS

CEB (End block)

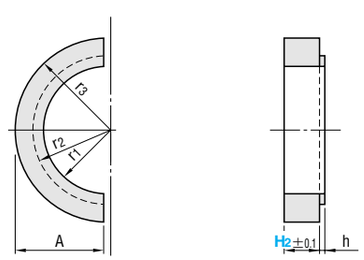


M SS400
A Bolt 2pcs.



RoHS

CSB (Stock block)



M SS400

PD	D	D_1	D_2	S	h	r_1	r_2	r_3	A	③	ℓ
25	46	31.5	36	37	2	15.75	18	23	22	M4×P0.7	10
32	56	41	45	45	2	20.5	22.5	28	27	M4×P0.7	10
38	72	49	56	60	3	24.5	28	36	35	M5×P0.8	10
50	86	62	68	72	3	31	34	43	42	M6×P1.0	10
60	112	76	84	92	3	38	42	56	55	M8×P1.25	12
80	140	100	108	116	3	50	54	70	69	M8×P1.25	12

■End block

Catalog No. Type	PD	H_1 5mm increments	Color	U/Price Q'ty：1～9
CEB	25	10～50	R (Red)	530
	32	10～50 55・60		700 940
	38	15～50 55～70		960 1,410
	50	20～50 55～80		1,280 1,820
	60	20～50 55～80	Y (Yellow)	1,810 2,710
	80	20～50 55～80		3,410 5,060

■Stock block

Catalog No. Type	PD	H_2 5mm increments	Color	U/Price Q'ty：1～9
CSB	25	10～20 25～40	R (Red)	270 530
	32	10～20 25～40		380 650
	38	10～20 25～50		530 800
	50	10～20 25～50	Y (Yellow)	750 1,020
	60	10～20 25～50		960 1,230
	80	10～20 25～50		1,490 1,760

Order

Catalog No.	—	H_1	—	Color (R・Y)
CEB 32	—	35	—	R

Delivery 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The volume discount rate is also applicable to alteration cost. P.39

Catalog No. Type	PD	①CEB (End block) H_1 5mm increments	Color	②CSB (Stock block) H_2 5mm increments	Color	U/Price Q'ty：1～9Sets EBW	EBS
EBS (CEB：1pc. CSB：1pc.)	25	10 ～ 50	R (Red)	10 ～ 20 25 ～ 40	R (Red)	1,060 1,590	800 1,060
	32	10 ～ 50		10 ～ 20 25 ～ 40		1,460 2,000	1,080 1,350
		55 ・ 60		10 ～ 20 25 ～ 40		1,700 2,230	1,320 1,590
	38	15 ～ 50		10 ～ 20 25 ～ 50		2,020 2,560	1,490 1,760
		55 ～ 70		10 ～ 20 25 ～ 50		2,470 3,000	1,940 2,200
EBW (CEB：2pcs. CSB：2pcs.)	50	20 ～ 50		10 ～ 20 25 ～ 50		2,770 3,310	2,020 2,290
		55 ～ 80	Y (Yellow)	10 ～ 20 25 ～ 50	Y (Yellow)	3,330 3,860	2,570 2,840
	60	20 ～ 50		10 ～ 20 25 ～ 50		3,720 4,260	2,770 3,040
		55 ～ 80		10 ～ 20 25 ～ 50		4,630 5,160	3,670 3,930
	80	20 ～ 50		10 ～ 20 25 ～ 50		6,380 6,920	4,900 5,170
		55 ～ 80		10 ～ 20 25 ～ 50		8,050 8,580	6,560 6,820

The guide post set requires tap hole machining for mounting. P.860

Order

Catalog No.	—	①		—	②	
Type	PD	H_1	R・Y		H_2	R・Y
EBS	38	— 40	R	—	40	— Y

Delivery 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Price

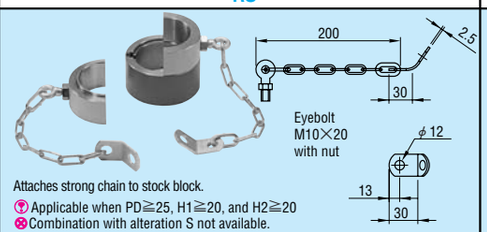
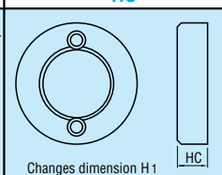
■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No.	—	①	—	②	—	(S・HC・RS)
EBW 38	—	40R	—	40 — Y	—	S — HC38
CSB 50			—	35 — Y	—	RS

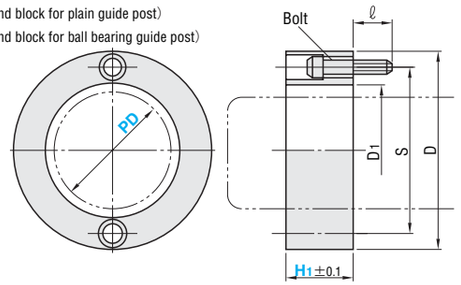
Alterations	Chaining	Chaining (with a strong chain)	Changes dimension H_1
Code	S	RS	HC
Spec.	Connects end block and stock block with chain.	 Attaches strong chain to stock block. Applicable when PD≧25, H1≧20, and H2≧20 Combination with alteration S not available.	 Changes dimension H1 H1 min.＜HC＜H1 max. 1mm increments CSB：Not applicable

¥/1Code PD No.	EBW	EBS	CSB・EBS	CEB・EBS・EBW
25	800	500	700	500
32				700
38				1,000
50	900	600		1,300
60				1,300
80				2,000

For chain RSC of alteration RS, see P.886

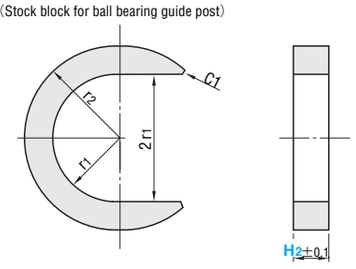
STROKE END BLOCKS
—FLAT TYPE—

①**CEBY** (End block for plain guide post)
②**CEBA** (End block for ball bearing guide post)



M SS400
A Bolt 2pcs.

③**CSBY** (Stock block for plain guide post)
④**CSBA** (Stock block for ball bearing guide post)



M SS400

PD	D	①CEBY D1	②CEBA D1	③CSBY r1	④CSBA r1	S	r2	Bolt	ℓ
25	46	29	31.5	14.5	15.75	37	23	M4×P0.7	10
32	56	37	41	18.5	20.5	45	28	M4×P0.7	10
38	72	43	49	21.5	24.5	60	36	M5×P0.8	10
50	86	56	62	28	31	72	43	M6×P1.0	10
60	112	66	76	33	38	92	56	M8×P1.25	12
80	140	88	100	44	50	116	70	M8×P1.25	12

■End block

Catalog No. Type	PD	H1 5mm increments	Color	U/Price Q'ty：1～9
①CEBY	25	10～30	R (Red)	470
		35～50		520
	32	10～30		630
		35～50		690
	38	15～30		860
		35～50		950
②CEBA	50	20～30	Y (Yellow)	1,150
		35～50		1,270
	60	20～30		1,620
		35～50		1,800
	80	20～30		3,040
		35～50		3,370

■Stock block

Catalog No. Type	PD	H2 5mm increments	Color	U/Price Q'ty：1～9
③CSBY	25	10～20	R (Red)	380
		25～40		420
	32	10～20		500
		25～40		560
	38	10～20		690
		25～50		760
④CSBA	50	10～20	Y (Yellow)	920
		25～50		1,030
	60	10～20		1,290
		25～50		1,440
	80	10～20		2,430
		25～50		2,700

Order Catalog No. — H1 — Color (R·Y)
CEBY 32 — 35 — R

Delivery 3 Days

Express	T	1,000/1Pc.
Express	A	500/1Pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

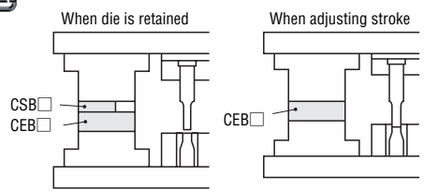
Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example



The volume discount rate is also applicable to alteration cost. P.39

Catalog No. Type	PD	①／②(End block) H1 5mm increments	Color	③／④(Stock block) H2 5mm increments	Color	U/Price Q'ty:1～9Sets
EBYS (①CEBY+③CSBY)	25	10 ～ 30	R (Red)	10 ～ 20	R (Red)	850
				25 ～ 40		880
		35 ～ 50		10 ～ 20		900
				25 ～ 40		940
	32	10 ～ 30		10 ～ 20		1,130
				25 ～ 40		1,190
		35 ～ 50		10 ～ 20		1,190
				25 ～ 40		1,250
	38	15 ～ 30		10 ～ 20		1,550
				25 ～ 50		1,620
		35 ～ 50		10 ～ 20		1,640
				25 ～ 50		1,710
EBAS (②CEBA+④CSBA)	50	20 ～ 30	Y (Yellow)	10 ～ 20	Y (Yellow)	2,070
				25 ～ 50		2,180
		35 ～ 50		10 ～ 20		2,190
				25 ～ 50		2,300
	60	20 ～ 30		10 ～ 20		2,910
				25 ～ 50		3,060
		35 ～ 50		10 ～ 20		3,090
				25 ～ 50		3,240
	80	20 ～ 30		10 ～ 20		5,470
				25 ～ 50		5,740
		35 ～ 50		10 ～ 20		5,800
				25 ～ 50		6,070

The guide post set requires tap hole machining for mounting. P.860

Order Catalog No. — ①・② — ③・④
Type PD — H1 R・Y — H2 R・Y
EBYS 38 — 40 R — 40 — Y

Delivery 3 Days

Express	T	1,000/1Pc.
Express	A	500/1Pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

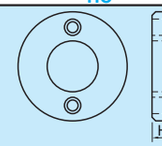
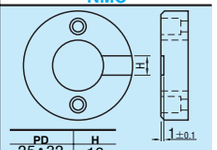
■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — ①・② — ③・④ —(S·HC·RS·NMC)
EBYS38 — 40R — 40—Y — S — HC38
CSBY50 — 35—Y — RS
CEBA60 — 40—Y — HC32

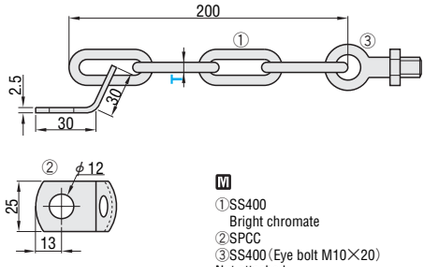
Price

Alterations Code	Chaining S	Chaining (with a strong chain) RS	Changes dimension HC	Lead groove NMC
Spec.	Connects end block and stock block with chain.	Eye bolt M10×20 With Nut. Attaches strong chain to stock block. Applicable when PD≧25, H1≧20, and H2≧20. ⊗Combination with alteration S not available.	 Changes dimension H1 H1 min.＜HC＜H1 max. 1mm increments ⊗CSBY/CSBA：Not applicable	 PD 25・32 H 10; 38～80 H 15. Adds a lead groove for height adjustment. Applicable for CEBY/CEBA.
¥/1Code PD No. 25	EBYS・EBAS 500	CSBY・CSBA・EBYS・EBAS 700	CEBY・CEBA・EBYS・EBAS 500	CEBY・CEBA 500
32			700	
38				
50	600		1,000	
60			1,300	
80			2,000	

■Chain for end block

RoHS

RSC



M
①SS400 Bright chromate
②SPCC
③SS400 (Eye bolt M10×20) Nut attached

Catalog No. Type	T	U/Price Q'ty：1～9
RSC	3	650
	5	680

This product, RSC3 is a chain for RS.

Order Catalog No.
RSC 3

Delivery 3 Days

Express	T	600/1Pc.
Express	A	300/1Pc.

P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T)

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

EFFECTIVE MOVABLE RANGE
—MOVABLE STOPPER TYPE （MYA / MYAP / MYJ / MYJP） —

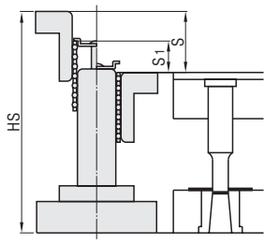
〔DATA〕 **Relation between the height of bottom dead center of MYA, MYAP, MYJ and MYJP and the post length**

■Basis of selection for Ball bearing guide

1. Sets the contact length α of post, bushing and ball bearing cage at the bottom dead center of the press machine as $\alpha \geqq D$. （When $\alpha < D$, there is the possibility of shortening die longevity. Fig.1）
2. The guide post length and the mounting height h must be within the range (colored in blue) of the table shown on the right page at the bottom of dead center of the press machine.
3. Select post length in order for h to be longer contact length as shown in Fig.C.

●Relationship between the bushing's movable distance S and the ball bearing cage movable distance S_1.

$$S_1 = \frac{S}{2}$$



HS：The position where the ball bearing cage begins to move.
Ideal position (long contact length) at the bottom dead center.

Fig. A Upper contact limit required for post/bushing functions.
$\alpha \geqq D$
（Positioned at Dmm lower than HS）

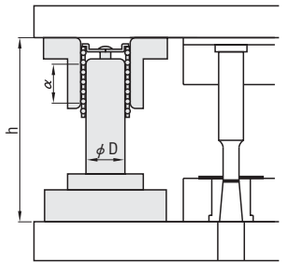


Fig. B The limit position when the punch holder has no relief hole. In addition to 5mm for the stopper thickness, it includes 10mm allowance for regrinding and safety purpose.

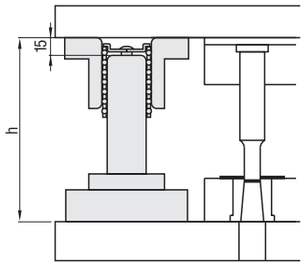


Fig. C Maximum contact length position of post, bushing and ball (bearing) cage.
（Recommended height (h).）

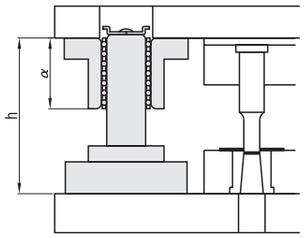


Fig. D Lower movable limit of ball bearing cage.
M=Solid height of spring
5mm=Allowance for regrinding and safety purpose
（When post length is short）

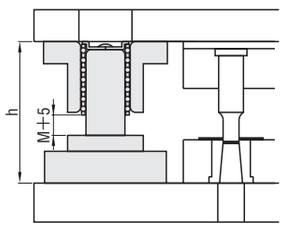


Fig. E Lower movable limit of bushing.
10mm=Allowance for regrinding and safety purpose

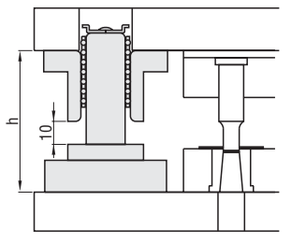
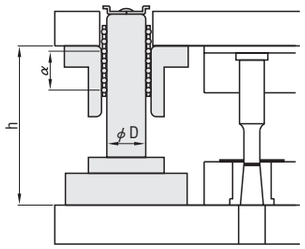


Fig. F Lower contact limit required for post/bushing functions.
$\alpha \geqq D$
（When post length is long）



■Effective movable range of MYA・MYAP・MYJ・MYJP （Movable range based on conditions A, B, C, D, E and F on the left page）

Post size	Die height h	60	80	100	120	140	160	180	200	220
20	90		E	C	B	A				
	100		E	C	B	A				
	110		E	C	B	A				
	120		E	C	B	A				
	130		E	C	B	A				
	140		F	C	B	A				
	150		F	C	B	A				
	160		F	C	B	A				

Post size	Die height h	80	100	120	140	160	180	200	220	240
25	90	E	C	B	A					
	100	E	C	B	A					
	110	E	C	B	A					
	120	E	C	B	A					
	130	F	C	B	A					
	140	F	C	B	A					
	150	F	C	B	A					
	160	F	C	B	A					
	170	F	C	B	A					
	180	F	C	B	A					
	200	F	C	B	A					

Post size	Die height h	100	120	140	160	180	200	220	240	260	280	300
32	110	D	B	A								
	120	E	C	B	A							
	130	E	C	B	A							
	140	E	C	B	A							
	150	E	C	B	A							
	160	E	C	B	A							
	170	F	C	B	A							
	180	F	C	B	A							
	200	F	C	B	A							
	220	F	C	B	A							
	240	F	C	B	A							
	260	F	C	B	A							

Post size	Die height h	120	140	160	180	200	220	240	260	280	300	320	340
38	130	D	B	A									
	140	D	C	B	A								
	150	E	C	B	A								
	160	E	C	B	A								
	170	E	C	B	A								
	180	E	C	B	A								
	200	F	C	B	A								
	220	F	C	B	A								
	240	F	C	B	A								
	260	F	C	B	A								
	300	F	C	B	A								

Post size	Die height h	160	180	200	220	240	260	280	300	320	340	360	380
50	170	D	C	B	A								
	180	E	C	B	A								
	200	E	C	B	A								
	220	E	C	B	A								
	240	F	C	B	A								
	260	F	C	B	A								
	300	F	C	B	A								
	350	F	C	B	A								

Use the values shown in the above tables for reference only. The effective movable ranges vary depending on parameters such as the ball pitch of ball bearing cage.

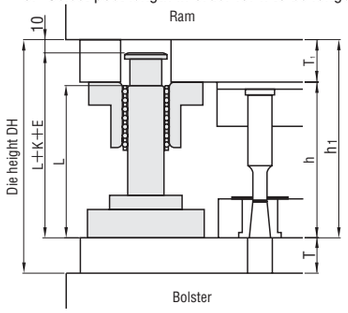
Express service system P.38 | MISUMI Press 2007 | http://misumi.jp/press/ | For inquiry, ordering and other information, refer to P.1269

EFFECTIVE FITING RANGE
—FIXED STOPPER TYPE（MYAK / MYKP / MYJK / MJKP）—

〔DATA〕 Relation between the height of bottom dead center of MYAK, MYKP, MYJK and MJKP and the post length

■Basis of selection for ball bearing

1. Sets the contact length α of post, bushing and ball bearing cage at the bottom dead center of the press machine as $\alpha \geqq D$.
（When $\alpha < D$, there is the possibility of shortening die longevity. Fig.1）
2. The guide post length and the mounting height h must be within the range（colored in blue）of the table shown on the right page at the bottom of dead center of the press machine.
3. Select post length in order for h to be longer contact length as shown in Fig.C.



L：Post length
K+E：Height of fixed stopper
（See page 867）

●How to determine T_1

$T_1 \geqq h_1 - h$　　$h_1 = L + K + E + 10$…See the figure at the left.

（10mm＝allowance for regrinding and safety purpose）

（Ex）When h＝190　　MYAK38－200

$T_1 \geqq 250 - 190$

$\therefore T_1 \geqq 60$　　T_1 is required to be 60mm or more.

Fig. A Upper contact limit required for post/bushing functions.
$\alpha \geqq D$
（Positioned at Dmm lower than HS）

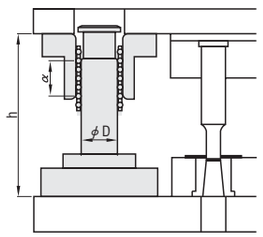


Fig. C Maximum contact length position of post, bushing and ball（bearing）cage.
（Recommended height（h）.）

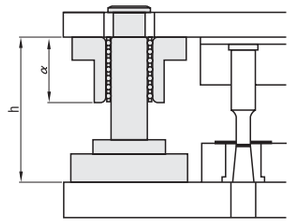


Fig. D Lower movable limit of ball bearing cage.
M＝Solid height of spring
5mm＝Allowance for regrinding and safety purpose
（When post length is short）

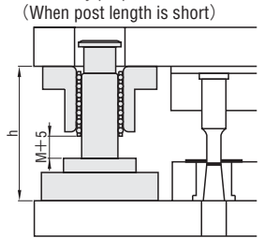


Fig. E Lower movable limit of bushing.
10mm＝Allowance for regrinding and safety purpose

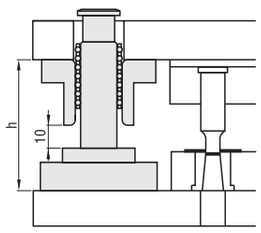
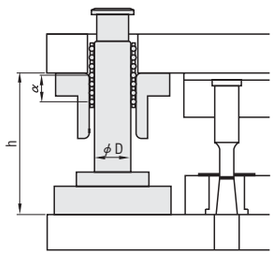


Fig. F Lower contact limit required for post/bushing functions.
$\alpha \geqq D$



■Effective movable range of MYAK, MYKP, MYJK AND MJKP（Movable range based on conditions A, B, C, D, E and F on the left page）

Post size	Die height h	80	100	120	140	160	180	200	220	240	260	280	h_1
25	90		D	A									125
	100		E	C	A								135
	110		E	C	A								145
	120		E	C	A								155
	130		E	C	A								165
	140		E	C	A								175
	150		F	C	A								185
	160		F	C	A								195
	170		F	C	A								205
	180		F	C	A								215
	200		F	C	A								235

Post size	Die height h	100	120	140	160	180	200	220	240	260	280	300	h_1
32	110		D	A									150
	120	D	C	A									160
	130	E	C	A									170
	140	E	C	A									180
	150	E	C	A									190
	160	E	C	A									200
	170	E	C	A									210
	180	F	C	A									220
	200	F	C	A									240
	220	F	C	A									260
	240	F	C	A									280
	260	F	C	A									300

Post size	Die height h	120	140	160	180	200	220	240	260	280	300	320	340	360	h_1
38	130		D	A											180
	140		D	A											190
	150	E	C	A											200
	160	E	C	A											210
	170	E	C	A											220
	180	E	C	A											230
	200	F	C	A											250
	220	F	C	A											270
	240	F	C	A											290
	260	F	C	A											310
	300	F	C	A											350

Post size	Die height h	160	180	200	220	240	260	280	300	320	340	360	380	400	h_1
50	170		D	A											230
	180	D	C	A											240
	200	E	C	A											260
	220	E	C	A											280
	240	E	C	A											300
	260	F	C	A											320
	300	F	C	A											360
	350	F	C	A											410

Post size	Die height h	180	200	220	240	260	280	300	320	340	360	380	400	420	h_1
60	200		D	A											275
	220	D	C	A											295
	240	E	C	A											315
	260	E	C	A											335
	300	F	C	A											375
	350	F	C	A											425

Use the values shown in the above tables for reference only. The effective movable ranges vary depending on parameters such as the ball pitch of ball bearing cage.

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

GUIDING COMPONENTS FOR AUTOMOBILE DIE

GUIDING COMPONENTS FOR AUTOMOBILE DIE

Price Cut

Name / Catalog No.	GUIDE POSTS GPM	OIL-FREE GUIDE BUSHINGS GBF GBW	OIL-FREE GUIDE BUSHINGS WITH FLANGE HGBF	GUIDE POSTS GPOB	STOPPERS FOR GUIDE POST GPSB
Delivery	③Ⓐ	③Ⓐ	③Ⓐ	③	③
Page	893	893	893	894	894

STROKE END BLOCKS GEB DSEB	LOCKING BLOCKS FOR GUIDE BUSHING KEB	BALL GUIDE POST SETS PKHL PKHLU PKH PKH—U	DISTANCE GUIDE RINGS HKD
③ⓉⒶ	③ⓉⒶ	③ⓉⒶ ③ⓉⒶ	③ⓉⒶ
895	896	898 898	900

OIL-FREE HEEL GUIDE PLATES OGG OGP OGPZ	HEEL GUIDE PLATES WITH OIL GROOVE OG OGZ	OIL-FREE HEEL GUIDE PLATES GWZ GWAZ GWBZ	HEEL GUIDE PLATES WITH OIL GROOVE GW GWA GWB
③ ③ ③	③ ③	③ ③ ③	③ ③ ③
901	902	903	904

KEEPER KEPN	—With oil groove— KEPNZ	PAD GUIDE BLOCK PGWN
③Ⓐ	⑤	⑤
905	905	906

GUIDE POSTS / OIL—FREE GUIDE BUSHINGS / OIL—FREE GUIDE BUSHINGS WITH FLANGE

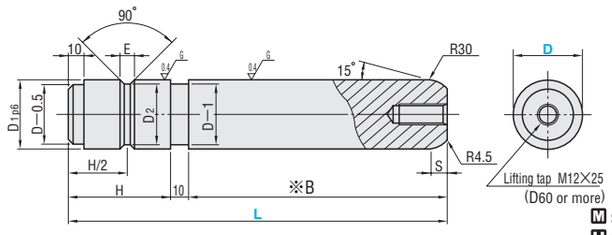
GUIDE POSTS / STOPPERS FOR GUIDE POSTS

Price Cut : Reduced Price

¥ The volume discount rate is also applicable to alteration cost. P.39

■Guide post RoHS

GPM



※Part B : Induction hardening

M S45C
H 55HRC～ Induction hardening

D		D1p6		D2	H	E	S	Catalog No. Type	Catalog No. D	L	U/Price Q'ty : 1～9
30	−0.005 −0.015	30	+0.035 +0.022	26	40	8	5	GPM	30	100	770
										120	830
										140	900
										160	1,050
										180	1,310
40		40	+0.042 +0.026	36	50				40	120	990
										140	1,160
										160	1,240
										180	1,410
										200	1,570
50	−0.005 −0.015	50	+0.042 +0.026	45	70	10	10		50	160	1,320
										180	1,410
										200	1,470
										250	1,620
										300	1,800
60	−0.010 −0.020	60	+0.051 +0.032	55	90	12			60	200	2,370
										220	2,520
										250	2,650
										300	2,700
										350	3,230
80	−0.010 −0.025	80	+0.051 +0.032	75	120	12	10		80	250	4,150
										300	4,660
										350	4,890
										400	5,670
100	−0.010 −0.025	100	+0.059 +0.037	95	150	12			100	300	6,360
										350	7,150
										400	7,280
										450	8,890
										500	9,830

Order: Catalog No. GPM 80 — 300 — L

Delivery: 3 Days; Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price: Volume discount rate P.37

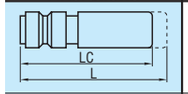
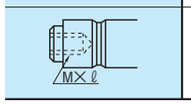
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration: Catalog No. GPM 40 — L(LC) LC110 — (MC) MC

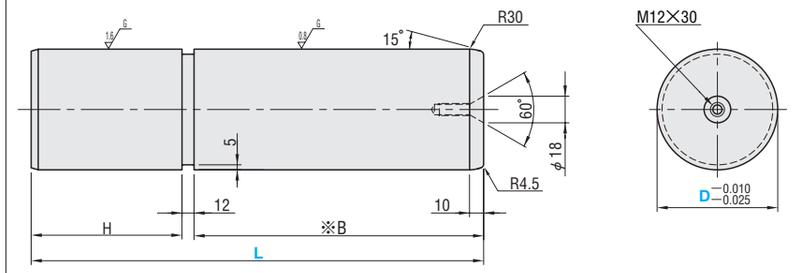
3 Days

⊗"Express A" is not available for alteration.

Alterations	Code	Spec.			¥/1Code	
	LC	Changes post length Lmin.≦LC＜L 1mm increments	D	Lmin.	D=30	500
			30	85		
			40	105	D=40・50	700
			50	140		
		Available for D≦50			D=30・40・50	400
	MC	Adds tapping for fixing side			D=60・80	600
		D: 30～80 M: M12 ℓ: 25; 100 M16 32			D=100	800

■Guide post RoHS

GPOB



※Part B : Induction hardening

M S45C
H 55HRC～ Induction hardening

D		H	Catalog No. Type	Catalog No. D	L	U/Price Q'ty : 1～9
80	−0.010 −0.025	100	GPOB	80	350	9,800
					400	11,380
100		120		100	350	12,890
					400	14,210
					450	17,680
120		150		120	450	20,280
					500	24,800

Order: Catalog No. GPOB 80 — 350 — L

Delivery: 3 Days

Price: Volume discount rate P.37

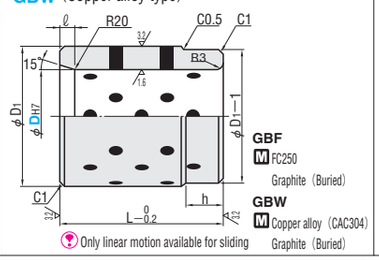
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Oil-free guide bushiug

GBF (Casting type)
GBW (Copper alloy type)

RoHS



GBF
M FC250 Graphite (Buried)

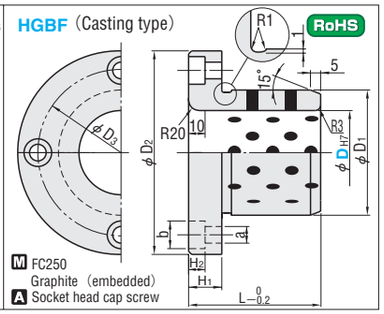
GBW
M Copper alloy (CAC304) Graphite (Buried)

Only linear motion available for sliding

■Oil-free guide bushings with flange

HGBF (Casting type)

RoHS



M FC250 Graphite (embedded)
A Socket head cap screw

D1		DH7		L	h	ℓ	Catalog No. Type	Catalog No. D	U/Price Q'ty : 1～9 GBF	U/Price Q'ty : 1～9 GBW
50	±0.008	30	+0.021 0	50	10	5		30	1,030	2,070
60	±0.0095	40	+0.025 0	60				40	1,430	2,700
70		50		75	15		GBF (Casting type)	50	1,550	2,940
80	±0.011	60	+0.030 0	90	20			60	2,000	4,160
100		80		120		10	GBW (Copper alloy type)	80	3,360	7,060
120	±0.0125	100	+0.035 0	150	25			100	4,380	9,650
140		120		180				120	6,240	13,720

D2	D3	D1		DH7		L	H1	H2	a	b	A Mounting bolts	Catalog No. Type	Catalog No. D	U/Price Q'ty : 1～9
90	70	50	±0.008	30	+0.021 0	50	20	10.8	11	17.5	CB10—30 Q'ty : 4	HGBF	30	2,200
100	80	60	±0.0095	40	+0.025 0	65							40	3,000
125	100	75		50		80							50	3,300
135	110	85	±0.011	60	+0.030 0	100							60	5,000
170	140	110		80		130							80	8,000
190	160	130	±0.0125	100	+0.035 0	160	25	13	14	20	CB12—40 Q'ty : 4		100	12,000

Order: Catalog No. GBF 50 HGBF 60

Delivery: 3 Days; Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

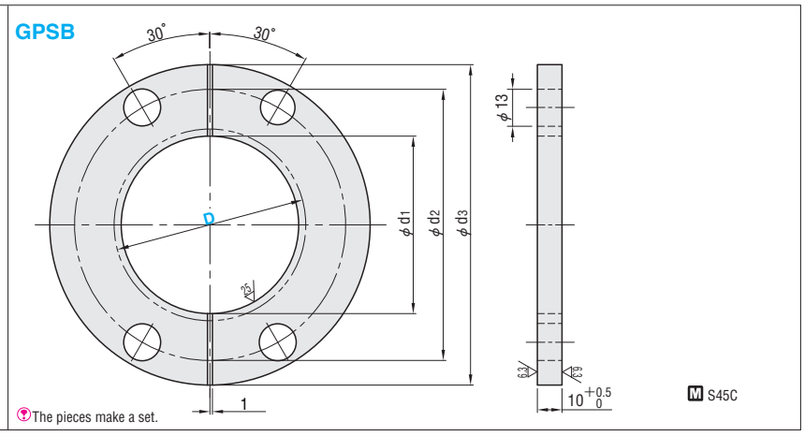
Price: Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Stoppers for guide post RoHS

GPSB



The pieces make a set.

M S45C

d1	d2	d3	Catalog No. Type	Catalog No. D	U/Price Q'ty : 1～9set
72	110	130	GPSB	80	2,980
92	130	150		100	3,330
112	156	177.8		120	3,730

Order: Catalog No. GPSB 80

Delivery: 3 Days

Price: Volume discount rate P.37

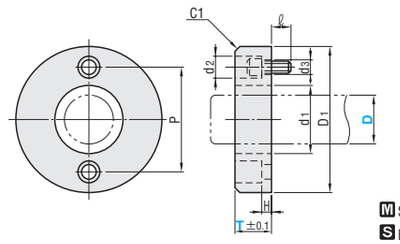
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

STROKE END BLOCKS
—FOR PRESS FIT POST / WIDE OUTER DIAMETER TYPE—

The volume discount rate is also applicable to alteration cost. P.39

GEB (For press fit post)
DSEB (Wide outer diameter type)



M SS400
S Black oxide (Fe3O4)
A Socket head cap screw

D1	P	d1	T	H	d2	d3	A Mounting bolts	ℓ	Catalog No. Type	Catalog No. D	T	Color	U/Price Q'ty : 1~9
75	60	43	20・25・30	10	10	5.5	CB5—20	10	GEB	38	20	R (Red)	900
90	72	55	20・25	10	11	6.5	CB6—20	10	GEB	50	25	R (Red)	1,000
			30・35・40	20			CB6—30						
120	92	65	20・25	8	14	9	CB8—20	12	GEB	60	30	Y (Yellow)	1,400
			30・35・40	18			CB8—30				35		
150	116	88	20・25	8			CB8—20		GEB	80	40	N (Normal)	2,990
			30・35・40	18			CB8—30						
120	100	54	15	5	14	9	CB8—20	15	DSEB	50	15	R (Red)	2,000
			20	10				10				Y (Yellow)	
140	120	64	15	5				15	DSEB	60	20	N (Normal)	3,000
			20	10				10					

Outer finishing of color code N (Normal) is black oxide (Fe3O4).

Order Catalog No. — T — R・Y・N
GEB 50 — 30 — Y

Delivery 3 Days

Express T	1,600/1Pc.
Express A	800/1Pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

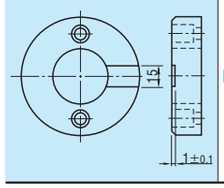
Price

Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

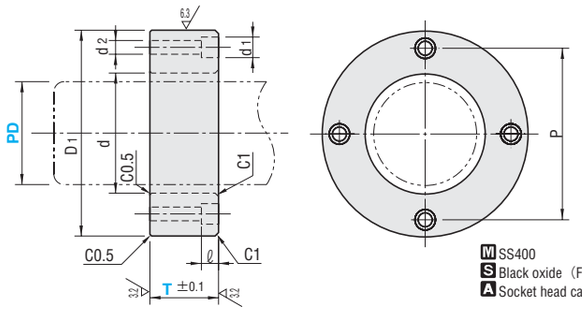
Alteration Catalog No. — T — R・Y・N — (NMC)
GEB 50 — 30 — Y — NMC

Alteration	Code	Spec.	¥/1Code
	NMC	Adds a groove for height adjustment. Surface treatment of the machined part is deleted.	500

LOCKING BLOCKS FOR GUIDE BUSHING

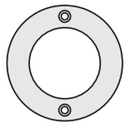
The volume discount rate is also applicable to alteration cost. P.39

KEB

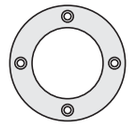


M SS400
S Black oxide (Fe3O4)
A Socket head cap screw

PD=30~60



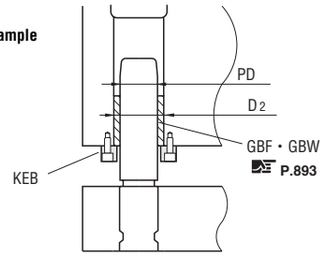
PD=80・100



A

Dimension T	Supplied bolt length L
20	25
25	30
30	35
35	40
40	45
45	50
50	55
55	60

Example



It has two functions of both locking block and end block, it would help reducing numbers of processing.

D1	PD Applicable diameter of posts	D2 Applicable bushing outside diameter	d	P	ℓ ※1	d1	d2	A Mounting bolts※2	Catalog No. Type	Catalog No. PD	T 5mm increments	Color	U/Price Q'ty : 1~9
96	30	50	35	72	15	17.5	11	CB10—L Q'ty : 2	KEB	30	20~30	R (Red)	1,830
106	40	60	45	82						40	20~40		1,960
116	50	70	55	92						50	20~55	Y (Yellow)	2,080
126	60	80	65	102						60			3,270
150	80	100	85	124		20	14	CB12—L Q'ty : 4		80		N (Normal)	4,780
170	100	120	105	144						100	20~50		5,400

Outer finishing of color code N (Normal) is black oxide (Fe3O4). ※1 If T=20, ℓ =12. ※2 See the above table for the dimension L.

Order Catalog No. — T — Color
KEB 50 — 30 — Y

Delivery 3 Days

Express T	1,600/1Pc.
Express A	800/1Pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

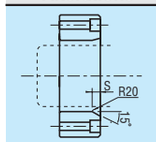
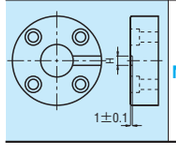
Price

Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — T — Color — (KTP・NMC)
KEB 50 — 30 — Y — KTP
5 Days

Alterations	Code	Spec.	¥/1Code
	KTP	Tapers lead-in guide for inserting guide post at inner diameter. PD: 30・40 → S: 5; 50~100 → S: 10. Surface treatment of the machined part is deleted.	800
	NMC	Adds a groove for height adjustment. PD: 30・40 → H: 10; 50~100 → H: 15. Surface treatment of the machined part is deleted.	500

BALL GUIDE POST SET FOR DIE/PAD
—GUIDE—

BALL GUIDE POST SETS
—FOR DIE/PAD—

■Reduce the production process (costs) by using the pad guide system with PKH

Existing pad guide systems

● Slide plate system

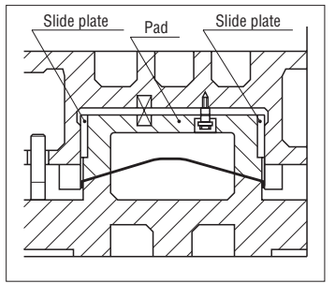
As shown in the illustration below, slide plates are generally used as pad guides for medium to large size press dies including dies for automobile. It is, however, difficult to finish the slide surfaces with precision. Therefore, clearance is measured and adjusted for the slide plate when assembling. Today, machining dies is done by NC with more precision, however adjusting slide plates may cause slip off of finely machined die surface.

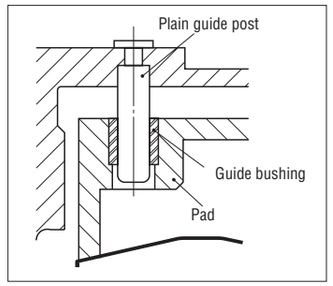
● Plain guide post system

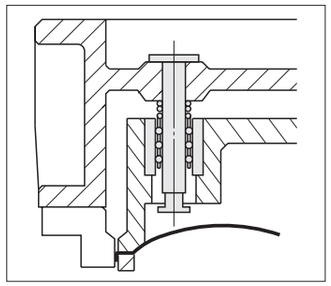
Sometimes a plain guide post is also used as a pad guide.
However, since most pads are not well-balanced, the use of plain guides will result in troublesome assembly and disassembly.

■Pad guide system with ball guide post

The ball guide post requires a shorter production process than the slide plate system. Also it allows smooth assemble/disassemble which is frequently done. It reduces the number of production process which leads to the reduction of die cost as well. It reduces the cost of machining fee and parts by 50% compared to slide plate system, and are excellent in workability of die set ups and the safety.

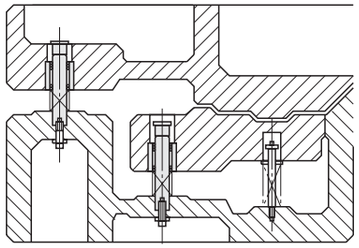






Other usage of ball guide post

● Example in drawing or bending dies

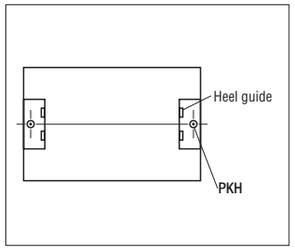


Examples : No slide plate requied.

Except for blanking die guides including guides which are affected by thrust, PKH—U or PKHLU types are extremely durable.

The PKHLU is the thrust load absorbing type. It is particularly suitable for bending dies and drawing dies, and errors from machine processing can be absorbed.

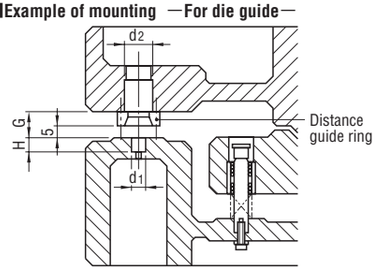
● Example in positioning the center of dies



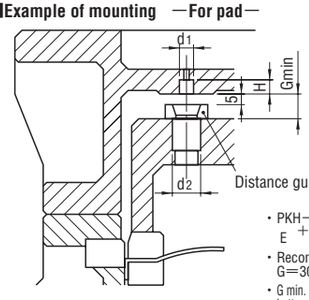
Used to center upper and lower dies with heel guide plates, the PKH type permits easier assembly and disassembly.

Example

■Example of mounting —For die guide—



■Example of mounting —For pad—



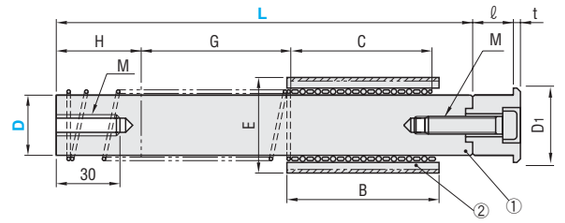
- PKH—U・PKHLU E +0.1 0
- Recommended clearance G=30mm
- G min. is minimum clearance at bottom dead center.

■Fixing method of bushing

(1) Loctite
- **PKHL・PKH** ····· No.638 (LOC638 P.758)
- **PKHLU・PKH—U** ··· No.401 or No.406 (made by Henkel Japan)

(2) Fixed by HKD P.900

—For die—



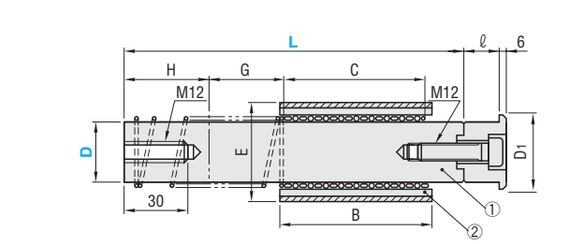
PKHL
①② M SUJ2
H 58HRC～

PKHLU
① M SUJ2
H 58HRC～
② M SUJ2 Urethane
H 58HRC～ Shore A90

D		d1		E PKHL	E PKHLU	d2	B	C	ℓ	M	t	D1	G min	H	Catalog No. Type	Catalog No. D	L	U/Price Q'ty : 1～9 PKHL	U/Price Q'ty : 1～9 PKHLU
50	+0.035 +0.030	+0.065 +0.045	83	0 −0.010	+0.1 0	+0.045 +0.015	120	110	40	12	10	58	30	60	PKHL PKHLU	50	240	18,900	24,300
									20								280	19,700	25,100
60			95				130	120	50			68		80		60	260	26,400	32,800
									30								300	27,200	33,500
80			120	0 −0.012		+0.045 +0.015	140	130	50			88		100		80	300	61,000	69,000
									30								340	61,900	70,000
100	+0.040 +0.032	+0.070 +0.045	145				160	150	50	16	15	108	40	120		100	350	92,400	106,400
									30								400	96,400	110,500
									10								450	100,600	114,700

Individual sales of the components P.899

—For pad—



PKH
①② M SUJ2
H 58HRC～

PKH—U
① M SUJ2
H 58HRC～
② M SUJ2 Urethane
H 58HRC～ Shore A95

D		d1		E PKH	E PKH—U	d2	B	C	ℓ	D1	G min	H	Catalog No. Type	Catalog No. D	L 10 mm increments	U/Price Q'ty : 1～9 PKH	U/Price Q'ty : 1～9 PKH—U
38	+0.030 +0.025	+0.060 +0.040	64	0 −0.008	+0.1 0	+0.040 +0.015	80	50	20	46	20	40	PKH PKH—U	38	130～160	10,800	13,700
								75	30		25				170～200	11,100	14,200
50	+0.035 +0.030	+0.065 +0.045	83	0 −0.010		+0.045 +0.015	100	60	20	58	30	50		50	150～190	16,800	21,000
								90	30						200～240	17,400	22,100
60			95					70	20	68	30	60		60	170～210	20,000	25,200
								90	30		20				220～260	21,000	26,300
80			120							88		80		80	260～300	39,900	45,200

Individual sales of the components P.899

Order Catalog No. — L
PKH 50 — 240

Price

Delivery 3 Days

Express	T	3,000/1Pc.
Express	A	1,500/1Pc.

P.38

■Volume discount rate P.37

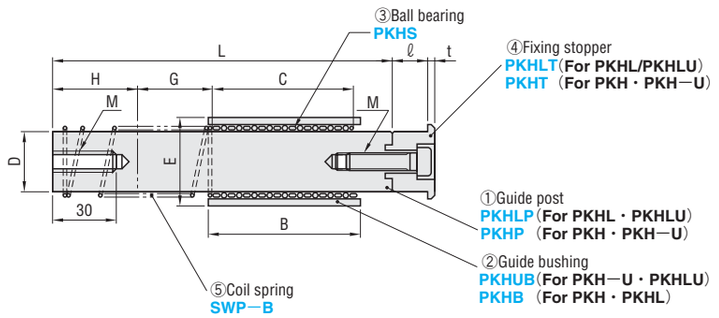
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

A flat charge of 4,050 yen for 3 pieces or more of the same size (excluding Express T).

PARTS FOR BALL GUIDE POST SET

RoHS



For detailed dimensions, see P.898

Set			①Guide post			U/Price	②Guide bushing		U/Price Q'ty：1~9		③Ball bearing		U/Price	④Fixed Stopper		U/Price
Type	D	L	Type	D	L	Q'ty：1~9	Type	D—B	PKHB	PKHUB	Type	D—C	Q'ty：1~9	Type	D—ℓ	Q'ty：1~9
For die PKHL PKHLU	50	240	For die PKHLP	50	240	5,800	PKHB (For PKHL PKH)	50—120	7,800	15,400	PKHS	50—110	5,500	For die PKHLT	50—20	1,700
		280			280	6,800									50—40	
	60	260		60	260	7,700		60—130	11,600	20,800		60—120	7,000		60—30	2,000
		300			300	8,700									60—50	
	80	300		80	300	15,200		80—140	35,000	44,100		80—130	12,300		80—30	3,100
		340			340	16,100									80—50	
	100	350		100	350	33,100		100—160	49,000	64,000		100—150	15,500		100—10	3,300
		400			400	37,800									100—30	
		450			450	42,600									100—50	
For pad PKH PKH—U	38	130~160	For pad PKHP	38	130~160	3,200	With urethane PKHUB (For PKHL PKH—U)	38— 80	3,200	8,600		38— 50	3,700	For pad PKHT	38—20	1,400
		170~200			170~200	3,600						38— 75			38—30	
	50	150~190		50	150~190	5,000		50—100	7,000	13,400		50— 60	5,500		50—20	1,700
		200~240			200~240	5,800						50— 90			50—30	
	60	170~210		60	170~210	6,120		60—100	7,700	14,300		60— 70	6,800		60—20	1,800
		220~260			220~260	7,000						60— 90			60—30	
	80	260~300		80	260~300	11,900		80—100	20,600	25,000		80— 90	9,200		80—30	3,100

Order

Catalog No.	—	L
PKHP 50	—	200

Catalog No.
PKHB 60—130

Delivery

- Guide posts/Guide bushings （φD38~60）
- Ball bearings/Stoppers

3	Days	Express T	1,600/1Pc.
		Express A	800/1Pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size（excluding Express T）.

- Guide posts/Guide bushings （φD80・100）

3	Days	Express T	3,000/1Pc.
		Express A	1,500/1Pc.

P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size（excluding Express T）.

Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

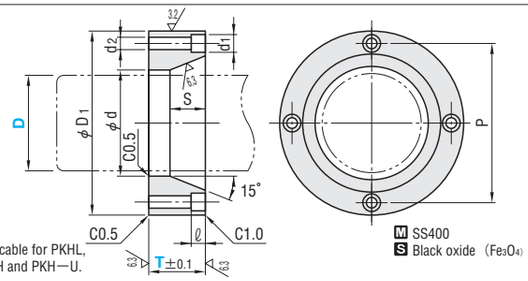
■⑤Coil spring （For specification details, the next page）

Set			⑤Coil spring		
Type	D	L	Type	D	FL（Free length）
For die PKHL PKHLU	50	240	SWP—B	50	140
		280			150
	60	260		60	150
		300			170
	80	300		80	180
		340			200
	100	350		100	200
		400			230
		450			260
For pad PKH PKH—U	38	130~160		38	L— 50
		170~200			L— 60
	50	150~190		50	L— 70
		200~240			L— 90
	60	170~210		60	L— 90
		220~260			L—100
	80	260~300		80	L—100

DISTANCE GUIDE RINGS

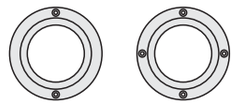
RoHS

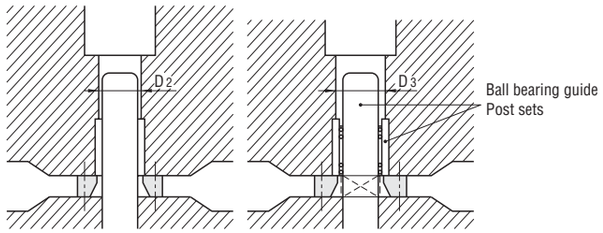
HKD



This is applicable for PKHL, PKHLU, PKH and PKH—U.

D=38・50・60　D=80・100





D1	d	P	S T=25	S T≧30	d1	d2	ℓ	D2	D3	Catalog No. Type	Catalog No. D	T 5 mm increments	Color	U/Price Q'ty：1~9 T=25~35	U/Price Q'ty：1~9 T=40~55
108	54	88	23	28	17.5	11	15	38	50	HKD	38	25~55	R (Red)	2,020	2,460
118	64	98						50	60		50		Y (Yellow)	2,510	3,050
148	84	126						60	80		60		N (Normal)	3,340	4,070
168	104	146						80	100		80			4,540	5,510
188	124	166			20	14		100	—		100			5,590	6,780

Outer finishing of color code N（Normal）is black oxide（Fe3O4）.

Order

Catalog No.	—	T	—	R・Y・N
HKD 38	—	30	—	R

Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

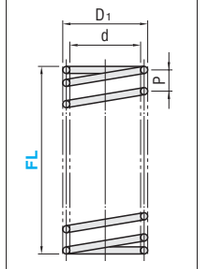
Delivery

3	Days	Express T	1,600/1Pc.
		Express A	800/1Pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size（excluding Express T）.

SWP—B RoHS



D1	d	P	Catalog No. Type	D	FL	U/Price Q'ty：1~9
42.5	38.5	18	SWP—B	38	80 90 100 110	310
					120 130 140	340
55.7	50.5	20		50	80 90 100 110	420
					120 130 140	510
					150	590
66.9	60.5	20		60	80 90 100	510
					110 120 130 140	590
					150 160 170	690
87.7	80.5	30		80	160	2,700
					170 180	2,800
					190 200	3,000
108.5	100.5	50		100	200	3,200
					230	3,500
					260	3,800

Order

Catalog No.	—	D	—	FL
SWP—B	—	50	—	130

Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery

3	Days	Express T	1,600/1Pc.
		Express A	800/1Pc.

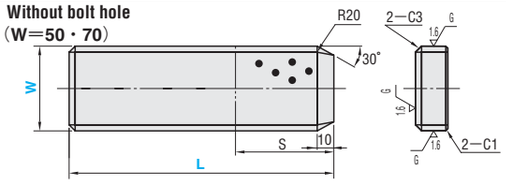
P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size（excluding Express T）.

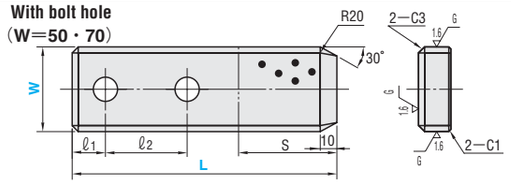
OIL-FREE HEEL GUIDE PLATES

RoHS

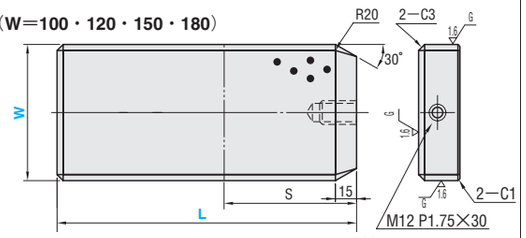
Without bolt hole
(W=50・70)



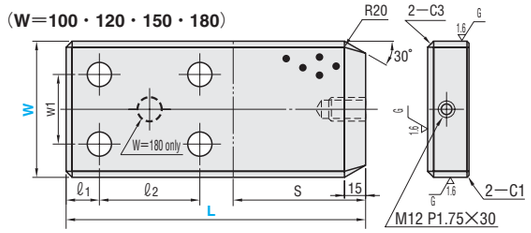
With bolt hole
(W=50・70)



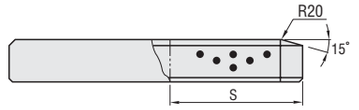
(W=100・120・150・180)



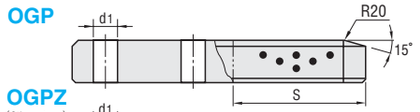
(W=100・120・150・180)



OGG



OGP



OGPZ
(C'bore type)

M S45C
MoS 2 (embedded)

Slide parts (S)
H 55HRC～ (Induction hardening)

W		T	S	OGP・OGPZ ℓ1	ℓ2	w1	d1	d2	t	Catalog No. Type	W	L	U/Price Q'ty : 1～9 OGG	OGP	OGPZ
50	0 −0.025	30	60	20	50	—	18	26	18	OGG OGP OGPZ	50	160	6,790	6,900	7,100
			120		50							200	7,890	8,000	8,200
			120		80							260	10,190	10,300	10,500
70	0 −0.030	35	100	25	60						70	230	10,590	10,700	10,900
			160		60							260	11,390	11,500	11,700
			160		75							300	12,890	13,000	13,200
			150									350	15,390	15,500	15,700
100	0 −0.035	45	100	30	60	60	22	32	22		100	230	15,350	15,600	15,900
			160		60							280	16,150	16,400	16,700
			160		100							330	18,350	18,600	18,900
			200		120							390	21,750	22,000	22,300
120	0 −0.035	45	100	30	60						120	230	15,750	16,000	16,300
			160		60							280	18,050	18,300	18,600
			160		100							330	20,950	21,200	21,500
			200		120							390	23,150	23,400	23,700
150	0 −0.040	50	160	30	60	90					150	280	20,750	21,000	21,300
			190		80							330	22,450	22,700	23,000
			190		140							390	26,250	26,500	26,800
			190		180							430	28,450	28,700	29,000
180	0 −0.040	55	160	30	60	120					180	280	24,140	24,500	25,000
			190		80							330	28,440	28,800	29,300
			190		140							390	35,240	35,600	36,100
			190		180							430	37,140	37,500	38,000
			200		200							480	41,840	42,200	42,700
			250		225							550	47,640	48,000	48,500

Order Catalog No. — L
OGP 50 — 160

Delivery 3 Days

Price

Volume discount rate P.37

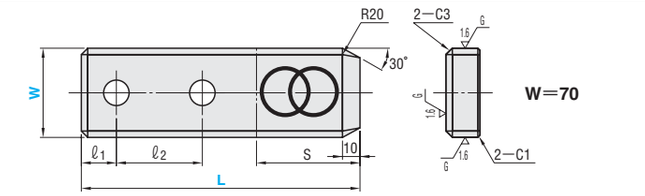
Quantity	Rate
1～9	—
10～19	5%
20～29	10%
30～50	15%

To be quoted on price & lead time above Max. Q'ty.

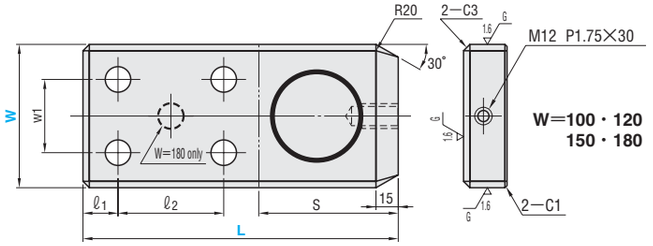
- Grease the guide plate before using (initial greasing).
- The special solid lubricant in the grooves keeps supplying sufficient amount of lubricant according to the load.
- The plate would slide only in the direction of dimension L.

HEEL GUIDE PLATES WITH OIL GROOVE

RoHS

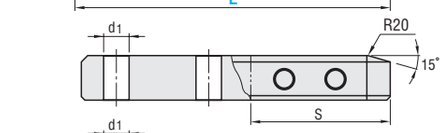


W=70

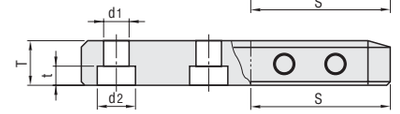


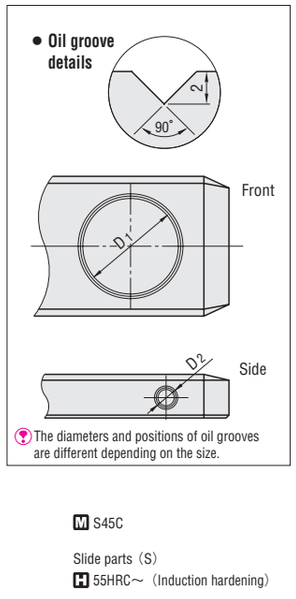
W=100・120
150・180

OG



OGZ
(C'bore type)





The diameters and positions of oil grooves are different depending on the size.

M S45C

Slide parts (S)
H 55HRC～ (Induction hardening)

W		T	S	ℓ1	ℓ2	w1	d1	OGZ d2	t	Oil groove Front Q'ty	Front D1	Side Q'ty	Side D2	Catalog No. Type	W	L	U/Price Q'ty : 1～9 OG	OGZ
70	0 −0.030	35	100	25	60	—	18	26	18	2	50	each2	20	OG OGZ	70	230	5,990	6,100
			160		60					2	50	each3	20			260	6,440	6,550
			160		75											300	7,580	7,700
100	0 −0.035	45	100	30	60	60	22	32	22	1	63	each2	20		100	230	9,100	9,270
			160		60					2	63	each3	20			280	9,560	9,740
			160		100											330	11,160	11,340
120	0 −0.035	45	100	30	60					2	50	each2	20		120	230	10,110	10,300
			160		60					4	50	each3	20			280	11,560	11,750
			160		100											330	13,390	13,580
			200		120					4	50	each4	20			390	15,210	15,400
150	0 −0.040	50	160	30	60	90				4	63	each3	20		150	280	13,650	13,840
			190		80					5	50	each4	20			330	14,750	14,950
			190		140											390	16,740	16,930
180	0 −0.040	55	160	30	60	120				5	50	each3	20		180	280	15,480	15,790
			190		80											330	18,200	18,510
			190		140					5	50	each4	20			390	20,760	21,050
			190		180											430	21,870	22,160

Order Catalog No. — L
OG 100 — 230

Delivery 3 Days

Price

Volume discount rate P.37

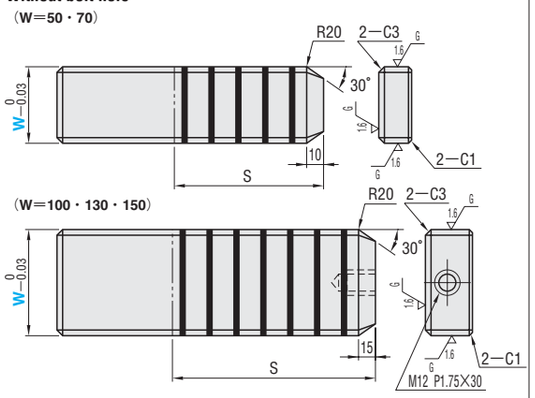
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

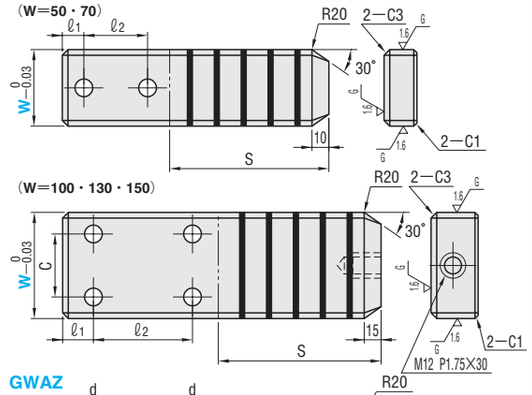
OIL-FREE HEEL GUIDE PLATES

RoHS

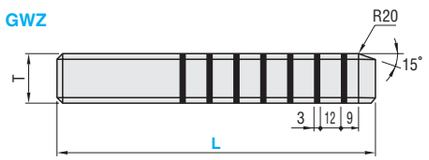
Without bolt hole
（W=50・70）



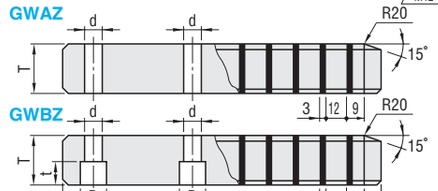
With bolt hole
（W=50・70）



GWZ



GWAZ



GWBZ

Slide parts （S）
M S45C　H 55HRC～（Induction hardening）
MoS 2 (embedded)

T	GWAZ・GWBZ ℓ1	ℓ2	C	d	D	t	Grooves	S	Catalog No. Type	W	L	U/Price Q'ty：1～9 GWZ	GWAZ	GWBZ
30	20	50	—	18	26	18	3	60	GWZ GWAZ GWBZ	50	160	6,100	6,350	6,470
							5	90			190	6,620	6,870	6,990
							7	120			220	7,140	7,380	7,500
35	25	60	—				6	100		70	230	8,480	8,800	8,880
							9	140			270	9,360	9,600	9,760
							11	180			310	10,240	10,480	10,640
45	30	90	60				8	130		100	300	12,560	13,040	13,280
							11	180			350	13,680	14,160	14,400
							14	230			400	14,800	15,360	15,520
50	30	120	80	22	32	22	9	150		130	350	16,320	16,960	17,280
							12	200			400	17,760	18,400	18,720
							16	250			450	19,200	19,840	20,160
60	35	150	100				11	180		150	420	20,880	21,520	21,840
							14	230			470	22,400	23,040	23,360
							18	280			520	23,920	24,560	24,880

Order　Catalog No. — L　GWBZ 50 — 160

Price　Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

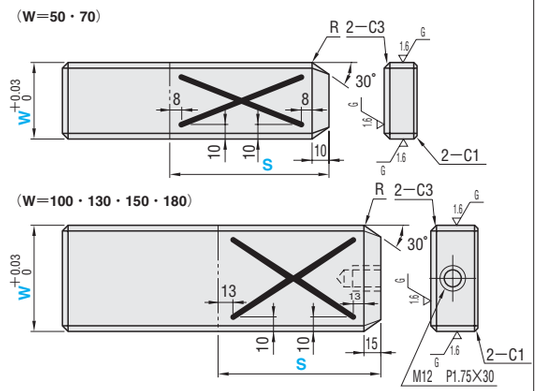
Delivery　3 Days

- Grease the guide plate before using（initial greasing）.
- The special solid lubricant in the grooves keeps supplying sufficient amount of lubricant according to the load.
- The plate would slide only in the direction of dimension L.

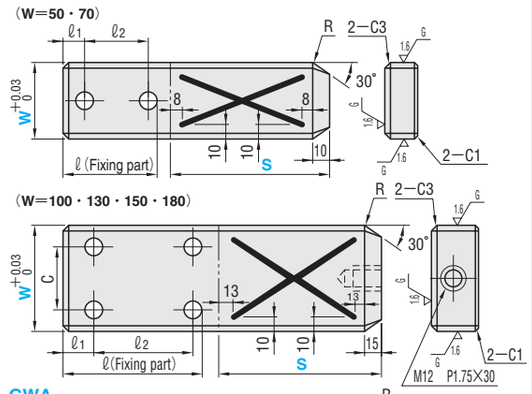
HEEL GUIDE PLATES WITH OIL GROOVE

RoHS

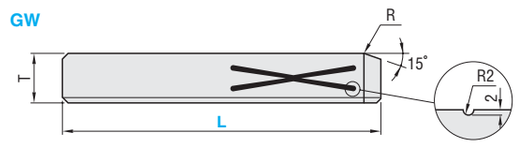
Without bolt hole
（W=50・70）



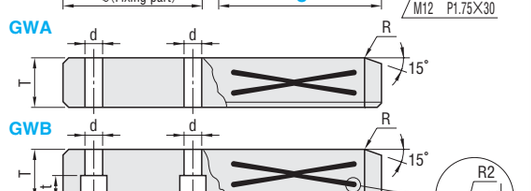
With bolt hole
（W=50・70）



GW



GWA



GWB

Slide parts （S）
M S45C　H 55HRC～（Induction hardening）

T	GWA・GWB ℓ	ℓ1	ℓ2	C	d	D	t	Catalog No. Type	W	S	L 10 mm increments	U/Price Q'ty：1～9 GW	GWA	GWB
30	90	20	50	—	18	26	18	GW GWA GWB	50	60	150～180	5,220	5,420	5,530
										90	190～250	6,100	6,310	6,410
35	110	25	60	—					70	90	200～250	7,250	7,470	7,570
										120	230～350	8,740	8,970	9,120
45	150	30	90	60					100	120	270～320	10,720	11,170	11,320
										180	330～400	12,690	13,070	13,300
50	150	30	90	80	22	32	22		130	150	300～380	13,910	14,520	14,740
	180		120							210	390～500	16,420	16,950	17,250
60	160	35	90	100					150	180	340～450	17,860	18,390	18,700
	220		150							240	460～550	20,440	21,050	21,280
	180		110	120					180	200	380～470	24,400	24,930	25,230

Order　Catalog No. — S — L　GW 100 — 180 — 350

Price　Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery　3 Days

Express service system P.38　MISUMI Press 2007　http://misumi.jp/press/　For inquiry, ordering and other information, refer to P.1269

KEEPER

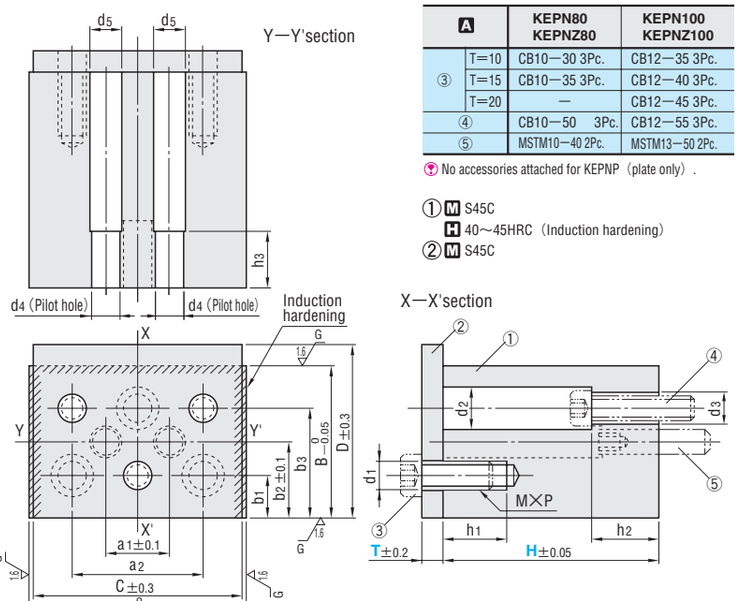
The volume discount rate is also applicable to alteration cost. P.39

KEPN

RoHS

KEPNZ (With oil groove)

RoHS



A		KEPN80 KEPNZ80	KEPN100 KEPNZ100
③	T=10	CB10—30 3Pc.	CB12—35 3Pc.
	T=15	CB10—35 3Pc.	CB12—40 3Pc.
	T=20	—	CB12—45 3Pc.
④		CB10—50 3Pc.	CB12—55 3Pc.
⑤		MSTM10—40 2Pc.	MSTM13—50 2Pc.

No accessories attached for KEPNP (plate only).

①M S45C
H 40~45HRC (Induction hardening)
②M S45C

A	B	a1	a2	b1	b2	b3	d1	d2	d3	d4	h1	h2	h3	M×P	C	D	a2	b1	b3	d5
80	60	25	50	15	30	45	11	18	11	9.8	25	30	20	10×1.5	76	75	50	15	45	12
100	70	30	60	20	35	50	13	20	13	12.8	30		25	12×1.75	96	85	60	20	50	15

Catalog No. Type	A	H	T	U/Price Q'ty : 1~9 KEPN	KEPNZ
KEPN KEPNZ (①~⑤)	80	50 60	10	5,100	5,400
		70 80 100	15	6,300	6,650
		120		7,300	7,700
	100	60	10	6,300	6,650
		70 80 100	15	7,600	8,000
		120	20	9,300	9,750

Catalog No. Type	A	T	U/Price Q'ty : 1~9
KEPNP (②only)	80	10	1,100
		15	1,250
	100	10	1,400
		15	1,500
		20	1,600

Order

Catalog No. — H — T

KEPN 80 — 50 — 10
KEPNP 80 — 10

Price

Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

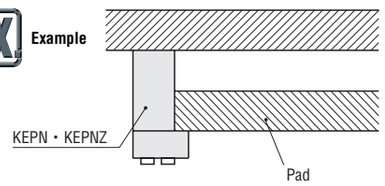
Catalog No. — H(HC) — T — (NC)
KEPN 80 — HC55 — 10
5 Days

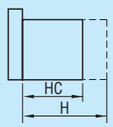
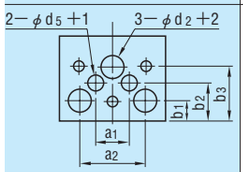
Delivery

●KEPN・KEPNP
3 Days — Express A 500/1Pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size.

●KEPNZ
5 Days

Example



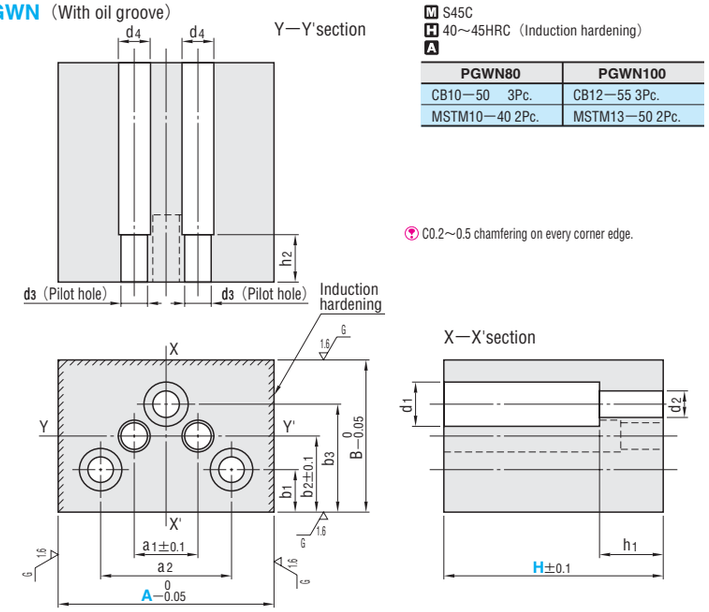
Alterations	Code	Spec.	¥/1Code
	HC	Changes dimension H Hmin<HC<Hmax 1 mm increments Available for KEPN and KEPNZ When (H—HC)<10··· h2,h3 are shortened by (H—HC). When 10≦(H—HC)<20··· h2,h3 are shortened by (H—HC—10).	2,000
	NC	Adds 3 holes for bolts and 2 holes for dowel pins at ② in order to remove/place ① mounting block and ② plates while they are set.	600

PAD GUIDE BLOCK

The volume discount rate is also applicable to alteration cost. P.39

RoHS

PGWN (With oil groove)



M S45C
H 40~45HRC (Induction hardening)
A

PGWN80	PGWN100
CB10—50 3Pc.	CB12—55 3Pc.
MSTM10—40 2Pc.	MSTM13—50 2Pc.

C0.2~0.5 chamfering on every corner edge.

A	B	a1	a2	b1	b2	b3	d1	d2	d3	d4	h1	h2	Catalog No. Type	A	H	U/Price Q'ty : 1~9
80	60	25	50	15	30	45	18	11	9.8	12	30	20	PGWN	80	50 60	4,200
															70 80 100	5,450
															120	6,200
100	70	30	60	20	35	50	20	13	12.8	15	30	25		100	60	5,150
															70 80 100	6,500
															120	8,050

Order

Catalog No. — H

PGWN 80 — 50

Price

Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

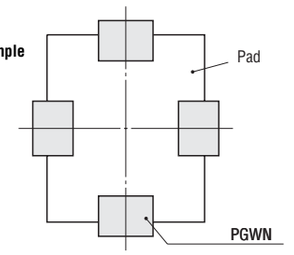
Alteration

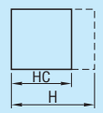
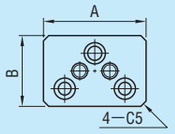
Catalog No. — H(HC) — (CC)
PGWN 80 — HC55 — CC

Delivery

5 Days

Example



Alterations	Code	Spec.	¥/1Code
	HC	Changes dimension H Hmin<HC<Hmax 1 mm increments When (H—HC)<10··· h1 is shortened by (H—HC). When 10≦(H—HC)<20··· h1 is shortened by (H—HC—10).	2,000
	CC	Changes C Chamfering of 4 corners to C5.	1,000

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

COMPONENTS FOR AUTOMOBILE DIE

COMPONENTS FOR AUTOMOBILE DIE

Name	SPOOL RETAINERS	COLLARS FOR SPOOL RETAINER	SPOOL RETAINER URETHANE WASHERS	SPOOL RETAINERS—Thick type—	SPOOL RETAINERS
Catalog No.	CSR	CSRE	CSRUR	CSRH CSRT	CSRTA CSRTB
Delivery	①	③Ⓐ	①	③ⓉⒶ	③
Page	909	910	910	911	911

Delivery Shortened Delivery Shortened

SPOOL RETAINERS—Counterbore type—	BLANK HOLDER STOPPER BOLTS	RETAINER PIN SETS	STOPPERS FOR RETAINER PIN
CSRZ	CBH	CSPST CSPWT CSPS CSPW P-CSPS P-CSPW CSPSP CSPWP	SPP CSPT CST-N
①	①	①	①
912	912	913	914

Add.

ROUND DISTANCE PLATES	SQUARE DISTANCE PLATES	SHIMS FOR DISTANCE PLATES	STROKE END BLOCKS
DTPM DTPME DTPY DTPYE	DTPK DTPB	DTPMS DTPKS	DEB
③ⓉⒶ	③ⓉⒶ	③Ⓐ	③ⓉⒶ
915	915	916	917

LOCATING KEYS	BACK UP KEYS	WASHERS FOR DIE FASTENING	WASHERS FOR OVAL HOLES	SCRAP BREAKER
LK	BUKE	KWN	WSS	CPSBR
①	③Ⓐ	①	①	①
918	918	919	919	919

AIR VENT		ANGLE STAIES	CUSHION PINS				LIFTER CUSHION PINS	BUSHINGS FOR LIFTER CUSHION PINS
WUR5	WAV5	UAS	RCUP	MCUP	HCUP	LCUP	DTCA DTCB	TGF TGW
①	①	①	③Ⓐ	③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	③Ⓐ	③Ⓐ
920	920	920	921	921	922	922	923	923

Add.

PLATE LIFTER PINS	LIFTER PLATE STOPPERS		SPARE PUNCH BOXES		TOUCH UP SCREWS	
LCP	BSE	BST	PBX100Y	PBX150Y	MM□	MM□B
③ⓉⒶ	①	③Ⓐ	①	①	①	①
924	924		925		926	

HINGE PINS	KEYS FOR HINGE PIN	PINS FOR TENSION SPRINGS	TENSION SPRINGS	TENSION SPRINGS	RINGS FOR TENSION SPRINGS
CLKGH	HK	SSPO WSPO	AW□	AWK	BSR
③ⓉⒶ	①	①	①	①	①
927	927	927	928	928	928

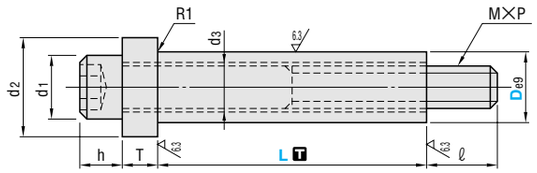
SPOOL RETAINERS

COLLARS FOR SPOOL RETAINER / URETHANE WASHERS

The volume discount rate is also applicable to alteration cost. P.39

RoHS

CSR



L T	
L≦100	L±0.03
L≧110	L±0.05

① M SCM435
Strength rank 12.9

② M S45C
H 38～43HRC
S Black oxide (Fe3O4)

De9		d1	d2	d3	M×P	h	T	ℓ
10	−0.025 −0.061	10	15	6.3	6×1.0	6	5	10
13	−0.032 −0.075	13	18	8.4	8×1.25	8	5	15
16		16	24	10.6	10×1.5	10	8	22
20	−0.040 −0.092	18	28	12.6	12×1.75	12	10	20
25		24	36	16.8	16×2.0	16	13	27
32	−0.050 −0.112	30	45	20.8	20×2.5	20	16	34

Catalog No. Type	D	L	U/Price Q'ty:1～19
CSR	10	10 15 20 25 30 35 40 45 50	240
		55 60 65 70 75 80	320
		85 90 100	430
	13	15 20 25 30 35 40 45 50	280
		55 60 65 70 75 80	360
		85 90 100 110 120	470
	16	20 25 30 35 40 45 50 55 60 65	410
		70 75 80 85 90 100 110 120	490
		130 140 150	710
		160 170 180	1,050
	20	30 35 40 45 50 55 60 65 70	660
		75 80 85 90 100 110 120	810
		130 140 150 160	1,050
		170 180	1,430
	25	40 45 50 55 60 65 70 75 80	1,050
		85 90 100 110 120	1,330
		130 140 150 160	1,620
		170 180 200	2,090
	32	60 70 80 90 100	1,710
		110 120 130	2,190
		140 150 160	2,850
		170 180 200	3,710

Order: Catalog No. — L
CSR 20 — 60

Delivery: 1 Day

Alteration: Catalog No. — L(LC)
CSR 20 — LC57.0

Price: Volume discount rate P.37

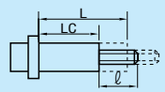
Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example: Right page

3 Days | Express T 1,000/1Pc. | Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

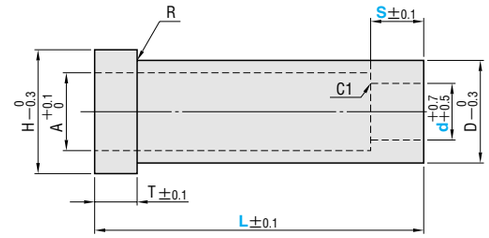
Alteration	Code	Spec.	¥/1Code
	LC	Changes retainer's dimension L LCmin≦LC＜Lmax L±0.03 0.1mm increments Bolts are set to be the dimension ℓ as shown below.	200

D	10	13	16	20	25	32
LCmin	10.1	10.0	10.0	25.0	30.0	55.0
ℓ	10～14.9	15～24.9	22～29.9	20～29.9	27～36.9	34～43.9

RoHS

CSRE

■Collar for spool retainer



M SS400
S Black oxide (Fe3O4)

Applicable CSR standard Type	D	H	T	A	D	R
CSR	10	36	5	16	28	1.0
	13	40	5	19	30	
	16	46	8	25	36	
	20	55	10	29	44	
	25	60	13	37	50	
	32	70	16	46	60	1.5

Catalog No. Type	d	L 10mm increments	S 5mm increments
CSRE	10	50～100	10～25
	13		
	16		
	20		
	25	60～100	
	32		

Order: Catalog No. — L — S
CSRE 13 — 100 — S25

Delivery: 3 Days
Express A 500/1Pc. P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size.

Price: Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

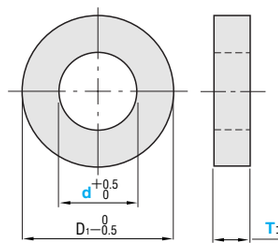
To be quoted on price & lead time above Max. Q'ty.

Catalog No. Type	d	U/Price Q'ty:1～9 L50	L60	L70	L80	L90	L100
CSRE	10	540	590	620	670	710	750
	13	610	660	710	770	820	870
	16	770	840	910	980	1,060	1,120
	20	980	1,080	1,180	1,280	1,380	1,480
	25	—	1,300	1,410	1,530	1,650	1,760
	32	—	1,800	1,950	2,100	2,250	2,400

■Urethane washer for spool retainers

RoHS

CSRUR



H Shore A90

Applicable standard Type	D	D1	d	Catalog No. Type	d	T (Selectable)	Unit Price Q'ty:1～19
CSR	16	24	16	CSRUR	16	5·10	260
	20	28	20		20		270
	25	36	25		25		280
	32	45	32		32	10·15	290

Order: Catalog No. — T
CSRUR 20 — 10

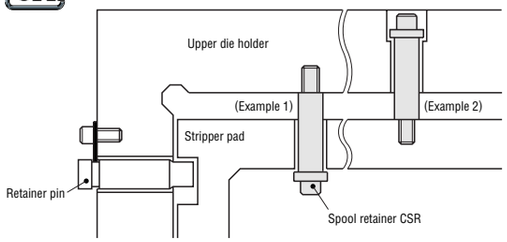
Delivery: 1 Day

Price: Volume discount rate P.37

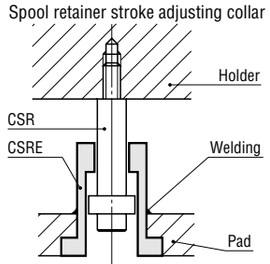
Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

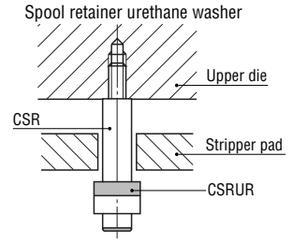
Example: Example of concurrent use of side pin and spool retainer



Spool retainer stroke adjusting collar



Spool retainer urethane washer

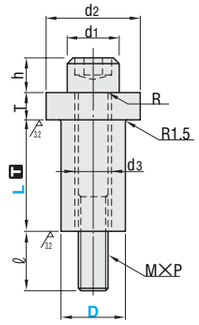


- If a spool retainer (CSR) is used for the pad in progressive die presses or transfer die presses, etc., by using a collar (CSRE), it enables to extend the stroke.
- The use of a urethane washer is effective for absorbing impact and vibration, muting noise, etc.

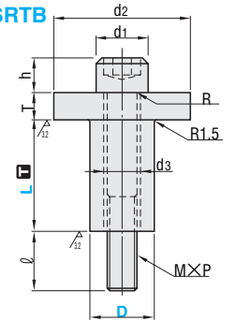
SPOOL RETAINERS
—THICK TYPE / LARGE FLANGED TYPE—

The volume discount rate is also applicable to alteration cost. P.39

Thick type
CSRH
CSRT



Large flanged type
CSRTA
CSRTB



L	T
L≦100	L±0.03
L≧110	L±0.05

① **CSRH・CSRTA**
Socket head cap screw (CB)
CSRT・CSRTB
Socket head techno bolt
M SCM435
Strength rank 12.9 (M10～20)
10.9 (M24)

② M S45C
H 25～30HRC
S Black oxide (Fe_3O_4)

De9	d1	d2	d3	M×P	R	h	T	ℓ	Catalog No. Type	D	L	U/Price Q'ty:1～9 CSRH	CSRT
18 −0.032 −0.075	16	27	10.7	10×1.5	1.0	10	8	22	Thick type CSRH CSRT	18	60 70 80 90 100 110 120 130 140 150	930	1,420
												1,160	1,770
												1,330	2,030
22	18	33	12.7	12×1.75	1.0	12	10	20		22	60 70 80 90 100 110 120 130 140 150	1,130	1,730
−0.040 −0.092												1,410	2,150
												1,630	2,480
30	24	44	16.7	16×2.0	1.5	16	13	27		30	60 70 80 90 100 110 120 130 140 150 160 170 180	1,660	2,530
												2,100	3,200
												2,700	4,110
36	30	53	20.7	20×2.5	1.5	20	16	34		36	80 90 100 110 120 130 140 150 160 170 180	2,430	3,690
−0.050 −0.112												3,170	4,830
												3,920	5,970
44	36	64	24.7	24×3.0	1.5	24	18	42		44	80 90 100 110 120 130 140 150 160 170 180	3,400	5,170
												4,370	6,650
												5,350	8,140

De9	d1	d2	d3	M×P	R	h	T	ℓ	Catalog No. Type	D	L	U/Price Q'ty:1～9 CSRTA	CSRTB
22 −0.040 −0.092	18	50	12.7	12×1.75	1.0	12	10	20	Large flanged type CSRTA CSRTB	22	80 90 100 110 120 130	1,330	1,760
												1,430	1,890
												1,700	2,270
30	24	60	16.7	16×2.0	1.5	16	13	27		30	80 90 100 110 120 130	1,880	2,490
												2,050	2,730
												2,570	3,480
36 −0.050 −0.112	30	70	20.7	20×2.5	1.5	20	16	34		36	100 110 120 130 140 150	3,050	4,070
												3,730	4,960
												4,260	5,680
44	36	80	24.7	24×3.0	1.5	24	18	42		44	100 110 120 130 140 150	4,290	5,730
												5,060	6,740
												6,000	7,980

Order

Catalog No.	—	L
CSRH 30	—	150
CSRTA 36	—	100

Delivery

• CSRH・CSRT
3 Days

Express T	1,000/1Pc.
Express A	500/1Pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).
Express T is not available for CSRT.

• CSRTA・CSRTB
3 Days

Price

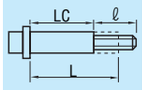
■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No.	—	L(LC)
CSRH 30	—	LC175.5

Alteration	Code	Spec.			¥/1Code		
	LC	Changes retainer's dimension L Lmin.≦LC<Lmax. 0.1mm increments Bolts are set to be the dimension ℓ as shown at the right.	D	ℓ	D	CSRH CSRT	CSRTA CSRTB
			18	22～31.9	18	300	—
			22	20～29.9	22	300	300
			30	27～36.9	30	300	300
			36	34～43.9	36	500	500
			44	42～51.9	44	500	500

Example Right page

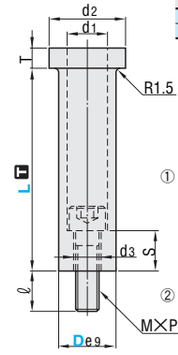
SPOOL RETAINERS/BLANK HOLDER STOPPER BOLTS
—COUNTERBORE TYPE—

DELIVERY SHORTENED

The volume discount rate is also applicable to alteration cost. P.39

■Spool retainer RoHS

Counterbore type
CSRZ

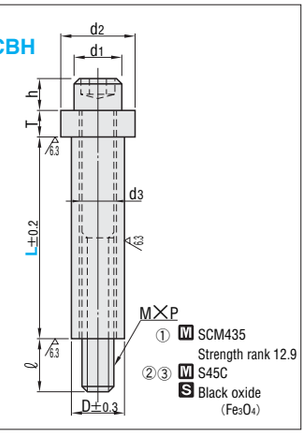


L	T
L≦100	L±0.03
L≧110	L±0.05

① **CSRZ**
Socket head cap screw(CB)
M SCM435
Strength rank 12.9 (M10～20)
10.9 (M24)
② M S45C
H 25～30HRC
S Black oxide (Fe_3O_4)

■Blank holder stopper bolt RoHS

CBH



① M SCM435
Strength rank 12.9
②③ M S45C
S Black oxide (Fe_3O_4)

De9	d1	d2	d3	M×P	Supplied bolt	T	S	ℓ	Catalog No. Type	D	L	U/Price Q'ty:1～9
20 −0.040 −0.092	15	26	9	8×1.25	CB 8–35	6	20	15	Counterbore type CSRZ	20	40 50 60 70 80 90	1,030
												1,210
24	18	33	11	10×1.5	CB10–45	6	25	20		24	50 60 70 80 90 100	1,230
												1,460
28	20	37	13	12×1.75	CB12–50	8	30	20		28	50 60 70 80 90 100 110	1,710
												2,060
35 −0.050 −0.112	26	47	17	16×2.0	CB16–60	8	35	25		35	60 70 80 90 100 110 120 130	2,520
												3,100
44	32	57	21	20×2.5	CB20–70	8	40	30		44	70 80 90 100 110 120 130	3,530
												4,290

D	d1	d2	d3	h	T	M×P	ℓ	Catalog No. Type	No.	L	U/Price Q'ty:1～9
25.4	24	36	17.4	16	13	16×2.0	27	CBH	25	100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 280 300	1,140
											1,430
											1,900
											2,380
											2,850
31.8	30	45	21.8	20	16	20×2.5	34		32	100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 280 300	1,520
											1,710
											1,900
											2,380
											2,850
											3,330

Order

Catalog No.	—	L
CSRZ 35	—	100
CBH 25	—	180

Alteration

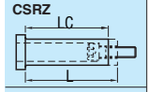
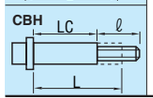
Catalog No.	—	L(LC)
CSRZ 35	—	LC110.0
CBH 25	—	LC175.0

3 Days

Express T	1,000/1Pc.
Express A	500/1Pc.

P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size excluding Express T).

Alterations	Code	Spec.	¥/1Code
CSRZ 	LC	Changes retainer's dimension L Lmin.−10≦LC<Lmax. 0.1mm increments Bolt size remains the same Dimension S is shortened by(L−LC).	D20・24・28 300 D35・44 500
CBH 		Changes retainer's dimension L 60≦LC<300 0.1mm increments Bolts are set to be the dimension as shown at the right. (No. 25: ℓ 27～36.9; No. 32: ℓ 34～43.9)	200

Delivery

1 Day

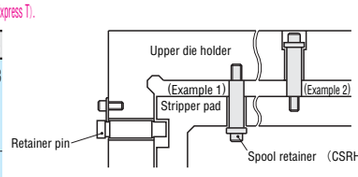
Price

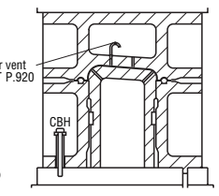
■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example Example of concurrent use of retainer pin and spool retainer





RETAINER PIN SETS

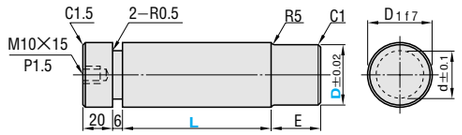
No.	Catalog No.	Parts list	M	H	S
①	CSPSP	Retainer pin (single groove type)	S45C	20～25 HRC	Black oxide (Fe_3O_4)
②	CSPWP	Retainer pin (double groove type)			
③	SPP	Round hole stopper	SS400	–	Black oxide (Fe_3O_4)
④	CSPT	Oval hole stopper			
⑤	CST–N	Spring lock stopper	For details, see right page		

Round hole stopper type

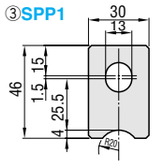
Single groove type

P–CSPS (①CSPSP+③SPPSet)

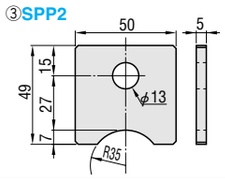
①CSPSP



③SPP1



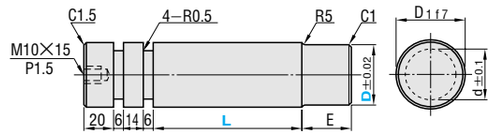
③SPP2



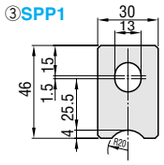
Double groove type

P–CSPW (②CSPWP+③SPPSet)

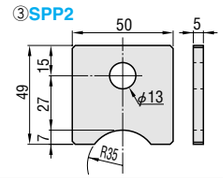
②CSPWP



③SPP1



③SPP2

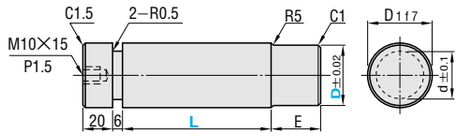


Oval hole stopper type

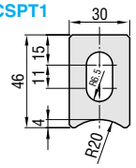
Single groove type

CSPS (①CSPSP+④CSPTSet)

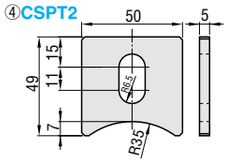
①CSPSP



④CSPT1



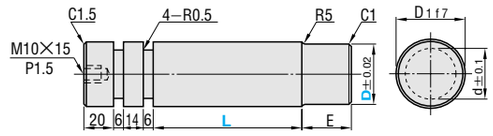
④CSPT2



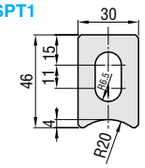
Double groove type

CSPW (②CSPWP+④CSPTSet)

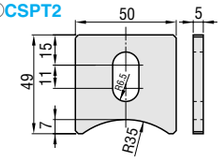
②CSPWP



④CSPT1



④CSPT2

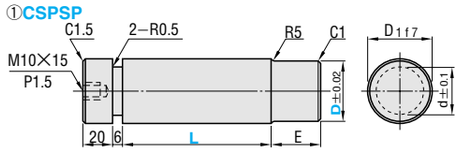


Spring lock stopper type

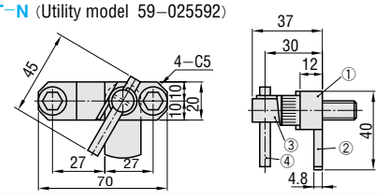
Single groove type

CSPST (①CSPSP+⑤CST–NSet)

①CSPSP



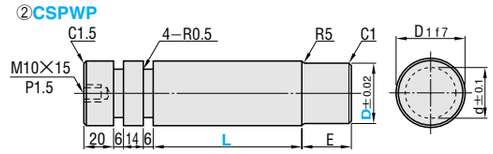
⑤CST–N (Utility model 59–025592)



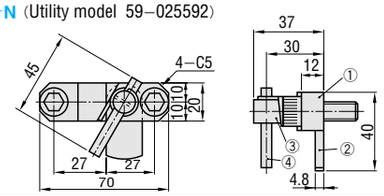
Double groove type

CSPWT (②CSPWP+⑤CST–NSet)

②CSPWP



⑤CST–N (Utility model 59–025592)



The volume discount rate is also applicable to alteration cost. P.39

① D	② D 1f7		② d	② E	⑤ S	Allowance load N {kgf} (Safety coefficient 1)	Static load N {kgf} (Safety coefficient 3)	Repeated load N {kgf} (Safety coefficient 5)	Alternate load N {kgf} (Safety coefficient 8)	Impact load N {kgf} (Safety coefficient 12)	Catalog No. Type	Catalog No. D–L	U/Price Q'ty:1～19 Single groove type CSPSP	P–CSPS	CSPS	CSPST	Double groove type CSPWP	P–CSPW	CSPW	CSPWT
20	22	−0.020 −0.041	14	25	27	37167 {3790}	12356 {1260}	7453 {760}	4609 {470}	3138 {320}	Single groove type (Pin only) CSPSP (Set) P–CSPS CSPS CSPST	20–40 60 80	420	560	580	2,090	510	660	670	2,190
30	32	−0.025 −0.050	22		31	125427 {12790}	41776 {4260}	25105 {2560}	15691 {1600}	10493 {1070}		30–60 80 100	750	890	910	2,440	800	940	960	2,490
40	42		30	30	35	253600 {25860}	84533 {8620}	50700 {5170}	31675 {3230}	21182 {2160}		40–60 80 100 120	1,170	1,310	1,330	2,880	1,360	1,500	1,520	3,080
50	52	−0.030 −0.060	40		40	495334 {50510}	165144 {16840}	99047 {10100}	61880 {6310}	41286 {4210}	Double groove type (Pin only) CSPWP (Set) P–CSPW CSPW CSPWT	50–80 100 120	1,500	1,690	1,710	3,230	1,790	1,980	2,000	3,530
60	62		50	35	45	727751 {74210}	242617 {24740}	145531 {14840}	91006 {9280}	60703 {6190}		60–100 120 140	2,360	2,550	2,570	4,130	2,690	2,880	2,900	4,480
70	72		60		50	990570 {101010}	330190 {33670}	198094 {20200}	123858 {12630}	82572 {8420}		70–120 140 160	3,150	3,340	3,360	4,970	3,570	3,760	3,780	5,410

• kgf=N×0.101972

Order — Catalog No.
CSPWT 30－80
P–CSPS50 120

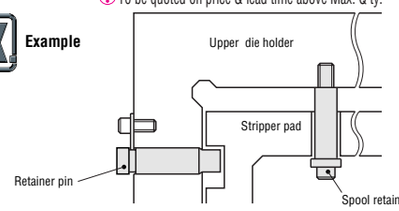
Price

■Volume discount rate P.37

Quantity	1～19	20～29	30～49	50～100
Rate	–	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example

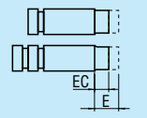
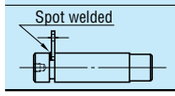


Delivery 1 Day

Alteration

Catalog No. – (EC・WD)
P–CSPS30－80 EC21－WD

3 Days — Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alterations	Code	Spec.	¥/1Code
	EC	Dimension E changed 1mm increments: D 20 30 40 50 60 70 / EC 21～24 25～29 25～34	D20・30 400 / D40・50 600 / D60・70 800
	WD	Spot weld retainer pin and stopper. Applicable to P–CSPS only	300

■Stoppers for retainer pin

D (Applicable retainer pins)	Catalog No.		U/Price Q'ty:1～19
20・30・40	Round hole type SPP	1	140
50・60・70		2	190
20・30・40	Oval hole type CSPT	1	160
50・60・70		2	210
All sizes	Spring lock type CST–N		1,650

Order — Catalog No.
SPP 2
CSPT 1
CST–N

Delivery 1 Day

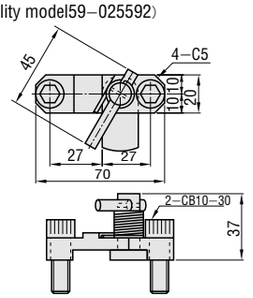
Price

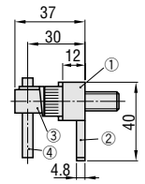
■Volume discount rate P.37

Quantity	1～19	20～29	30～49	50～100
Rate	–	5%	10%	15%

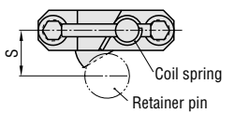
To be quoted on price & lead time above Max. Q'ty.

⑤Spring lock stopper type–Details–
CST–N (Utility model59–025592)





M ①SUS304 ②③④S45C
A CB10–30



(※Example of setting a retainer pin)

- Locking by spring pressure strength aloows one hand lever operation to lock retainer pin securely.
- Stoppers can be mounted at any position.

PRESS ADD.SPEC. Printed in Red

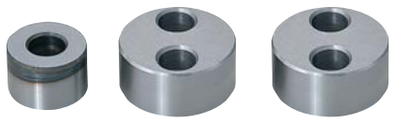
ROUND DISTANCE PLATES / SQUARE DISTANCE PLATES

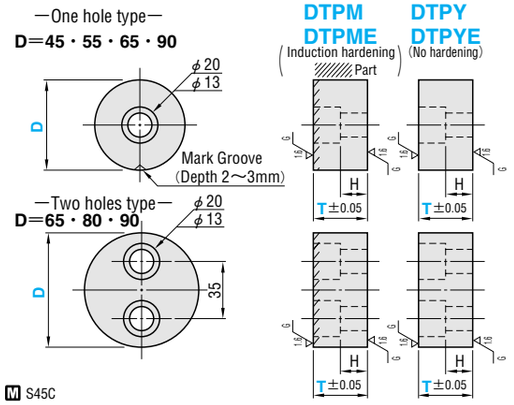
SHIMS FOR ROUND DISTANCE PLATES / SHIMS FOR SQUARE DISTANCE PLATES

The volume discount rate is also applicable to alteration cost. P.39

■Round distance plate

RoHS

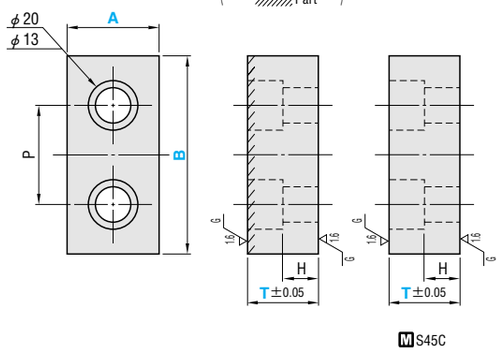




M S45C

■Square distance plate

RoHS



M S45C

■Round distance plate

Bolt hole	H	Catalog No. Type	D	T	Color	U/Price Q'ty:1～9 DTPM・DTPME N (Normal)	DTPM・DTPME R(Red) Y(Yellow)	DTPY・DTPYE N (Normal)	DTPY・DTPYE R(Red) Y(Yellow)
One hole	6	DTPM (Induction hardening)	45	20	R(Red) Y(Yellow) N(Normal)	900	1,240	750	1,080
	15			30		1,000	1,340	850	1,180
				40		1,100	1,440	950	1,280
	6	DTPY (No hardening)	55	20		1,200	1,540	1,050	1,380
	15			30		1,300	1,640	1,150	1,480
				40		1,400	1,740	1,250	1,580
One hole	15	DTPME (Induction hardening)	65	30		1,400	1,740	1,130	1,580
				50		1,940	2,280	1,640	2,020
		DTPYE (No hardening)	90	30		2,100	2,440	1,700	2,040
				50		2,980	3,320	2,580	2,920
Two holes	15	DTPM (Induction hardening)	65	30		1,500	1,840	1,230	1,570
				40		1,700	2,040	1,430	1,770
				50		2,070	2,400	1,800	2,140
				100		4,580	4,890	4,280	4,590
		DTPY (No hardening)	80	30		1,800	2,140	1,500	1,840
				40		2,000	2,340	1,700	2,040
				50		2,500	2,840	2,200	2,540
			90	30		2,200	2,540	1,800	2,140
				40		2,500	2,840	2,100	2,440
				50		3,100	3,440	2,700	3,040

The mark groove with the depth of 2～3mm is machined for one bolt hole type.

■Square distance plate (Colors specifiable)

H	P	Catalog No. Type	A	B	T	Color	U/Price Q'ty:1～9 DTPK N (Normal)	DTPK R(Red) Y(Yellow)	DTPB N (Normal)	DTPB R(Red) Y(Yellow)
6	30	DTPK (Induction hardening) DTPB (No hardening)	38	60	20	R(Red) Y(Yellow) N(Normal)	1,800	2,180	1,650	2,030
15					30		1,940	2,320	1,800	2,180
					40		2,250	2,630	2,100	2,480
6	55			80	20		2,000	2,380	1,850	2,230
15					30		2,160	2,540	2,000	2,380
					40		2,450	2,830	2,300	2,680
6	30		50	60	20		1,900	2,280	1,750	2,130
15					30		2,060	2,440	1,910	2,290
					40		2,350	2,730	2,200	2,580
6	55			80	20		2,300	2,680	2,150	2,530
15					30		2,460	2,840	2,310	2,690
					40		2,750	3,130	2,600	2,980
6	55		60	80	20		2,800	3,180	2,600	2,980
15					30		2,960	3,340	2,760	3,140
					40		3,250	3,630	3,050	3,430
6	70			100	20		3,300	3,680	3,100	3,480
15					30		3,460	3,840	3,260	3,640
					40		3,750	4,130	3,550	3,930
6	70		80	100	20		3,800	4,180	3,500	3,880
15					30		3,960	4,340	3,660	4,040
					40		4,250	4,630	3,950	4,330
6	85			120	20		4,300	4,680	4,000	4,380
15					30		4,460	4,840	4,160	4,540
					40		4,750	5,130	4,450	4,830

Order

Catalog No. — B — T — Color(R・Y・N)

DTPME 65 — 30 — R
DTPK 50 — 80 — 30 — N

Delivery

3 Days

Express T 600/1Pc.
Express A 300/1Pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Note that because color can be specified for square types, the ordering method has been changed.

former ordering method	New ordering method
DTPK60-80-20	DTPK60-80-20-N

Price

Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

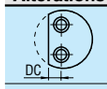
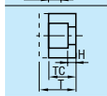
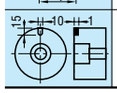
To be quoted on price & lead time above Max. Q'ty.

Catalog No. — T — (DC・TC・NMC)

DTPM 65 — 40 — R — DC20

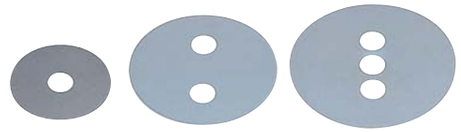
A flat charge of 810 yen for 3 pieces or more of the same size.

- DTPY・DTPYE 3 Days — Express A 300/1Pc. P.38
- DTPM・DTPME 3 Days — Express delivery not available.

Alterations	Code	Spec.	¥/1Code DTPM・DTPME	¥/1Code DTPY・DTPYE
	DC	Cuts, one side of the dimension D 13≦DC＜D／2 1mm increments Only round distance plates are available	900	500
	TC	Changes plate thickness (dimension T) (T−5) ≦TC＜T 1mm increments DTPM.DTPME.DTPK:Not applicable T=20:Not applicable	—	500
	NMC	Cuts a groove T=50 Only available DTPM.DTPME:Not available Round distance plate only	—	500

■Shim for round distance plate

RoHS

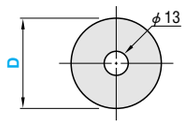


■Shims for square distance plate

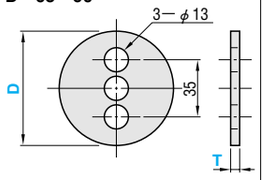
RoHS

DTPMS

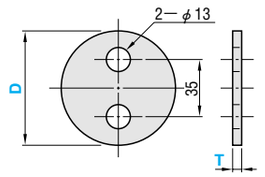
D=45・55



D=65・90



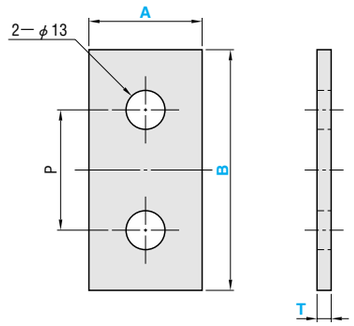
D=80



T	T
0.05	±0.005
0.1	±0.020
0.2	±0.030
0.3	±0.035
0.5	±0.040
1.0	±0.050

M SUS304

DTPKS



T	T
0.05	±0.005
0.1	±0.020
0.2	±0.030
0.3	±0.035
0.5	±0.040
1.0	±0.050

M SUS304

■Shims for round distance plate

Catalog No. Type	D	T	U/Price Q'ty:1～9
DTPMS	45	0.05	130
		0.1	150
		0.2	250
		0.3	360
		0.5	510
		1.0	650
	55	0.05	150
		0.1	170
		0.2	270
		0.3	380
		0.5	530
		1.0	670
	65	0.05	180
		0.1	200
		0.2	300
		0.3	410
		0.5	560
		1.0	700
	80	0.05	230
		0.1	250
		0.2	350
		0.3	460
		0.5	610
		1.0	750
	90	0.05	270
		0.1	290
		0.2	390
		0.3	500
		0.5	650
		1.0	790

■Shims for square distance plate

P	Catalog No. Type	A	B	T	U/Price Q'ty:1～9
30	DTPKS	38	60	0.05	170
				0.1	180
				0.2	310
				0.3	410
				0.5	550
				1.0	690
55			80	0.05	190
				0.1	200
				0.2	330
				0.3	430
				0.5	570
				1.0	710
30		50	60	0.05	200
				0.1	210
				0.2	340
				0.3	440
				0.5	580
				1.0	720
55			80	0.05	210
				0.1	220
				0.2	350
				0.3	450
				0.5	590
				1.0	730

P	Catalog No. Type	A	B	T	U/Price Q'ty:1～9
55	DTPKS	60	80	0.05	220
				0.1	230
				0.2	360
				0.3	460
				0.5	600
				1.0	740
70			100	0.05	230
				0.1	240
				0.2	370
				0.3	470
				0.5	610
				1.0	750
70		80	100	0.05	240
				0.1	250
				0.2	380
				0.3	480
				0.5	620
				1.0	760
85			120	0.05	250
				0.1	260
				0.2	390
				0.3	490
				0.5	630
				1.0	770

Order

Catalog No. — B — T

DTPMS 65 — 0.2
DTPKS 50 — 60 — 0.2

Delivery

3 Days — Express A 300/1Pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size.

Price

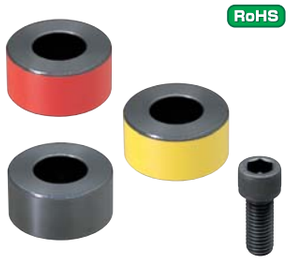
Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

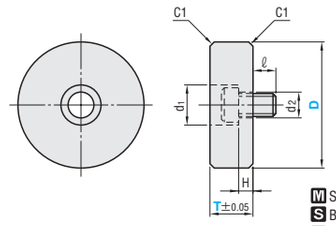
STROKE END BLOCKS
—FOR DRAW/WRIST/PRESSER BALANCER—

¥ The volume discount rate is also applicable to alteration cost. P.39



RoHS

DEB (For Draw/Wrist/Presser balancer)



M S45C
S Black oxide (Fe_3O_4)
A Socket head cap screw (CB12—30)

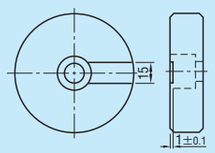
d1	d2	H	ℓ	Catalog No. Type	Catalog No. D	T	Color	U/Price Q'ty:1~9
20	14	6	24	DEB	40	20	R (Red)	600
		14	16			30		660
		6	24		50	20		670
		14	16			30		760
		6	24		60	20	Y (Yellow)	730
		14	16			30		850
						40		960
						50		1,070
		6	24		70	20	N (Normal)	860
		14	16			30		900
						40		1,140
						50		1,280

Outer finishing of color code N (Normal) is black oxide (Fe_3O_4).

Order: Catalog No. — T — R・Y・N
DEB 60 — 20 — N

Delivery: 3 Days
Express T 600/1Pc.
Express A 300/1Pc.
P.38
A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Alteration: Catalog No. — T — R・Y・N — (NMC)
DEB 50 — 30 — Y — NMC

Alteration	Code	Spec.	¥/1Code
	NMC	Adds a groove for height adjustment. Surface treatment of the machined part is deleted.	500

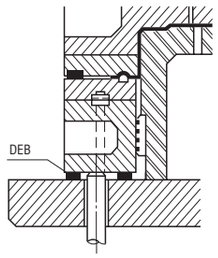
¥ Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

ex Example



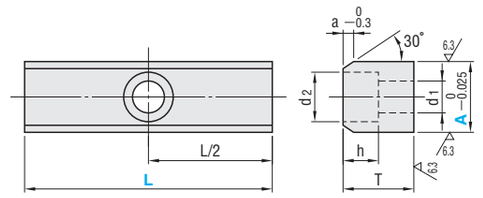
LOCATING KEYS/BACK UP KEYS

¥ The volume discount rate is also applicable to alteration cost. P.39

■Locating key

RoHS

LK



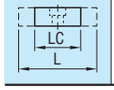
M S45C

A	T	d1	d2	h	a	Catalog No. Type	Catalog No. A	L	U/Price Q'ty:1~49
20	20	9	14	10	3	LK	20	60	860
								80	910
25	25	11	18	12	4		25	60	880
								80	920
								100	940
28							28	60	940
								80	960
								100	980
32					5		32	60	960
								80	980
								100	1,000

Order: Catalog No. — L
LK 20 — 60

Delivery: 1 Day

Alteration: Catalog No. — L(LC)
LK 25 — LC70
3 Days Express A 300/1Pc.
A flat charge of 810 yen for 3 pieces or more of the same size.
P.38

Alteration	Code	Spec.	¥/1Code
	LC	Changes dimension L 30≦LC＜L 5mm increments Cuts at both ends to specified dimension.	300

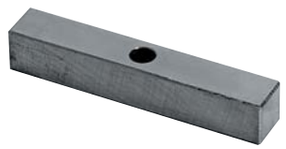
¥ Price

■Volume discount rate P.37

Quantity	1~49	50~99	100~199	200~500
Rate	—	5%	10%	15%

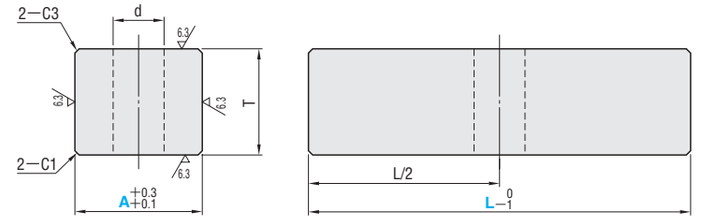
To be quoted on price & lead time above Max. Q'ty.

■Back up key



RoHS

BUKE



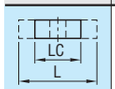
M SS400

T	d	Catalog No. Type	Catalog No. A	L (Selection)	U/Price Q'ty:1~19
20	11	BUKE	20	120	460
25	13		25	150	640
25	13		30	100	780
				125	800
				150	820

Order: Catalog No. — L
BUKE 25 — 150

Delivery: 3 Days
Express A 300/1Pc.
P.38
A flat charge of 810 yen for 3 pieces or more of the same size.

Alteration: Catalog No. — L(LC)
BUKE 20 — LC115

Alteration	Code	Spec.	¥/1Code
	LC	Changes dimension L 50≦LC＜L 1mm increments Cuts at both ends to specified dimension.	300

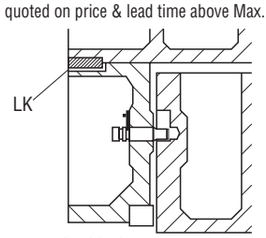
¥ Price

■Volume discount rate P.37

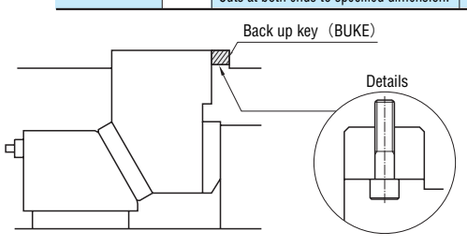
Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

ex Example



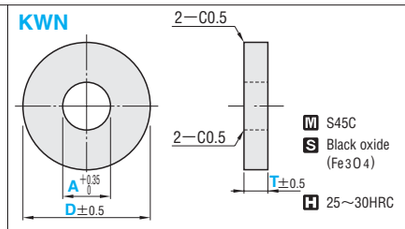
Positioning of mutual dies



WASHERS FOR DIE FASTENING / WASHERS FOR OVAL HOLES/SCRAP BREAKER

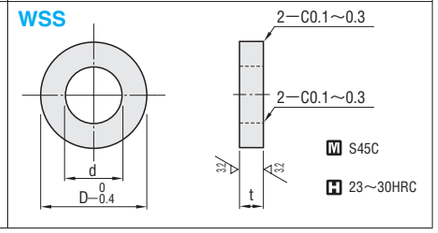
■Washer for die fastening RoHS

KWN



■Washer for oval holes RoHS

WSS



Catalog No. Type	D	A	T	U/Price Q'ty : 1～19
KWN	50	22	10・15	350
	60	26		
	70	26	10・15	410
	80	26	10・15	460
		30	15	

D	d T	t T	Catalog No. Type	No.	U/Price Q'ty:1～49	50～199	200～499	500～1000
12.5	6.4 +0.25 0	2.5 ±0.25	WSS	6	45	42	40	38
17	8.4			8	55	52	49	46
21	10.5	3 ±0.3		10	70	66	63	59
24	13 +0.3 0	4 ±0.4		12	85	80	76	72
30	17	5 ±0.5		16	110	104	99	93
37	21			20	160	152	144	136

Order

Catalog No.	—	A	—	T
KWN 60 / WSS 8	—	22	—	15

Example

Delivery 1 Day

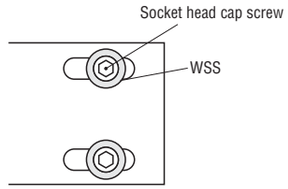
Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

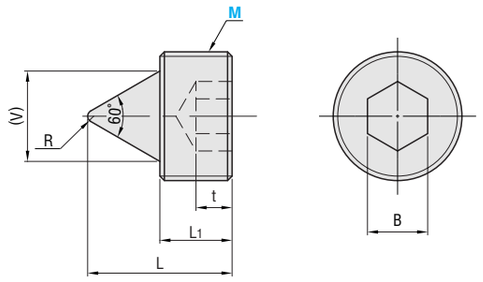
Applicable to KWN.



To prevent breakage, the plate thickness is slightly thicker and the hardness is finished at 23～30HRC.

■Scrap breaker RoHS

CPSBR



The dimension with ( ) is a reference value.

M×P	L	L1	B	V	t	R	Catalog No. Type	M	U/Price Q'ty:1～9
16×1.5	20	10	8	(12.7)	5	1	CPSBR	16	420
20×1.5	24	12	10	(15.0)	6			20	450
24×1.5	26	12	14	(17.3)	8			24	480

Order

Catalog No. CPSBR20

Delivery 1 Day

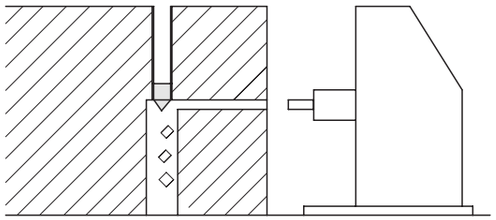
Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example



AIR VENTS / ANGLE STAIES

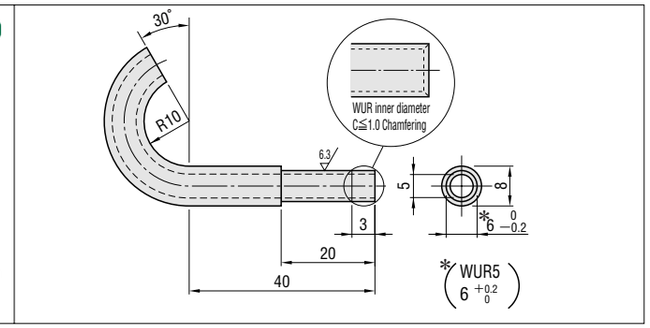
■Air vent RoHS

WUR 5

WAV 5

Yellow
M Polyurethane
H Shore A90

Please use epoxy resin adhesive for mounting
M Brass (C2700T)



Catalog No.	U/Price Q'ty:1～9
WUR 5 (Polyurethane)	150
WAV 5 (C2700T)	150

Order

Catalog No. WAV 5

Delivery 1 Day

Price

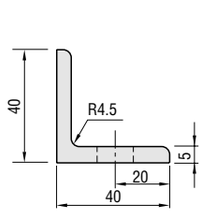
■Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

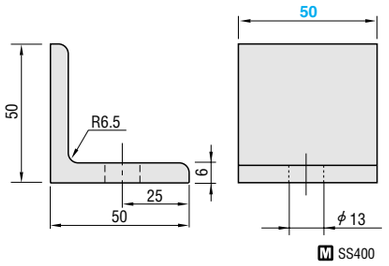
To be quoted on price & lead time above Max. Q'ty.

■Angle Stay RoHS

UAS40—40



UAS50—50



Catalog No. Type	No.	U/Price Q'ty:1～9
UAS	40—40	180
	50—50	210

Order

Catalog No. UAS 40—40

Delivery 1 Day

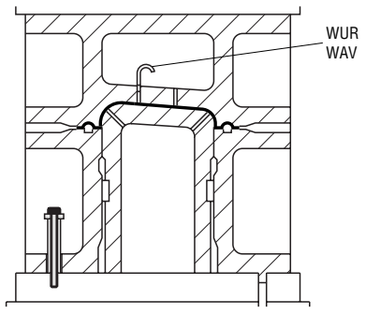
Price

■Volume discount rate P.37

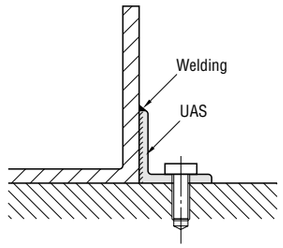
Quantity	1～9	10～29	30～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example



Releasing the air out of a bending die

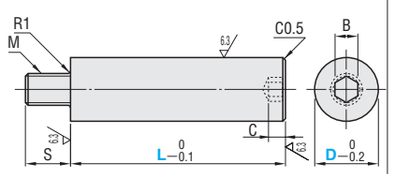


CUSHION PINS

The volume discount rate is also applicable to alteration cost. P.39

RCUP (Hex wrench tightening type with male threads)

RoHS



M S45C H 50HRC～(Induction hardening)

Order / Delivery / Price / Alteration

Catalog No. — L

RCUP 20 — 200

3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

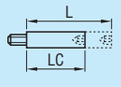
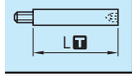
To be quoted on price & lead time above Max. Q'ty.

Catalog No. — L(LC) — (LKC)

RCUP 20 — LC195 — LKC

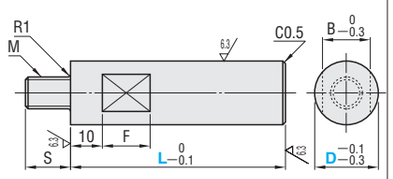
M×P	S	B	C	Catalog No. Type	Catalog No. D	L 10 mm increments	U/Price Q'ty : 1～9
10×1.5	15	8	5	RCUP	16	50 ～ 100	750
						110 ～ 150	880
						160 ～ 200	1,040
12×1.75	18	10	6		20	50 ～ 100	920
						110 ～ 150	1,110
						160 ～ 200	1,310
						210 ～ 250	1,520
16×2.0	24	14	9		25	50 ～ 100	1,060
						110 ～ 150	1,230
						160 ～ 200	1,440
						210 ～ 250	1,650
20×2.5	30	17	12		32	50 ～ 100	1,220
						100 ～ 150	1,370
						160 ～ 200	1,600
						210 ～ 250	1,800

The RCUP male thread diameter is 1 rank larger than MCUP.

Alterations	Code	Spec.	¥/1Code
	LC	Changes full length L 35≦LC＜L 1 mm increments	200
	LKC	Changes L tolerance T L tolerance 0 −0.1 ⇨ 0 −0.04 LC •••▸0.1 mm increments (When using with LC, LC can be specified by 0.1mm increments)	400

MCUP (Spanner tightening type with male threads)

RoHS



M S45C H 55HRC～(Induction hardening)

Order / Delivery / Price / Alteration

Catalog No. — L

MCUP 20 — 200

3 Days

Express T 1,600/1Pc.
Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Volume discount rate P.37

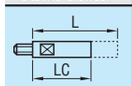
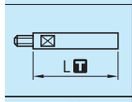
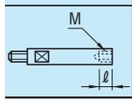
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No. — L(LC) — (LKC·MC)

MCUP 20 — LC195 — LKC

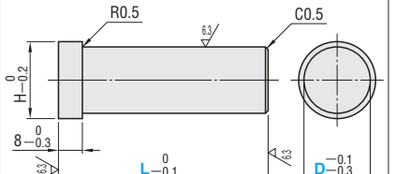
M×P	S	B	F	Catalog No. Type	Catalog No. D	L 10 mm increments	U/Price Q'ty : 1～9
8×1.25	12	13	16	MCUP	16	50 ～ 100	770
						110 ～ 150	910
						160 ～ 200	1,070
						210 ～ 250	1,420
10×1.5	15	16			20	50 ～ 100	950
						110 ～ 150	1,150
						160 ～ 200	1,350
						210 ～ 250	1,570
12×1.75	18	18			25	50 ～ 100	1,090
						110 ～ 150	1,270
						160 ～ 200	1,490
						210 ～ 250	1,700
16×2.0	24	21			32	100 ～ 150	1,420
						160 ～ 200	1,650
						210 ～ 250	1,860

Alterations	Code	Spec.	¥/1Code
	LC	Changes full length L 35≦LC＜L 1 mm increments	200
	LKC	Changes L tolerance T L tolerance 0 −0.1 ⇨ 0 −0.04 LC •••▸0.1 mm increments (When using with LC, LC can be designated in 0.1mm increments)	400
	MC	Adds tapping D: 16 / 20 / 25 / 32 — M: 8 / 10 / 12 / 16 — ℓ: 2×M	200

The volume discount rate is also applicable to alteration cost. P.39

HCUP (With head)

RoHS



M S45C H 55HRC～(Induction hardening)

Order / Delivery / Price / Alteration

Catalog No. — L

HCUP 13 — 150

3 Days

Express T 1,600/1Pc.
Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Volume discount rate P.37

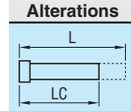
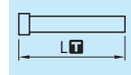
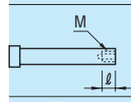
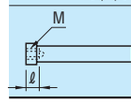
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No. — L(LC) — (LKC·MC·NC)

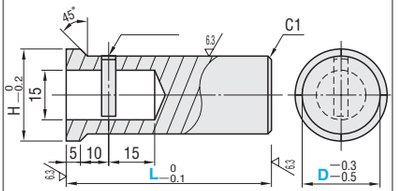
HCUP 13 — LC155 — LKC

H	Catalog No. Type	Catalog No. D	L 10 mm increments	U/Price Q'ty : 1～9
15	HCUP	10	50 ～ 100	610
			110 ～ 150	810
			160 ～ 200	1,000
18		13	50 ～ 100	670
			110 ～ 150	840
			160 ～ 200	1,050
			210 ～ 250	1,250
21		16	50 ～ 100	730
			110 ～ 150	900
			160 ～ 200	1,130
			210 ～ 250	1,350
25		20	50 ～ 100	770
			110 ～ 150	950
			160 ～ 200	1,220
			210 ～ 250	1,500
30		25	50 ～ 100	860
			110 ～ 150	1,060
			160 ～ 200	1,350
			210 ～ 250	1,600
37		32	50 ～ 100	990
			110 ～ 150	1,230
			160 ～ 200	1,570
			210 ～ 250	1,850

Alterations	Code	Spec.	¥/1Code
	LC	Changes full length L 35≦LC＜L 1 mm increments	200
	LKC	Changes L tolerance T L tolerance 0 −0.1 ⇨ 0 −0.04 LC •••▸0.1 mm increments (When using with LC, LC can be designated in 0.1mm increments)	400
	MC	Adds tapping D: 10 / 13·16 / 20 / 25·32 — M: 6 / 8 / 10 / 12 — ℓ: 2×M	200
	NC	Adds tapping D: 10 / 13·16 / 20 / 25·32 — M: 6 / 8 / 10 / 12 — ℓ: 2×M	200

LCUP (Flanged large diameter type)

RoHS



M S45C H 55HRC～(Induction hardening)

Order / Delivery / Price / Alteration

Catalog No. — L

LCUP 38 — 160

3 Days

Express T 1,600/1Pc.
Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Volume discount rate P.37

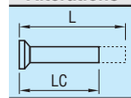
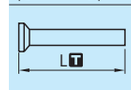
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No. — L(LC) — (LKC)

LCUP 38 — LC153 — LKC

H	Catalog No. Type	Catalog No. D	L 20 mm increments	U/Price Q'ty : 1～9
30	LCUP	25	80 ～ 160	1,200
			180 ～ 240	1,380
40		32	100 ～ 160	1,380
			180 ～ 240	1,630
45		38	100 ～ 160	1,950
			200 ～ 280	2,210
60		50	160 ～ 220	2,700
			240 ～ 300	3,160

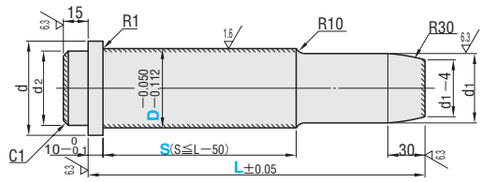
Alterations	Code	Spec.	¥/1Code
	LC	Changes full length L 45≦LC＜L 1 mm increments	ϕ25·32 200 ϕ38·50 400
	LKC	Changes L tolerance T L tolerance 0 −0.1 ⇨ 0 −0.04	400

LIFTER CUSHION PINS / BUSHINGS FOR LIFTER CUSHION PIN

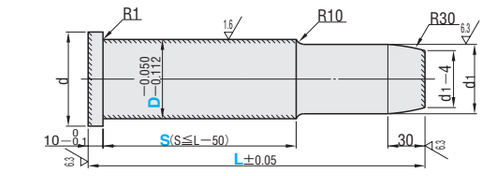
Lifter cushion pin

RoHS

DTCA



DTCB



Part : Induction hardening

M S45C

H 55HRC～

d	d1	d2	Catalog No. Type	D	L 5 mm increments	S 5 mm increments	U/Price Q'ty : 1～9 DTCA	DTCB
38	29	26	DTCA / DTCB	30	100～160	50～110	1,240	1,180
					165～240	50～190	2,080	2,010
					245～275	50～225	3,770	3,690
48	39	36		40	100～160	50～110	2,140	2,050
					165～280	50～230	3,470	3,300
					285～360	50～310	4,430	4,210
					365～460	50～410	4,990	4,730
58	49	46		50	160～220	50～170	4,160	3,940
					225～300	50～250	4,710	4,470
					305～410	50～360	8,310	7,890
					415～460	50～410	9,000	8,590

Order

Catalog No.	L	S
DTCA 50	300	100

Delivery 3 Days — Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

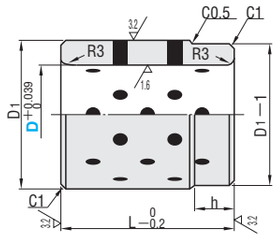
To be quoted on price & lead time above Max. Q'ty.

Bushing for lifter cushion pin

RoHS

TGF (Casting type)

TGW (Copper alloy type)



TGF M FC250
Graphite (embedded)

TGW M High strength copper casting 4 type (CAC304)
(Old JIS: HBsC4)
Graphite (embedded)

D1		h	L	Catalog No. Type	D	U/Price Q'ty : 1～9 TGF	TGW
50	±0.008	10	60	TGF (Casting type) TGW (Copper alloy type)	30	2,370	2,580
60	±0.0095	15	80		40	2,910	3,770
70			100		50	3,820	4,740

Order

Catalog No.
TGF 30

Delivery 3 Days — Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

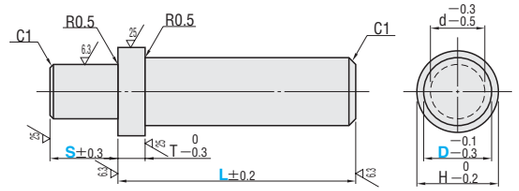
PLATE LIFTER PINS / LIFTER PLATE STOPPERS

The volume discount rate is also applicable to alteration cost. P.39

Plate lifter pin

RoHS

LCP



M S45C

H 55HRC～ (Induction hardening)

d	T	H	Catalog No. Type	D	L 10 mm increments	S 1 mm increments	U/Price Q'ty : 1～9
10	8	18	LCP	13	100～200	10～20	1,250
					210～250		1,400
13		21		16	100～200		1,350
					210～300		1,750
16		25		20	100～190	15～30	1,420
					200～300		1,860
					310～400		2,280
20		30		25	100～240	15～40	1,880
					250～300		2,040
					310～400		2,480
					410～500		2,840
25		40		32	100～240	15～50	2,460
					250～300		2,760
					310～400		3,410
					410～500		3,900

Order

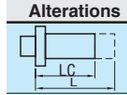
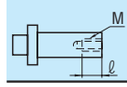
Catalog No.	L	S
LCP 20	250	25

Delivery 3 Days — Express T 1,600/1Pc. / Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Alteration

Catalog No.	L(LC)	S	(MC)
LCP 20	LC248	25	MC

Alterations	Code	Spec.	¥/1Code
	LC	Changes full length L Lmin＜LC＜Lmax 1 mm increments	200
	MC	Adds tapping D: 13 / 16 / 20 / 25 / 32 M: 8 / 8 / 10 / 12 / 16 ℓ: 2×M	200

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

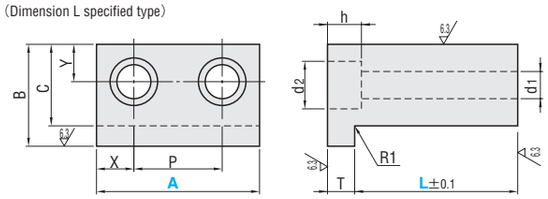
To be quoted on price & lead time above Max. Q'ty.

Lifter plate stopper

RoHS

BSE (Dimension L fixed type)

BST (Dimension L specified type)



M S45C

B	T	C	X	Y	P	d1	d2	h	Catalog No. Type	A	L	U/Price Q'ty : 1～9
38	10	30	15	15	30	11	18	12	BSE (Dimension L fixed type)	60	40 50 60	2,180
											70 80	2,420
45	13	36	20	18	40	14	20	14		80	50 60	2,520
											70 80 90	2,960
											100	3,380
60	15	50	25	25	50	18	26	18		100	60	2,930
											70 80 90	3,640
											100	3,980

B	T	C	X	Y	P	d1	d2	h	Catalog No. Type	A	L 1 mm increments	U/Price Q'ty : 1～9
38	10	30	15	15	30	11	18	12	BST (Dimension L specified type)	60	41～ 59	4,730
											61～ 79	5,110
45	13	36	20	18	40	14	20	14		80	51～ 59	5,300
											61～ 89	5,670
											91～ 99	6,150
60	15	50	25	25	50	18	26	18		100	61～ 89	6,050
											91～ 99	6,720
											101～120	6,720

Please use the BSE for specifying the dimension L in 10mm increments when BST is L100 or less.

Order

Catalog No.	L
BSE 80	70
BST 60	43

Delivery

● BSE: 1 Day

● BST: 3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

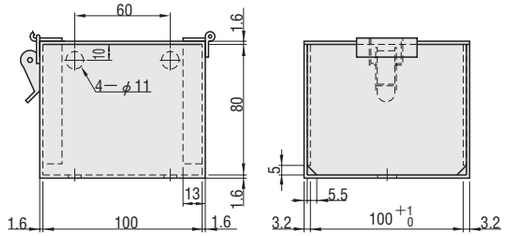
To be quoted on price & lead time above Max. Q'ty.

SPARE PUNCH BOXES

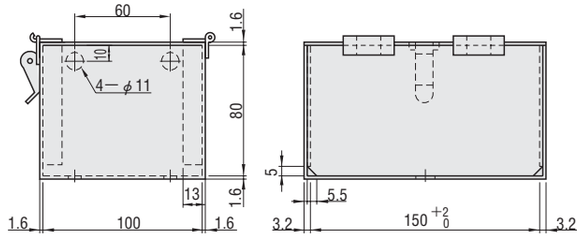
RoHS

PBX100Y

●Having 2 bolt holes on one side and bottom, PBX can be fixed from each side.



PBX150Y



M SPCC
S Baking finish（Yellow）

Catalog No.	U/Price Q'ty:1～9
PBX100Y	1,200
PBX150Y	1,800

Order — Catalog No. PBX100Y

Delivery — 1 Day

Price

■Volume discount rate P.37

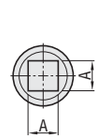
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

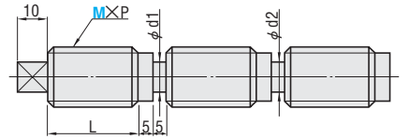
To be quoted on price & lead time above Max. Q'ty.

PRESS ADD.SPEC. Printed in Red TOUCH UP SCREWS

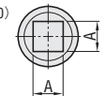
RoHS

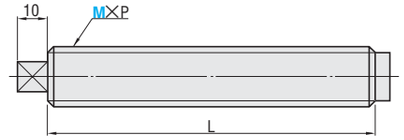
MMS (SS400)
MMF (FC250)





MMSB (SS400)
MMFB (FC250)



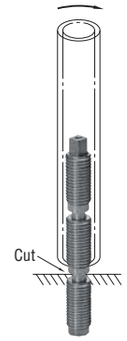


MMS・MMSB M SS400
MMF・MMFB M FC250

M×P (Coarse thread)	A	d1	d2	L	Catalog No. Type	Catalog No. M	Price Q'ty:1～19 MMS	Price Q'ty:1～19 MMF
12×1.75	8	8.5	8.0	24	MMS (SS400)	12	500	870
16×2.0	8	8.5	8.0	32		16	600	840
20×2.5	13	10.5	10.0	40		20	750	800
24×3.0	16	10.5	10.0	48	MMF (FC250)	24	980	1,060
30×3.5	18	12.5	12.0	60		30	1,350	1,450

■How to use

This can be used to repair holes drilled by mistake.
Tighten upper square part with a wrench, cut with iron saw after the attachment.
MMS and MMF can be broken using a pipe wrench.



M×P (Coarse thread)	A	L	Catalog No. Type	Catalog No. M	Price Q'ty:1～19 MMSB	Price Q'ty:1～19 MMFB
6×1.0	4	100	MMSB (SS400)	6	250	—
8×1.25	5			8	270	—
10×1.5	6			10	300	—
10×1.5	7	130	MMFB (FC250)	10	—	940
12×1.75	8	200	MMSB (SS400)	12	500	830
16×2.0	8			16	600	810
20×2.5	13			20	750	780
24×3.0	16		MMFB (FC250)	24	980	990
30×3.5	18			30	1,350	1,350

Order — Catalog No. MMS 12

Delivery — 1 Day

Price

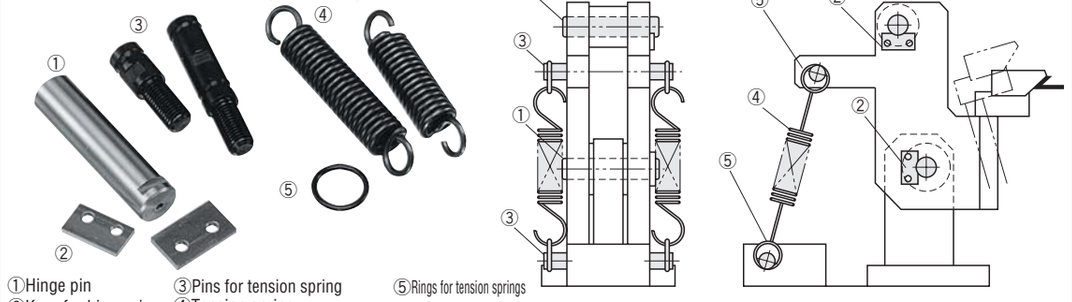
■Volume discount rate P.37

Quantity	1～19
Rate	—

To be quoted on price & lead time above Max. Q'ty.

COMPONENTS FOR HEMMING DIE GUIDE / HINGE PINS

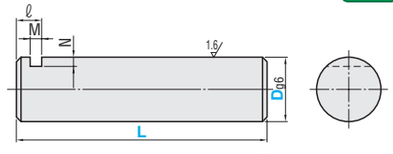
■Please use for standardizing hemming die.



①Hinge pin ②Keys for hinge pin ③Pins for tension spring ④Tension spring ⑤Rings for tension springs

■HINGE PIN

CLKGH RoHS



M S45C
H 55HRC～ (Induction hardening)

D_{g6}		ℓ	M	N	Catalog No. Type	Catalog No. D_{g6}	L 1mm increments	U/Price Q'ty : 1～9
25	−0.007 −0.020	8	3.7	3	CLKGH	25	50～150	1,190
							151～300	1,670
30		10	5	4		30	50～150	1,630
							151～300	2,120
35	−0.009 −0.025			5		35	80～150	1,920
							151～300	2,550
							301～400	3,140
40						40	80～150	2,310
							151～300	3,160
							301～400	3,960
45						45	100～150	2,790
							151～300	3,850
							301～500	5,220
50						50	100～150	3,460
							151～300	4,750
							301～500	6,510

Order: Catalog No. — L → CLKGH 30 — 157

Delivery: 3 Days; Express T 1,600/1Pc.; Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

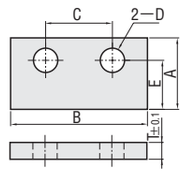
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■KEY FOR HINGE PIN

RoHS

HK

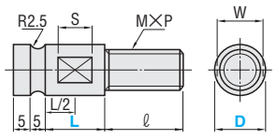


M SS400

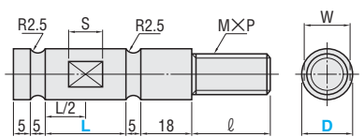
■PIN FOR TENSION SPRING

RoHS

SSPO



WSPO



M S45C
S Black oxide (Fe_3O_4)

A	B	C	D	E	T	Catalog No. Type	Catalog No. No.	U/Price Q'ty : 1～19
20	35	18	6.5	13	4.5	HK	7	760
25	40	20		15			8	

Order: Catalog No. — L → SSPO 20 HK 7 — 15

Delivery: 1 Day

Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

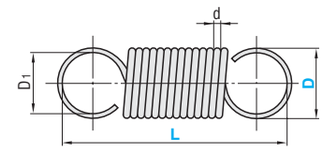
S	W	M×P	ℓ	Catalog No. Type	Catalog No. D	L	U/Price Q'ty : 1～19
8	14	12×1.75	24	SSPO	16	12 15 18	390
	17	16×2.0	32		20		550
10	22	20×2.5	40		25		720
8	14	12×1.75	24	WSPO	16	25 30	420
	17	16×2.0	32		20	25 30 35	610
10	22	20×2.5	40		25	35 45	770

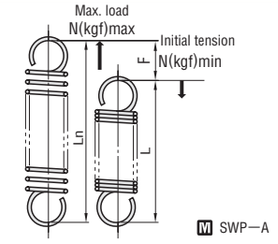
TENSION SPRINGS / RINGS FOR TENSION SPRINGS

■Tension spring

RoHS

AWL
AWM
AWH
AWB





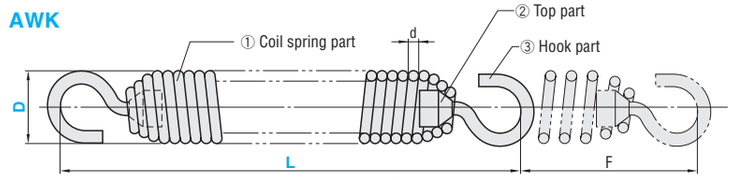
Max. load N{kgf} max ±10%

M SWP—A

■Tension spring

RoHS

AWK

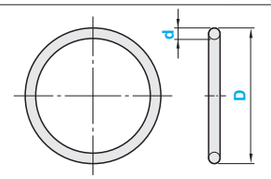


M ①Coil spring part SWP—A
②Top part S45C
③Hook part SWP—A (Wire diameter φ6)

■Rings for tension spring

RoHS

BSR



M SS400
S Black oxide (Fe_3O_4)

■Tension spring

D_1	d	Spring constant N/mm {kgf/mm}	F max	Maximum load N {kgf}	Initial tension N {kgf}	Catalog No. Type D — L	U/Price Q'ty : 1～19
21 (±0.4)	2	0.95 {0.097}	55.22	61.98 {6.32}	9.22 {0.94}	AWL25 — 68	400
		0.60 {0.061}	87.94			83	420
		0.39 {0.040}	132.93			105	440
		0.25 {0.026}	210.64			143	490
		0.16 {0.016}	333.34			203	600
26.8 (±0.5)	2.6	1.30 {0.133}	64.94	101.40 {10.34}	16.57 {1.69}	AWL32 — 86.1	630
		0.82 {0.084}	103.42			106.5	660
		0.54 {0.055}	156.33			135.5	700
		0.34 {0.035}	247.72			184.9	750
		0.22 {0.022}	392.02			262.9	900
19.8 (±0.4)	2.6	2.95 {0.301}	35.10	132.39 {13.50}	28.73 {2.93}	AWM25 — 72.1	490
		1.86 {0.190}	55.90			92.5	510
		1.23 {0.125}	84.50			121.5	550
		0.77 {0.079}	133.90			170.9	600
		0.49 {0.050}	211.90			248.9	660
25.6 (±0.5)	3.2	3.19 {0.325}	45.50	184.66 {18.83}	39.42 {4.02}	AWM32 — 91.2	700
		2.00 {0.204}	72.46			116.8	720
		1.32 {0.135}	109.53			152.0	800
		0.83 {0.085}	173.56			212.8	870
		0.53 {0.054}	274.66			308.8	940

D_1	d	Spring constant N/mm {kgf/mm}	F max	Maximum load N {kgf}	Initial tension N {kgf}	Catalog No. Type D — L	U/Price Q'ty : 1～19
18.6 (±0.4)	3.2	7.37 {0.752}	23.76	242.22 {24.70}	67.08 {6.84}	AWH25 — 77.2	530
		4.63 {0.472}	37.84			102.8	570
		3.06 {0.312}	57.20			138.0	600
		1.93 {0.197}	90.64			198.8	640
		1.22 {0.124}	143.44			294.8	750
24 (±0.5)	4	8.48 {0.865}	29.97	353.53 {36.05}	99.44 {10.14}	AWH32 — 98	820
		5.33 {0.543}	47.73			130	1,020
		3.52 {0.359}	72.15			174	1,080
		2.23 {0.227}	114.33			250	1,160
		1.40 {0.143}	180.93			370	1,380
17 (±0.4)	4	20.00 {2.040}	15.26	466.99 {47.62}	161.91 {16.51}	AWB25 — 84	830
		12.55 {1.280}	24.30			116	900
		8.31 {0.847}	36.73			160	980
		5.25 {0.535}	58.20			236	1,050
		3.31 {0.338}	92.10			356	1,240

● {kgf}=N×0.101972

The values of initial tension are only reference.

kgf=N×0.101972

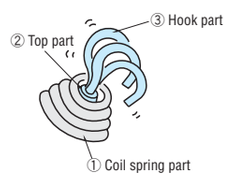
Wire diameter d	Spring constant N/mm {kgf/mm}	F=L×23% Fmm	F=L×23% N {kgf} Load	F=L×25% Fmm	F=L×25% N {kgf} Load	Initial tension N {kgf} Load	Identification Color	Catalog No. Type D — L	U/Price Q'ty : 1～19
5.0	12.55 {1.28}	42.1	703.1 {71.7}	45.7	748.3 {76.3}	174.8 {17.84}	Brown	AWK 34—183	1,850
	10.91 {1.11}	45.5	671.2 {68.3}	49.5	714.8 {72.8}		Red	198	1,930
	10.04 {1.03}	47.8	654.7 {67.1}	52.0	696.9 {71.4}		Black	208	2,000
	9.30 {0.95}	50.1	640.7 {65.4}	54.5	681.6 {69.6}		Yellow	218	2,080
	8.66 {0.88}	52.4	628.6 {64.0}	57.0	668.4 {68.0}		Light blue	228	2,160
Durable operation frequency		1 million times		5×10⁵ times					

■Rings for tension springs

Catalog No. Type	Catalog No. d	D	U/Price Q'ty : 1～19
BSR	4	34	170
		40	220
	5	40	460

■Features

Because the hook part ③ and the coil spring part ① are separated, it resists to fatigue breakdown caused by rotating move of spring moving and the biased load.
The coil spring part ① and the top part ② have line contact, has high durability.



Order: Catalog No. → AWL25—105 AWK34—183 BSR4—40

Delivery: 1 Day

Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

LOCATING COMPONENTS FOR AUTOMOBILE DIE

LOCATING COMPONENTS FOR AUTOMOBILE DIE

New

New

Name / Catalog No.	PANEL INPUT DETECTORS—Linear type— PLGL PLGR	PANEL INPUT DETECTORS PACO□—□ PACO□N—□	ROUGH GUIDES RG—R	RG	RG—L	NEST GUIDES NGUA NGUBR NGUBL
Delivery	③	③ⓉⒶ		③Ⓐ		③Ⓐ
Page	931	933		934		935

Add.

NEST GUIDES—Reinforced type— NGNA NGNBR NGNBL	—Economy type— ENSTB ENSTR ENSTL	NEST GUIDES NGGA NGGC NGGBR NGGBL	NEST GUIDES (With selective mounting plate)—Reinforced type— NGNBA NGNBC
③Ⓐ	③Ⓐ	⑧	③Ⓐ
936	936	937	938

—Economy type— ENSTA ENSTC ENSTD	NEST GUIDES (With length-designative mounting plate) NGNX ENSX	NEST GUIDES—Guide shape-designative type— NGW NGWK NGWS	NEST GUIDES BLANKS—Long type— NBBCL
③Ⓐ	⑤Ⓑ	⑤Ⓑ	③Ⓐ
939	940	941	943

Delivery Shortened

NEST GUIDE BLANKS NBB NBBC	MOUNTING PLATE FOR NEST GUIDE TEA TEB TEC TEE TEL	NEST GUIDES—Surface support type— NSTFA NSTFB	LOCATING PILOT PIN SLTL□ SLPS□	LOCATING PILOT PIN SNST□ SDST□ SDKL□
③Ⓐ	①	③Ⓐ	③ⓉⒶ	③
943	943	944	945	946

Add.

LOCATING PILOT PIN SKSTH SFSTH	LOCATING PILOT PIN PST PSTM	LOCATING PILOT PIN RFPP	PILOT PUNCHES—Free designation type— RTP T-RTP RTPE T-RTPE	LOCATION PINS FOR ARRANGEMENTS DIKPA DIKPB IKPDA IKPDB IKPDC IKPE
③Ⓐ	③ⓉⒶ	⑤Ⓑ	③Ⓐ	③
947	948	948	949	950

LOCATION PINS TLPA TLPB TLPC	LOCATION PINS LPU LPL DLPA	MAGNET LIFTER PINS MLP	PRE-HOLDING PUSH PIN SETS—Normal type— PAPZ PAPZU	—Economy type— PAEZS PAEZU	—Long stroke type— PAP□ PAPG□
①	①	③Ⓐ	⑤Ⓑ ⑤Ⓑ	⑤Ⓑ ⑤Ⓑ	③Ⓐ ③Ⓐ
951	951	952	953	955	956

Add.

Add.

Add.

PRE-HOLDING PUSH PIN SETS PALZS PALZU PALZP	PRE-HOLDING PUSH PIN SETS—Air type— PAEAS PAEAU	PUSH PIN SETS PSPH PSH	PUSH-OUT PIN POP HPOP	PUSH-OUT PINS FOR DRAWING DHPA	COVERS FOR PUSH-OUT PINS FOR DRAWING DHPF100
⑤Ⓑ	⑤Ⓑ	③Ⓐ	③Ⓐ	⑤	⑤
957	958	959	960	960	960

New

SPRING PLUNGERS PJ□	SPRING PLUNGERS PJLR PJHR	WRENCH FOR SPRING PLUNGER PJRW	SPRING PLUNGERS—For slanted surface— PJHZ	MAGNETS MG MGN HX HXH HXU HXMB
①	①	①	①	①
961	962	962	962	963

MAGNETS MLG	MAGNET—Press-fit type— MGATA	MGATB	SQUARE SKID BRACKETS STB STB-N	STBY STBY-N	ROUND SKID BRACKETS MRTB MRTB-N	MRTBY MRTBY-N	SKID BRACKETS SCTB	SCTBY
③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ	③Ⓐ
964	964	964	965		965		966	

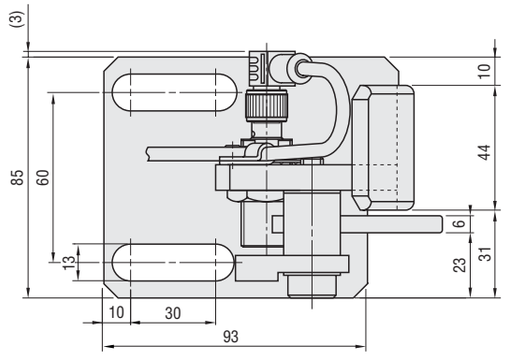
PRESS NEW

PANEL INPUT DETECTORS
—Linear type—

RoHS

PLGL(L type)
PLGR(R type)

Photograph : PLGL(L type)



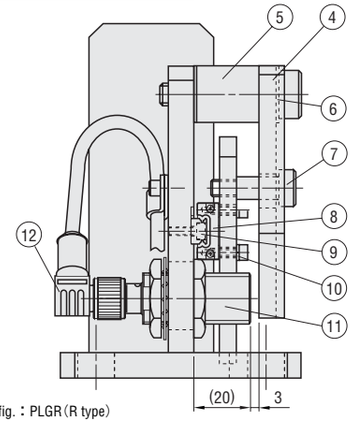
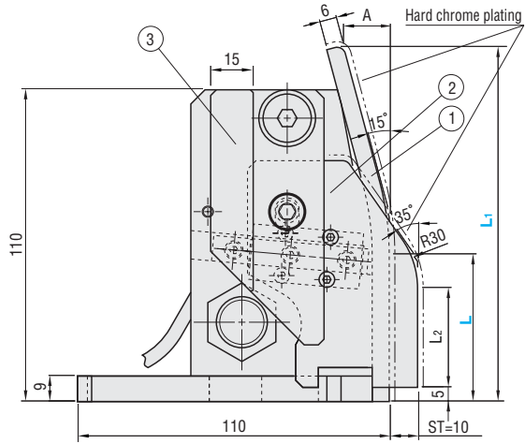


fig. : PLGR(R type)



Components

No.	Name	Q'ty	Note
①	Body of gauge	1	SS400
②	Detection lever	1	SS400
③	Detection plate	1	SS400
④	Shoulder bolt	1	MSB12—30
⑤	Spacer for detection plate	1	SS400
⑥	Oil-free bushing	2	LFZF12—12
⑦	Shoulder bolt	1	MSB8—15
⑧	Linear guide	1	SSELBZ10—55
⑨	Hexagon socket head cap screw	7	SCB3—10
⑩	Spring washer	4	CBW3
⑪	Proximity sensor	1	Made by OMRON
⑫	Connector cable	1	Made by TURCK
⑬	Cable clamp	1	UC—0.5
⑭	Hexagon socket head cap screw	1	CB4—10

A	L2	Catalog No. Type	L	L1	U/Price Q'ty : 1~9
(16.1)	35	(L type) PLGL	50	125	31,000
(17.4)	55	(L type) PLGL	70	150	31,300
(24.1)	55	(L type) PLGL	70	175	31,600
(18.7)	55	(R type) PLGR	90	175	31,600
(25.5)	55	(R type) PLGR	90	200	32,000
(32.2)	75	(R type) PLGR	90	225	32,300

Order Catalog No. — L — L1
PLGL — 50 — 125

Delivery 3 Days

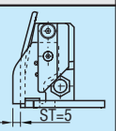
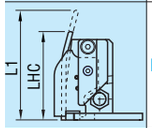
Price

Volume discount rate P.37

Quantity	1~9	10~20
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L — L1 — (STC · LHC···etc.)
PLGL — 50 — 125 — CLC

Alteration	Code	Spec.	¥/1Code
	STC	Changes detection lever's stroke length ST ST=10→5mm	3,000
	LHC	Changes gauge height L1 115≦LHC≦L1 max 5mm increments Delivery : 10 days	3,000
Changes cable length	CLC	The cable can be lengthened from 5m to 10m.	2,000
Without switch Without connector cable	SCN	PLGL and PLGR can be ordered without proximity sensor and connector cable.	—4,000

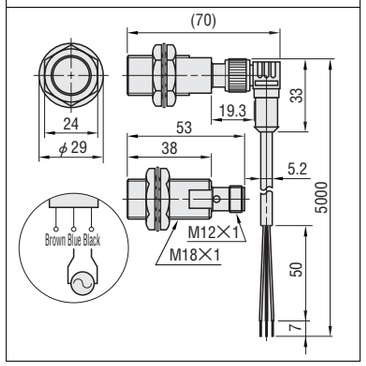
■Features

1) The detection lever moves horizontally. ··· In contrast to the conventional rocking detection levers, this detection lever realizes stable detection without being affected by the variations position of the panel.
2) Smooth operation ··· The use of a linear guide and an oil-free bushing enables the detector to operate with light load.
3) Proximity sensor
   - The connector type proximity sensor can be easily installed and removed, which enables you easy maintenance.
   - Bottom installation ··· The relief of the upper die can be reduced, moderating strength reduction of the upper die.

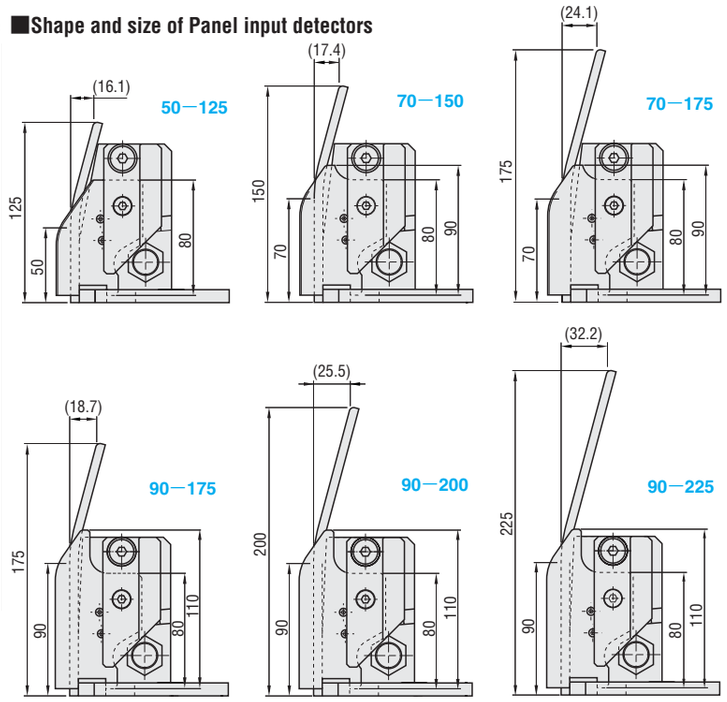
■Specifications of proximity sensor and cable

Proximity sensor(Made by OMRON)
Type:E2E-X5Y1
Power supply:AC24~240V
Ambient temperature:85℃ or less

Connector cable(Made by TURCK)
Type:WWAKW 4T-5
Power supply:4A

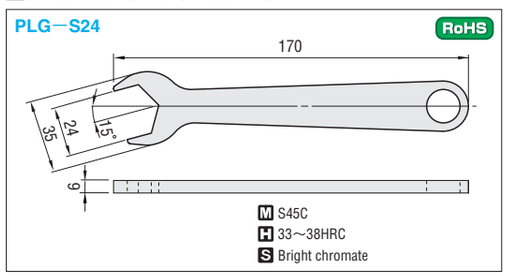


■Shape and size of Panel input detectors



■SPANNER FOR INSTALLATION

PLG—S24 RoHS

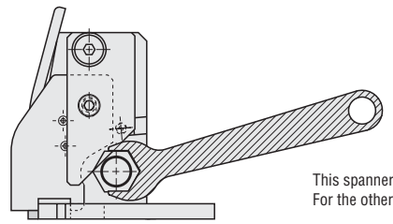


Catalog No.	U/Price
PLG—S24	1,800

Order Catalog No.
PLG—S24

Delivery 1 Day

Example



This spanner is for fixing the nut in the illustration.
For the other nut, use a normal spanner.

Express service system P.38

For inquiry, ordering and other information, refer to P.1269

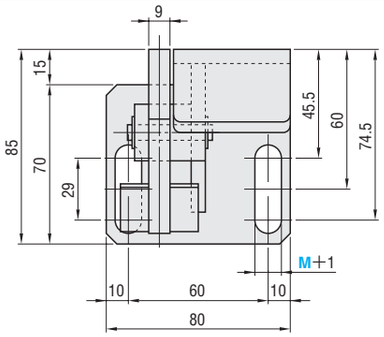
PANEL INPUT DETECTORS

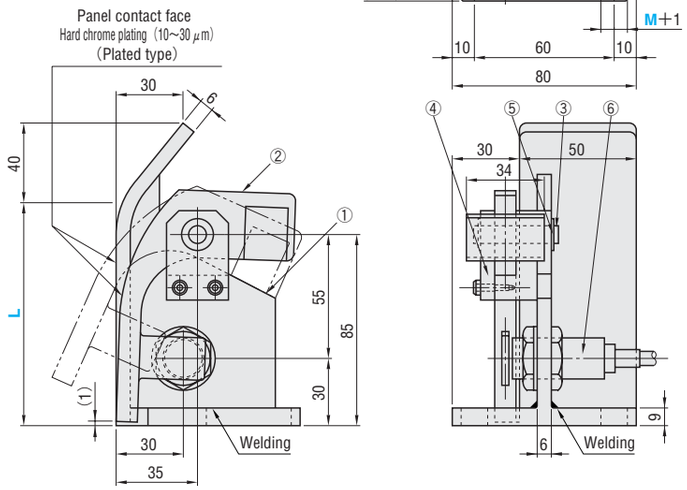
The volume discount rate is also applicable to alteration cost. P.39

RoHS

Type		Catalog No.	
		With proximity sensor	Without proximity sensor
Non-plated type	Left hand	PACOA—L	PACOAN—L
	Right hand	PACOA—R	PACOAN—R
Plated type	Left hand	PACOB—L	PACOBN—L
	Right hand	PACOB—R	PACOBN—R

Shown in the diagram is the left-hand type.





Components

Part No.	Name	Q'ty	M
①	Body of front gauge	1	SS400
②	Detection lever	1	SS400
③	Lever pin	1	S45C
④	Support plate	1	SS400
⑤	Snap ring (C type)	1	—
⑥	Proximity sensor (Cable length 5m)	1	Made by OMRON (2-wire system) AC100V : E2E—X5Y1 DC 24V : E2E—X7D1—N

■With proximity sensor (Component ①~⑥)

Catalog No. Type	L	Electrode	Mounting bolt hole M	U/Price Q'ty : 1~9 PACOA—L PACOA—R	PACOB—L PACOB—R
Non-plated type Left hand PACOA—L Right hand PACOA—R	75	AC100V	M10	13,300	13,980
		DC24V		12,360	12,980
	100	AC100V		13,900	14,600
		DC24V		12,980	13,600
Plated type Left hand PACOB—L Right hand PACOB—R	150	AC100V	M12	14,600	15,200
		DC24V		13,600	14,200

■Without proximity sensor (Component ①~⑤)

Catalog No. Type	L	Mounting bolt hole M	U/Price Q'ty : 1~9 PACOAN—L PACOAN—R	PACOBN—L PACOBN—R
Non-plated type Left hand PACOAN—L Right hand PACOAN—R	75	M10	7,900	8,480
	100		8,500	9,100
Plated type Left hand PACOBN—L Right hand PACOBN—R	150	M12	9,100	9,700

Order

Catalog No.	L	—	Electrode	—	M
PACOA—R	150	—	DC24V	—	M12
PACOBN—L	100			—	M10

Alteration

Catalog No.	L	—	Electrode	—	M	— (LC·AMC)
PACOB—L	100	—	AC100V	—	M10	— LC80

Delivery

3 Days | Express T 1,000/1Pc. | Express A 500/1Pc. P.38

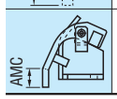
A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

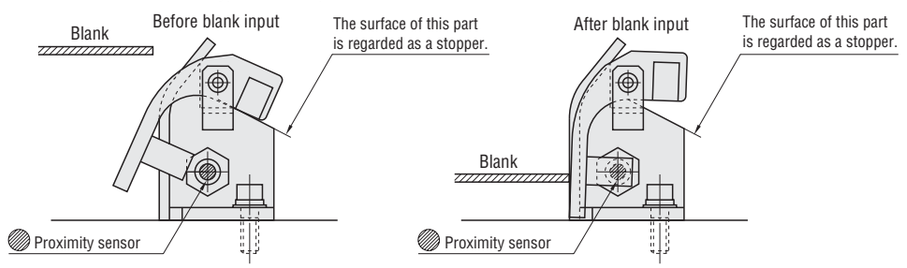
Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alterations	Code	Spec.	¥/1Code
	LC	Changes dimension L 75＜LC＜150 5 mm increments	1,000
	AMC	Changes arm length 10≦AMC≦100 10 mm increments	500

Example

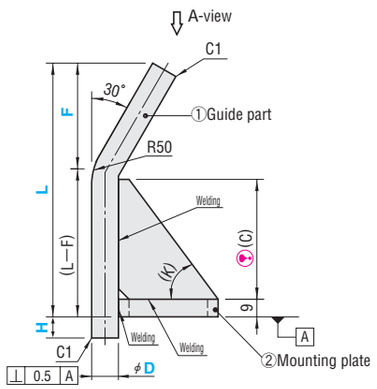
This unit detects whether a draw-type blank is input or not.

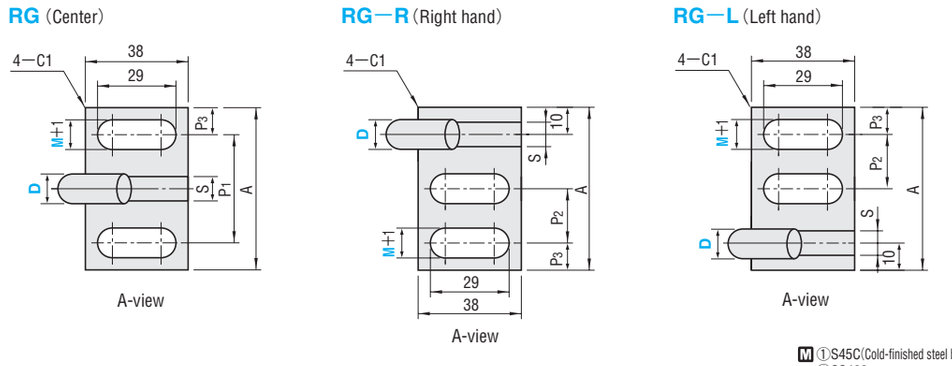


ROUGH GUIDES

The volume discount rate is also applicable to alteration cost. P.39

RoHS





F is dimension before machining R50

(C) (K) : 134≦(L—F) ···▸C=100, K=74°
74≦(L—F)＜134 ···▸C=L—F—34, K=74°
(L—F)＜ 74 ···▸C=40, K=55°

M ①S45C (Cold-finished steel bar) ②SS400

■Mounting bolt and other accessories

M	A
M10	CB10—30 (2pcs.) Spring washer for M10 (2pcs.)
M12	CB12—30 (2pcs.) Spring washer for M12 (2pcs.)

A	P1 (RG)	P2 (RG—R·L)	P3	S	Catalog No. Type	D	5mm increments L	F	H	Mounting bolt hole M	U/Price Q'ty : 1~9
60	40	20	10	6	RG RG—R RG—L	8	60~300	10~50 F≦L—50	0~80	M10	1,580
						10					1,630
				9		12				M12	1,690
						16					1,850
75	50	25	12.5	16		20				M12	1,970

Order

Catalog No.	—	L	—	F	—	H	—	M
RG 20	—	200	—	40	—	40	—	M12

Alteration

Catalog No.	—	L	—	F	—	H	—	M	—(SN·HTC)
RG—L20	—	200	—	40	—	40	—	M12	— SN50

Delivery

3 Days | Express A 800/1Pc. P.38

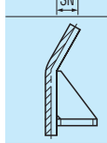
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

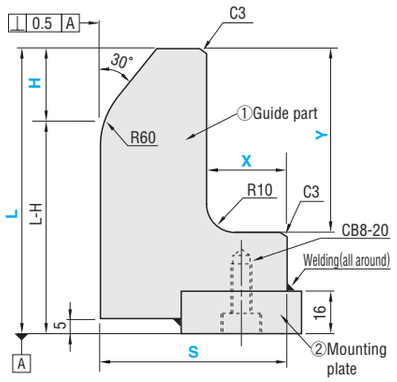
To be quoted on price & lead time above Max. Q'ty.

Alterations	Code	Spec.	¥/1Code
	SN	Puts foward guide part① 5mm increments 0≦SN≦150	800
	HTC	Quenches guide part① 45HRC～	500

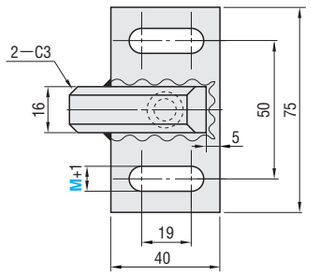
NEST GUIDES

NEST GUIDES
—REINFORCED TYPE / ECONOMY TYPE—

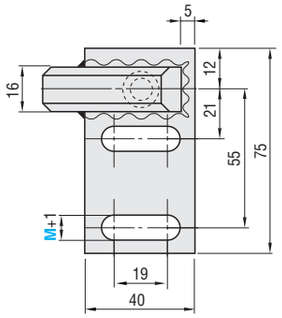
The volume discount rate is also applicable to alteration cost. P.39



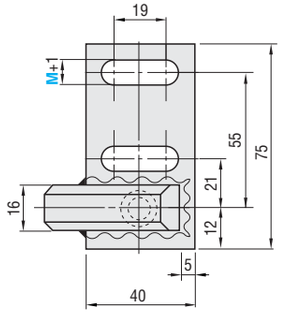
NGUA



NGUBR



NGUBL



(L—Y)≧40
(S—X)≧30

■Mounting bolt and other accessories

M	A
M10	CB10—35(2pcs.) Spring washer for M10(2pcs.)
M12	CB12—35(2pcs.) Spring washer for M12(2pcs.)

Mounting orientation	Catalog No.	M
Center	NGUA	①S45C ②SS400
Right hand	NGUBR	
Left hand	NGUBL	

Catalog No.	5 mm increments L	H	S	X	Y	Mounting bolt hole M
NGUA	75～100	20～40	50～100	20～70	35～ 60	M10 M12
NGUBR	105～150				65～110	
NGUBL	155～200				115～160	

Catalog No.	L	U/Price Q'ty : 1～9 S50～75	S80～100
NGUA	75～100	4,950	5,500
NGUBR	105～150	5,350	6,100
NGUBL	155～200	6,100	6,900

H is dimension before machining R60.
The guide part ① and the mounting plate ② are to be fixed by welding and bolting.
As the guide part ① is made of S45C, it can be hardened by flame hardening, HTC alteration, etc.

Order

Catalog No. — L — H — S — X — Y — M
NGUA — 90 — 40 — S60 — X40 — Y40 — M10

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

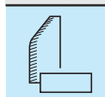
Catalog No. — L — H — S — X — Y — M — (HTC·GRC·WSS)
NGUBL — 150 — 40 — S70 — X35 — Y85 — M12 — GRC20 — WSS12

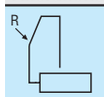
Delivery

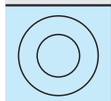
3	Days
Express A	800/1Pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Alterations	Code	Spec.	¥/1Code
	HTC	Quenches guide part ① 45HRC～	500

Alterations	Code	Spec.	¥/1Code
	GRC	Reduces R(R60) of guide part. Specify between R10 and 30 in increments of 10.	200

Alterations	Code	Spec.	¥/1Code
	WSS	Changes spring washers to washer for elongate hole (2pcs.) For M10→WSS10 For M12→WSS12	120

H is dimension before machining R60.

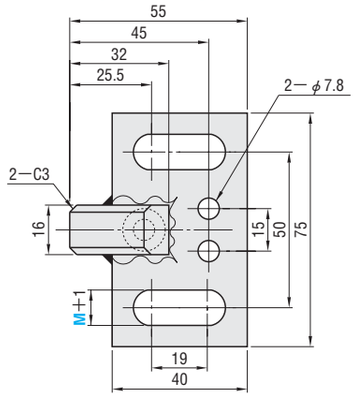
■Mounting bolt and other accessories

M	A
M10	CB10—35(2pcs.) Spring washer for M10(2pcs.)
M12	CB12—35(2pcs.) Spring washer for M12(2pcs.)

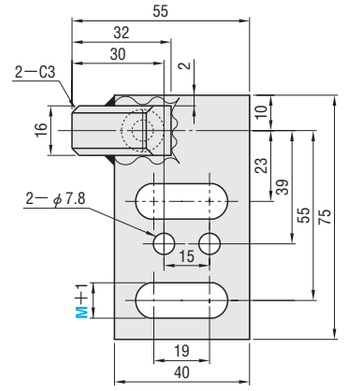
Type	Mounting orientation	Catalog No.	M
Reinforced type	Center	NGNA	①S45C ②SS400
	Right hand	NGNBR	
	Left hand	NGNBL	

Type	Mounting orientation	Catalog No.	M
Economy type	Center	ENSTB	①SS400 ②SS400
	Right hand	ENSTR	
	Left hand	ENSTL	

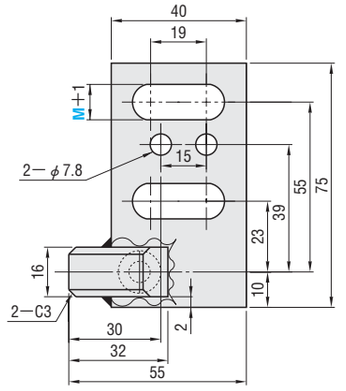
NGNA ENSTB



NGNBR ENSTR



NGNBL ENSTL



■Reinforced type

Catalog No.	L 5 mm increments	H 5 mm increments	Mounting bolt hole M	U/Price Q'ty : 1～9
NGNA NGNBR NGNBL	65～100	20～40	M10 M12	2,620
	105～150			2,760
	155～200			2,970
	205～250			3,980
	255～300			4,480
	305～350			4,980

The guide part ① and the mounting plate ② are to be fixed by welding and bolting.
As the guide part ① is made of S45C, it can be hardened by flame hardening, HTC alteration, etc.

■Economy type

Catalog No.	L 5 mm increments	H 5 mm increments	Mounting bolt hole M	U/Price Q'ty : 1～9
ENSTB ENSTR ENSTL	65～100	20～40	M10 M12	1,690
	105～150			1,770
	155～200			1,940

The guide part ① and the mounting plate ② are fixed by welding only.

Order

Catalog No. — L — H — M
NGNA — 185 — 30 — M12
ENSTB — 185 — 40 — M10

Delivery

3	Days
Express A	800/1Pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

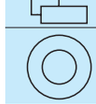
■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. — L — H — M — (HTC·GRC·WSS)
NGNBL — 120 — 35 — M12 — HTC — WSS10

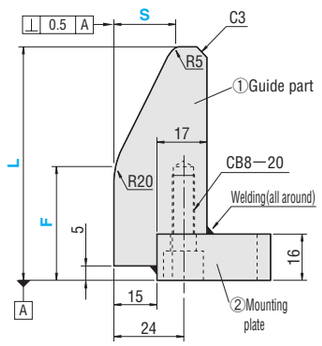
Alterations	Code	Spec.	¥/1Code
	HTC	Quenches guide part ① 45HRC～ Available only for reinforced type	500
	GRC	Reduces R(R60) of guide part. Specify between R10 and 30 in increments of 10.	200
	WSS	Changes spring washers to washer for elongate hole (2pcs.) For M10→WSS10 For M12→WSS12	120

PRESS ADD.SPEC. Printed in Red

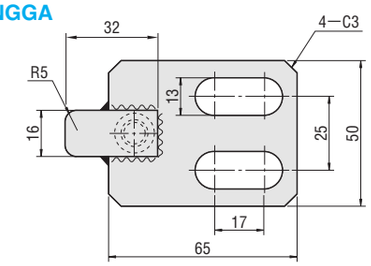
NEST GUIDES
—ROUND TYPE WITHOUT PILOT HOLES FOR DOWELS—

¥ The volume discount rate is also applicable to alteration cost. P.39

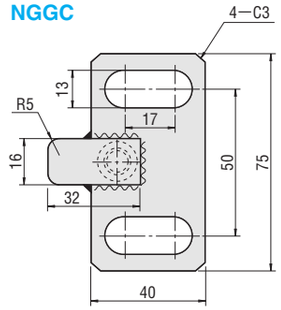
RoHS



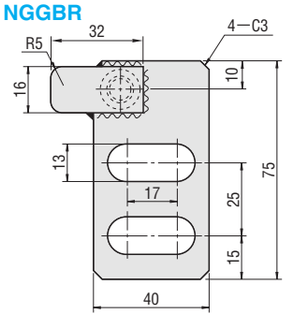
NGGA



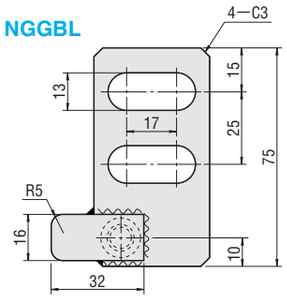
NGGC



NGGBR



NGGBL



F is dimension before machining R20.
(L—F)≧10

■Mounting bolt and other accessories

M	A
M12	CB12—35(2pcs.) Spring washer for M12(2pcs.)

Mounting orientation	Catalog No.	M
Center	NGGA NGGC	①S45C ②SS400
Right hand	NGGBR	
Left hand	NGGBL	

Catalog No.	L	F 10 mm increments	S	U/Price Q'ty : 1~9
NGGA NGGC NGGBR NGGBL	60	20~ 50	15	3,630
	80	20~ 70		
	100	20~ 90		4,250
	120	20~110		
	140	20~130	20	4,520
	160	20~150		
	180	20~170		5,240
	200	20~190		

Order: Catalog No. — L — F — S
NGGA — 200 — 50 — 15

Delivery: 8 Days

Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

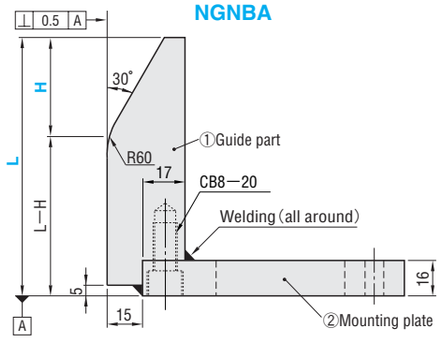
To be quoted on price & lead time above Max. Q'ty.

NEST GUIDES (With selective mounting plate)
—REINFORCED TYPE—

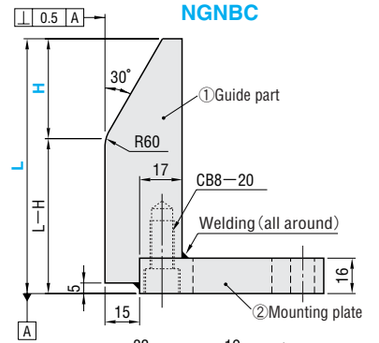
¥ The volume discount rate is also applicable to alteration cost. P.39

RoHS

NGNBA



NGNBC



H is dimension before machining R60

M ①S45C ②SS400

■Mounting bolt and other accessories

M	A
M10	CB10—35(2pcs.) Spring washer for M10(2pcs.)
M12	CB12—35(2pcs.) Spring washer for M12(2pcs.)

Catalog No.	L 5 mm increments	H 5 mm increments	Mounting bolt hole M	U/Price Q'ty : 1~9
NGNBA NGNBC	65~100	20~40	M10 (M12)	2,760
	105~150			2,910
	155~200			3,130

M12 is only applicable to NGNBA.
The guide part ① and the mounting plate ② are fixed by welding only.
As the guide part ① is made of S45C, it can be hardened by flame hardening, HTC alteration, etc.

Order: Catalog No. — L — H — M
NGNBA — 185 — 40 — M10

Delivery: 3 Days | Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

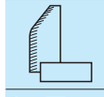
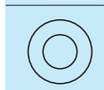
Alteration

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

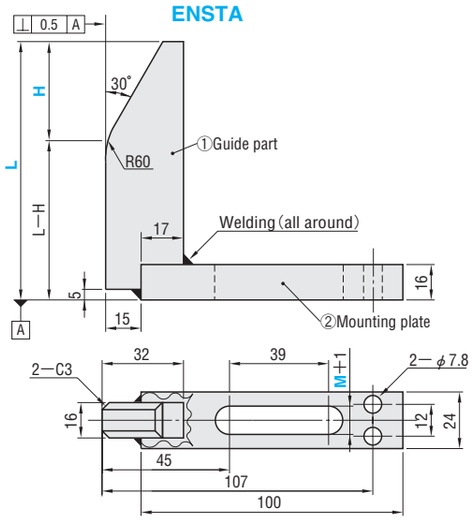
To be quoted on price & lead time above Max. Q'ty.

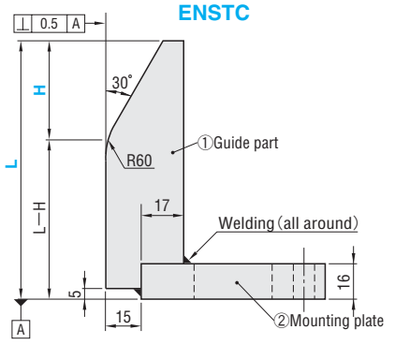
Catalog No. — L — H — M — (HTC·GRC·WSS)
NGNBA — 120 — 40 — M12 — HTC

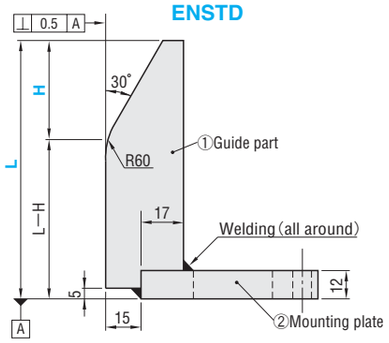
Alterations	Code	Spec.	¥/1Code
	HTC	Quenches guide part① (45HRC~)	500
	GRC	Reduces R(R60) of guide part. Specify between R10 and 30 in increments of 10.	200
	WSS	Changes spring washers to washer for elongate hole(2pcs.) For M10→WSS10 For M12→WSS12	120

NEST GUIDES (With selective mounting plate)
—ECONOMY TYPE—

The volume discount rate is also applicable to alteration cost. P.39







H is dimension before machining R60

■Mounting bolt and other accessories

M	A
M10	CB10—35(2pcs.) Spring washer for M10(2pcs.)
M12	CB12—35(2pcs.) Spring washer for M12(2pcs.)

M ①②SS400

Catalog No.	L 5 mm increments	H 5 mm increments	Mounting bolt hole M	U/Price Q'ty : 1~9
ENSTA	65~100	20~40	M10 (M12)	1,690
ENSTC	105~150			1,770
ENSTD	155~200			1,940

M12 is only applicable to ENSTA.
The guide part ① and the mounting plate ② are fixed by welding only.

Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. — L — H — M — (GRC)
ENSTA — 185 — 40 — M10 — GRC20

Alteration	Code	Spec.	¥/1Code
R	GRC	Reduces R (R60) of guide part. Specify between R10 and 30 in increments of 10.	200

Order

Catalog No. — L — H — M
ENSTA — 185 — 40 — M10

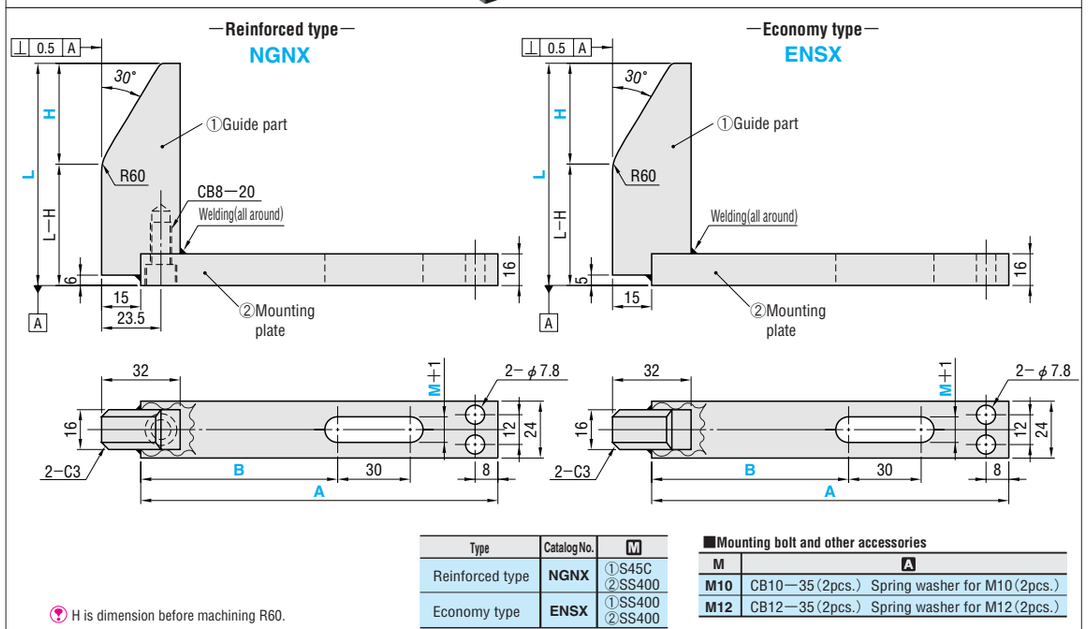
Delivery

3 Days | Express A | 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

NEST GUIDES (With length-designative mounting plate)
—REINFORCED TYPE/ECONOMY TYPE—

The volume discount rate is also applicable to alteration cost. P.39



H is dimension before machining R60.

Type	Catalog No.	M
Reinforced type	NGNX	①S45C ②SS400
Economy type	ENSX	①SS400 ②SS400

■Mounting bolt and other accessories

M	A
M10	CB10—35(2pcs.) Spring washer for M10(2pcs.)
M12	CB12—35(2pcs.) Spring washer for M12(2pcs.)

Catalog No.		L 5 mm increments	H 5 mm increments	A 10 mm increments	B 5 mm increments	Mounting bolt hole M
Reinforced type	NGNX	65~100	20~40	100~200	35≦B≦A—50	M10
Economy type	ENSX	105~150				M12
		155~200				

Reinforced type NGNX
The guide part ① and the mounting plate ② are to be fixed by welding and bolting.
As the guide part is made of S45C, it can be hardened by flame hardening, HTC alteration, etc.

Economy type ENSX
The guide part ① and the mounting plate ② are fixed by welding only.

Order

Catalog No. — L — H — A — B — M
NGNX — 150 — 40 — A150 — B80 — M12

Alteration

Catalog No. — L — H — A — B — M — (HTC·GRC·WSS)
NGNX — 150 — 40 — A150 — B80 — M12 — HTC

Alterations	Code	Spec.	¥/1Code
	HTC	Quenches guide part ① 55HRC~ Available only for reinforced type.	500
R	GRC	Reduces R (R60) of guide part. Specify between R10 and 30 in increments of 10.	200
	WSS	Changes spring washers to washer for elongate hole (2pcs.) For M10→WSS10 For M12→WSS12	120

Delivery

5 Days | Express B | 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

L \ A	U/Price Q'ty:1~9			
	NGNX		ENSX	
	A100~150	A160~200	A100~150	A160~200
65~100	3,480	3,900	2,750	3,170
105~150	3,630	4,050	2,850	3,270
155~200	3,780	4,200	2,950	3,370

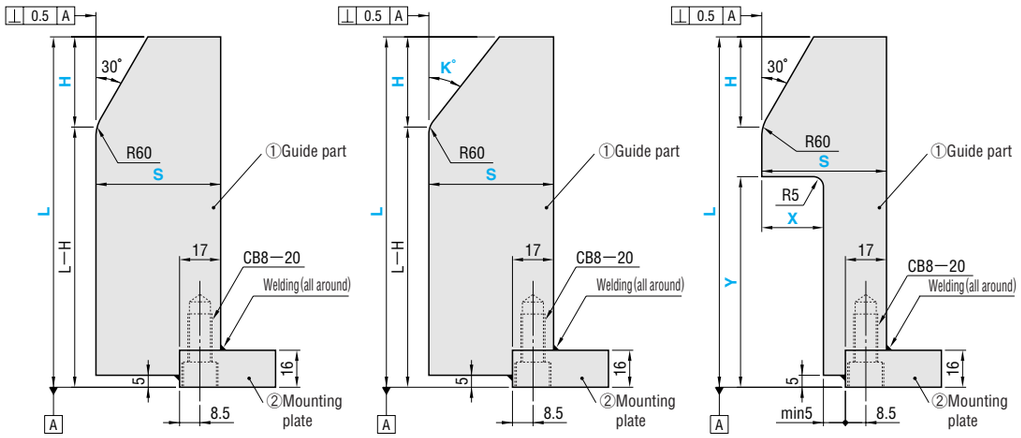
NEST GUIDES
—GUIDE SHAPE-DESIGNATIVE TYPE—

RoHS

—Guide width-designative type—
NGW

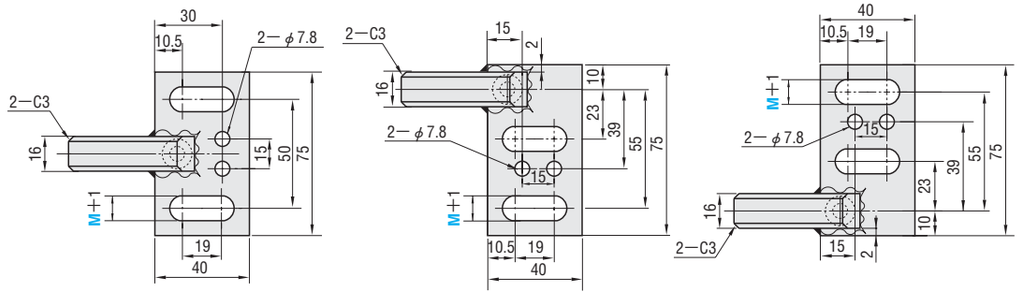
—Insertion angle-designative type—
NGWK

—Notched type—
NGWS



S≧10+H×tank°

A (Center) **BR (Right hand)** **BL (Left hand)**



H is dimension before machining R60.
The guide part ① and the mounting plate ② are to be fixed by welding and bolting.
As the guide part is made of S45C, it can be hardened by flame hardening, HTC alteration, etc.

M ①S45C ②SS400

■Mounting bolt and other accessories

M	A
M10	CB10—35 (2pcs.) Spring washer for M10 (2pcs.)
M12	CB12—35 (2pcs.) Spring washer for M12 (2pcs.)

The volume discount rate is also applicable to alteration cost. P.39

■Guide width-designative type

Catalog No. Type	Mounting orientation	L 5 mm increments	H 5 mm increments	S 5 mm increments	Mounting bolt hole M
NGW	A (Center)	65～100	20～40	35～100	M10 M12
	BR (Right hand)	105～150			
	BL (Left hand)	155～200			

NGNA (P.937) is available for S32

■Insertion angle-designative type

Catalog No. Type	Mounting orientation	L 5 mm increments	H 5 mm increments	S 5 mm increments	K 5° increments	Mounting bolt hole M
NGWK	A (Center)	65～100	20～40	32 35～100	15≦K≦60	M10 M12
	BR (Right hand)	105～150				
	BL (Left hand)	155～200				

S≧10+H×tank°

■Notched type

Catalog No. Type	Mounting orientation	L 5 mm increments	H 5 mm increments	S 5 mm increments	X 1 mm increments	Y 5 mm increments	Mounting bolt hole M
NGWS	A (Center)	65～100	20～40	32 35～100	X≦S−22	Y≦L−H−15	M10 M12
	BR (Right hand)	105～150					
	BL (Left hand)	155～200					

Order

	Catalog No.	L	H	S	K	X	Y	M
	Type / Mounting orientation							
Guide width-designative type	NGW A	100	40	S35				M10
Insertion angle-designative type	NGWK A	200	40	S50	K45			M12
Notched type	NGWS BL	200	40	S40		X10	Y100	M12

Delivery 5 Days — Express B 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

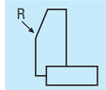
■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Type	L	U/Price Q'ty : 1～9 S=32	35≦S≦50	55≦S≦100
NGW	65～100	—	3,170	3,390
	105～150	—	3,320	3,540
	155～200	—	3,470	3,690
NGWK	65～100	3,260	3,470	3,690
	105～150	3,410	3,620	3,840
	155～200	3,560	3,770	3,990
NGWS	65～100	3,760	4,170	4,690
	105～150	4,210	4,520	5,140
	155～200	4,660	4,970	5,590

Alteration Catalog No. — L — H — S — K — X — Y — M — (HTC・GRC・WSS)
NGWBL — 120 — 40 — S35 — M12 — HTC

Alterations	Code	Spec.	¥/1Code
	HTC	Quenches guide part ① 55HRC～	500
	GRC	Reduces R (R60) of guide part. Specify between R10 and 30 in increments of 10.	200
	WSS	Changes spring washers to washer for elongate hole (2pcs.) For M10→WSS10 For M12→WSS12	120

NEST GUIDE BLANKS/MOUNTING PLATE FOR NEST GUIDE

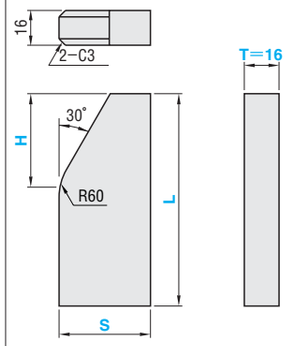
DELIVERY SHORTENED

NEST GUIDES —SURFACE SUPPORT TYPE—

Nest guide blank —Long type—

RoHS

NBBCL M S45C



※H is dimension before machining R60.

Catalog No. Type	Plate thickness T	S	L 10mm increments	H 10mm increments	U/Price Q'ty:1~9
NBBCL	16	50	200~250	20~60	1,410
			260~300		1,720
			310~350		2,120

Order: Catalog No. — S — L — H
NBBCL16 — 50 — 300 — 30

Delivery: 3 Days | Express A 800/1Pc. P.38

※A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

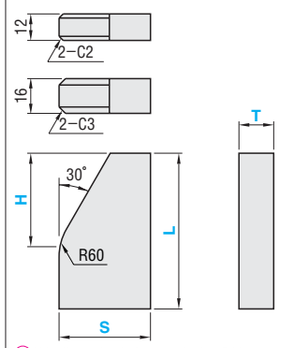
Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

※To be quoted on price & lead time above Max. Q'ty.

Nest guide blank

RoHS

NBB (SS400) M NBB SS400 NBBC S45C
NBBC (S45C)



※H is dimension before machining R60.

Catalog No. Type	Plate thickness T	S Selection	L 5mm increments	H Selection	U/Price Q'ty : 1~9 S32・50	S75・100
NBB	12	32 50 75 100	65~200	30 40	800	960
	16				880	1,080
NBBC	16				1,010	1,240

Order: Catalog No. — S — L — H
NBB12 — 75 — 100 — 30

Delivery: 3 Days | Express A 800/1Pc. P.38

※A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

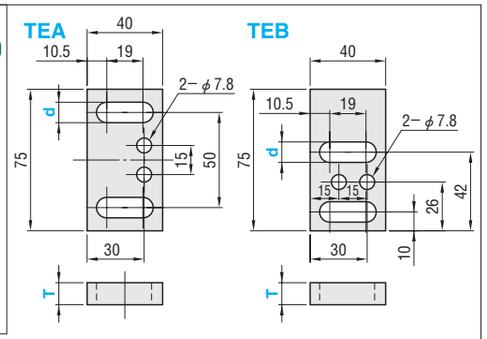
■Volume discount rate P.37

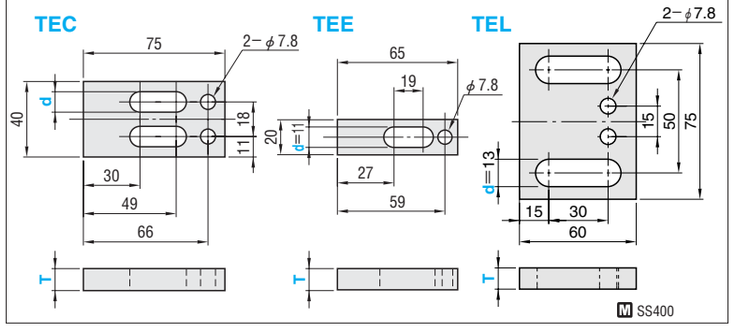
Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

※To be quoted on price & lead time above Max. Q'ty.

■Mounting plates for nest guide

RoHS





M SS400

Catalog No. Type	Plate thickness T	d	U/Price Q'ty : 1~9
TEA	12	11	900
		13	950
TEB ※TEC	16	11	1,000
		13	1,050
TEE	12	11	900
TEL	16	13	1,360

※d13 is not applicable to TEC.

Order: Catalog No. — d
TEA12 — 13

Delivery: 1 Day

Price

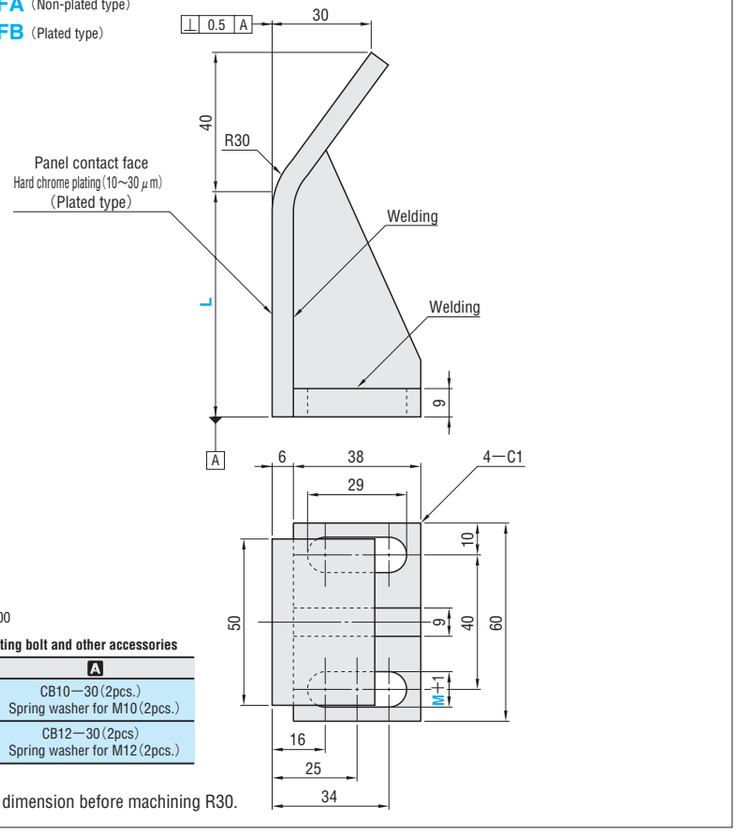
■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

※To be quoted on price & lead time above Max. Q'ty.

RoHS

NSTFA (Non-plated type)
NSTFB (Plated type)



M SS400

■Mounting bolt and other accessories

M	A
M10	CB10−30(2pcs.) Spring washer for M10(2pcs.)
M12	CB12−30(2pcs) Spring washer for M12(2pcs.)

※L is dimension before machining R30.

Catalog No.	L 5 mm increments	Mounting bolt hole M	U/Price Q'ty : 1~9 NSTFA	NSTFB
NSTFA (Non-plated type)	75~100	M10	3,450	4,700
NSTFB (Plated type)	105~150	M12	3,820	5,300

Order: Catalog No. — L — M
NSTFA — 100 — M12

Delivery: 3 Days | Express A 800/1Pc. P.38

※A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

※To be quoted on price & lead time above Max. Q'ty.

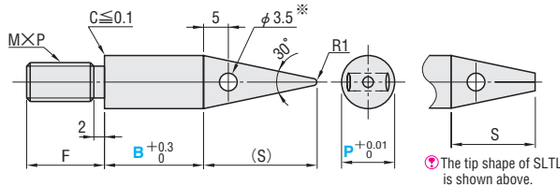
LOCATING PILOT PIN

¥ The volume discount rate is also applicable to alteration cost. P.39

Male screw type

RoHS

SLTL (Standard)
SLTLH (Configurable P・B)



The tip shape of SLTL is shown above.

M SKS93
H 37～43HRC

SLTLH is (S) ≒1.6×P.　※SLTL6→ φ2, SLTL8・SLTLH8→ φ2.5

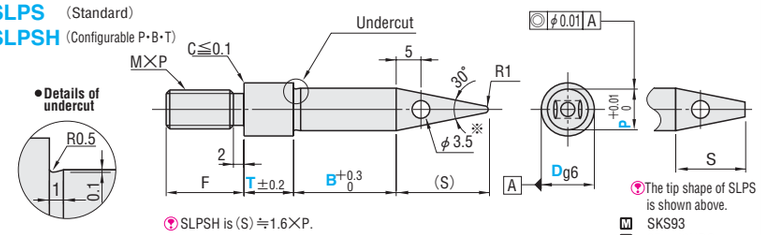
M×P	F	S	Catalog No. Type	P	B	U/Price Q'ty：1～9
5×0.8	12	10	(Standard) SLTL	6	5 10	570
6×1.0				8		640
8×1.25	15			9		640
10×1.5		15		10	10 15	640
12×1.75				12		640
		17		14	15 20	640
				15		640
				16	20 25	850
16×2.0	25	20		20	25 30	850

M×P	F	Catalog No. Type	No.	P 0.01 mm increments	B 1 mm increments	U/Price Q'ty：1～9
5×0.8	12	(Configurable P・B) SLTLH	8	6.00～ 8.00	5～50	790
6×1.0			10	8.00～10.00		790
8×1.25	15		12	10.00～12.00		790
10×1.5			14	12.00～14.00		790
12×1.75			16	14.00～16.00		1,040
16×2.0	25		20	16.00～20.00		1,040

Inlay male screw type

RoHS

SLPS (Standard)
SLPSH (Configurable P・B・T)



The tip shape of SLPS is shown above.

M SKS93
H 37～43HRC

SLPSH is (S) ≒1.6×P.
※D8→ φ2, D10→ φ2.5

M×P	F	P	B	T	S	Catalog No. Type	D	U/Price Q'ty：1～9
6×1.0	12	6	5	3	10	(Standard) SLPS	8	1,010
8×1.25	15	8		5			10	1,010
12×1.75		10			15		13	1,010
		13			17		16	1,220
16×2.0	25	16	10	10	20		20	1,220
		20			25		25	1,580

M×P	F	Catalog No. Type	D	P 0.01 mm increments	B 1 mm increments	T 1 mm increments	U/Price Q'ty：1～9
6×1.0	12	(Configurable P・B・T) SLPSH	8	6.00～ 8.00	5～60	3～15	1,300
8×1.25	15		10	8.00～10.00			1,300
12×1.75			13	10.00～12.00			1,300
			16	12.00～14.00			1,480
16×2.0	25		20	14.00～16.00			1,480
			25	16.00～20.00			1,920

Order

Catalog No. — P — B — T

SLTL 8 — B10
SLTLH 14 — P13.80 — B20
SLPS 10
SLPSH 16 — P14.00 — B60 — T15

Delivery

● SLTL・SLPS

3 Days

Express	T	1,600/1Pc.
Express	A	800/1Pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

● SLTLH・SLPSH

3 Days　Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

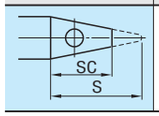
■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

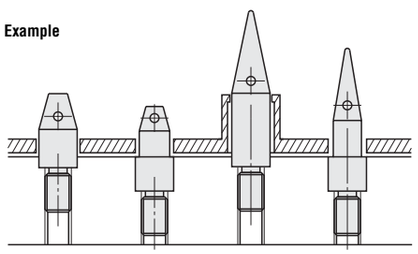
To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. — P — B — T — (SC)
SLPSH 10 — P8.50 — B10 — T3 — SC9

Alteration	Code	Spec.	¥/1Code
	SC	Changes dimension S alteration 8＜SC＜S 1 mm increments	100

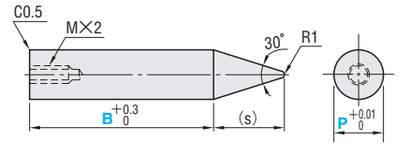
Example



Female screw type

RoHS

SNST (Standard)
SNSTH (Configurable P・B)



(s) ≒1.6×P.

M SKS3
H 60～63HRC

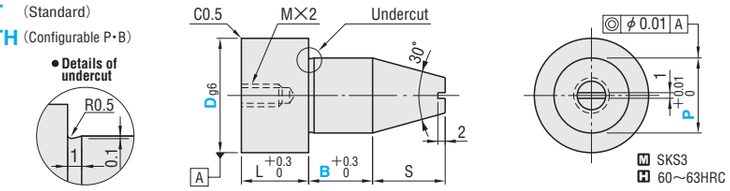
M×P	Catalog No. Type	P	B	U/Price Q'ty：1～9
4×0.7	(Standard) SNST	6	10 15	790
5×0.8		8		890
		10	15 20	1,000
6×1.0		12		1,050
		13	20 30	1,110
		15		1,160
		16	30 40	1,220
8×1.25		20	40 50	1,300

M×P	Catalog No. Type	No.	P 0.01 mm increments	B 0.1 mm increments	U/Price Q'ty：1～9
4×0.7	(Configurable P・B) SNSTH	6	6.00～ 7.00	10.0～80.0	1,000
5×0.8		8	7.00～ 8.00		1,130
		10	8.01～10.00		1,260
6×1.0		12	10.00～12.00		1,330
		13	12.01～13.00		1,410
		15	13.01～15.00		1,470
		16	15.01～16.00		1,550
8×1.25		20	16.00～20.00		1,640

Small head female screw type

RoHS

SDST (Standard)
SDSTH (Configurable P・B)



M SKS3
H 60～63HRC

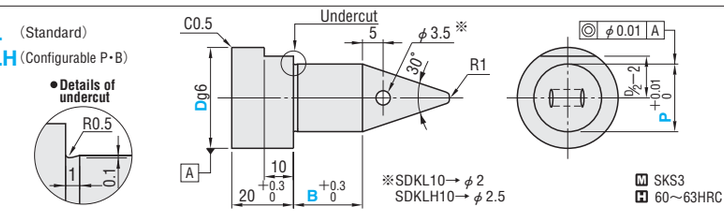
Dg6		M	P	L	S	B	Catalog No. Type	D	U/Price Q'ty：1～9
8	−0.005	5	6	15	6	10	(Standard) SDST	8	950
10	−0.014	6	8		8			10	1,000
13	−0.006	8	10	20	12			13	1,050
16	−0.017	10	12	24	17			16	1,100
20	−0.007 −0.020	12	16		20	15		20	1,190

Dg6		M	L	S	Catalog No. Type	D	P 0.01 mm increments	B 0.1 mm increments	U/Price Q'ty：1～9
8	−0.005	5	15	6	(Configurable P・B) SDSTH	8	6.00～ 7.00	3.0～20.0	1,400
10	−0.014	6		8		10	7.00～ 9.00	3.0～30.0	1,400
13	−0.006	8	20	12		13	9.00～12.00		1,400
16	−0.017	10	24	17		16	12.00～15.00	3.0～50.0	1,580
20	−0.007 −0.020	12		20		20	15.00～18.00		1,580

Small head one-side flat type

RoHS

SDKL (Standard)
SDKLH (Configurable P・B)



※SDKL10→ φ2
SDKLH10→ φ2.5

M SKS3
H 60～63HRC

Dg6		P	B	Catalog No. Type	D	U/Price Q'ty：1～9
10	−0.005 −0.014	6	10	(Standard) SDKL	10	1,000
13	−0.006	8			13	1,050
16	−0.017	10			16	1,100
20	−0.007	12			20	1,190
25	−0.020	16	15		25	1,500

Dg6		Catalog No. Type	D	P 0.01 mm increments	B 0.1 mm increments	U/Price Q'ty：1～9
10	−0.005 −0.014	(Configurable P・B) SDKLH	10	6.00～ 7.00	3.0～30.0	1,400
13	−0.006		13	7.00～ 9.00		1,400
16	−0.017		16	9.00～12.00	3.0～50.0	1,580
20	−0.007		20	12.00～15.00		1,580
25	−0.020		25	15.00～20.00		2,020

Order

Catalog No. — P — B

SNST 8 — B10
SDSTH 13 — P11.48 — B28.0
SDKL 20

Delivery

3 Days

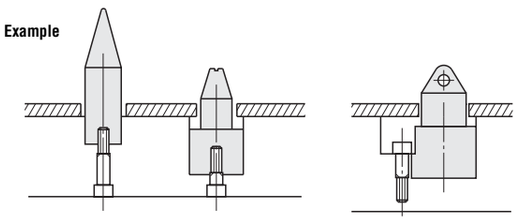
Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example

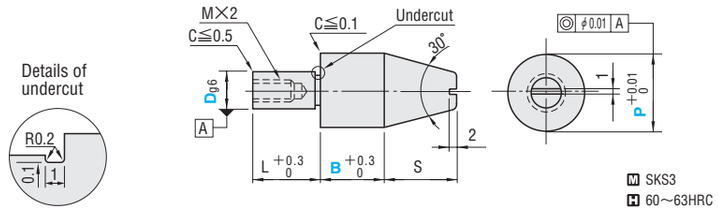


LOCATING PILOT PINS

Inlay female screw type

RoHS

SKSTH (Configurable P・B)



Dg6		M	L	S	Catalog No. Type	Catalog No. D	P 0.01mm increments	B 0.1mm increments	U/Price Q'ty：1～9
5	−0.004 −0.012	3	12	8	(Configurable P・B) SKSTH	5	8.00～ 8.99	1.0～12.0	920
				10			9.00～10.00		
6				10		6	10.00～10.99	1.0～15.0	1,150
				12			11.00～12.00		
8	−0.005 −0.014	4	15	15		8	12.00～12.99	1.0～15.0	1,320
				17			13.00～16.00		
10		5		17		10	14.00～14.99	1.0～20.0	1,320
				20			15.00～20.00		
13	−0.006 −0.017	6	20	20		13	16.00～16.99	1.0～20.0	1,650
				25			17.00～20.00		
16		8	24	25		16	18.00～20.00	1.0～20.0	2,000

Order — Catalog No. — P — B
SKSTH 8 — P12.80 — B3.5

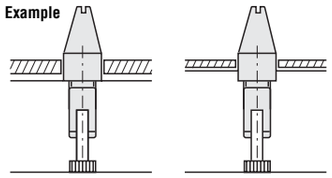
Delivery — 3 Days — Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price — Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

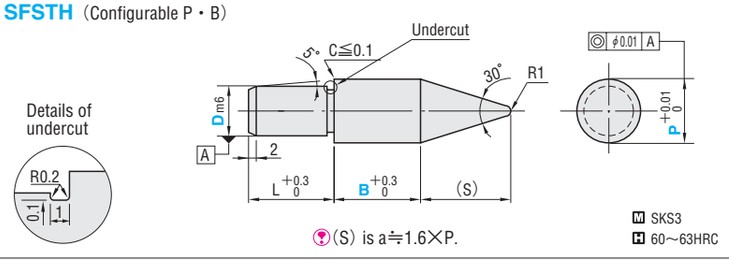
Example



Press fit type

RoHS

SFSTH (Configurable P・B)



(S) is a≒1.6×P.

Dm6		L	Catalog No. Type	Catalog No. D	P 0.01mm increments	B 0.1mm increments	U/Price Q'ty：1～9
4	+0.012 +0.004	12	(Configurable P・B) SFSTH	4	4.00～ 8.00	1.0～12.0	840
5				5	5.00～10.00	1.0～12.0	900
6		15		6	6.00～12.00	1.0～15.0	980
8	+0.015			8	8.00～14.00	1.0～15.0	1,050
10	+0.006	20		10	10.00～16.00	1.0～20.0	1,170
13	+0.018			13	13.00～18.00	1.0～20.0	1,250
16	+0.007	24		16	16.00～20.00	1.0～20.0	1,330

Order — Catalog No. — P — B
SFSTH 6 — P7.98 — B4.5

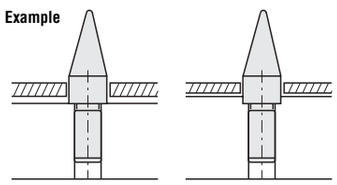
Delivery — 3 Days — Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price — Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example

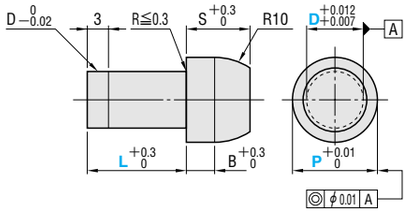


LOCATING PILOT PINS

The volume discount rate is also applicable to alteration cost. P.39

PST

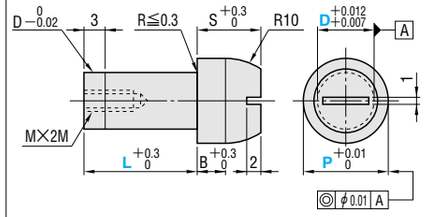
RoHS



B	S	M	Catalog No. Type	Catalog No. D	L	0.01mm increments min. P max.	U/Price Q'ty：1～9
1	4	—	PST	1	12	1.50～ 3.00	690
	5			2		2.50～ 4.00	690
2	6			3	12	4.00～ 6.00	610
	7			4		5.00～ 7.00	610
	8			5	15	6.00～ 8.00	640
3	9			6		7.00～ 9.00	660
				8	15	9.00～13.00	790
				10	18	11.00～15.00	1,010

PSTM

RoHS



B	S	M	Catalog No. Type	Catalog No. D	L	0.01mm increments min. P max.	U/Price Q'ty：1～9
2	7	3	PSTM	5	12	6.00～ 8.00	1,050
	8			6	15	7.00～ 9.00	1,050
3	9	4		8	15	9.00～13.00	1,220
		5		10	18	11.00～15.00	1,220

Order — Catalog No. — L — P
PSTM 5 — 15 — P7.20

Alteration — Catalog No. — L — P(PC) — (BC・PKC)
PSTM 5 — 15 — P7.20 — BC3.5

Alterations	Code	Spec.	¥/1Code
PC, P	PC	Changes dimension P PC≧Pmin.−0.2 0.01mm increments	200
B, BC	BC	Changes dimension B 1≦BC≦Bmax. 0.1mm increments (P) The dimension S is not affected.	200
P	PKC	Changes P tolerance P +0.01 0 ⇨ +0.005 0	400

BC:

D	Bmax.
1・2	3.0
3	4.0
4・5	5.0
6	6.0
8・10	7.0

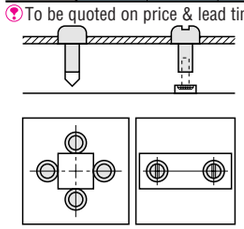
Delivery — 3 Days — Express T 1,000/1Pc. / Express A 500/1Pc. P.38
A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Price — Volume discount rate P.37

Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

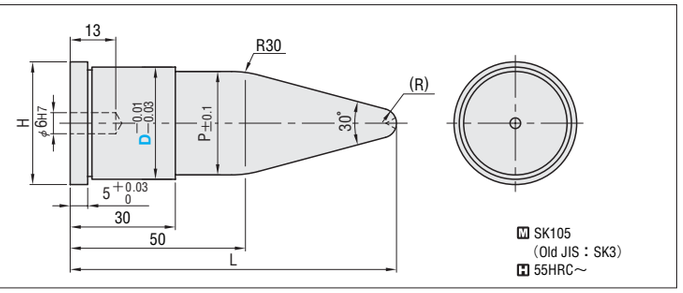
To be quoted on price & lead time above Max. Q'ty.

Example



RFPP

RoHS



H	L	(R)	P	Catalog No. Type	Catalog No. D	U/Price Q'ty：1～4
35	90	5	29.5	RFPP	32	4,680
48	110	8	44.5		45	4,980

Order — Catalog No.
RFPP 32

Delivery — 5 Days — Express B 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price — Volume discount rate P.37

Quantity	1～4	5～10
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

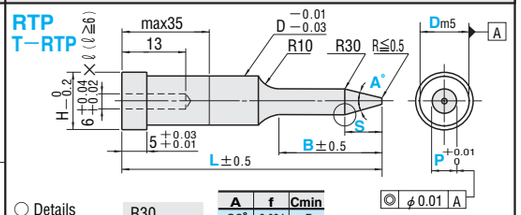
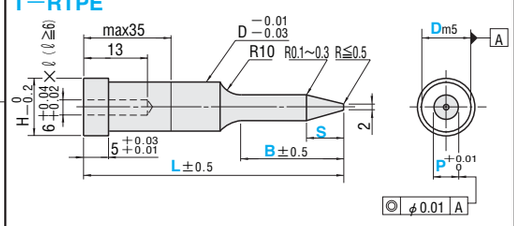
PRESS ADD.SPEC. Printed in Red

PILOT PUNCHES —FREE DESIGNATION TYPE—

PRODUCTS DATA P.1215

DICOAT® PUNCHES

The volume discount rate is also applicable to alteration cost. P.39

Type	Shank dia. D T	M H	Catalog No.	Configuration
—Normal— RoHS	D m5	M SKD11 or equivalent H 60～63HRC	RTP	RTP T—RTP 
—Dicoat®— RoHS	D m5	M SKD11 or equivalent H 60～63HRC Surface 3000HV	T—RTP	
—Normal— RoHS	D m5	M SKD11 or equivalent H 60～63HRC	RTPE	(Economy type) RTPE T—RTPE 
—Dicoat®— RoHS	D m5	M SKD11 or equivalent H 60～63HRC Surface 3000HV	T—RTPE	

H	Catalog No. Type	D	1mm increments L	0.01mm increments min. P max.	1mm increments B	1mm increments S	A	U/Price Q'ty : 1～9 RTP	T—RTP 70≦L≦100	T—RTP 100<L≦150
13	RTP T—RTP	(10)	70～(200)	6.00～ 9.99	20～(100)	10～50 S≦B—Cmin	20 30 45	3,170	—	—
16		13		6.00～12.99				3,270	6,510	8,190
19		16		8.00～15.99				3,620	7,150	9,250
23		20		11.00～19.99				4,350	8,420	10,980
28		25		16.00～24.99				5,400	10,360	13,320
35		(32)		18.00～31.99				6,750	—	—

Center hole remains at the tip. Flat at the tip must be over 2mm for center hole. P—2Stan(A/2)≧2 (L—35)≧B≧(S+Cmin)
⊗D(10)(32) •••▶T-RTP : Not applicable ⊗L(200) •••▶D(10)of RTP, T-RTP are available up to L150. ⊗B(100) •••▶When D=10, dim B is up to 50.

H	Catalog No. Type	D	1mm increments L	0.01mm increments min. P max.	1mm increments B	1mm increments S	U/Price Q'ty : 1～9 RTPE	T—RTPE 70≦L≦100	T—RTPE 100<L≦150
13	RTPE T—RTPE	(10)	70～150	6.00～ 9.99	10～50	8～45 S≦B—2	2,320	—	—
16		13		6.00～12.99			2,420	5,460	7,260
19		16		8.00～15.99			2,680	5,980	7,960
23		20		11.00～19.99			3,220	6,890	9,140
28		25		16.00～24.99			3,980	7,940	10,360
35		(32)		18.00～31.99			5,000	—	—

(L—35)≧B≧(S+2) ⊗D(10)(32) •••▶Cannot be applied to T-RTPE

Order

Catalog No.	L	P	B	S	A
RTP 20	160	P15.20	B43	S20	A30
RTPE 20	150	P15.20	B43	S20	
T—RTP 20	120	P15.20	B43	S20	A30

Delivery 3 Days — Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.
⊗Express A is not available for Dicoat® types.

Alterations Catalog No. – L – P – B – S – A –(HC・TC・LKC…etc.)

Catalog No.	L	P	B	S	A	(HC・TC・LKC…etc.)
RTP 20	160	P15.20	B43	S20	A30	HC22.0
RTPE 20	150	P15.20	B43	S20		HC22.0

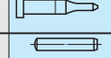
Price

Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alterations		Code	Spec.	¥/1Code
Alteration of head		HC	Changes head diameter D≦HC<H 0.1mm increments	200
		TC	Changes dimension T(head thickness) 2≦TC<5 0.1mm increments	200
		KC	Adds single key flat at head.	200

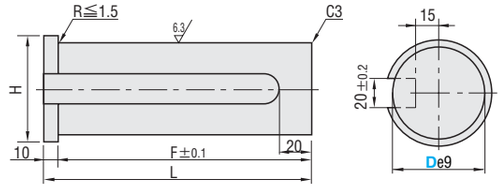
Alterations		Code	Spec.	¥/1Code
Overall length		LKC	Changes tolerance L L±0.5⇨L±0.05 ⊗Dicoat® type is Not available ?0.1mm incr. available for L with LKC. ?The tips R shape remains as is.	400
The shank		NDC	No press-in lead ℓ≧3⇨ℓ=0	0
Other		TPC	Replaces dowel pin. From attached MS6-25 to MSTP6-25(tapped type).	100

LOCATION PINS FOR ARRANGEMENTS

The volume discount rate is also applicable to alteration cost. P.39

DIKPA

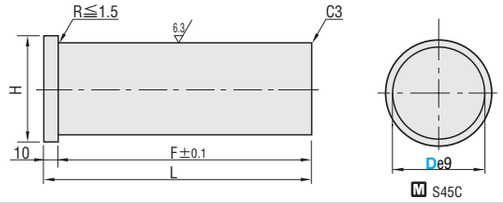
RoHS



De9		H	F	L	Catalog No. Type	D	U/Price Q'ty:1～9
60	−0.060 −0.134	70	170	180	DIKPA	60	4,980

DIKPB

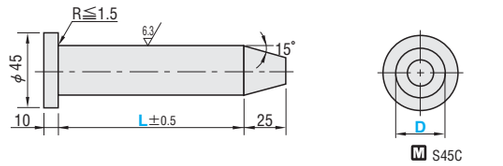
RoHS



De9		H	F	L	Catalog No. Type	D	U/Price Q'ty:1～9
50	−0.050 −0.112	60	145	155	DIKPB	50	3,980
60	−0.060 −0.134	70	170	180		60	4,380

IKPDA

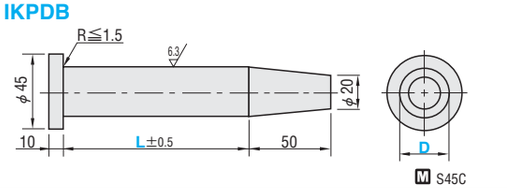
RoHS



D Tolerance		Catalog No. Type	D	L 5mm increments	U/Price Q'ty:1～9
30	−0.1 −0.2	IKPDA	30	110～150	2,980
				155～200	3,480

IKPDB

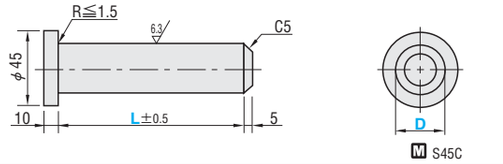
RoHS



D Tolerance		Catalog No. Type	D	L 5mm increments	U/Price Q'ty:1～9
30	−0.1 −0.2	IKPDB	30	110～150	2,980
				155～200	3,680

IKPDC

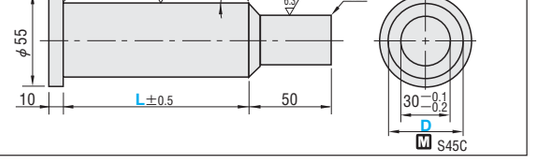
RoHS



D Tolerance		Catalog No. Type	D	L 5mm increments	U/Price Q'ty:1～9
30	−0.1 −0.2	IKPDC	30	110～150	2,880
				155～200	3,380

IKPE

RoHS



D Tolerance		Catalog No. Type	D	L 5mm increments	U/Price Q'ty:1～9
45	−0.1 −0.2	IKPE	45	110～150	3,980
				155～200	4,680

Order

Catalog No.	L
DIKPA60 IKPDA30	120

Delivery 3 Days

Price

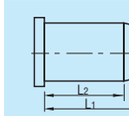
Volume discount rate P.37

Quantity	1～9	10～19	20～50
Rate	—	5%	10%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. – L – (SDC)

Catalog No.	L	(SDC)
DIKPA60		SDC

Alteration	Code	Spec.	¥/1Code
	SDC	Adds step to dimension D. (D-1) ?The D dimension tolerance will change ?Applicable to DIKPA・DIKPB.	600

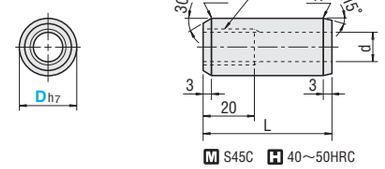
Type	D	L1	L2
DIKPA	60	100	80
DIKPB	50	70	50
	60	100	80

LOCATION PINS

The volume discount rate is also applicable to alteration cost. P.39

TLPA

RoHS

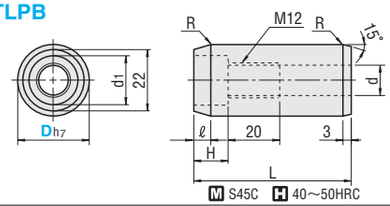


M S45C H 40～50HRC

Dh7		L	R	d	Catalog No. Type	Catalog No. D	U/Price Q'ty : 1~9
20	0 −0.021	46	3	10.5	TLPA	20	1,240

TLPB

RoHS

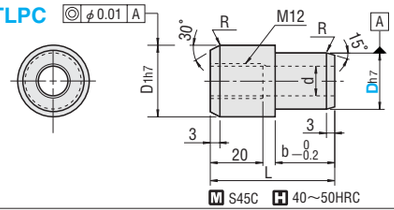


M S45C H 40～50HRC

Dh7		L	R	d	d1	H	ℓ	Catalog No. Type	Catalog No. D	U/Price Q'ty : 1~9
25	0 −0.021	56	3	10.5	17.5	12	6	TLPB	25	1,350
32	0 −0.025	65	5			24	10		32	1,560

TLPC

RoHS

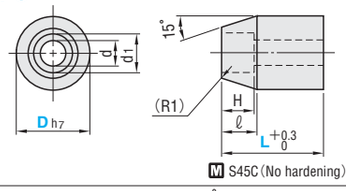


M S45C H 40～50HRC

Dh7		D1h7		L	R	d	b	Catalog No. Type	Catalog No. D	U/Price Q'ty : 1~9
20	0 −0.021	25	0 −0.021	44	3	10.5	21	TLPC	20	1,230

LPU

LOCATION PINS —Tapered type— RoHS

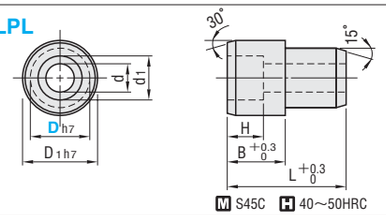


M S45C (No hardening)

Dh7		ℓ	d	d1	H	Catalog No. Type	Catalog No. D	L	U/Price Q'ty : 1~19
25	0 −0.021	12	9	14	11	LPU	25	25 30	350
32	0 −0.025	15	11	17.5	13		32	30 35	460
40		18	14	20	15		40	35 40	500

LPL

LOCATION PINS —Stepped type— RoHS

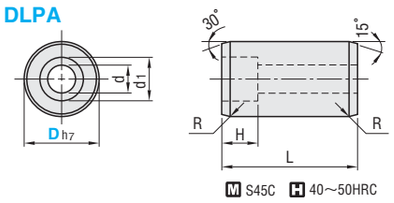


M S45C H 40～50HRC

Dh7		D1h7		L	B	d	d1	H	Catalog No. Type	Catalog No. D	U/Price Q'ty : 1~19
20	0 −0.021	25	0 −0.021	40	20	9	14	11	LPL	20	440
25		32		50	25	11	17.5	12		25	510
32	0 −0.025	40	0 −0.025	70	35	11	17.5	24		32	610

DLPA

LOCATION PINS —Straight type— RoHS



M S45C H 40～50HRC

Dh7		L	R	d	d1	H	Catalog No. Type	Catalog No. D	U/Price Q'ty : 1~19
20	0 −0.021	46	3	11	—	—	DLPA	20	320
25		56			17.5	12		25	380
32	0 −0.025	70	5			24		32	540

D20 has ϕ11 throough hole instead of counterbore.

Order Catalog No. — LPL 25

Delivery 1 Day

Price

● TLPA · TLPB · TLPC

Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

● LPU · LPL · DLPA

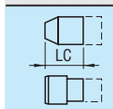
Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — (LC) — LPU 25 — LC22

3 Days

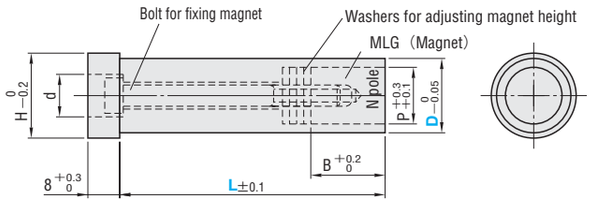
Alteration	Code	Spec.	¥/1Code
	LC	Changes full length 1 mm increments LPU=L−(ℓ+3)≦LC<L LPL=B+2≦LC<Lmax. ⊗ Applicable to LPU · LPL only.	200

MAGNET LIFTER PINS

The volume discount rate is also applicable to alteration cost. P.39

MLP

RoHS



M SK4
H 53～58HRC

Use under 80℃. Magnet (MLG) details P.964

Bolt for fixing magnet	H	P	B Magnet part length	d	Catalog No. Type	Catalog No. D	L 1mm increments	U/Price Q'ty:1～9
CB6	23	16	25	11	MLP	20	35～ 90	2,500
CB8	28	20	30	14		25	40～100	2,900
	35	28	35			32	45～100	3,590

Order Catalog No. — L

MLP 20 — 70

Delivery 3 Days — Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

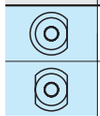
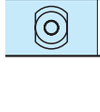
Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

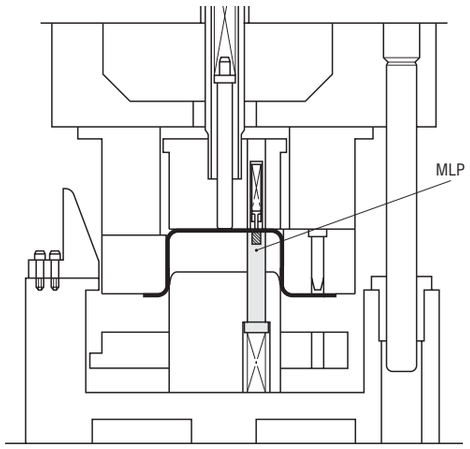
To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — L — (KC · WKC)

MLP 20 — 70 — WKC

Alteration	Code	Spec.	¥/1Code
	KC	Adds single key flat.	450
	WKC	Adds double key flats in parallel. ⊗ Comb. with KC:Not applicable	600

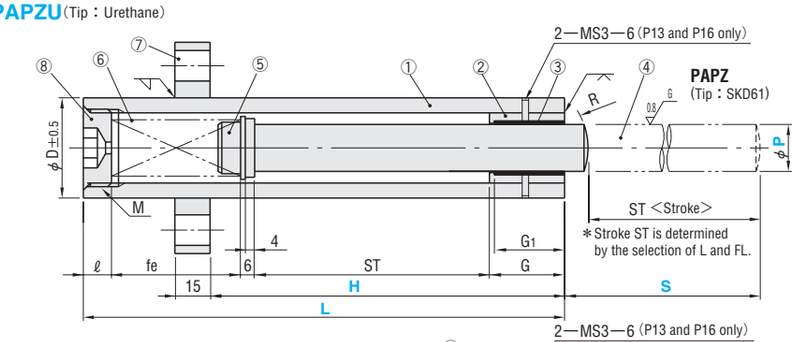
Example



PRE-HOLDING PUSH PIN SETS
—NORMAL TYPE—

RoHS

PAPZ (Tip : Steel)
PAPZU (Tip : Urethane)



①②⑤⑦ M SS400
③ LFZB (Oil-free bushing)
④ M SKD61+Nitriding
H 40~50HRC (Inside)
900HV~ (Surface)
⑥ M SWP—A
⑧ MSWZSH
⑨ M Urethane
H A90

①Case					④Push pin				⑦Mounting flange				Catalog No.		S	L	H	Spring free length	U/Price Q'ty : 1~9	
D	G	G1	ℓ	M	R	U	M1	ℓ1	A	A1	B	d	Type	P		10 mm increments	1 mm increments	FL	PAPZ	PAPZU
27.2	22	20	10	22	20	15	M6	9	70	52	40	11	PAPZ (Tip : Steel)	13	100	150~250	0≦H≦L−20	90	7,500	8,800
															150			125	7,800	9,100
															200			150	8,200	9,400
34.0	27	25	10	26	25	20	M8	12	80	60	50	11		16	100	150~350	0≦H≦L−20	175	8,200	9,600
															150			200	8,600	10,000
															200			250	9,000	10,400
															250			300	9,500	10,900
															300			350	9,800	11,200
42.7	32	30	12	33	30	25	M10	15	90	70	60	13	PAPZU (Tip : Urethane)	20	100	180~500	0≦H≦L−20	90	10,900	12,400
															150			150	11,400	12,900
															200			175	12,000	13,500
															250			200	12,500	14,000
															300			250	13,100	14,600
															350			300	13,700	15,200
															400			350	15,000	16,500
															450			400	16,400	17,900
															500			425	17,700	19,200
																		450		
																		500		

Be sure to make selections so that the urethane tip of PAPZU would not enter inside the bushing. S—ST>U

Order

Catalog No.	—	S	—	L	—	H	—	FL
PAPZ 16	—	150	—	220	—	190	—	200

Delivery 5 Days | Express B 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

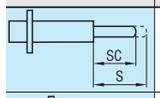
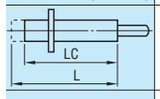
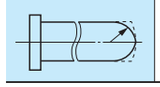
To be quoted on price & lead time above Max. Q'ty.

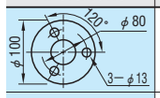
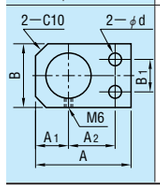
■**Features**
- Endurance is improved by the use of oilless bushing and SKD61 (nitrided) polished pin and it is also possible to use on slanted surfaces.

The volume discount rate is also applicable to alteration cost. P.39

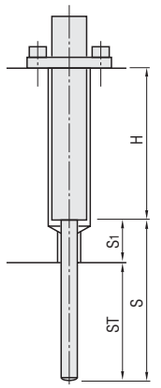
Alteration

Catalog No.	—	S(SC)	—	L(LC)	—	H	—	FL	—	(SRC・TFC・TFS)
PAPZ 16	—	SC148	—	220	—	190	—	200	—	SRC

Alterations	Code	Spec.	¥/1Code
	SC	**Changes ④Push pin length** 31≦SC<S 1 mm increments	600
	LC	**Changes ①case length** 75≦LC<L 1 mm increments	600
	SRC	**Machines SR on ④Push pin tip** Applicable to PAPZ only. The tip R of the pin is machined to SR (spherical surface).	600

Alterations	Code	Spec.	¥/1Code
	TFC	Changes mounting flange to round flange (for former PAP20). Flange thickness 15mm Applicable to PAPZ20/PAPZU20 only.	200
	TFS	Changes mounting flange to one that is bolted on one side only. Flange thickness 15mm	

P	A	A1	A2	B	B1	d	¥/1Code
13	60	20	25	38	20	11	700
16	70	25	30	50	24	11	800
20	88	30	40	60	30	13	900



Initial deflection f1=FL−(L−G−6−ℓ)
Initial load P1=f1×k (spring constant)
Maximum diflection fmax.=FL×0.7 (70% of maximum permissible flexure)
Spring free length FL≧fmax./0.7
≧(ST+f1)/0.7

■**How to select FL, L and S selection method**

If the push pin diameter P=13mm, the push pin stroke ST=100mm and the spring's initial deflection f1=25mm (The maximum deflection fmax.=100+25).

(1) Free length FL selection
FL≧(ST+f1)/0.7
≧(100+25)/0.7
≧179mm
Select FL200 from the table.

(2) Case length L selection.
L≧ST+(G+6+FL−fmax+ℓ)
≧100+(22+6+200−125+10)
≧213
Select L=220.

(3) Protrude length S of the push pin
Select S=150 from the table.
S1=S−ST=150−100
=50mm

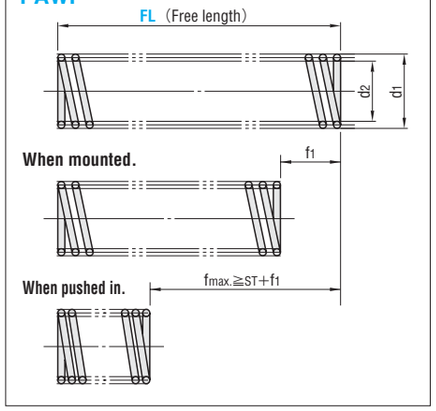
P	−	S	−	L	−	H	−	FL

∴Select PAPZ13−150−220−200−200.

At this time, the initial deflection, initial load, maximum load and maximum stroke are
Initial deflection f1=FL−(L−G−6−ℓ) =200−(220−22−6−10) =18mm
Initial load P1=k×f1=0.27[N/mm]×18[mm] =4.9N {0.5kgf}
Max. load Pe=k×fmax. =0.27×(100+18) =32[N] {3.3kgf}
Max stroke ST=L−(G+6+FL−FL×0.7+ℓ) =220−(22+6+200−140+10) =122mm

■**Coil spring for PAPZ and PAPZU**

PAWP



Order Catalog No. PAWP 13—175

Delivery 3 Days

Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Spring constant K N/mm {kgf/mm}	Maximum flexure fmax.	Maximum Load N {kgf}	Effective minimum length fe=FL−fmax.	Outer diameter d1	Inner diameter d2	Wire diameter	Catalog No. Type No.—FL	U/Price Q'ty : 1~9
0.63 {0.064}	63	39.2 {4}	27	17	14.2	1.4	PAWP13— 90	480
0.45 {0.046}	87.5		37.5				125	510
0.37 {0.038}	105		45				150	570
0.32 {0.033}	122.5		52.5				175	630
0.27 {0.028}	140		60				200	690
0.23 {0.023}	175		75				250	800
0.80 {0.082}	63	49.0 {5}	27	20	17	1.5	PAWP16— 90	590
0.55 {0.056}	87.5		37.5				125	630
0.47 {0.048}	105		45				150	690
0.39 {0.040}	122.5		52.5				175	740
0.34 {0.035}	140		60				200	800
0.28 {0.029}	175		75				250	910
0.24 {0.024}	210		90				300	1,030
0.20 {0.02}	245		105				350	1,190
0.95 {0.097}	63	58.8 {6}	27	25.6	22	1.8	PAWP20— 90	570
0.57 {0.058}	105		45				150	790
0.48 {0.049}	123		53				175	840
0.42 {0.043}	140		60				200	900
0.33 {0.034}	175		75	26		2.0	250	1,010
0.28 {0.029}	210		90				300	1,130
0.24 {0.024}	245		105				350	1,240
0.21 {0.021}	280		120				400	1,360
0.20 {0.020}	298		128				425	1,410
0.19 {0.019}	315		135				450	1,470
0.17 {0.017}	350		150				500	1,590

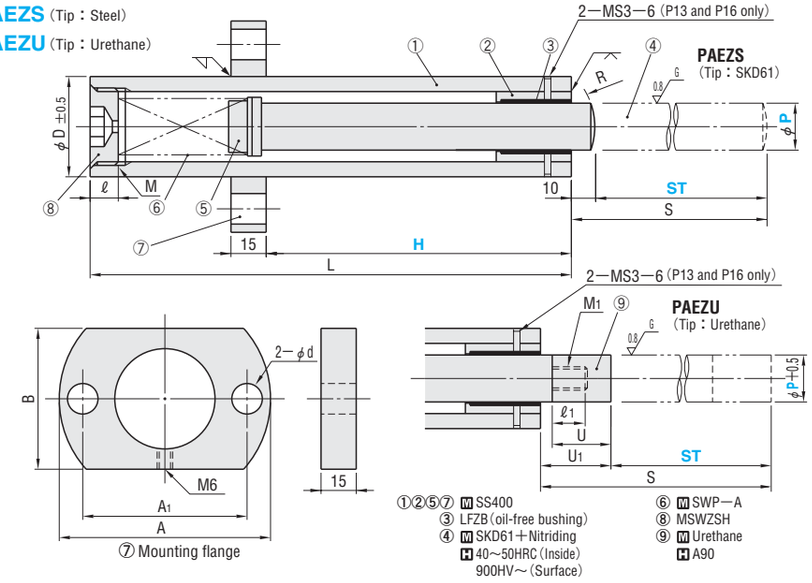
{kgf} =N×0.101972

PRE-HOLDING PUSH PIN SETS
—ECONOMY TYPE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

PAEZS (Tip : Steel)
PAEZU (Tip : Urethane)



①②⑤⑦ M SS400
③ LFZB (oil-free bushing)
④ M SKD61＋Nitriding
A 40～50HRC (Inside)
900HV～(Surface)
⑥ M SWP—A
⑧ MSWZSH
⑨ M Urethane
A A90

①Case			④Push pin					⑦Mounting flange				Free length	Spring constant N/mm {kgf/mm}	Initial load	Max. load	S		L	Catalog No. Type	Catalog No. P	ST	H 1 mm increments	U/Price Q'ty : 1～9 PAEZS	U/Price Q'ty : 1～9 PAEZU
D	ℓ	M	R	U	U1	M1	ℓ1	A	A1	B	d	FL	N{kgf}			PAEZS	PAEZU							
27.2	10	22	20	15	20	M6	9	70	52	40	11	90	0.63 {0.064}	7.8 {0.8}	39.2 {4.0}	60	70	115	PAEZS (Tip : Steel) PAEZU (Tip : Urethane)	13	50	0～ 95	6,800	7,800
												175	0.32 {0.033}	7.8 {0.8}		110	120	190			100	0～170	7,200	8,200
												270	0.21 {0.021}	7.8 {0.8}		160	170	270			150	0～250	7,500	8,500
34.0	10	26	25	20	25	M8	12	80	60	50	11	90	0.80 {0.082}	9.8 {1.0}	49.0 {5.0}	60	75	120		16	50	0～100	7,500	8,500
												175	0.39 {0.040}	9.8 {1.0}		110	115	195			100	0～175	7,900	8,900
												270	0.26 {0.027}	9.8 {1.0}		160	175	275			150	0～255	8,300	9,300
												350	0.20 {0.020}	8.8 {0.9}		210	225	350			200	0～330	8,700	9,700
42.7	12	33	30	25	30	M10	15	90	70	60	13	90	0.95 {0.097}	9.8 {1.0}	58.8 {6.0}	60	80	130		20	50	0～110	9,000	10,000
												175	0.48 {0.049}	9.8 {1.0}		110	130	205			100	0～185	9,300	10,300
												260	0.32 {0.033}	9.8 {1.0}		160	180	280			150	0～260	9,700	10,700
												350	0.23 {0.024}	9.8 {1.0}		210	230	360			200	0～340	10,200	11,200
												425	0.20 {0.020}	8.8 {0.9}		260	280	430			250	0～410	10,600	11,600

Order Catalog No. — ST — H
PAEZS 20 — 100 — 150

Delivery 5 Days | Express B 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

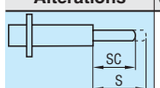
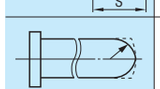
■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

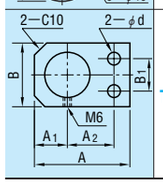
To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. — ST — H — (SC・SRC・TFC・TFS)
PAEZU 20 — 150 — 220 — SC130

Alterations	Code	Spec.	¥/1Code
	SC	**Changes ④Push pin length** 31≦SC＜S 1 mm increments	600
	SRC	**Machines SR on ④Push pin tip** Applicable to PAEZS only. The tip R of the pin is machined to SR (spherical surface).	600

■Features
- Like PAPZ, use of oilless bushing in basic structure makes it possible to use on slanted surfaces.

Alterations	Code	Spec.	¥/1Code
	TFC	Changes mounting flange to round flange (for former PAP20). Flange thickness 15mm Applicable to PAEZS20/PAEZU20 only.	200
	TFS	Changes mounting flange to one that is bolted on one side only. Flange thickness 15mm	

P	A	A1	A2	B	B1	d	¥/1Code
13	60	20	25	38	20	11	700
16	70	25	30	50	24	11	800
20	88	30	40	60	30	13	900

PRE-HOLDING PUSH PIN SETS
—LONG STROKE TYPE—

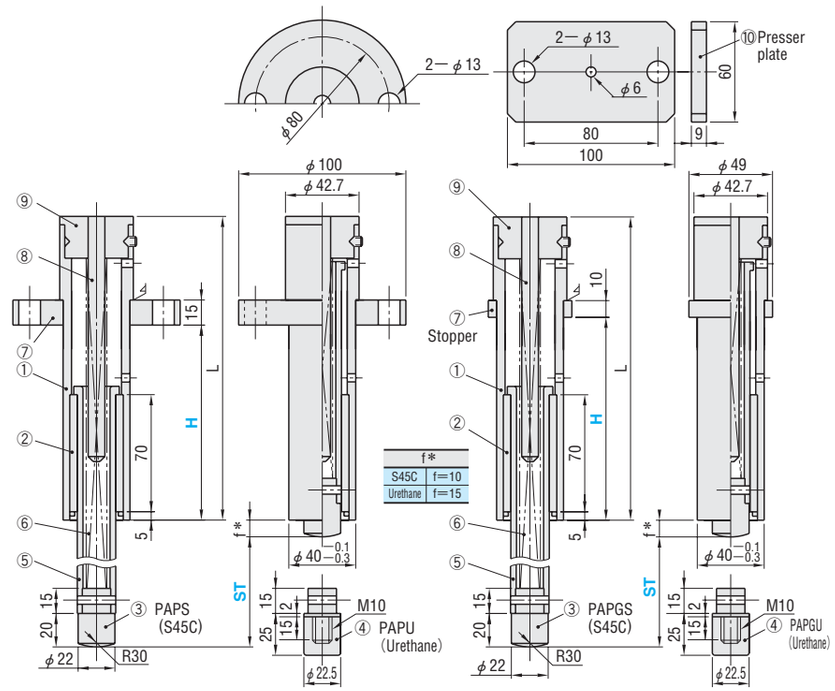
The volume discount rate is also applicable to alteration cost. P.39

RoHS

①⑤⑧⑨⑩ M SS400
② M BC6
③ M S45C
A 55HRC～ (Induction hardening)
④ M Urethane
A A90
⑥ M SWP—A
⑦ M S45C

Spring type
PAPS (Tip : S45C)
PAPU (Tip : Urethane)

Spring＋Dead weight type
PAPGS (Tip : S45C)
PAPGU (Tip : Urethane)



Spring constant N/mm{kgf/mm}	Initial load N{kgf}	Max. load N{kgf}	Weight* 〔g〕	L	Catalog No. Type	Catalog No. Stroke ST	H 1 mm increments	U/Price Q'ty : 1～9 PAPS PAPGS	U/Price Q'ty : 1～9 PAPU PAPGU
0.29{0.029}	10.8{1.1}	67{6.9}	3550	312	Spring type PAPS PAPU	200	90～260	17,100	17,800
0.26{0.026}	10.8{1.1}		3800	338		220	90～290	18,300	19,100
0.24{0.024}	8.8{0.9}		4020	364		250	90～310	19,500	20,300
0.22{0.022}	8.8{0.9}		4180	390	Spring＋Dead weight type PAPGS PAPGU	270	90～340	20,700	21,400
0.20{0.021}	6.9{0.7}		4400	414		300	90～360	21,900	22,700

＊The weight changes in accordance with dimension H. (Weight of PAPGS, PAPGU)

■Features
- Because of the special structure, longer strokes can be obtained.
- The pin tip can be selected from S45C or urethane.
- PAPGS and PAPGU (spring＋dead weight type) can obtain much longer strokes than conventional pins.

Order Catalog No. — H
PAPU 200 — 230
PAPGS 200 — 250

Example

Delivery 3 Days | Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

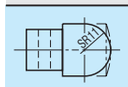
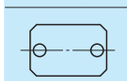
■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

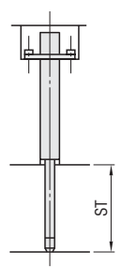
To be quoted on price & lead time above Max. Q'ty.

Alteration

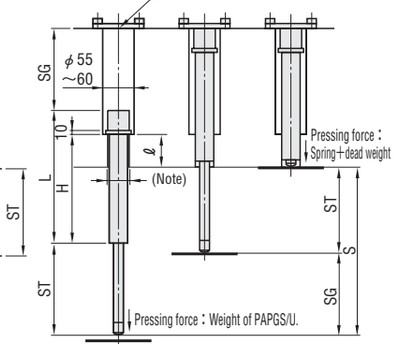
Catalog No. — H — (SRC・PNC)
PAPGS 200 — 220 — SRC

Alterations	Code	Spec.	¥/1Code
	SRC	Changes Push pin tip The pin tip R30 is modified to SR11 (spherical surface). Applicable to PAPS・PAPGS only.	600
	PNC	Without the presser plate. Applicable to PAPGS・PAPGU only.	−800

Spring type



Spring＋Dead weight type
⑩Presser plate



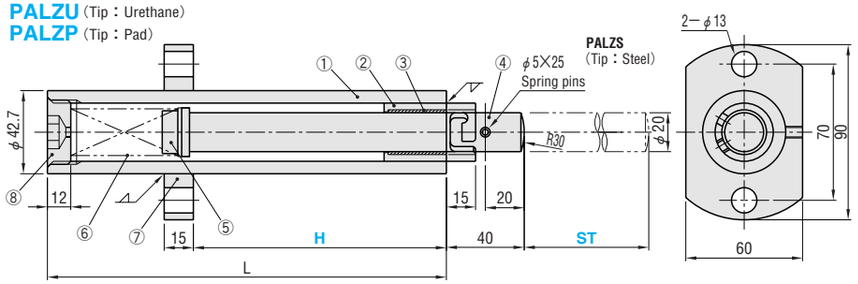
Total stroke S＝ST＋SG
ST : Stroke of pre-holding push pin
SG : Distance of movement by die machining.

(Note) Recommended machining method of mounting holes (PAPGS, PAPGU).
In order to use the die as a case guide, make smooth mounting holes of φ40H7 in diameter using reamer or end mill. (ℓ≧60)

PRE-HOLDING PUSH PIN SETS(With lock mechanism)

The volume discount rate is also applicable to alteration cost. P.39

PALZS (Tip : Steel)
PALZU (Tip : Urethane)
PALZP (Tip : Pad)



	PALZS	PALZU	PALZP
f	28.5	38.5	80.5

■**How to lock**
Spring pin is set in lock groove.

①②⑤⑦ M SS400
③ Oil-free bushing
④ M SKD61＋Nitriding
H 40～50HRC (Inside)
900HV (Surface)

⑥ M SWP—A
⑧ MSWZSH
⑨ M Urethane
H A90
⑩ M NBR (Rubber)

Spring constant N/mm {kgf/mm}	Initial load N{kgf}	Max. load N{kgf}	L	Catalog No. Type	Catalog No. No.	ST	H 1 mm increments	U/Price Q'ty : 1～9 PALZS	PALZU	PALZP
0.88{0.090}	0{0}	44.1{4.5}	150	PALZS (Tip : Steel) PALZU (Tip : Urethane) PALZP (Tip : Pads)	20	50	0～130	14,700	15,700	29,400
0.49{0.050}	0{0}	49.0{5.0}	210			100	0～190	15,000	16,000	29,700
0.32{0.033}	0{0}	49.0{5.0}	285			150	0～265	15,400	16,400	30,100
0.28{0.029}	0{0}	55.9{5.7}	355			200	0～335	15,900	16,900	30,600
0.24{0.024}	0{0}	54.9{5.6}	415			250	0～395	16,300	17,300	31,000

Order Catalog No. — ST — H
PALZS 20 — 150 — 120

Delivery 5 Days
Express B 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price
■Volume discount rate P.37

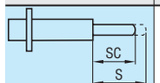
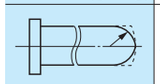
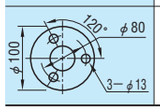
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

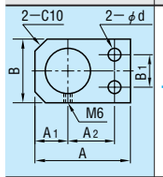
To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — ST — H — (SC・SRC・TFC・TFS)
PALZS 20 — 150 — 220 — SRC

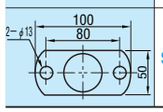
■**Features**
1) The pin can be retracted when moving or maintaining the die, which improves workability.
2) The pad type, which lessens damage to the workpiece is added to the lineup.
3) The use of oil-free bushing and SKD61 (nitrided) polished pin makes it possible to use on slanted surfaces.

■**Cautions**
1) Be careful not to move the pin past its stroke, otherwise the lock mechanism will break.

Alterations	Code	Spec.	¥/1Code
	SC	Changes ④Push pin length 61≦SC＜S 1 mm increments	600
	SRC	Machines SR to ④Push pin tip Applicable to PALZS only. The tip R of the pin is machined to SR (spherical surface).	600
	TFC	Changes mounting flange to round flange Flange thickness 15mm	200

Alterations	Code	Spec.	¥/1Code
	TFS	Changes mounting flange to one that is bolted on one side only. Flange thickness 15mm	

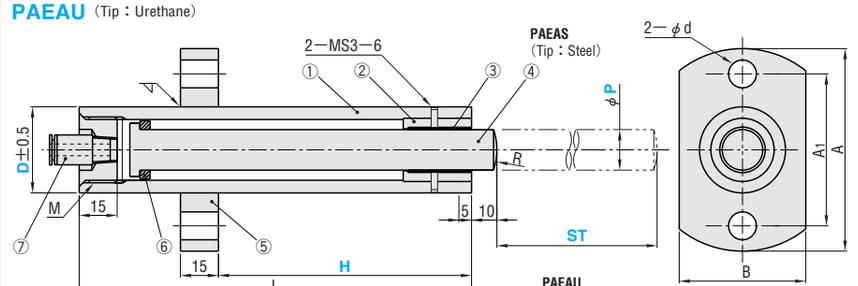
No.	A	A1	A2	B	B1	d	¥/1Code
20	88	30	40	60	30	13	900

	SFC	Changes mounting flange Changes diameter width and mounting pitch for bolts.	200

PRE-HOLDING PUSH PIN SETS
—Air type—

The volume discount rate is also applicable to alteration cost. P.39

PAEAS (Tip : Steel)
PAEAU (Tip : Urethane)



①②⑤ M SS400
③ Oil-free bushing
④ M SKD61＋Nitriding
H 40～50HRC (Inside)
900HV (Surface)

⑥⑨ M Urethane H A90
⑦ Coupling for air KQ2S06—01S (made by SMC)

①Case D	M	G	④Push pin R	U	U1	ℓ	M1	P1	⑦Mounting flange A	A1	B	d	Presser load N{kgf} 0.3MPa	0.4MPa	0.5MPa	L	Catalog No. Type	P	ST	H 1 mm increments	U/Price Q'ty : 1～9 PAEAS	PAEAU
27.2	22	22	20	15	20	9	M6	13.5	70	52	40	11	41.2 {4.2}	54.9 {5.6}	66.7 {6.8}	100	PAEAS (Tip : Steel)	13	50	0～ 80	10,800	11,800
																150			100	0～130	11,200	12,200
																200			150	0～180	11,500	12,500
34	26	27	25	20	25	12	M8	16.5	80	60	50		63.7 {6.5}	83.4 {8.5}	103 {10.5}	105	PAEAU (Tip : Urethane)	16	50	0～ 85	11,500	12,500
																155			100	0～135	11,900	12,900
																205			150	0～185	12,300	13,300
																255			200	0～235	12,700	13,700

＊Presser load is reference value.

Order Catalog No. — ST — H
PAEAS 16 — 150 — 120

Delivery 5 Days
Express B 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price
■Volume discount rate P.37

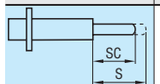
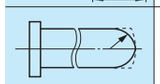
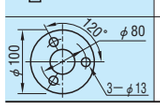
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

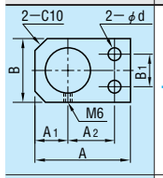
To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — ST — H — (SC・SRC・TFC・TFS)
PAEAS 16 — 150 — 120 — SRC

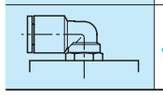
■**Features…The air-driven pin set so it has the following characteristics.**
1) Space saving.
• Since springs are not used, the overall length is short.
• The high presser load enables the pin set to be made one rank smaller than spring type.
2) The presser load can be easily adjusted by adjusting the air pressure.
3) The oil-free bushing and SKD61 (nitrided) polished pin, makes it possible to use on slanted surfaces.

■**Cautions**
1) Use tubes for piping that has an O.D. of 6 mm and an I.D. of 4 mm.
2) Use dry, compressed air.

Alterations	Code	Spec.	¥/1Code
	SC	Changes ④Push pin length 31≦SC＜S 1 mm increments	600
	SRC	Machines SR to ④Push pin tip Applicable to PAEAS only. The tip R of the pin point is machined to a SR spherical surface.	600
	TFC	Changes mounting flange to round flange Flange thickness 15mm	200

Alterations	Code	Spec.	¥/1Code
	TFS	Changes mounting flange to one that is bolted on one side only. Flange thickness 15mm	

P	A	A1	A2	B	B1	d	¥/1Code
13	60	20	25	38	20	11	700
16	70	25	30	50	24	11	800

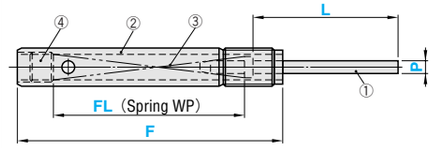
	JLC	Replaces joint From the attached quick joint to L-shape (elbow) type.	500

PUSH PIN SETS

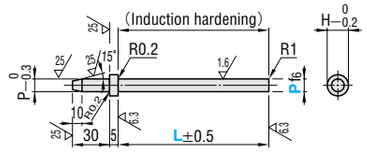
The volume discount rate is also applicable to alteration cost. P.39

RoHS

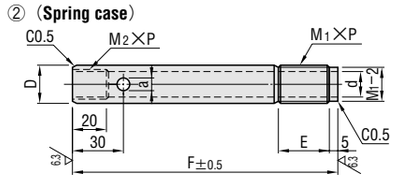
PSPH (①②③④)



PSH (①)



② (Spring case)



① M S45C
H 50HRC～ (Induction hardening)
② M Seamless steel pipe

Catalog No. Type	P	L	F	WP FL	PSPH U/Price Q'ty:1～9 L100	L150	L200	PSH U/Price Q'ty:1～9 L100	L150	L200
PSPH (①②③④)	8	100	150	100	5,690	6,290	6,980	900	1,140	1,600
	10		200	125	5,990	6,780	7,490	950	1,230	1,700
	13	150	250	150	6,290	7,180	7,980	1,000	1,300	1,800
PSH (①)	16	200	300	175	6,990	7,790	8,390	1,250	1,550	2,150
	20			200 250 300	8,790	9,390	9,990	1,550	1,850	2,450

①PSH Pf6		H	② (Spring case) D	M1×P	E	M2×P	a	d	③WP	④MSW
8	−0.013	13	21.7	22×1.5	35	16×1.5	7	14.3	WP 8	MSW16
10	−0.022	16	27.2	27×1.5	40	22×1.5	10	19.4	WP10	MSW22
13	−0.016	20	32	30×1.5	45	24×1.5		22	WP13	MSW24
16	−0.027	23	34	33×1.5	50	28×1.5	12	26.2	WP16	MSW28
20	−0.020 −0.033	28	42.7	42×1.5	55	33×1.5		29.9	WP20	MSW33

Order

Catalog No. — L — F — FL

PSPH 10 — 150 — 200 — 200
PSH 13 — 200

Delivery 3 Days | Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

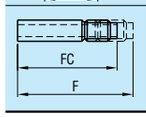
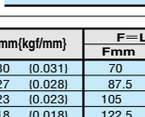
To be quoted on price & lead time above Max. Q'ty.

Alteration

Catalog No. — L(LC) — F(FC) — FL

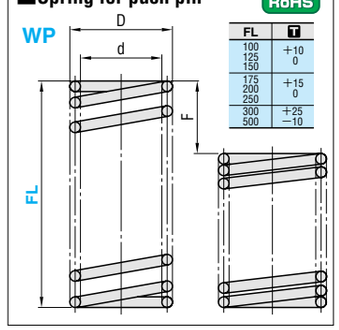
PSPH 10 — LC143 — FC193 — 200
PSH 13 — LC143

5 Days

Alterations	Code	Spec.	¥/1Code
	LC	Changes ①Push pin length 50≦LC＜L 1mm increments	200
	FC	Changes ②Spring case overall length FCmin≦FC＜F 1mm increments (P: FCmin 8: 80, 10: 85, 13: 90, 16: 95, 20: 100)	600

Spring for push pin

RoHS



FL	T
100 125 150	+10 0
175 200 250	+15 0
300 500	+25 −10

Order Catalog No. — WP 13—150

Delivery 1 Day

Price

Volume discount rate P.37

Quantity	1～9	10～19	20～99	100～500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

d	D	Wire diameter	Min. Length	N/mm{kgf/mm}	F=L×70% Fmm	N{kgf}	Catalog No. Type No. — FL	U/Price Q'ty:1～9
Over 8.5	11.5 or less	0.9	23	0.30 (0.031)	70	21.3(2.2)	WP 8 — 100	150
			28	0.27 (0.028)	87.5	24.0(2.5)	125	230
			33	0.23 (0.023)	105	23.7(2.4)	150	290
			40	0.18 (0.018)	122.5	21.6(2.2)	175	360
			46	0.16 (0.016)	140	22.0(2.2)	200	440
			55	0.12 (0.012)	175	20.6(2.1)	250	590
			71	0.10 (0.010)	210	20.6(2.1)	300	750
			118	0.06 (0.006)	350	20.6(2.1)	500	1,110
Over 10.5	13.5 or less	1.0	23	0.37 (0.038)	70	26.1(2.7)	WP 10 — 100	160
			30	0.27 (0.028)	87.5	24.0(2.5)	125	240
			35	0.24 (0.024)	105	24.7(2.5)	150	300
			40	0.20 (0.020)	122.5	24.0(2.5)	175	370
			45	0.18 (0.018)	140	24.7(2.5)	200	450
			56	0.15 (0.015)	175	25.7(2.6)	250	610
			64	0.12 (0.012)	210	24.7(2.5)	300	780
			106	0.08 (0.008)	350	27.5(2.8)	500	1,150
Over 13.5	17 or less	1.2	17	0.59 (0.060)	70	41.2(4.2)	WP 13 — 100	170
			22	0.42 (0.043)	87.5	36.9(3.8)	125	250
			26	0.31 (0.032)	105	33.0(3.4)	150	310
			34	0.25 (0.025)	122.5	30.0(3.1)	175	390
			37	0.23 (0.023)	140	31.6(3.2)	200	480
			42	0.19 (0.019)	175	32.6(3.3)	250	660
			53	0.15 (0.015)	210	30.9(3.2)	300	840
			80	0.10 (0.010)	350	34.3(3.5)	500	1,200
Over 16.5	21 or less	1.4	18.9	0.54 (0.055)	70	37.8(3.9)	WP 16 — 100	250
			22.4	0.44 (0.045)	87.5	38.5(3.9)	125	350
			25.9	0.37 (0.038)	105	38.9(3.9)	150	500
			29.4	0.31 (0.032)	122.5	38.0(3.9)	175	600
			33.6	0.27 (0.028)	140	37.8(3.9)	200	650
			42	0.22 (0.022)	175	38.5(3.8)	250	750
			46.2	0.19 (0.019)	210	39.9(3.9)	300	800
			79.8	0.11 (0.011)	350	38.5(3.8)	500	1,150
Over 20.5	25.7 or less	1.6	16.8	0.69 (0.070)	70	48.3(4.9)	WP 20 — 100	380
			19.2	0.56 (0.057)	87.5	49.0(4.9)	125	530
			22.4	0.46 (0.047)	105	48.3(4.9)	150	740
			25.6	0.39 (0.040)	122.5	47.7(4.9)	175	880
			28.8	0.34 (0.025)	140	47.6(3.5)	200	1,030
			35.2	0.27 (0.028)	175	47.2(4.9)	250	1,100
			41.6	0.23 (0.023)	210	48.3(4.8)	300	1,200
			65.6	0.14 (0.014)	350	49.0(4.9)	500	1,700

● {kgf}=N×0.101972

PUSH-OUT PINS/PUSH-OUT PINS FOR DRAWING

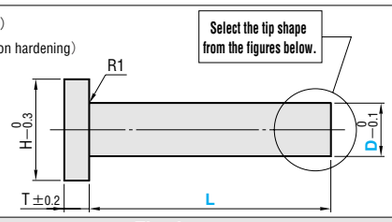
The volume discount rate is also applicable to alteration cost. P.39

■Push-out pins

RoHS

POP (Normal)
HPOP (Induction hardening)

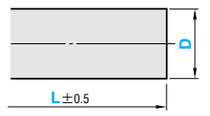
Select the tip shape from the figures below.



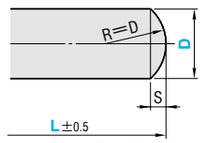
Type	M	H
POP	S45C	20～25HRC
HPOP	S45C	50HRC～(Induction hardening)

Tip shapes

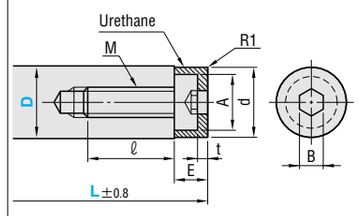
N (No tip machining)



R (R machining)



U (With urethane cap)



D	M	ℓ	t	d	A	B	E
8	3	5	3	7.5	5.5	2.5	6
10	4	6	3	9.5	7	3	7
13	5	7	4	12.5	8.5	4	9
16	6	8	4	15	10	5	10
20	8	10	5	19	13	6	13
25	10	12	5	24	16	8	15

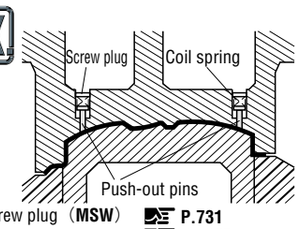
Urethane cap and bolt are bonded by Loctite.

Bolt
M SCM435
※Strength class 10.9
S Bright chromate

Urethane
H Shore A90 (Black)

H	T	Catalog No. Type	Tip machining	D	L 10mm increments	U/Price Q'ty:1～9 POP N	POP R	POP U	HPOP N	HPOP R	HPOP U
18	8	POP HPOP (Induction hardening)	N R U	8	30～120	500	650	840	780	930	1,120
25				10	40～150	650	800	1,010	980	1,130	1,340
28				13	50～180	850	1,000	1,220	1,200	1,350	1,540
30	10			16	50～180	950	1,100	1,320	1,300	1,450	1,670
35				20	50～200	1,300	1,450	1,720	1,670	1,820	2,090
40				25	50～200	1,580	1,730	2,030	1,980	2,130	2,430

ex.



■Screw plug (MSW) P.731
■Coil springs P.1055

Catalog No. — L(LC)
POP R 16 — LC114

Order

Catalog No. — L

Type | Tip machining | D — L
POP R 16 — 100

Delivery 3 Days | Express A 500/1Pc. P.37

A flat charge of 1,350 yen for 3 pieces or more of the same size.

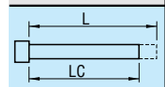
Price

Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

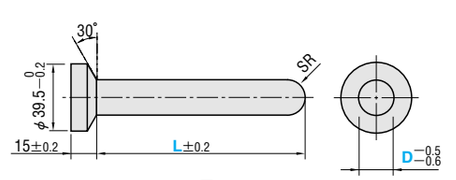
Alteration

Alteration	Code	Spec.	¥/1Code
	LC	Changes total length Lmin.＜LC＜Lmax. 1mm increments	200

■Push-out pins for drawing

RoHS

DHPA

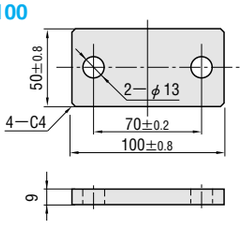


M S45C
H 55HRC～ (Induction hardening)

■Covers for Push-out pins for drawing

RoHS

DHPF100



M SS400

Catalog No. Type	D	L	U/Price Q'ty:1～9
DHPA	20	120	2,980
		170	3,290
		220	4,100
	26	200	4,100

Catalog No.	U/Price Q'ty:1～9
DHPF100	1,160

Order Catalog No. — L
DHPA 20 — 120
DHPF 100

Delivery 5 Days

Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

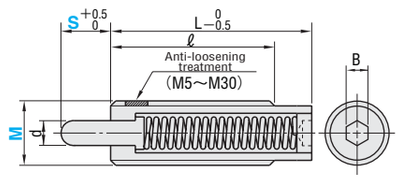
SPRING PLUNGERS

PRESS NEW Printed in Red

SPRING PLUNGERS / WRENCHES / SPRING PLUNGERS
—Hex-head pin type— —For slanted surface—

Spring plungers —Steel type— RoHS

Type			Main body M	Main body H	Main body S	Pin M	Pin H	Pin S	Spring M	Allowable temperature
Steel nose	For light load	PJL	S45C	29~35HRC	Fe_3O_4 (Black oxide)	S45C	57~63HRC (Carburizing)	Bright chromate	SWP—B	—30~80℃
	For heavy load	PJH			Nickel plating			Fe_3O_4 (Black oxide)		
	For extremely heavy load	PJX								



d	ℓ	L Light and heavy load	L Extremely heavy load	B	For light load (PJL) min. N{kgf}	For light load (PJL) max.	For heavy load (PJH) min. N{kgf}	For heavy load (PJH) max.	For extremely heavy load (PJX) min. N{kgf}	For extremely heavy load (PJX) max.
1.1	10(15)	10	15	0.9	0.49 {0.05}	1.0 {0.1}	0.78 {0.08}	2.9 {0.3}	2.2 {0.2}	4.5 {0.5}
1.1	15(20)	15	20	0.9	0.29 {0.03}	1.0 {0.1}	0.78 {0.08}	2.9 {0.3}	1.8 {0.2}	4.5 {0.5}
1.6	15(24)	15	24	1.3	1.0 {0.1}	2.0 {0.2}	2.9 {0.3}	8.8 {0.9}	5.2 {0.5}	13 {1.3}
1.6	24	24	24	1.3	0.59 {0.06}	2.0 {0.2}	2.0 {0.2}	8.8 {0.9}	5.2 {0.5}	13 {1.3}
2.0	20(27)	20	27	1.5	2.0 {0.2}	9.8 {1.0}	4.9 {0.5}	19.6 {2.0}	9.1 {0.9}	24.5 {2.5}
2.0	27(39)	27	39	1.5	2.0 {0.2}	9.8 {1.0}	2.9 {0.3}	19.6 {2.0}	8.8 {0.9}	24.8 {2.5}
2.5	25(30)	25	30	2	5.9 {0.6}	9.8 {1.0}	7.8 {0.8}	29.4 {3.0}	14.2 {1.4}	39.5 {4.0}
2.5	30(36)	30	36	2	2.0 {0.2}	9.8 {1.0}	4.9 {0.5}	29.4 {3.0}	14.1 {1.4}	39.4 {4.0}
2.5	30	39	—	2	1.4 {0.14}	9.8 {1.0}	5.0 {0.5}	28.0 {3.0}	—	—
3.1	25(27)	25	27	2.5	5.9 {0.6}	9.8 {1.0}	14.7 {1.5}	29.4 {3.0}	35.3 {3.6}	41.2 {4.2}
3.1	27(30)	27	35	2.5	2.9 {0.3}	9.8 {1.0}	7.8 {0.8}	29.4 {3.0}	14.7 {1.5}	41.2 {4.2}
3.1	30	43	—	2.5	3.0 {0.3}	9.8 {1.0}	7.0 {0.7}	28.8 {3.0}	—	—
3.8	30	30	35	3	5.9 {0.6}	14.7 {1.5}	8.8 {0.9}	49.0 {5.0}	15.7 {1.6}	62.8 {6.4}
3.8	30	43	53	3	2.9 {0.3}	14.7 {1.5}	7.8 {0.8}	49.0 {5.0}	12.7 {1.3}	62.8 {6.4}
3.8	30	58	—	3	2.9 {0.3}	14.7 {1.5}	6.2 {0.6}	48.7 {5.0}	—	—
5.5	30(35)	30	43	4	5.9 {0.6}	14.7 {1.5}	6.2 {0.6}	48.7 {5.0}	37.2 {3.8}	98.1 {10.0}
5.5	35	43	58	4	2.9 {0.3}	19.6 {2.0}	7.8 {0.8}	49.0 {5.0}	14.7 {1.5}	98.1 {10.0}
5.5	35	51	78	4	2.9 {0.3}	19.6 {2.0}	4.9 {0.5}	49.0 {5.0}	14.9 {1.5}	98.1 {10.0}
5.5	35	78	—	4	3.5 {0.3}	19.6 {2.0}	6.9 {0.7}	49.0 {5.0}	—	—
8	35	60	60	5	5.9 {0.6}	39.2 {4.0}	12.7 {1.3}	78.5 {8.0}	23.5 {2.4}	147.2 {15.0}
8	35	60	70	5	3.9 {0.4}	39.2 {4.0}	12.7 {1.3}	78.5 {8.0}	21.6 {2.2}	147.2 {15.0}
8	35	85	90	5	4.9 {0.5}	39.2 {4.0}	9.8 {1.0}	78.5 {8.0}	12.7 {1.3}	147.2 {15.0}
8	35	125	125	5	2.9 {0.3}	39.2 {4.0}	6.9 {0.7}	78.5 {8.0}	19.6 {2.0}	147.2 {15.0}
8	35	125		5	4.9 {0.5}	39.2 {4.0}	6.9 {0.7}	78.5 {8.0}		
8	35	155		5	19.6 {2.0}	49.0 {5.0}	29.4 {3.0}	78.5 {8.0}		
8	35	159	—	5	2.9 {0.3}	49.0 {5.0}	3.9 {0.4}	78.5 {8.0}	—	—
8	35	185		5	3.4 {0.35}	49.0 {5.0}	5.5 {0.56}	78.5 {8.0}		
8	35	185		5	19.6 {2.0}	49.0 {5.0}	29.4 {3.0}	93.2 {9.5}		
10	45	60	80	6	12.7 {1.3}	78.5 {8.0}	24.5 {2.5}	147.1 {15.0}	12.7 {1.3}	245.3 {25.0}
10	45	72		6	11.7 {1.2}	78.5 {8.0}	22.6 {2.3}	147.1 {15.0}		
10	45	96	—	6	11.7 {1.2}	78.5 {8.0}	22.6 {2.3}	147.1 {15.0}	—	—
10	45	120		6	11.7 {1.2}	78.5 {8.0}	22.6 {2.3}	147.1 {15.0}		
10	45	60		10	19.6 {2.0}	98.1 {10.0}	44.1 {4.5}	196.1 {20.0}		
10	45	60	84	10	19.6 {2.0}	98.1 {10.0}	47.1 {4.8}	215.7 {22.0}	24.5 {2.5}	314.0 {32.0}
10	45	75		10	17.7 {1.8}	98.1 {10.0}	44.1 {4.5}	215.7 {22.0}		
10	45	100		10	17.7 {1.8}	98.1 {10.0}	44.1 {4.5}	215.7 {22.0}		
10	45	124		10	17.7 {1.8}	98.1 {10.0}	44.1 {4.5}	215.7 {22.0}		
14	45	66	—	14	27.5 {2.8}	117.7 {12.0}	44.1 {4.5}	274.6 {28.0}	—	—
14	45	78		14	27.5 {2.8}	117.7 {12.0}	53.0 {5.4}	274.6 {28.0}		
14	45	100		14	27.5 {2.8}	117.7 {12.0}	45.1 {4.6}	274.6 {28.0}		
14	45	123		14	27.5 {2.8}	117.7 {12.0}	47.1 {4.8}	274.6 {28.0}		

Catalog No. Type	Catalog No. M Coarse thread	Catalog No. S	U/Price Q'ty:1~19 PJL PJH	U/Price Q'ty:1~19 PJX
PJL PJH PJX (Only available with ＊)	3	＊1.5	330	370
		＊3	380	420
	4	＊2	330	370
		＊4	380	420
	5	＊3	330	370
		＊5	380	420
	6	＊3	330	370
		＊5	380	420
		10	450	—
	8	＊3	330	380
		＊5	380	410
		10	500	—
	10	＊5	350	390
		＊10	450	500
		15	520	—
	12	＊5	380	420
		＊10	500	560
		＊15	570	620
		20	760	—
	16	＊10	640	680
		＊15	640	700
		＊20	800	850
		＊30	1,140	1,190
		40	1,900	
		50	2,370	
		60	2,940	—
		70	3,610	
		80	3,610	
	20	＊15	950	1,040
		20	1,140	
		30	1,420	—
		40	2,090	
	24	7	1,140	
		＊15	1,140	1,250
		20	1,280	
		30	1,710	
		40	2,370	
	30	15	1,710	—
		20	1,990	
		30	2,850	
		40	3,700	

Dimension ℓ in the brackets are for PJX.

{kgf}=N×0.101972

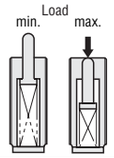
Order — Catalog No. PJL12—5

Delivery — 1 Day

Price — Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.



What is loosening prevention treatment ?

Anaerobic adhesive agent, sealed inside micro capsules, helps prevent the plunger from becoming loose. Its effect will be lost once the plunger is unscrewed.To regain the effect, apply the plunger's thread with a commercially available anaerobic adhesive agent for screws.

■Wrenches for spring plunger

PJG RoHS

M S45C
S Fe_3O_4

M	Catalog No.	U/Price Q'ty:1~9
5・6	PJG1	550
8・10	PJG2	
	PJG2A (for flanged spring plungers)	
12	PJG3	700
16	PJG4	
20・24	PJG5	
30	PJG6	800

Order — Catalog No. PJG1

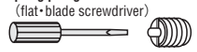
Delivery — 1 Day

Price — Volume discount rate P.37

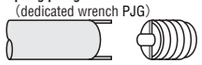
Quantity	1~9	10~19	20~29	30~50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example — Spring plunger M3・M4 (flat・blade screwdriver)

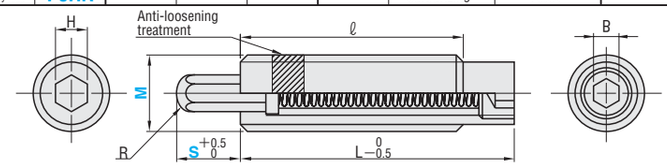


Spring plunger M5~M30 (dedicated wrench PJG)



Hex-head pin Type RoHS

Type		Main body M	Main body H	Main body S	Pin M	Pin H	Pin S	Spring M	Use temperature range
For light load	PJLR	S45C	29~35HRC	Fe_3O_4	S45C	57~63HRC	Unchrome plating	SWP—B	—30° ~80°
For heavy load	PJHR					Carburizing	Fe_3O_4		

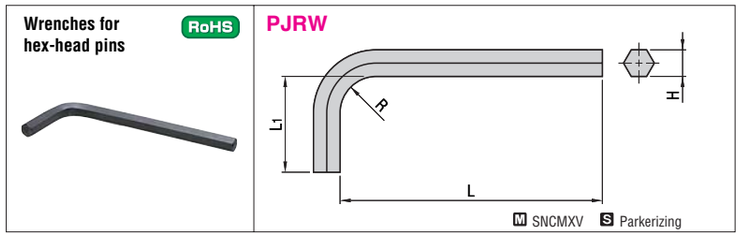


■Features of PJLR・PJHR : The pin is hexagonal in shape, enabling it to be installed using a spanner, i.e, a dedicated wrench is not necessary.

M×P (Coarse thread)	H	R	S	ℓ	L	B	PJLR Load min. N{kgf}	PJLR Load max.	PJHR Load min. N{kgf}	PJHR Load max.	Catalog No. Type	Catalog No. M—S	U/Price Q'ty:1~19
10×1.5	4	1.9	5	30	30	3	5.9 {0.6}	14.7 {1.5}	8.8 {0.9}	49.0 {5.0}	PJLR PJHR	10 — 5	570
			10		43		2.9 {0.3}	14.7 {1.5}	7.8 {0.8}	49.0 {5.0}		10 — 10	680
12×1.75	5	2.9	5		30		5.9 {0.6}	14.7 {1.5}	18.6 {1.9}	49.0 {5.0}		12 — 5	610
			10		43	4	2.9 {0.3}	19.6 {2.0}	7.8 {0.8}	49.0 {5.0}		12 — 10	730
			15		51		2.9 {0.3}	19.6 {2.0}	4.9 {0.5}	49.0 {5.0}		12 — 15	800
16×2.0	7	4.1	10	35	60	5	5.9 {0.6}	39.2 {4.0}	12.7 {1.3}	78.5 {8.0}		16 — 10	920
			15		60		3.9 {0.4}	39.2 {4.0}	12.7 {1.3}	78.5 {8.0}		16 — 15	920
			20		85		4.9 {0.5}	39.2 {4.0}	9.8 {1.0}	78.5 {8.0}		16 — 20	1,090
			30		125		2.9 {0.3}	39.2 {4.0}	6.9 {0.7}	78.5 {8.0}		16 — 30	1,440
			50		155		19.6 {2.0}	49.0 {5.0}	29.4 {3.0}	78.5 {8.0}		16 — 50	2,740
			80		185		19.6 {2.0}	49.0 {5.0}	29.4 {3.0}	93.2 {9.5}		16 — 80	4,040
24×3.0	10	5.2	7	45	60	10	19.6 {2.0}	98.1 {10.0}	44.1 {4.5}	196.1 {20.0}		24 — 7	1,450
			15		60		19.6 {2.0}	98.1 {10.0}	47.1 {4.8}	215.7 {22.0}		24 — 15	1,450
30×3.5	13	7.6	20		78	14	27.5 {2.8}	117.7 {12.0}	53.0 {5.4}	274.6 {28.0}		30 — 20	2,430

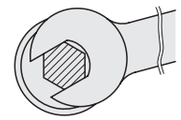
Wrenches for hex-head pins RoHS

PJRW



M SNCMXV S Parkerizing

H	L	L1	R	Catalog No. Type	Catalog No. No.	U/Price Q'ty:1~19
7	95	34	7	PJRW	16	400
13	132	50	13		30	1,200



Order — Catalog No. PJHR 10—10 PJRW 16

Delivery — 1 Day

Price — Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

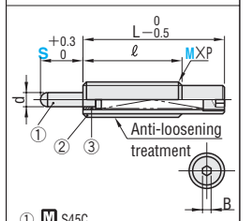
To be quoted on price & lead time above Max. Q'ty.

■Features of PJLR・PJHR

1. The pin is hexagonal in shape, enabling it to be installed using a socket wrench or a spanner.
2. If the pin becomes indented due to breakage of the spring, it can be removed with a dedicated wrench (PJRW). Regarding M10, 12 and 24, use a commercially available wrench.

■Spring plungers for slanted surface PATENT PENDING

PJHZ (for slanted surface) RoHS



① M S45C
H 50HRC~ (Carburizing)
② M S45C
③ Special bushing

M×P (Coarse thread)	d	S	ℓ	L	B	Load W N {kgf} min.	Load W N {kgf} max.	Catalog No. Type	Catalog No. M—S	U/Price Q'ty : 1~19
10×1.5	4	10	30	43	3	7.8{0.8}	49.0{5.0}	PJHZ	10—10	1,180
12×1.75	5		35	43	4	7.8{0.8}	49.0{5.0}		12—10	1,200
12×1.75		15	35	51		4.9{0.5}	49.0{5.0}		12—15	1,300
16×2.0	8	10	35	60	5	12.7{1.3}	78.5{8.0}		16—10	1,400
16×2.0		15	35	60		12.7{1.3}	78.5{8.0}		16—15	1,400
16×2.0		20	35	85		9.8{1.0}	78.5{8.0}		16—20	1,700
16×2.0		30	35	125		6.9{0.7}	78.5{8.0}		16—30	2,100

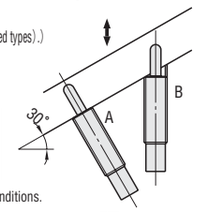
kgf=N×0.101972

■PJHZ Features

①A special structure improves wear resistence and seize resistence. Therefore, it can be used on slanted surfaces.
(Conventional spring plungers, should be used at 0° (oil-free types), and if oil is supplied, use them on surfaces with a slant within 5° (lubricated types).)
②It can be used even without supplying oil.
③Use angle : 0~30°

Test Condition
Press Machine : 20-ton crank press
Speed : 130SPM
Angle of slant : 30°
Oil supply : No oil supply
(Note)These data are limited to the above conditions, and product life will vary depending on use conditions.

Type	Life span A	Life span B
PJHZ16—30	300,000 strokes or more	300,000 strokes or more
PJH 16—30	scuffing will occur at 17,000 strokes	scuffing will occur at 50,000 strokes



Order — Catalog No. PJHZ 12—10

Delivery — 1 Day

Price — Volume discount rate P.37

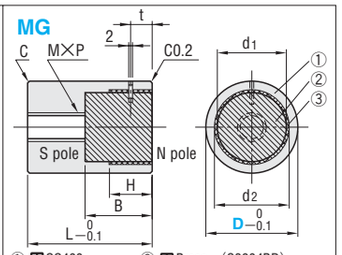
Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

MAGNETS

MG

RoHS



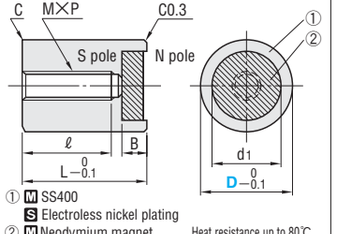
L	M×P	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	d1	d2	B	C	H	t	Catalog No. Type	Catalog No. D	U/Price Q'ty:1～19
15	5X0.8	5.9 {0.6}	1100～1300	6	8	7	0.5	5	2.5	MG	10	600
15	5X0.8	11.8 {1.2}		8	10.5		1.0				13	730
20	6X1.0	15.7 {1.6}	1200～1400	10	13	10		6	3.5		16	850
25	8X1.25	29.4 {3.0}	1200～1500	13	16	12					20	950
30	8X1.25	44.1 {4.5}	1300～1700	15.5	18	13	1.5	9	6.5		25	1,300
30	8X1.25	78.5 {8.0}	1400～1700	20	23.5	15					28	1,350

kgf=N×0.101972 ＊Adsorption: See the right page (the figure below)

- Since magnets are broken easily, do not alter them.
- The end face is ground.

MGN (Strong/Rustproof type)

RoHS



L	M×P	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	d1	B	C	ℓ	Catalog No. Type	Catalog No. D	U/Price Q'ty:1～19
10	3X0.5	2.9 {0.3}	3000～3200	4.0	2.0	0.3	6	MGN	6	960
		5.8 {0.6}	3500～3700	5.0					8	900
15	5X0.8	9.8 {1.0}	3400～3600	6.0		0.5	10		10	790
		15.6 {1.6}	3200～3400	7.0	1.5				13	880
20	6X1.0	36.2 {3.7}	3500～3700	9.5	2.0	1.0	12		16	1,000
25	8X1.25	58.8 {6.0}	3100～3300	12.5			16		20	1,180
30		112.7 {11.5}	3500～3700	16.5	3.0	1.5	18		25	1,520
		196.1 {20.0}	3300～3500	18.5					28	1,840

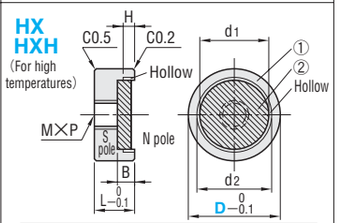
kgf=N×0.101972 ＊Adsorption: See the right page (the figure below)

- Since magnets are broken easily, do not alter them.
- The magnetic face is recessed 0.1 to 0.3 below the case.

HX / HXH

(For high temperatures)

RoHS



L	M×P	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	d1	d2	B	H	Catalog No. Type	Catalog No. D	U/Price Q'ty:1～19 HX	U/Price Q'ty:1～19 HXH
6	3X0.5	2.9 {0.3}	2100～2600	4	5	2.0	1.5	HX Heat resistance : 80℃	6	1,000	1,200
		3.9 {0.4}	2200～2600	5.5	6.5				8	900	1,080
8	4X0.7	9.8 {1.0}	2100～2300	7	8	1.5	1.1		10	800	1,000
		29.4 {3.0}	2200～2400	9.5	11	2.0	1.6		13	910	1,150
	5X0.8	49.0 {5.0}	2200～2500	12.5	14			HXH Heat resistance : 200℃	16	1,000	1,250
10		88.3 {9.0}	2300～2600	16.5	18	3.0	2.6		20	1,300	1,550
13	6X1.0	127.5 {13.0}		21.5	23				25	1,780	2,030

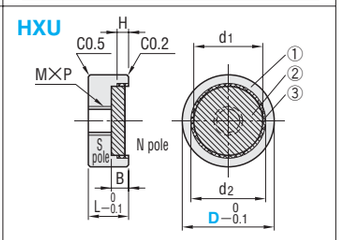
kgf=N×0.101972 ＊Adsorption: See the right page (the figure below)

- Since magnets are broken easily, do not alter them.
- The magnet is fixed to the holder using adhesive agent.
- The magnetic face is recessed 0.1 to 0.3 below the case.

	HX	HXH
M ① ②	SS400	
	Cobalt magnet	
S	—	Raydent treatment
Heat resistance temperature	80℃	200℃

HXU

RoHS



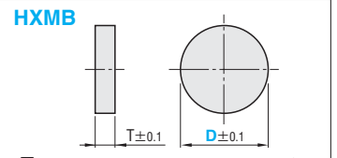
L	M×P	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	d1	d2	B	H	Catalo No. Type	Catalo No. D	U/Price Q'ty:1～19
8	3X0.5	3.9 {0.4}	2100～2600	4	5	2	1.6	HXU	6	1,150
		5.9 {0.6}	2400～2600	5	6				8	1,050
	4X0.7	14.7 {1.5}	2700～2900	7	8	3	2.1		10	980
10		34.3 {3.5}	2800～3100	9.5	11	4	3.1		13	1,100
	5X0.8	58.8 {6.0}	2900～3300	12.5	14				16	1,240
13		98.1 {10.0}	2900～3400	16.5	18	6	5.1		20	1,560
15	6X1.0	137.3 {14.0}		21.5	23				25	2,200

kgf=N×0.101972 ＊Adsorption: See the right page (the figure below)

- Since magnets are broken easily, do not alter them.
- The magnet is fixed to the holder using adhesive agent.
- The magnetic face is recessed 0.1 to 0.3 below the case.

HXMB

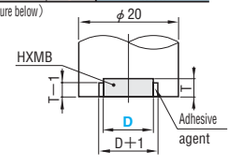
RoHS



T	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	Catalog No. Type	Catalog No. D	U/Price Q'ty:1～19
2	1.0 {0.10}	2000～2100	HXMB (Heat resistance up to 200℃)	3	280
	1.5 {0.15}			4	290
	3.9 {0.40}			5	310
1.5	6.9 {0.70}	2200～2400		7	340

kgf=N×0.101972 ＊Adsorption: See the right page (the figure below)

- Magnets are extermely brittle and easy to break, so please handle them carefully.
- Use adhesive agent to fix the magnets.
- Fix the magnets not to protrude from the holder.



Order — Catalog No.
MG 13
HX 20

Delivery — 1 Day

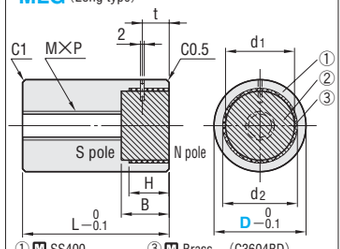
Price — Volume discount rate P.37

Quantity	1～19	20～49	50～199	200～400
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

MLG (Long type)

RoHS



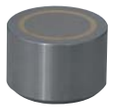
L	M×P	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	d1	d2	B	H	t	Catalog No. Type	Catalog No. D	U/Price Q'ty:1～9
25	6X1.0	15.7 {1.6}	1100～1300	10	13	10	6	3.5	MLG	16	1,050
30	8X1.25	29.4 {3.0}	1100～1400	13	16	12	9	6.5		20	1,160
35	8X1.25	78.5 {8.0}	1200～1500	20	23.5	15				28	1,580

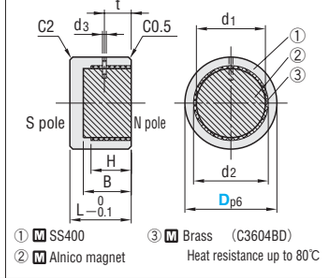
kgf=N×0.101972 ＊Adsorption：Refer to the figure below

- Since magnets are broken easily, do not alter them.
- The end face is ground.

MGATA (Press-fit type)

RoHS





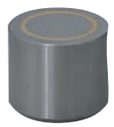
Dp6	L	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	d1	d2	d3	B	H	t	Catalog No. Type	Catalog No. D	U/Price Q'ty:1～9
20 +0.035 +0.022	16	25.5 {2.6}	1400～1700	13	16	2	12	8	4.0	MGATA	20	1,000
25 +0.035 +0.022	19	47.1 {4.8}	1600～1900	15.5	18.5		13	10	5.0		25	1,470
30 +0.035 +0.022	20	68.6 {7.0}		19.5	23		15				30	1,550
35 +0.042 +0.026	26	98.1 {10.0}	1900～2100	24.5	28	3	18	13	6.5		35	2,720
40 +0.042 +0.026	27	142.2 {14.5}		29.5	33		20				40	3,710

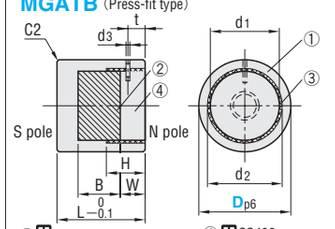
kgf=N×0.101972 ＊Adsorption：Refer to the figure below

- Since magnets are broken easily, do not alter them.
- The end face is ground.

MGATB (Press-fit type)

RoHS



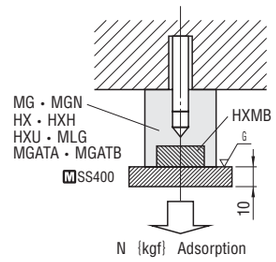


Dp6	L	＊Adsorption N{kgf}	Surface magnetic flux density Gauss[G]	d1	d2	d3	B	H	t	W	Catalog No. Type	Catalog No. D	U/Price Q'ty:1～9
20 +0.035 +0.022	18	26.5 {2.7}	900～1200	13	16	2	12	8	2.5	5	MGATB	20	1,100
25 +0.035 +0.022	20	49.0 {5.0}	1100～1400	15.5	18.5		13	10	3.0	6		25	1,600
30 +0.035 +0.022	26	73.5 {7.5}		20	23		15		3.5	7		30	1,710
35 +0.042 +0.026	28	103.0 {10.5}	1300～1600	25	28	3	18	13	4.0	8		35	2,990
40 +0.042 +0.026	30	147.1 {15.0}	1400～1600	30	33		20					40	4,070

kgf=N×0.101972 ＊Adsorption：Refer to the figure below

- Since magnets are broken easily, do not alter them.
- The end face is ground.

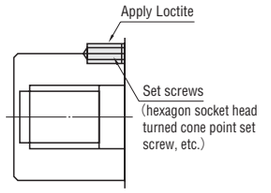
＊"Adsorption" indicates the power of lifting the material SS400 (ground surface of 10mm thick plate).



Example

■How to Install
After press-fitting, install the magnet as shown in the figure to prevent it from loosening.

Hole drilling (reference) D H7	
20 25 30	+0.021 0
35 40	+0.025 0



Order — Catalog No.
MGATA 20
MGATB 20

Delivery — 3 Days
Express A 800/1Pc. P.37
A flat charge of 2,160 yen for 3 pieces or more of the same size.

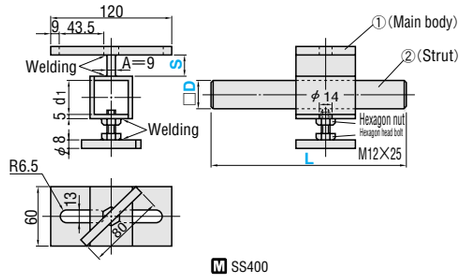
Price — ■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

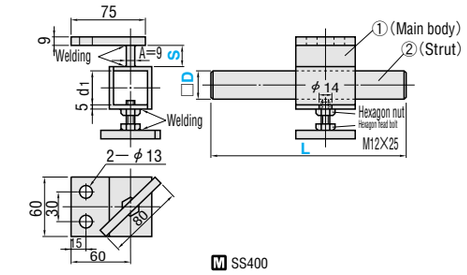
SQUARE SKID BRACKETS / ROUND SKID BRACKETS

STB (①+②) / STB—N (①only)



M SS400
S Black oxide (Fe_3O_4)

STBY (①+②) / STBY—N (①only)



M SS400
S Black oxide (Fe_3O_4)

d_1	Catalog No. Type	D	10mm increments L	S	U/Price Q'ty:1~9 STB STBY	STB—N STBY—N
21.5	STB	20	100~300	0~150	5,000	4,500
33.5	STB—N	32			5,300	4,800
21.5	STBY	20			4,500	4,000
33.5	STBY—N	32			4,800	4,300

When S=10, A=20 (D20) or A=32 (D32) must be selected.

Order

Catalog No.	L	S
STB 20	100	100
STB—N 32		40

Delivery

3 Days

Express A 800/1Pc.

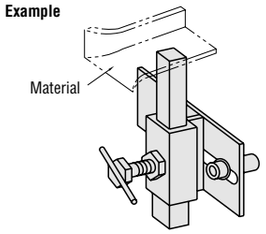
A flat charge of 2,160 yen for 3 pieces or more of the same size. P.38

Volume discount rate P.37

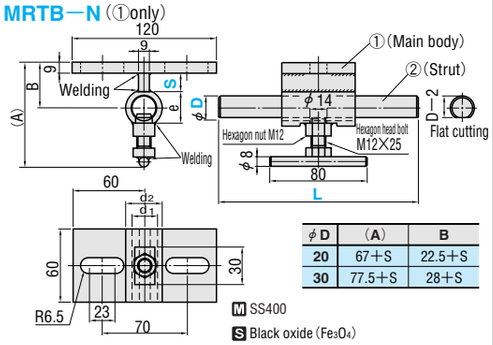
Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example



MRTB (①+②) / MRTB—N (①only)



φD	(A)	B
20	67+S	22.5+S
30	77.5+S	28+S

M SS400
S Black oxide (Fe_3O_4)

e	d_1	d_2	Catalog No. Type	D	10mm increments L	S	U/Price Q'ty:1~9 MRTB MRTBY	MRTB—N MRTBY—N
26.0	21	30	MRTB	20	100~300	0~150	4,350	4,050
37.5	32	40	MRTB-N	30			4,600	4,300
26.0	21	30	MRTBY	20			3,900	3,600
37.5	32	40	MRTBY-N	30			4,200	3,900

Order

Catalog No.	L	S
MRTB 20	100	100
MRTB—N 30		40

Delivery

3 Days

Express A 800/1Pc.

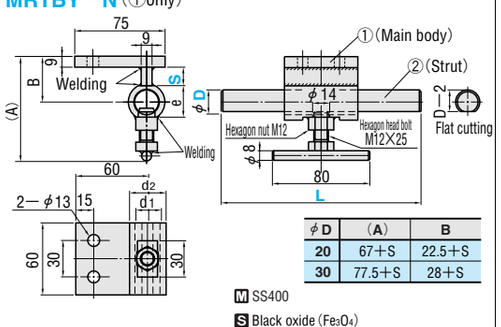
A flat charge of 2,160 yen for 3 pieces or more of the same size. P.38

Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

MRTBY (①+②) / MRTBY—N (①only)



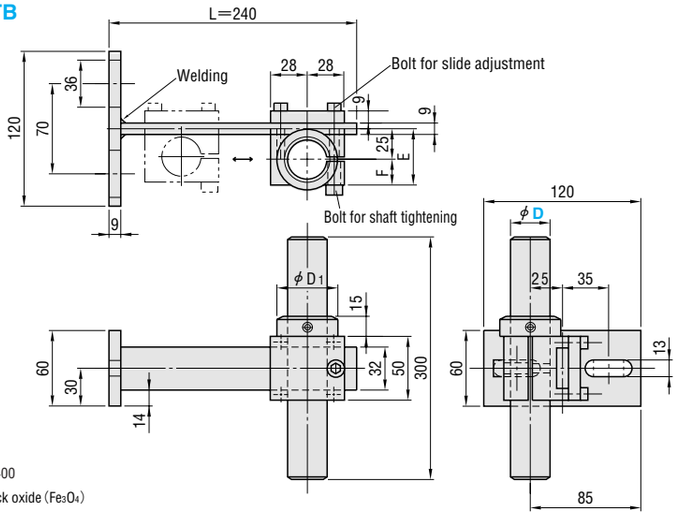
φD	(A)	B
20	67+S	22.5+S
30	77.5+S	28+S

M SS400
S Black oxide (Fe_3O_4)

SKID BRACKETS WITH SLIDE ADJUSTMENT FUNCTION

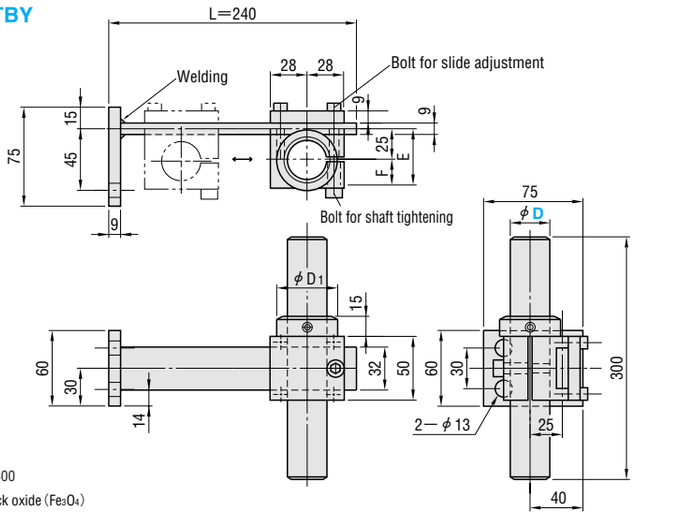
The volume discount rate is also applicable to alteration cost. P.39

SCTB



M SS400
S Black oxide (Fe_3O_4)

SCTBY



M SS400
S Black oxide (Fe_3O_4)

E	F	D_1	Catalog No. Type	D	U/Price Q'ty : 1~9 SCTB	SCTBY
40	15	32	SCTB	20	3,700	3,500
45	20	46	SCTBY	30	3,950	3,600

Order

Catalog No.
SCTB 30

Delivery

3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

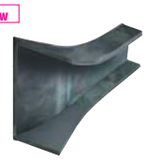
Alteration

Catalog No.	—	(LC)
SCTB 20	—	LC100

Alteration	Code	Spec.	¥/1Code
	LC	Changes dimension L. 80≦LC≦235 5mm increments	300

COMPONENTS FOR TRANSFER DIE

COMPONENTS FOR TRANSFER DIE



New

Delivery Shortened

Delivery Shortened

Name	COILED MATERIAL GUIDES	STOCK GUIDES	STOCK GUIDE SETS			STOCK GUIDE SETS		
Catalog No.	CILG	MCG MCGN MCGE	GDRT□	GDRT□W	GDRT□T	EGDR	EGDRW	EGDRT
Delivery	⑤	③ⓉⒶ	①	③Ⓐ	①	①	③Ⓐ	①
Page	969	970	971			972		

New

Add.

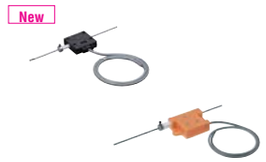
Add.

STOCK GUIDE SETS	STOCK LIFTERS	STOCK FEEDER LIFTER UNITS	SHEET LIFTERS	SHEET LIFTERS	SHEET LIFTERS
GDRA	SRL	ZORW□□	SLCES	SLC	SLCE
①	①	①	③Ⓐ	③Ⓐ	③Ⓐ
972	973	973	974	974	974

LIFTER UNITS		AIR CYLINDER	PADS FOR LIFTING UP	QUICK FITTING JOINTS FOR AIR PIPING		QUICK FITTING JOINTS FOR AIR PIPING	
LTH	CLTH	LTHCT LTHCS	VCH VCHT	M-PC	M-POC	M-PL	M-POL
⑧	⑧	③	③	①	①	①	①
975		977	978	979	979	979	979

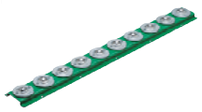
TUBES FOR AIR PIPING	CUTTER FOR TUBE M-UB	BRACKETS FOR AIR PIPING	TERMINALS FOR PIPING	AIR MANIFOLDS
M-UB	M-TCN	DAHK-A DAHK-B DAHK-C DAHK-D DAHK-E	TAHK-A TAHK-B TAHK-C TAHK-D	DMFDA DMFDB
③ⓉⒶ	①	①	①	①
980	980	981	981	982

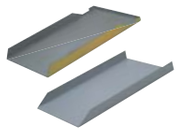
New



Delivery Shortened

SENSOR UNITS FOR MISGRIPPING—Light type—				—High rigidity type—		JUNCTION BOXES		HOOKS FOR TRANSPORTING DEVICE	CURL CORD HOOKS
MGUG□	MGUC□	MGUE□	MGUL□	MGUA□	MGU□	JBX160	JBX100	DVJ	DKLH
①	①	①	①	①	①	①	①	①	①
983				984		985		986	986





ROLLER CARRIERS	BALL CARRIERS	BALL CARRIERS	EMBOSSED SHOOTING PLATES	SCRAP SHOOTERS
CORO	GORO	GORON	EBSP	SRST□
③Ⓐ	③Ⓐ	③Ⓐ	③	⑧
987	987	987	988	989

CHAINS FOR SCRAP SHOOTER		GENERAL PURPOSE CHAINS	JOINTS FOR CHAINS
SRT	SRTN	CN	JT
③ⓉⒶ	③ⓉⒶ	③ⓉⒶ	①
990		990	990

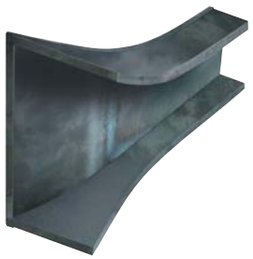
PRESS NEW

COILED MATERIAL GUIDES

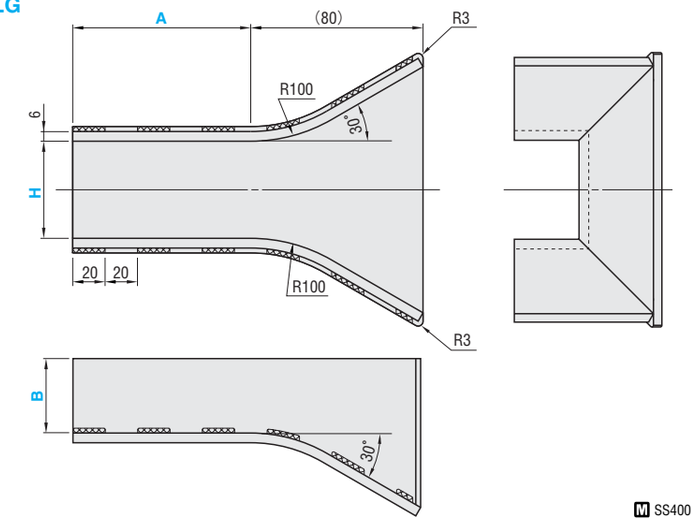
STOCK GUIDES

The volume discount rate is also applicable to alteration cost. P.39

RoHS



CILG



M SS400

Catalog No. Type	A	B	H
CILG	60	40 60	30 50 60
	70		
	80		
	90		
	100		
	110		

Order

Catalog No.	A	B	H
CILG	100	60	50

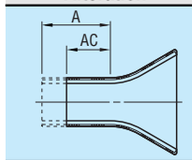
Delivery 5 Days

Alteration

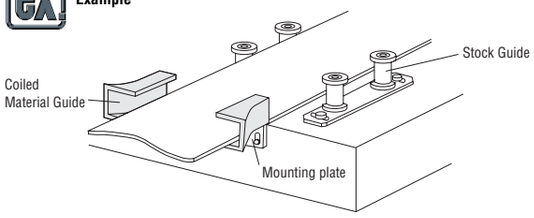
Catalog No.	A	B	H	(AC)
CILG	100	60	60	AC95

Price To be quoted on price & lead time above Max. Q'ty.

Catalog No. Type	A	B	H	U/Price Q'ty : 1~10
CILG	60	40	30	4,950
			50	5,250
			60	5,650
		60	30	5,100
			50	5,450
			60	5,800
	70	40	30	5,900
			50	6,250
			60	6,600
		60	30	6,100
			50	6,400
			60	6,800
	80	40	30	6,850
			50	7,200
			60	7,550
		60	30	7,050
			50	7,400
			60	7,750
	90	40	30	7,800
			50	7,900
			60	8,200
		60	30	7,900
			50	8,100
			60	8,250
	100	40	30	8,200
			50	8,400
			60	8,600
		60	30	8,500
			50	8,600
			60	8,700
	110	40	30	8,600
			50	8,800
			60	8,900
		60	30	8,750
			50	8,850
			60	8,950

Alteration	Code	Spec.	¥/1Code
	AC	Changes dimension A 5mm increments 60＜AC＜110	900

Example



■Features

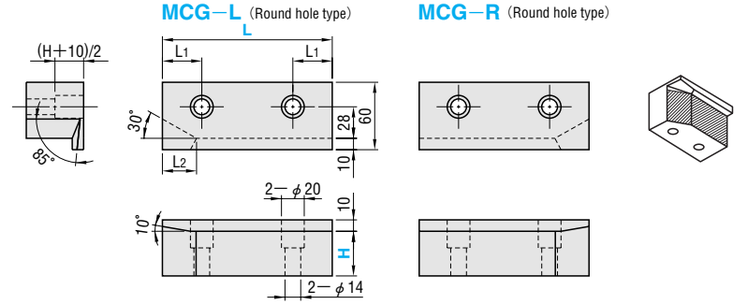
- Placement of flared shape Coiled material guides at the time of coiling material input would prevent the coiled material warpage or running onto the guide by winding.
- Due to its flexibility of mounting position, it is applicable to various dimensions.

※When mounting, please use angle stay or attachment plate.

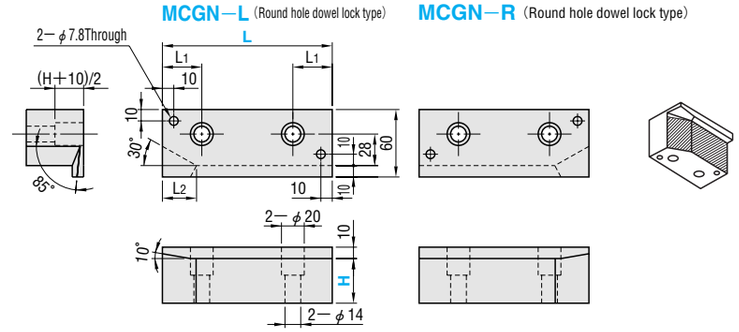
RoHS

—For left side— —For right side—

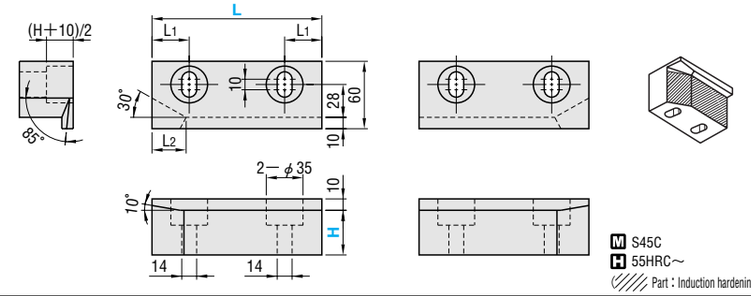
MCG—L (Round hole type) / MCG—R (Round hole type)



MCGN—L (Round hole dowel lock type) / MCGN—R (Round hole dowel lock type)



MCGE—L (Slotted hole type) / MCGE—R (Slotted hole type)



M S45C
H 55HRC～
Part : Induction hardening

L1	L2	Catalog No. Type	Mounting direction	L	H 10mm increments
25	30	MCG MCGN MCGE	R L	100	20~70
35				150	

Order

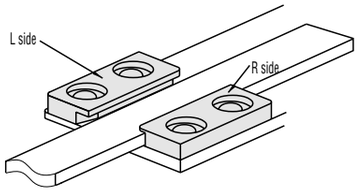
Catalog No.	L	H
MCG—R	100	50

Delivery 3 Days

Express T 1,000/1Pc.
Express A 500/1Pc.
P.38

A flat charge of 1,350 yen for 3 pieces or more of the same size (excluding Express T).

Example



Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Type	H	U/Price Q'ty:1~19 L100	L150
MCG—L MCG—R	20	1,980	2,350
	30	2,190	2,630
	40	2,410	2,970
	50	2,660	3,340
	60	2,930	3,750
	70	3,230	4,190
MCGN—L MCGN—R	20	2,200	2,570
	30	2,410	2,850
	40	2,630	3,190
	50	2,880	3,560
	60	3,150	3,970
	70	3,450	4,410
MCGE—L MCGE—R	20	2,600	2,970
	30	2,810	3,250
	40	3,030	3,590
	50	3,280	3,960
	60	3,550	4,370
	70	3,850	4,810

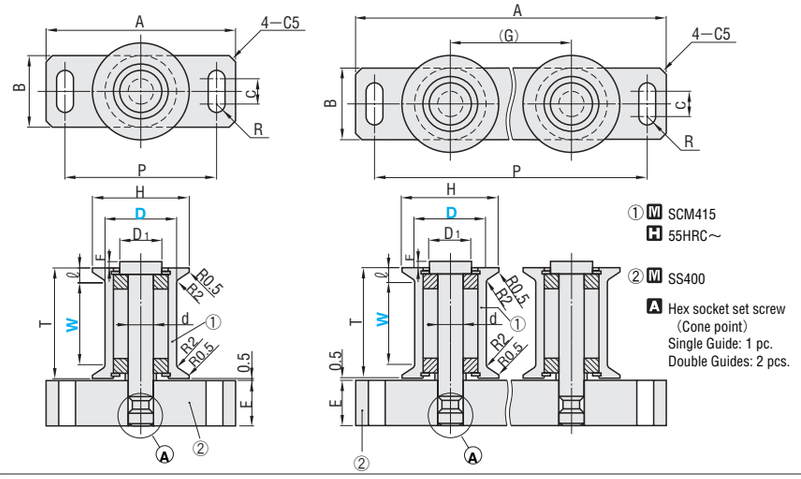
STOCK GUIDE SETS
—BEARING TYPE—

DELIVERY SHORTENED

RoHS

Single guide **GDRTA** (Roller bearing type) **GDRTB** (Ball bearing type)

Double guides **GDRTAW** (Roller bearing type) **GDRTBW** (Ball bearing type)



① M SCM415
H 55HRC～

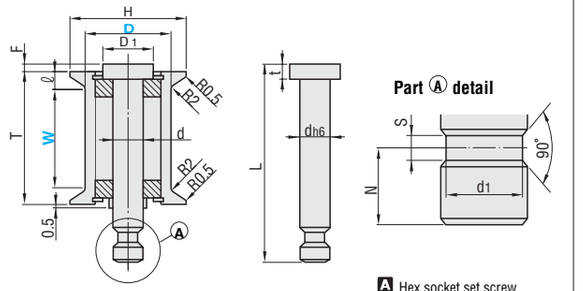
② M SS400

A Hex socket set screw (Cone point)
Single Guide: 1 pc.
Double Guides: 2 pcs.

RoHS

Guide roller unit

GDRTAT (Roller bearing type)
GDRTBT (Ball bearing type)



A Hex socket set screw (Cone point) 1 pc.

■Set

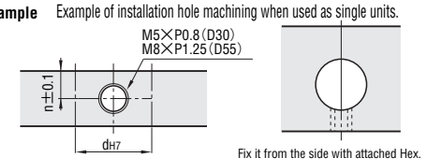
T	H	ℓ	d	A	B	C	P	R	E	F	(G)	D1	Catalog No. Type	Catalog No. D	W	U/Price Q'ty:1～9Sets Single guide	U/Price Q'ty:1～9Sets Double guides
48	40	5	10	95(395)	30	10	73(373)	5.5	20	1.5	(300)	14	(roller bearing) GDRTA GDRTAW	30	38	15,400	31,600
54	75	8	25	145(445)	55	20	115(415)	6.5	35	5.5	(300)	32		55	38	20,000	41,100
86															70	22,800	46,800
48	40	5	9	95(395)	30	10	73(373)	5.5	20	1.5	(300)	12	(ball bearing) GDRTB GDRTBW	30	38	14,000	28,700
54	75	8	20	145(445)	55	20	115(415)	6.5	35	5.5	(300)	32		55	38	18,500	38,000
86															70	21,000	43,100

Numbers in parentheses are dimensions of the double guides (GDRTAW and GDRTBW).

■Unit

T	H	ℓ	d	F	D1	L	t	d1	S	N	Catalog No. Type	Catalog No. D	W	U/Price Q'ty:1～9
48	40	5	10	1.5	14	67	5.5	8	2.5	7	(roller bearing) GDRTAT	30	38	12,320
54	75	8	25	5.5	32	92	9.5	22	5	17		55	38	16,000
86						124							70	18,240
48	40	5	9	1.5	12	67	5.5	7	2.5	7	(ball bearing) GDRTBT	30	38	11,200
54	75	8	20	5.5	32	92	9.5	17	5	17		55	38	14,800
86						124							70	16,800

Example Example of installation hole machining when used as single units.



See the standards table for d.

Fix it from the side with attached Hex. socket set screw.

Order

Catalog No.	—	W
GDRTA 55	—	38

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery

- GDRTA
- GDRTB
- GDRTAT

1 Day — GDRTAT Now in stock.

- GDRTAW
- GDRTBW
- GDRTBT

3 Days

Express A 800/1Pc. P.38

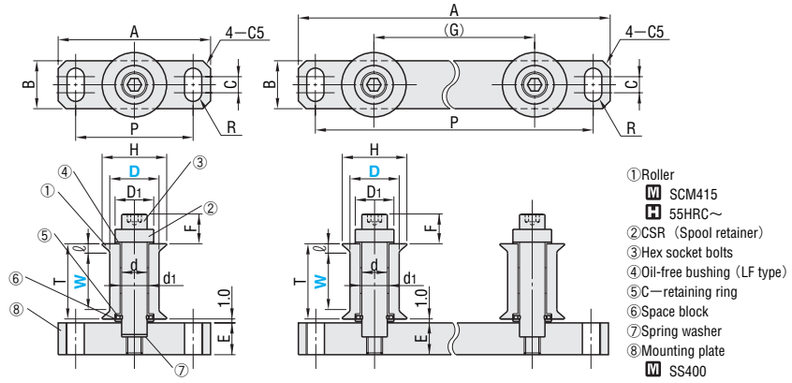
A flat charge of 2,160 yen for 3 pieces or more of the same size.

STOCK GUIDE SETS
—OIL-FREE BUSHING TYPE—

DELIVERY SHORTENED

RoHS

Single guide **EGDR** **Double guides** **EGDRW**

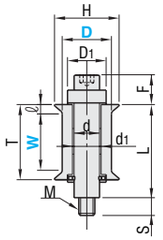


①Roller
M SCM415
H 55HRC～
②CSR (Spool retainer)
③Hex socket bolts
④Oil-free bushing (LF type)
⑤C—retaining ring
⑥Space block
⑦Spring washer
⑧Mounting plate
M SS400

RoHS

Guide roller unit

EGDRT



A ⑦Spring washer
D30 ···▸CBW10 1 pc.
D55 ···▸CBW16 1 pc.

■Set parts

T	H	ℓ	d	d1	A	B	C	P	R	E	F	(G)	D1	Catalog No. Type	Catalog No. D	W	U/Price Q'ty:1～9Sets Single guide	U/Price Q'ty:1～9Sets Double guides
48	40	5	16	18	95(395)	30	10	73(373)	5.5	20	19	(300)	24	EGDR EGDRW	30	38	8,200	17,500
54	75	8	25	28	145(445)	55	20	115(415)	6.5	35	30.5		36		55	38	11,100	22,600
86																70	12,500	25,300

Numbers in parenthesis are dimensions of the double guides (EGDRW).

■Unit

T	H	L	ℓ	d	F	S	D1	d1	M	Catalog No. Type	Catalog No. D	W	U/Price Q'ty:1～9
48	40	52	5	16	19	15	24	18	10	EGDRT	30	38	5,600
54	75	61	8	25	30.5	26	36	28	16		55	38	7,200
86		93				24						70	8,300

Order

Catalog No.	—	W
EGDR 55	—	38

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery

- EGDR
- EGDRT

1 Day — EGDR & EGDRT Now in stock.

- EGDRW

3 Days

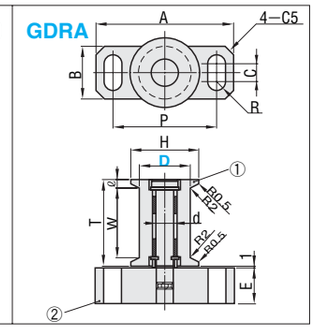
Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

RoHS

GDRA

① M SKS93
H 55～60HRC
② M SS400



T	H	W	ℓ	d	A	B	C	P	R	E	Catalog No. Type	Catalog No. D	U/Price Q'ty:1～9
50	40	40	5	10	90	30	10	66	5.5	20	GDRA	30	15,400
70	70	54	8	25	130	50	15	100	6.5	30		55	21,800

Order

Catalog No.
GDRA 30

Delivery

1 Day

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

STOCK LIFTERS/STOCK FEEDER LIFTER UNITS

PRESS NEW Printed in Red

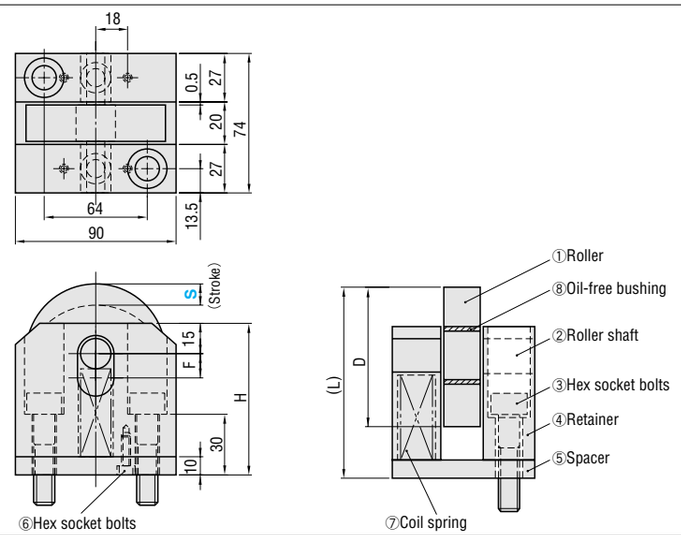
SHEET LIFTERS

■Stock lifters

RoHS

①M SK3 H 55～58HRC
②M SUJ2 H 55～58HRC
③LB12—50（2pcs.）
④M SS400
⑤M SS400
⑥CB6—15（4pcs.）
⑦S=10 ･･･▸SWF20—45（2pcs.）
S=20 ･･･▸SWR21—65（2pcs.）
⑧PTFE filler fitted

SRL



D	H	F	(L)	N {kgf} min.	N {kgf} max.	Catalog No. Type	Catalog No. S	U/Price Q'ty:1～9
60	75	12	90	165 {16.8}	439 {44.8}	SRL	10	12,800
80	95	22	120	108 {11.0}	469 {47.8}	SRL	20	14,560

●{kgf}=N×0.101972

Order — Catalog No. SRL 20

Delivery — 1 Day

Price

■Volume discount rate P.37

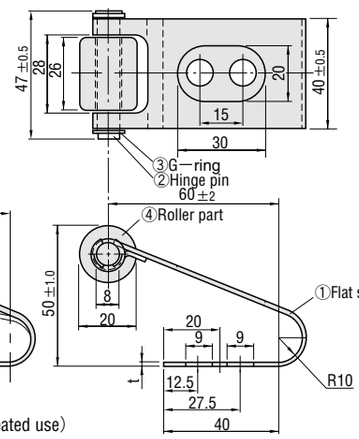
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Stock feeder lifter units

RoHS

Steel roller type
ZORWMS
ZORWHS
Resin roller type
ZORWMP
ZORWHP



Resin roller type
Roller part detail — POM / S45C

①M SK5M
②M S45C
③IWATA RING G—8
④Steel roller type
M S45C H 45HRC～
Resin roller type
Outside M POM（Polyacetal resin）
Inside M S45C
A CB8-20 Q'ty:2

Stroke Fmax 16mm
（Guaranteed range of repeated use）

t	N/mm{kgf/mm}	Type	Catalog No.	U/Price Q'ty:1～19
1.4	5.88 {0.60}	Steel roller	ZORWMS	1,740
1.6	8.43 {0.86}	Steel roller	ZORWHS	1,740

t	N/mm{kgf/mm}	Type	Catalog No.	U/Price Q'ty:1～19
1.4	5.88 {0.60}	Resin roller	ZORWMP	1,740
1.6	8.43 {0.86}	Resin roller	ZORWHP	1,740

●{kgf}=N×0.101972

Order — Catalog No. ZORWMS

Delivery — 1 Day

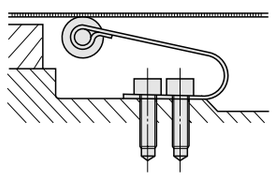
Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

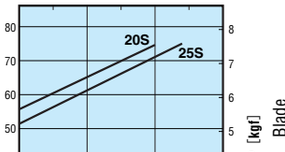
Example



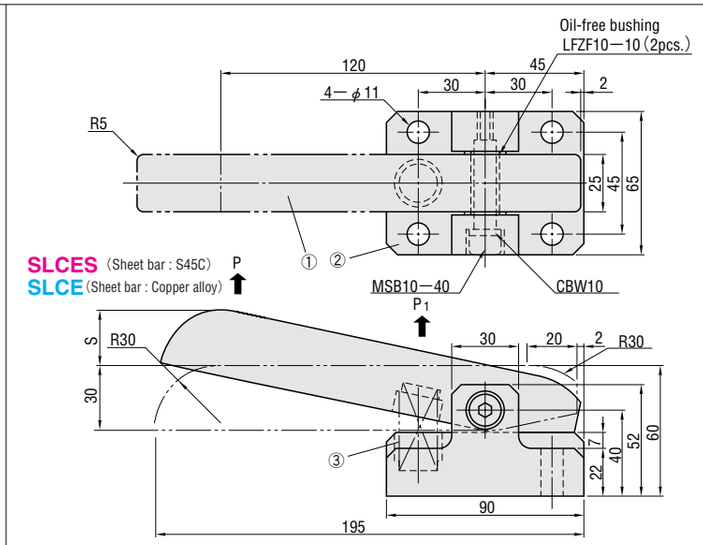
RoHS

SLCES

SLCE



SLC

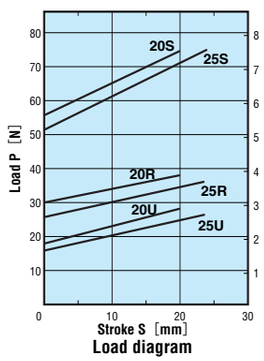


①Sheet bar M SLCES S45C SLCE・SLC Copper alloy ②Block M FC250

Lifting load P N(kgf) min.	Lifting load P N(kgf) max.	Spring load P1 N(kgf) min.	Spring load P1 N(kgf) max.	Coil spring（Color）③	Stroke S	Catalog No. Type	Catalog No. No.	U/Price Q'ty:1～9 SLCES	SLCE	SLC
18.3(1.9)	24.5(2.5)	73(7.5)	98(10.0)	SWU17—50（Light blue）	20	SLCES SLCE SLC	20U	7,500	9,800	15,000
29.3(3.0)	39.2(4.0)	117(12.0)	157(16.0)	SWR17—50（Ivory）	20	SLCES SLCE SLC	20R	7,500	9,800	15,000
54.9(5.6)	73.5(7.5)	220(22.5)	294(30.0)	SWS17—50（Orange）	20	SLCES SLCE SLC	20S	7,500	9,800	15,000
16.9(1.7)	24.5(2.5)	67(6.9)	98(10.0)	SWU17—50（Light blue）	25	SLCES SLCE SLC	25U	7,500	9,800	15,000
27.0(2.8)	39.2(4.0)	108(11.0)	157(16.0)	SWR17—50（Ivory）	25	SLCES SLCE SLC	25R	7,500	9,800	15,000
51.0(5.2)	73.5(7.5)	202(20.6)	294(30.0)	SWS17—50（Orange）	25	SLCES SLCE SLC	25S	7,500	9,800	15,000

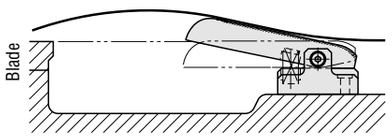
The full stroke should be avoided. It is recommended to shorten the stroke setting by about 1mm.

{kgf}=N×0.101972



Load diagram

Example



Order — Catalog No. SLCE 20S

Delivery — 3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

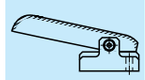
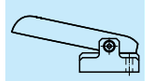
■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

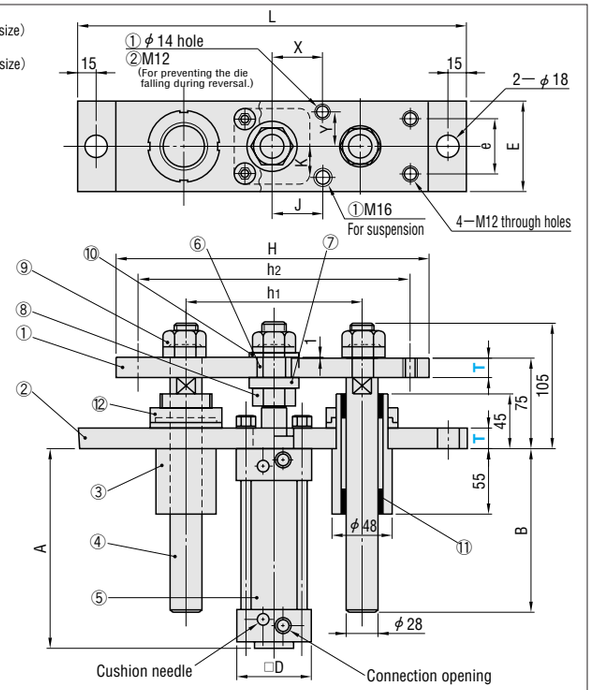
Alterations — Catalog No. —(HTC・HTM) SLCES20U — HTM

3 Days

Alterations	Code	Spec.	¥/1Code
	HTC	Induction hardening of the upper surface (Sheet bar body only) 55HRC～ ⊗SLCE・SLC not applicable	850
	HTM	Plating of Sheet bar. (Electroless nickel plating.) ⊗SLCE・SLC not applicable	1,000

LIFTER UNITS

LTH (Standard size)
CLTH (Compact size)



No.	Parts list	M	Qty.	Notes
①	Lifter plate	SS400	1	
②	Base plate	SS400	1	
③	Guide holder	STKM13A	2	
④	Guide pin	S45C	2	55～60HRC
⑤	Air cylinder		1	For detailed specifications, see the table at right.
⑥	Collar	STKM13A	1	
⑦	Spacer	SS400	1	
⑧	Hex nut	SS400	1	M20×P2.5
⑨	Hard lock nut	SS400	3	M20×P2.5
⑩	Flat washer	SS400	1	M20(For M20)
⑪	Oil-free bushing	PTFE filler fitted	4	
⑫	Hard lock nut	SS400	2	HLB—08 M40×P1.5

■Air cylinder (⑤) specifications

⑤Air cylinder	TANHAY	SMC
Cylinder tube inner diameter	φ40 φ63	
Model	TCA2	MB
Operation method	Double acting side rod	
Guaranteed pressure resistance	1.5MPa (15.3kgf/cm²)	
Maximum allowable working pressure	1.0MPa (10.2kgf/cm²)	
Minimum allowable working pressure	0.05MPa (0.5kgf/cm²)	
Ambient temperature and air temperature during use	5～60℃	—10～70℃
Piston speed	50～500mm/s	50～1000mm/s
Stroke length tolerance	$^{+1.0}_{0}$	
Cushion	Both sides (air cushion)	
Connection opening diameter	φ40 : Rc(PT)1/4 φ63 : Rc(PT)3/8	
Installation instruction	Basic form	

■Selection Method

1. Using the table at right, select the appropriate cylinder inner diameter from the required lift-up force.
2. Select the stroke and each plate thickness depending on the use conditions.

Lifter unit's lift up force (N)

Cylinder inner diameter	Use air pressure (MPa)				
	0.2	0.3	0.4	0.5	0.6
φ40	126	189	252	315	377
φ63	312	468	624	780	935

Calculated with an air cylinder load factor of 0.5.
(kgf) =N×0.101972

■Features

- Effective when lifting up panels, etc. horizontally.
- Standard size and Compact size (Dimension L and H are shorter by 35mm～40mm) are available.
- The size of base plate can be shortened with Alteration (LC) to meet the need for more compact type.
- The economy type with TANHAY air cylinder is also available. The price is 20% lower than the same size and standards product with SMC air cylinder.
- The plate thickness selectable.

The volume discount rate is also applicable to alteration cost. P.39

H	h1	h2	L	E	e	D	J	K	X	Y	A	B	Catalog No. Type	Air cylinder	Cylinder inner diameter	Stroke	T	U/Price T=16	U/Price T=19
250	140	220	310	75	45	60	30	25	33	28	139	110	LTH (Standard size)	T Economy (TANHAY)	40	50	16	20,900	21,400
											189	160				100	19	22,040	22,540
270	160	240	330	90	70	85	35	30	48	32	154	110			63	50	16	25,650	26,150
											204	160				100	19	26,790	27,290
250	140	220	310	75	45	52	30	25	33	28	138	110		S (SMC)	40	50	16	27,000	27,500
											163	135				75	19	28,300	28,800
											188	160				100		28,300	28,800
270	160	240	330	90	70	75	35	30	48	32	148	110			63	50	16	32,000	32,500
											173	135				75	19	33,200	33,700
											198	160				100		33,200	33,700
215	115	185	270	75	45	60	30	25	33	28	139	110	CLTH (Compact size)	T Economy (TANHAY)	40	50	16	20,900	21,400
											189	160				100	19	22,040	22,540
240	135	210	295	90	70	85	35	30	48	32	154	110			63	50	16	25,650	26,150
											204	160				100	19	26,790	27,290
215	115	185	270	75	45	52	30	25	33	28	138	110		S (SMC)	40	50	16	27,000	27,500
											163	135				75	19	28,300	28,800
											188	160				100		28,300	28,800
240	135	210	295	90	70	75	35	30	48	32	148	110			63	50	16	32,000	32,500
											173	135				75	19	33,200	33,700
											198	160				100		33,200	33,700

The stroke over 125 is no more available.

Order: Catalog No. (Type / Air cylinder / Cylinder Inner diameter) — Stroke — T

Delivery: 8 Days

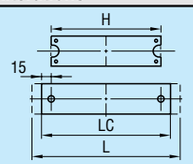
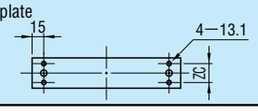
LTH S 40 — 100 — T19

■Notes for the use

- When attaching air piping to the cylinder, remove metal dusts within the piping, cutting oil or any dusts and prevent them getting into the cylinder. When using seal tape, leave 1.5～2 threads of thread part.
- Keep the air source cleaned up by placing air filters at the upstream side etc.
- The cushion is adjusted upon the shipment, however, readjust it depending on the actual load and work speed. To adjust the cushion, turn the cushion needle to the right and it makes the cushion stronger.
- Make sure if the appropriate attachment is done by conducting the performance check after mounting the lifter unit to the die.

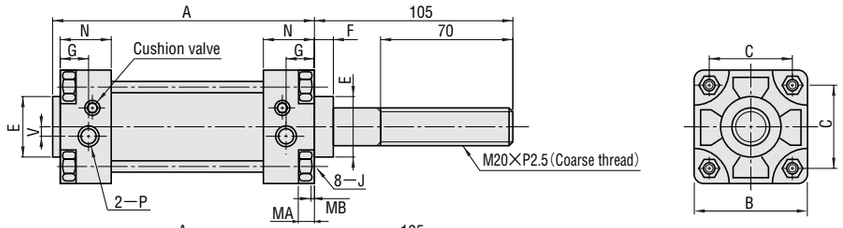
Alteration: Catalog No. (Type / Air cylinder / Cylinder Inner diameter) — Stroke — T — (LC・ZC)

LTH S 40 — 100 — T19 — LC

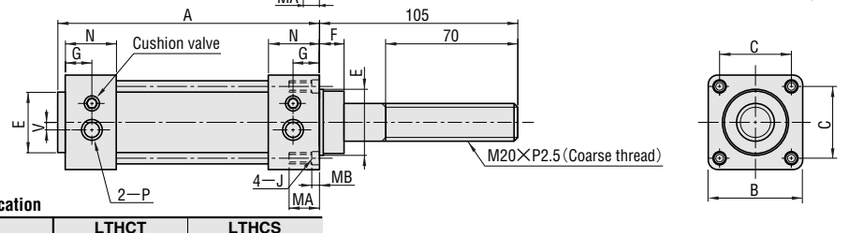
Alterations	Code	Spec.	¥/1Code
①Lifter plate ②Base plate 	LC	Machines notches in both ends of the lifter plate and shortens dimension L of the base plate. Catalog No. Type / Cylinder inner diameter / LC: LTH (Standard size) 40 285, 63 305; CLTH (Compact size) 40 260, 63 280	1,800
②Base plate 	ZC	Machines φ13.1 lifter mounting holes at four places in the base plate. ⊗Combination with LC is not applicable. Cylinder inner diameter / ZC: 40 55, 63 60	900

AIR CYLINDER FOR LIFTER UNITS

LTHCT
(TANHAY)



LTHCS
(SMC)



■**Air Cylinder Specification**

Type	LTHCT	LTHCS
Cylinder tube inner diameter	φ40	φ63
Model	TCA2	MB
Operation method	Double acting side rod	
Guaranteed pressure resistance	1.5MPa (15.3kgf/cm²)	
Maximum allowable working pressure	1.0MPa (10.2kgf/cm²)	
Minimum allowable working pressure	0.05MPa (0.5kgf/cm²)	
Ambient temperature and air temperature during use	5～60℃	−10～70℃
Piston speed	50～500mm/s	50～1000mm/s
Stroke length tolerance	$^{+1.0}_{0}$	
Cushion	Both sides (air cushion)	
Connection opening diameter	φ40 : Rc(PT)1/4	φ63 : Rc(PT)3/8
Installation instruction	Basic form	

Theoretical Output of Air Cylinder (N) [Operational direction: □ ← OUT]

Cylinder inner diameter	Use air pressure (MPa)				
	0.2	0.3	0.4	0.5	0.6
φ40	251	377	503	629	754
φ63	623	935	1247	1559	1870

{kgf}=N×0.101972

B	C	E	F	G	MA	MB	J	N	P	V	A	Catalog No. Type	Catalog No. Cylinder inner diameter	Stroke	U/Price
60	44	32	10	15	8	1	M6	27	Rc1/4	5	139	LTHCT (TANHAY)	40	50	6,000
											189			100	6,600
85	64	40	10	17	10	1	M8	31	Rc3/8	9	154		63	50	8,200
											204			100	9,100
52	38	35	13	14	16	4	M6	27	Rc1/4	4	138	LTHCS (SMC)	40	50	11,500
											163			75	11,800
											188			100	12,100
75	56.5	45	14	16.5	16	5	M8	31.5	Rc3/8	9	148		63	50	13,700
											173			75	14,200
											198			100	14,600

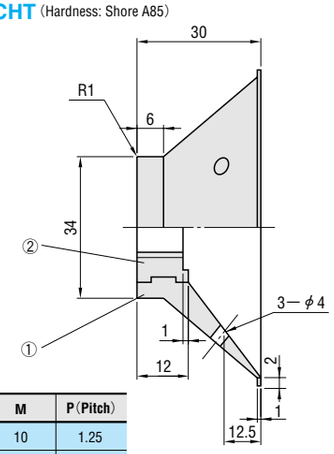
The stroke over 125 is no more available.

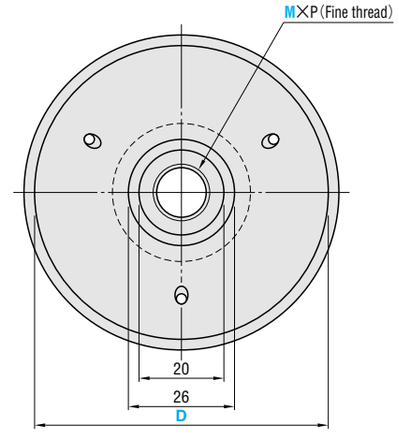
Order Catalog No. (Type / Cylinder inner diameter) — Stroke
LTHCT 40 — 100

Delivery 3 Days

PADS FOR LIFTING UP

VCH (Hardness: Shore A70)
VCHT (Hardness: Shore A85)





M	P (Pitch)
10	1.25
12	1.5
14	1.5

M ①Nitrile rubber (NBR)
②Aluminum (A5052)

① (Shore)	Catalog No. Type	Catalog No. D	M	U/Price Q'ty:1～9
A70	VCH	50	10 12 14	700
		70		780
A85	VCHT	70	12 14	800

Please order after confirming the screw diameter of the air cylinder's piston rod.
This is not applicable for the piston rods of LTHCT and LTHCS in the left page.

Order Catalog No. — M
VCH 50 — 10

Delivery 3 Days

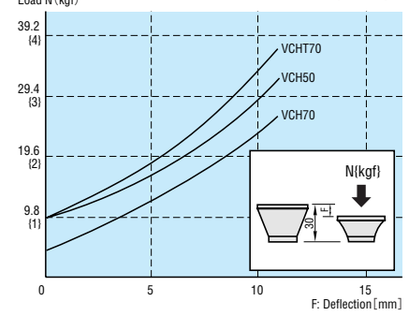
Price
■**Volume discount rate** P.37

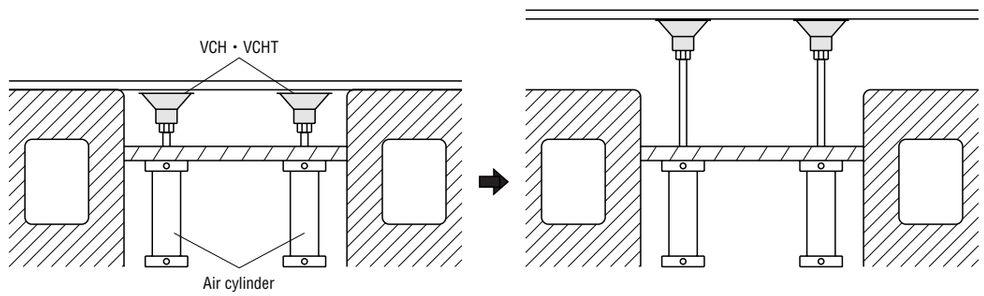
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example ■It can be attached directly to commercially available air cylinder to lift up workpieces.

■**Deflection vs Load characteristics**
This graph shows the standard characteristics.
Actual characteristics vary according to temperature and speed.



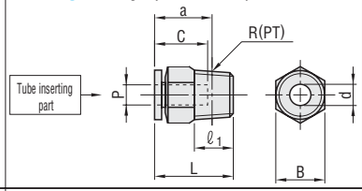


QUICK FITTING JOINTS FOR AIR PIPING

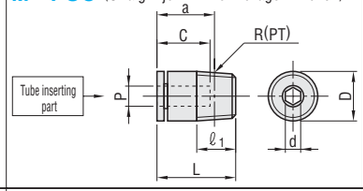
Ⓜ Main body: Brass（C3604）+Nickel plating
Open ring: Polyacetal resin（POM）
Screw part：Brass（C3604）+Nickel plating
Taper screw R（PT）for JIS B0203 tube
※Sealed material is applied to the thread part.

Quick fitting joints for air piping is single-piece and cannot be separated.

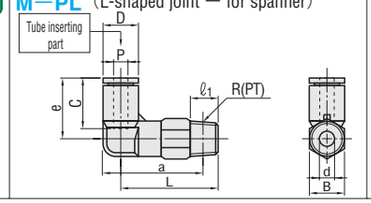
RoHS **M—PC**（Straight joint — for spanner）



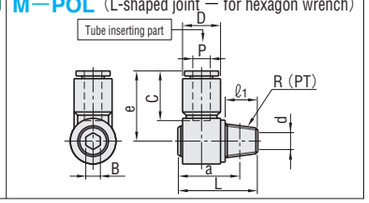
RoHS **M—POC**（Straight joint — for hexagon wrench）



RoHS **M—PL**（L-shaped joint — for spanner）



RoHS **M—POL**（L-shaped joint — for hexagon wrench）



■M—PC

Applicable tube Outside diameter ×Inside diameter	Tube inserting hole part Hole diameter P	Tube inserting hole part Depth C	d	L	a	B	ℓ1	R（PT）	Catalog No. Type	Catalog No. No.	U/Price Q'ty:1～19
4×2.5	4	15	3	21.5	17.5	10	8	1/8	M—PC	4—01	150
					15.5	14	11	1/4		4—02	160
6×4	6	17	4.6	23	19	12	8	1/8		6—01	160
				25		14	11	1/4		6—02	170
				24	17.5	17	12	3/8		6—03	220
8×5	8	18.5	6	28	24	14	8	1/8		8—01	190
			7	27	21		11	1/4		8—02	200
				24	17.5	17	12	3/8		8—03	230
10×6.5	10	21	6	30.5	26.5		8	1/8		10—01	250
			8.5	30	24		11	1/4		10—02	240
				29.5	23		12	3/8		10—03	250
12×8	12	23.5	8.5	36	30	21	11	1/4		12—02	290
			11	32	25.5		12	3/8		12—03	310

■M—POC

Applicable tube Outside diameter ×Inside diameter	Tube inserting hole part Hole diameter P	Tube inserting hole part Depth C	D	Hexagon wrench hole ⬡d	L	a	ℓ1	R（PT）	Catalog No. Type	Catalog No. No.	U/Price Q'ty:1～19
4×2.5	4	15	10	⬡2.5	21	17	8	1/8	M—POC	4—01	180
6×4	6	17	12	⬡4	22.5	18.5				6—01	200
			14			16.5	11	1/4		6—02	220
8×5	8	18		⬡5	28	24	8	1/8		8—01	220
			17	⬡6	26.5	20.5	11	1/4		8—02	240
					24	17.5	12	3/8		8—03	270
10×6.5	10	20.5	18		30	24	11	1/4		10—02	280
					29.5	23	12	3/8		10—03	300
12×8	12	23.5	21	⬡8	32	25.5				12—03	380

■M—PL

Applicable tube Outside diameter ×Inside diameter	Tube inserting hole part Hole diameter P	Tube inserting hole part Depth C	D	d	L	a	e	B	ℓ1	R（PT）	Catalog No. Type	Catalog No. No.	U/Price Q'ty:1～19
4×2.5	4	15	10	3	23.5	24.5	18	10	8	1/8	M—PL	4—01	250
					26.5	25.5		14	11	1/4		4—02	270
6×4	6	17	12.5	4.6	25	27	20	12	8	1/8		6—01	260
					28	28		14	11	1/4		6—02	270
					30	29.5		17	12	3/8		6—03	310
8×5	8	18	14.5	6	28	31	23	14	8	1/8		8—01	290
					31	32			11	1/4		8—02	310
					38	38.5		17	12	3/8		8—03	320
10×6.5	10	20.5	17.5	6	33	37.5	26.5		8	1/8		10—01	420
				8	36	38.5			11	1/4		10—02	410
					37	39			12	3/8		10—03	420
12×8	12	23.5	21	8	38	42.5	29.5	21	11	1/4		12—02	490
				10	39	43			12	3/8		12—03	510

■M—POL

Applicable tube Outside diameter ×Inside diameter	Tube inserting hole part Hole diameter P	Tube inserting hole part Depth C	Hexagon wrench size ⬡B	D	d	L	a	e	ℓ1	R（PT）	Catalog No. Type	Catalog No. No.	U/Price Q'ty:1～19
6×4	6	17	⬡5	13	4.6	24	20	24	8	1/8	M—POL	6—01	370
						27	21		11	1/4		6—02	400
8×5	8	18	⬡8	14	6	27	23	27	8	1/8		8—01	400
						30	24		11	1/4		8—02	440
						31	24.5		12	3/8		8—03	590
10×6.5	10	20	⬡10	18	8	34	28	31	11	1/4		10—02	570
						35	28.5		12	3/8		10—03	610
12×8	12	23.5	⬡12	21	10	39	32.5	37	12	3/8		12—03	710

Order — Catalog No.
M—PC 4—01
M—POC 6—02
M—PL 10—03
M—POL 6—01

Delivery — 1 Day

Price

■Volume discount rate P.37

Quantity	1～19	20～99	100～199	200～500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Guide right page

TUBES FOR AIR PIPING / CUTTERS FOR TUBE M-UB

Tubes for air piping
M—UB
RoHS

Ⓜ Polyurethane
Applicable fluid: Compressed Air
Operating temperature range 0～60℃

Outside diameter of tube	Inside diameter of tube	Minimum bending radius	Available pressure range	Catalog No. Type	Catalog No. No.	Total length L (Meter)	Color	U/Price Q'ty：1～9 L5	L10	L20
4	2.5	10	0～700 kPa (0～7kgf/cm²)	M—UB	0425	5	B (Black)	450	810	1,260
6	4	15			0640			650	1,220	2,070
8	5	20			0850	10		1,310	2,520	4,680
10	6.5	27			1065	20	C (Colorless)	1,820	3,560	6,750
12	8	35			1280			2,480	4,860	9,360

Total length L is measured by the meter

Order — Catalog No. — L — Color
M—UB 0640 — 5 — B

Delivery — 3 Days
Express T 600/1Pc.
Express A 300/1Pc.
P.38
A flat charge of 810 yen for 3 pieces or more of the same size（excluding Express T）.

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

•Notes for the use

（1）This product is designed solely for air and should not be used for water or oil.
（2）When connecting with Quick fitting joints for air piping, cut the tube's both ends vertically. Slant tube ends may cause tube separation or air leakage.

Cutters for tube M-UB
M—TCN
RoHS

Catalog No.	U/Price Q'ty：1～9	10～19	20～29	30～50
M—TCN	1,800	1,710	1,620	1,530

Order — Catalog No. — M—TCN

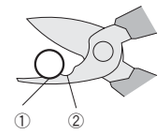
Delivery — 1 Day

Price

To be quoted on price & lead time above Max. Q'ty.

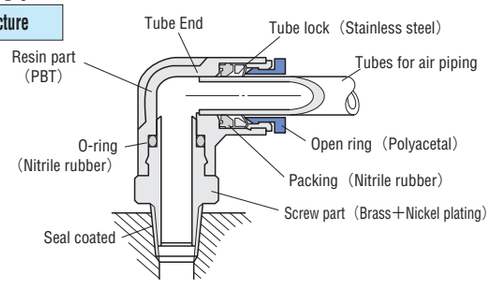
• Features

（1）Using the cutter for tube makes the cutting work easier due to the tube guide R effect.
Tube guide R ①For large diameter（tube outside diameter over 10mm）
②For small diameter（tube outside diameter smaller than 8mm）
（2）Cutting other tubes than M-UB or electric wire may damage the cutter and it would be unable to cut M-UB.
（3）This product is consumable, please replace it accordingly.



■Quick fitting joints

L-shaped joint structure



Features

●Attaching and detaching a tube requires one step.
●Once the screw is tightened, the tube removal angle of L-shaped joints (M-PL and M-POL) can be changed by turning the resin part.

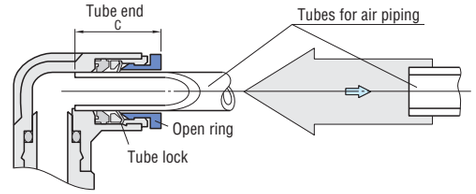
Specifications

Usable fluid	Air
Operating pressure range kPa {kgf/cm²}	0～900 {0～9}
Operating temperature range ℃	0～60

Attaching and detaching a tube

①Attaching
●Make sure that the cut surface of tube is vertically cut and there is no damage or deformation on the tube.
●Insert the tube to the tube end (dimension C) of the socket.
(Refer to each specification table for dimension C details.)
●Once the tube is attached, pull the tube and make sure it would not come off.

②Detaching
Push the tube open ring straight into the joint, and pull the tube toward.（By pushing the tube open ring, the tube locks will unlock.）



Notes

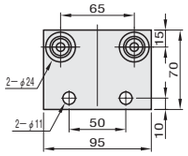
●Before removing the tube, confirm that the pressure is zero.
●DO NOT TOUCH the open ring when under pressure.
●Do not load any stresses such as pulling, twisting, or bending to the Quick fitting joint.（It may cause the damage to the joint body.）

BRACKETS FOR AIR PIPING / TERMINALS FOR PIPING

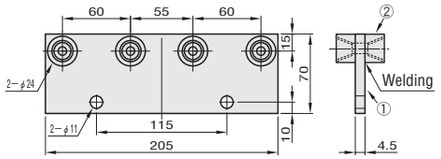
■Brackets for air piping

RoHS

DAHK—A

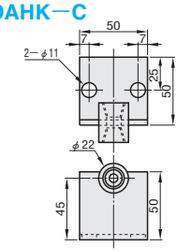


DAHK—B

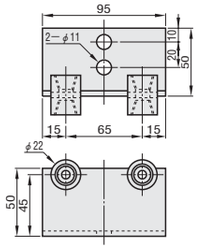


Catalog No.	M ①	M ②	S
DAHK—A	SPCC	SS400	Black oxide (Fe3O4)
DAHK—B			
DAHK—C	SS400		
DAHK—D			
DAHK—E			

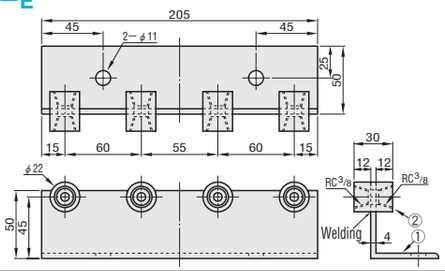
DAHK—C



DAHK—D



DAHK—E



Catalog No.	U/Price Q'ty : 1～9
DAHK—A	2,900
DAHK—B	5,020
DAHK—C	2,300
DAHK—D	3,500
DAHK—E	6,720

Order — Catalog No. DAHK—A

Delivery — 1 Day

Price

■Volume discount rate P.37

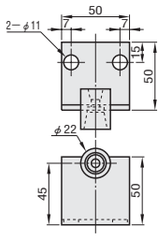
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

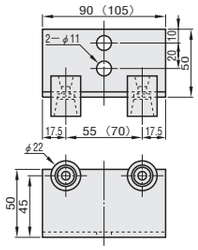
■Terminals for piping

RoHS

TAHK—A

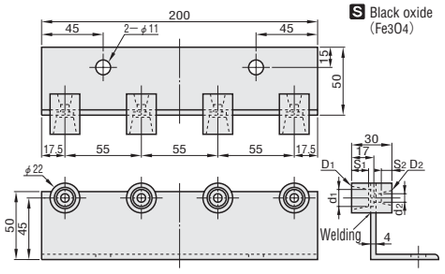


TAHK—B
TAHK—C〔Dimensions in( )〕



TAHK—D

M SS400
S Black oxide (Fe3O4)



RC(PT) D1	RC(PT) D2	d1	d2	S1	S2	Catalog No. Type	Catalog No. No.	U/Price Q'ty : 1～9 TAHK—A	TAHK—B	TAHK—C	TAHK—D
3/8	1/8	12	6	12	8	TAHK—A	1	1,670	2,590	2,680	4,300
	1/4		8		11	TAHK—B	2				
	3/8		12		12	TAHK—C	3				
						TAHK—D					

Order — Catalog No. TAHK—D— 2

Delivery — 1 Day

Price

■Volume discount rate P.37

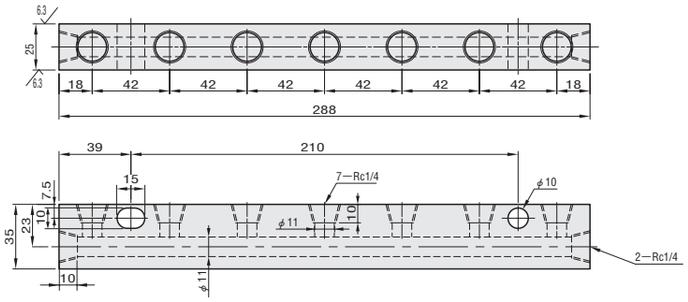
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

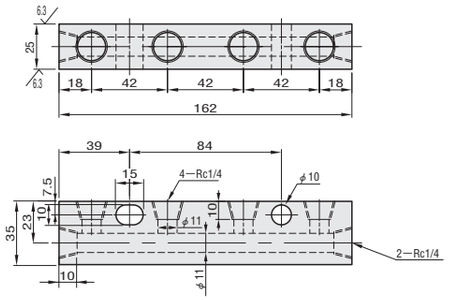
AIR MANIFOLDS

RoHS

DMFDA



DMFDB



M A5052

Catalog No.	U/Price Q'ty : 1～9
DMFDA	6,200
DMFDB	4,980

Order — Catalog No. DMFDA

Delivery — 1 Day

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

PRESS NEW Printed in Red

SENSOR UNITS FOR MISGRIPPING —LIGHT TYPE—

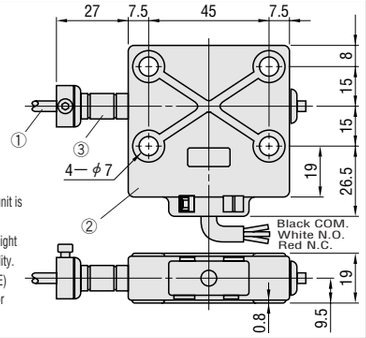
MGUE · MGUEN will not be available in the next catalog.
MGUG · MGUGN are recommended

SENSOR UNITS FOR MISGRIPPING —HIGH RIGIDITY TYPE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

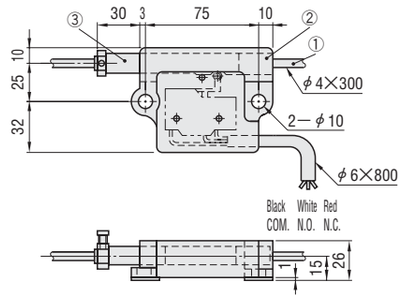
MGUG
MGUGN
(Switchless type)



The body of the sensor unit is composed of composite reinforced nylon, and is light and possesses high rigidity. (About as twice as MGUE) Able to attach reversed or turned 180 degree.

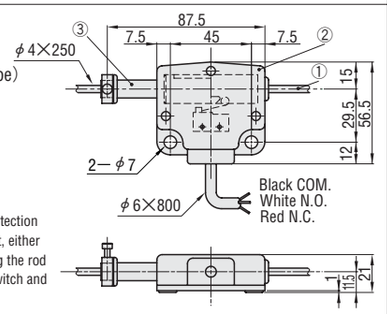
RoHS

MGUC
MGUCN
(Switchless type)



RoHS

MGUE
MGUEN
(Switchless type)

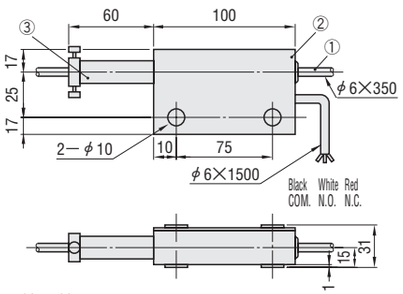


MGUE allows detection from right or left, either side by replacing the rod bar, the microswitch and the check bar.

This product will not be available in the next catalog.

RoHS

MGUL
MGULN
(Switchless type)



MGUL is attachable from either side.

①Check bar	M SWP—A SS400 (MGUL · MGULN)	●Microswitch (OMRON)	Utility model No.55—32665
②Protection cover	M Nylon, Reinforced nylon (MGUG · MGUGN)	MGUC Z—15GW2255—B	32666
③Rod bar	M Polyacetal	MGUE · MGUL · MGUG D2SW—3L2H	13558
			13559

Order Catalog No. MGUG MGUCN

Delivery 1 Day

Price

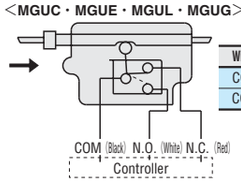
■Volume discount rate P.37

Quantity	1—19	20—49	50—99	100—200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No.	U/Price Q'ty : 1—19	Catalog No.	U/Price Q'ty : 1—19	Catalog No.	U/Price Q'ty : 1—19	Catalog No.	U/Price Q'ty : 1—19
MGUG	6,590	MGUC	6,620	MGUE	6,300	MGUL	9,000
MGUGN	5,120	MGUCN	5,150	MGUEN	4,830	MGULN	7,500

<MGUC · MGUE · MGUL · MGUG>



Wiring connections	Signal
COM and N.C.	Off during operation
COM and N.O.	On during operation

●Operation

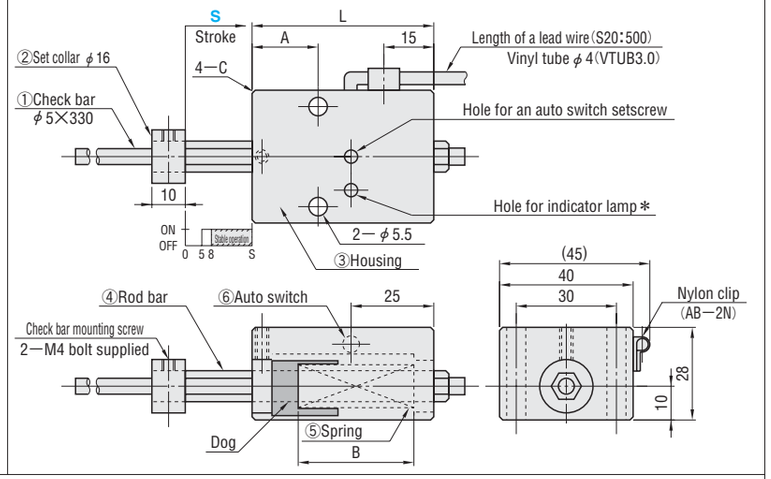
Check-bar motion	Rod bar motion	Status	Length of stroke MGUC·MGUE·MGUG	Length of stroke MGUL
		Advance end	0mm	0 mm
		Switch ON	5±1mm	5±1mm
		Stable detection	8mm	8mm
		Reverse end	15mm	50mm

●Use Method
The misgrip sensor unit operates a built-in microswitch by pressing a rod mounted in the unit.
It outputs a signal when the flip fingers do not grasp the work piece (during misgrip) and wires to stop operation of the press machine.

RoHS

With a check bar
MGUA
MGUAN (Switchless type)

Without a check bar
MGU
MGUN (Switchless type)



①② M SS400
③ M Aluminum alloy
④ M SS400
⑤ M SWOC—V

S Black oxide (Fe_3O_4)
S Electroless nickel plating

⑥

Auto switch	D—A90 (without indicator lamp) (SMC)		
Application load	IC circuit relay PLC		
Load voltage	AC DC 24V or less	AC DC 48V or less	AC DC 100V or less
Max. load current	50mA	40mA	20mA

L	A	B	C	⑤ Spring	Catalog No. Type	Catalog No. Stroke S	U/Price Q'ty : 1—99 With a check bar MGUA	MGUAN	Without a check bar MGU	MGUN
55	20	35	0.3	WY13—45	MGUA MGU (Switchless type) MGUAN MGUN	20	3,950	3,350	3,750	3,150

Order Catalog No. MGUA 20

Delivery 1 Day

Price

Alteration Catalog No. MGUA 20 — (A93·DP) A93 — 5 Days

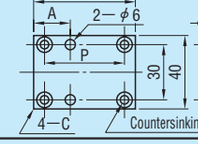
■Volume discount rate P.37

Quantity	1—99	100—200
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

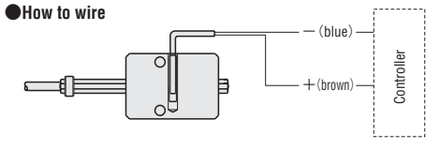
Alterations	Changes auto switch	Sets the protection cover at the lower part of the main body
Code	A93	DP
Spec.	Changes the type to the one with indicator lamp for operation check.	• Screw M4 tightening • Check bar position gets higher by 3mm.
¥/1Code	900	700

Auto switch product number	D—A93 (Made by SMC)	
Application load	Relay PLC	
Load voltage	DC24V	AC100V
Load current range and Max. load current	5—40mA	5—20mA
Indicator lamp	When the switch is on, the red light emitting diode illuminates	



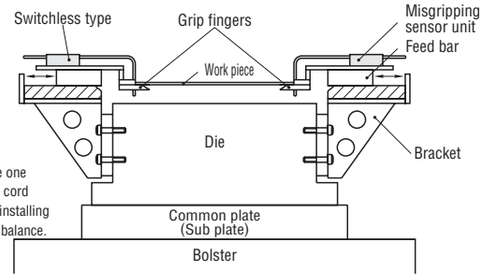
Stroke S	P
20	43

●How to wire



MGUA is N.O. (Normally ON) only.
The contact longevity may be shortened for the following cases, and the use of contact protection box CD-P11 or CD-P12 is strongly recommended.
①The use load is inductive load.
②The wire length is 5m or longer.
③The load voltage is AC100V or higher.

Example



●The switchless type is the one which has the switch and cord removed, and is used by installing it on the opposite side to balance.

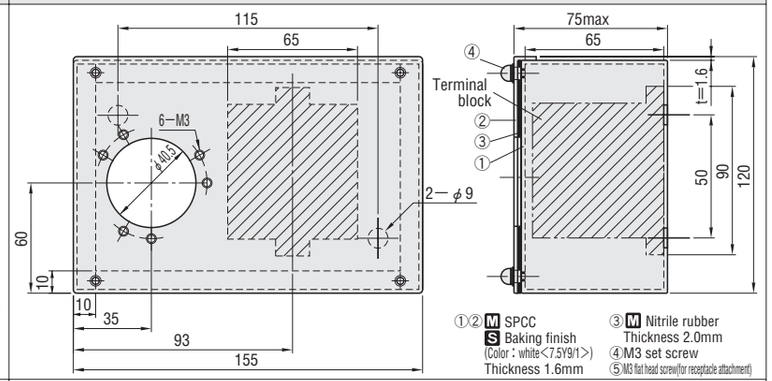
JUNCTION BOXES

DELIVERY SHORTENED

HOOK FOR TRANSPORTING DEVICE / CURL CORD HOOK

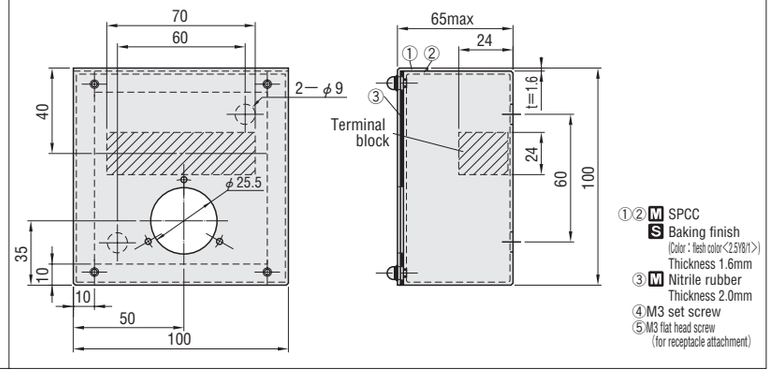
Type	View

JBX160 RoHS



①② M SPCC
S Baking finish
(Color : white<7.5Y9/1>)
Thickness 1.6mm
③ M Nitrile rubber
Thickness 2.0mm
④M3 set screw
⑤M3 flat head screw(for receptacle attachment)

JBX100 RoHS



①② M SPCC
S Baking finish
(Color : flesh color<2.5YR/1>)
Thickness 1.6mm
③ M Nitrile rubber
Thickness 2.0mm
④M3 set screw
⑤M3 flat head screw
(for receptacle attachment)

Receptacles	Terminal block spec.						Catalog No.		U/Price
Applicable spec.	Terminal block	Rated Voltage(V)	Rated Current(A)	Applicable cable	Terminal screw	Terminals	Type	No.	Q'ty : 1~9Sets
Nanaboshi Scientific NCS25□R	RTK—10M—8P	250	15	1.25mm²	M3	6	JBX	100	4,650
Nanaboshi Scientific NCS40□R	BNDH15LW	600	21	2mm²	M3.5	12		160	6,900

Order Catalog No. JBX 100

Delivery 1 Day
JBX is now in stock.

Price

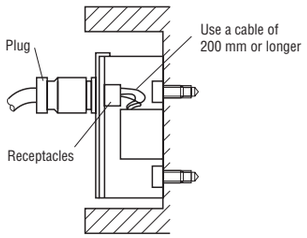
■Volume discount rate P.37

Quantity	1~9	10~29	30~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example

■Example of JBX attachment



When attaching the junction box to die, two M8 bolts should be passed through to the back of the box and fix. Please note that this product has no hole machined for sensor cable.

■Direction of receptacle key(JBX160)

<Vertical setting> <Horizontal setting>

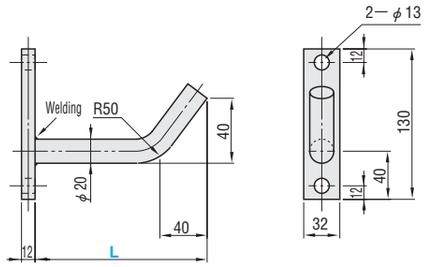
JBX160 has six holes for receptacle attachment tap in order to have the receptacle key direction downward whether it is set vertically or horizontally.

■Selection of receptaIce

Specify the type of receptacle that meets the specifications of your press machine.

Hook for transporting device RoHS

DVJ



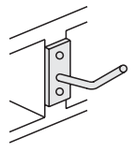
M SS400

Catalog No.		U/Price
Type	L	Q'ty : 1~19
DVJ	100	1,510
	150	1,580

Order Catalog No. DVJ 100

Delivery 1 Day

Example



Price

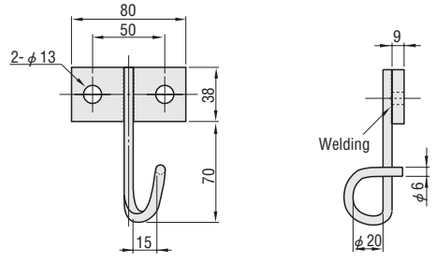
■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Curl cord hook RoHS

DKLH



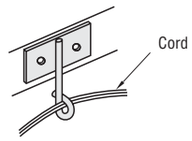
M SS400

Catalog No.		U/Price
Type	No.	Q'ty : 1~19
DKLH	80	1,260

Order Catalog No. DKLH 80

Delivery 1 Day

Example



Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

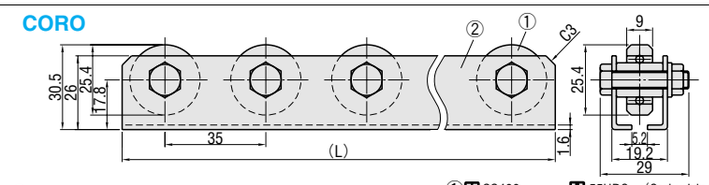
To be quoted on price & lead time above Max. Q'ty.

ROLLER CARRIERS / BALL CARRIERS

■Roller carriers

RoHS

CORO



The dimension (L) is a reference value.
Load resistance of a roller: 20kg/piece

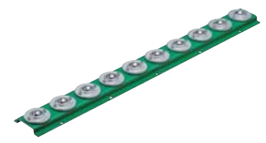
①M SS400
②M SPCC
H 55HRC～(Carburizing)

L	Catalog No.	A Number of Rollers	U/Price Q'ty:1～9
(105)	CORO	3	580
(140)		4	770
(175)		5	960
(210)		6	1,160
(245)		7	1,350
(280)		8	1,550
(315)		9	1,740
(350)		10	1,940
(385)		11	2,120
(420)		12	2,310
(455)		13	2,510
(490)		14	2,700
(525)		15	2,900

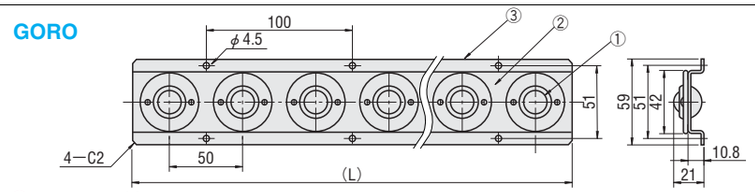
L	Catalog No.	A Number of Rollers	U/Price Q'ty:1～9
(560)	CORO	16	3,090
(595)		17	3,280
(630)		18	3,470
(665)		19	3,670
(700)		20	3,860
(735)		21	4,060
(770)		22	4,250
(805)		23	4,450
(840)		24	4,630
(875)		25	4,820
(910)		26	5,020
(945)		27	5,210
(980)		28	5,410

■Ball carriers

RoHS



GORO



The dimension (L) is a reference value.
Load resistance of a roller: 8kg/piece

①M SUJ2
②③M SPCC

L	Catalog No.	A Number of Rollers	U/Price Q'ty:1～9
(200)	GORO	4	2,900
(300)		6	4,350
(400)		8	5,650
(500)		10	6,950
(600)		12	8,250
(700)		14	9,550
(800)		16	10,850
(900)		18	12,150
(1000)		20	13,450
(1100)		22	14,750
(1200)		24	16,050

Order

Catalog No. — A

CORO — 10
GORO — 8

Delivery

3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

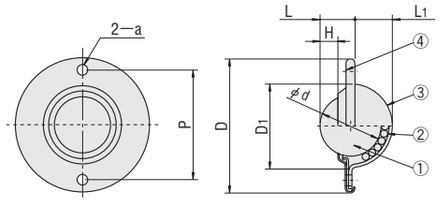
Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Ball carriers

RoHS

GORON



①②M SUJ2
③M SUS304
④M SPCC

Catalog No.	D	D1	L	L1	H	P	a	d	Load resistance N(kgf)	Weight (g)	U/Price Q'ty:1～9
GORON	41.3	24	10.2	(9.1)	4	30	3.5	15.875	78.4(8)	45	410

Order

Catalog No.

GORON

Delivery

3 Days

Express A 200/1Pc. P.38

A flat charge of 560 yen for 3 pieces or more of the same size.

Price

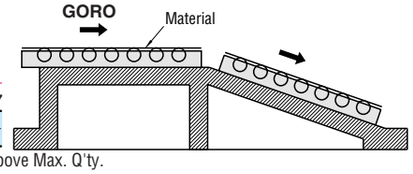
■Volume discount rate P.37

Quantity	1～9	10～19	20～29	30～50
Rate	—	5%	10%	15%

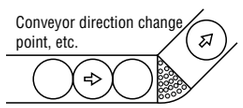
To be quoted on price & lead time above Max. Q'ty.

Example

CORO
GORO



GORON



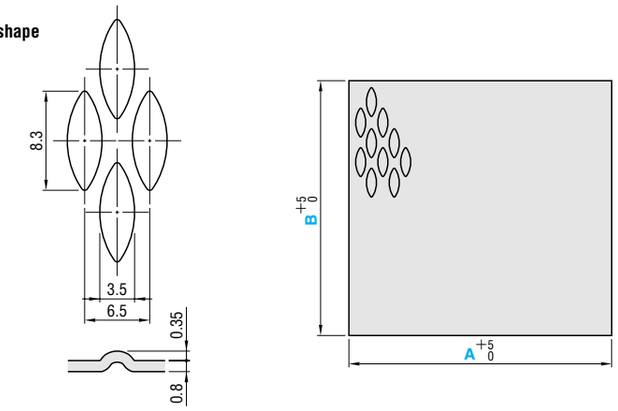
EMBOSSED SHOOTING PLATES

Price Revised
: New Price

RoHS

EBSP

■Surface shape



M SUS304

Catalog No.	A	B	U/Price
EBSP	500	1000	4,700
	1000	1000	8,000
		2000	15,000

Order

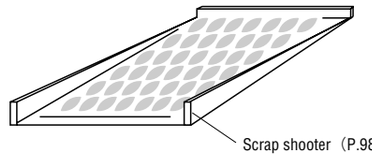
Catalog No. — A — B

EBSP — 500 — 1000

Delivery

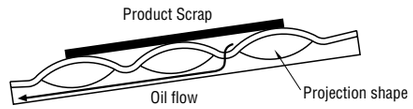
3 Days

Example



After cutting to the required dimensions, mount the scrap shooter, etc. by welding, etc.

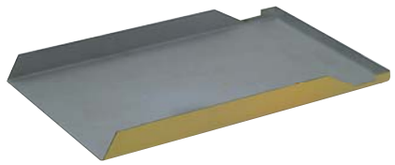
■Features

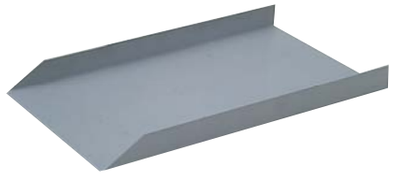


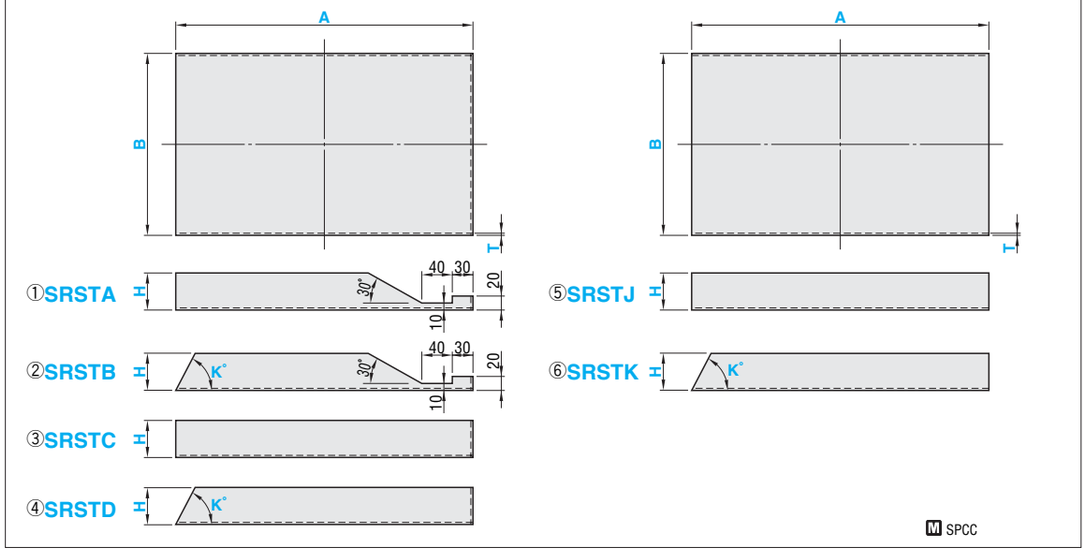
①Due to the small contact area with scrap, this product is suitable for scrap shooter which can not have angles (UP to 12°)

②Prevents absorption by lubricating oil.

SCRAP SHOOTERS







Catalog No. Type	T (Thickness)	A	B 10mm increments	H 5mm increments	K° Angle	COLOR	U/Price Q'ty:1～9 ①SRSTA ②SRSTB ③SRSTC ④SRSTD ⑤SRSTJ ⑥SRSTK								
							T1.6	T2.3	T3.2	T1.6	T2.3	T3.2	T1.6	T2.3	T3.2
①SRSTA ②SRSTB ③SRSTC ④SRSTD ⑤SRSTJ ⑥SRSTK	1.6	300	100 ～ 300	20～100	30	R(Red)	2,590	3,110	4,140	2,200	2,640	3,520	2,080	2,500	3,330
			310 ～ 600				3,490	4,190	5,580	2,960	3,550	4,730	2,800	3,360	4,490
			610 ～ 800				4,660	5,590	7,460	3,960	4,750	6,330	3,760	4,510	6,020
		400	100 ～ 300				2,770	3,330	4,430	2,350	2,820	3,770	2,230	2,680	3,570
			310 ～ 600				3,770	4,520	6,030	3,190	3,830	5,110	3,030	3,630	4,850
			610 ～ 800				5,060	6,080	8,100	4,300	5,160	6,880	4,080	4,900	6,530
		500	100 ～ 300				3,000	3,600	4,800	2,540	3,060	4,070	2,420	2,900	3,870
			310 ～ 600				4,090	4,910	6,550	3,470	4,160	5,560	3,290	3,950	5,270
			610 ～ 800				5,510	6,620	8,820	4,680	5,620	7,500	4,440	5,330	7,110
		600	100 ～ 300				3,470	4,160	5,560	2,950	3,540	4,720	2,790	3,350	4,480
			310 ～ 600				4,680	5,620	7,500	3,970	4,770	6,360	3,770	4,520	6,030
			610 ～ 800				6,250	7,500	10,000	5,310	6,370	8,490	5,040	6,040	8,060
	2.3	700	100 ～ 300			Y(Yellow)	3,820	4,570	6,100	3,230	3,870	5,170	3,070	3,670	4,910
			310 ～ 600				5,150	6,190	8,250	4,370	5,260	7,010	4,150	4,980	6,650
			610 ～ 800		60		6,910	8,290	11,050	5,860	7,040	9,380	5,570	6,690	8,920
	3.2	800	100 ～ 300			N(No coloring)	4,150	4,980	6,650	3,530	4,240	5,650	3,340	4,010	5,340
			310 ～ 600				5,630	6,750	9,010	4,770	5,730	7,640	4,540	5,450	7,260
			610 ～1000				7,550	9,070	12,080	6,410	7,690	10,260	6,080	7,300	9,740
		900	100 ～ 300				4,750	5,700	7,610	4,030	4,840	6,460	3,830	4,580	6,120
			310 ～ 600				6,380	7,660	10,220	5,420	6,500	8,670	5,140	6,180	8,230
			610 ～1000				8,490	10,190	13,590	7,210	8,650	11,540	6,750	8,110	10,810
		1000	100 ～ 300				5,190	6,230	8,310	4,400	5,280	7,050	4,170	5,010	6,680
			310 ～ 600				6,980	8,390	11,180	5,940	7,120	9,500	5,630	6,750	9,010
			610 ～1000				9,310	11,170	14,900	7,920	9,500	12,670	7,500	9,010	12,010
		1100	100 ～ 300				5,680	6,820	9,100	4,820	5,790	7,720	4,570	5,500	7,330
			310 ～ 600				7,660	9,180	12,240	6,500	7,810	10,400	6,180	7,420	9,880
			610 ～1000				10,210	12,250	16,350	8,670	10,400	13,880	8,230	9,880	13,180

Order: Catalog No. — A — B — H — K — COLOR
SRSTB 1.6 — 300 — 200 — H30 — K60 — Y

Delivery: 8 Days

Price

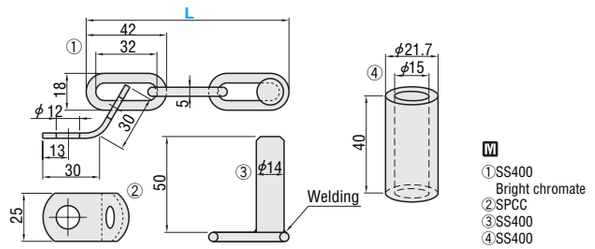
■Volume discount rate P.37

Quantity	1～9	10～29
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

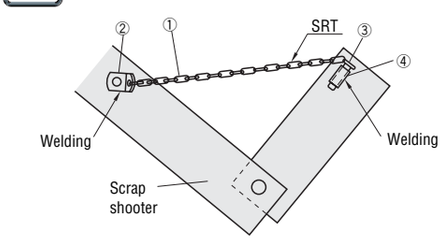
■Chains for scrap shooter

SRT
SRTN (③No pin welding)



Catalog No.	L	U/Price Q'ty:1～9 SRT	SRTN
SRT SRTN	200	1,270	1,070
	300	1,390	1,190
	400	1,510	1,310
	500	1,630	1,430

Example



Order: Catalog No. — L
SRT — 300

Delivery: 3 Days

Express T	600/1Pc.	P.38
Express A	300/1Pc.	

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

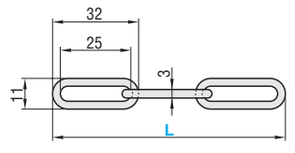
■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

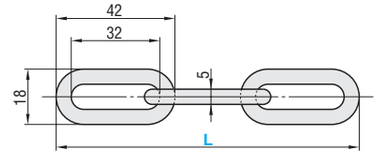
To be quoted on price & lead time above Max. Q'ty.

■General purpose chains

CN3 (Chain diameter= φ3)



CN5 (Chain diameter= φ5)



M SS400
S Bright chromate

Catalog No. Type	No.	L 100mm increments	U/Price Q'ty：1～9
CN	3	100～1000	340
		1100～2000	670
	5	100～1000	600
		1100～2000	1,190

Order: Catalog No. — L
CN 3 — 300

Delivery: 3 Days

Express T	600/1Pc.	P.38
Express A	300/1Pc.	

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

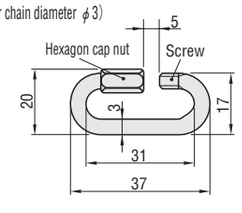
■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

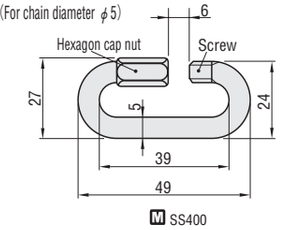
To be quoted on price & lead time above Max. Q'ty.

■Joints for chains

JT3 (For chain diameter φ3)



JT5 (For chain diameter φ5)



M SS400
S Bright chromate

Catalog No. Type	No.	U/Price Q'ty：1～9
JT	3	390
	5	470

Order: Catalog No.
JT 3

Delivery: 1 Day

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

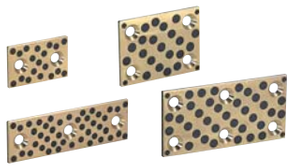
Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

OIL-FREE SLIDE PLATES

OIL-FREE SLIDE PLATES

Name / Catalog No.	OIL-FREE SLIDE PLATES —Casting 20mm, 2-bolt hole type—	OIL-FREE SLIDE PLATES —Casting 20mm, 4-bolt hole type—	OIL-FREE SLIDE PLATES —Copper alloy 20mm, 2-bolt hole type—	OIL-FREE SLIDE PLATES —Copper alloy 20mm, 4-bolt hole type—
Delivery	①	①	①	①
Page	993	993	994	994

OIL-FREE SLIDE PLATES —Copper alloy 10mm, 2-bolt hole type—	OIL-FREE SLIDE PLATES —Copper alloy 10mm, 4-bolt hole type—	SHIMS FOR OIL-FREE SLIDE PLATES SMP	COMPACT OIL-FREE SLIDE PLATES —Copper alloy 10mm type —
①	①	①	①
995	995	996	997



OIL-FREE THIN-WALL SLIDE PLATES —Copper alloy 5mm type—
①
998

OIL-FREE SLIDE PLATES —GUIDE—

■Oil-free slide plates guide

MISUMI's oil-free components are manufactured by impregnating special solid lubricant molybdenum disulfide (MoS_2) at appropriate place. Because the metal base material supports load, and the embedded solid lubricant provides lubricating action, the components show excellent durability under the severe conditions.

■Features

①It is effective where lubricant always must be supplied or where oil film is hard to form because of reciprocating motions or frequent startup and shutdown.

②Because it can be used in the oil-free condition, it does not require oil supply equipment and it can realize the reduction of assembly time and the environmental cleanup including oil pollution measures.

③It has excellent seizure resistance.

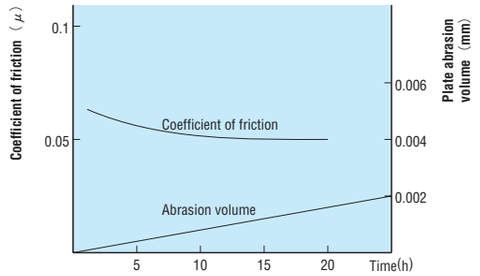
■Physical properties

M	Catalog No.	Allowable load N/mm²	Allowable sliding speed m/min	Limit PV value N/mm²·m/min	Specific gravity	Base material hardness (HB)	Tensile strength N/mm²
FC250+MoS_2	MWF・MWFT	8	15	50	7.1～7.3	＜241	250
Copper alloy+MoS_2	SEW・SEWT・STW・STWT・UTW	36～50	15～30	100	8.2	＞210	765

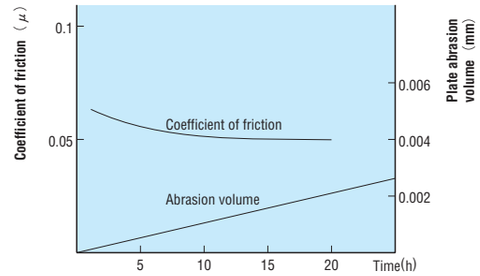
● kgf=N×0.101972

■Abrasion test graph

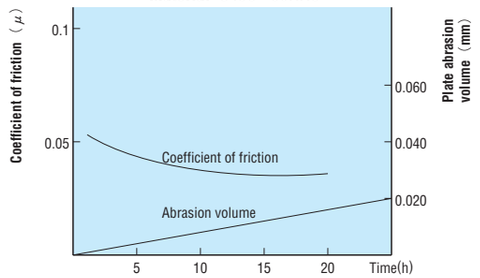
(MWF) **Load** 392N/cm²(40kgf/cm²)
Speed 150SPM(Continuous operation)
Stroke length 50mm
Material S45C 50HRC～



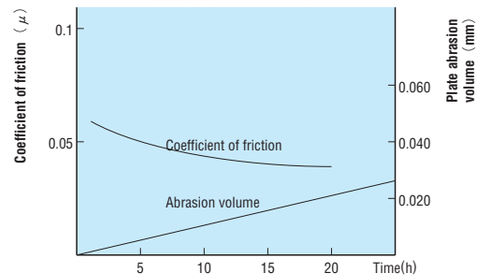
(MWF) **Load** 785N/cm²(80kgf/cm²)
Speed 150SPM(Continuous operation)
Stroke length 50mm
Material S45C 50HRC～



(SEW) **Load** 785N/cm²(80kgf/cm²)
Speed 150SPM(Continuous operation)
Stroke length 50mm
Material S45C 50HRC～



(SEW) **Load** 1569N/cm²(160kgf/cm²)
Speed 150SPM(Continuous operation)
Stroke length 50mm
Material S45C 50HRC～



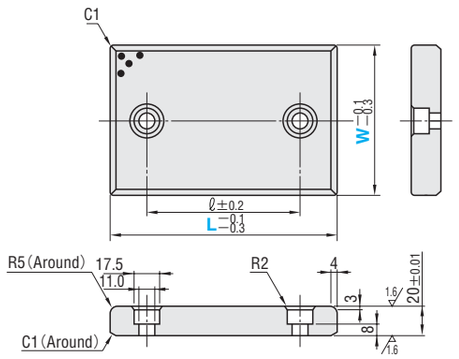
OIL-FREE SLIDE PLATES
—CASTING 20mm, 2-BOLT / 4-BOLT HOLE TYPE—

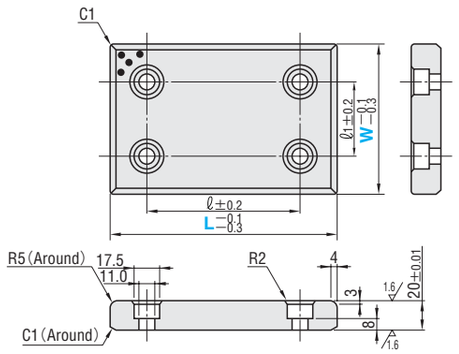
—2-bolt hole type— RoHS

MWF W= 28～ 75
MWFT W=100～150

—4-bolt hole type— RoHS

MWF W=100～200





※The long side's R is R2 when W=28, 38.

- The plate slides only in the direction of dimension L when W=28, 38.
- Initial greasing would make the guide plate work more effectively.

M FC250
MoS_2 (Buried)

ℓ	Catalog No.	W	L	U/Price Q'ty : 1～19
45	— 2-bolt hole type — MWF	28	75	720
50			100	820
75			125	980
100			150	1,030
150			200	1,400
45		38	75	800
50			100	920
75			125	1,080
100			150	1,100
150			200	1,550
45		48	75	820
50			100	1,020
75			125	1,170
100			150	1,300
150			200	1,780
45		58	75	940
50			100	1,160
100			150	1,380
25		75	75	960
50			100	1,250
75			125	1,400
100			150	1,550
150			200	1,860
50	— 2-bolt hole type — MWFT	100	100	1,570
75			125	1,800
100			150	2,030
150			200	2,480
200			250	2,930
75		125	125	2,230
100			150	2,310
150			200	2,850
200			250	3,370
100		150	150	2,620
150			200	3,290
200			250	3,970
250			300	5,890

ℓ	ℓ1	Catalog No.	W	L	U/Price Q'ty : 1～19
50	50	— 4-bolt hole type — MWF	100	100	1,620
75				125	1,850
100				150	2,080
150				200	2,530
200				250	2,980
75	50		125	125	2,280
100				150	2,360
150				200	2,900
200				250	3,420
100	100		150	150	2,670
150				200	3,340
200				250	4,020
250				300	5,940
150	150		200	200	5,830
200				250	7,070
250				300	8,260

Order

Catalog No.	W	—	L
MWF	75	—	100
MWFT	125	—	200

Delivery: 1 Day

Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Shims for Oil-free slide plates P.996

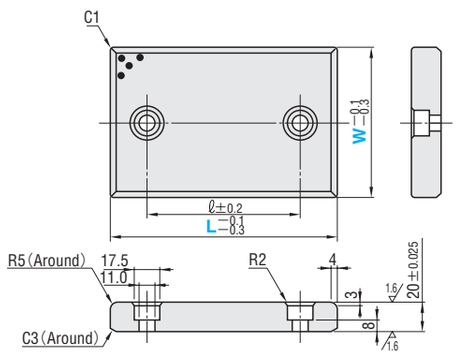
OIL-FREE SLIDE PLATES
—COPPER ALLOY 20mm, 2-BOLT / 4-BOLT HOLE TYPE—

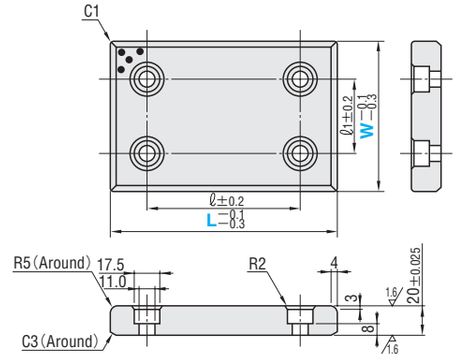
—2-bolt hole type— RoHS

SEW W= 28～ 75
SEWT W=100～150

—4-bolt hole type— RoHS

SEW W=100～150





※The long side's R is R2 when W=28, 38.

- The plate slides only in the direction of dimension L when W=28, 38.
- Initial greasing would make the guide plate work more effectively.

M CAC304
MoS_2 (Buried)

ℓ	Catalog No.	W	L	U/Price Q'ty : 1～19
45	— 2-bolt hole type — SEW	28	75	1,370
50			100	1,810
100			150	2,070
45		38	75	1,410
50			100	1,860
100			150	2,290
45		48	75	1,450
50			100	1,910
75			125	2,200
100			150	2,520
150			200	3,440
45		58	75	1,820
50			100	2,310
100			150	3,230
25		75	75	2,030
50			100	2,480
75			125	3,160
100			150	3,750
150			200	4,800
50	— 2-bolt hole type — SEWT	100	100	3,370
75			125	3,910
100			150	4,650
150			200	6,150
200			250	7,470
200			300	9,750
75		125	125	5,220
100			150	5,700
150			200	7,390
200			250	8,990
200			300	11,770
200			350	14,150
100		150	150	6,670
150			200	8,630
200			250	10,320

ℓ	ℓ1	Catalog No.	W	L	U/Price Q'ty : 1～19
50	50	— 4-bolt hole type — SEW	100	100	3,420
75				125	3,960
100				150	4,700
150				200	6,200
200				250	7,520
200				300	9,800
75	50		125	125	5,270
100				150	5,750
150				200	7,440
200				250	9,040
200				300	11,820
200				350	14,200
100	100		150	150	6,720
150				200	8,680
200				250	10,370

Order

Catalog No.	W	—	L
SEW	75	—	125
SEWT	150	—	200

Delivery: 1 Day

Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Shims for Oil-free slide plates P.996

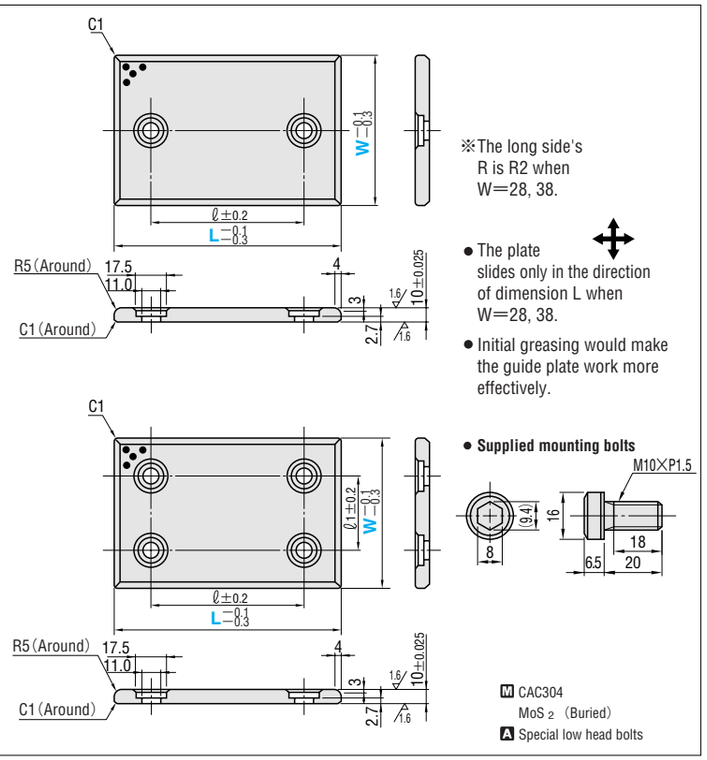
OIL-FREE SLIDE PLATES
—COPPER ALLOY 10mm, 2-BOLT / 4-BOLT HOLE TYPE—

—2-bolt hole type— RoHS

STW W= 28～ 75
STWT W=100～150

—4-bolt hole type— RoHS

STW W=100～150



※The long side's R is R2 when W=28, 38.

- The plate slides only in the direction of dimension L when W=28, 38.
- Initial greasing would make the guide plate work more effectively.
- **Supplied mounting bolts**

M CAC304
MoS 2 (Buried)
A Special low head bolts

ℓ	Catalog No.	W	L	U/Price Q'ty : 1～19
45	— 2-bolt hole type — STW	28	75	1,200
50			100	1,470
75			125	1,740
100			150	1,960
45		38	75	1,230
50			100	1,500
75			125	1,940
100			150	2,010
45		48	75	1,450
50			100	1,680
75			125	1,980
100			150	2,290
150			200	2,710
45		58	75	1,800
50			100	2,210
100			150	3,130
25		75	75	1,960
50			100	2,240
75			125	2,610
100			150	3,020
150			200	3,740
50	— 2-bolt hole type — STWT	100	100	2,920
75			125	3,510
100			150	3,880
150			200	4,810
200			250	5,720
100		125	150	4,670
150			200	5,870
200			250	6,890
100		150	150	5,470
150			200	6,770

ℓ	ℓ1	Catalog No.	W	L	U/Price Q'ty : 1～19
50	50	— 4-bolt hole type — STW	100	100	2,970
75				125	3,560
100				150	3,930
150				200	4,860
200				250	5,770
100	50		125	150	4,720
150				200	5,920
200				250	6,940
100	100		150	150	5,520
150				200	6,820

Order

Catalog No.	W	—	L
STW	75	—	100
STWT	100	—	200

Delivery: 1 Day

Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Shims for Oil-free slide plates P.996

SHIMS FOR OIL-FREE SLIDE PLATES

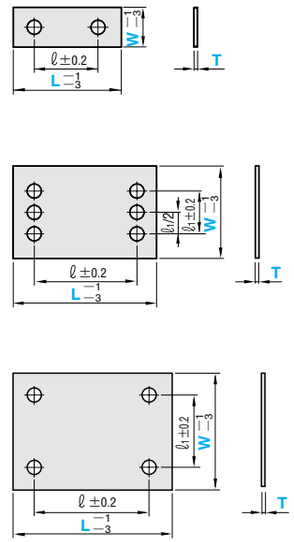
RoHS

SMP

W=28～75 (2-bolt hole type)

W=100～150 (For both types)

W=200 (4-bolt hole type)



T	T
0.05	±0.01
0.1	±0.02

M SUS304

ℓ	ℓ1	Catalog No.	W	L	T	U/Price Q'ty : 1～19
45	—	SMP	28	75	0.05	190
50				100		200
75				125		210
100				150		230
150				200		250
45			38	75		200
50				100		210
75				125		220
100				150		240
150				200		260
45			48	75		210
50				100		220
75				125		230
100				150	0.1	250
150				200		270
45			58	75		220
50				100		240
100				150		260
25			75	75		230
50				100		240
75				125		250
100				150		260
150				200		280

ℓ	ℓ1	Catalog No.	W	L	T	U/Price Q'ty : 1～19
50	50	SMP	100	100	0.05	260
75				125		270
100				150		300
150				200		320
200				250		340
200				300		370
75	50		125	125		290
100				150		300
150				200		330
200				250		370
200				300		390
200				350	0.1	400
100	100		150	150		320
150				200		350
200				250		380
250				300		400
150	150		200	200		360
200				250		390
250				300		420

Order

Catalog No.	W	—	L	—	T
SMP	75	—	100	—	0.1

Delivery: 1 Day

Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

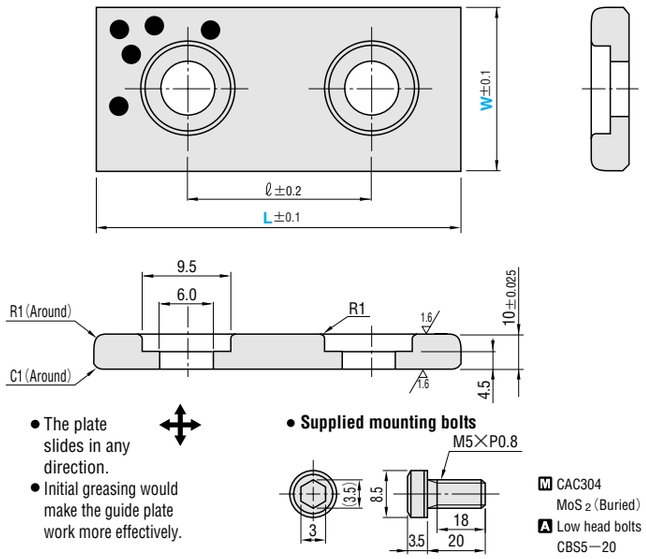
■Applicable Oil-free slide plate

- MWF · MWFT P.993
- SEW · SEWT P.994
- STW · STWT P.995

COMPACT OIL-FREE SLIDE PLATES
—COPPER ALLOY 10mm TYPE—

RoHS

STS



- The plate slides in any direction.
- Initial greasing would make the guide plate work more effectively.

- Supplied mounting bolts

M CAC304
MoS 2 (Buried)
A Low head bolts
CBS5—20

ℓ	Catalog No.	W	L	U/Price Q'ty : 1～19
14	STS	15	30	1,100
20			40	1,200
30			50	1,300
50			75	1,400
14		18	30	1,300
20			40	1,400
30			50	1,500
50			75	1,600
14		22	30	1,500
20			40	1,600
30			50	1,700
50			75	1,800

Order — Catalog No. STS | W 18 | L 50

Delivery — 1 Day

Price

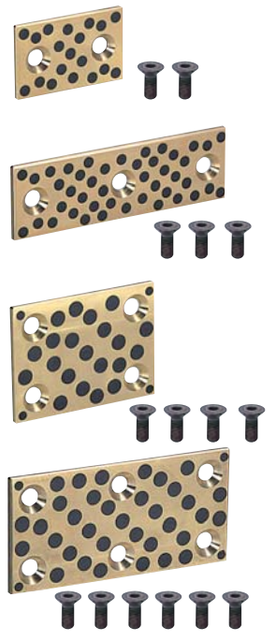
■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

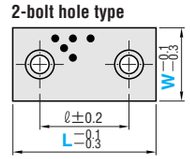
OIL-FREE THIN-WALL SLIDE PLATES
—COPPER ALLOY 5mm TYPE—

RoHS

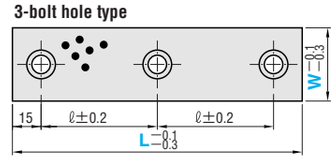


UTW

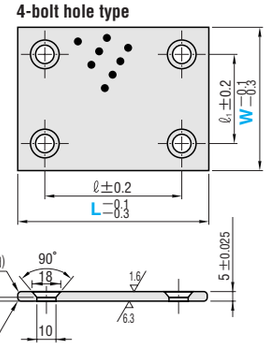
2-bolt hole type



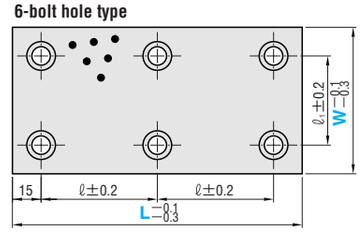
3-bolt hole type



4-bolt hole type

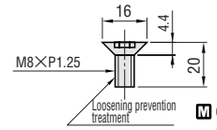


6-bolt hole type



About "Loosening Prevention Treatment"
The thread grooves are coated with a special resin that has superior elasticity, as well as, resistance to abrasion and oil. The effectiveness of the treatment is at maximum from the initial through the fourth run, after which it gradually diminishes.

- Supplied mounting bolts



- The plate slides in any direction.

M CAC304
MoS 2 (Buried)
A Special hexagon socket head countersunk screws

Bolt hole type	ℓ	ℓ1	Catalog No.	W	L	U/Price Q'ty : 1～19
2-bolt hole type	20	—	UTW	28	50	1,170
	45				75	1,390
	70				100	1,590
3-bolt hole type	60				150	2,070
2-bolt hole type	20	—		38	50	1,360
	45				75	1,570
	70				100	1,850
3-bolt hole type	60				150	2,550
2-bolt hole type	45	—		48	75	1,680
	70				100	1,890
	95				125	2,370
3-bolt hole type	60				150	2,670
4-bolt hole type	45	45		75	75	2,200
	70				100	2,570
	95				125	3,110
6-bolt hole type	60				150	3,650
4-bolt hole type	70	70		100	100	3,400
	95				125	4,000
6-bolt hole type	60				150	4,760

Order — Catalog No. UTW | W 75 | L 100

Delivery — 1 Day

Price

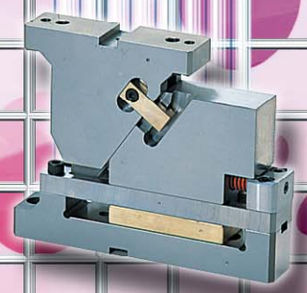
■Volume discount rate P.37

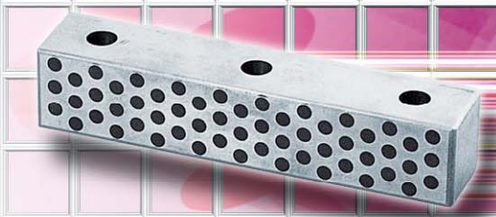
Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

COMPONENTS OF CAMS





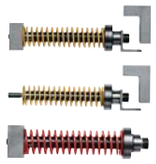
COMPONENTS OF CAMS

Name	OIL-FREE FLYING CAM UNIT— V type—				OIL-FREE UNDER CAM UNIT
Catalog No.	MFV48—□	MFV65—□	MFV68—□	MFV80—□	MUC50—□
Delivery	⑤	⑤	⑤	⑤	⑤
Page	1003～1036				1037～1040

CAM SLIDE PLATES	CAM SIDE PLATES	CAM UPPER PLATES	CAM SIDE BLOCKS
CSLA	CSLP	CUPF_CUPW	CSBL
①	①	①	①
1041	1041	1042	1042

CAM STROKE PLATES—30°type—	—15°type—	CAM BOTTOM GUIDE PLATE	CAM BOTTOM SLIDE PLATE
CS30W_CS30F	CS15W_CS15F	CBG	CBP
①	①	①	①
1043	1044	1045	1045

CAM COMPULSORY RETURNING FOLLOWER	CAM COMPULSORY RETURNING BLOCK	CAM STOPPER	SILENCER URETHANES	
CKF	CKB	CCS	CCUC	CCUR
①	①	①	①	①
1046	1046	1047	1048	



RETURNING UNITS FOR CAM SLIDER	SPRING GUIDE UNITS	WASHERS	COMPACT CAMS	PUNCHES FOR COMPACT CAM
CUKI_CUKS_CUKA	CUK	CUP_CUR	KPAR_KPFR	UN□□
③	③	①	③Ⓐ	③Ⓐ
1049	1051	1052	1053	1054

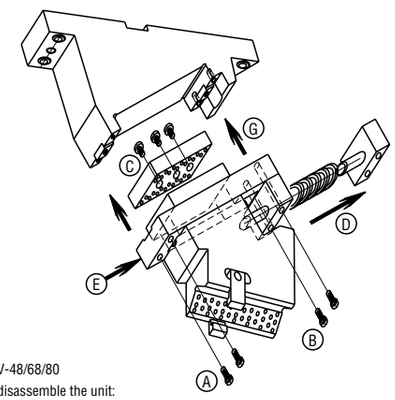
OIL-FREE FLYING CAM UNIT / UNDER CAM UNIT —GUIDE—

■Oil-free flying cam unit standard categories and specifications

Page	Catalog No.	Processing stroke	Processing capacity kN (ton)	Space for punch mount W mm	Space for punch mount H mm	Cam returning pressure N (kg)	Overall dimensions (under pressing) W mm	Overall dimensions (under pressing) H mm	Overall dimensions (under pressing) L mm	Weight kg	U/Price
P.1003	MFV48-0	19.2	14.7 (1.5)	48	62	784 (80.0)	48	160	215	7.0	45,000
P.1004	MFV48-5	20.6									
P.1005	MFV48-10	22.0									
P.1006	MFV48-15	23.5									
P.1007	MFV48-20	25.0									
P.1008	MFV48-30	28.4									
P.1009	MFV48-40	32.6									
P.1010	MFV48-50	38.9									
P.1011	MFV48-60	50.0									
P.1012	MFV65-0	15.0	14.7 (1.5)	65	65	657 (67.0)	65	180	190	9.0	67,000
P.1013	MFV65-5	15.1									
P.1014	MFV65-10	15.2							185		
P.1015	MFV65-15	15.5									
P.1016	MFV65-20	16.5									
P.1017	MFV65-30	18.5									
P.1018	MFV65-40	21.6									
P.1019	MFV65-50	26.6						185			
P.1020	MFV65-60	36.2						195	195		
P.1021	MFV68-0	33.9	29.4 (3.0)	68	85	1000 (102.0)	68	200	280	16.0	76,000
P.1022	MFV68-5	36.9									
P.1023	MFV68-10	39.9									
P.1024	MFV68-20	46.3									
P.1025	MFV68-30	53.5									
P.1026	MFV68-40	62.4									
P.1027	MFV68-50	74.7									
P.1028	MFV68-60	96.0									
P.1029	MFV80-0	32.1	29.4 (3.0)	80	80	784 (80.0)	80	270	270	22.0	86,000
P.1030	MFV80-5	35.5									
P.1031	MFV80-10	38.9								23.0	
P.1032	MFV80-20	46.1								22.0	
P.1033	MFV80-30	54.3								21.0	
P.1034	MFV80-40	64.3								20.0	
P.1035	MFV80-50	77.8								19.0	
P.1036	MFV80-60	100.0								20.0	

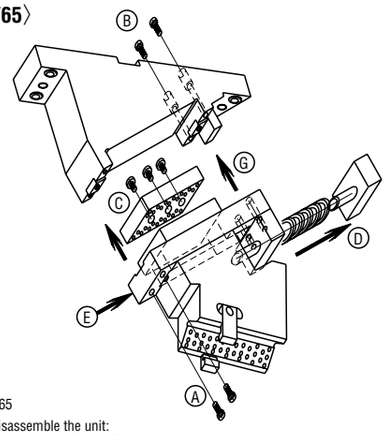
■Flying cam unit parts disassembly

〈MFV48, 68, 80〉



MFV-48/68/80
To disassemble the unit:
Remove bolts Ⓐ and Ⓑ.
Remove them by holding up Ⓐ side of cam slide first.
It is fully disassembled when bolt Ⓒ is removed.
To re-assemble
Locate side Ⓖ first,
temporarily tighten bolts Ⓐ and Ⓑ
then fully tighten them from direction Ⓔ.
Note : When re-assembling, apply grease to the sliding surface.

〈MFV65〉

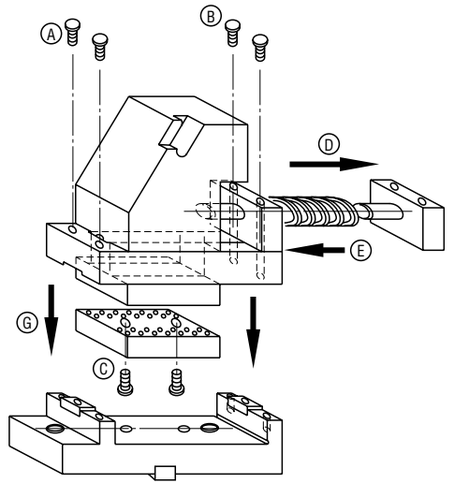


MFV65
To disassemble the unit:
Remove bolts Ⓐ and Ⓑ.
Remove them by holding up Ⓐ side of cam slide first.
It is fully disassembled when bolt Ⓒ is removed.
To re-assemble
Locate side Ⓖ first,
temporarily tighten bolts Ⓐ and Ⓑ
then fully tighten them from direction Ⓔ.
Note : When re-assembling, apply grease to the sliding surface.

■Oil-free under cam unit standard categories and specifications

Page	Catalog No.	Processing stroke	Processing capacity kN (ton)	Space for punch mount W mm	Space for punch mount H mm	Cam returning pressure N (kg)	Overall dimensions (under pressing) W mm	Overall dimensions (under pressing) H mm	Overall dimensions (under pressing) L mm	Weight kg	U/Price
P.1037	MUC50-0	60.0	19.6 (2.0)	50	68	430 (43.9)	50	210	275	14.0	44,000
P.1038	MUC50-5							215			49,000
P.1039	MUC50-10							220			49,000
P.1040	MUC50-15							225		16.0	49,000

■Analysis of under cam unit



MCU50—0°/5°/10°/15°
To disassemble the unit:
Remove bolts Ⓐ and Ⓑ.
Remove it by holding up Ⓐ or Ⓑ of cum slide.
Spring part is removable when side Ⓓ is free.
It is fully disassembled when bolt Ⓒ is removed.
To re-assemble
After fully tightening the bolt Ⓒ,
locate side Ⓖ first.
Spring part is attachable if Ⓓ side is free
when bolts Ⓐ and Ⓑ are temporarily tightened
Fully tighten it by pushing from direction Ⓔ.
Note : When re-assembling, apply grease to the sliding surface for;
Smoothing sliding surface
Preventing troubles of sliding surface
Rust prevention of sliding surface
Prevention of foreign body entry
Lubricated grease is highly recommended (Ex. Molybdenum Paste 300).

■Thickness/Hole diameter and punching force

Units : kN (ton)

Punch Diameter \ Thickness	0.6 t	0.7 t	0.8 t	1.0 t	1.2 t	1.4 t	1.6 t	1.8 t	2.0 t	2.3 t
ϕ 3	0.78(0.08)	2.25(0.23)	2.94(0.30)	3.37(0.38)	4.41(0.45)	5.20(0.53)	5.88(0.60)	6.67(0.68)	7.35(0.75)	8.35(0.87)
ϕ 4	2.94(0.30)	3.43(0.35)	3.92(0.40)	4.90(0.50)	5.88(0.60)	6.86(0.70)	7.84(0.80)	8.82(0.90)	9.80(1.00)	11.37(1.16)
ϕ 5	3.73(0.38)	4.31(0.44)	4.90(0.50)	6.18(0.63)	7.35(0.75)	8.63(0.88)	9.90(1.01)	11.08(1.13)	12.36(1.26)	14.22(1.45)
ϕ 6	4.41(0.45)	5.20(0.53)	5.88(0.60)	7.35(0.75)	8.82(0.90)	10.39(1.06)	10.98(1.12)	13.33(1.36)	14.80(1.51)	16.96(1.73)
ϕ 8	5.88(0.60)	6.86(0.70)	7.85(0.80)	9.90(1.01)	11.87(1.21)	13.82(1.41)	15.79(1.61)	17.75(1.81)	19.71(2.01)	22.65(2.31)
ϕ 10	7.35(0.75)	8.63(0.88)	9.90(1.01)	12.36(1.26)	14.81(1.51)	17.25(1.76)	19.71(2.01)	22.16(2.26)	24.61(2.51)	28.34(2.89)
ϕ 13	9.61(0.98)	11.18(1.14)	12.85(1.31)	15.98(1.63)	19.22(1.96)	22.54(2.29)	25.60(2.61)	28.82(2.94)	32.07(3.27)	36.87(3.76)
ϕ 16	11.86(1.21)	13.82(1.41)	15.79(1.61)	19.71(2.01)	23.63(2.41)	27.55(2.81)	31.58(3.22)	35.49(3.62)	39.42(4.02)	45.31(4.62)
ϕ 20	14.80(1.51)	17.25(1.76)	19.71(2.01)	24.61(2.51)	29.62(3.02)	34.51(3.52)	39.42(4.02)	44.31(4.52)	49.33(5.03)	56.68(5.78)
ϕ 25	18.43(1.88)	21.57(2.20)	24.61(2.51)	30.79(3.14)	36.79(3.77)	43.14(4.40)	49.33(5.03)	54.51(5.56)	61.59(6.28)	70.90(7.23)
ϕ 32	23.63(2.41)	27.55(2.81)	31.57(3.22)	39.41(4.02)	47.25(4.82)	55.20(5.63)	63.04(6.43)	70.88(7.23)	78.82(8.04)	90.59(9.24)
ϕ 38	28.04(2.86)	32.75(3.34)	37.45(3.82)	46.76(4.77)	56.18(5.73)	65.49(6.68)	74.90(7.64)	84.22(8.59)	97.55(9.95)	107.65(10.98)

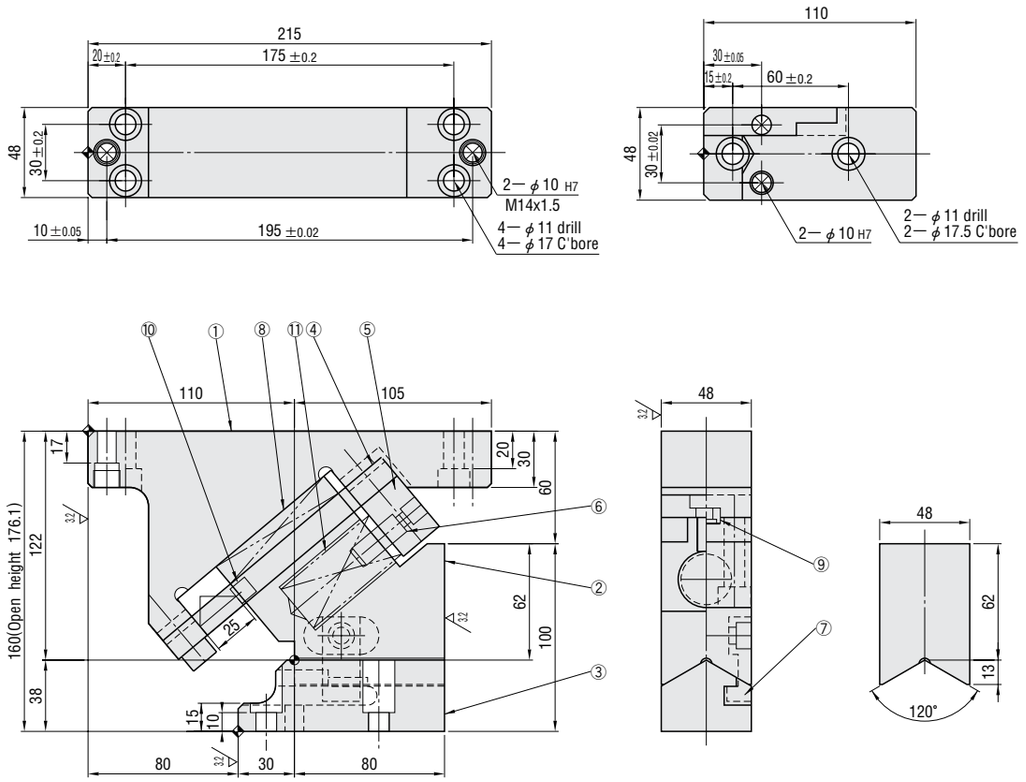
• Punching force {kN (ton)} = Punch circumference (mm) × Plate thickness (t) × Shear Stress {392N/mm² (40kgf/mm²)} ÷1000

OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
48mm	0°	1.5t	19.2mm

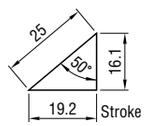
MFV48-0

RoHS



- Cam diagram

Final pressure : 784N {80.0kg}



Initial pressure : 104N {10.6kg}

- Processing capacity : 14.7kN {1.5ton}
- Processing stroke : 19.2mm
- Inclination : 0°
- Cam returning pressure
  Initial pressure : 104N {10.6kg}
  Final pressure : 784N {80.0kg}
- Unit weight : 7kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	12M48M75
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ10×10
11	Cam spring	Spring steel	1	SWL27-90

Order — Catalog No. MFV48-0

Delivery — 5 Days

Price

U/Price
45,000

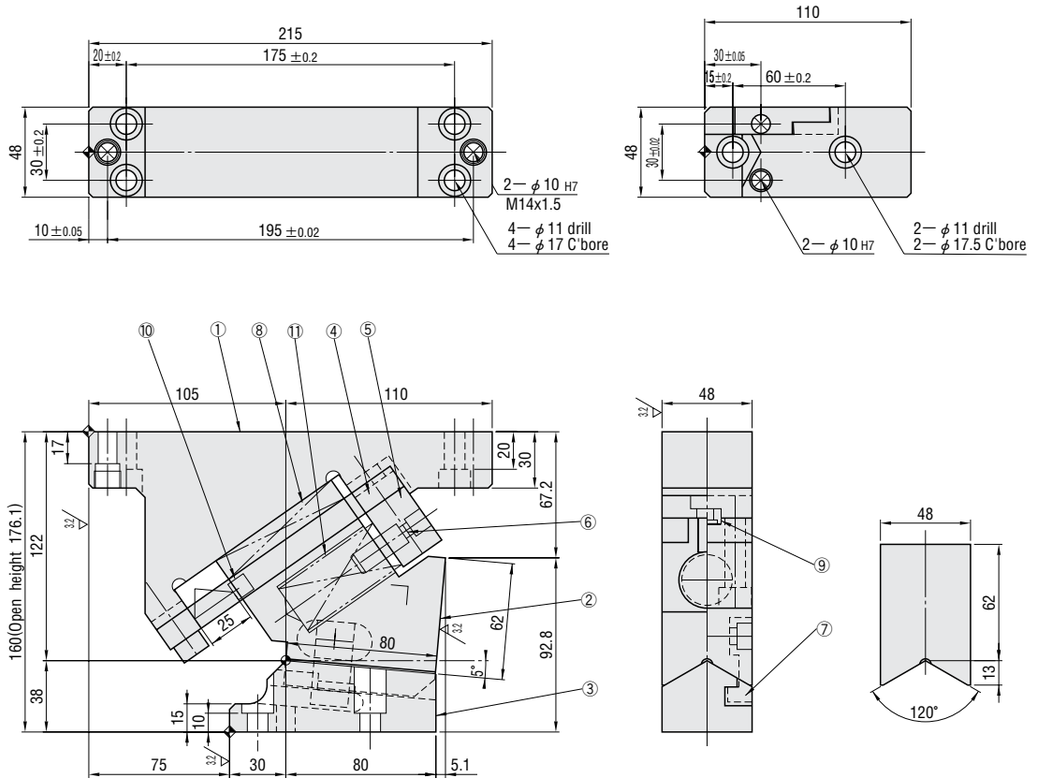
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
48mm	5°	1.5t	20.6mm

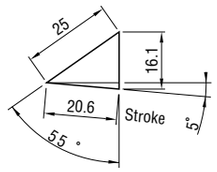
MFV48-5

RoHS



- Cam diagram

Final pressure : 784N {80.0kg}



Initial pressure : 104N {10.6kg}

- Processing capacity : 14.7kN {1.5ton}
- Processing stroke : 20.6mm
- Inclination : 5°
- Cam returning pressure
  Initial pressure : 104N {10.6kg}
  Final pressure : 784N {80.0kg}
- Unit weight : 7kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	12×48×75
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ10×10
11	Cam spring	Spring steel	1	SWL27-90

Order — Catalog No. MFV48-5

Delivery — 5 Days

Price

U/Price
45,000

To be quoted on price & lead time above Max. Q'ty.

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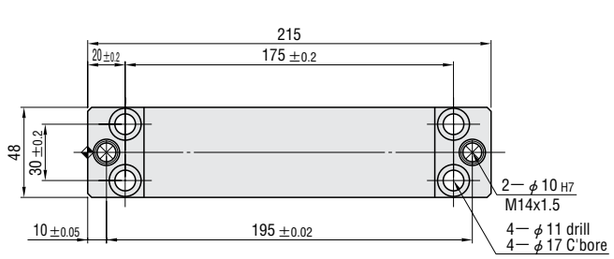
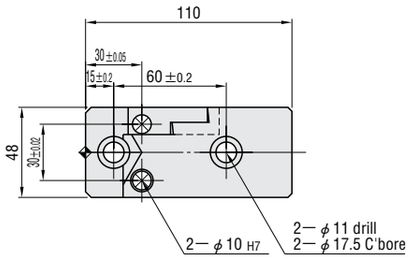
OIL-FREE FLYING CAM UNIT
—V TYPE—

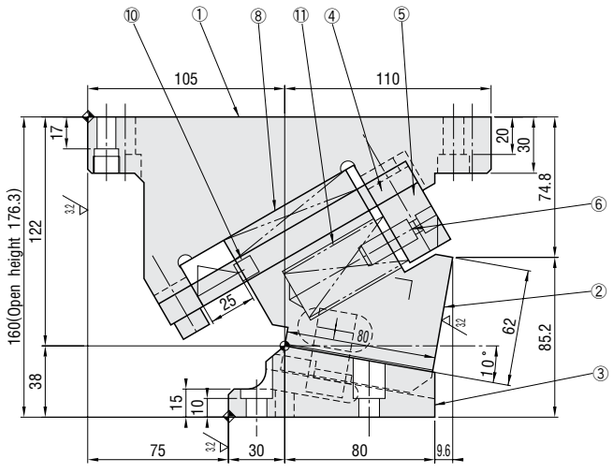
Space	Inclination	Processing capacity	Processing stroke
48mm	10°	1.5t	22.0mm

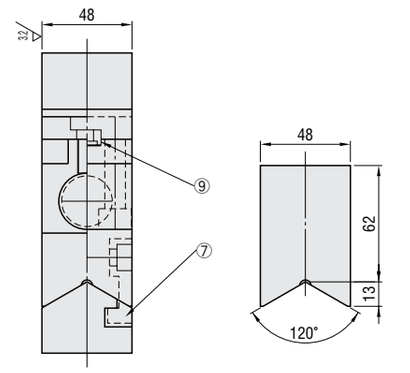
MFV48-10

RoHS



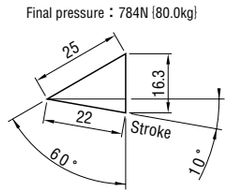






No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	12×48×75
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ10×10
11	Cam spring	Spring steel	1	SWL27-90

- Cam diagram



Initial pressure : 104N {10.6 kg}

- Processing capacity : 14.7kN {1.5ton}
- Processing stroke : 22.0mm
- Inclination : 10°
- Cam returning pressure
  - Initial pressure : 104N {10.6kg}
  - Final pressure : 784N {80.0kg}
- Unit weight : 7kg

Order — Catalog No. MFV48-10

Delivery — 5 Days

Price — U/Price 45,000

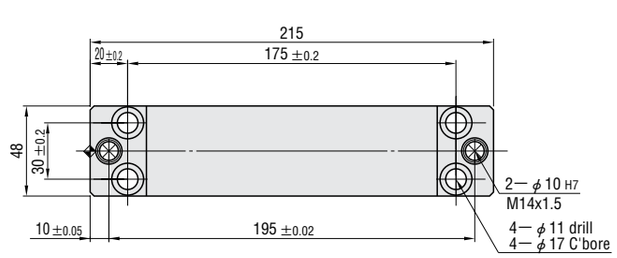
To be quoted on price & lead time above Max. Q'ty.

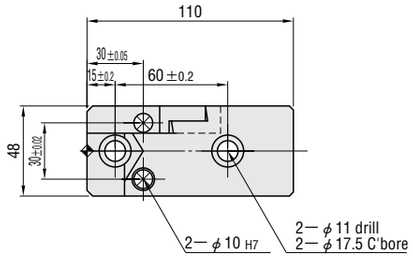
OIL-FREE FLYING CAM UNIT
—V TYPE—

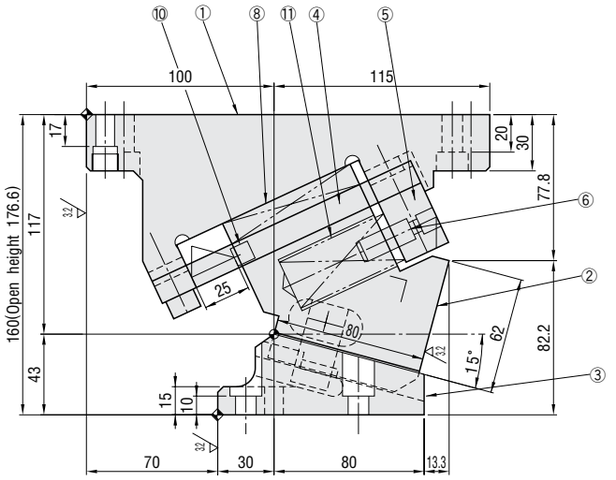
Space	Inclination	Processing capacity	Processing stroke
48mm	15°	1.5t	23.5mm

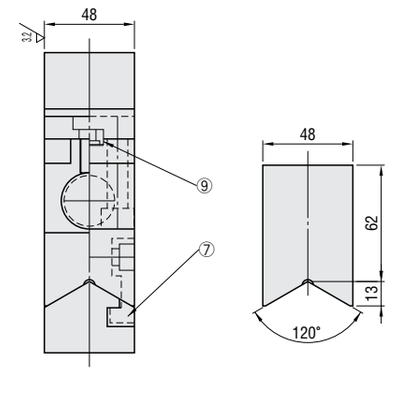
MFV48-15

RoHS



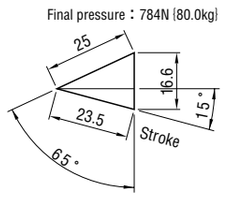






No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	12×48×75
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ10×10
11	Cam spring	Spring steel	1	SWL27-90

- Cam diagram



Initial pressure : 104N {10.6 kg}

- Processing capacity : 14.7kN {1.5ton}
- Processing stroke : 23.5mm
- Inclination : 15°
- Cam returning pressure
  - Initial pressure : 104N {10.6kg}
  - Final pressure : 784N {80.0kg}
- Unit weight : 7kg

Order — Catalog No. MFV48-15

Delivery — 5 Days

Price — U/Price 45,000

To be quoted on price & lead time above Max. Q'ty.

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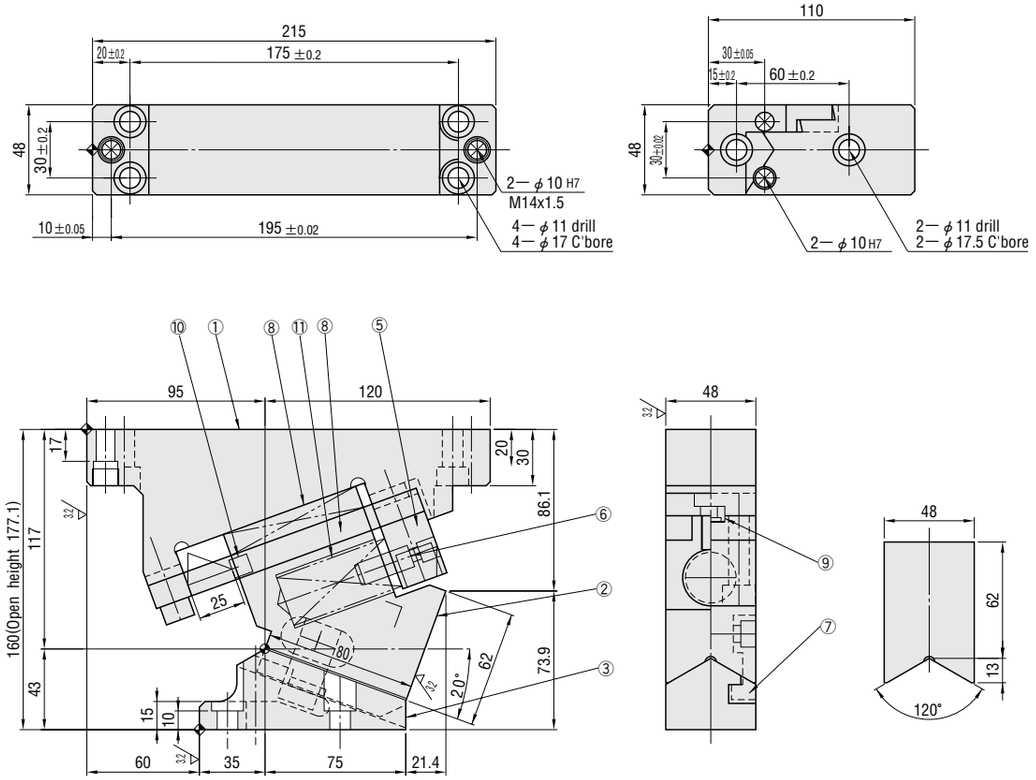
OIL-FREE FLYING CAM UNIT —V TYPE—

Space	Inclination	Processing capacity	Processing stroke
48mm	20°	1.5t	25.0mm

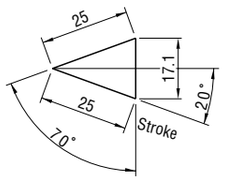
MFV48-20

RoHS



- Cam diagram

Final pressure：784N {80.0kg}



Initial pressure：104N {10.6 kg}

- Processing capacity：14.7kN {1.5ton}
- Processing stroke：25.0mm
- Inclination：20°
- Cam returning pressure
  Initial pressure：104N {10.6kg}
  Final pressure：784N {80.0kg}
- Unit weight：7kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	12×48×75
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ10×10
11	Cam spring	Spring steel	1	SWL27-90

Order Catalog No. MFV48-20

Delivery 5 Days

Price U/Price 45,000

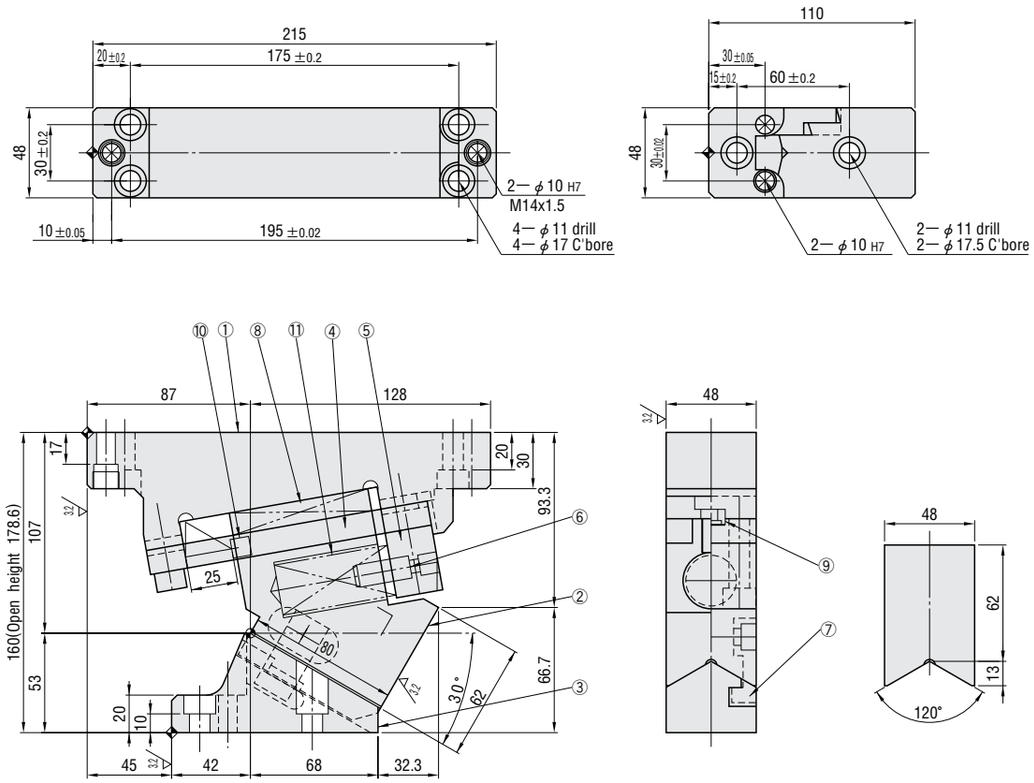
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT —V TYPE—

Space	Inclination	Processing capacity	Processing stroke
48mm	30°	1.5t	28.4mm

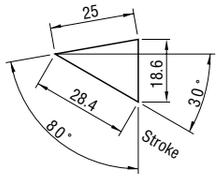
MFV48-30

RoHS



- Cam diagram

Final pressure：784N {80.0kg}



Initial pressure：104N {10.6 kg}

- Processing capacity：14.7kN {1.5ton}
- Processing stroke：28.4mm
- Inclination：30°
- Cam returning pressure
  Initial pressure：104N {10.6kg}
  Final pressure：784N {80.0kg}
- Unit weight：7kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	12×48×75
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ10×10
11	Cam spring	Spring steel	1	SWL27-90

Order Catalog No. MFV48-30

Delivery 5 Days

Price U/Price 45,000

To be quoted on price & lead time above Max. Q'ty.

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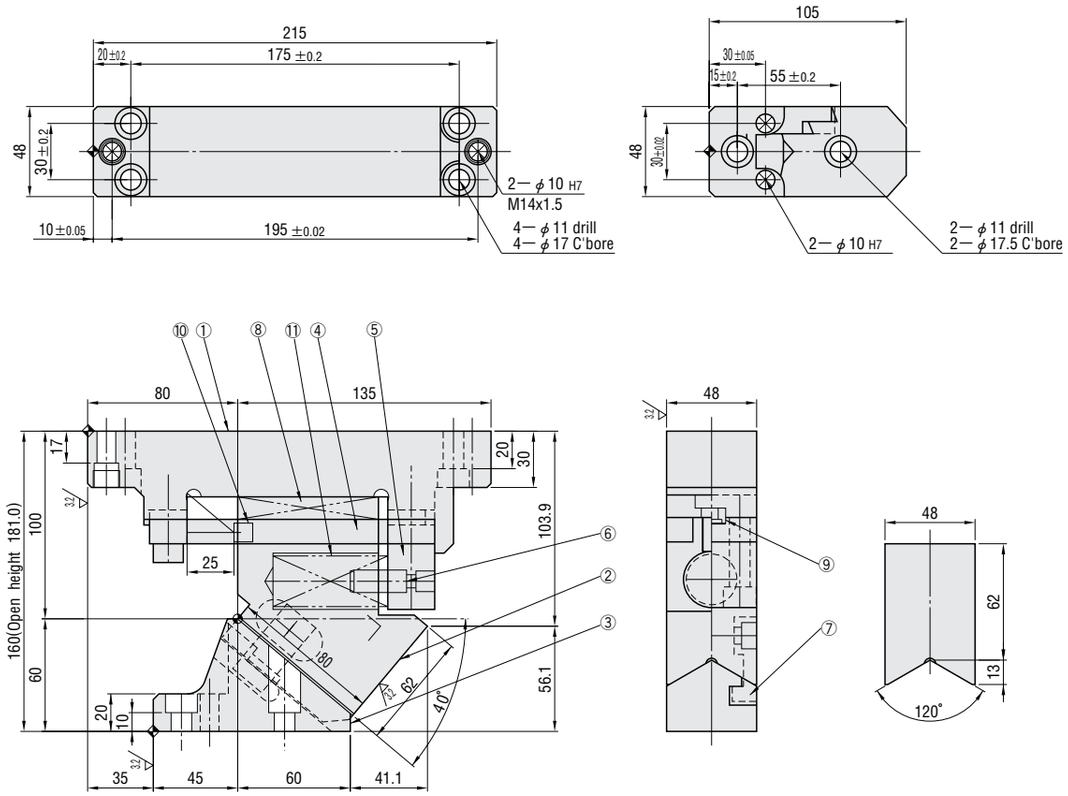
OIL-FREE FLYING CAM UNIT
—V TYPE—

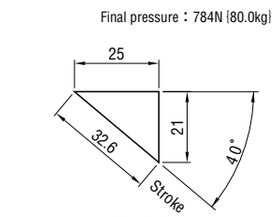
Space	Inclination	Processing capacity	Processing stroke
48mm	40°	1.5t	32.6mm

MFV48-40

RoHS



- Cam diagram



- Processing capacity：14.7kN {1.5ton}
- Processing stroke：32.6mm
- Inclination：40°
- Cam returning pressure
  Initial pressure：104N {10.6kg}
  Final pressure：784N {80.0kg}
- Unit weight：7kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	12×48×75
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ10×10
11	Cam spring	Spring steel	1	SWL27-90

Order **Catalog No.** MFV48-40

Delivery **5** Days

Price **U/Price** 45,000

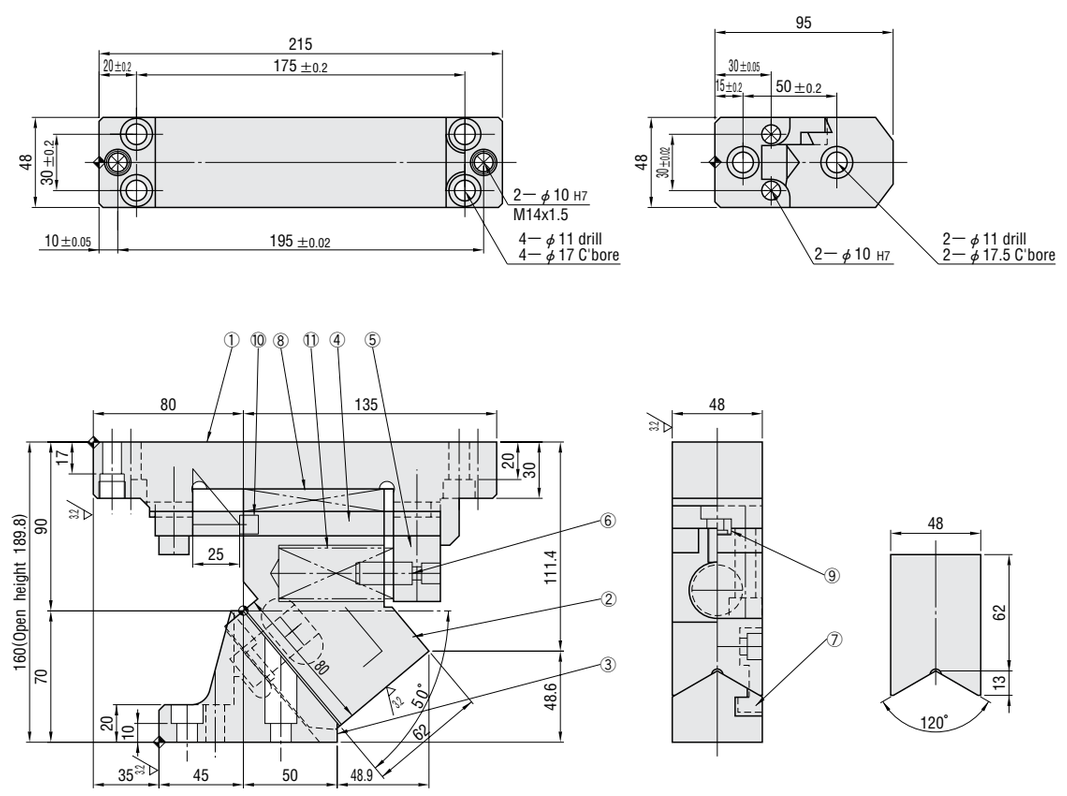
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT
—V TYPE—

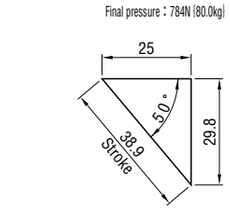
Space	Inclination	Processing capacity	Processing stroke
48mm	50°	1.5t	38.9mm

MFV48-50

RoHS



- Cam diagram



- Processing capacity：14.7kN {1.5ton}
- Processing stroke：38.9mm
- Inclination：50°
- Cam returning pressure
  Initial pressure：104N {10.6kg}
  Final pressure：784N {80.0kg}
- Unit weight：7kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	12×48×75
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ10×10
11	Cam spring	Spring steel	1	SWL27-90

Order **Catalog No.** MFV48-50

Delivery **5** Days

Price **U/Price** 45,000

To be quoted on price & lead time above Max. Q'ty.

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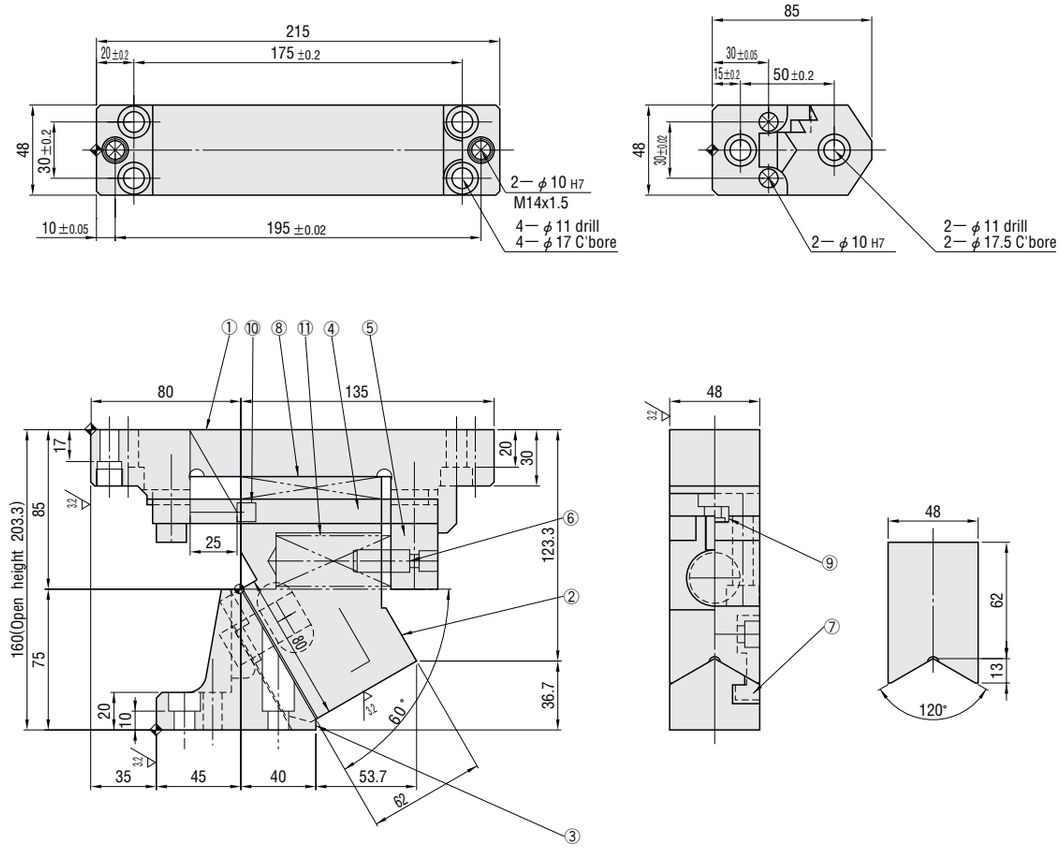
OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
48mm	60°	1.5t	50.0mm

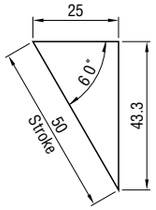
MFV48-60

RoHS



- Cam diagram

Final pressure : 784N {80.0kg}



Initial pressure : 104N {10.6kg}

- Processing capacity : 14.7kN {1.5ton}
- Processing stroke : 50.0mm
- Inclination : 60°
- Cam returning pressure
  Initial pressure : 104N {10.6kg}
  Final pressure : 784N {80.0kg}
- Unit weight : 7kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	12×48×75
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ 10×10
11	Cam spring	Spring steel	1	SWL27-90

Order — Catalog No. MFV48-60 — Delivery 5 Days — Price — U/Price 45,000

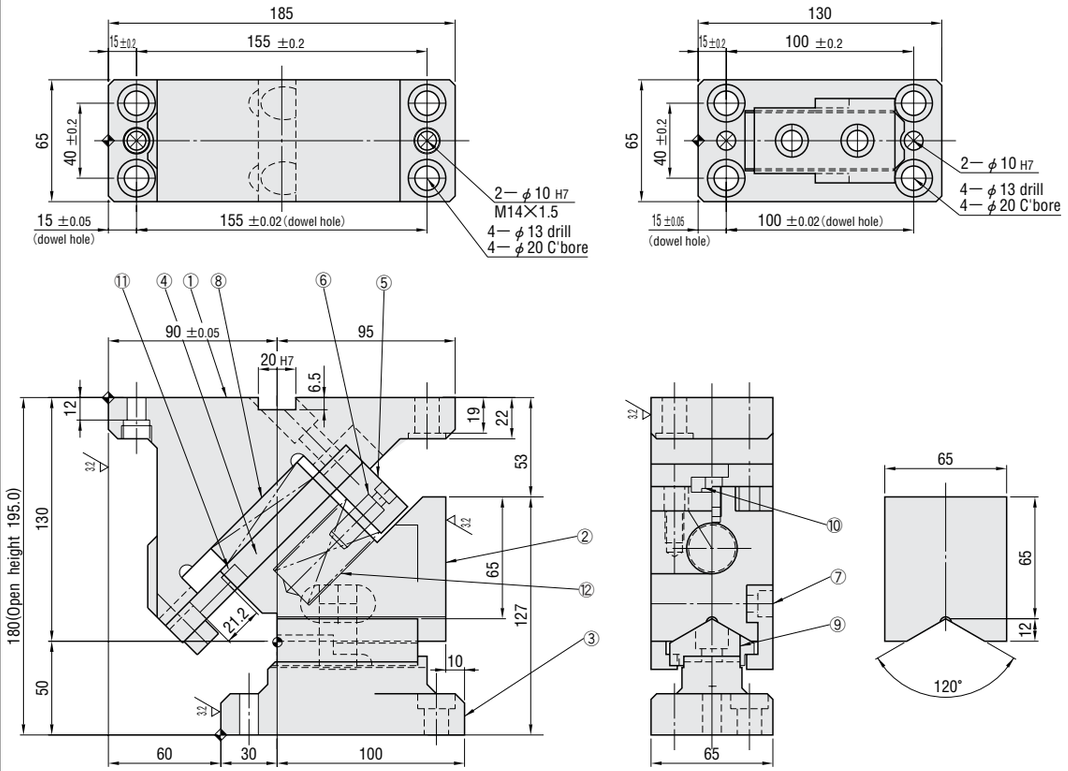
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
65mm	0°	1.5t	15.0mm

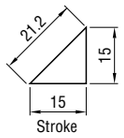
MFV65-0

RoHS



- Cam diagram

Final pressure : 657N {67.0kg}



Initial pressure : 112N {11.4kg}

- Processing capacity : 14.7kN {1.5ton}
- Processing stroke : 15.0mm
- Inclination : 0°
- Cam returning pressure
  Initial pressure : 112N {11.4kg}
  Final pressure : 657N {67.0kg}
- Unit weight : 9kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	12×65×65
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ 10×10
12	Cam spring	Spring steel	1	SWL25-80

Order — Catalog No. MFV65-0 — Delivery 5 Days — Price — U/Price 67,000

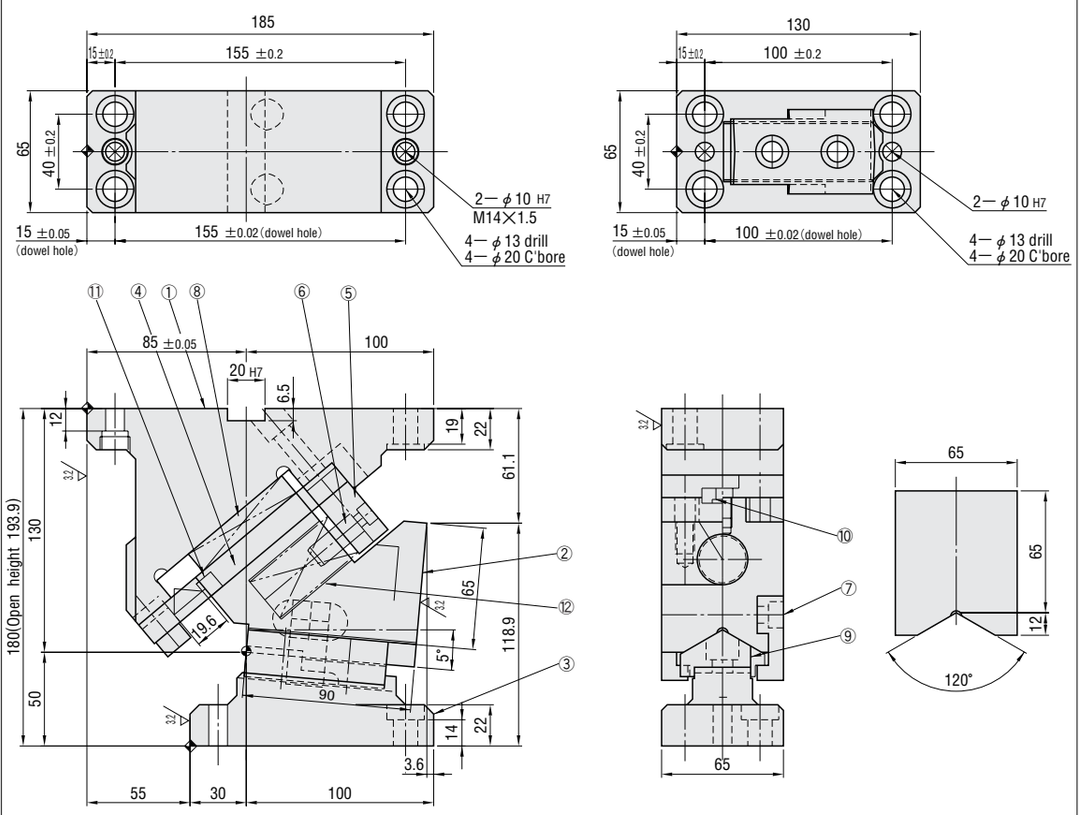
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
65mm	5°	1.5t	15.1mm

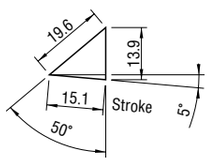
MFV65-5

RoHS



- Cam diagram

Final pressure：657N {67.0kg}



Initial pressure：112N {11.4kg}

- Processing capacity：14.7kN {1.5ton}
- Processing stroke：15.1mm
- Inclination：5°
- Cam returning pressure
  Initial pressure：112N {11.4kg}
  Final pressure：657N {67.0kg}
- Unit weight：9kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	12×65×65
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ10×10
12	Cam spring	Spring steel	1	SWL25-80

Order — Catalog No. MFV65-5

Delivery — 5 Days

Price

U/Price
67,000

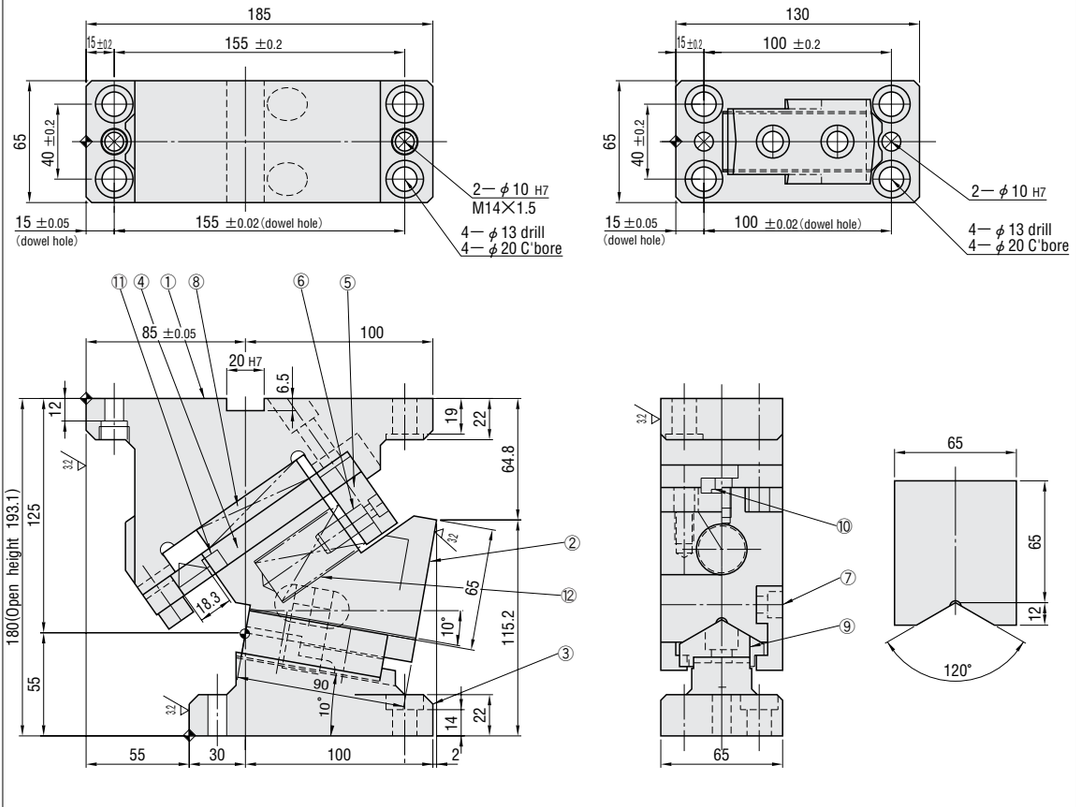
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
65mm	10°	1.5t	15.2mm

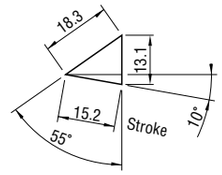
MFV65-10

RoHS



- Cam diagram

Final pressure：657N {67.0kg}



Initial pressure：112N {11.4kg}

- Processing capacity：14.7kN {1.5ton}
- Processing stroke：15.2mm
- Inclination：10°
- Cam returning pressure
  Initial pressure：112N {11.4kg}
  Final pressure：657N {67.0kg}
- Unit weight：9kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	12×65×65
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ10×10
12	Cam spring	Spring steel	1	SWL25-80

Order — Catalog No. MFV65-10

Delivery — 5 Days

Price

U/Price
67,000

To be quoted on price & lead time above Max. Q'ty.

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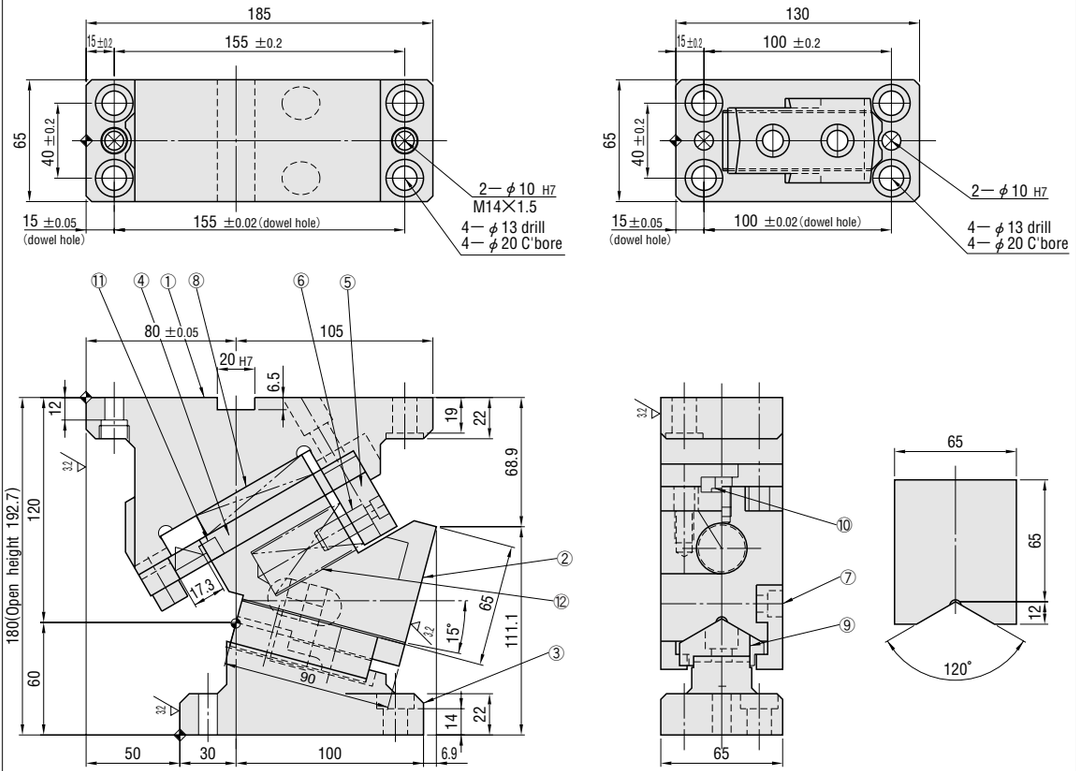
OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
65mm	15°	1.5t	15.5mm

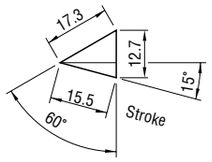
MFV65-15

RoHS



- Cam diagram

Final pressure：657N {67.0kg}



Initial pressure：112N {11.4kg}

- Processing capacity：14.7kN {1.5ton}
- Processing stroke：15.5mm
- Inclination：15°
- Cam returning pressure
  - Initial pressure：112N {11.4kg}
  - Final pressure：657N {67.0kg}
- Unit weight：9kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	12×65×65
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ10×10
12	Cam spring	Spring steel	1	SWL25-80

Order — Catalog No. MFV65-15

Delivery — 5 Days

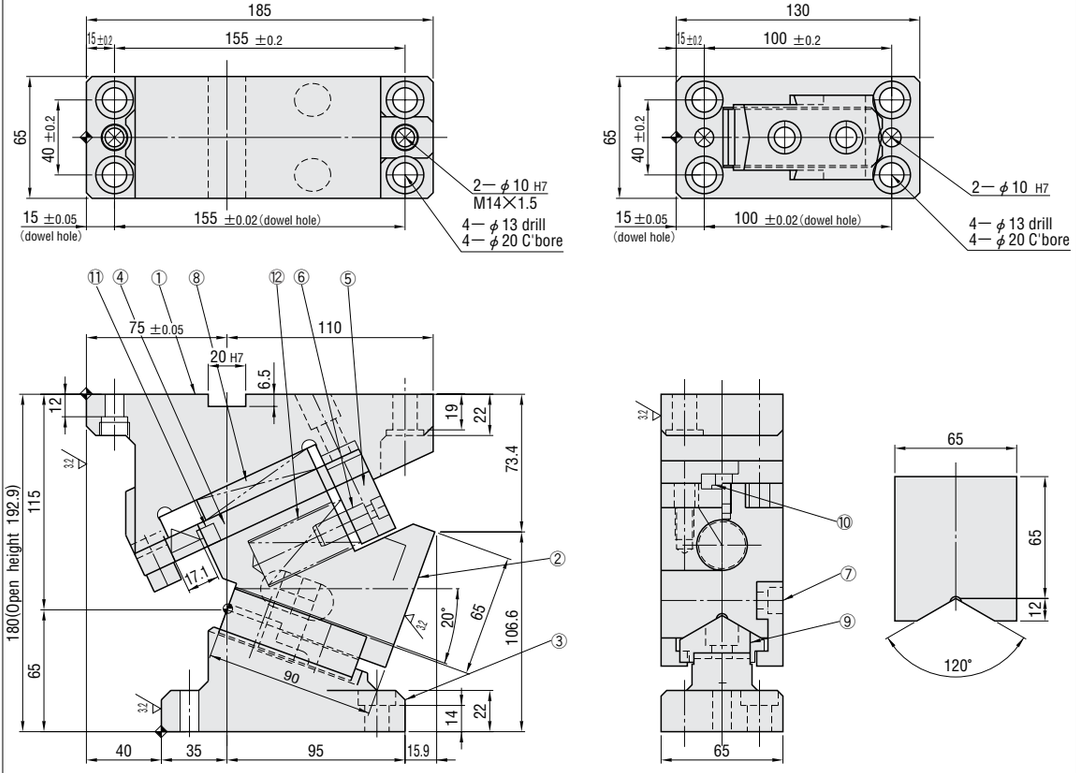
Price — U/Price 67,000

To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT
—V TYPE—

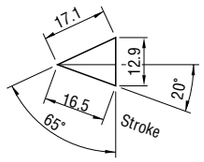
Space	Inclination	Processing capacity	Processing stroke
65mm	20°	1.5t	16.5mm

MFV65-20



- Cam diagram

Final pressure：657N {67.0kg}



Initial pressure：112N {11.4kg}

- Processing capacity：14.7kN {1.5ton}
- Processing stroke：16.5mm
- Inclination：20°
- Cam returning pressure
  - Initial pressure：112N {11.4kg}
  - Final pressure：657N {67.0kg}
- Unit weight：9kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	12×65×65
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ10×10
12	Cam spring	Spring steel	1	SWL25-80

Order — Catalog No. MFV65-20

Delivery — 5 Days

Price — U/Price 67,000

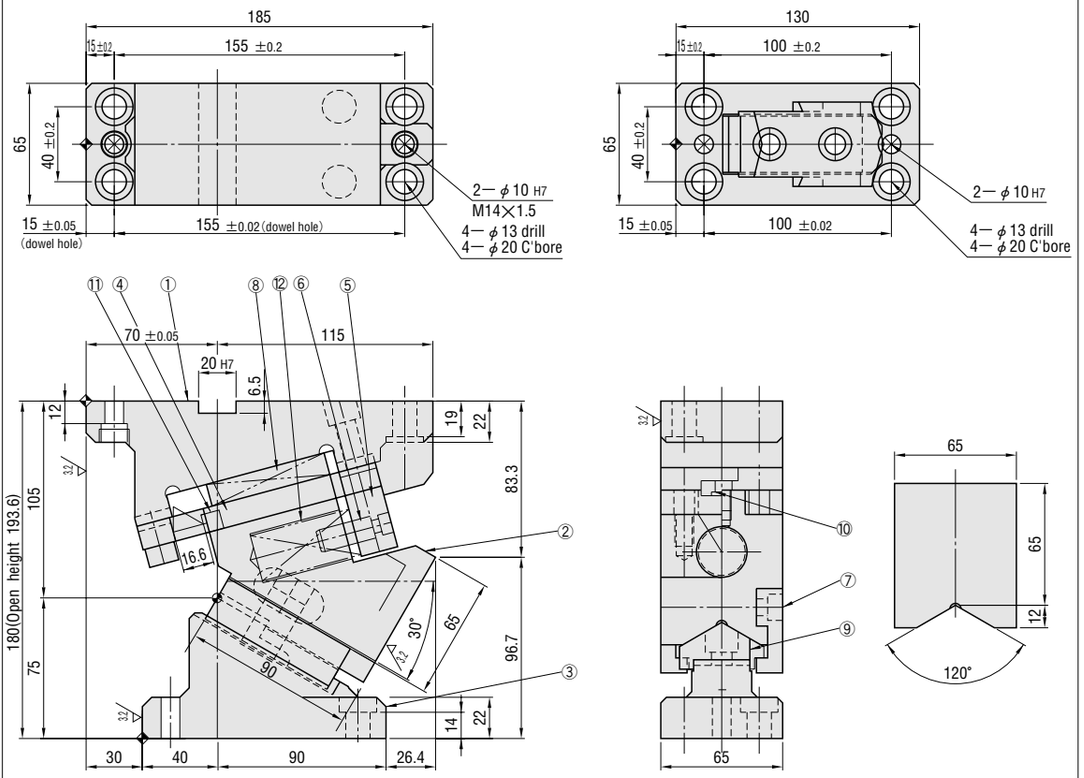
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT —V TYPE—

Space	Inclination	Processing capacity	Processing stroke
65mm	30°	1.5t	18.5mm

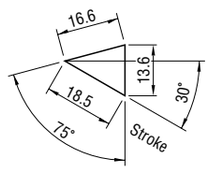
MFV65-30

RoHS



- Cam diagram

Final pressure：657N {67.0kg}



Initial pressure：112N {11.4kg}

- Processing capacity：14.7kN {1.5ton}
- Processing stroke：18.5mm
- Inclination：30°
- Cam returning pressure
  Initial pressure：112N {11.4kg}
  Final pressure：657N {67.0kg}
- Unit weight：9kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	12×65×65
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ10×10
12	Cam spring	Spring steel	1	SWL25-80

Order — Catalog No. MFV65-30

Delivery — 5 Days

Price — U/Price 67,000

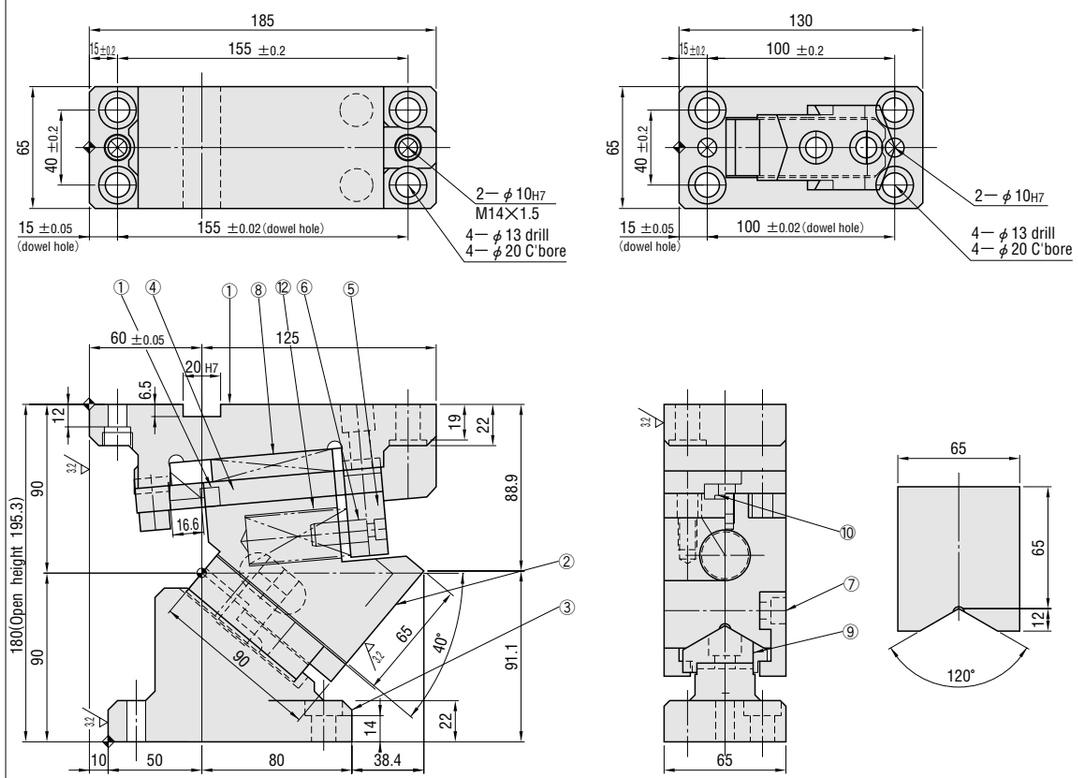
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT —V TYPE—

Space	Inclination	Processing capacity	Processing stroke
65mm	40°	1.5t	21.6mm

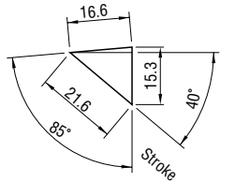
MFV65-40

RoHS



- Cam diagram

Final pressure：657N {67.0kg}



Initial pressure：112N {11.4kg}

- Processing capacity：14.7kN {1.5ton}
- Processing stroke：21.6mm
- Inclination：40°
- Cam returning pressure
  Initial pressure：112N {11.4kg}
  Final pressure：657N {67.0kg}
- Unit weight：9kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	12×65×65
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ10×10
12	Cam spring	Spring steel	1	SWL25-80

Order — Catalog No. MFV65-40

Delivery — 5 Days

Price — U/Price 67,000

To be quoted on price & lead time above Max. Q'ty.

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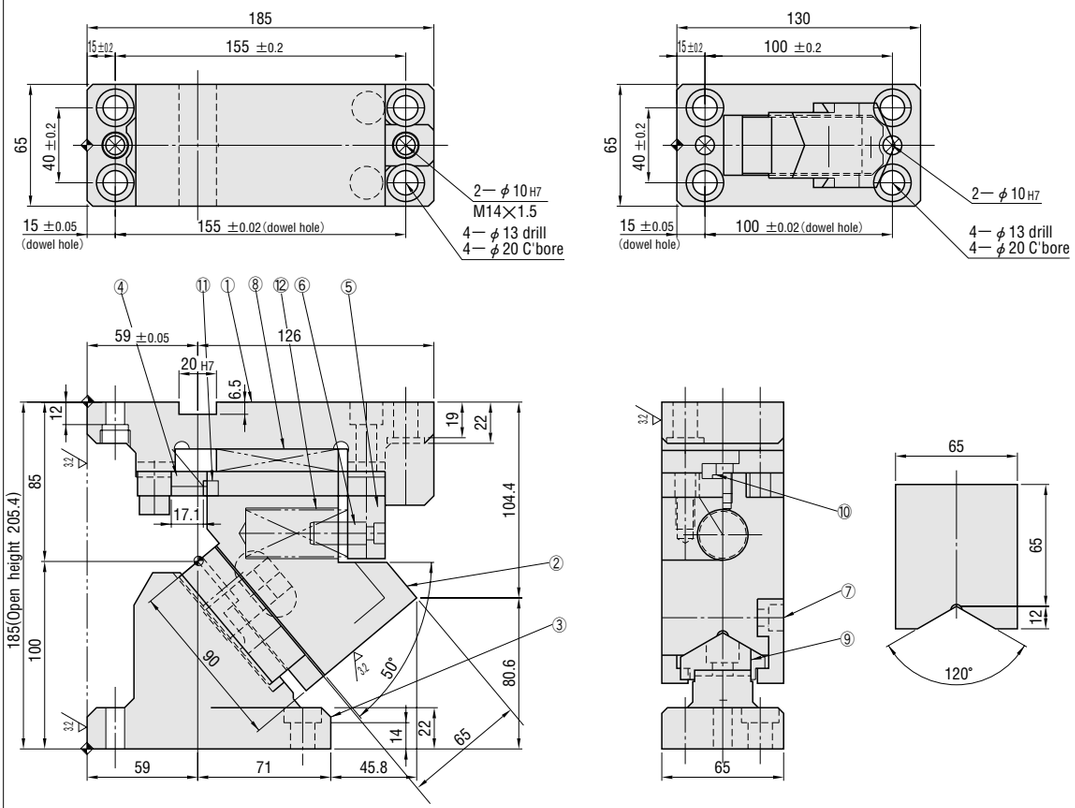
OIL-FREE FLYING CAM UNIT
—V TYPE—

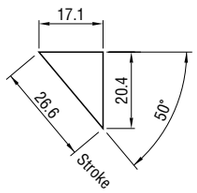
Space	Inclination	Processing capacity	Processing stroke
65mm	50°	1.5t	26.6mm

MFV65-50 RoHS



- Cam diagram

Final pressure : 657N {67.0kg}



Initial pressure : 112N {11.4kg}

- Processing capacity : 14.7kN {1.5ton}
- Processing stroke : 26.6mm
- Inclination : 50°
- Cam returning pressure
  - Initial pressure : 112N {11.4kg}
  - Final pressure : 657N {67.0kg}
- Unit weight : 9kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	12×65×65
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ10×10
12	Cam spring	Spring steel	1	SWL25-80

Order **Catalog No.** MFV65-50

Delivery **5** Days

Price

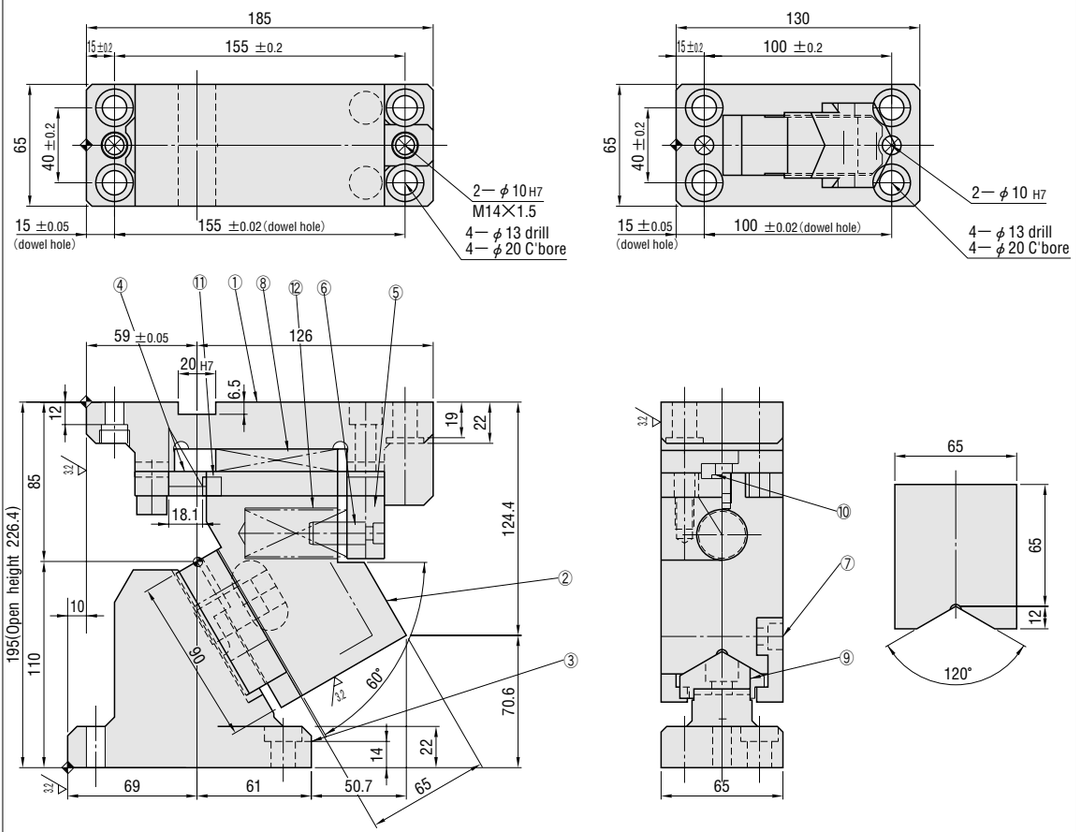
U/Price
67,000

To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT
—V TYPE—

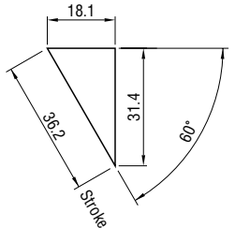
Space	Inclination	Processing capacity	Processing stroke
65mm	60°	1.5t	36.2mm

MFV65-60 RoHS



- Cam diagram

Final pressure : 657N {67.0kg}



Initial pressure : 112N {11.4kg}

- Processing capacity : 14.7kN {1.5ton}
- Processing stroke : 36.2mm
- Inclination : 60°
- Cam returning pressure
  - Initial pressure : 112N {11.4kg}
  - Final pressure : 657N {67.0kg}
- Unit weight : 9kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST12-30
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	12×65×65
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ10×10
12	Cam spring	Spring steel	1	SWL25-80

Order **Catalog No.** MFV65-60

Delivery **5** Days

Price

U/Price
67,000

To be quoted on price & lead time above Max. Q'ty.

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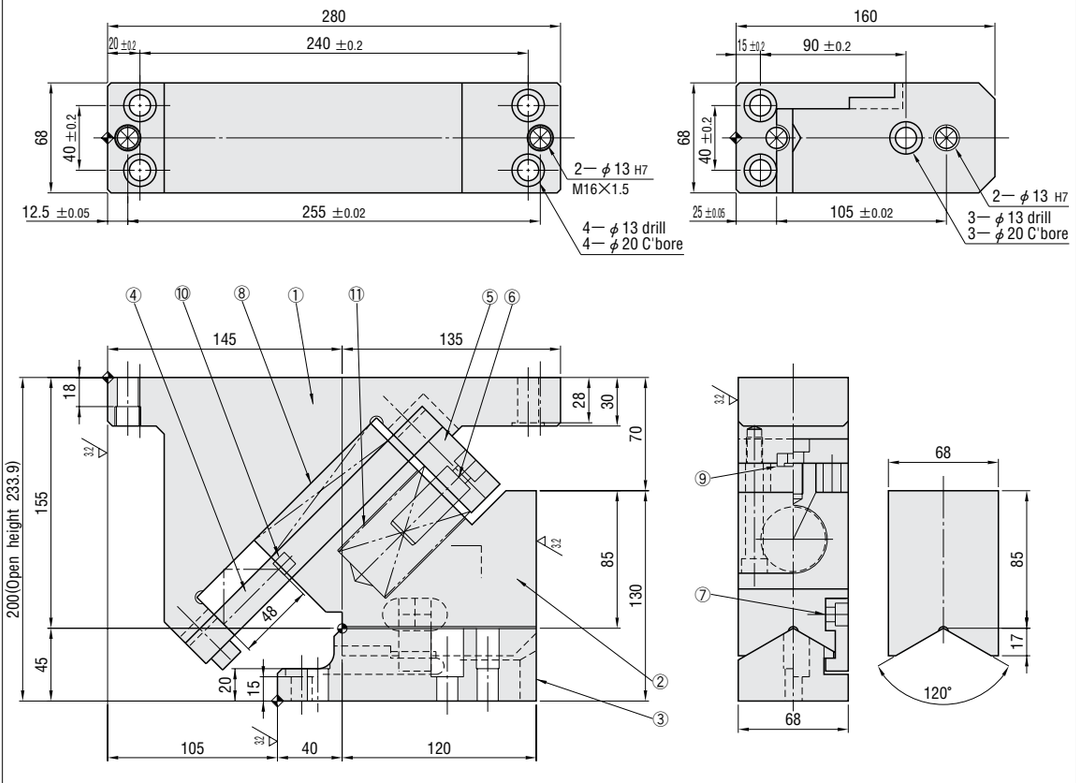
OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
68mm	0°	3.0t	33.9mm

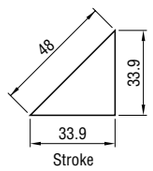
MFV68-0

RoHS



- Cam diagram

Final pressure : 1000N {102.0kg}



Initial pressure : 39N {4.0kg}

- Processing capacity : 29.4kN {3.0ton}
- Processing stroke : 33.9mm
- Inclination : 0°
- Cam returning pressure
  - Initial pressure : 39N {4.0kg}
  - Final pressure : 1000N {102.0kg}
- Unit weight : 16kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	15×68×100
9	Key	S45C	2	
10	Silent stopper	Urethane	1	ϕ15×15
11	Cam spring	Spring steel	1	SWF40-125

Order — Catalog No. MFV68-0

Delivery — 5 Days

Price — U/Price 76,000

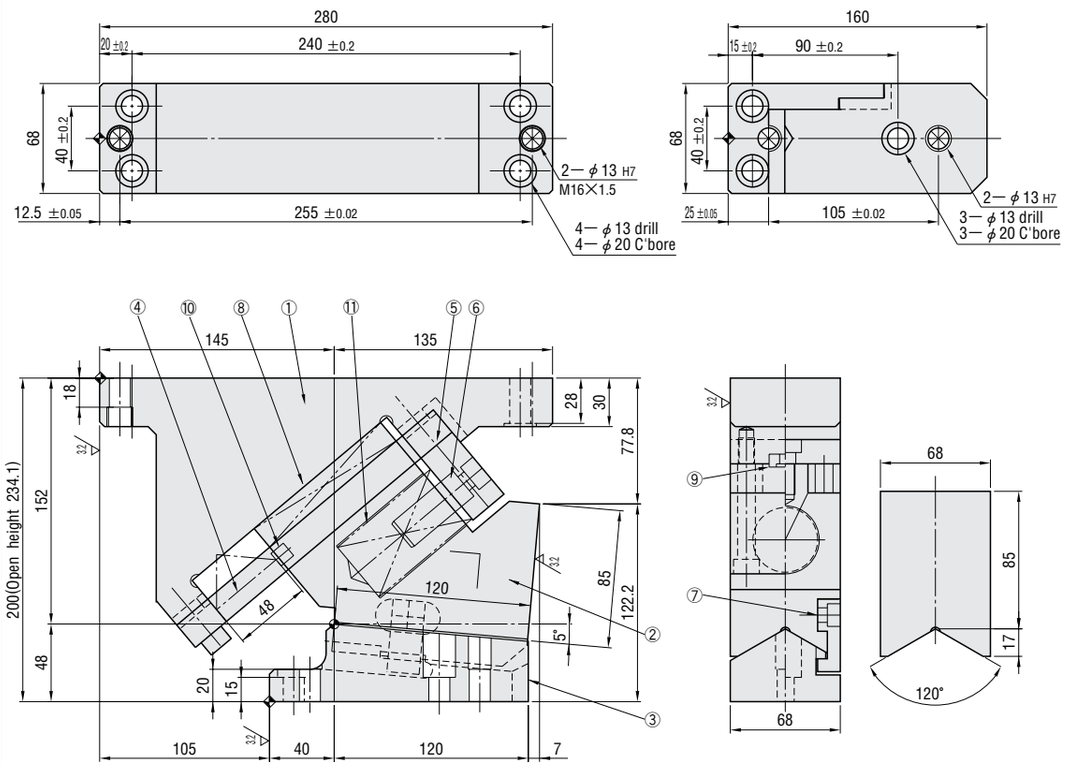
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
68mm	5°	3.0t	36.9mm

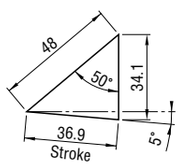
MFV68-5

RoHS



- Cam diagram

Final pressure : 1000N {102.0kg}



Initial pressure : 39N {4.0kg}

- Processing capacity : 29.4kN {3.0ton}
- Processing stroke : 36.9mm
- Inclination : 5°
- Cam returning pressure
  - Initial pressure : 39N {4.0kg}
  - Final pressure : 1000N {102.0kg}
- Unit weight : 16kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	15×68×100
9	Key	S45C	2	
10	Silent stopper	Urethane	1	ϕ15×15
11	Cam spring	Spring steel	1	SWF40-125

Order — Catalog No. MFV68-5

Delivery — 5 Days

Price — U/Price 76,000

To be quoted on price & lead time above Max. Q'ty.

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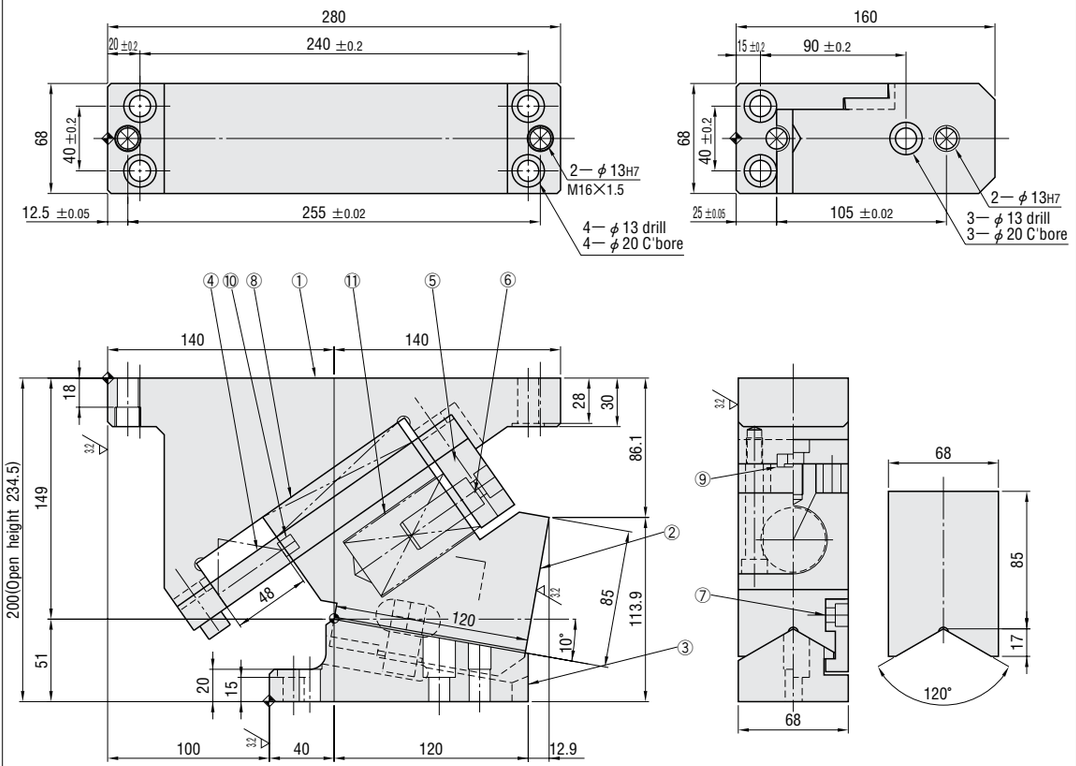
OIL-FREE FLYING CAM UNIT
—V TYPE—

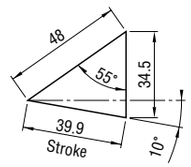
Space	Inclination	Processing capacity	Processing stroke
68mm	10°	3.0t	39.9mm

MFV68-10 RoHS



- Cam diagram

Final pressure：1000N {102.0kg}



Initial pressure：39N {4.0kg}

- Processing capacity：29.4kN {3.0ton}
- Processing stroke：39.9mm
- Inclination：10°
- Cam returning pressure
  - Initial pressure：39N {4.0kg}
  - Final pressure：1000N {102.0kg}
- Unit weight：16kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	15×68×100
9	Key	S45C	2	
10	Silent stopper	Urethane	1	ϕ15×15
11	Cam spring	Spring steel	1	SWF40-125

Order — Catalog No. MFV68-10

Delivery — 5 Days

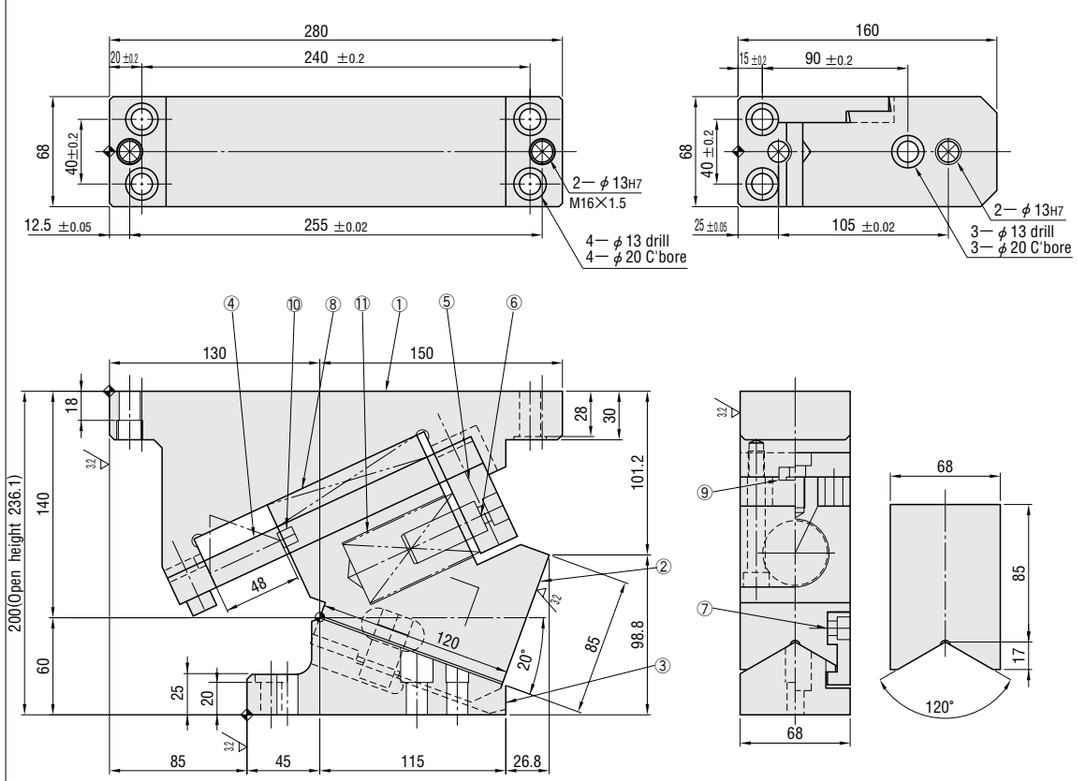
Price — U/Price 76,000

To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT
—V TYPE—

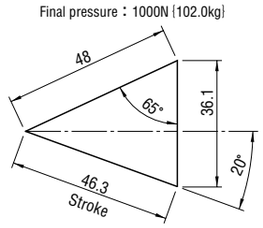
Space	Inclination	Processing capacity	Processing stroke
68mm	20°	3.0t	46.3mm

MFV68-20 RoHS



- Cam diagram

Final pressure：1000N {102.0kg}



Initial pressure：39N {4.0kg}

- Processing capacity：29.4kN {3.0ton}
- Processing stroke：46.3mm
- Inclination：20°
- Cam returning pressure
  - Initial pressure：39N {4.0kg}
  - Final pressure：1000N {102.0kg}
- Unit weight：16kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	15×68×100
9	Key	S45C	2	
10	Silent stopper	Urethane	1	ϕ15×15
11	Cam spring	Spring steel	1	SWF40-125

Order — Catalog No. MFV68-20

Delivery — 5 Days

Price — U/Price 76,000

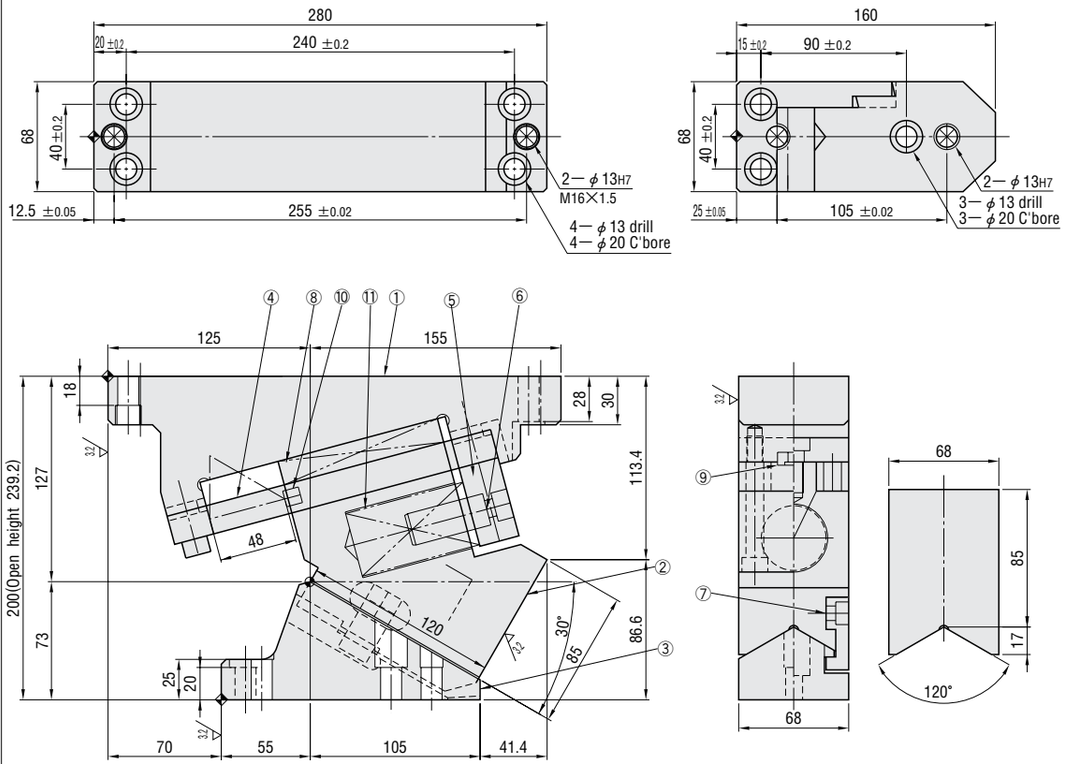
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
68mm	30°	3.0t	53.5mm

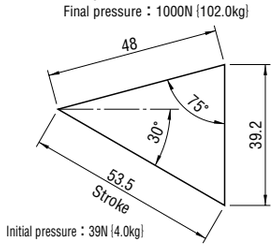
MFV68-30

RoHS



- Cam diagram

Final pressure：1000N {102.0kg}



Initial pressure：39N {4.0kg}

- Processing capacity：29.4kN {3.0ton}
- Processing stroke：53.5mm
- Inclination：30°
- Cam returning pressure
  - Initial pressure：39N {4.0kg}
  - Final pressure：1000N {102.0kg}
- Unit weight：16kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	15×68×100
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ15×15
11	Cam spring	Spring steel	1	SWF40-125

Order — Catalog No. MFV68-30

Delivery — 5 Days

Price — U/Price 76,000

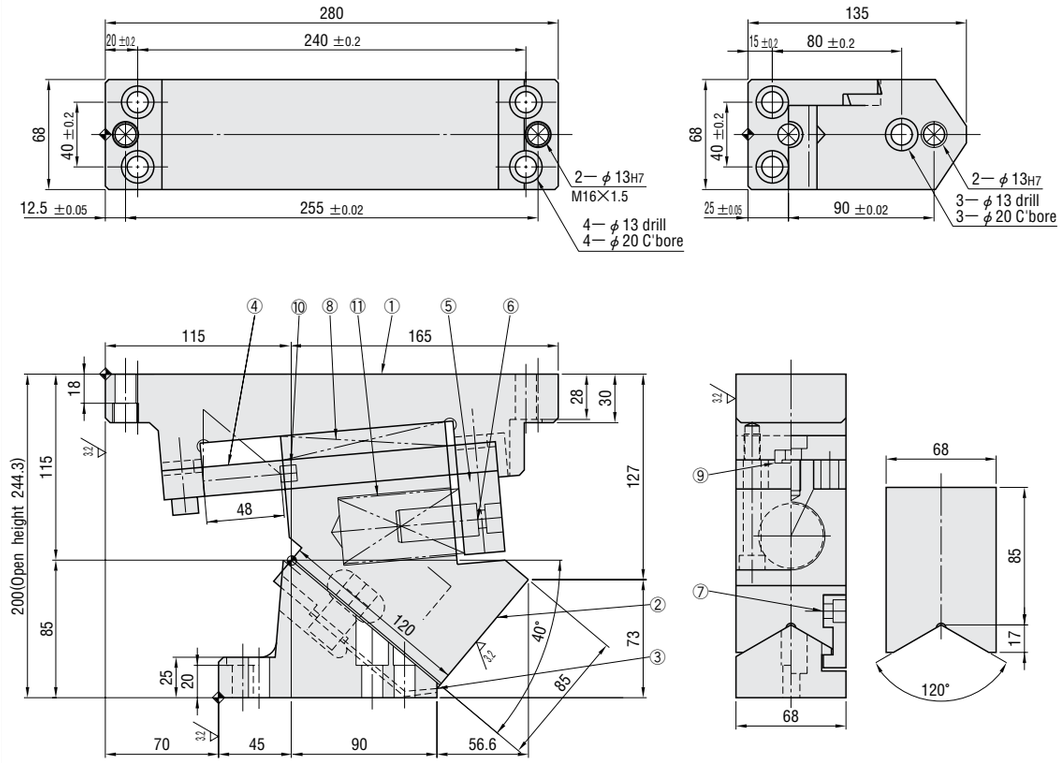
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
68mm	40°	3.0t	62.4mm

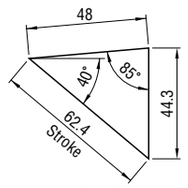
MFV68-40

RoHS



- Cam diagram

Final pressure：1000N {102.0kg}



Initial pressure：39N {4.0kg}

- Processing capacity：29.4kN {3.0ton}
- Processing stroke：62.4mm
- Inclination：40°
- Cam returning pressure
  - Initial pressure：39N {4.0kg}
  - Final pressure：1000N {102.0kg}
- Unit weight：16kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	15×68×100
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ15×15
11	Cam spring	Spring steel	1	SWF40-125

Order — Catalog No. MFV68-40

Delivery — 5 Days

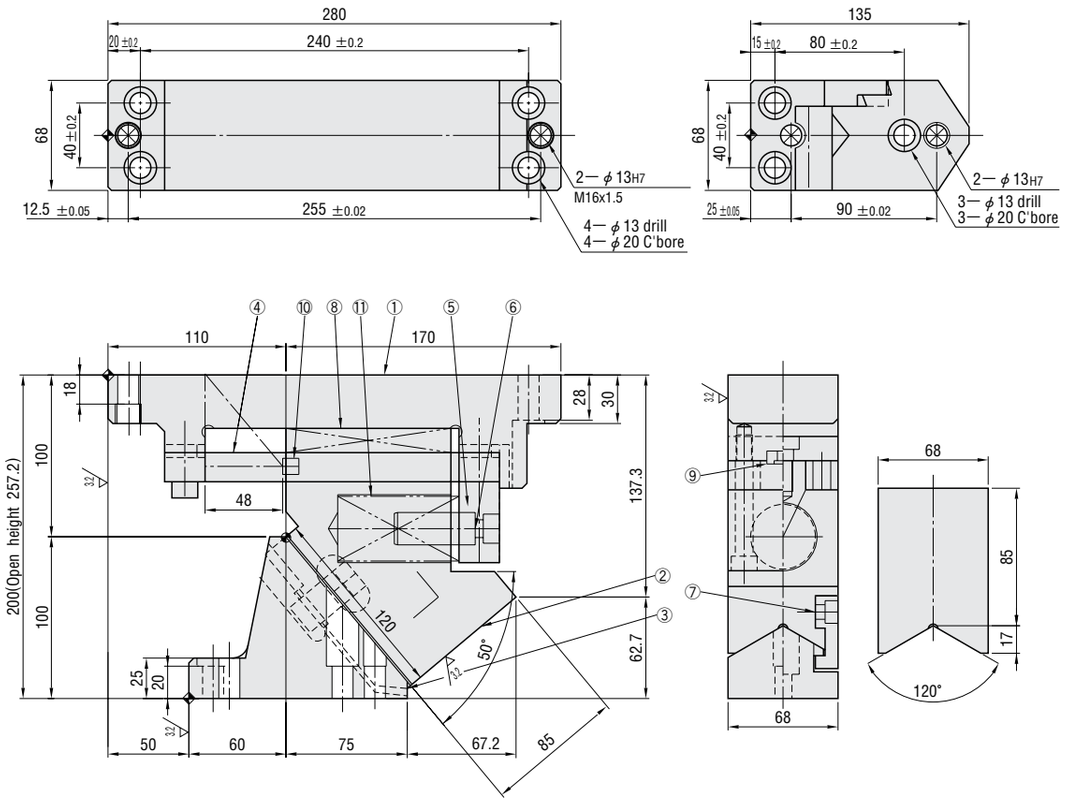
Price — U/Price 76,000

To be quoted on price & lead time above Max. Q'ty.

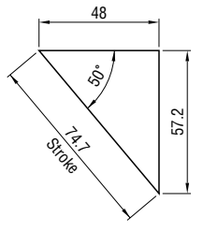
OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
68mm	50°	3.0t	74.7mm

MFV68-50 RoHS



- Cam diagram
  Final pressure : 1000N {102.0kg}



Initial pressure : 39N {4.0kg}

- Processing capacity : 29.4kN {3.0ton}
- Processing stroke : 74.7mm
- Inclination : 50°
- Cam returning pressure
  Initial pressure : 39N {4.0kg}
  Final pressure : 1000N {102.0kg}
- Unit weight : 16kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	15×68×100
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ 15×15
11	Cam spring	Spring steel	1	SWF40-125

Order — Catalog No. MFV68-50

Delivery — 5 Days

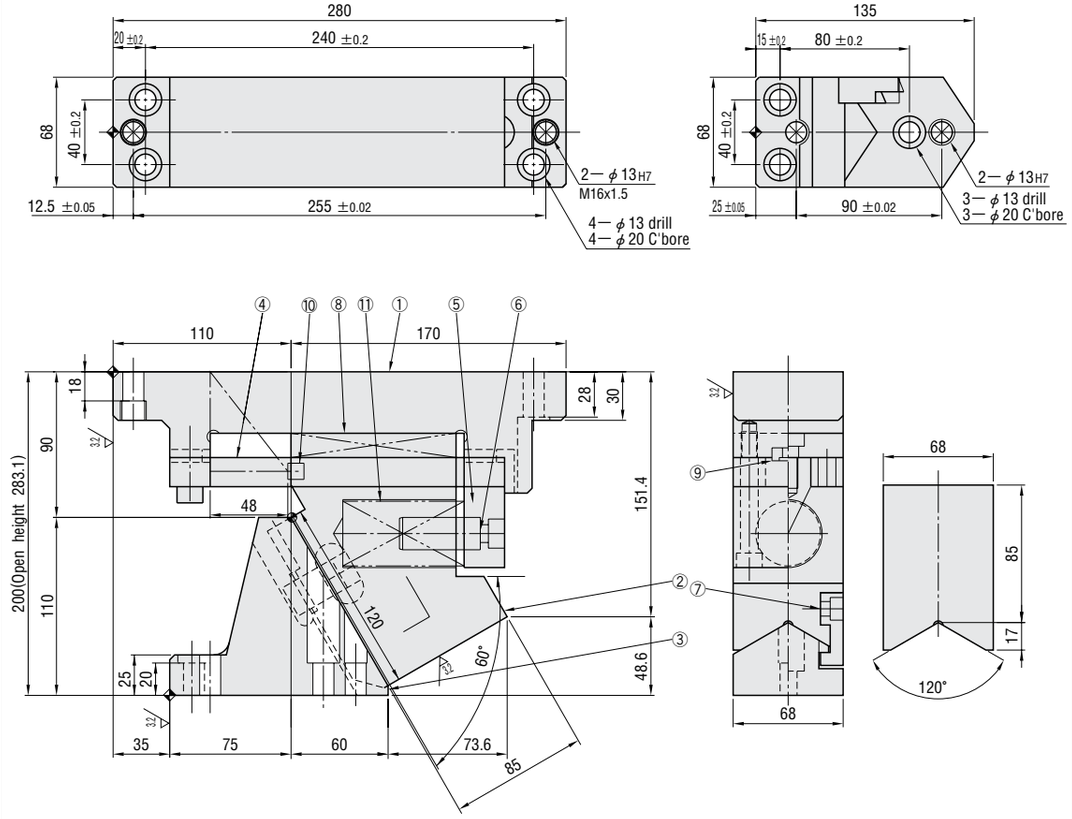
Price — U/Price 76,000

To be quoted on price & lead time above Max. Q'ty.

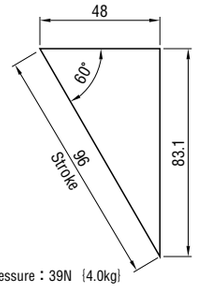
OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
68mm	60°	3.0t	96.0mm

MFV68-60 RoHS



- Cam diagram
  Final pressure : 1000N {102.0kg}



Initial pressure : 39N {4.0kg}

- Processing capacity : 29.4kN {3.0ton}
- Processing stroke : 96.0mm
- Inclination : 60°
- Cam returning pressure
  Initial pressure : 39N {4.0kg}
  Final pressure : 1000N {102.0kg}
- Unit weight : 16kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	S50C	1	HQI
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	S50C	1	HQI
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	15×68×100
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ 15×15
11	Cam spring	Spring steel	1	SWF40-125

Order — Catalog No. MFV68-60

Delivery — 5 Days

Price — U/Price 76,000

To be quoted on price & lead time above Max. Q'ty.

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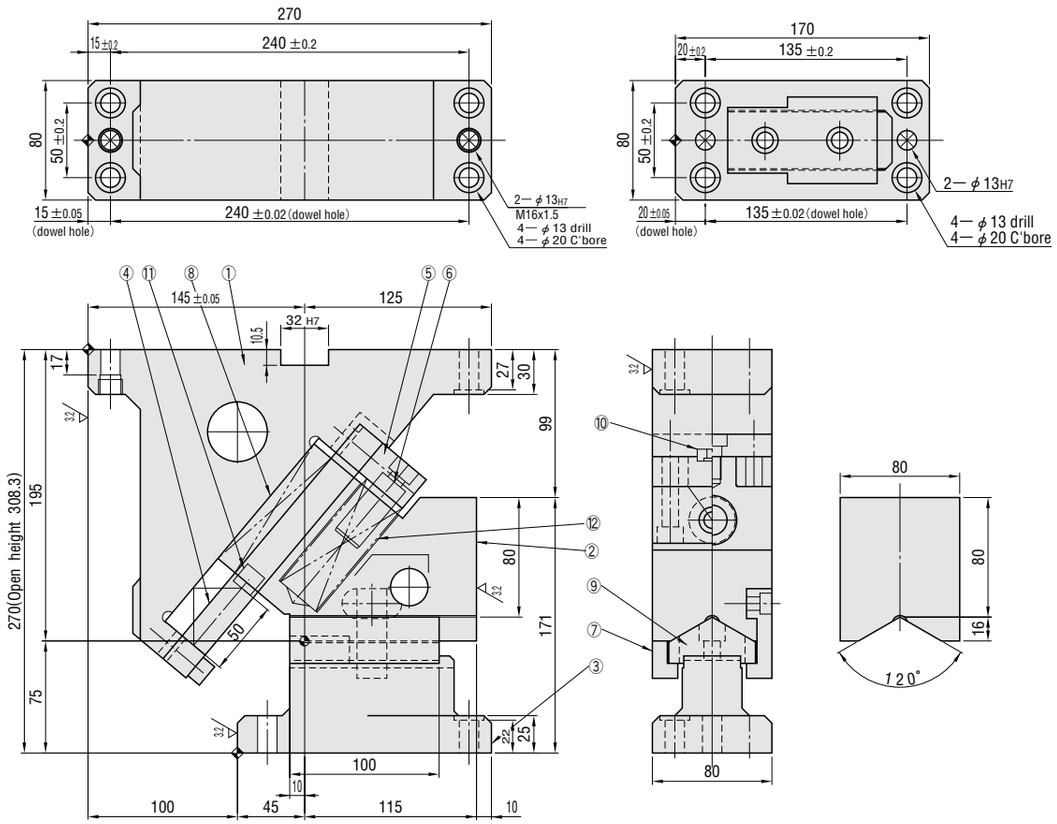
OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
80mm	0°	3.0t	32.1mm

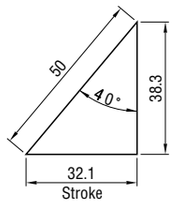
MFV80-0

RoHS



- Cam diagram

Final pressure : 784N {80.0kg}



Initial pressure : 130N {13.3kg}

- Processing capacity : 29.4kN {3.0ton}
- Processing stroke : 32.1mm
- Inclination : 0°
- Cam returning pressure
  - Initial pressure : 130N {13.3kg}
  - Final pressure : 784N {80.0kg}
- Unit weight : 22kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	15×80×100
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ15×15
12	Cam spring	Spring steel	1	SWS31-150

Order — Catalog No. MFV80-0

Delivery — 5 Days

Price — U/Price 86,000

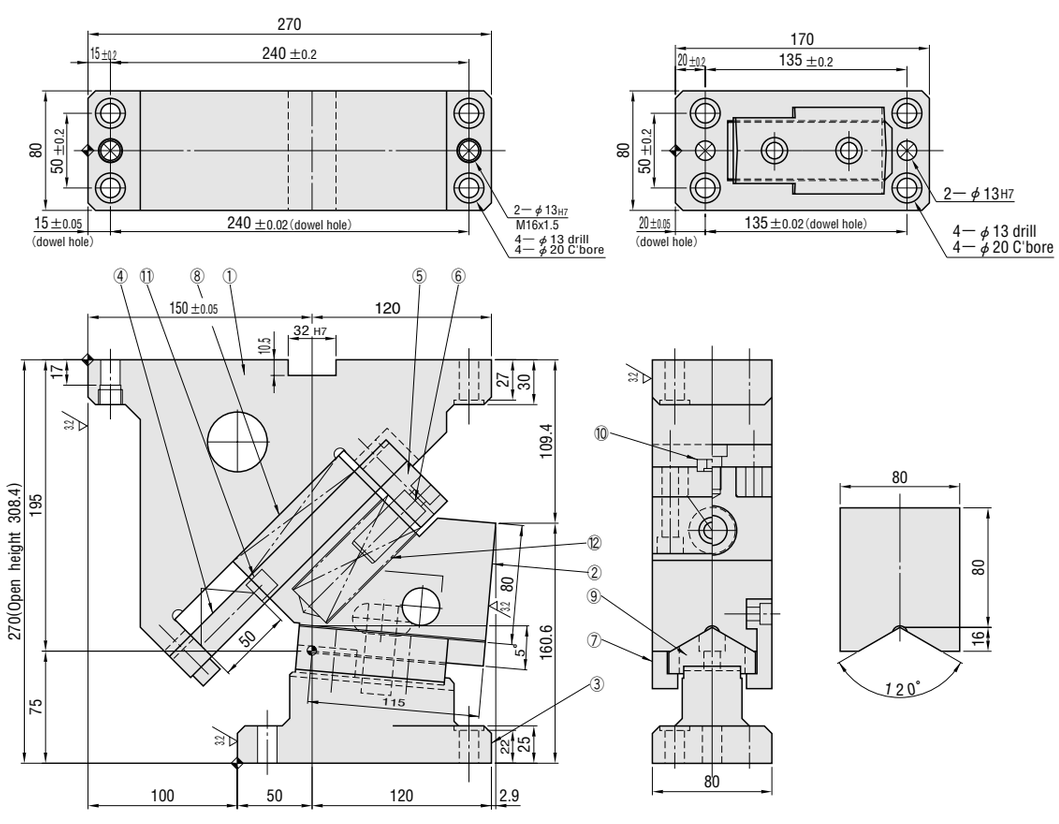
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
80mm	5°	3.0t	35.5mm

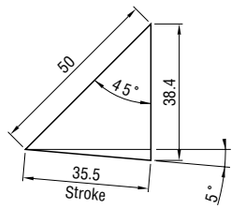
MFV80-5

RoHS



- Cam diagram

Final pressure : 784N {80.0kg}



Initial pressure : 130N {13.3kg}

- Processing capacity : 29.4kN {3.0ton}
- Processing stroke : 35.5mm
- Inclination : 5°
- Cam returning pressure
  - Initial pressure : 130N {13.3kg}
  - Final pressure : 784N {80.0kg}
- Unit weight : 22kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	15×80×100
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ15×15
12	Cam spring	Spring steel	1	SWS31-150

Order — Catalog No. MFV80-5

Delivery — 5 Days

Price — U/Price 86,000

To be quoted on price & lead time above Max. Q'ty.

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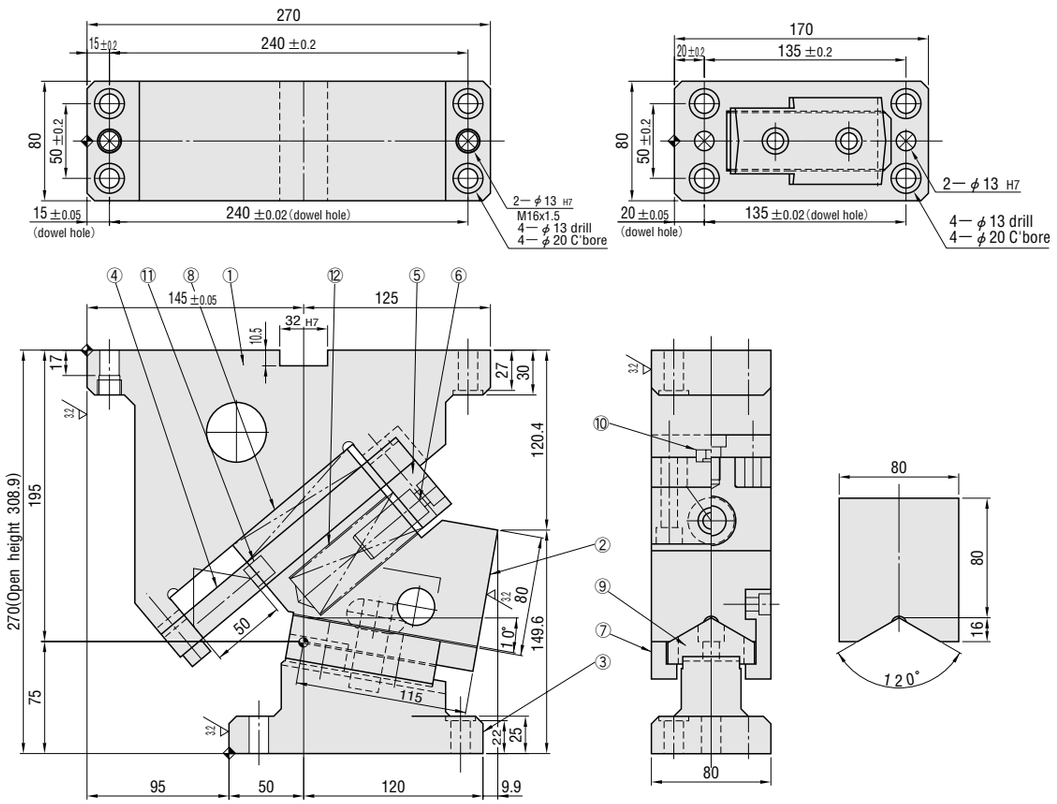
OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
80mm	10°	3.0t	38.9mm

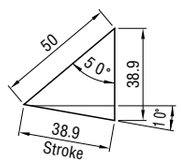
MFV80-10 RoHS



No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	15×80×100
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ15×15
12	Cam spring	Spring steel	1	SWS31-150

- Cam diagram

Final pressure：784N {80.0kg}



Initial pressure：130N {13.3kg}

- Processing capacity：29.4kN {3.0ton}
- Processing stroke：38.9mm
- Inclination：10°
- Cam returning pressure
  - Initial pressure：130N {13.3kg}
  - Final pressure：784N {80.0kg}
- Unit weight：23kg

Order — Catalog No. MFV80-10

Delivery — 5 Days

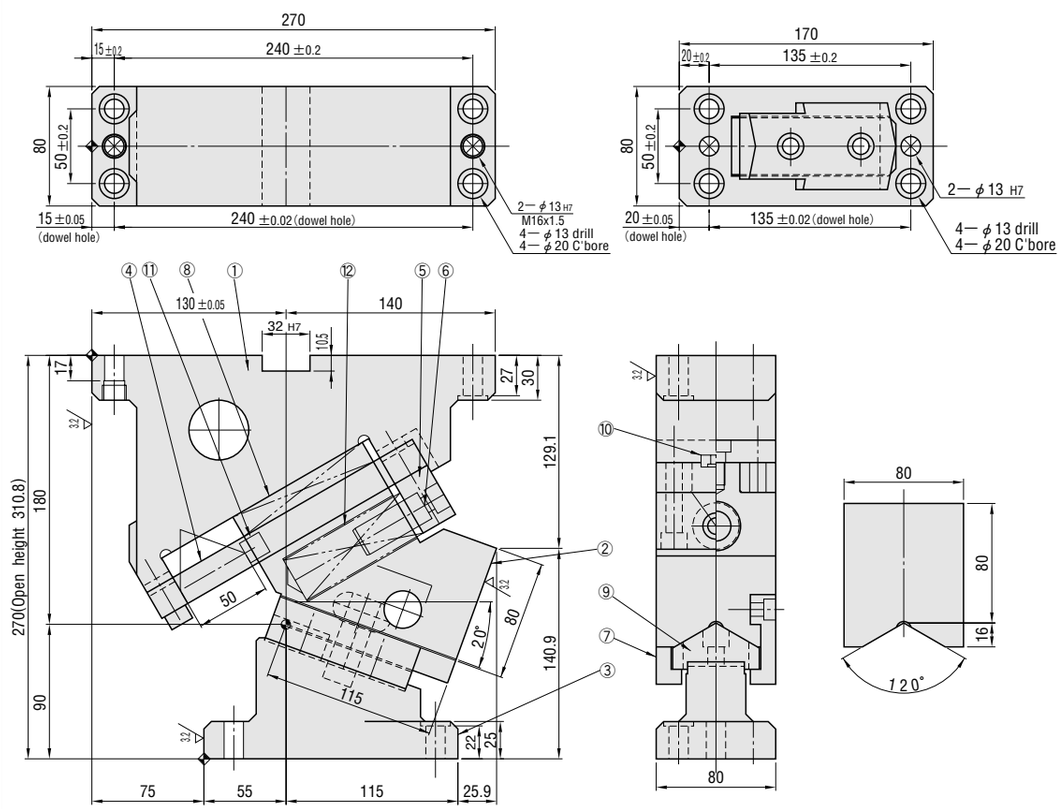
Price — U/Price 86,000

To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
80mm	20°	3.0t	46.1mm

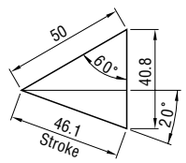
MFV80-20 RoHS



No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	15×80×100
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ15×15
12	Cam spring	Spring steel	1	SWS31-150

- Cam diagram

Final pressure：784N {80.0kg}



Initial pressure：130N {13.3kg}

- Processing capacity：29.4kN {3.0ton}
- Processing stroke：46.1mm
- Inclination：20°
- Inclination Initial pressure：130N {13.3kg}
  - Final pressure：784N {80.0kg}
- Unit weight：22kg

Order — Catalog No. MFV80-20

Delivery — 5 Days

Price — U/Price 86,000

To be quoted on price & lead time above Max. Q'ty.

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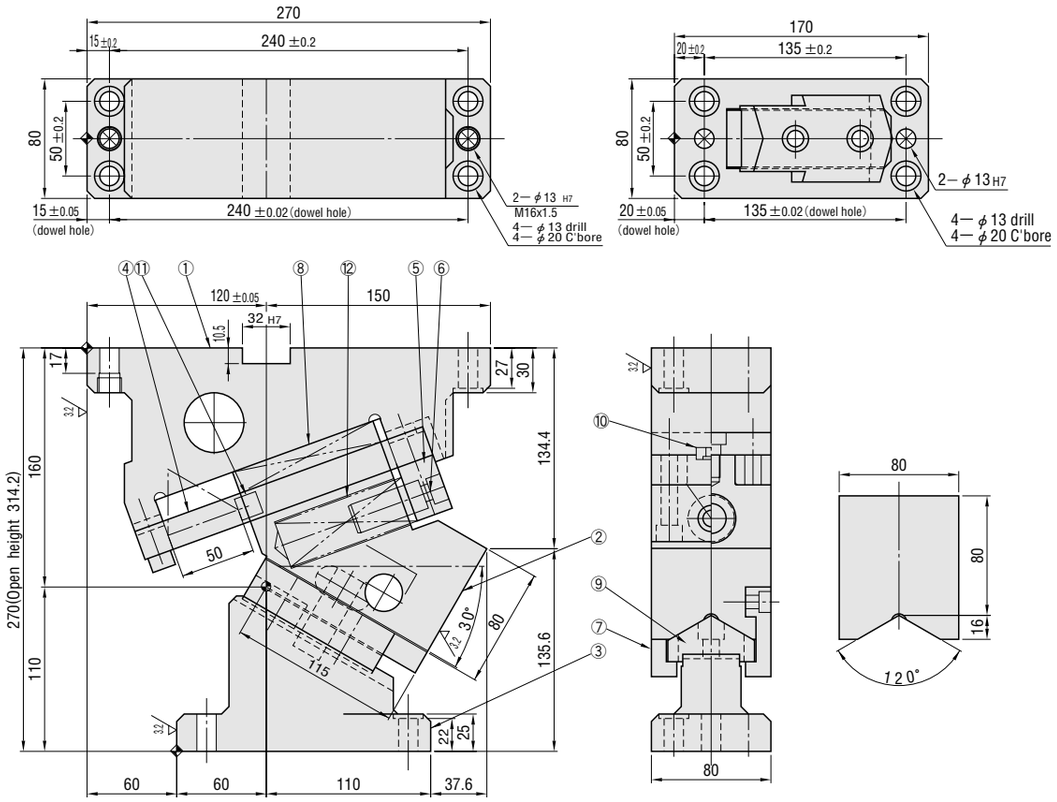
OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
80mm	30°	3.0t	54.3mm

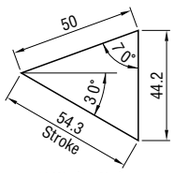
MFV80-30

RoHS



- Cam diagram

Final pressure：784N {80.0kg}



Initial pressure：130N {13.3kg}

- Processing capacity：29.4kN {3.0ton}
- Processing stroke：54.3mm
- Inclination：30°
- Cam returning pressure
  Initial pressure：130N {13.3kg}
  Final pressure：784N {80.0kg}
- Unit weight：21kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	15×80×100
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	ϕ15×15
12	Cam spring	Spring steel	1	SWS31-150

Order — Catalog No. MFV80-30

Delivery — 5 Days

Price — U/Price 86,000

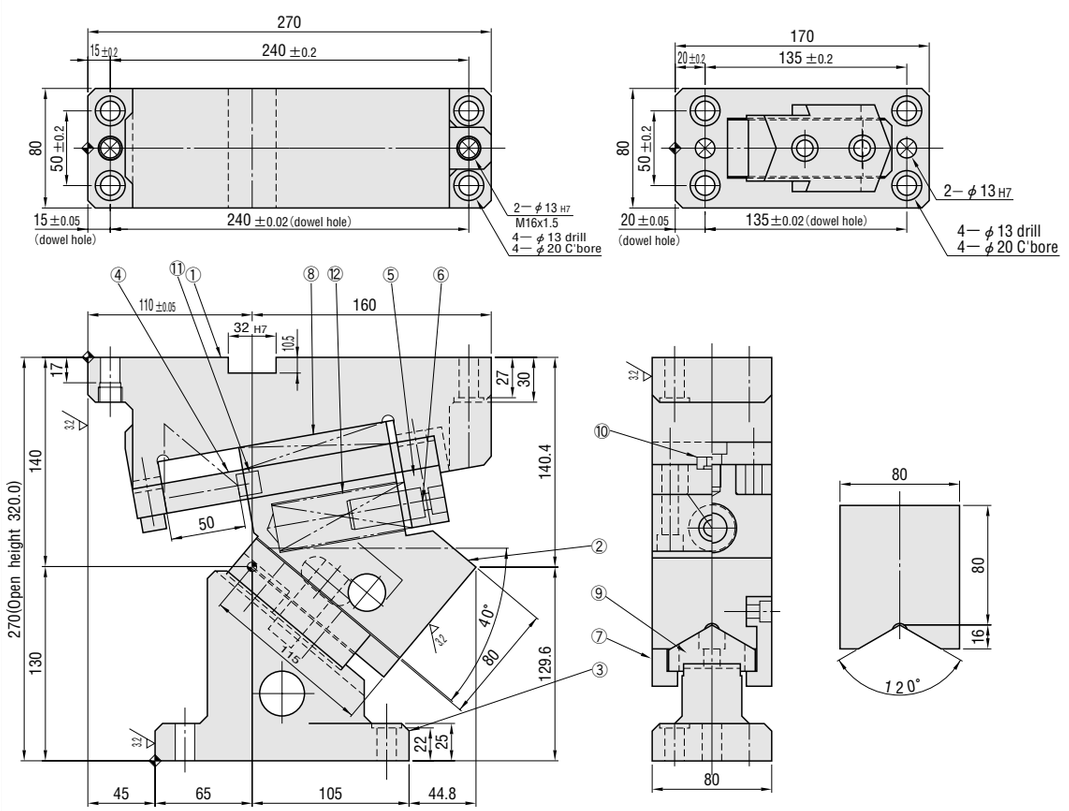
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT
—V TYPE—

Space	Inclination	Processing capacity	Processing stroke
80mm	40°	3.0t	64.3mm

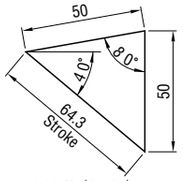
MFV80-40

RoHS



- Cam diagram

Final pressure：784N {80.0kg}



Initial pressure：130N {13.3kg}

- Processing capacity：29.4kN {3.0ton}
- Processing stroke：64.3mm
- Inclination：40°
- Cam returning pressure
  Initial pressure：130N {13.3kg}
  Final pressure：784N {80.0kg}
- Unit weight：20kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	15×80×100
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	ϕ15×15
12	Cam spring	Spring steel	1	SWS31-150

Order — Catalog No. MFV80-40

Delivery — 5 Days

Price — U/Price 86,000

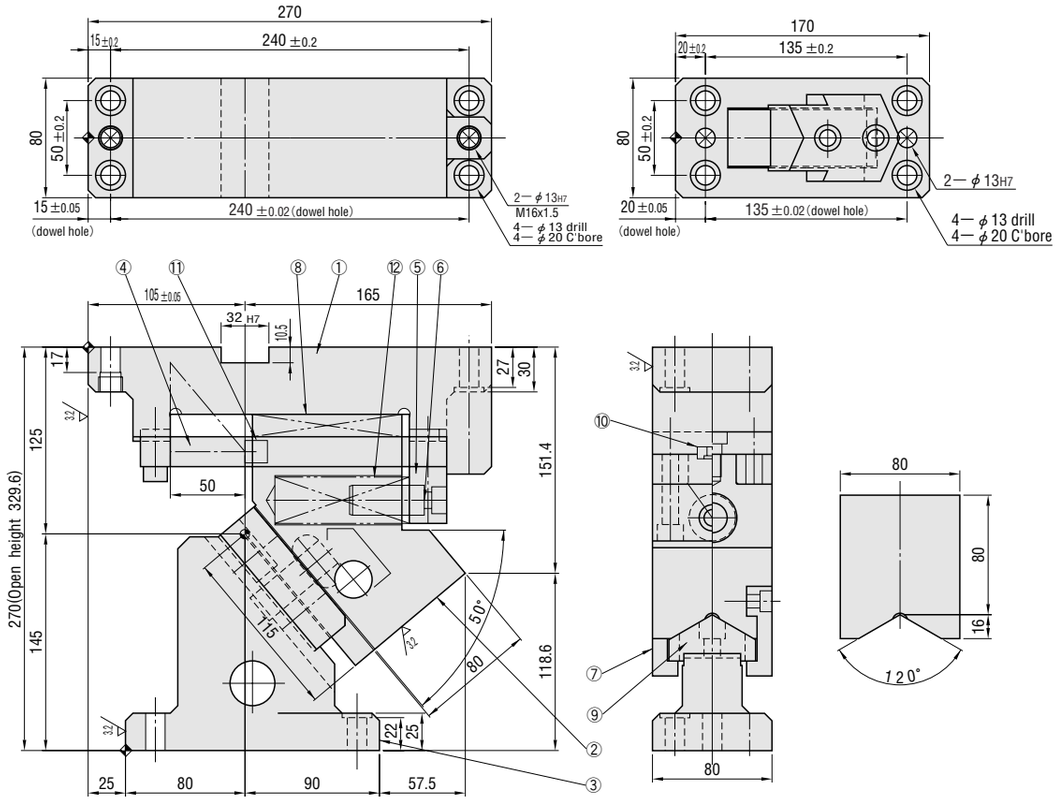
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT —V TYPE—

Space	Inclination	Processing capacity	Processing stroke
80mm	50°	3.0t	77.8mm

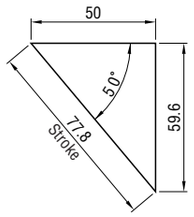
MFV80-50

RoHS



- Cam diagram

Final pressure : 784N {80.0kg}



Initial pressure : 130N {13.3kg}

- Processing capacity : 29.4kN {3.0ton}
- Processing stroke : 77.8mm
- Inclination : 50°
- Cam returning pressure
  - Initial pressure : 130N {13.3kg}
  - Final pressure : 784N {80.0kg}
- Unit weight : 19kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	15×80×100
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ15×15
12	Cam spring	Spring steel	1	SWS31-150

Order — Catalog No. MFV80-50

Delivery — 5 Days

Price — U/Price 86,000

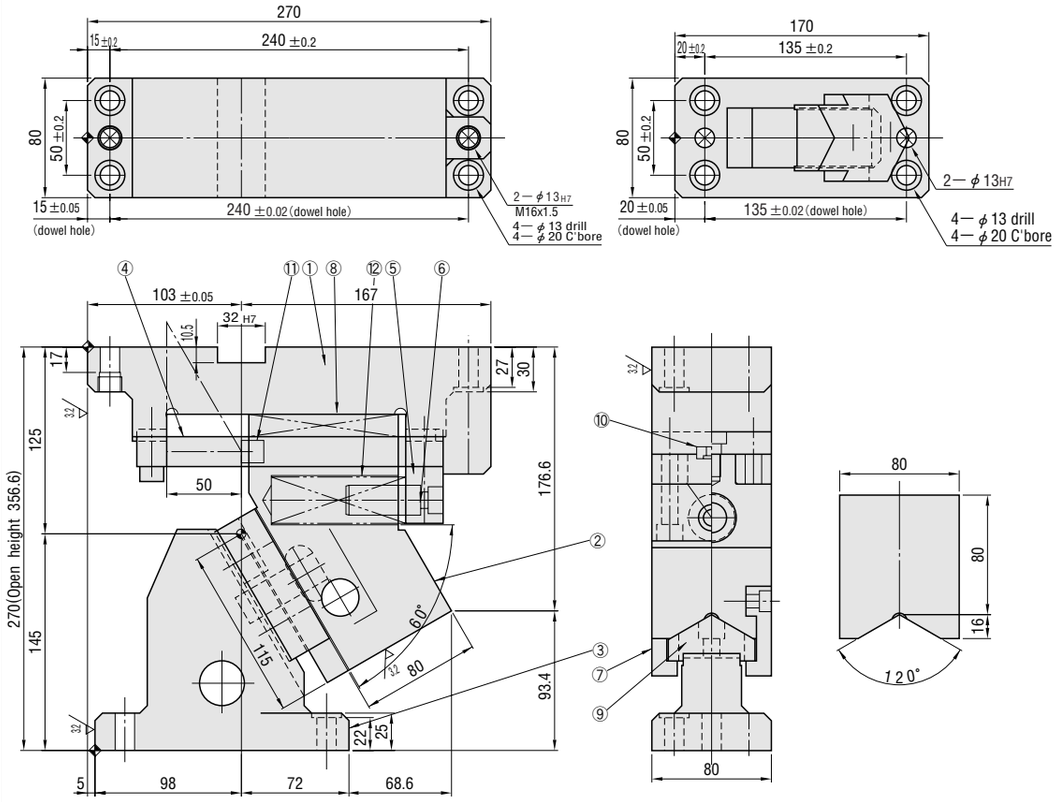
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE FLYING CAM UNIT —V TYPE—

Space	Inclination	Processing capacity	Processing stroke
80mm	60°	3.0t	100.0mm

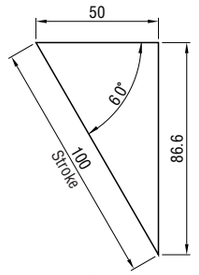
MFV80-60

RoHS



- Cam diagram

Final pressure : 784N {80.0kg}



Initial pressure : 130N {13.3kg}

- Processing capacity : 29.4kN {3.0ton}
- Processing stroke : 100.0mm
- Inclination : 60°
- Cam returning pressure
  - Initial pressure : 130N {13.3kg}
  - Final pressure : 784N {80.0kg}
- Unit weight : 20kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	SCM440	1	HQT
5	Spring plate	SS400	1	
6	Spring guide pin	SUJ2	1	MST20-50
7	Cam compulsory returning plate	CAC304	2	
8	Cam lower plate	CAC304+MoS_2	1	15×80×100
9	Cam bottom plate	S45C	1	HQI
10	Key	S45C	2	
11	Silent stopper	Urethane	1	φ15×15
12	Cam spring	Spring steel	1	SWS31-150

Order — Catalog No. MFV80-60

Delivery — 5 Days

Price — U/Price 86,000

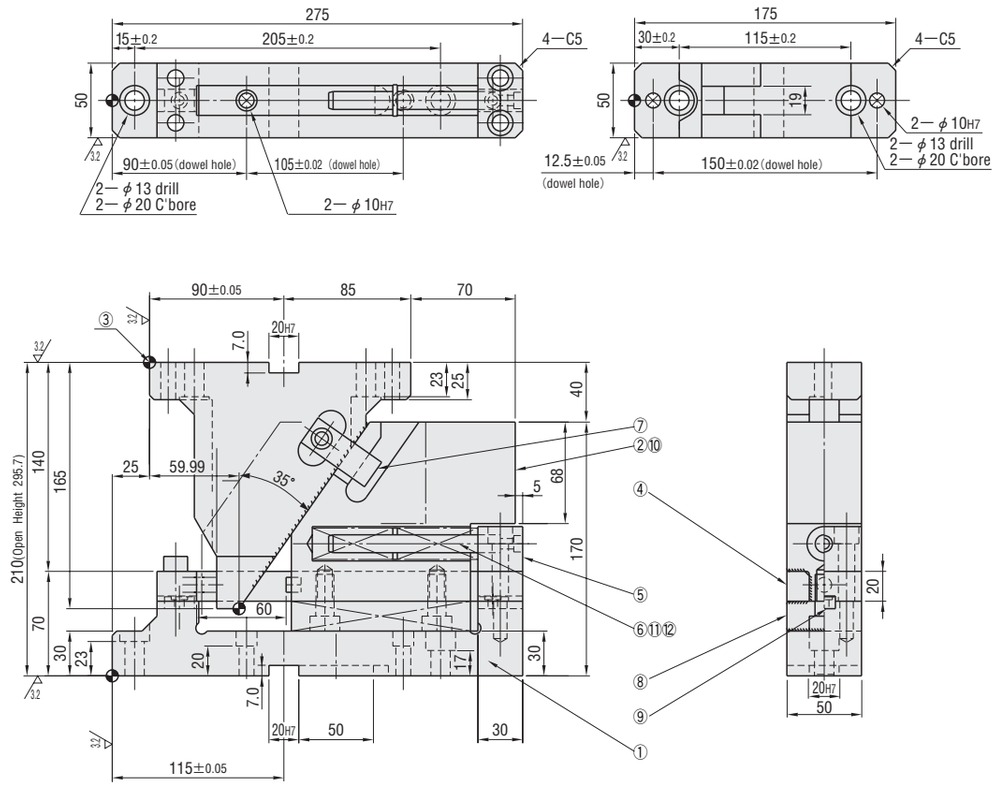
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE UNDER CAM UNIT

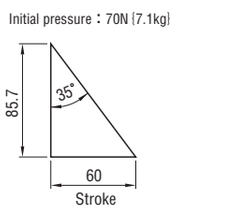
Space	Inclination	Processing capacity	Processing stroke
50mm	0°	2.0t	60.0mm

MUC50-0

RoHS



- Cam diagram



- Processing capacity : 19.6kN {2.0ton}
- Processing stroke : 60.0mm
- Inclination : 0°
- Cam returning pressure
  Initial pressure : 70N {7.1kg}
  Final pressure : 430N {43.9kg}
- Unit weight : 14.0kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	Prehardened steel	1	
5	Spring plate	S50C	1	
6	Spring guide pin	SUJ2	1	
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	20×50×120
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ10×10
11	Cam spring	Spring steel	2	SWS21—90
12	Guide washer	S45C	1	WSSB20—3

Order — Catalog No. MUC50-0

Delivery — 5 Days

Price — U/Price 44,000

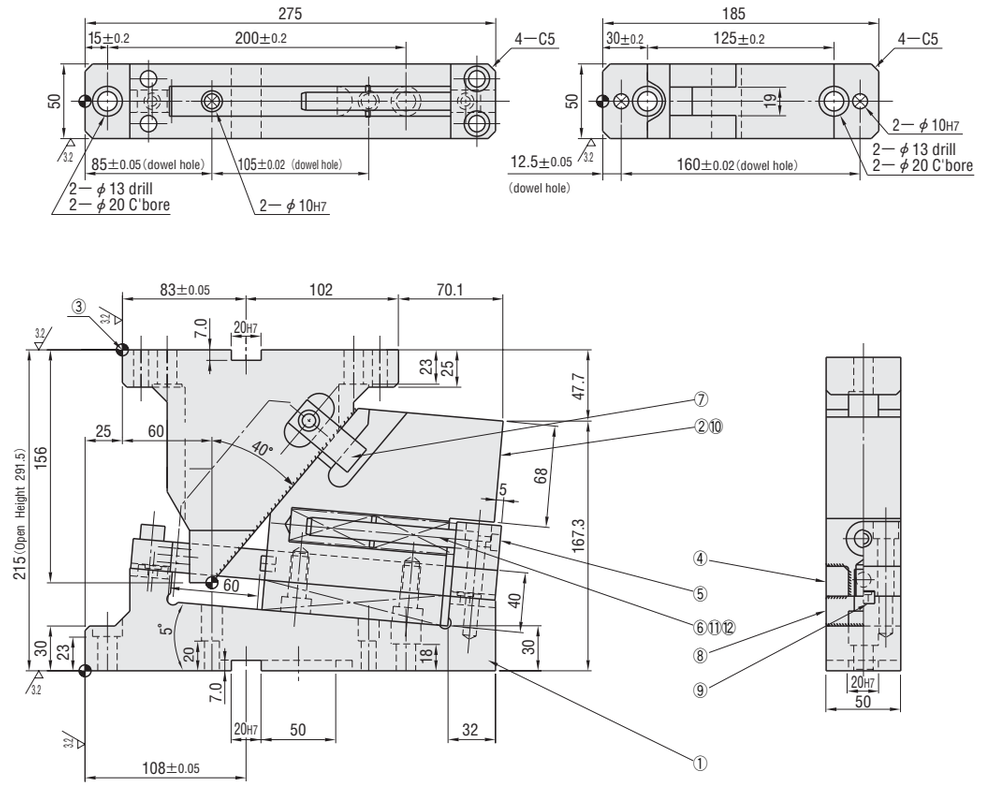
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE UNDER CAM UNIT

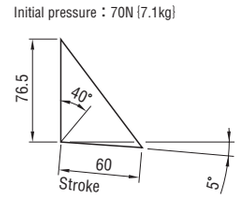
Space	Inclination	Processing capacity	Processing stroke
50mm	5°	2.0t	60.0mm

MUC50-5

RoHS



- Cam diagram



- Processing capacity : 19.6kN {2.0ton}
- Processing stroke : 60.0mm
- Inclination : 5°
- Cam returning pressure
  Initial pressure : 70N {7.1kg}
  Final pressure : 430N {43.9kg}
- Unit weight : 14.0kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	Prehardened steel	1	
5	Spring plate	S50C	1	
6	Spring guide pin	SUJ2	1	
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	20×50×120
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ10×10
11	Cam spring	Spring steel	2	SWS21—90
12	Guide washer	S45C	1	WSSB20—3

Order — Catalog No. MUC50-5

Delivery — 5 Days

Price — U/Price 49,000

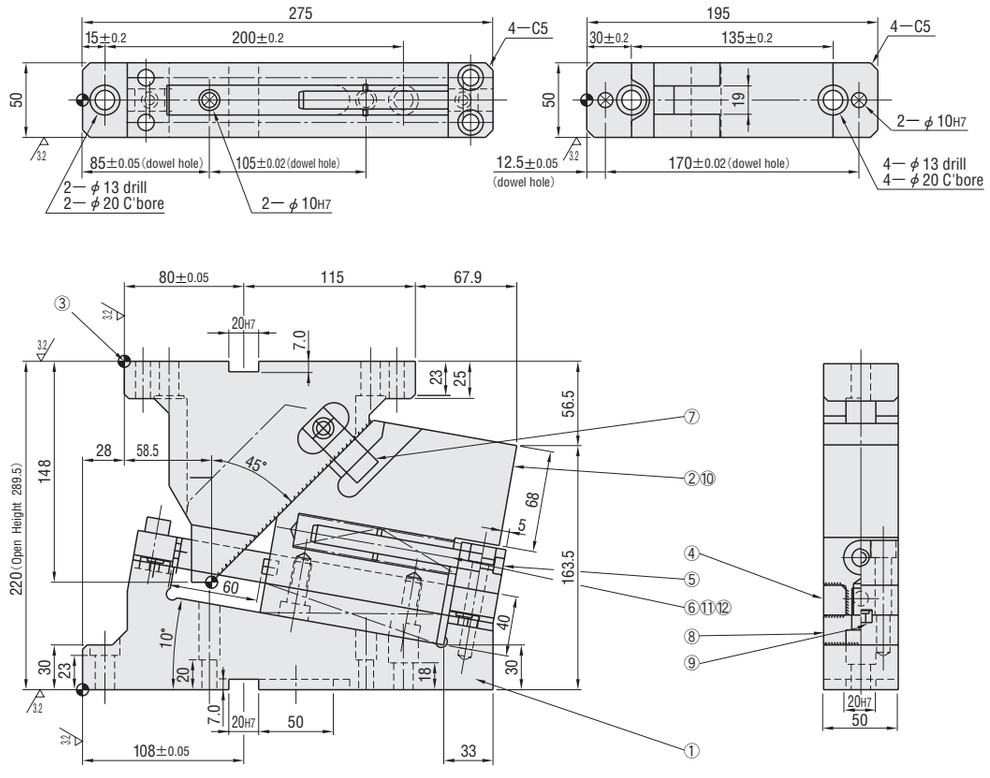
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE UNDER CAM UNIT

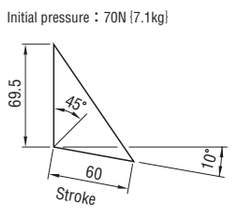
Space	Inclination	Processing capacity	Processing stroke
50mm	10°	2.0t	60.0mm

MUC50-10

RoHS



• Cam diagram



- Processing capacity : 19.6kN {2.0ton}
- Processing stroke : 60.0mm
- Inclination : 10°
- Cam returning pressure
  Initial pressure : 70N {7.1kg}
  Final pressure : 430N {43.9kg}
- Unit weight : 14.0kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	Prehardened steel	1	
5	Spring plate	S50C	1	
6	Spring guide pin	SUJ2	1	
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	20×50×120
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ10×10
11	Cam spring	Spring steel	2	SWS21—90
12	Guide washer	S45C	1	WSSB20—3

Order — Catalog No. MUC50—10

Delivery — 5 Days

Price — U/Price 49,000

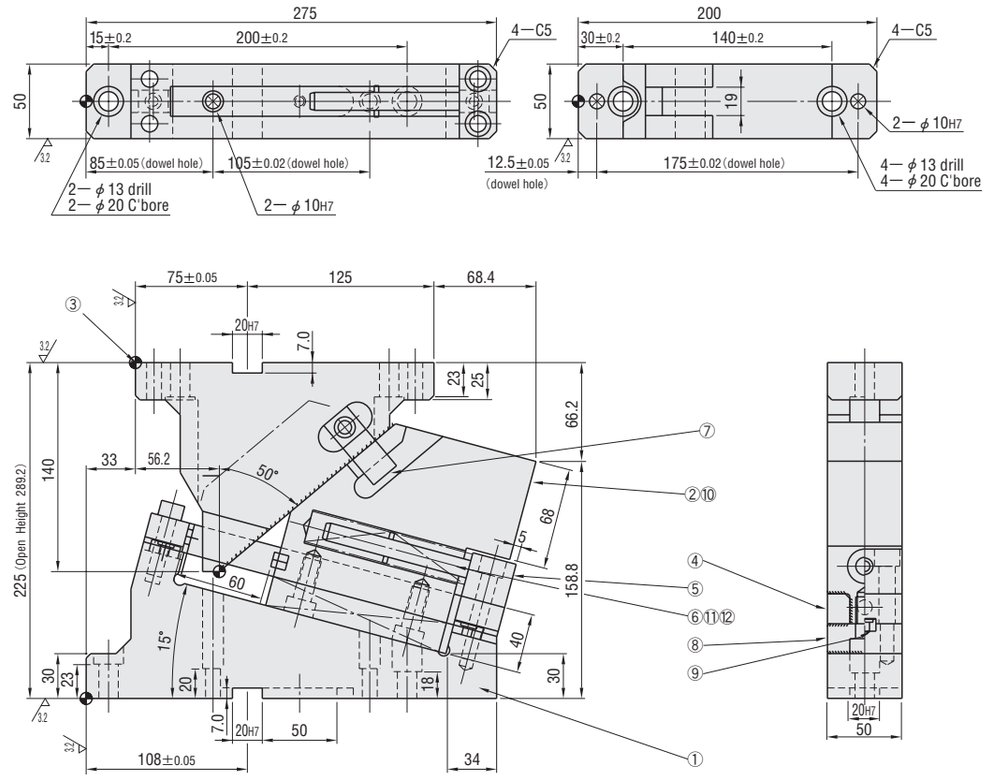
To be quoted on price & lead time above Max. Q'ty.

OIL-FREE UNDER CAM UNIT

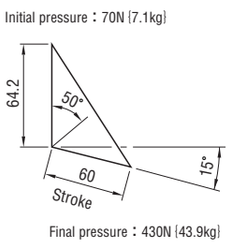
Space	Inclination	Processing capacity	Processing stroke
50mm	15°	2.0t	60.0mm

MUC50-15

RoHS



• Cam diagram



- Processing capacity : 19.6kN {2.0ton}
- Processing stroke : 60.0mm
- Inclination : 15°
- Cam returning pressure
  Initial pressure : 70N {7.1kg}
  Final pressure : 430N {43.9kg}
- Unit weight : 16.0kg

No.	Parts list	M	Q'ty	Notes
1	Cam holder	FC250	1	
2	Cam slide	FC250+MoS_2	1	
3	Cam driver	FC250	1	
4	Guide plate	Prehardened steel	1	
5	Spring plate	S50C	1	
6	Spring guide pin	SUJ2	1	
7	Cam compulsory returning plate	CAC304	1	
8	Cam lower plate	CAC304+MoS_2	1	20×50×120
9	Key	S45C	2	
10	Silent stopper	Urethane	1	φ10×10
11	Cam spring	Spring steel	2	SWS21—90
12	Guide washer	S45C	1	WSSB20—3

Order — Catalog No. MUC50—15

Delivery — 5 Days

Price — U/Price 49,000

To be quoted on price & lead time above Max. Q'ty.

Express service system P.38 | MISUMI Press 2007 | http://misumi.jp/press/ | For inquiry, ordering and other information, refer to P.1269

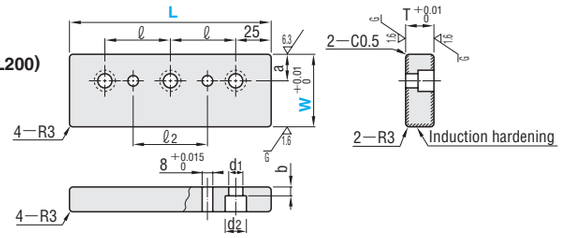
CAM SLIDE PLATES / CAM SIDE PLATES

Cam slide plates

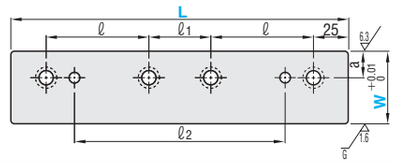
RoHS

CSLA

(L150・L200)



(L250)



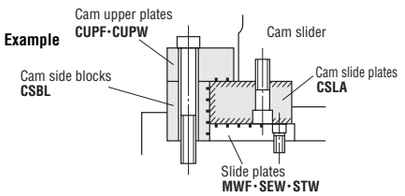
M S45C
H 55HRC～
(Induction hardening)

ℓ	ℓ1	ℓ2	a	b	d1	d2	T	Catalog No.	W	L	U/Price Q'ty : 1～19
50	—	60	20	8	11	18	20	CSLA	55	150	2,450
75		110								200	3,080
75	50	160								250	3,780
50	—	50	25	21	13	20	35		80	150	3,810
75		100								200	4,900
75	50	150								250	6,060
50	—	40	35	32	18	26	50		95	150	5,110
75		90								200	6,580
75	50	140								250	8,120

Order — Catalog No. | W | — | L
CSLA | 55 | — | 150

Delivery — 1 Day

Example



Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	20%

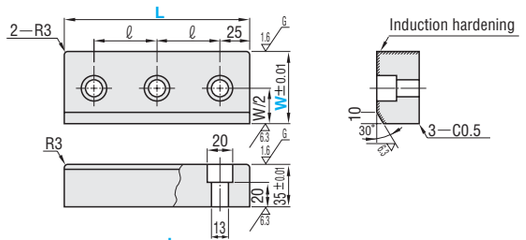
To be quoted on price & lead time above Max. Q'ty.

Cam side plates

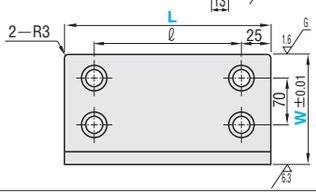
RoHS

CSLP

(W60・W80)



(W110)



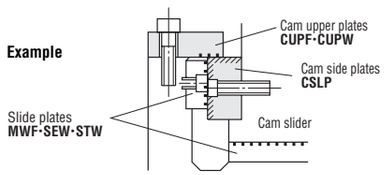
M S45C
H 55HRC～
(Induction hardening)

ℓ	Catalog No.	W	L	U/Price Q'ty : 1～19
50	CSLP	60	150	2,730
75			200	3,500
100			250	4,270
50		80	150	3,360
75			200	4,060
100			250	5,180
100		110	150	3,850
150			200	4,970
200			250	6,090

Order — Catalog No. | W | — | L
CSLP | 60 | — | 150

Delivery — 1 Day

Example



Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	20%

To be quoted on price & lead time above Max. Q'ty.

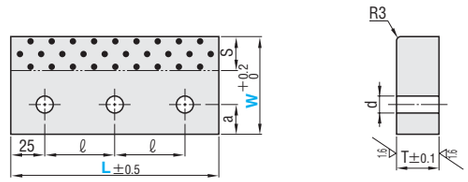
CAM UPPER PLATES / CAM SIDE BLOCKS

Cam upper plates

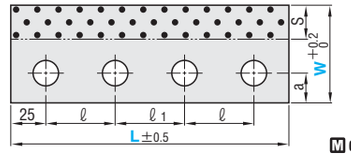
RoHS

CUPF (Casting type)
CUPW (Copper alloy type)

(L150・L200)



(L250)



M CUPF FC250
CUPW CAC304

ℓ	ℓ1	a	S	d	T	Catalog No.	W	L	U/Price Q'ty : 1～19 CUPF	U/Price Q'ty : 1～19 CUPW
50	—	20	12	13	20	CUPF (Casting type) CUPW (Copper alloy type)	52	150	2,600	4,150
75								200	3,050	5,300
	50							250	3,500	6,600
50	—	25	22	18	30		72	150	3,300	7,050
75								200	4,250	9,000
	50							250	5,300	11,150
50	—		27		35		77	150	3,850	8,130
75								200	4,900	10,550
	50							250	5,850	12,860
50	—		32		40		82	150	4,600	9,550
75								200	5,650	12,420
	50							250	6,800	15,380
50	—						105	150	5,450	11,910
	50							200	6,900	15,660
75								250	8,600	19,320

Order — Catalog No. | W | — | L
CUPF | 52 | — | 150

Delivery — 1 Day

Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	20%

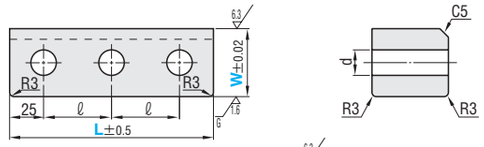
To be quoted on price & lead time above Max. Q'ty.

Cam side blocks

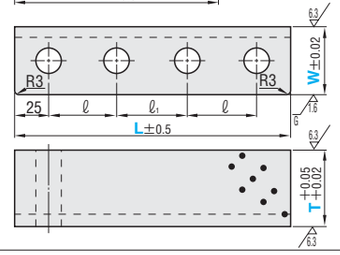
RoHS

CSBL

(L150・L200)



(L250)



M FC250

ℓ	ℓ1	d	Catalog No.	W	L	T	U/Price Q'ty : 1～19
50	—	14	CSBL	40	150	30	3,020
						40	3,180
75					200	30	3,900
	50					40	4,110
					250	30	4,760
						40	5,010
50	—	20		50	150	45	3,800
						55	3,990
						60	4,420
						70	4,650
75	—				200	45	4,760
						55	5,040
						60	5,610
						70	5,920
	50				250	45	5,900
						55	6,200
						60	6,810
						70	7,200

Order — Catalog No. | W | — | L | — | T
CSBL | 40 | — | 150 | — | 40

Delivery — 1 Day

Price

■Volume discount rate P.37

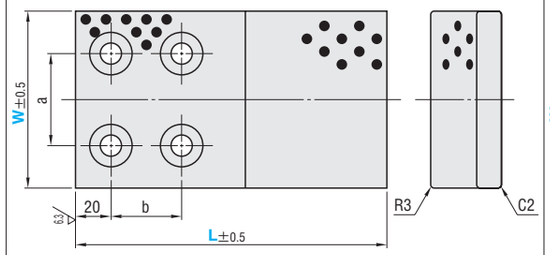
Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	20%

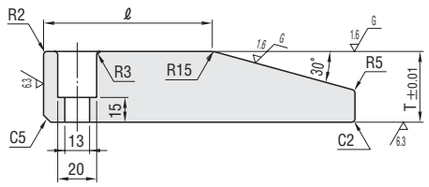
To be quoted on price & lead time above Max. Q'ty.

CAM STROKE PLATES
—30° TYPE—

RoHS

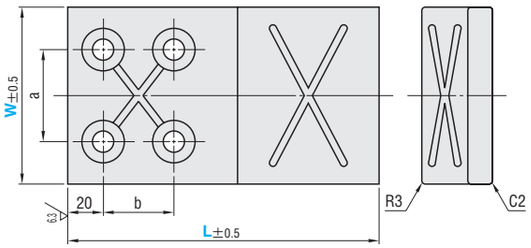
CS30W (Copper alloy type)

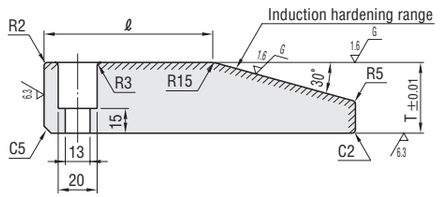




M CAC304
MoS2 (embedded)

CS30F (S45C type)





M S45C
H 55HRC～
(Induction hardening)

T	ℓ	a	b	Catalog No.	W	L	U/Price Q'ty：1～19 CS30W	CS30F
30	95	40	50	CS30W (Copper alloy type) CS30F (S45C type)	75	130	5,460	4,830
45	90		45			150	7,550	6,290
60						170	10,470	7,560
	120		75			200	12,470	8,530
30	95	60	50		100	130	5,960	5,290
45	90		45			150	8,390	6,990
60						170	11,600	8,390
	120		75			200	13,420	10,740
30	95	85	50		125	130	7,710	6,530
45	90		45			150	10,710	8,140
60						170	14,600	9,800
	120		75			200	17,930	12,980
30	95	110	50		150	130	8,960	8,060
45	90		45			150	12,590	10,480
60						170	17,350	12,600
	120		75			200	21,240	14,880

Order — Catalog No. | W | — | L
CS30W | 100 | — | 200

Delivery — 1 Day

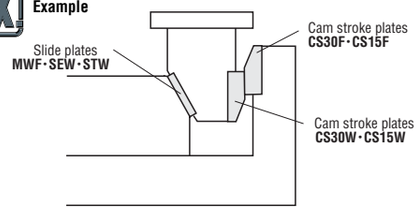
Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

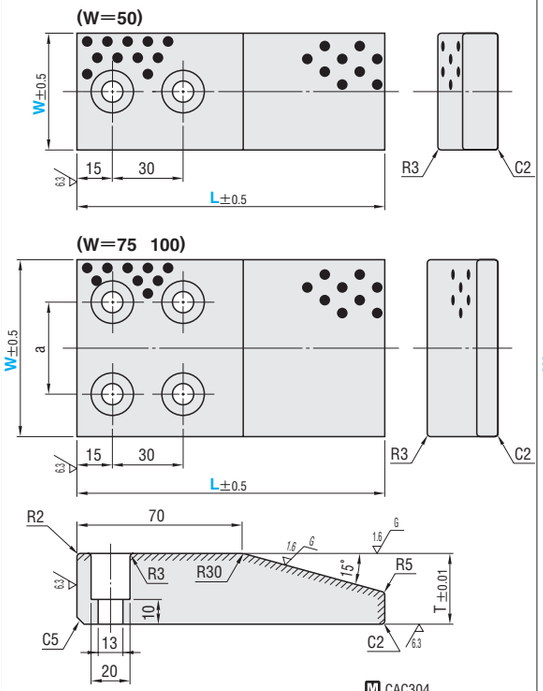
Example



CAM STROKE PLATES
—15° TYPE—

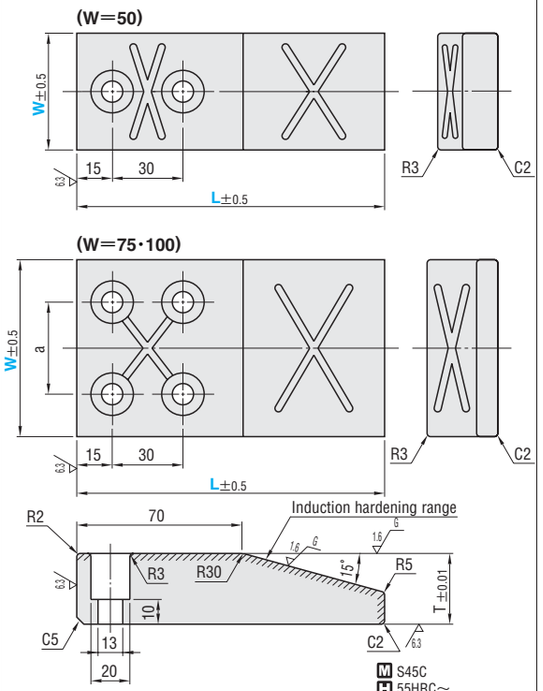
RoHS

CS15W (Copper alloy type)



M CAC304
MoS2 (embedded)

CS15F (S45C type)



M S45C
H 55HRC～
(Induction hardening)

T	a	Catalog No.	W	L	U/Price Q'ty：1～19 CS15W	CS15F
25	—	CS15W (Copper alloy type) CS15F (S45C type)	50	110	3,300	2,360
30				130	4,160	2,780
35				150	4,880	3,420
25	40		75	110	4,460	4,050
30				130	5,150	4,700
35				150	6,560	5,730
25	60		100	110	4,870	4,550
30				130	6,000	5,210
35				150	7,280	6,660

Order — Catalog No. | W | — | L
CS15W | 50 | — | 110

Delivery — 1 Day

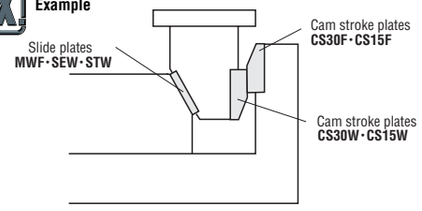
Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example



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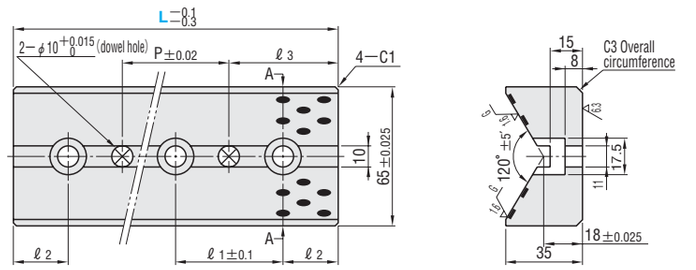
CAM BOTTOM GUIDE PLATE／CAM BOTTOM SLIDE PLATE

Cam bottom guide plate RoHS

CBG



(Cross section A—A)

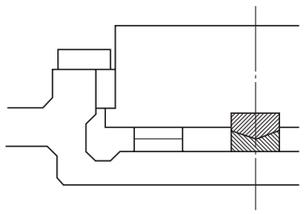
M CAC304
MoS_2 (embedded)

P	ℓ1	ℓ2	ℓ3	Number of bolt holes	Catalog No.	L	U/Price Q'ty : 1~19
20	60	20	40	2	CBG	100	7,070
50	50	25	50	3		150	9,320
100				4		200	11,850
150				5		250	14,240
200				6		300	16,540

Order — Catalog No. CBG | L 200

Delivery — 1 Day

Example



Price

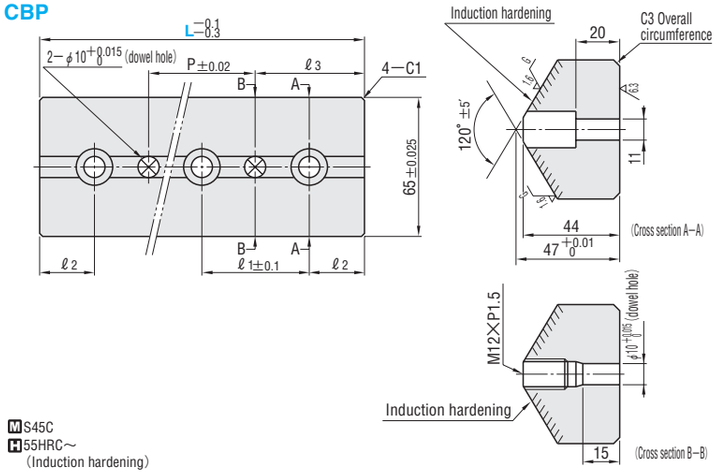
■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Cam bottom slide plate RoHS

CBP



M S45C
H 55HRC～
(Induction hardening)

P	ℓ1	ℓ2	ℓ3	Number of bolt holes	Catalog No.	L	U/Price Q'ty : 1~19
20	60	20	40	2	CBP	100	6,210
50	50	25	50	3		150	7,070
100				4		200	8,340
150				5		250	10,700
200				6		300	11,880

Order — Catalog No. CBP | L 100

Delivery — 1 Day

Price

■Volume discount rate P.37

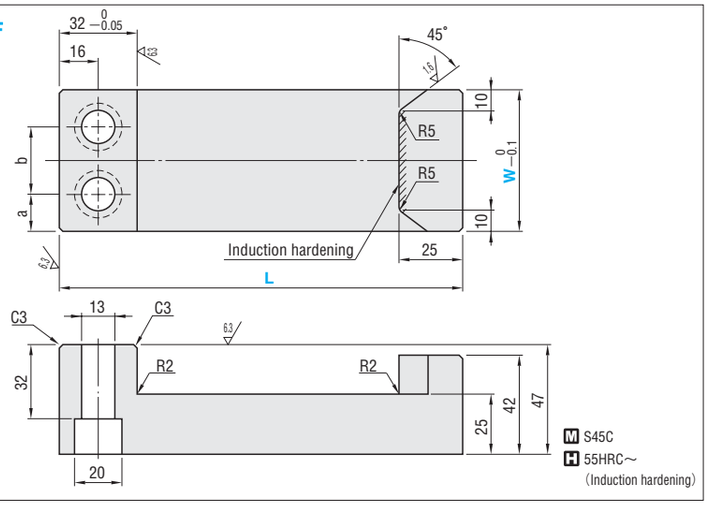
Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

CAM COMPULSORY RETURNING FOLLOWER／CAM COMPULSORY RETURNING BLOCK

Cam compulsory returning follower RoHS

CKF



M S45C
H 55HRC～
(Induction hardening)

a	b	Catalog No.	W	L	U/Price Q'ty : 1~19
15	30	CKF	60	171	4,560
				191	4,730
20	40		80	171	5,220
				191	5,400

Order — Catalog No. CKF | W 60 — L 171

Delivery — 1 Day

Price

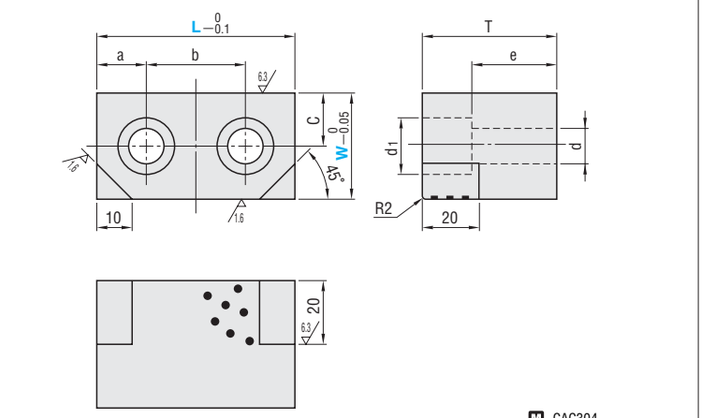
■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Cam compulsory returning block RoHS

CKB



M CAC304
MoS_2 (embedded)

a	b	c	d	d1	e	T	Catalog No.	W	L	U/Price Q'ty : 1~19
15	30	11	11	17.5	18	30	CKB	25	60	2,270
		16	13	20	23	38		32	60	2,900
20	40								80	3,870

Order — Catalog No. CKB | W 25 — L 60

Delivery — 1 Day

Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

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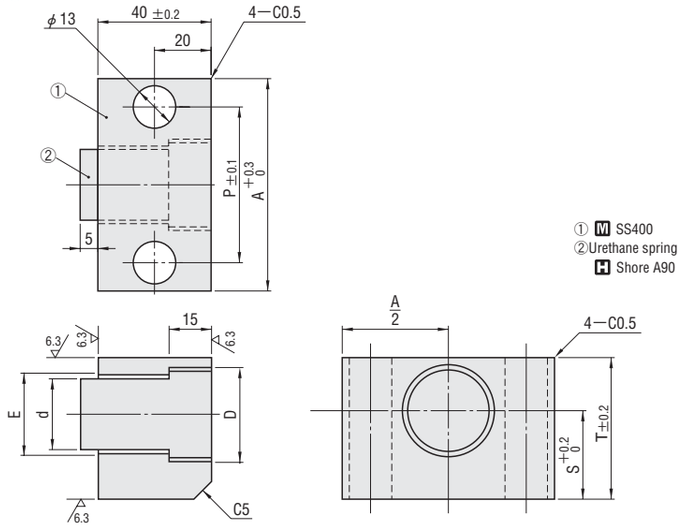
CAM STOPPER

RoHS

CCS



A	T	D	S	E	d	P	F (Maximum load) N {kgf}	Catalog No. Type	Catalog No. No.	U/Price Q'ty : 1～9
70	60	35	40	30	27	50	5100 {520}	CCS	27	1,590
80	70	45	45	40	36	60	9610 {980}		36	2,040

● kgf=N×0.101972

Order Catalog No.

CCS 36

Delivery 1 Day

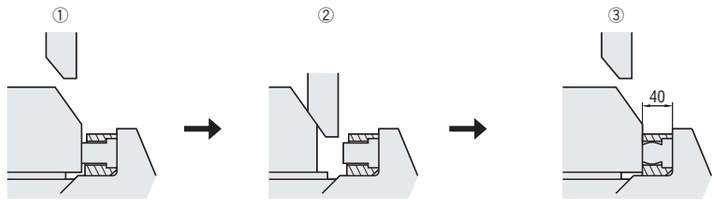
Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

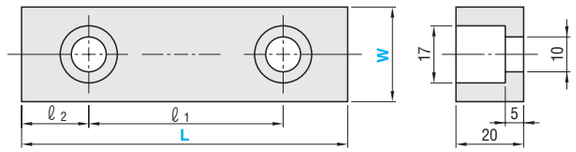
Example



SILENCER URETHANES

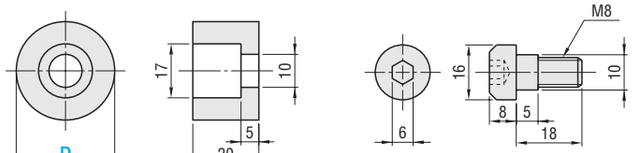
RoHS

CCUC (Block type)



CCUR (Round type)

● Mounting bolt



M Urethane
H Shore A90
A Mounting bolt

● Mounting bolt
M SCM 435
H 33～38HRC

■Block type (Two mounting bolts are attached.)

ℓ1	ℓ2	Catalog No. Type	Catalog No. W	L	U/Price Q'ty : 1～9
60	20	CCUC	30	100	1,050
110				150	1,100
140	30			200	1,250

■Round type (One mounting bolt is attached.)

Catalog No. Type	Catalog No. D	U/Price Q'ty : 1～9
CCUR	30	530

Order Catalog No. — L

CCUC 30 — 100

Delivery 1 Day

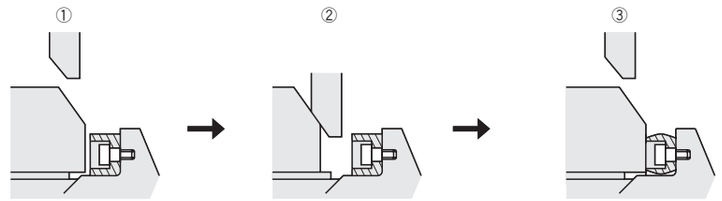
Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example



■Refer to "Mechanical Standard Components for Factory Automation Catalog" for other Urethanes blocks.

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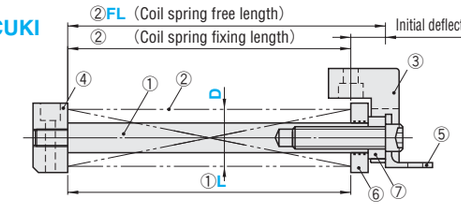
RETURNING UNITS FOR CAM SLIDER

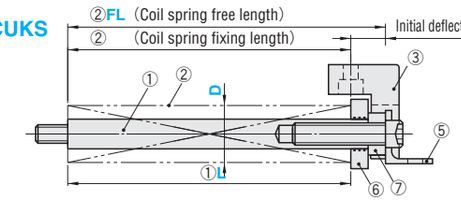
RoHS

This unit is tentatively assembled.

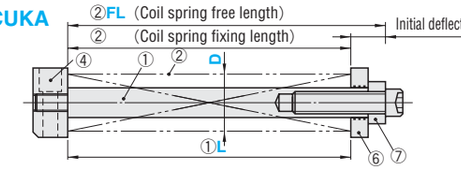
CUKI



CUKS



CUKA

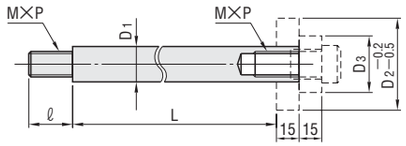


②Spec. of coil springs
SWF P.1075
SWL P.1077
SWM P.1079
SWH P.1081

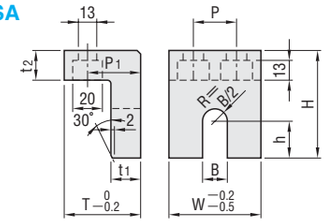
⑥Spec. of separate disk (CUKSD)
⑦Spec. of pressure disk (CUKPD)
P.1051 (Spring guide unit)

① Guide pin
M S45C
H 50HRC～ (Induction hardening)
② Coil spring
③ Slide angle
M SS400
④ Fixed plate
M SS400
A Socket set screw
⑤ Support angle
M SS400
⑥ Separate disk
M FC250
MoS2 (Buried)
⑦ Pressure disk
M SS400

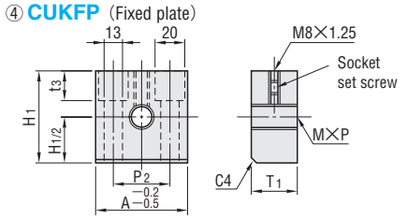
① CUKGP (Guide pin P.1051)



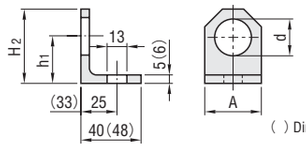
③ CUKSA (Slide angle)



④ CUKFP (Fixed plate)



⑤ CUKFA (Support angle)



( ) Dimension:D=70

D	①Guide pin					③Slide angle									④Fixed plate					⑤Support angle			
	D1	D2	D3	M×P	ℓ	H	h	W	B	P	T	t1	t2	P1	T1	A	P2	H1	t3	A	H2	h1	d
40	19	50	28	12×1.75	24	70	25	60	33	30	50	20	20	35	25	55	30	50	15	27	40	25	19
50	24	60	36	16×2.0	28	85	30	70	41	40	60	25	25	40	32	60	35	60	20	35	48	30	25
60	29	70	43			95	35	80	48	50						70	40	70	30	42	56	35	
70	35	80	48	20×2.5	33	97	27	90	54	50	63	28	28	43	35	80	45	80	30	43	65	40	31

Catalog No.	D	②Type \ ②FL	90	100	125	150	175	200	250	300	350	＊400	＊450	＊500
		①	L specified 1mm increments											
CUKI CUKS CUKA	40	F (SWF) L (SWL)	68～90	80～100	90～125	105～150	130～175	145～200	195～250	—	—	—	—	—
	50				95～125	110～150	120～175	135～200	185～250	225～300	275～350	325～400	375～450	425～500
	60											—	—	—
	70													
	40	M (SWM) H (SWH)	68～90	80～100	90～125	105～150	130～175	145～200	195～250	—	—	—	—	—
	50				95～125	110～150	120～175	135～200	185～250	225～300	275～350			
	60													

＊(over FL400) marked products are available for SWF only.

Order: Catalog No. CUKI — D 40 — ②Type F — ②FL 100 — L L85

Delivery: 3 Days

Price

Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Catalog No.	D	②Type \ ②FL	U/Price Q'ty：1～9											
			90	100	125	150	175	200	250	300	350	400	450	500
CUKI	40	F	11,800	11,900	12,100	12,300	12,500	12,700	13,200	—	—	—	—	—
	50		13,300	13,400	13,700	14,000	14,300	14,500	14,800	15,200	16,330	16,730	16,930	17,150
	60		15,100	15,400	15,700	16,100	16,500	16,900	17,400	17,800	18,600	19,490	19,770	20,070
	70		21,810	22,140	22,540	23,070	23,490	24,120	24,890	25,910	26,780	—	—	—
	40	L	12,000	12,100	12,300	12,500	12,700	13,000	13,400	—	—	—	—	—
	50		13,500	13,600	13,900	14,200	14,500	14,800	15,500	16,100	16,870	—	—	—
	60		15,500	15,700	16,100	16,500	16,900	17,400	18,200	19,000	19,800	—	—	—
	70		22,190	22,620	23,080	23,660	24,190	25,040	26,020	27,260	29,830	—	—	—
	40	M	12,200	12,300	12,500	12,700	13,000	13,200	13,600	—	—	—	—	—
	50		13,800	13,900	14,200	14,500	14,800	15,200	15,800	16,400	17,170	—	—	—
	60		15,800	16,000	16,500	17,100	17,600	18,100	18,900	19,800	20,600	—	—	—
	40	H	12,400	12,500	12,700	13,000	13,200	13,400	13,800	—	—	—	—	—
	50		14,000	14,200	14,600	15,100	15,500	15,900	16,600	17,400	18,170	—	—	—
	60		16,100	16,300	16,800	17,400	17,900	18,400	19,300	20,100	20,900	—	—	—
CUKS	40	F	9,600	9,700	9,900	10,100	10,300	10,500	11,000	—	—	—	—	—
	50		11,000	11,100	11,400	11,700	12,000	12,200	12,500	12,900	13,800	14,690	14,900	15,110
	60		12,600	13,000	13,300	13,700	14,100	14,500	15,000	15,300	16,250	17,200	17,480	17,790
	70		19,780	20,070	20,370	20,890	21,370	21,900	22,570	23,420	24,220	—	—	—
	40	L	9,800	9,900	10,100	10,300	10,500	10,800	11,200	—	—	—	—	—
	50		11,200	11,300	11,600	11,900	12,200	12,500	13,200	13,800	14,700	—	—	—
	60		13,100	13,300	13,700	14,100	14,500	15,000	15,800	16,600	17,550	—	—	—
	70		20,160	20,560	20,910	21,480	22,070	22,820	23,700	24,770	25,730	—	—	—
	40	M	10,000	10,100	10,300	10,500	10,800	11,000	11,400	—	—	—	—	—
	50		11,500	11,600	11,900	12,200	12,500	12,900	13,500	14,100	15,000	—	—	—
	60		13,400	13,600	14,100	14,600	15,200	15,700	16,500	17,400	18,350	—	—	—
	40	H	10,200	10,300	10,500	10,800	11,000	11,200	11,600	—	—	—	—	—
	50		11,700	11,900	12,300	12,700	13,200	13,600	14,300	15,100	16,000	—	—	—
	60		13,700	13,900	14,400	15,000	15,500	16,000	16,800	17,700	18,650	—	—	—
CUKA	40	F	6,900	7,000	7,200	7,400	7,600	7,800	8,200	—	—	—	—	—
	50		7,700	7,800	8,100	8,400	8,800	9,000	9,300	9,600	10,100	10,600	10,800	11,020
	60		8,900	9,200	9,500	9,900	10,300	10,800	11,200	11,600	12,280	12,970	13,250	13,560
	70		13,120	13,420	13,720	14,230	14,720	15,250	15,920	16,770	17,570	—	—	—
	40	L	7,100	7,200	7,400	7,600	7,800	8,000	8,400	—	—	—	—	—
	50		7,900	8,000	8,300	8,700	9,000	9,300	9,900	10,500	11,000	—	—	—
	60		9,300	9,500	9,900	10,300	10,800	11,200	12,000	12,900	13,580	—	—	—
	70		13,500	13,900	14,260	14,820	15,420	16,160	17,050	18,120	19,080	—	—	—
	40	M	7,300	7,400	7,600	7,800	8,000	8,200	8,700	—	—	—	—	—
	50		8,200	8,300	8,700	9,000	9,300	9,600	10,200	10,900	11,400	—	—	—
	60		9,600	9,800	10,300	10,900	11,400	11,900	12,700	13,600	14,280	—	—	—
	40	H	7,500	7,600	7,800	8,000	8,200	8,400	8,900	—	—	—	—	—
	50		8,400	8,700	9,100	9,500	9,900	10,300	11,100	11,800	12,300	—	—	—
	60		9,900	10,100	10,600	11,200	11,700	12,200	13,100	13,900	14,580	—	—	—

③Slide angle

Applicable coil spring outer diameter D	Catalog No. Type	Catalog No. No.	U/Price Q'ty：1～9
40	CUKSA	40	5,350
50		50	6,450
60		60	7,130
70		70	8,610

④Fixed plate

Applicable coil spring outer diameter D	Catalog No. Type	Catalog No. No.	U/Price Q'ty：1～9
40	CUKFP	40	1,910
50		50	2,450
60		60	2,760
70		70	4,420

⑤Support angle

Applicable coil spring outer diameter D	Catalog No. Type	Catalog No. No.	U/Price Q'ty：1～9
40	CUKFA	40	1,320
50		50	1,720
60		60	2,040
70		70	2,470

Order: Catalog No. CUKSA 40

Delivery: 3 Days

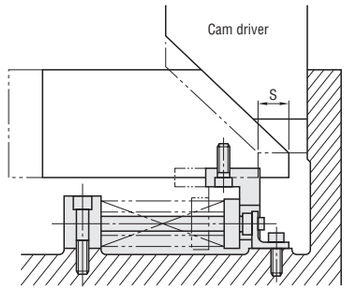
Price

Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

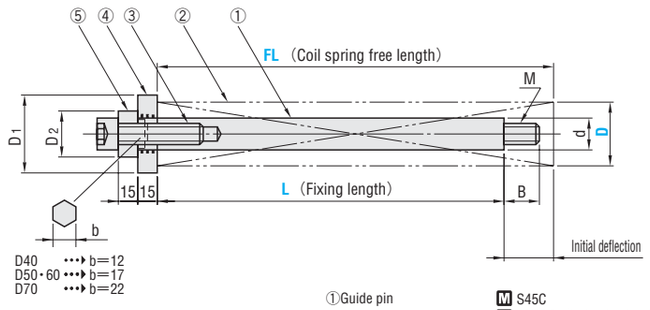
Example



SPRING GUIDE UNITS

RoHS

CUK



①Guide pin — M S45C, H 50HRC (Induction hardening)
②Coil spring
③Socket head cap screw — (D40 : M12 D50・60 : M16 D70 : M20)
④Separate disk — M FC250 MoS_2 (embedded)
⑤Pressure disk — M SS400

When using for returning cam, P.1049

d	D_1	D_2	M×P	B	Catalog No.	Type	D	FL	L specified 1mm increments 90	100	125	150	175	200	250	300	350	*400	*450	*500
19	50	28	12×1.75	24	CUK	SWF	40		68 ~90	80 ~100	90 ~125	105 ~150	130 ~175	145 ~200	195 ~250	240 ~300	—	—	—	—
24	60	36	16×2.0	28		SWL	50		68 ~90	80 ~100	95 ~125	110 ~150	120 ~175	135 ~200	185 ~250	225 ~300	275 ~350	325 ~400	375 ~450	425 ~500
29	70	43	16×2.0			SWM	60													
35	80	48	20×2.5	33		SWH	(70)											—	—	—

D= (70) : Available for SWF & SWL only. * (over FL400) marked products are available for SWF only.

Order

Catalog No.	—	Spring Type	—	D	—	FL	—	L
CUK	—	SWM	—	60	—	250	—	200

Delivery 3 Days

Price

Volume discount rate P.37

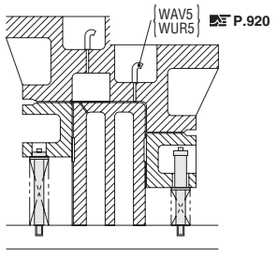
Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

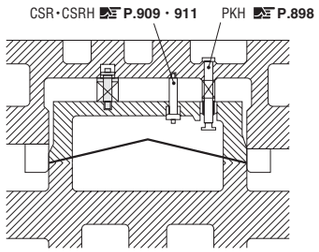
Spec. of coil springs
SWF P.1075 SWM P.1079
SWL P.1077 SWH P.1081

Catalog No.	②Spring Type	D	U/Price Q'ty : 1~9 FL90	FL100	FL125	FL150	FL175	FL200	FL250	FL300	FL350	FL400	FL450	FL500
CUK	SWF	40	4,620	4,730	4,940	5,150	5,360	5,570	5,990	6,410	—	—	—	—
		50	5,360	5,460	5,780	6,090	6,410	6,620	6,930	7,250	7,660	8,460	8,670	8,880
		60	6,090	6,410	6,720	7,140	7,560	7,980	8,400	8,820	9,340	10,450	10,730	11,040
		70	6,860	7,120	7,650	8,230	8,700	9,390	10,240	11,350	12,310	—	—	—
	SWL	40	4,830	4,940	5,150	5,360	5,570	5,780	6,200	6,620	—	—	—	—
		50	5,570	5,670	5,990	6,300	6,620	6,930	7,560	8,190	8,970	—	—	—
		60	6,510	6,720	7,140	7,560	7,980	8,400	9,240	10,100	11,100	—	—	—
		70	7,280	7,660	8,660	8,890	9,500	10,400	11,480	12,840	13,970	—	—	—
	SWM	40	5,040	5,150	5,360	5,570	5,780	5,990	6,410	6,830	—	—	—	—
		50	5,880	5,990	6,300	6,620	6,930	7,250	7,880	8,510	9,240	—	—	—
		60	6,830	7,040	7,560	8,090	8,610	9,140	10,000	10,900	11,900	—	—	—
	SWH	40	5,250	5,360	5,570	5,780	5,990	6,200	6,620	7,140	—	—	—	—
		50	6,090	6,300	6,720	7,140	7,560	7,980	8,720	9,450	10,380	—	—	—
		60	7,140	7,350	7,880	8,400	8,930	9,450	10,300	11,200	12,400	—	—	—

Example

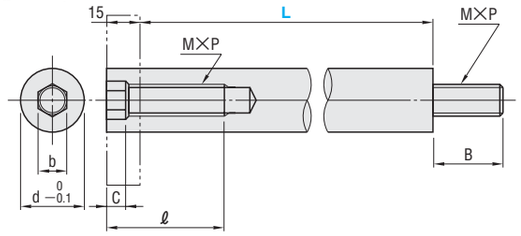


(When using as a cushion for drawing)



(When using as a pressure source for pad)

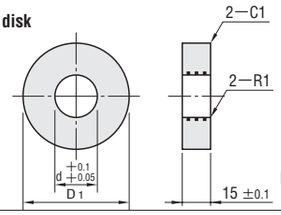
①Guide pin



Adaptable coil spring Diameter D	d	b	C	M×P	B	ℓ ②Spring length (FL) 90	100	125	150	175	200	250	300	350	400	450	500
40	19	12	7	12×1.75	24	55	65	75	85	85	95	95	110	—	—	—	—
50	24	17	10	16×2.0	28	60	70	80	90	90	100	100	110	110	110	110	110
60	29	17	10	16×2.0	28	60	70	80	90	90	100	100	110	110	110	110	110
70	35	22	10	20×2.5	33	60	70	80	90	90	100	100	110	110	—	—	—

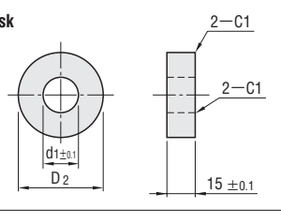
M S45C
H 50HRC~ (Induction hardening)

④Separate disk



M FC250 MoS_2 (embedded)

⑤Pressure disk



M SS400

■Components of spring guide units

Applicable coil spring outer diameter D	Catalog No. Type	No.	L specified 1mm increments FL 90	100	125	150	175	200	250	300	350	400	450	500	U/Price Q'ty : 1~9 FL 90	100	125	150	175	200	250	300	350	400	450	500
40	①Guide pins CUKGP	40	68 ~ 90	80 ~ 100	90 ~ 125	105 ~ 150	130 ~ 175	145 ~ 200	195 ~ 250	240 ~ 300	—	—	—	—	4,150	4,220	4,320	4,420	4,520	4,620	4,830	5,040	—	—	—	—
50		50	68 ~ 90	80 ~ 100	95 ~ 125	110 ~ 150	120 ~ 175	135 ~ 200	185 ~ 250	225 ~ 300	275 ~ 350	325 ~ 400	375 ~ 450	425 ~ 500	4,680	4,710	4,880	5,040	5,200	5,260	5,260	5,280	5,500	5,660	5,760	5,860
60		60													5,140	5,370	5,460	5,650	5,850	6,040	6,060	6,070	6,200	6,650	6,750	6,850
70		70													5,400	5,580	5,620	5,810	5,970	6,120	6,200	6,350	6,510	—	—	—

Applicable coil spring outer diameter D	D_1	d	Catalog No. Type	No.	U/Price Q'ty : 1~9
40	50	19	④Separate disks CUKSD	40	1,380
50	60	24		50	1,500
60	70	29		60	1,790
70	80	35		70	1,900

Applicable coil spring outer diameter D	D_2	d_1	Catalog No. Type	No.	U/Price Q'ty : 1~9
40	28	13	⑤Pressure disks CUKPD	40	540
50	36	17		50	600
60	43			60	670
70	48	21		70	750

Order

Catalog No.	—	Spring FL	—	L
CUKGP 60	—	250	—	200
CUKSD 60				

Delivery 3 Days

Price

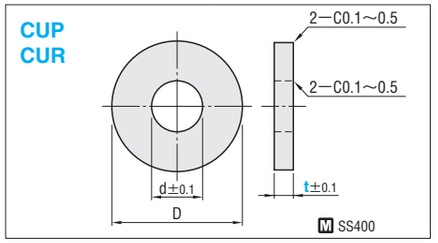
Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

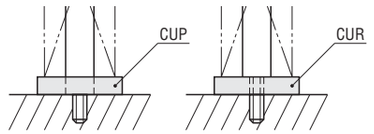
To be quoted on price & lead time above Max. Q'ty.

■Washers for adjusting height

CUP
CUR



M SS400



D	d	Catalog No. Type	No.	t	U/Price Q'ty : 1~9
45	20	CUP	40	1	470
55	25		50	2	630
65	30		60	5	790
75	36		70		1,220

D	d	Catalog No. Type	No.	t	U/Price Q'ty : 1~9
45	12.5	CUR	40	5	520
55	16.5		50		680
65	16.5		60		840
75	20.5		70		1,490

Order

Catalog No.	—	t
CUR 40	—	5

Delivery 1 Day

Price

Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Express service system P.38 · MISUMI Press 2007 · http://misumi.jp/press/ · For inquiry, ordering and other information, refer to P.1269

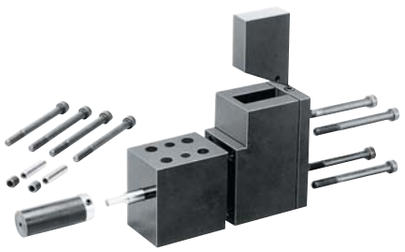
COMPACT CAMS

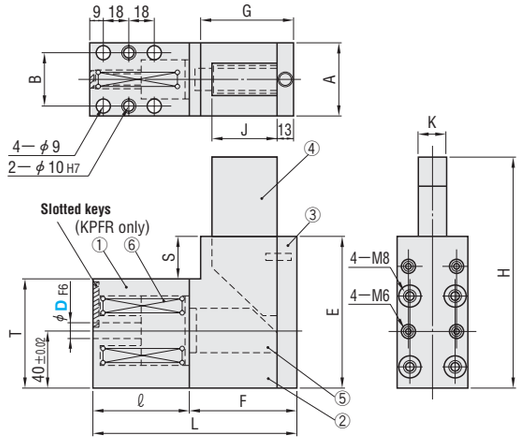
This product is to be discontinued in the next catalog.

Ⓐ (For round punch)
KPAR

D R E G (For shaped punch)
KPFR

RoHS





①Punch holder	②Cam holder	③Backing plate	④Punch driver	⑤Cam slider	⑥Coil spring（SWKP）
M SCM440	M SCM440	M SCM440	M SKD11	M SK4	A CB8—90 MSTM10—30
H 1000HV	H 1000HV	H 1000HV	H 58～63HRC	H 58～63HRC	
S Sur-Sulf treatment	S Sur-Sulf treatment	S Sur-Sulf treatment	S Fe_3O_4（Black oxide）	S Fe_3O_4（Black oxide）	

D_{F6}		A	B	L	F	ℓ	E	S	G	J	K	T	H	Catalog No. Type	D	U/Price Q'ty：1～4 sets KPAR	KPFR
10	+0.022 +0.013	50	36	142	75	67	105	32	65	45	20	73	160	KPAR Ⓐ(For round punch)	10	30,880	32,800
13	+0.027 +0.016														13	30,880	32,800
16														KPFR D R E G (For shaped punch)	16	30,880	32,800
20	+0.033 +0.020	66	52					28			28	77			20	35,200	37,440
25															25	35,360	37,600

Order — Catalog No. — KPAR 10

Delivery — 3 Days — Express A 1,500/1Pc. P.38

A flat charge of 4,050 yen for 3 pieces or more of the same size.

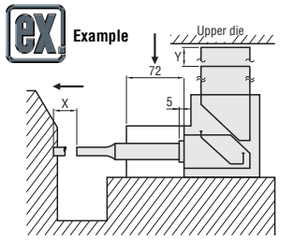
Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～19	20～50
Rate	—	5%	10%	15%

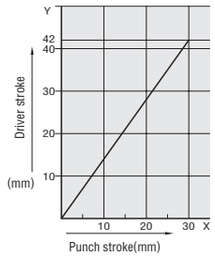
To be quoted on price & lead time above Max. Q'ty.

Example

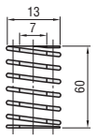


■Notes for users

- The punch stroke is 30mm. See the right table for punch and driver strokes.
- The sliding part of the cam is finished with molybdenum disulfide grease.
- When supplying additional lubrication, use molybdenum disulfide grease.
- Keep the maximum blanking pressure on the punch less than 4 tons.
- Be sure to use a urethane stripper with the universal retainer.
  See **P.688** for detailed specs of urethane stripper.
- Use punches exclusively designed for compact cam （ **P.1054**）
- The projection part length of the punch, when it is inserted, is the overall length of the punch—72mm.



■Coil spring for compact cam



Max. Deflection	N{kgf}/mm	Catalog No.	U/Price Q'ty：1～4
30	4.7{0.48}	SWKP	700

● kgf=N×0.101972

Order — Catalog No. — SWKP

Delivery — 3 Days — Express A 300/1Pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～19	20～50
Rate	—	5%	10%	15%

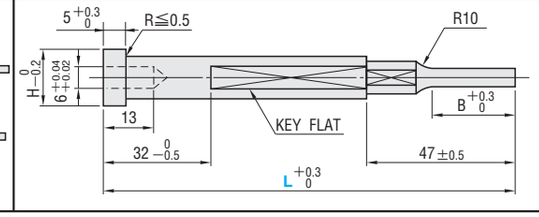
To be quoted on price & lead time above Max. Q'ty.

PUNCHES FOR COMPACT CAM

This product is to be discontinued in the next catalog.

The volume discount rate is also applicable to alteration cost. P.39

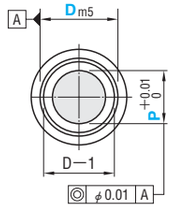
M H	Catalog No. Type	Shape	B Blade length	For blade shape, select from Shape A～G shown below.
SKD11 60～63 HRC	UN	A D R E G	S L	



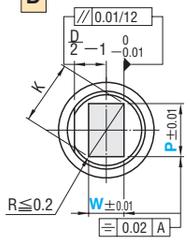
RoHS

The φ6 dowel hole on the head part is not used for compact cams.

Shape A



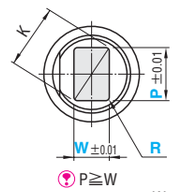
Shape D



P≧W

$K=\sqrt{P^2+W^2}$

Shape R

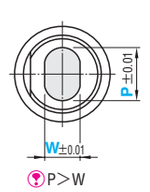


P≧W

$0.15 \leqq R < \frac{W}{2}$

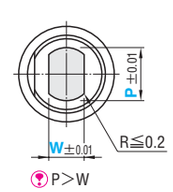
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Shape E



P>W

Shape G



P>W

Catalog No. Type	Shape	B Blade length	D	L	0.01 mm increments Ⓐ min P max	0.01 mm increments D R E G P·Kmax	0.01 mm increments D R E G P·Wmin	0.01 mm increments R R	B S	B L	H
UN	Ⓐ	S	10	120 130 140 150	3.00～ 8.90	7.90	2.50	$0.15 \leqq R < \frac{W}{2}$ (Ⓡonly)	13	19	13
	D		13		6.00～11.90	10.90	3.00				16
	R		16		10.00～14.90	13.90	4.00		19	25	19
	E	L	20		13.00～18.90	17.90	5.00				23
	G		25		18.00～23.90	22.90	6.00				28

Order — Catalog No. — L — P — W — R(Ⓡonly)

UNRL 20 — 130 — P16.30 — W6.50 — R0.25

Delivery — 3 Days — Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

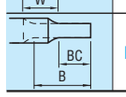
Quantity	1～9	10～29	30～99	100～200
Rate	—	5%	10%	15%

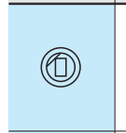
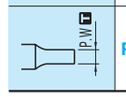
To be quoted on price & lead time above Max. Q'ty.

D	U/Price Q'ty：1～9 UNAS UNAL	UNDS UNDL	UNRS UNRL	UNES UNEL	UNGS UNGL
10	2,280	5,740	7,740	6,090	5,540
13	2,550	6,680	8,830	6,930	6,510
16	2,790	7,550	9,810	7,940	7,490
20	3,490	9,180	11,430	9,450	9,180
25	4,620	10,260	12,780	10,710	10,440

Alteration — Catalog No. — L — P(PC) — W(WC) — R — (BC·KC·PKC)

UNEL 20 — 130 — PC12.30 — W9.00 — BC23

Alterations	Code	Ⓐ	D R E G	¥/1Code
	PC WC	PC≧ Pmin/2 0.01 mm increments: P 1.50～1.99 B max 20; 2.00～3.99 35; 4.00～5.99 40; 6.00～ 40	PC/WC ≧ P·Wmin/2 0.01 mm increments: P·W 1.25～1.49 B max 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	200
	BC	Changes blade length 2≦BC≦Bmax 0.1 mm increments		200

Alterations	Code	Ⓐ	D R E G	¥/1Code
	KC	Key flat on one side Pmax=D—2.10	90° 0° 180° 270° Change angle 1° increments.	400
	PKC	Changes tolerance on P·W P +0.01 0 ⇨ +0.005 0	Changes tolerance on P·W P·W ±0.01 ⇨ +0.01 0	400

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

COIL SPRINGS

COIL SPRINGS

Name	WIRE SPRINGS	—Internal diameter standard type—	COIL SPRINGS			
Catalog No.	WY·WR·WF·WL·WT·WM·WH·WB	NWL・NWM・WP	SWY	SWU	SWR	SWS
Delivery	①	①	①	①	①	①
Page	1058～1065	1066	1067	1068	1069	1071

COIL SPRINGS									
SWC	SWF	SWL	SWM	SWH	SWB	SWG	SWZ	SWV	SWX
①	①	①	①	①	①	①	①	①	①
1073	1075	1077	1079	1081	1083	1085	1087	1089	1090

New

COIL SPRINGS —Stainless type— SWUF・SWUL・SWUM・SWUH	SPRING GUIDE UNITS CUK	WASHERS FOR COIL SPRING SSWA·SSWB·SSWC	FLANGE FOR SPRING UNITS WUNT	SPRING GUIDE PINS SGA	SPRING GUIDE RETAINERS SGC
①	③	①	③Ⓐ	①	①
1091	1095	1097	1098	1099	1100

Category	Features	Page	Type Catalog No.	Color	Outside diameter min.	Outside diameter max.	Full length min.	Full length max.	Allowable deflection	Load N{kgf} min.	Load N{kgf} max.
Round wire coil springs	● Spring constant is fixed for each diameter. (Load varies depending on Full length.)	P.1058	WY	—	φ3	φ16	5	70	75% (1 million shots)	0.38 {0.04}	10.3 {1.05}
		P.1059	WR	—	φ3	φ27	5	90	60% (1 million shots)	0.9 {0.09}	23.5 {2.4}
		P.1060	WF	—	φ3	φ27	5	90	45% (1 million shots)	1.1 {0.11}	35.3 {3.6}
		P.1061	WL	—	φ2	φ27	5	100	40% (1 million shots)	0.98 {0.1}	117.7 {12.0}
		P.1062	WT	—	φ3	φ27	5	80	40% (1 million shots)	2.9 {0.3}	125.5 {12.8}
		P.1063	WM	—	φ3	φ27	5	100	35% (1 million shots)	3.4 {0.4}	171.6 {17.5}
		P.1064	WH	—	φ4	φ27	5	100	30% (1 million shots)	4.9 {0.5}	441.3 {45.0}
		P.1065	WB	—	φ3	φ27	5	100	25% (1 million shots)	4.9 {0.5}	735.5 {75.0}
		P.1066	NWL (Int. diam.)	—	φ5.5 (Int. diam.)	φ16.6 (Int. diam.)	30	60	40% (1 million shots)	13.7 {1.4}	27.5 {2.8}
		P.1066	NWM (Int. diam.)	—	φ5.5 (Int. diam.)	φ16.6 (Int. diam.)	30	60	32% (1 million shots)	20.6 {2.1}	34.3 {3.5}
		P.1066	WP (Long type)	—	φ11.5	φ17	100	500	70% (1 million shots)	21.3 {2.2}	34.3 {3.5}

●Operating temperature

The data shown on this catalog such as load values have been obtained through measurements conducted at normal temperatures (40℃ or less). If coil springs are used at temperatures higher than normal temperature, the load capacity and maximum number of durable operating times may be reduced, though it also depends on other conditions.

The maximum working ambient temperature is up to 80℃. Although the allowable temperature limit of spring wires are higher than springs' maximum operating temperatures limit (120℃ for round wires, 200℃ for irregular shaped wires), if springs are used at temperatures higher than working ambient temperatures, significant degradation in their functions is expected. ℗ Except stainless steel type (P.1091)

●Allowable deflection

Do not use the springs exceeding the allowable deflection values.If they are used exceeding the allowable deflection, their load capacity and durability will degrade, leading to their breakage in the worst case.

℗ If once round wire coil springs are compressed exceeding the allowable deflection, their dimension L will be shortened.

Category	Features	Page	Type Load	Type Catalog No.	Type Color	Outside diameter min.	Outside diameter max.	Overall length min.	Overall length max.	Allowable deflection	Load N{kgf} min.	Load N{kgf} max.
Irregular shaped wire coil springs — high deflection type	● Load is fixed for each diameter.	P.1067	Light	SWY	Pastel green	φ11	φ42	20	300	65% (1 million shots)	29.4 {3.0}	392.3 {40.0}
										70% (300,000 shots)	31.4 {3.2}	425.6 {43.4}
		P.1068		SWU	Light blue	φ10.5	φ43	15	300	60% (1 million shots)	68.6 {7.0}	588.4 {60.0}
										65% (300,000 shots)	73.9 {7.5}	637.4 {65.0}
		P.1069		SWR	Ivory	φ10.5	φ50	15	400	50% (1 million shots)	78.5 {8.0}	1323.9 {135.0}
										55% (300,000 shots)	87.2 {8.8}	1456.3 {148.5}
		P.1071		SWS	Orange	φ10.5	φ52	20	300	40% (1 million shots)	87.2 {8.9}	1569.0 {160.0}
										45% (300,000 shots)	97.1 {9.9}	1765.2 {180.0}
Irregular shaped wire coil springs — heavy load type	● Load is fixed for each diameter.	P.1073		SWC	Purple	φ6 (φ3)	φ30 (φ15)	15	200	50% (1 million shots)	27 {2.8}	392 {40.0}
										60% (300,000 shots)	32 {3.3}	471 {48.0}
		P.1075		SWF	Yellow	φ6 (φ3)	φ70 (φ38.5)	10	500	40% (1 million shots)	47 {4.8}	3136 {320}
										50% (300,000 shots)	59 {6.0}	3920 {400}
		P.1077		SWL	Blue	φ6 (φ3)	φ70 (φ38.5)	10	350	32% (1 million shots)	63 {6.4}	4782 {488}
										40% (300,000 shots)	78 {8.0}	5978 {610}
		P.1079		SWM	Red	φ6 (φ3)	φ70 (φ38.5)	10	350	25.6% (1 million shots)	79 {8.0}	6664 {680}
										32% (300,000 shots)	98 {10}	8330 {850}
		P.1081		SWH	Green	φ6 (φ3)	φ70 (φ38.5)	10	350	19.2% (1 million shots)	110 {11}	10046 {1024}
										24% (300,000 shots)	137 {14}	12557 {1280}
		P.1083		SWB	Brown	φ6 (φ3)	φ70 (φ38.5)	10	350	16% (1 million shots)	142 {14}	13655 {1392}
										20% (300,000 shots)	177 {18}	17069 {1740}
		P.1085		SWG	Black	φ10 (φ5)	φ50 (φ25)	15	200	16% (1 million shots)	392 {40}	9807 {1000}
										20% (300,000 shots)	490 {50}	12258 {1250}
		P.1087		SWZ	Gold	φ10 (φ5)	φ50 (φ25)	25	200	10.5% (1 million shots)	416 {42}	12959 {1321}
										13% (300,000 shots)	515 {53}	16045 {1636}
		P.1089	Heavy	SWV	Wine red	φ10 (φ5)	φ50 (φ25)	30	200	10.5% (1 million shots)	644 {66}	14904 {1228}
										13% (300,000 shots)	797 {81}	18452 {1882}
High speed type		P.1090	—	SWX	— (no painting)	φ20 (φ9.5)	φ40 (φ20.5)	25	100	10% (10 million shots)	1275 {130}	5198 {530}
anticorrosive and heat proof	New	P.1091	—	SWUF SWUL SWUM SWUH	— (no painting)	φ10 (φ5)	φ30 (φ15)	20	60	℗ Refer to P.1091		

●Painting of irregular shaped wire coil springs

Misumi irregular shaped wire coil springs have been painted for identification and rust prevention.
(SWX and SWU□ are no painting.)

●Spring load calculation method

Load=spring constant×deflection
N=N/mm × Fmm (SI unit)
kgf=kgf/mm × Fmm
(kgf=N×0.101972)

〔TECHNICAL DATA〕 DIRECTIONS AND PRECAUTIONS FOR COIL SPRINGS

WIRE SPRINGS
—WY（75%DEFLECTION）—

■Directions and precautions for coil springs

MISUMI is engaged in a constant effort to design coil springs with optimum cross-sectional shape （except round wire coil springs） and maximum durability. When using the springs, pay due attention to the following precautions and undesirable usage that should be avoided for the sake of safety.

①Always use a spring guide

When used without a spring guide, the coil spring may buckle or bend midway. This can cause it to break since the internal surface of the bend is subjected to concentrated high stress.Be sure to use a spring guide, such as a shaft and OD（outside diameter）guide, with the coil spring.

※In most cases, the best results are being obtained by inserting a shaft all the way through the coil spring, from top to bottom, as an ID（inside diameter）guide.

②Clearance between spring ID and shaft

When clearance between the spring and the shaft is insufficient, the coil spring's internal surface may come into contact with the shaft and be subject to abrasion at that point. This will lead to the spring's eventually breaking at the point of wear.Excessive clearance, on the other hand, can lead to buckling of the coil spring. It is recommended that the shaft diameter be set approximately 1.00mm smaller than the ID of the coil spring. When the coil spring has a long free length（i.e., free length/OD is 4 or higher）, set up a step on the shaft as shown in Fig. 1 to prevent the coil spring's internal surface from touching the shaft when it bends.

③Clearance between spring OD and counterbore hole

The coil spring expands in the outward direction when it deflects. Insufficient clearance between the spring and the counterbore hole restrains expansion, and the resulting concentration of stress can cause the coil spring to break.It is recommended that the spotfaced hole diameter be set approximately 1.5 mm larger than the coil spring OD.The spotfaced hole configuration shown in Fig. 1 is ideal for a coil spring with a long free length.

④Avoid a short shaft length and shallow counterbore hole depth

If the guide is too short, the coil spring may touch the guide's tip when it is compressed. The resulting friction could cause the coil spring to beak.It is recommended that the guide length be set longer than half of the initial height.Also make sure to chamfer the shaft around C3 level.

⑤Do not use in excess of maximum deflection（300,000-times limit） （or near its solid length）

When the coil spring is used in excess of the 300,000-times limit, its cross section starts receiving a stress higher than the theoretical value. This can cause the coil spring to break. Furthermore when the coil spring is used at around its solid height its active coils gradually adhere each other, increasing the spring constant value and causing the load curve to rise, as shown in Fig. 2.The resulting high stress that develops will cause the coil spring to break.Furthermore, it becomes a cause of strain.Do not use the coil spring in excess of the 300,000-times limit.

⑥Set up an initial deflection

When there is room for the coil spring to move vertically, it receives an impact force that causes it to bend midway or to buckle.Setting up an initial deflection stabilizes the top and bottom ends of the spring.

⑦Avoid entrapment of debris or foreign matter

Debris or foreign matter that gets caught between the coils causes that part of the coil spring to stop functioning as active coils, forcing the other coils deflect as shown in Fig. 3. This effectively reduces the number of active coils, increasing the stress on the spring, and eventually causing it to break.Be careful not to allow debris or foreign matter clog the coils.

⑧Keep mounting faces parallel

The coil spring should be mounted properly, with its mounting faces（top and bottom faces）parallel to each other. Misalignment can cause the spring to bend midway, subjecting the bend to high stress. This can cause to spring to break at that point.The same applies to the dies in which the coil spring is used, if the parallel alignment between the dies is poor, as shown in Fig. 4, the coil spring can bend midway or exceed the 300,000-times limit prematurely.Keep the coil spring's mounting faces as perfectly parallel as possible to prevent this from occurring.

⑨Do not use coil springs in series

If you use two coil springs in series, they will tend to bend, as shown in Fig. 5. This can cause them to move out of the shaft or spotfaced holes. If this happens, the coil spring will eventually break for the same reasons described in ① above. Moreover, due to spring load differences, the weaker spring is overcome by （and deflects more than） the stronger spring, as shown in Fig. 6. This will make the weaker spring more prone to damage, or cause it to break.

⑩Do not use two coil springs in parallel

Use of two coil springs parallel may result in the inner coils being sandwiched between the outer coils, or vice versa, when they contract. This can cause the coil springs to break for the same reason noted in ④.

⑪Do not use the coil spring horizontally

When the coil spring is used horizontally, the internal surface of the spring will come into contact with the shaft, causing abrasion at those spots. The spring will eventually break at these weakened spots.

MISUMI endurance test conditions

①**Spring guide formula**
Shaft penetration
1.0mm less than shaft diameter d

②**Initial deflection**
1.0mm

③**Amplitude**
Deflection with 300,000-times limit value

④**Speed**
180spm

※The maximum number of durable operating times may vary depending on the service conditions.

Fig. 1

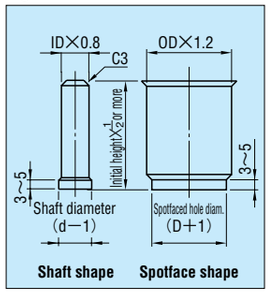


Fig. 2

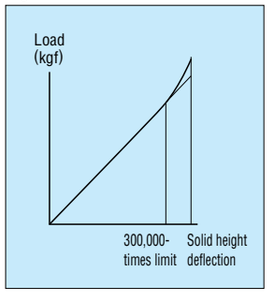


Fig. 3

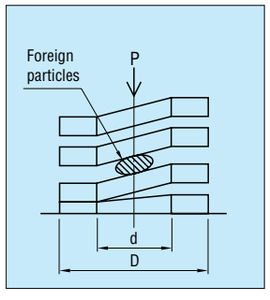


Fig. 4

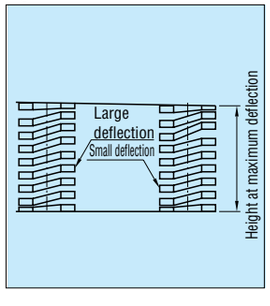


Fig. 5

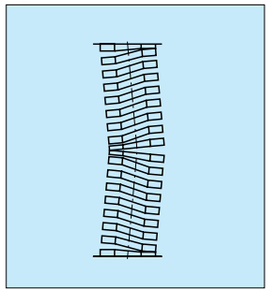


Fig. 6

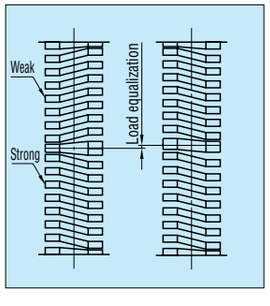
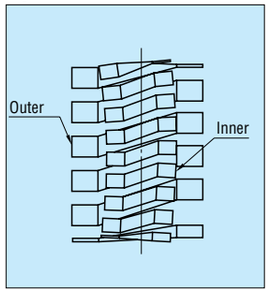
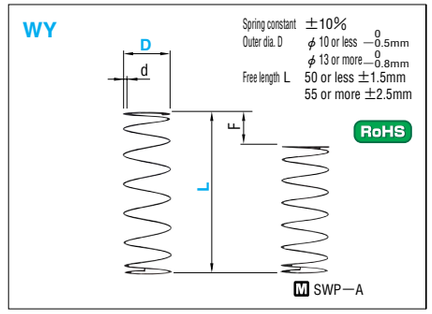


Fig. 7





■Spring constant

WY type D12 and D14 are not available.

D \ Type	WY	WR	WF	WL	WT	WM	WH	WB
2	N/mm 0.1 {kgf/mm} {0.01}	N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	0.5{0.05} N/mm 1.0 {kgf/mm} {0.1}	1.5 {0.15} N/mm 2.0 {kgf/mm} {0.2}	2.0 {0.2} N/mm 2.9 {kgf/mm} {0.3}	2.9{0.3} N/mm 5.9 {kgf/mm} {0.6} N/mm 9.8 {kgf/mm} {1.0}	3.9{0.4} 4.9{0.5} N/mm 9.8 {kgf/mm} {1.0} N/mm 19.6 {kgf/mm} {2.0} 29.4{3.0} N/mm 29.4 {kgf/mm} {3.0}
3								
4								
5								
6								
8								
10	N/mm 0.2 {kgf/mm} {0.02}							
12								
13								
14								
16								
18		N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 3.9 {kgf/mm} {0.4}	N/mm 4.9 {kgf/mm} {0.5}	N/mm 14.7 {kgf/mm} {1.5}	
20								
22								
27								
Fmax.	F=L×75%	F=L×60%	F=L×45%	F=L×40%	F=L×40%	F=L×35%	F=L×30%	F=L×25%

Order — Catalog No. WY 13−60 — Delivery 1 Day — Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~99	100~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■WY：Fmax.(Allowable deflection)=L×75%

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D−L	U/Price Q'ty:1~9
0.16	1.0	3.75	0.38(0.04)	WY 3− 5	65
0.2	2.0	7.5	0.75(0.08)	10	
0.23	3.6	11.2	1.12(0.11)	15	
0.23	3.6	15	1.5 (0.15)	20	
0.25	5.5	18.7	1.87(0.19)	25	70
0.26	6.5	22.5	2.25(0.23)	30	
0.2	1.1	3.75	0.38(0.04)	WY 4− 5	70
0.23	1.9	7.5	0.7 (0.08)	10	
0.23	1.9	11.2	1.1 (0.11)	15	
0.25	2.7	15	1.5 (0.15)	20	
0.29	5	18.7	1.8 (0.19)	25	75
0.29	5	22.5	2.2 (0.23)	30	
0.32	7.7	26.2	2.6 (0.26)	35	
0.32	7.7	30	2.9 (0.3)	40	
0.25	1.7	7.5	0.7 (0.08)	WY 5−10	73
0.25	1.7	11.2	1.1 (0.11)	15	
0.3	3.2	15	1.5 (0.15)	20	
0.3	3.2	18.7	1.8 (0.19)	25	78
0.35	6.3	22.5	2.2 (0.23)	30	
0.35	6.3	26.2	2.6 (0.26)	35	
0.38	9.2	30	2.9 (0.3)	40	
0.38	9.2	33.7	3.3 (0.34)	45	
0.38	9.2	37.5	3.7 (0.38)	50	
0.3	2.1	7.5	0.75(0.08)	WY 6−10	75
0.32	2.8	11.2	1.1 (0.11)	15	
0.32	2.8	15	1.5 (0.15)	20	
0.35	4.1	18.7	1.8 (0.19)	25	80
0.38	5.6	22.5	2.2 (0.23)	30	
0.38	5.6	26.2	2.6 (0.26)	35	
0.4	7.2	30	2.9 (0.3)	40	
0.4	7.2	33.7	3.3 (0.34)	45	
0.4	7.2	37.5	3.7 (0.38)	50	
0.45	12.2	41.2	4.0 (0.41)	55	85
0.45	12.2	45	4.4 (0.45)	60	
0.45	12.2	48.7	4.8 (0.49)	65	
0.45	12.2	52.5	5.1 (0.53)	70	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D−L	U/Price Q'ty:1~9
0.35	2.1	7.5	0.75(0.08)	WY 8−10	85
0.38	3	11.2	1.1 (0.11)	15	
0.4	3.5	15	1.5 (0.15)	20	
0.4	3.5	18.7	1.8 (0.19)	25	90
0.45	5.7	22.5	2.2 (0.23)	30	
0.45	5.7	26.2	2.6 (0.26)	35	
0.45	5.7	30	2.9 (0.3)	40	
0.45	5.7	33.7	3.3 (0.34)	45	95
0.5	9	37.5	3.7 (0.38)	50	
0.5	9	41.2	4.0 (0.41)	55	
0.5	9	45	4.4 (0.45)	60	
0.5	9	48.7	4.8 (0.49)	65	
0.5	9	52.5	5.1 (0.53)	70	
0.5	3	11.2	2.26(0.23)	WY10−15	100
0.55	4.6	15	2.9 (0.3)	20	
0.55	4.6	18.7	3.7 (0.37)	25	
0.6	6.6	22.5	4.4 (0.45)	30	
0.6	6.6	26.2	5.1 (0.52)	35	
0.65	9.1	30	5.9 (0.6)	40	
0.65	9.1	33.7	6.6 (0.67)	45	
0.65	9.1	37.5	7.4 (0.75)	50	
0.7	12.6	41.2	8.1 (0.82)	55	105
0.7	12.6	45	8.8 (0.9)	60	
0.7	12.6	48.7	9.6 (0.97)	65	
0.7	12.6	52.5	10.3 (1.05)	70	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D−L	U/Price Q'ty:1~9
0.6	3.9	15	2.9(0.3)	WY13−20	105
0.65	5.1	18.7	3.7(0.37)	25	
0.65	5.1	22.5	4.4(0.45)	30	
0.7	6.7	26.2	5.1(0.52)	35	
0.75	8.7	30	5.9(0.6)	40	
0.75	8.7	33.7	6.6(0.67)	45	
0.8	11.6	37.5	7.4(0.75)	50	
0.8	11.6	41.2	8.1(0.82)	55	110
0.8	11.6	45	8.8(0.9)	60	
0.85	15.3	48.7	9.6(0.97)	65	
0.85	15.3	52.5	10.3(1.05)	70	
0.65	3.6	15	2.9(0.3)	WY16−20	130
0.7	4.6	18.7	3.7(0.37)	25	
0.75	5.7	22.5	4.4(0.45)	30	
0.8	7	26.2	5.1(0.52)	35	
0.85	9	30	5.9(0.6)	40	
0.85	9	33.7	6.6(0.67)	45	
0.9	11.3	37.5	7.4(0.75)	50	
0.9	11.3	41.2	8.1(0.82)	55	140
0.9	11.3	45	8.8(0.9)	60	
0.9	11.3	48.7	9.6(0.97)	65	
0.9	11.3	52.5	10.3(1.05)	70	

●Load calculation method：N(load)=N/mm(spring constant)×F(deflection)
（International units）N=N/mm×Fmm
kgf=kgf/mm×Fmm
（kgf=N×0.101972）

No grinding on both ends of all WY type springs.
The solid height values are reference only. There may be some variations depending on lots.
Operation frequency：1 million times.
Product Outline P.1055
Directions and precautions for coil springs P.1057

WIRE SPRINGS
—WR(60% DEFLECTION), WF(45% DEFLECTION)—

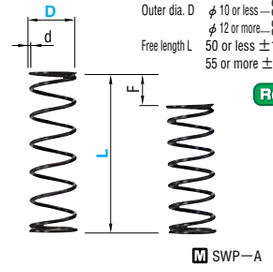
Order — Catalog No. WR 13—60 — Delivery 1 Day — Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~99	100~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

WR
WF



Spring constant ±10%
Outer dia. D φ10 or less 0 -0.5mm; φ12 or more 0 -0.8mm
Free length L 50 or less ±1.5mm; 55 or more ±2.5mm

RoHS

M SWP—A

■Spring constant

D \ Type	WY	WR	WF	WL	WT	WM	WH	WB
2				0.5{0.05}				3.9{0.4}
3	N/mm 0.1 {kgf/mm} {0.01}	N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	1.5 {0.15}	2.0 {0.2}	2.9{0.3}	4.9{0.5}
4					N/mm 2.0 {kgf/mm} {0.2}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 5.9 {kgf/mm} {0.6}	N/mm 9.8 {kgf/mm} {1.0}
5								
6								
8								
10	N/mm 0.2 {kgf/mm} {0.02}						N/mm 9.8 {kgf/mm} {1.0}	N/mm 19.6 {kgf/mm} {2.0}
12								
13								29.4{3.0}
14								
16								N/mm 29.4 {kgf/mm} {3.0}
18		N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 3.9 {kgf/mm} {0.4}	N/mm 4.9 {kgf/mm} {0.5}	N/mm 14.7 {kgf/mm} {1.5}	
20								
22								
27								
Fmax.	F=L×75%	F=L×60%	F=L×45%	F=L×40%	F=L×40%	F=L×35%	F=L×30%	F=L×25%

■WR : Fmax.(Allowable deflection)=L×60%

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
0.23	1.8	3	0.9(0.09)	WR 3— 5	60
0.25	2.3	6	1.8(0.18)	10	
0.3	4.8	9	2.6(0.27)	15	
0.3	4.8	12	3.5(0.36)	20	
0.32	6.8	15	4.4(0.45)	25	65
0.32	6.8	18	5.3(0.54)	30	
0.35	11.5	21	6.2(0.63)	35	
0.35	11.5	24	7.1(0.72)	40	
0.26	1.6	3	0.9(0.09)	WR 4— 5	65
0.29	2.2	6	1.8(0.18)	10	
0.32	3.2	9	2.6(0.27)	15	
0.38	6.5	12	3.5(0.36)	20	
0.38	6.5	15	4.4(0.45)	25	70
0.4	8.4	18	5.3(0.54)	30	
0.4	8.4	21	6.2(0.63)	35	
0.45	15	24	7.1(0.72)	40	
0.45	15	27	7.9(0.81)	45	
0.45	15	30	8.8(0.9)	50	
0.45	15	33	9.7(0.99)	55	
0.5	23.5	36	10.6(1.08)	60	
0.5	25	39	11.5(1.17)	65	
0.5	25	42	12.4(1.26)	70	
0.3	1.6	3	0.9(0.09)	WR 5— 5	68
0.35	1.6	6	1.8(0.18)	10	
0.35	2.8	9	2.6(0.27)	15	
0.4	4.8	12	3.5(0.36)	20	
0.45	8	15	4.4(0.45)	25	73
0.45	8	18	5.3(0.54)	30	
0.5	12.5	21	6.2(0.63)	35	
0.5	12.5	24	7.1(0.72)	40	
0.55	17.6	27	7.9(0.81)	45	
0.55	18	30	8.8(0.9)	50	75
0.55	20	33	9.7(0.99)	55	
0.55	20	36	10.6(1.08)	60	
0.55	20.9	39	11.5(1.2)	65	
0.55	20.9	42	12.4(1.3)	70	
0.32	1.6	3	0.9(0.09)	WR 6— 5	70
0.4	3.2	6	1.8(0.18)	10	
0.4	3.2	9	2.6(0.27)	15	
0.5	7.5	12	3.5(0.36)	20	
0.5	7.5	15	4.4(0.45)	25	75
0.5	7.5	18	5.3(0.54)	30	
0.55	11.5	21	6.2(0.63)	35	
0.55	11.5	24	7.1(0.72)	40	
0.6	17.4	27	7.9(0.81)	45	
0.6	17.4	30	8.8(0.9)	50	80
0.6	17.4	33	9.7(0.99)	55	
0.6	17.4	36	10.6(1.08)	60	
0.6	17.4	39	11.5(1.17)	65	
0.6	17.4	42	12.4(1.26)	70	
0.65	27.3	48	14.1(1.4)	80	
0.45	2.7	6	1.8(0.18)	WR 8—10	80
0.5	4	9	2.6(0.27)	15	
0.5	4	12	3.5(0.36)	20	
0.55	5.8	15	4.4(0.45)	25	85
0.6	8.4	18	5.3(0.54)	30	
0.6	8.4	21	6.2(0.63)	35	
0.6	8.4	24	7.1(0.72)	40	
0.7	16	27	7.9(0.81)	45	
0.7	16	30	8.8(0.9)	50	
0.7	16	33	9.7(0.99)	55	90
0.7	16	36	10.6(1.08)	60	
0.7	16	39	11.5(1.17)	65	
0.7	16	42	12.4(1.26)	70	
0.75	22.9	48	14.1(1.4)	80	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
0.55	3.6	6	1.8(0.18)	WR10—10	90
0.6	4.8	9	2.6(0.27)	15	
0.65	6.5	12	3.5(0.36)	20	
0.65	6.5	15	4.4(0.45)	25	95
0.7	8.8	18	5.3(0.54)	30	
0.7	8.8	21	6.2(0.63)	35	
0.7	8.8	24	7.1(0.72)	40	
0.8	16	27	7.9(0.81)	45	
0.8	16	30	8.8(0.9)	50	
0.8	16	33	9.7(0.99)	55	100
0.85	21	36	10.6(1.08)	60	
0.85	21	39	11.5(1.17)	65	
0.85	21	42	12.4(1.26)	70	
0.9	28.8	48	14.1(1.4)	80	
0.6	3.6	6	1.8(0.18)	WR12—10	93
0.65	4.6	9	2.6(0.27)	15	
0.65	4.6	12	3.5(0.36)	20	
0.7	6	15	4.4(0.45)	25	
0.7	6	18	5.3(0.54)	30	110
0.7	6	21	6.2(0.63)	35	
0.8	10.4	24	7.1(0.72)	40	
0.8	10.4	27	7.9(0.81)	45	
0.9	17.1	30	8.8(0.9)	50	
0.9	17.1	33	9.7(0.99)	55	120
0.9	17.1	36	10.6(1.08)	60	
0.9	17.1	39	11.5(1.17)	65	
0.9	17.1	42	12.4(1.26)	70	
1.0	28	48	14.1(1.4)	80	
0.6	3.2	6	1.8(0.18)	WR13—10	95
0.7	4.9	9	2.6(0.27)	15	
0.7	4.9	12	3.5(0.36)	20	
0.8	8.4	15	4.4(0.45)	25	
0.8	8.4	18	5.3(0.54)	30	130
0.8	8.4	21	6.2(0.63)	35	
0.9	13.5	24	7.1(0.72)	40	
0.9	13.5	27	7.9(0.81)	45	
0.9	13.5	30	8.8(0.9)	50	
0.9	13.5	33	9.7(0.99)	55	145
1.0	22	36	10.6(1.08)	60	
1.0	22	39	11.5(1.17)	65	
1.0	22	42	12.4(1.26)	70	
1.0	22	48	14.1(1.4)	80	
1.0	22	54	15.9(1.62)	90	
0.7	4.6	9	2.6(0.27)	WR14—15	110
0.75	5.6	12	3.5(0.36)	20	
0.8	7.2	15	4.4(0.45)	25	
0.8	7.2	18	5.3(0.54)	30	155
0.8	7.2	21	6.2(0.63)	35	
0.9	11.3	24	7.1(0.72)	40	
0.9	11.3	27	7.9(0.81)	45	
0.9	11.3	30	8.8(0.9)	50	
1.0	18	33	9.7(0.99)	55	160
1.0	18	36	10.6(1.08)	60	
1.0	18	39	11.5(1.17)	65	
1.0	18	42	12.4(1.26)	70	
1.1	28.6	48	14.1(1.4)	80	
1.1	28.6	54	15.9(1.62)	90	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
0.75	4.5	9	2.6(0.27)	WR16—15	120
0.8	5.6	12	3.5(0.36)	20	
0.9	8	15	4.4(0.45)	25	
0.9	8	18	5.3(0.54)	30	
0.9	8	21	6.2(0.63)	35	
1.0	13	24	7.1(0.72)	40	
1.0	13	27	7.9(0.81)	45	
1.0	13	30	8.8(0.9)	50	
1.0	13	33	9.7(0.99)	55	130
1.1	20	36	10.6(1.08)	60	
1.1	20	39	11.5(1.17)	65	
1.1	20	42	12.4(1.26)	70	
1.1	20	48	14.1(1.4)	80	
1.2	28.8	54	15.9(1.62)	90	
1.0	7	12	5.8(0.6)	WR18—20	140
1.0	7	15	7.4(0.75)	25	
1.1	9.9	18	8.8(0.9)	30	
1.1	9.9	21	10.3(1.05)	35	
1.2	14.4	24	11.8(1.2)	40	
1.2	14.4	27	13.2(1.35)	45	
1.2	14.4	30	14.7(1.5)	50	
1.3	19.5	33	16.2(1.65)	55	
1.3	19.5	36	17.7(1.8)	60	
1.3	19.5	39	19.1(1.95)	65	150
1.3	19.5	42	20.6(2.1)	70	
1.4	27.3	48	23.5(2.4)	80	
1.0	6	12	5.8(0.6)	WR20—20	145
1.1	8.3	15	7.4(0.75)	25	
1.1	8.3	18	8.8(0.9)	30	
1.2	10.8	21	10.3(1.05)	35	
1.2	10.8	24	11.8(1.2)	40	
1.2	10.8	27	13.2(1.35)	45	
1.3	15	30	14.7(1.5)	50	
1.3	15	33	16.2(1.65)	55	
1.3	15	36	17.7(1.8)	60	155
1.3	15	39	19.1(1.95)	65	
1.4	21	42	20.6(2.1)	70	
1.4	21	48	23.5(2.4)	80	
1.1	6.9	12	5.9(0.6)	WR22—20	150
1.2	9	15	7.4(0.75)	25	
1.2	9	18	8.8(0.9)	30	
1.3	12.4	21	10.3(1.05)	35	
1.3	12.4	24	11.8(1.2)	40	
1.3	12.4	27	13.2(1.35)	45	
1.4	16.1	30	14.7(1.5)	50	
1.4	16.1	33	16.2(1.65)	55	
1.4	16.1	36	17.7(1.8)	60	160
1.5	22.5	39	19.1(1.95)	65	
1.5	22.5	42	20.6(2.1)	70	
1.5	22.5	48	23.5(2.4)	80	
1.3	8.5	18	8.8(0.9)	WR27—30	170
1.4	10.5	21	10.3(1.05)	35	
1.4	10.5	24	11.8(1.2)	40	
1.4	10.5	27	13.2(1.35)	45	
1.6	17.6	30	14.7(1.5)	50	
1.6	17.6	33	16.2(1.65)	55	
1.6	17.6	36	17.7(1.8)	60	180
1.7	22.1	39	19.1(1.95)	65	
1.7	22.1	42	20.6(2.1)	70	
1.7	22.1	48	23.5(2.4)	80	

●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

No grinding on both ends of all WR type series.
The solid height values are reference only. There may be some variations depending on lots.
Operation frequency : 1 million times.
Product Outline P.1055 Directions and precautions for coil springs P.1057

■WF : Fmax. (Allowable deflection)=L×45%

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
0.26	2	2.25	1.1(0.11)	WF 3— 5*	60
0.32	5	4.5	2.2(0.22)	10*	
0.32	5	6.7	3.2(0.33)	15*	
0.35	7	9	4.4(0.45)	20*	
0.35	7	11.2	5.5(0.56)	25*	65
0.4	13.2	13.5	6.6(0.67)	30	
0.4	13.2	15.7	7.6(0.78)	35	
0.4	13.2	18	8.8(0.9)	40	
0.32	2.3	2.25	1.1(0.11)	WF 4— 5*	65
0.35	3.1	4.5	2.2(0.22)	10*	
0.4	5.6	6.7	3.2(0.33)	15*	
0.4	5.6	9	4.4(0.45)	20*	
0.45	9.9	11.2	5.5(0.56)	25*	
0.45	9.9	13.5	6.6(0.67)	30*	70
0.5	16.5	15.7	7.6(0.78)	35	
0.5	16.5	18	8.8(0.9)	40	
0.5	16.5	20	9.8(1.0)	45	
0.5	16.5	22.5	10.8(1.1)	50	
0.5	16.5	24.7	12.1(1.23)	55	
0.5	16.5	27	12.7(1.3)	60	
0.55	26.4	29.2	14.3(1.46)	65*	
0.55	26.4	31.5	15.4(1.58)	70*	
0.35	2	2.25	1.1(0.11)	WF 5— 5*	68
0.38	2.8	4.5	2.2(0.22)	10*	
0.4	3.4	6.7	3.2(0.33)	15*	
0.45	5.4	9	4.4(0.45)	20*	
0.5	8.5	11.2	5.5(0.56)	25*	
0.55	13.2	13.5	6.6(0.67)	30	73
0.55	13.2	15.7	7.6(0.78)	35	
0.55	20.4	18	8.8(0.9)	40	
0.6	20.4	20	9.8(1.0)	45	
0.6	20.4	22.5	10.8(1.1)	50	
0.6	20.4	24.7	12.1(1.23)	55	75
0.6	20.4	27	12.7(1.3)	60	
0.6	20.4	29.2	14.3(1.5)	65	
0.6	20.4	31.5	15.4(1.6)	70	
0.4	2.3	2.25	1.1(0.11)	WF 6— 5*	70
0.5	5	4.5	2.2(0.22)	10	
0.55	8	6.7	3.2(0.33)	15	
0.55	8	9	4.4(0.45)	20	
0.6	12	11.2	5.5(0.56)	25	
0.65	16	13.5	6.6(0.67)	30	75
0.65	17	15.7	7.6(0.78)	35	
0.65	17	18	8.8(0.9)	40	
0.65	17	20	9.8(1.0)	45	
0.7	25.2	22.5	10.8(1.1)	50	
0.7	25.2	24.7	12.1(1.23)	55	
0.7	25.2	27	12.7(1.3)	60	80
0.7	25.2	29.2	14.3(1.46)	65	
0.7	25.2	31.5	14.7(1.5)	70	
0.7	25.2	36	17.7(1.8)	80	
0.6	5	4.5	2.2(0.22)	WF 8—10	80
0.65	7.5	6.7	3.2(0.33)	15	
0.7	10.8	9	4.4(0.45)	20	
0.7	10.8	11.2	5.5(0.56)	25	
0.75	14.5	13.5	6.6(0.67)	30	85
0.75	14.5	15.7	7.6(0.78)	35	
0.8	20	18	8.8(0.9)	40	
0.8	20	20	9.8(1.0)	45	
0.8	20	22.5	10.8(1.1)	50	
0.8	20	24.7	12.1(1.23)	55	
0.85	27.6	27	12.7(1.3)	60	90
0.85	27.6	29.2	14.3(1.46)	65	
0.85	27.6	31.5	14.7(1.5)	70	
0.85	28.1	36	17.7(1.8)	80	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
0.65	5	4.5	2.2(0.22)	WF10—10	90
0.65	5	6.7	3.2(0.33)	15	
0.8	10.4	9	4.4(0.45)	20	
0.8	10.4	11.2	5.5(0.56)	25	
0.85	14	13.5	6.6(0.67)	30	
0.85	14	15.7	7.6(0.78)	35	95
0.9	17.5	18	8.8(0.9)	40	
0.9	17.5	20	9.8(1.0)	45	
0.9	17.5	22.5	10.8(1.1)	50	
0.9	17.5	24.7	12.1(1.23)	55	
1.0	31	27	12.7(1.3)	60	
1.0	31	29.2	14.3(1.46)	65	98
1.0	31	31.5	14.7(1.5)	70	
1.0	31	36	17.7(1.8)	80	
0.7	4.6	4.5	2.3(0.23)	WF12—10	93
0.7	4.6	6.7	3.2(0.33)	15	
0.8	7.2	9	4.4(0.45)	20	
0.8	7.2	11.2	5.5(0.56)	25	
0.9	11.3	13.5	6.6(0.67)	30	
0.9	11.3	15.7	7.6(0.78)	35	98
0.9	11.3	18	8.8(0.9)	40	
0.9	11.3	20	9.8(1.0)	45	
1.0	18	22.5	10.8(1.1)	50	
1.0	18	24.7	12.1(1.23)	55	
1.0	18	27	12.7(1.3)	60	
1.0	18	29.2	14.3(1.46)	65	
1.1	28.1	31.5	14.7(1.5)	70	
1.1	27.5	36	17.7(1.8)	80	
0.75	4.9	4.5	2.3(0.23)	WF13—10	95
0.8	6	6.7	3.2(0.33)	15	
0.8	6	9	4.4(0.45)	20	
0.85	7.2	11.2	5.5(0.56)	25	
1.0	15	13.5	6.6(0.67)	30	
1.0	15	15.7	7.6(0.78)	35	100
1.0	15	18	8.8(0.9)	40	
1.0	15	20	9.8(1.0)	45	
1.0	15	22.5	10.8(1.1)	50	
1.1	22	24.7	12.1(1.23)	55	
1.1	22	27	12.7(1.3)	60	
1.1	22	29.2	14.3(1.46)	65	
1.1	22	31.5	14.7(1.5)	70	110
1.1	22	36	17.7(1.8)	80	
1.2	33.6	40.5	19.9(2.0)	90	
0.8	5.2	6.7	3.2(0.33)	WF14—15	110
0.9	7.9	9	4.4(0.45)	20	
0.9	7.9	11.2	5.5(0.56)	25	
1.0	12	13.5	6.6(0.67)	30	
1.0	12	15.7	7.6(0.78)	35	
1.0	12	18	8.8(0.9)	40	
1.0	12	20	9.8(1.0)	45	
1.1	18.2	22.5	10.8(1.1)	50	
1.1	18.2	24.7	12.1(1.23)	55	
1.1	18.2	27	12.7(1.3)	60	
1.2	27.6	29.2	14.3(1.46)	65	120
1.2	27.6	31.5	14.7(1.5)	70	
1.2	27.6	36	17.7(1.8)	80	
1.3	39.7	40.5	19.9(2.0)	90	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
0.9	6.3	6.7	3.2(0.33)	WF16—15	120
1.0	8.7	9	4.4(0.45)	20	
1.0	8.7	11.2	5.5(0.56)	25	
1.1	12.8	13.5	6.6(0.67)	30	
1.1	12.8	15.7	7.6(0.78)	35	
1.2	18.6	18	8.8(0.9)	40	
1.2	18.6	20	9.8(1.0)	45	
1.2	18.6	22.5	10.8(1.1)	50	
1.2	18.6	24.7	12.1(1.23)	55	
1.3	26.8	27	12.7(1.3)	60	
1.3	26.8	29.2	14.3(1.46)	65	130
1.3	26.8	31.5	14.7(1.5)	70	
1.4	36	36	17.7(1.8)	80	
1.4	36.4	40.5	19.9(2.0)	90	
1.2	9	9	8.8(0.9)	WF18—20	140
1.3	12.4	11.2	10.8(1.1)	25	
1.3	12.4	13.5	12.7(1.3)	30	
1.4	16.1	15.7	14.7(1.5)	35	
1.5	21	18	17.7(1.8)	40	
1.5	21	20	19.9(2.03)	45	
1.5	21	22.5	22.1(2.25)	50	
1.6	28.8	24.7	24.3(2.48)	55	
1.6	28.8	27	26.5(2.7)	60	
1.6	28.8	29.2	28.7(2.93)	65	150
1.7	37.4	31.5	30.9(3.15)	70	
1.7	37.4	36	35.3(3.6)	80	
1.2	7.2	9	8.8(0.9)	WF20—20	145
1.3	9.8	11.2	10.8(1.1)	25	
1.4	12.6	13.5	12.7(1.3)	30	
1.4	12.6	15.7	14.7(1.5)	35	
1.5	16.5	18	17.7(1.8)	40	
1.5	16.5	20	19.9(2.03)	45	
1.6	21.6	22.5	22.1(2.25)	50	
1.6	21.6	24.7	24.3(2.48)	55	
1.6	21.6	27	26.5(2.7)	60	
1.7	28.1	29.2	28.7(2.93)	65	155
1.7	28.1	31.5	30.9(3.15)	70	
1.7	28.1	36	35.3(3.6)	80	
1.3	7.8	9	8.8(0.9)	WF22—20	150
1.4	10.5	11.2	11.0(1.12)	25	
1.4	10.5	13.5	13.2(1.35)	30	
1.5	13.5	15.7	15.4(1.57)	35	
1.5	13.5	18	17.7(1.8)	40	
1.7	22.1	20.2	19.8(2.02)	45	
1.7	22.1	22.5	22.1(2.25)	50	
1.7	22.1	24.7	24.2(2.47)	55	
1.8	28.8	27	26.5(2.7)	60	160
1.8	28.8	29.2	28.6(2.92)	65	
1.8	28.8	31.5	30.9(3.15)	70	
1.8	28.8	36	35.3(3.6)	80	
1.7	14.1	13.5	13.2(1.35)	WF27—30	170
1.7	14.1	15.7	15.4(1.57)	35	
1.7	14.1	18	17.7(1.8)	40	
1.9	21.4	20.2	19.8(2.02)	45	
1.9	21.4	22.5	22.1(2.25)	50	
2.0	26	24.7	24.2(2.47)	55	
2.0	26	27	26.5(2.7)	60	
2.0	26	29.2	28.6(2.92)	65	180
2.0	26	31.5	30.9(3.15)	70	
2.0	26	36	35.3(3.6)	80	

●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

No grinding on both ends of * marked WF type springs.
The solid height values are reference only.
There may be some variations depending on lots.
Operation frequency : 1 million times.
Product Outline P.1055
Directions and precautions for coil springs P.1057

Express service system P.38 — MISUMI Press 2007 — http://misumi.jp/press/ — For inquiry, ordering and other information, refer to P.1269

WIRE SPRINGS
—WL (40% DEFLECTION), WT (40% DEFLECTION) —

Order — Catalog No. WL 13—60

Delivery — 1 Day

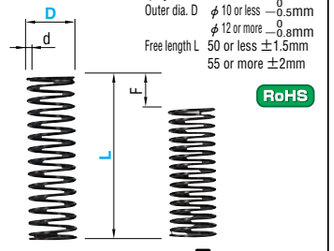
Price

Volume discount rate P.37

Quantity	1~9	10~19	20~99	100~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

WL
WT



Spring constant ±10%
Outer dia. D φ10 or less $^{0}_{-0.5}$mm
φ12 or more $^{0}_{-0.8}$mm
Free length L 50 or less ±1.5mm
55 or more ±2mm

RoHS

M SWP—A

Spring constant (D12/14/20 are not available for WT type.)

D \ Type	WY	WR	WF	WL	WT	WM	WH	WB
2				0.5{0.05}				3.9{0.4}
3	N/mm 0.1 {kgf/mm} {0.01}				1.5 {0.15}	2.0 {0.2}		4.9{0.5}
4							2.9{0.3}	
5		N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	N/mm 2.0 {kgf/mm} {0.2}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 5.9 {kgf/mm} {0.6}	N/mm 9.8 {kgf/mm} {1.0}
6								
8								
10	N/mm 0.2 {kgf/mm} {0.02}						N/mm 9.8 {kgf/mm} {1.0}	N/mm 19.6 {kgf/mm} {2.0}
12								
13								29.4{3.0}
14								
16							N/mm 14.7 {kgf/mm} {1.5}	N/mm 29.4 {kgf/mm} {3.0}
18		N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 3.9 {kgf/mm} {0.4}	N/mm 4.9 {kgf/mm} {0.5}		
20								
22								
27								
Fmax.	F=L×75%	F=L×60%	F=L×45%	F=L×40%	F=L×40%	F=L×35%	F=L×30%	F=L×25%

■WL : Fmax. (Allowable deflection) =L×40%

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
0.2	1.7	2	0.98 {0.1}	WL 2— 5*	60
0.26	5.2	4	2.0 {0.2}	10*	
0.26	5.2	6	2.9 {0.3}	15*	
0.29	9	8	3.9 {0.4}	20*	
0.29	9	10	4.9 {0.5}	25*	65
0.3	10.8	12	5.9 {0.6}	30*	
0.3	2.1	2	2.0 {0.2}	WL 3— 5*	60
0.35	3.9	4	3.9 {0.4}	10*	
0.4	6.5	6	5.9 {0.6}	15*	
0.4	6.5	8	7.8 {0.8}	20*	
0.45	13	10	9.8 {1.0}	25*	65
0.45	13	12	11.8 {1.2}	30*	
0.45	13	14	13.7 {1.4}	35*	
0.5	21	16	15.7 {1.6}	40*	
0.35	2.1	2	2.0 {0.2}	WL 4— 5*	65
0.45	5	4	3.9 {0.4}	10*	
0.45	5	6	5.9 {0.6}	15*	
0.5	9	8	7.8 {0.8}	20	
0.5	9	10	9.8 {1.0}	25	70
0.55	13.9	12	11.8 {1.2}	30	
0.55	13.9	14	13.7 {1.4}	35	
0.6	21.6	16	15.7 {1.6}	40	
0.6	21.6	18	17.7 {1.8}	45	
0.6	21.6	20	19.6 {2.0}	50	
0.6	21.6	22	21.6 {2.2}	55	
0.65	33	24	23.5 {2.4}	60	
0.4	2.3	2	2.0 {0.2}	WL 5— 5*	68
0.45	3.4	4	3.9 {0.4}	10*	
0.5	5	6	5.9 {0.6}	15*	
0.55	7.7	8	7.8 {0.8}	20	
0.6	10.8	10	9.8 {1.0}	25	73
0.6	10.8	12	11.8 {1.2}	30	
0.65	15.6	14	13.7 {1.4}	35	
0.65	15.6	16	15.7 {1.6}	40	
0.7	20	18	17.7 {1.8}	45	
0.7	20	20	19.6 {2.0}	50	
0.7	23.1	22	21.6 {2.2}	55	75
0.75	33	24	23.5 {2.4}	60	
0.75	32.3	26	25.5 {2.6}	65	
0.75	32.3	28	27.5 {2.8}	70	
0.45	2.5	2	2.0 {0.2}	WL 6— 5*	70
0.55	4.7	4	3.9 {0.4}	10	
0.55	4.7	6	5.9 {0.6}	15	
0.65	9	8	7.8 {0.8}	20	
0.65	9	10	9.8 {1.0}	25	75
0.7	13.7	12	11.8 {1.2}	30	
0.7	13.7	14	13.7 {1.4}	35	
0.7	13.7	16	15.7 {1.6}	40	
0.75	18.9	18	17.7 {1.8}	45	
0.75	18.9	20	19.6 {2.0}	50	
0.75	18.9	22	21.6 {2.2}	55	80
0.8	26.4	24	23.5 {2.4}	60	
0.8	26.4	26	25.5 {2.6}	65	
0.85	30.6	28	27.5 {2.8}	70	
0.85	34.9	32	31.4 {3.2}	80	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
0.65	4.7	4	3.9{0.4}	WL 8—10	80
0.75	8.5	6	5.9{0.6}	15	
0.75	8.5	8	7.8{0.8}	20	
0.75	8.5	10	9.8{1.0}	25	85
0.8	11.2	12	11.8{1.2}	30	
0.8	11.2	14	13.7{1.4}	35	
0.8	11.2	16	15.7{1.6}	40	
0.85	15.3	18	17.7{1.8}	45	
0.85	15.3	20	19.6{2.0}	50	
0.85	15.3	22	21.6{2.2}	55	
0.9	19.4	24	23.5{2.4}	60	90
0.9	19.4	26	25.5{2.6}	65	
1.0	31	28	27.5{2.8}	70	
1.0	31	32	31.4{3.2}	80	
0.75	5.3	4	3.9{0.4}	WL10—10	
0.8	6.4	6	5.9{0.6}	15	
0.8	6.4	8	7.8{0.8}	20	
0.9	10.8	10	9.8{1.0}	25	
0.9	10.8	12	11.8{1.2}	30	90
0.9	10.8	14	13.7{1.4}	35	
0.9	10.8	16	15.7{1.6}	40	
1.0	17	18	17.7{1.8}	45	
1.0	17	20	19.6{2.0}	50	
1.0	17	22	21.6{2.2}	55	
1.0	17	24	23.5{2.4}	60	95
1.1	24	26	25.5{2.6}	65	
1.1	24	28	27.5{2.8}	70	
1.1	24.2	32	31.4{3.2}	80	
0.8	4.8	4	4.0{0.4}	WL12—10	
0.9	7.2	6	5.9{0.6}	15	
0.9	7.2	8	7.8{0.8}	20	
0.9	7.2	10	9.8{1.0}	25	
1.0	10.5	12	11.8{1.2}	30	93
1.0	10.5	14	13.7{1.4}	35	
1.0	10.5	16	15.7{1.6}	40	
1.1	15.4	18	17.7{1.8}	45	
1.1	15.4	20	19.6{2.0}	50	
1.1	15.4	22	21.6{2.2}	55	
1.2	22.8	24	23.5{2.4}	60	98
1.2	22.8	26	25.5{2.6}	65	
1.2	22.8	28	27.5{2.8}	70	
1.3	34.5	32	31.4{3.2}	80	
0.85	5.1	4	4.0{0.4}	WL13—10	
0.9	6.3	6	5.9{0.6}	15	
1.0	8.7	8	7.8{0.8}	20	
1.0	8.7	10	9.8{1.0}	25	95
1.1	13.2	12	11.8{1.2}	30	
1.1	13.2	14	13.7{1.4}	35	
1.1	13.2	16	15.7{1.6}	40	
1.1	13.2	18	17.7{1.8}	45	
1.1	13.2	20	19.6{2.0}	50	
1.1	13.2	22	21.6{2.2}	55	
1.1	13.2	24	23.5{2.4}	60	100
1.2	18.6	26	25.5{2.6}	65	
1.2	18.6	28	27.5{2.8}	70	
1.4	37.8	32	31.4{3.2}	80	
1.4	37.8	36	35.3{3.6}	90	
1.0	7.5	6	5.9{0.6}	WL14—15	
1.0	7.5	8	7.8{0.8}	20	
1.0	7.5	10	9.8{1.0}	25	
1.1	11	12	11.8{1.2}	30	110
1.1	11	14	13.7{1.4}	35	
1.1	11	16	15.7{1.6}	40	
1.2	15.6	18	17.7{1.8}	45	
1.2	15.6	20	19.6{2.0}	50	
1.2	15.6	22	21.6{2.2}	55	
1.2	15.6	24	23.5{2.4}	60	120
1.3	22.1	26	25.5{2.6}	65	
1.3	22.1	28	27.5{2.8}	70	
1.3	22.1	32	31.4{3.2}	80	
1.5	43.5	36	35.3{3.6}	90	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
1.1	8.2	6	5.9{0.6}	WL16—15	120
1.1	8.2	8	7.8{0.8}	20	
1.2	10	10	9.8{1.0}	25	
1.2	10	12	11.8{1.2}	30	
1.2	10	14	13.7{1.4}	35	
1.2	10	16	15.7{1.6}	40	
1.4	21	18	17.7{1.8}	45	
1.4	21	20	19.6{2.0}	50	
1.4	21	22	21.6{2.2}	55	
1.4	21	24	23.5{2.4}	60	130
1.5	29.7	26	25.5{2.6}	65	
1.5	29.7	28	27.5{2.8}	70	
1.5	29.7	32	31.4{3.2}	80	
1.6	40	36	35.3{3.6}	90	
1.5	10	8	23.5{2.4}	WL18—20	
1.6	12	10	29.4{3.0}	25	
1.6	12	12	35.3{3.6}	30	
1.7	16.2	14	41.2{4.2}	35	140
1.7	16.2	16	47.1{4.8}	40	
1.8	19.8	18	53.0{5.4}	45	
1.8	19.8	20	58.8{6.0}	50	
1.8	19.8	22	64.7{6.6}	55	
1.8	19.8	24	70.6{7.2}	60	150
2.0	32	26	76.5{7.8}	65	
2.0	32	28	82.4{8.4}	70	
2.0	32	32	94.1{9.6}	80	
2.2	43	36	105.9{10.8}	90	160
2.2	43	40	117.7{12.0}	100	
1.6	10.4	8	23.5{2.4}	WL20—20	
1.6	10.4	10	29.4{3.0}	25	
1.7	12.8	12	35.3{3.6}	30	
1.7	12.8	14	41.2{4.2}	35	145
1.8	15.8	16	47.1{4.8}	40	
1.8	15.8	18	53.0{5.4}	45	
1.8	15.8	20	58.8{6.0}	50	
1.8	15.8	22	64.7{6.6}	55	
2.0	24	24	70.6{7.2}	60	
2.0	24	26	76.5{7.8}	65	155
2.0	24	28	82.4{8.4}	70	
2.2	37.4	32	94.1{9.6}	80	
2.2	37.4	36	105.9{10.8}	90	165
2.2	37.4	40	117.7{12.0}	100	
1.7	10.8	8	23.5{2.4}	WL22—20	
1.8	13.3	10	29.4{3.0}	25	
1.8	13.3	12	35.3{3.6}	30	
1.8	13.3	14	41.2{4.2}	35	150
2.0	20	16	47.1{4.8}	40	
2.0	20	18	53.0{5.4}	45	
2.0	20	20	58.8{6.0}	50	
2.0	20	22	64.7{6.6}	55	
2.2	28.6	24	70.6{7.2}	60	
2.2	28.6	26	76.5{7.8}	65	160
2.2	28.6	28	82.4{8.4}	70	
2.2	28.6	32	94.1{9.6}	80	
2.3	34.5	36	105.9{10.8}	90	170
2.3	34.5	40	117.7{12.0}	100	
2.1	14	12	35.3{3.6}	WL27—30	
2.1	14	14	41.2{4.2}	35	
2.3	19	16	47.1{4.8}	40	170
2.3	19	18	53.0{5.4}	45	
2.3	19	20	58.8{6.0}	50	
2.3	19	22	64.7{6.6}	55	
2.5	28	24	70.6{7.2}	60	
2.5	28	26	76.5{7.8}	65	180
2.6	34.5	28	82.4{8.4}	70	
2.6	34.5	32	94.1{9.6}	80	
2.8	46.7	36	105.9{10.8}	90	190
2.8	46.7	40	117.7{12.0}	100	

●Load calculation method : N(load) =N/mm(spring constant) ×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

- No grinding on both ends of * marked WL type springs.
- The solid height values are reference only. There may be some variations depending on lots.
- Operation frequency : 1 million times.
- Product Outline P.1055
- Directions and precautions for coil springs P.1057

■WT : Fmax. (Allowable deflection) =L×40% (L×35%)

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
0.3	1.73	2	2.9{0.3}	WT 3— 5*	60
0.4	5	4	5.9{0.6}	10*	
0.45	8.78	6	8.8{0.9}	15*	
0.45	8.78	8	11.8{1.2}	20*	65
0.5	14.5	10	14.7{1.5}	25*	
0.4	2.7	2	2.9{0.3}	WT 4— 5*	
0.4	2.7	4	5.9{0.6}	10*	65
0.5	6.5	6	8.8{0.9}	15*	
0.55	9.63	8	11.8{1.2}	20	
0.55	9.63	10	14.7{1.5}	25	
0.6	15	12	17.7{1.8}	30	70
0.6	15	14	20.6{2.1}	35	
0.65	22.1	16	23.5{2.4}	40	
0.45	2.36	2	3.9{0.4}	WT 5— 5*	
0.5	3.25	4	7.8{0.8}	10*	68
0.6	6.3	6	11.8{1.2}	15	
0.6	6.3	8	15.7{1.6}	20	
0.7	12.6	10	19.6{2.0}	25	
0.7	12.6	12	23.5{2.4}	30	
0.75	17.3	14	27.5{2.8}	35	73
0.75	17.3	14	31.4{3.2}	(40)	
0.8	24	15.8	35.3{3.6}	(45)	
0.8	24	17.5	34.3{3.5}	(50)	
0.85	32.3	19.3	37.8{3.9}	(55)	
0.85	32.3	21	41.2{4.2}	(60)	75
0.85	34	22.7	44.5{4.5}	(65)	
0.9	44.6	24.5	48.1{4.9}	(70)	
0.5	2.38	2	3.9{0.4}	WT 6— 5*	
0.6	4.35	4	7.8{0.8}	10	70
0.6	4.35	6	11.8{1.2}	15	
0.7	7.7	8	15.7{1.6}	20	
0.7	7.7	10	19.6{2.0}	25	
0.8	14	12	23.5{2.4}	30	75
0.8	14	14	27.5{2.8}	35	
0.85	18.7	16	31.4{3.2}	40	
0.85	18.7	18	35.3{3.6}	45	
0.9	24.8	20	39.2{4.0}	50	
0.9	24.8	19	37.8{3.9}	(55)	
0.9	24.8	21	41.2{4.2}	(60)	80
0.9	26.1	22.7	44.5{4.5}	(65)	
1	43	24.5	48.1{4.9}	(70)	
1	43	28	54.9{5.6}	(80)	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
0.7	4.38	4	7.8{0.8}	WT 8—10	80
0.8	6.8	6	11.8{1.2}	15	
0.8	6.8	8	15.7{1.6}	20	
0.8	6.8	10	19.6{2.0}	25	
0.9	10.8	12	23.5{2.4}	30	85
0.9	10.8	14	27.5{2.8}	35	
1	17.5	16	31.4{3.2}	40	
1	17.5	18	35.3{3.6}	45	
1	17.5	20	39.2{4.0}	50	
1.1	27.5	22	43.1{4.4}	55	
1.1	27.5	24	47.1{4.8}	60	90
1.1	27.5	26	51.0{5.2}	65	
1.1	27.5	28	54.9{5.6}	70	
1.2	42	32	62.8{6.4}	80	
0.85	5.53	4	7.8{0.8}	WT10—10	
0.9	6.75	6	11.8{1.2}	15	
0.9	6.75	8	15.7{1.6}	20	
1	10	10	19.6{2.0}	25	
1	10	12	23.5{2.4}	30	90
1	10	14	27.5{2.8}	35	
1	10	16	31.4{3.2}	40	
1.1	14.3	18	35.3{3.6}	45	
1.1	14.3	20	39.2{4.0}	50	
1.2	21.6	22	43.1{4.4}	55	
1.2	21.6	24	47.1{4.8}	60	95
1.2	21.6	26	51.0{5.2}	65	
1.3	32.5	28	54.9{5.6}	70	
1.3	32.5	32	62.8{6.4}	80	
1	6	6	11.8{1.2}	WT13—15	
1.1	8.25	8	15.7{1.6}	20	
1.1	8.25	10	19.6{2.0}	25	
1.2	11.1	12	23.5{2.4}	30	95
1.2	11.1	14	27.5{2.8}	35	
1.2	11.1	16	31.4{3.2}	40	
1.2	11.1	18	35.3{3.6}	45	
1.3	15.6	20	39.2{4.0}	50	
1.3	15.6	22	43.1{4.4}	55	
1.3	15.6	24	47.1{4.8}	60	100
1.4	21	26	51.0{5.2}	65	
1.4	21	28	54.9{5.6}	70	
1.4	21	32	62.8{6.4}	80	
1.2	7.5	6	11.8{1.2}	WT16—15	
1.3	9.43	8	15.7{1.6}	20	
1.4	12.6	10	19.6{2.0}	25	
1.4	12.6	12	23.5{2.4}	30	120
1.4	12.6	14	27.5{2.8}	35	
1.4	12.6	16	31.4{3.2}	40	
1.6	22.4	18	35.3{3.6}	45	
1.6	22.4	20	39.2{4.0}	50	
1.6	22.4	22	43.1{4.4}	55	
1.7	28.9	24	47.1{4.8}	60	
1.7	28.9	26	51.0{5.2}	65	130
1.7	28.9	28	54.9{5.6}	70	
1.7	28.9	32	62.8{6.4}	80	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
1.6	10.8	8	31.4{3.2}	WT18—20	140
1.7	13.6	10	39.2{4.0}	25	
1.7	13.6	12	47.1{4.8}	30	
1.7	13.6	14	54.9{5.6}	35	
1.8	16.7	16	62.8{6.4}	40	
1.9	20.5	18	70.6{7.2}	45	
1.9	20.5	20	78.5{8.0}	50	
2	26	22	86.3{8.8}	55	
2	26	24	94.1{9.6}	60	150
2	26	26	102.0{10.4}	65	
2	26	28	109.8{11.2}	70	
2.1	31.5	32	125.5{12.8}	80	
1.8	11.3	8	31.4{3.2}	WT22—20	
1.8	11.3	10	39.2{4.0}	25	
1.9	13.3	12	47.1{4.8}	30	
1.9	13.3	14	54.9{5.6}	35	150
2	16	16	62.8{6.4}	40	
2.1	19.5	18	70.6{7.2}	45	
2.1	19.5	20	78.5{8.0}	50	
2.3	28.2	22	86.3{8.8}	55	
2.3	28.2	24	94.1{9.6}	60	160
2.3	28.2	26	102.0{10.4}	65	
2.3	28.2	28	109.8{11.2}	70	
2.4	33.6	32	125.5{12.8}	80	
2.1	13.2	12	47.1{4.8}	WT27—30	
2.3	17.9	14	54.9{5.6}	35	
2.3	17.9	16	62.8{6.4}	40	170
2.4	20.4	18	70.6{7.2}	45	
2.6	28.6	20	78.5{8.0}	50	
2.6	28.6	22	86.3{8.8}	55	
2.6	28.6	24	94.1{9.6}	60	
2.6	28.6	26	102.0{10.4}	65	180
2.8	39.2	28	109.8{11.2}	70	
2.8	39.2	32	125.5{12.8}	80	

●Load calculation method : N(load) =N/mm(spring constant) ×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

- Allowable deflection for (L) size
  WT5—40Fmax=L×35%
  WT5—45Fmax=L×35%
  WT5—50Fmax=L×35%
  WT5—55Fmax=L×35%
  WT5—60Fmax=L×35%
  WT5—65Fmax=L×35%
  WT5—70Fmax=L×35%
  WT6—55Fmax=L×35%
  WT6—60Fmax=L×35%
  WT6—65Fmax=L×35%
  WT6—70Fmax=L×35%
  WT6—80Fmax=L×35%
- No grinding on both ends of * marked WT type springs.
- The solid height values are reference only. There may be some variations depending on lots.
- Operation frequency : 1 million times.
- Product Outline P.1055
- Directions and precautions for coil springs P.1057

Express service system P.38 | MISUMI Press 2007 | http://misumi.jp/press/ | For inquiry, ordering and other information, refer to P.1269

WIRE SPRINGS
—WM(35% DEFLECTION), WH(30% DEFLECTION)—

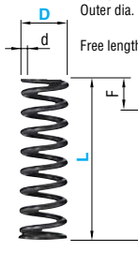
Order — Catalog No. WM 13—60 — Delivery 1 Day — Price

Volume discount rate P.37

Quantity	1~9	10~19	20~99	100~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

WM WH



Spring constant ±10%
Outer dia. D φ10 or less $^{0}_{-0.5}$mm φ12 or more $^{0}_{-0.8}$mm
Free length L 50 or less±1.5mm 55 or more±2mm

RoHS

M SWP—A

Spring constant

D \ Type	WY	WR	WF	WL	WT	WM	WH	WB
2				0.5{0.05}				
3	N/mm 0.1 {kgf/mm} {0.01}				1.5 {0.15}	2.0 {0.2}		3.9{0.4}
4							2.9{0.3}	4.9{0.5}
5		N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}			N/mm 5.9 {kgf/mm} {0.6}	N/mm 9.8 {kgf/mm} {1.0}
6					N/mm 2.0 {kgf/mm} {0.2}	N/mm 2.9 {kgf/mm} {0.3}		
8							N/mm 9.8 {kgf/mm} {1.0}	N/mm 19.6 {kgf/mm} {2.0}
10	N/mm 0.2 {kgf/mm} {0.02}							29.4{3.0}
12							N/mm 19.6 {kgf/mm} {2.0}	
13								N/mm 29.4 {kgf/mm} {3.0}
14								
16								
18		N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 3.9 {kgf/mm} {0.4}	N/mm 4.9 {kgf/mm} {0.5}	N/mm 14.7 {kgf/mm} {1.5}	
20								
22								
27								
Fmax.	F=L×75%	F=L×60%	F=L×45%	F=L×40%	F=L×40%	F=L×35%	F=L×30%	F=L×25%

■WM : Fmax.(Allowable deflection)=L×35%

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
0.35	2.5	1.8	3.4 {0.4}	WM 3— 5*	75
0.38	3.3	3.5	6.9 {0.7}	10*	
0.45	7	5.3	10.3 {1.1}	15*	
0.5	11.5	7	13.7 {1.4}	20*	
0.5	11.5	7.5	14.7 {1.5}	(25)	80
0.55	20.4	9	17.7 {1.8}	(30)	
0.4	2.3	1.7	3.9 {0.4}	WM 4— 5*	68
0.45	3.4	3.5	6.9 {0.7}	10*	
0.5	5.1	5.2	10.8 {1.1}	15*	
0.55	7.7	7	13.7 {1.4}	20	
0.6	11.7	8.7	17.7 {1.8}	25	73
0.6	11.7	10.5	20.6 {2.1}	30	
0.65	17.6	12.2	24.0 {2.5}	35	
0.65	17.6	12	23.5 {2.4}	(40)	
0.5	2.8	1.7	4.9 {0.5}	WM 5— 5*	68
0.6	4.2	3.5	9.8 {1.0}	10	
0.65	6.5	5.2	14.7 {1.5}	15	
0.65	6.5	7	20.6 {2.1}	20	
0.7	9.1	8.7	25.5 {2.6}	25	73
0.75	12.7	10.5	30.4 {3.1}	30	
0.8	17.4	12.2	35.3 {3.6}	35	
0.85	23.8	14	41.2 {4.2}	40	
0.85	23.8	15.8	46.1 {4.7}	45	
0.9	23.8	15	43.5 {4.5}	(50)	
0.9	30	16.5	49.0 {5.0}	(55)	75
0.9	30	18	53.0 {5.4}	(60)	
0.9	30	17.6	52.0 {5.3}	(65)	
0.9	30	19.6	58.8 {6.0}	(70)	
0.55	2.8	1.7	4.9 {0.5}	WM 6— 5*	70
0.65	4.7	3.5	9.8 {1.0}	10	
0.75	8	5.2	14.7 {1.5}	15	
0.75	8	7	20.6 {2.1}	20	75
0.85	13.6	8.7	25.5 {2.6}	25	
0.85	13.6	10.5	30.4 {3.1}	30	
0.9	18	12.2	35.3 {3.6}	35	
0.9	18	14	41.2 {4.2}	40	
0.9	18	15.8	46.1 {4.7}	45	
0.9	18	17.5	51.0 {5.2}	50	
1.0	31	19.2	55.9 {5.7}	55	80
1.0	31	18	53.0 {5.4}	(60)	
1.0	31	18.8	54.9 {5.6}	(65)	
1.1	47.3	20	58.8 {6.0}	(70)	
1.1	48.4	22.4	65.9 {6.7}	(80)	
0.75	4.2	3.5	9.8 {1.0}	WM 8—10	80
0.9	8.5	5.2	14.7 {1.5}	15	
0.9	8.5	7	20.6 {2.1}	20	85
0.9	8.5	8.7	25.5 {2.6}	25	
0.9	8.5	10.5	30.4 {3.1}	30	
1.0	13	12.2	35.3 {3.6}	35	
1.0	13	14	41.2 {4.2}	40	
1.1	19.8	15.8	46.1 {4.7}	45	
1.1	19.8	17.5	51.0 {5.2}	50	
1.2	31.2	19.2	55.9 {5.7}	55	90
1.2	31.2	21	61.8 {6.3}	60	
1.2	31.2	22.7	64.7 {6.6}	65	
1.2	31.2	24.5	71.6 {7.3}	70	
1.3	44.2	28	82.4 {8.4}	80	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
0.9	5.2	3.5	9.8 {1.0}	WM10—10	90
1.0	7.7	5.2	14.7 {1.5}	15	
1.0	7.7	7	20.6 {2.1}	20	
1.1	11	8.7	25.5 {2.6}	25	
1.1	11	10.5	30.4 {3.1}	30	
1.2	16.2	12.2	35.3 {3.6}	35	
1.2	16.2	14	41.2 {4.2}	40	
1.3	22.1	15.8	46.1 {4.7}	45	
1.3	22.1	17.5	51.0 {5.2}	50	
1.3	22.1	19.2	55.9 {5.7}	55	
1.4	32.1	21	61.8 {6.3}	60	95
1.4	32.1	22.7	64.7 {6.6}	65	
1.4	32.1	24.5	71.6 {7.3}	70	
1.4	32.2	28	82.4 {8.4}	80	
1.0	5.5	3.5	10.3 {1.1}	WM12—10	
1.1	7.4	5.2	14.7 {1.5}	15	
1.1	7.4	7	20.6 {2.1}	20	
1.1	7.4	8.7	25.5 {2.6}	25	
1.2	10.2	10.5	30.4 {3.1}	30	93
1.2	10.2	12.2	35.3 {3.6}	35	
1.3	14.3	14	41.2 {4.2}	40	
1.3	14.3	15.8	46.1 {4.7}	45	
1.3	14.3	17.5	51.0 {5.2}	50	
1.4	19.6	19.2	55.9 {5.7}	55	
1.4	19.6	21	61.8 {6.3}	60	
1.5	26.3	22.7	64.7 {6.6}	65	98
1.5	26.3	24.5	71.6 {7.3}	70	
1.6	36.8	28	82.4 {8.4}	80	
1.0	5	3.5	10.3 {1.1}	WM13—10	
1.2	8.4	5.2	14.7 {1.5}	15	
1.3	11.7	7	20.6 {2.1}	20	
1.3	11.7	8.7	25.5 {2.6}	25	
1.4	14.5	10.5	30.4 {3.1}	30	
1.4	14.5	12.2	35.3 {3.6}	35	95
1.4	14.5	14	41.2 {4.2}	40	
1.4	14.5	15.8	46.1 {4.7}	45	
1.4	14.5	17.5	51.0 {5.2}	50	
1.5	22.5	19.2	55.9 {5.7}	55	
1.5	22.5	21	61.8 {6.3}	60	
1.6	28.8	22.7	64.7 {6.6}	65	
1.6	28.8	24.5	71.6 {7.3}	70	100
1.7	37.4	28	82.4 {8.4}	80	
1.7	37.4	31.5	92.9 {9.5}	90	
1.2	7.5	5.2	14.7 {1.5}	WM14—15	
1.3	9.8	7	20.6 {2.1}	20	
1.4	13.3	8.7	25.5 {2.6}	25	
1.4	13.3	10.5	30.4 {3.1}	30	
1.4	13.3	12.2	35.3 {3.6}	35	110
1.4	13.3	14	41.2 {4.2}	40	
1.5	17.3	15.8	46.1 {4.7}	45	
1.5	17.3	17.5	51.0 {5.2}	50	
1.5	17.3	19.2	55.9 {5.7}	55	
1.6	23.2	21	61.8 {6.3}	60	
1.6	23.2	22.7	64.7 {6.6}	65	120
1.7	30.6	24.5	71.6 {7.3}	70	
1.7	30.6	28	82.4 {8.4}	80	
1.8	39.6	31.5	92.7 {9.5}	90	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
1.3	7.8	5.2	14.7 {1.5}	WM16—15	120
1.4	9.8	7	20.6 {2.1}	20	
1.5	12.5	8.7	25.5 {2.6}	25	
1.5	12.5	10.5	30.4 {3.1}	30	
1.6	15	12.2	35.3 {3.6}	35	
1.6	15	14	41.2 {4.2}	40	
1.7	20.4	15.8	46.1 {4.7}	45	
1.7	20.4	17.5	51.0 {5.2}	50	
1.8	27	19.2	55.9 {5.7}	55	
1.8	27	21	61.8 {6.3}	60	
1.8	27	22.7	64.7 {6.6}	65	130
1.8	27	24.5	71.6 {7.3}	70	
1.8	27	28	82.4 {8.4}	80	
1.9	34.2	31.5	92.7 {9.5}	90	
1.7	11.9	7	34.3 {3.5}	WM18—20	
1.8	14.4	8.7	42.2 {4.3}	25	
1.8	14.4	10.5	51.0 {5.2}	30	
1.8	14.4	12.2	59.8 {6.1}	35	140
1.8	14.4	14	68.6 {7.0}	40	
2.0	22	15.8	77.5 {7.9}	45	
2.0	22	17.5	85.3 {8.7}	50	
2.0	22	19.2	94.1 {9.6}	55	
2.0	22	21	103.0 {10.5}	60	
2.2	34.1	22.7	110.8 {11.3}	65	150
2.2	34.1	24.5	119.6 {12.2}	70	
2.2	34.1	28	137.3 {14.0}	80	
2.3	41.4	31.5	154.0 {15.7}	90	
2.3	41.4	35	171.6 {17.5}	100	160
1.8	11.7	7	34.3 {3.5}	WM20—20	
1.8	11.7	8.7	42.2 {4.3}	25	
1.9	14.3	10.5	51.0 {5.2}	30	
1.9	14.3	12.2	59.8 {6.1}	35	145
1.9	14.3	14	68.6 {7.0}	40	
2.0	17	15.8	77.5 {7.9}	45	
2.0	17	17.5	85.3 {8.7}	50	
2.2	24.8	19.2	94.1 {9.6}	55	
2.2	24.8	21	103.0 {10.5}	60	
2.2	24.8	22.7	110.8 {11.3}	65	155
2.2	24.8	24.5	119.6 {12.2}	70	
2.4	36	28	137.3 {14.0}	80	
2.4	36	31.5	154.0 {15.7}	90	100
2.4	36	35	171.6 {17.5}	100	165
1.9	12	7	34.3 {3.5}	WM22—20	
2.0	14	8.7	42.2 {4.3}	25	
2.0	14	10.5	51.0 {5.2}	30	
2.0	14	12.2	59.8 {6.1}	35	150
2.0	14	14	68.6 {7.0}	40	
2.3	23	15.8	77.5 {7.9}	45	
2.3	23	17.5	85.3 {8.7}	50	
2.3	23	19.2	94.1 {9.6}	55	
2.3	23	21	103.0 {10.5}	60	
2.4	30	22.7	110.8 {11.3}	65	160
2.4	30	24.5	119.6 {12.2}	70	
2.4	30	28	137.3 {14.0}	80	
2.6	40	31.5	154.0 {15.7}	90	170
2.6	40	35	171.6 {17.5}	100	
2.3	14	10.5	51.0 {5.2}	WM27—30	
2.4	17	12.2	59.8 {6.1}	35	
2.4	17	14	68.6 {7.0}	40	170
2.4	18	15.8	77.5 {7.9}	45	
2.6	23	17.5	85.3 {8.7}	50	
2.6	23	19.2	94.1 {9.6}	55	
2.6	23	21	103.0 {10.5}	60	
2.8	31	22.7	110.8 {11.3}	65	180
2.8	31	24.5	119.6 {12.2}	70	
2.8	31	28	137.3 {14.0}	80	
3.0	43.5	31.5	154.0 {15.7}	90	190
3.0	43.5	35	171.6 {17.5}	100	

●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

The solid height values are reference only.
There may be some variations depending on lots.
Operation frequency : 1 million times.
Product Outline P.1055
Directions and precautions for coil springs P.1057

Allowable deflection for (L) size
WM3—25 Fmax.=L×30%
WM3—30 Fmax.=L×30%
WM4—40 Fmax.=L×30%
WM5—50 Fmax.=L×30%
WM5—55 Fmax.=L×30%
WM5—60 Fmax.=L×30%
WM5—65 Fmax.=L×27%
WM5—70 Fmax.=L×28%
WM6—60 Fmax.=L×30%
WM6—65 Fmax.=L×29%
WM6—70 Fmax.=L×28%
WM6—80 Fmax.=L×28%

No grinding on both ends of * marked WM type springs.

■WH : Fmax.(Allowable deflection)=L×30%

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
0.45	2.7	1.5	4.9 {0.5}	WH 4— 5*	68
0.45	2.7	3	8.8 {0.9}	10*	
0.55	5.8	4.5	13.7 {1.4}	15	
0.6	8.4	6	17.7 {1.8}	20	
0.65	12.4	7.5	22.6 {2.3}	25	73
0.65	12.4	9	26.5 {2.7}	30	
0.6	3.3	1.5	8.8 {0.9}	WH 5— 5*	68
0.7	5.5	3	17.7 {1.8}	10	
0.75	7.5	4.5	26.5 {2.7}	15	
0.75	7.5	6	35.3 {3.6}	20	
0.85	13.6	7.5	44.1 {4.5}	25	
0.85	13.6	7.5	44.3 {4.5}	(30)	73
0.9	17.1	8.8	51.6 {5.3}	(35)	
0.9	17.1	8.8	51.9 {5.3}	(40)	
0.65	3.3	1.5	8.8 {0.9}	WH 6— 5*	
0.75	5.2	3	17.7 {1.8}	10	70
0.8	6.4	4.5	26.5 {2.7}	15	
0.9	9.9	6	35.3 {3.6}	20	
0.9	9.9	7.5	44.1 {4.5}	25	
1.0	16	9	53.0 {5.4}	30	75
1.0	16	10.5	61.8 {6.3}	35	
1.1	25	12	70.6 {7.2}	40	
1.1	25	11.3	66.7 {6.8}	(45)	
1.2	39.6	10	58.8 {6.0}	(50)	
1.2	39.6	14.5	85.3 {8.7}	(55)	
1.2	39.6	14	82.4 {8.4}	(60)	80
1.2	39.6	14	82.4 {8.4}	(65)	
1.2	39.6	15	88.3 {9.0}	(70)	
0.9	5.4	3	17.7 {1.8}	WH 8—10	80
1.0	8	4.5	26.5 {2.7}	15	
1.1	11.5	6	35.3 {3.6}	20	
1.1	11.5	7.5	44.1 {4.5}	25	
1.2	16.8	9	53.0 {5.4}	30	85
1.2	16.8	10.5	61.8 {6.3}	35	
1.2	16.8	12	70.6 {7.2}	40	
1.3	24.7	13.5	79.4 {8.1}	45	
1.3	24.7	15	88.3 {9.0}	50	
1.4	35	16.5	97.1 {9.9}	55	
1.4	35	18	105.9 {10.8}	60	90
1.4	35	17	100.0 {10.2}	(65)	
1.4	35	19	111.8 {11.4}	(70)	
1.0	5.4	3	17.7 {1.8}	WH10—10	
1.1	7	4.5	26.5 {2.7}	15	
1.2	9.6	6	35.3 {3.6}	20	
1.2	9.6	7.5	44.1 {4.5}	25	90
1.3	13.9	9	53.0 {5.4}	30	
1.4	18	10.5	61.8 {6.3}	35	
1.4	18	12	70.6 {7.2}	40	
1.5	25	13.5	79.4 {8.1}	45	
1.5	25	15	88.3 {9.0}	50	
1.5	25	16.5	97.1 {9.9}	55	
1.5	25	18	105.9 {10.8}	60	95
1.6	35	19.5	114.7 {11.7}	65	
1.6	35	21	123.6 {12.6}	70	
1.7	45.9	24	141.0 {14.4}	80	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
1.2	6.9	3	17.7 {1.8}	WH12—10	
1.3	9.1	4.5	26.5 {2.7}	15	
1.3	9.1	6	35.3 {3.6}	20	
1.3	9.1	7.5	44.1 {4.5}	25	
1.4	11.9	9	53.0 {5.4}	30	93
1.4	11.9	10.5	61.8 {6.3}	35	
1.5	15.4	12	70.6 {7.2}	40	
1.5	15.4	13.5	79.4 {8.1}	45	
1.6	20.4	15	88.3 {9.0}	50	
1.6	20.4	16.5	97.1 {9.9}	55	
1.7	26.8	18	105.9 {10.8}	60	
1.7	26.8	19.5	114.7 {11.7}	65	98
1.8	35.1	21	123.6 {12.6}	70	
1.9	45.6	24	141.0 {14.4}	80	
1.3	6.2	3	29.4 {3.0}	WH13—10	
1.5	9.3	4.5	44.1 {4.5}	15	
1.6	12.3	6	58.8 {6.0}	20	
1.6	12.3	7.5	73.5 {7.5}	25	
1.7	15	9	88.3 {9.0}	30	95
1.7	15	10.5	103.0 {10.5}	35	
1.8	19	12	117.7 {12.0}	40	
1.9	25	13.5	132.4 {13.5}	45	
1.9	25	15	147.1 {15.0}	50	
2.0	30	16.5	161.8 {16.5}	55	
2.0	30	18	176.5 {18.0}	60	
2.1	39	19.5	191.2 {19.5}	65	100
2.1	39	21	205.9 {21.0}	70	
2.1	39	24	235.4 {24.0}	80	
1.6	10.4	4.5	44.1 {4.5}	WH14—15	
1.6	10.4	6	58.8 {6.0}	20	
1.6	10.4	7.5	73.5 {7.5}	25	
1.7	12.8	9	88.3 {9.0}	30	
1.7	12.8	10.5	103.0 {10.5}	35	110
1.9	20	12	117.7 {12.0}	40	
1.9	20	13.5	132.4 {13.5}	45	
2.1	30.5	15	147.1 {15.0}	50	
2.1	30.5	16.5	161.8 {16.5}	55	
2.1	30.5	18	176.5 {18.0}	60	
2.2	37.4	19.5	191.2 {19.5}	65	120
2.2	37.4	21	205.9 {21.0}	70	
2.3	47.2	24	235.4 {24.0}	80	
1.7	10.2	4.5	44.1 {4.5}	WH16—15	
1.8	12.6	6	58.8 {6.0}	20	
1.9	14.5	7.5	73.5 {7.5}	25	
1.9	14.5	9	88.3 {9.0}	30	
2.0	18	10.5	103.0 {10.5}	35	120
2.1	21	12	117.7 {12.0}	40	
2.2	26	13.5	132.4 {13.5}	45	
2.2	26	15	147.1 {15.0}	50	
2.2	26	16.5	161.8 {16.5}	55	
2.3	32	18	176.5 {18.0}	60	
2.3	32	19.5	191.2 {19.5}	65	130
2.4	38	21	205.9 {21.0}	70	
2.5	47.5	24	235.4 {24.0}	80	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty:1~9
2.1	12.6	6	88.3 {9.0}	WH18— 20	140
2.2	15.4	7.5	109.8 {11.2}	25	
2.2	15.4	9	132.4 {13.5}	30	
2.3	18.4	10.5	154.0 {15.7}	35	
2.4	21.6	12	176.5 {18.0}	40	
2.5	25	13.5	199.1 {20.3}	45	
2.5	25	15	220.6 {22.5}	50	
2.6	30	16.5	242.2 {24.7}	55	
2.6	30	18	264.8 {27.0}	60	150
2.8	42	19.5	286.4 {29.2}	65	
2.8	42	21	308.9 {31.5}	70	
2.9	49.3	24	353.0 {36.0}	80	
3.0	57	26.1	397.2 {40.5}	(90)	160
3.0	57	24	441.3 {45.0}	(100)	
2.2	12.7	6	88.3 {9.0}	WH20— 20	
2.3	15	7.5	109.8 {11.2}	25	
2.3	15	9	132.4 {13.5}	30	
2.5	20	10.5	154.0 {15.7}	35	145
2.5	20	12	176.5 {18.0}	40	
2.5	20	13.5	199.1 {20.3}	45	
2.6	22.8	15	220.6 {22.5}	50	
2.6	22.8	16.5	242.2 {24.7}	55	
2.8	30.8	18	264.8 {27.0}	60	
2.8	30.8	19.5	286.4 {29.2}	65	155
3.0	42	21	308.9 {31.5}	70	
3.0	42	24	353.0 {36.0}	80	
3.2	56.8	27	397.2 {40.5}	90	
3.2	56.8	30	441.3 {45.0}	100	165
2.3	12.7	6	88.3 {9.0}	WH22— 20	
2.5	16.7	7.5	109.8 {11.2}	25	
2.5	16.7	9	132.4 {13.5}	30	
2.6	18.2	10.5	154.0 {15.7}	35	150
2.8	25	12	176.5 {18.0}	40	
2.8	25	13.5	199.1 {20.3}	45	
2.8	25	15	220.6 {22.5}	50	
3.0	33	16.5	242.2 {24.7}	55	
3.0	33	18	264.8 {27.0}	60	
3.0	33	19.5	286.4 {29.2}	65	160
3.2	43	21	308.9 {31.5}	70	
3.2	43	24	353.0 {36.0}	80	
3.2	43	26.1	397.2 {40.5}	(90)	170
3.5	64.4	26	441.3 {45.0}	(100)	
2.8	16.8	9	132.4 {13.5}	WH27— 30	
2.8	16.8	10.5	154.0 {15.7}	35	
2.9	18.8	12	176.5 {18.0}	40	170
2.9	19.4	13.5	199.1 {20.3}	45	
3.2	25.5	15	220.6 {22.5}	50	
3.2	25.5	16.5	242.2 {24.7}	55	
3.5	35.5	18	264.8 {27.0}	60	
3.5	35.5	19.5	286.4 {29.2}	65	180
3.5	35.5	21	308.9 {31.5}	70	
3.5	35.5	24	353.0 {36.0}	80	
3.5	35.5	27	397.2 {40.5}	90	
4.0	68	30	441.3 {45.0}	100	190

●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

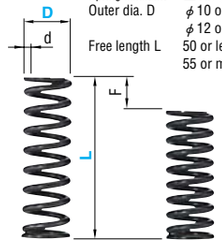
The solid height values are reference only.
There may be some variations depending on lots.
Operation frequency : 1 million times.
Product Outline P.1055
Directions and precautions for coil springs P.1057

Allowable deflection for (L) size
WH5 — 30 Fmax.=L×25%
WH5 — 35 Fmax.=L×25%
WH5 — 40 Fmax.=L×22%
WH6 — 45 Fmax.=L×25%
WH6 — 50 Fmax.=L×20%
WH6 — 55 Fmax.=L×26%
WH6 — 60 Fmax.=L×23%
WH6 — 65 Fmax.=L×21%
WH6 — 70 Fmax.=L×21%
WH8 — 65 Fmax.=L×26%
WH8 — 70 Fmax.=L×27%
WH18— 90 Fmax.=L×29%
WH18—100 Fmax.=L×24%
WH22— 90 Fmax.=L×29%
WH22—100 Fmax.=L×26%

No grinding on both ends of * marked WH type springs.

WIRE SPRINGS
—WB (25% DEFLECTION) —

WB



Spring constant ±10%
Outer dia. D ϕ 10 or less $^{0}_{-0.5}$mm
ϕ 12 or more $^{0}_{-0.8}$mm
Free length L 50 or less ±1mm
55 or more ±1.5mm

RoHS

M SWP—A

■Spring constant

D \ Type	WY	WR	WF	WL	WT	WM	WH	WB
2	N/mm 0.1 {kgf/mm} {0.01}	N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	0.5{0.05} N/mm 1.0 {kgf/mm} {0.1}	1.5 {0.15} N/mm 2.0 {kgf/mm} {0.2}	2.0 {0.2} N/mm 2.9 {kgf/mm} {0.3}	2.9{0.3} N/mm 5.9 {kgf/mm} {0.6}	3.9{0.4} 4.9{0.5} N/mm 9.8 {kgf/mm} {1.0}
3								
4								
5								
6								
8								
10								
12	N/mm 0.2 {kgf/mm} {0.02}							
13								
14								
16								
18								
20								
22								
27		N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 3.9 {kgf/mm} {0.4}	N/mm 4.9 {kgf/mm} {0.5}	N/mm 14.7 {kgf/mm} {1.5}	N/mm 19.6 {kgf/mm} {2.0} 29.4{3.0} N/mm 29.4 {kgf/mm} {3.0}
Fmax.	F=L×75%	F=L×60%	F=L×45%	F=L×40%	F=L×40%	F=L×35%	F=L×30%	F=L×25%

■WB : Fmax.(Allowable deflection)=L×25%

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty : 1~9
0.4	3.2	1.3	4.9{ 0.5}	WB 3— 5*	75
0.5	6.5	2.5	9.8{ 1.0}	10*	
0.55	10.5	3.8	14.7{ 1.5}	15*	
0.55	12.7	5	19.6{ 2.0}	20*	
0.6	17.4	6.3	24.5{ 2.5}	25*	80
0.6	21.0	7.5	29.4{ 3.0}	30*	
0.65	24.0	8.8	34.3{ 3.5}	35*	
0.65	27.0	10.0	39.2{ 4.0}	40*	
0.5	3	1.3	5.9{ 0.6}	WB 4— 5*	75
0.6	6	2.5	12.3{ 1.3}	10	
0.65	9.8	3.8	18.1{ 1.9}	15	
0.7	12.6	5	24.5{ 2.5}	20	
0.75	16.5	6.3	30.4{ 3.1}	25	80
0.75	20.3	7.5	36.8{ 3.8}	30	
0.8	24	8.8	43.1{ 4.4}	35	
0.8	28	10	49.0{ 5.0}	40	
0.8	29	11.3	55.4{ 5.7}	45	
0.85	34	12.5	61.3{ 6.3}	50	
0.65	3.3	1.3	12.7{ 1.3}	WB 5— 5*	75
0.8	7	2.5	24.5{ 2.5}	10	
0.8	7	3.8	37.3{ 3.8}	15	
0.9	13	5	49.0{ 5.0}	20	
0.9	13	6.3	61.8{ 6.3}	25	81
1.0	21	7.5	73.5{ 7.5}	30	
1.0	25	8.8	86.3{ 8.8}	35	
1.0	25	10	98.1{ 10.0}	40	
1.1	31	11.3	110.8{ 11.3}	45	
1.1	34	12.5	122.6{ 12.5}	50	
1.1	39	13.8	135.3{ 13.8}	55	
1.1	43	15	147.1{ 15.0}	60	86
1.2	46	16.3	159.8{ 16.3}	65	
1.2	50	17.5	171.6{ 17.5}	70	
0.7	3.5	1.3	12.7{ 1.3}	WB 6— 5*	77
0.8	7	2.5	24.5{ 2.5}	10	
0.9	7.5	3.8	37.3{ 3.8}	15	
1.0	11.5	5	49.0{ 5.0}	20	
1.1	17.5	6.3	61.8{ 6.3}	25	
1.1	19.5	7.5	73.5{ 7.5}	30	83
1.1	20	8.8	86.3{ 8.8}	35	
1.2	28	10	98.1{ 10.0}	40	
1.2	30	11.3	110.8{ 11.3}	45	
1.2	32	12.5	122.6{ 12.5}	50	
1.2	32	13.8	135.3{ 13.8}	55	
1.3	43	15	147.1{ 15.0}	60	88
1.3	46	16.3	159.8{ 16.3}	65	
1.3	50	17.5	171.6{ 17.5}	70	
1.4	57	20	196.1{ 20.0}	80	
1.0	6	2.5	24.5{ 2.5}	WB 8—10	88
1.2	10.8	3.8	37.3{ 3.8}	15	
1.2	11.5	5	49.0{ 5.0}	20	
1.3	17	6.3	61.8{ 6.3}	25	
1.3	17	7.5	73.5{ 7.5}	30	94
1.4	24.5	8.8	86.3{ 8.8}	35	
1.4	25.2	10	98.1{ 10.0}	40	
1.5	32	11.3	110.8{ 11.3}	45	
1.5	33	12.5	122.6{ 12.5}	50	
1.5	36.5	13.8	135.3{ 13.8}	55	
1.5	36.5	15	147.1{ 15.0}	60	
1.6	48	16.3	159.8{ 16.3}	65	99
1.6	48	17.5	171.6{ 17.5}	70	
1.6	55	20	196.1{ 20.0}	80	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty : 1~9
1.2	6	2.5	24.5{ 2.5}	WB10— 10	99
1.3	8.5	3.8	37.3{ 3.8}	15	
1.4	12	5	49.0{ 5.0}	20	
1.5	16.5	6.3	61.8{ 6.3}	25	
1.5	17	7.5	73.5{ 7.5}	30	
1.6	23	8.8	86.3{ 8.8}	35	
1.6	24	10	98.1{ 10.0}	40	
1.7	30	11.3	110.8{ 11.3}	45	
1.7	31.5	12.5	122.6{ 12.5}	50	
1.8	40	13.8	135.3{ 13.8}	55	
1.8	40	15	147.1{ 15.0}	60	105
1.8	43	16.3	159.8{ 16.3}	65	
1.8	43	17.5	171.6{ 17.5}	70	
1.8	54	20	196.1{ 20.0}	80	
1.4	6.5	2.5	24.5{ 2.5}	WB12— 10	
1.4	7.7	3.8	36.3{ 3.7}	15	
1.6	12.5	5	49.0{ 5.0}	20	
1.6	13.6	6.3	60.8{ 6.2}	25	105
1.7	18	7.5	73.5{ 7.5}	30	
1.8	22.5	8.8	85.3{ 8.7}	35	
1.8	24	10	98.1{ 10.0}	40	
1.8	24	11.3	109.8{ 11.2}	45	
2.0	34	12.5	122.6{ 12.5}	50	
2.0	38	13.8	134.4{ 13.7}	55	
2.0	40	15	147.1{ 15.0}	60	110
2.0	42	16.3	158.9{ 16.2}	65	
2.1	48.5	17.5	171.6{ 17.5}	70	
2.1	52.5	20	196.1{ 20.0}	80	
1.6	6.4	2.5	49.0{ 5.0}	WB13— 10	
1.8	11	3.8	74.5{ 7.6}	15	
1.8	11	5	98.1{ 10.0}	20	
2.0	17	6.3	123.6{ 12.6}	25	
2.0	18	7.5	147.1{ 15.0}	30	105
2.1	22	8.8	172.6{ 17.6}	35	
2.1	22	10	196.1{ 20.0}	40	
2.3	32	11.3	221.6{ 22.6}	45	
2.3	32	12.5	245.2{ 25.0}	50	
2.4	40	13.8	270.7{ 27.6}	55	
2.4	42	15	294.2{ 30.0}	60	110
2.4	42	16.3	319.7{ 32.6}	65	
2.5	50	17.5	343.2{ 35.0}	70	
2.5	50	20	392.3{ 40.0}	80	
1.8	9	3.8	72.6{ 7.4}	WB14— 15	
2.0	13	5	98.1{ 10.0}	20	
2.0	14	6.3	121.6{ 12.4}	25	
2.1	18	7.5	147.1{ 15.0}	30	125
2.1	23	8.8	170.6{ 17.4}	35	
2.3	26.3	10	196.1{ 20.0}	40	
2.3	27.6	11.3	219.7{ 22.4}	45	
2.4	31	12.5	245.2{ 25.0}	50	
2.5	37.5	13.8	268.7{ 27.4}	55	
2.5	41	15	294.2{ 30.0}	60	
2.5	43.5	16.3	317.7{ 32.4}	65	135
2.6	48	17.5	343.2{ 35.0}	70	
2.6	52	20	392.3{ 40.0}	80	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty : 1~9
2.0	10	3.8	74.5{ 7.6}	WB16— 15	132
2.1	12.5	5	98.1{ 10.0}	20	
2.3	17	6.3	123.6{ 12.6}	25	
2.3	18.5	7.5	147.1{ 15.0}	30	
2.4	21.5	8.8	172.6{ 17.6}	35	
2.4	21.5	10	196.1{ 20.0}	40	
2.5	27.5	11.3	221.6{ 22.6}	45	
2.5	27.5	12.5	245.2{ 25.0}	50	
2.6	32	13.8	270.7{ 27.6}	55	
2.6	32	15	294.2{ 30.0}	60	
2.8	46	16.3	319.7{ 32.6}	65	143
2.8	46	17.5	343.2{ 35.0}	70	
2.9	55	20	392.3{ 40.0}	80	
2.5	13.5	5	147.1{ 15.0}	WB18— 20	
2.6	17	6.3	185.3{ 18.9}	25	
2.6	17	7.5	220.6{ 22.5}	30	
2.8	23.5	8.8	258.9{ 26.4}	35	154
2.9	27.5	10	294.2{ 30.0}	40	
2.9	27.5	11.3	332.4{ 33.9}	45	
3.0	33	12.5	367.7{ 37.5}	50	
3.0	33	13.8	406.0{ 41.4}	55	
3.2	43	15	441.3{ 45.0}	60	165
3.2	44.5	16.3	479.5{ 48.9}	65	
3.2	44.5	17.5	514.8{ 52.5}	70	
3.4	58	20	588.4{ 60.0}	80	
3.4	61	22.5	661.9{ 67.5}	90	
3.5	71	25	735.5{ 75.0}	100	176
2.8	13.5	5	147.1{ 15.0}	WB22— 20	
2.9	16	6.3	185.3{ 18.9}	25	
3.0	18	7.5	220.6{ 22.5}	30	
3.0	18	8.8	258.9{ 26.4}	35	165
3.2	24	10	294.2{ 30.0}	40	
3.2	24	11.3	332.4{ 33.9}	45	
3.5	36	12.5	367.7{ 37.5}	50	
3.5	36	13.8	406.0{ 41.4}	55	
3.5	36	15	441.3{ 45.0}	60	
3.6	45	16.3	479.5{ 48.9}	65	176
3.6	45	17.5	514.8{ 52.5}	70	
3.8	57	20	588.4{ 60.0}	80	
3.8	57	22.5	661.9{ 67.5}	90	187
4.0	72	25	735.5{ 75.0}	100	
3.5	19	7.5	220.6{ 22.5}	WB27— 30	
3.6	21	8.8	258.9{ 26.4}	35	
3.6	21	10	294.2{ 30.0}	40	187
3.8	30	11.3	332.4{ 33.9}	45	
3.8	30	12.5	367.7{ 37.5}	50	
4.0	38	13.8	406.0{ 41.4}	55	
4.0	38	15	441.3{ 45.0}	60	
4.0	38	16.3	479.5{ 48.9}	65	198
4.0	38	17.5	514.8{ 52.5}	70	
4.5	57	20	588.4{ 60.0}	80	
4.5	63	22.5	661.9{ 67.5}	90	
4.5	67	25	735.5{ 75.0}	100	209

●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

No grinding on both ends of * marked WB type springs.
The solid height values are reference only.
There may be some variations depending on lots.
Operation frequency : 1 million times.
Product Outline P.1055
Directions and precautions for coil springs P.1057

Order — Catalog No. WB 13—60
Delivery — 1 Day
Price

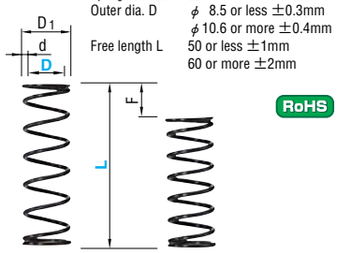
■Volume discount rate P.37

Quantity	1~9	10~19	20~99	100~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

WIRE SPRINGS
—NWL · NWM (INTERNAL DIAMETER STANDARD TYPE)/WP (70% DEFLECTION LONG TYPE) —

NWL
NWM



Spring constant ±10%
Outer dia. D ϕ 8.5 or less ±0.3mm
ϕ 10.6 or more ±0.4mm
Free length L 50 or less ±1mm
60 or more ±2mm

RoHS

M SWP—A

Order — Catalog No. NWL 6.5—50
Delivery — 1 Day
Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~99	100~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Features
The NWL/NWM wire springs feature a constant spring coefficient based on their internal diameters. The load value is the same for all springs with a given internal diameter.
●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)
The solid height values are reference only. There may be some variations depending on lots.
Operation frequency : 1 million times. Product Outline P.1055 Directions and precautions for coil springs P.1057

■NWL : Fmax.(Allowable deflection)=L×40%

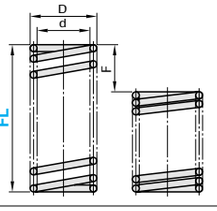
Pin dia.	D	D1	d	F max.	Solid height	N{kgf} max.	Spring constant N/mm {kgf/mm}	Catalog No. Type D—L	U/Price Q'ty : 1~9
5	5.5	7	0.75	12	10.9	13.7(1.4)	1.1(0.12)	NWL 5.5—30	85
				14	12		1.0(0.10)	35	
				16	13.5		0.9(0.09)	40	
				18	15		0.8(0.08)	45	90
				20	16.5		0.7(0.07)	50	
6	6.5	8.1	0.8	12	9.6	13.7(1.4)	1.1(0.12)	NWL 6.5—30	90
				14	10.8		1.0(0.10)	35	
				16	12		0.9(0.09)	40	
				18	13.2		0.8(0.08)	45	95
				20	14.4		0.7(0.07)	50	
8	8.5	10.5	1.0	12	9.8	20.6(2.1)	1.7(0.18)	NWL 8.5—30	100
				14	10.8		1.5(0.15)	35	
				16	12		1.3(0.13)	40	
				18	13		1.1(0.12)	45	105
				20	14		1.0(0.11)	50	
				24	16.5		0.9(0.09)	60	
10	10.6	12.8	1.1	12	9.1	20.6(2.1)	1.7(0.18)	NWL 10.6—30	110
				14	9.9		1.5(0.15)	35	
				16	11		1.3(0.13)	40	
				18	12.1		1.1(0.12)	45	120
				20	12.7		1.0(0.11)	50	
				24	14.9		0.9(0.09)	60	
13	13.6	16.4	1.4	14	12.3	27.5(2.8)	2.0(0.20)	NWL 13.6—35	125
				16	13.3		1.7(0.18)	40	
				18	14.7		1.5(0.16)	45	135
				20	15.8		1.4(0.14)	50	
				24	18.2		1.1(0.12)	60	
16	16.6	19.8	1.6	14	13.6	27.5(2.8)	2.0(0.20)	NWL 16.6—35	160
				16	14.8		1.7(0.18)	40	
				18	16		1.5(0.16)	45	
				20	17.2		1.4(0.14)	50	170
				24	20		1.1(0.12)	60	

■NWM : Fmax.(Allowable deflection)=L×32%

Pin dia.	D	D1	d	F max.	Solid height	N{kgf} max.	Spring constant N/mm {kgf/mm}	Catalog No. Type D—L	U/Price Q'ty : 1~9
5	5.5	7.3	0.9	9.6	13.1	20.6(2.1)	2.1(0.22)	NWM 5.5—30	85
				11.2	14.9		1.8(0.19)	35	
				12.8	16.2		1.6(0.16)	40	
				14.4	18		1.4(0.15)	45	90
				16	19.8		1.3(0.13)	50	
6	6.5	8.5	1.0	9.6	14	20.6(2.1)	2.1(0.22)	NWM 6.5—30	90
				11.2	15.5		1.8(0.19)	35	
				12.8	17.5		1.6(0.16)	40	
				14.4	19.5		1.4(0.15)	45	95
				16	21		1.3(0.13)	50	
8	8.5	10.7	1.1	9.6	9.4	27.5(2.8)	2.9(0.29)	NWM 8.5—30	100
				11.2	10.5		2.5(0.25)	35	
				12.8	11.6		2.1(0.22)	40	
				14.4	12.7		1.9(0.19)	45	105
				16	13.8		1.7(0.18)	50	
				19.2	16		1.4(0.15)	60	
10	10.6	13.2	1.3	9.6	11.4	27.5(2.8)	2.9(0.29)	NWM 10.6—30	110
				11.2	12.7		2.5(0.25)	35	
				12.8	14		2.1(0.22)	40	
				14.4	15.3		1.9(0.19)	45	120
				16	16.6		1.7(0.18)	50	
				19.2	19.2		1.4(0.15)	60	
13	13.6	16.8	1.6	11.2	14.4	34.3(3.5)	3.1(0.31)	NWM 13.6—35	125
				12.8	15.6		2.7(0.27)	40	
				14.4	17.2		2.4(0.24)	45	135
				16	18.4		2.1(0.22)	50	
				19.2	20.8		1.8(0.18)	60	
16	16.6	20.2	1.8	11.2	15.3	34.3(3.5)	3.1(0.31)	NWM 16.6—35	160
				12.8	16.7		2.7(0.27)	40	
				14.4	18.5		2.4(0.24)	45	
				16	19.4		2.1(0.22)	50	170
				19.2	22.5		1.8(0.18)	60	

■WP (Long type)

WP



RoHS

FL	Tolerance
100~150	$^{+10}_{0}$
175~250	$^{+15}_{0}$
300 · 500	$^{+25}_{-10}$

Order — Catalog No. WP 13—100
Delivery — 1 Day
Price

■Volume discount rate P.37

Quantity	1~9	10~19	20~99	100~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

d	D	Wire diameter	Solid height	Spring constant N/mm{kgf/mm}	F=L×70% Fmm	F=L×70% N{kgf}	Catalog No. Type No.— FL	U/Price Q'ty : 1~9
More 8.5	Less 11.5	0.9	23	0.30(0.031)	70	21.3(2.2)	WP 8—100	150
			28	0.27(0.028)	87.5	24.0(2.5)	125	230
			33	0.23(0.023)	105	23.7(2.4)	150	290
			40	0.18(0.018)	122.5	21.6(2.2)	175	360
			46	0.16(0.016)	140	22.0(2.2)	200	440
			55	0.12(0.012)	175	20.6(2.1)	250	590
			71	0.10(0.010)	210	20.6(2.1)	300	750
			118	0.06(0.006)	350	20.6(2.1)	500	1,110
More 10.5	Less 13.5	1.0	23	0.37(0.038)	70	26.1(2.7)	WP 10—100	160
			30	0.27(0.028)	87.5	24.0(2.5)	125	240
			35	0.24(0.024)	105	24.7(2.5)	150	300
			40	0.20(0.020)	122.5	24.0(2.5)	175	370
			45	0.18(0.018)	140	24.7(2.5)	200	450
			56	0.15(0.015)	175	25.7(2.6)	250	610
			64	0.12(0.012)	210	24.7(2.5)	300	780
			106	0.08(0.008)	350	27.5(2.8)	500	1,150
More 13.5	Less 17	1.2	17	0.59(0.060)	70	41.2(4.2)	WP 13—100	170
			22	0.42(0.043)	87.5	36.9(3.8)	125	250
			26	0.31(0.032)	105	33.0(3.4)	150	310
			34	0.25(0.025)	122.5	30.0(3.1)	175	390
			37	0.23(0.023)	140	31.6(3.2)	200	480
			42	0.19(0.019)	175	32.6(3.3)	250	660
			53	0.15(0.015)	210	30.9(3.2)	300	840
			80	0.10(0.010)	350	34.3(3.5)	500	1,200

●{kgf}=N×0.101972

PRESS ADD.SPEC. Printed in Red

COIL SPRINGS
—ULTRA HIGH DEFLECTION SWY—

Light — Load — Heavy
SWY

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓmin	F=L×65% Fmm	Load N{kgf}	Catalog No. Type D−L	U/Price Q'ty: 1~19
11	7	20	2.26 {0.23}	5.0	13.0	29.4 {3.0}	SWY 11− 20	160
		25	1.81 {0.18}	6.3	16.3		25	170
		30	1.51 {0.15}	7.5	19.5		30	180
		35	1.29 {0.13}	8.8	22.8		35	190
		40	1.13 {0.12}	10.0	26.0		40	200
		45	1.01 {0.10}	11.3	29.3		45	210
		50	0.91 {0.092}	12.5	32.5		50	220
		55	0.82 {0.084}	13.8	35.8		55	230
		60	0.75 {0.077}	15.0	39.0		60	240
		65	0.70 {0.071}	16.3	42.3		65	250
		70	0.65 {0.066}	17.5	45.5		70	260
		75	0.60 {0.061}	18.8	48.8		75	270
		80	0.57 {0.058}	20.0	52.0		80	280
		90	0.50 {0.051}	22.5	58.5		90	310
		100	0.45 {0.046}	25.0	65.0		100	330
12.5	8.5	20	3.09 {0.32}	5.0	13.0	40.2 {4.1}	SWY 12.5− 20	165
		25	2.47 {0.25}	6.3	16.3		25	185
		30	2.06 {0.21}	7.5	19.5		30	200
		35	1.77 {0.18}	8.8	22.8		35	210
		40	1.55 {0.16}	10.0	26.0		40	225
		45	1.37 {0.14}	11.3	29.3		45	235
		50	1.24 {0.13}	12.5	32.5		50	250
		55	1.12 {0.11}	13.8	35.8		55	260
		60	1.03 {0.11}	15.0	39.0		60	270
		65	0.95 {0.10}	16.3	42.3		65	290
		70	0.88 {0.090}	17.5	45.5		70	300
		75	0.82 {0.084}	18.8	48.8		75	320
		80	0.77 {0.079}	20.0	52.0		80	330
		90	0.69 {0.070}	22.5	58.5		90	340
		100	0.62 {0.063}	25.0	65.0		100	365
		110	0.56 {0.057}	27.5	71.5		110	375
		120	0.52 {0.053}	30.0	78.0		120	380
		125	0.49 {0.050}	31.3	81.3		125	390
16.5	10.5	20	7.02 {0.72}	5.0	13.0	91.2 {9.3}	SWY 16.5− 20	190
		25	5.61 {0.57}	6.3	16.3		25	200
		30	4.68 {0.48}	7.5	19.5		30	210
		35	4.01 {0.41}	8.8	22.8		35	215
		40	3.51 {0.36}	10.0	26.0		40	225
		45	3.12 {0.32}	11.3	29.3		45	250
		50	2.81 {0.29}	12.5	32.5		50	260
		55	2.55 {0.26}	13.8	35.8		55	280
		60	2.34 {0.24}	15.0	39.0		60	290
		65	2.16 {0.22}	16.3	42.3		65	300
		70	2.00 {0.20}	17.5	45.5		70	315
		75	1.87 {0.19}	18.8	48.8		75	330
		80	1.75 {0.18}	20.0	52.0		80	340
		90	1.56 {0.16}	22.5	58.5		90	360
		100	1.40 {0.14}	25.0	65.0		100	385
		110	1.28 {0.13}	27.5	71.5		110	395
		120	1.17 {0.12}	30.0	78.0		120	400
		125	1.12 {0.11}	31.3	81.3		125	410
		150	0.94 {0.10}	37.5	97.5		150	420
20.5	13.5	30	5.58 {0.57}	7.5	19.5	108.9 {11.1}	SWY20.5−30	235
		35	4.78 {0.49}	8.8	22.8		35	250
		40	4.19 {0.43}	10.0	26.0		40	260
		45	3.72 {0.38}	11.3	29.3		45	280
		50	3.35 {0.34}	12.5	32.5		50	290
		55	3.04 {0.31}	13.8	35.8		55	300
		60	2.79 {0.28}	15.0	39.0		60	315
		65	2.58 {0.26}	16.3	42.3		65	330
		70	2.39 {0.24}	17.5	45.5		70	340
		75	2.23 {0.23}	18.8	48.8		75	350
		80	2.09 {0.21}	20.0	52.0		80	360
		90	1.86 {0.19}	22.5	58.5		90	375
		100	1.67 {0.17}	25.0	65.0		100	395
		110	1.52 {0.16}	27.5	71.5		110	405
		120	1.40 {0.14}	30.0	78.0		120	420
		125	1.34 {0.14}	31.3	81.3		125	420
		130	1.29 {0.13}	32.5	84.5		130	425
		140	1.20 {0.12}	35.0	91.0		140	435
		150	1.12 {0.11}	37.5	97.5		150	435
24.5	16.5	30	6.99 {0.71}	7.5	19.5	136.3 {13.9}	SWY24.5−30	290
		35	5.99 {0.61}	8.8	22.8		35	300
		40	5.24 {0.53}	10.0	26.0		40	315
		45	4.66 {0.48}	11.3	29.3		45	330
		50	4.19 {0.43}	12.5	32.5		50	340
		55	3.81 {0.39}	13.8	35.8		55	350
		60	3.50 {0.36}	15.0	39.0		60	365
		65	3.23 {0.33}	16.3	42.3		65	375
		70	3.00 {0.31}	17.5	45.5		70	395
		75	2.80 {0.29}	18.8	48.8		75	405
		80	2.62 {0.27}	20.0	52.0		80	420
		90	2.33 {0.24}	22.5	58.5		90	425
		100	2.10 {0.21}	25.0	65.0		100	435
		110	1.91 {0.19}	27.5	71.5		110	445
		120	1.75 {0.18}	30.0	78.0		120	455
		125	1.68 {0.17}	31.3	81.3		125	455
		130	1.61 {0.16}	32.5	84.5		130	470
		140	1.50 {0.15}	35.0	91.0		140	480
		150	1.40 {0.14}	37.5	97.5		150	490
		175	1.20 {0.12}	43.8	113.8		175	500
		200	1.05 {0.11}	50.0	130.0		200	520
30	21	35	8.79 {0.90}	8.8	22.8	200.1 {20.4}	SWY 30− 35	310
		40	7.69 {0.78}	10.0	26.0		40	320
		45	6.84 {0.70}	11.3	29.3		45	330
		50	6.16 {0.63}	12.5	32.5		50	340
		55	5.60 {0.57}	13.8	35.8		55	350
		60	5.13 {0.52}	15.0	39.0		60	365
		65	4.74 {0.48}	16.3	42.3		65	375
		70	4.40 {0.45}	17.5	45.5		70	385
		75	4.10 {0.42}	18.8	48.8		75	395
		80	3.85 {0.39}	20.0	52.0		80	410
		90	3.42 {0.35}	22.5	58.5		90	425
		100	3.08 {0.31}	25.0	65.0		100	470
		110	2.80 {0.29}	27.5	71.5		110	490
		120	2.56 {0.26}	30.0	78.0		120	500
		125	2.46 {0.25}	31.3	81.3		125	510
		130	2.37 {0.24}	32.5	84.5		130	520
		140	2.20 {0.22}	35.0	91.0		140	540
		150	2.05 {0.21}	37.5	97.5		150	560
		160	1.92 {0.20}	40.0	104.0		160	570
		170	1.81 {0.18}	42.5	110.5		170	595
		175	1.76 {0.18}	43.8	113.8		175	605
		180	1.71 {0.17}	45.0	117.0		180	615
		190	1.62 {0.17}	47.5	123.5		190	630
		200	1.54 {0.16}	50.0	130.0		200	655
		250	1.23 {0.13}	62.5	162.5		250	730
		300	1.03 {0.10}	75.0	195.0		300	780
37	26	40	11.32 {1.15}	10.0	26.0	294.2 {30.0}	SWY 37− 40	415
		45	10.06 {1.03}	11.3	29.3		45	430
		50	9.05 {0.92}	12.5	32.5		50	445
		55	8.23 {0.84}	13.8	35.8		55	460
		60	7.54 {0.77}	15.0	39.0		60	470
		65	6.96 {0.71}	16.3	42.3		65	485
		70	6.47 {0.66}	17.5	45.5		70	500
		75	6.03 {0.62}	18.8	48.8		75	520
		80	5.66 {0.58}	20.0	52.0		80	540
		90	5.03 {0.51}	22.5	58.5		90	560
		100	4.53 {0.46}	25.0	65.0		100	580
		110	4.11 {0.42}	27.5	71.5		110	600
		120	3.77 {0.38}	30.0	78.0		120	620
		130	3.48 {0.36}	32.5	84.5		130	650
		140	3.23 {0.33}	35.0	91.0		140	670
		150	3.02 {0.31}	37.5	97.5		150	690
		160	2.83 {0.29}	40.0	104.0		160	705
		170	2.66 {0.27}	42.5	110.5		170	730
		180	2.51 {0.26}	45.0	117.0		180	755
		190	2.38 {0.24}	47.5	123.5		190	780
		200	2.26 {0.23}	50.0	130.0		200	810
		225	2.01 {0.21}	56.3	146.3		225	880
		250	1.81 {0.18}	62.5	162.5		250	960
		275	1.65 {0.17}	68.8	178.8		275	1,030
		300	1.51 {0.15}	75.0	195.0		300	1,100
42	31	50	12.07 {1.23}	12.5	32.5	392.3 {40.0}	SWY 42− 50	490
		60	10.06 {1.03}	15.0	39.0		60	510
		70	8.62 {0.88}	17.5	45.5		70	535
		80	7.54 {0.77}	20.0	52.0		80	560
		90	6.71 {0.68}	22.5	58.5		90	585
		100	6.03 {0.62}	25.0	65.0		100	610
		110	5.49 {0.56}	27.5	71.5		110	640
		120	5.03 {0.51}	30.0	78.0		120	670
		130	4.64 {0.47}	32.5	84.5		130	705
		140	4.31 {0.44}	35.0	91.0		140	745
		150	4.02 {0.41}	37.5	97.5		150	780
		160	3.77 {0.38}	40.0	104.0		160	815
		170	3.55 {0.36}	42.5	110.5		170	850
		180	3.35 {0.34}	45.0	117.0		180	885
		190	3.18 {0.32}	47.5	123.5		190	910
		200	3.02 {0.31}	50.0	130.0		200	940
		225	2.68 {0.27}	56.3	146.3		225	1,050
		250	2.41 {0.25}	62.5	162.5		250	1,260
		275	2.19 {0.22}	68.8	178.8		275	1,350
		300	2.01 {0.21}	75.0	195.0		300	1,430

Order — Catalog No.
SWY 12.5−40
SWU 17 −40

Delivery — 1 Day

Price

Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

M SWOSC−V
●Load calculation method：N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

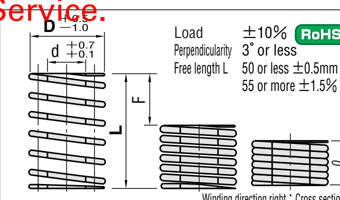
The solid height values are reference only.
There may be some variations depending on lots.
Operation frequency：1 million times. (L×70% is 300,000 times.)
Product Outline P.1056　Load-deflection diagram P.1094
Directions and precautions for coil springs P.1057

Alterations (NT) − Catalog No.
NT − SWY 30−40
5 Days

Alteration	Paint peeling No painting
Code	NT
Spec.	Peel the coating by shot peening. Since the springs which have undergone the painting peeling are easy to rust, be careful in handling. A rusty spring could cause early breakage. Compared to painted springs, there may be some variations in terms of load, etc. depending on the lot.
Price	Details P.1093

COIL SPRINGS
—SUPER HIGH DEFLECTION SWU—

Light — Load — Heavy
SWU



Load ±10% RoHS
Perpendicularity 3° or less
Free length L 50 or less ±0.5mm
55 or more ±1.5%

Dim. D and counterbored hole, Dim. d and shaft P.1057

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓmin	F=L×60% Fmm	Load N{kgf}	Catalog No. Type D−L	U/Price Q'ty: 1~19
10.5	6.0	15	7.63 {0.78}	4.5	9.0	68.6 {7.0}	SWU10.5−15	110
		20	5.72 {0.58}	6.0	12.0		20	110
		25	4.58 {0.47}	7.5	15.0		25	120
		30	3.81 {0.39}	9.0	18.0		30	130
		35	3.27 {0.33}	10.5	21.0		35	140
		40	2.86 {0.29}	12.0	24.0		40	150
		45	2.54 {0.26}	13.5	27.0		45	160
		50	2.29 {0.23}	15.0	30.0		50	160
		55	2.08 {0.21}	16.5	33.0		55	165
		60	1.91 {0.19}	18.0	36.0		60	175
		65	1.76 {0.18}	19.5	39.0		65	185
		70	1.63 {0.17}	21.0	42.0		70	190
		75	1.53 {0.16}	22.5	45.0		75	195
		80	1.43 {0.15}	24.0	48.0		80	205
12.5	7.0	15	8.72 {0.89}	4.5	9.0	78.5 {8.0}	SWU12.5−15	140
		20	6.54 {0.67}	6.0	12.0		20	140
		25	5.23 {0.53}	7.5	15.0		25	150
		30	4.36 {0.44}	9.0	18.0		30	150
		35	3.74 {0.38}	10.5	21.0		35	155
		40	3.27 {0.33}	12.0	24.0		40	165
		45	2.91 {0.30}	13.5	27.0		45	180
		50	2.62 {0.27}	15.0	30.0		50	190
		55	2.38 {0.24}	16.5	33.0		55	195
		60	2.18 {0.22}	18.0	36.0		60	205
		65	2.01 {0.21}	19.5	39.0		65	215
		70	1.87 {0.19}	21.0	42.0		70	225
		75	1.74 {0.18}	22.5	45.0		75	235
		80	1.63 {0.17}	24.0	48.0		80	255
		90	1.45 {0.15}	27.0	54.0		90	265
		100	1.31 {0.13}	30.0	60.0		100	285
14.5	8.5	15	10.90 {1.11}	4.5	9.0	98.1 {10.0}	SWU14.5−15	130
		20	8.17 {0.83}	6.0	12.0		20	140
		25	6.54 {0.67}	7.5	15.0		25	160
		30	5.45 {0.56}	9.0	18.0		30	170
		35	4.67 {0.48}	10.5	21.0		35	180
		40	4.09 {0.42}	12.0	24.0		40	190
		45	3.63 {0.37}	13.5	27.0		45	200
		50	3.27 {0.33}	15.0	30.0		50	210
		55	2.97 {0.30}	16.5	33.0		55	220
		60	2.72 {0.28}	18.0	36.0		60	230
		65	2.51 {0.26}	19.5	39.0		65	250
		70	2.33 {0.24}	21.0	42.0		70	260
		75	2.18 {0.22}	22.5	45.0		75	270
		80	2.04 {0.21}	24.0	48.0		80	285
		90	1.82 {0.19}	27.0	54.0		90	290
		100	1.63 {0.17}	30.0	60.0		100	310
		110	1.49 {0.15}	33.0	66.0		110	320
		120	1.36 {0.14}	36.0	72.0		120	325
		125	1.31 {0.13}	37.5	75.0		125	330
		150	1.09 {0.11}	45.0	90.0		150	350
17	10.5	20	12.26 {1.25}	6.0	12.0	147.1 {15.0}	SWU 17− 20	170
		25	9.81 {1.00}	7.5	15.0		25	170
		30	8.17 {0.83}	9.0	18.0		30	180
		35	7.00 {0.71}	10.5	21.0		35	185
		40	6.13 {0.63}	12.0	24.0		40	190
		45	5.45 {0.56}	13.5	27.0		45	210
		50	4.90 {0.50}	15.0	30.0		50	220
		55	4.46 {0.45}	16.5	33.0		55	240
		60	4.09 {0.42}	18.0	36.0		60	250
		65	3.77 {0.38}	19.5	39.0		65	260
		70	3.50 {0.36}	21.0	42.0		70	270
		75	3.27 {0.33}	22.5	45.0		75	285
		80	3.06 {0.31}	24.0	48.0		80	290
		90	2.72 {0.28}	27.0	54.0		90	310
		100	2.45 {0.25}	30.0	60.0		100	330
		110	2.23 {0.23}	33.0	66.0		110	340
		120	2.04 {0.21}	36.0	72.0		120	345
		125	1.96 {0.20}	37.5	75.0		125	350
		150	1.63 {0.17}	45.0	90.0		150	365
		175	1.40 {0.14}	52.5	105.0		175	380
21	13.5	25	15.04 {1.53}	7.5	15.0	225.6 {23.0}	SWU 21− 25	190
		30	12.53 {1.28}	9.0	18.0		30	200
		35	10.74 {1.10}	10.5	21.0		35	210
		40	9.40 {0.96}	12.0	24.0		40	220
		45	8.35 {0.85}	13.5	27.0		45	240
		50	7.52 {0.77}	15.0	30.0		50	250
		55	6.83 {0.70}	16.5	33.0		55	260
		60	6.27 {0.64}	18.0	36.0		60	270
		65	5.78 {0.59}	19.5	39.0		65	285
		70	5.37 {0.55}	21.0	42.0		70	290
		75	5.01 {0.51}	22.5	45.0		75	300
		80	4.70 {0.48}	24.0	48.0		80	310
		90	4.18 {0.43}	27.0	54.0		90	320
		100	3.76 {0.38}	30.0	60.0		100	340
		110	3.42 {0.35}	33.0	66.0		110	350
		120	3.13 {0.32}	36.0	72.0		120	360
		125	3.01 {0.31}	37.5	75.0		125	360
		130	2.89 {0.29}	39.0	78.0		130	365
		140	2.69 {0.27}	42.0	84.0		140	375
		150	2.51 {0.26}	45.0	90.0		150	375
		175	2.15 {0.22}	52.5	105.0		175	395
		200	1.88 {0.19}	60.0	120.0		200	415
26	16.5	30	16.34 {1.67}	9.0	18.0	294.2 {30.0}	SWU 26− 30	250
		35	14.01 {1.43}	10.5	21.0		35	260
		40	12.26 {1.25}	12.0	24.0		40	270
		45	10.90 {1.11}	13.5	27.0		45	285
		50	9.81 {1.00}	15.0	30.0		50	290
		55	8.92 {0.91}	16.5	33.0		55	300
		60	8.17 {0.83}	18.0	36.0		60	310
		65	7.54 {0.77}	19.5	39.0		65	320
		70	7.00 {0.71}	21.0	42.0		70	340
		75	6.54 {0.67}	22.5	45.0		75	350
		80	6.13 {0.63}	24.0	48.0		80	360
		90	5.45 {0.56}	27.0	54.0		90	365
		100	4.90 {0.50}	30.0	60.0		100	375
		110	4.46 {0.45}	33.0	66.0		110	380
		120	4.09 {0.42}	36.0	72.0		120	390
		125	3.92 {0.40}	37.5	75.0		125	390
		130	3.77 {0.38}	39.0	78.0		130	400
		140	3.50 {0.36}	42.0	84.0		140	410
		150	3.27 {0.33}	45.0	90.0		150	420
		175	2.80 {0.29}	52.5	105.0		175	430
		200	2.45 {0.25}	60.0	120.0		200	450
		225	2.18 {0.22}	67.5	135.0		225	480
		250	1.96 {0.20}	75.0	150.0		250	520
31	21	35	17.75 {1.81}	10.5	21.0	372.7 {38.0}	SWU 31− 35	265
		40	15.53 {1.58}	12.0	24.0		40	275
		45	13.80 {1.41}	13.5	27.0		45	285
		50	12.42 {1.27}	15.0	30.0		50	290
		55	11.29 {1.15}	16.5	33.0		55	300
		60	10.35 {1.06}	18.0	36.0		60	310
		65	9.56 {0.97}	19.5	39.0		65	320
		70	8.87 {0.90}	21.0	42.0		70	330
		75	8.28 {0.84}	22.5	45.0		75	340
		80	7.76 {0.79}	24.0	48.0		80	350
		90	6.90 {0.70}	27.0	54.0		90	365
		100	6.21 {0.63}	30.0	60.0		100	400
		110	5.65 {0.58}	33.0	66.0		110	420
		120	5.18 {0.53}	36.0	72.0		120	430
		125	4.97 {0.51}	37.5	75.0		125	440
		130	4.78 {0.49}	39.0	78.0		130	450
		140	4.44 {0.45}	42.0	84.0		140	465
		150	4.14 {0.42}	45.0	90.0		150	480
		160	3.88 {0.40}	48.0	96.0		160	490
		170	3.65 {0.37}	51.0	102.0		170	510
		175	3.55 {0.36}	52.5	105.0		175	520
		180	3.45 {0.35}	54.0	108.0		180	530
		190	3.27 {0.33}	57.0	114.0		190	545
		200	3.11 {0.32}	60.0	120.0		200	565
		250	2.48 {0.25}	75.0	150.0		250	630
		300	2.07 {0.21}	90.0	180.0		300	670
37	26	40	19.20 {1.96}	12.0	24.0	460.9 {47.0}	SWU 37− 40	360
		45	17.07 {1.74}	13.5	27.0		45	370
		50	15.36 {1.57}	15.0	30.0		50	380
		55	13.97 {1.42}	16.5	33.0		55	390
		60	12.80 {1.31}	18.0	36.0		60	405
		65	11.82 {1.21}	19.5	39.0		65	415
		70	10.97 {1.12}	21.0	42.0		70	430
		75	10.24 {1.04}	22.5	45.0		75	445
		80	9.60 {0.98}	24.0	48.0		80	465
		90	8.54 {0.87}	27.0	54.0		90	480
		100	7.68 {0.78}	30.0	60.0		100	500
		110	6.98 {0.71}	33.0	66.0		110	520
		120	6.40 {0.65}	36.0	72.0		120	540
		130	5.91 {0.60}	39.0	78.0		130	560
		140	5.49 {0.56}	42.0	84.0		140	575
		150	5.12 {0.52}	45.0	90.0		150	595
		160	4.80 {0.49}	48.0	96.0		160	615
		170	4.52 {0.46}	51.0	102.0		170	635
		180	4.27 {0.44}	54.0	108.0		180	655
		190	4.04 {0.41}	57.0	114.0		190	670
		200	3.84 {0.39}	60.0	120.0		200	690
		225	3.41 {0.35}	67.5	135.0		225	750
		250	3.07 {0.31}	75.0	150.0		250	815
		275	2.79 {0.28}	82.5	165.0		275	870
		300	2.56 {0.26}	90.0	180.0		300	940
43	31	50	19.61 {2.00}	15.0	30.0	588.4 {60.0}	SWU 43− 50	425
		60	16.34 {1.67}	18.0	36.0		60	445
		70	14.01 {1.43}	21.0	42.0		70	465
		80	12.26 {1.25}	24.0	48.0		80	480
		90	10.90 {1.11}	27.0	54.0		90	500
		100	9.81 {1.00}	30.0	60.0		100	530
		110	8.92 {0.91}	33.0	66.0		110	560
		120	8.17 {0.83}	36.0	72.0		120	575
		130	7.54 {0.77}	39.0	78.0		130	605
		140	7.00 {0.71}	42.0	84.0		140	635
		150	6.54 {0.67}	45.0	90.0		150	670
		160	6.13 {0.63}	48.0	96.0		160	700
		170	5.77 {0.59}	51.0	102.0		170	730
		180	5.45 {0.56}	54.0	108.0		180	760
		190	5.16 {0.53}	57.0	114.0		190	785
		200	4.90 {0.50}	60.0	120.0		200	825
		225	4.36 {0.44}	67.5	135.0		225	910
		250	3.92 {0.40}	75.0	150.0		250	1,090
		275	3.57 {0.36}	82.5	165.0		275	1,165
		300	3.27 {0.33}	90.0	180.0		300	1,235

M SWOSC−V
●Load calculation method：N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

The solid height values are reference only.
There may be some variations depending on lots.
Operation frequency：1 million times. (L×65% is 300,000 times.)
Product Outline P.1056　Load-deflection diagram P.1094
Directions and precautions for coil springs P.1057

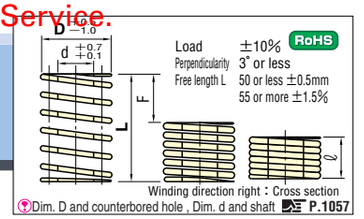
Alterations (NT) − Catalog No.
NT − SWU 31−50
5 Days

Alteration	Paint peeling No painting
Code	NT
Spec.	Peel the coating by shot peening. Since the springs which have undergone the painting peeling are easy to rust, be careful in handling. A rusty spring could cause early breakage. Compared to painted springs, there may be some variations, etc. depending on the lot.
Price	Details P.1093

PRESS ADD.SPEC. Printed in Red

COIL SPRINGS
—HIGH DEFLECTION SWR—

Light ← Load → Heavy
SWR



D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×50% Fmm	F=L×50% Load N{kgf}	Catalog No. Type D — L	U/Price Q'ty : 1~19
10.5	6.0	15	10.46 {1.07}	6.0	7.5	78.5 {8.0}	SWR 10.5—15	90
		20	7.85 {0.80}	8.0	10.0		20	90
		25	6.28 {0.64}	10.0	12.5		25	95
		30	5.23 {0.53}	12.0	15.0		30	100
		35	4.48 {0.46}	14.0	17.5		35	110
		40	3.92 {0.40}	16.0	20.0		40	120
		45	3.49 {0.36}	18.0	22.5		45	120
		50	3.14 {0.32}	20.0	25.0		50	130
		55	2.85 {0.29}	22.0	27.5		55	140
		60	2.62 {0.27}	24.0	30.0		60	150
		65	2.41 {0.25}	26.0	32.5		65	160
		70	2.24 {0.23}	28.0	35.0		70	170
		75	2.09 {0.21}	30.0	37.5		75	180
		80	1.96 {0.20}	32.0	40.0		80	190
12.5	7.0	15	11.77 {1.20}	6.0	7.5	88.3 {9.0}	SWR 12.5—15	95
		20	8.83 {0.90}	8.0	10.0		20	95
		25	7.06 {0.72}	10.0	12.5		25	100
		30	5.88 {0.60}	12.0	15.0		30	110
		35	5.04 {0.51}	14.0	17.5		35	120
		40	4.41 {0.45}	16.0	20.0		40	130
		45	3.92 {0.40}	18.0	22.5		45	140
		50	3.53 {0.36}	20.0	25.0		50	150
		55	3.21 {0.33}	22.0	27.5		55	160
		60	2.94 {0.30}	24.0	30.0		60	170
		65	2.72 {0.28}	26.0	32.5		65	180
		70	2.52 {0.26}	28.0	35.0		70	190
		75	2.35 {0.24}	30.0	37.5		75	195
		80	2.21 {0.23}	32.0	40.0		80	205
		90	1.96 {0.20}	36.0	45.0		90	225
		100	1.77 {0.18}	40.0	50.0		100	245
14.5	8.5	15	17.00 {1.73}	6.0	7.5	127.5 {13.0}	SWR 14.5—15	110
		20	12.75 {1.30}	8.0	10.0		20	120
		25	10.20 {1.04}	10.0	12.5		25	130
		30	8.50 {0.87}	12.0	15.0		30	140
		35	7.28 {0.74}	14.0	17.5		35	150
		40	6.37 {0.65}	16.0	20.0		40	160
		45	5.67 {0.58}	18.0	22.5		45	170
		50	5.10 {0.52}	20.0	25.0		50	180
		55	4.64 {0.47}	22.0	27.5		55	185
		60	4.25 {0.43}	24.0	30.0		60	190
		65	3.92 {0.40}	26.0	32.5		65	200
		70	3.64 {0.37}	28.0	35.0		70	210
		75	3.40 {0.35}	30.0	37.5		75	220
		80	3.19 {0.33}	32.0	40.0		80	230
		90	2.83 {0.29}	36.0	45.0		90	250
		100	2.55 {0.26}	40.0	50.0		100	270
		125	2.04 {0.21}	50.0	62.5		125	290
		150	1.70 {0.17}	60.0	75.0		150	310
17	10.5	20	19.61 {2.00}	8.0	10.0	196.1 {20.0}	SWR 17— 20	130
		25	15.69 {1.60}	10.0	12.5		25	140
		30	13.08 {1.33}	12.0	15.0		30	150
		35	11.21 {1.14}	14.0	17.5		35	160
		40	9.81 {1.00}	16.0	20.0		40	170
		45	8.72 {0.89}	18.0	22.5		45	180
		50	7.85 {0.80}	20.0	25.0		50	185
		55	7.13 {0.73}	22.0	27.5		55	190
		60	6.54 {0.67}	24.0	30.0		60	200
		65	6.03 {0.62}	26.0	32.5		65	210
		70	5.60 {0.57}	28.0	35.0		70	220
		75	5.23 {0.53}	30.0	37.5		75	230
		80	4.90 {0.50}	32.0	40.0		80	240
		90	4.36 {0.44}	36.0	45.0		90	260
		100	3.92 {0.40}	40.0	50.0		100	275
		125	3.14 {0.32}	50.0	62.5		125	300
		150	2.62 {0.27}	60.0	75.0		150	330
		175	2.24 {0.23}	70.0	87.5		175	360
21	13.5	25	23.54 {2.40}	10.0	12.5	294.2 {30.0}	SWR 21— 25	160
		30	19.61 {2.00}	12.0	15.0		30	170
		35	16.81 {1.71}	14.0	17.5		35	180
		40	14.71 {1.50}	16.0	20.0		40	185
		45	13.08 {1.33}	18.0	22.5		45	190
		50	11.77 {1.20}	20.0	25.0		50	200
		55	10.70 {1.09}	22.0	27.5		55	210
		60	9.81 {1.00}	24.0	30.0		60	220
		65	9.05 {0.92}	26.0	32.5		65	230
		70	8.41 {0.86}	28.0	35.0		70	240
		75	7.85 {0.80}	30.0	37.5		75	250
		80	7.35 {0.75}	32.0	40.0		80	260
		90	6.54 {0.67}	36.0	45.0		90	270
		100	5.88 {0.60}	40.0	50.0		100	275
		110	5.35 {0.55}	44.0	55.0		110	285
		120	4.90 {0.50}	48.0	60.0		120	290
		125	4.71 {0.48}	50.0	62.5		125	300
		130	4.53 {0.46}	52.0	65.0		130	310
		140	4.20 {0.43}	56.0	70.0		140	320
		150	3.92 {0.40}	60.0	75.0		150	330
		175	3.36 {0.34}	70.0	87.5		175	355
		200	2.94 {0.30}	80.0	100.0		200	380
26	16.5	25	31.38 {3.20}	10.0	12.5	392.3 {40.0}	SWR 26— 25	190
		30	26.15 {2.67}	12.0	15.0		30	200
		35	22.42 {2.29}	14.0	17.5		35	210
		40	19.61 {2.00}	16.0	20.0		40	220
		45	17.43 {1.78}	18.0	22.5		45	230
		50	15.69 {1.60}	20.0	25.0		50	240
		55	14.26 {1.45}	22.0	27.5		55	250
		60	13.08 {1.33}	24.0	30.0		60	260
		65	12.07 {1.23}	26.0	32.5		65	270
		70	11.21 {1.14}	28.0	35.0		70	275
		75	10.46 {1.07}	30.0	37.5		75	285
		80	9.81 {1.00}	32.0	40.0		80	290
		90	8.72 {0.89}	36.0	45.0		90	300
		100	7.85 {0.80}	40.0	50.0		100	310
		110	7.13 {0.73}	44.0	55.0		110	320
		120	6.54 {0.67}	48.0	60.0		120	330
		125	6.28 {0.64}	50.0	62.5		125	330
		130	6.03 {0.62}	52.0	65.0		130	340
		140	5.60 {0.57}	56.0	70.0		140	350
		150	5.23 {0.53}	60.0	75.0		150	350
		175	4.48 {0.46}	70.0	87.5		175	400
		200	3.92 {0.40}	80.0	100.0		200	455
		225	3.49 {0.36}	90.0	112.5		225	475
		250	3.14 {0.32}	100.0	125.0		250	500
31	21	35	28.02 {2.86}	14.0	17.5	490.3 {50.0}	SWR 31— 35	220
		40	24.52 {2.50}	16.0	20.0		40	230
		45	21.79 {2.22}	18.0	22.5		45	240
		50	19.61 {2.00}	20.0	25.0		50	250
		55	17.83 {1.82}	22.0	27.5		55	260
		60	16.34 {1.67}	24.0	30.0		60	270
		65	15.09 {1.54}	26.0	32.5		65	280
		70	14.01 {1.43}	28.0	35.0		70	285
		75	13.08 {1.33}	30.0	37.5		75	290
		80	12.26 {1.25}	32.0	40.0		80	300
		90	10.90 {1.11}	36.0	45.0		90	320
		100	9.81 {1.00}	40.0	50.0		100	340
		110	8.92 {0.91}	44.0	55.0		110	350
		120	8.17 {0.83}	48.0	60.0		120	365
		125	7.85 {0.80}	50.0	62.5		125	375
		130	7.54 {0.77}	52.0	65.0		130	380
		140	7.00 {0.71}	56.0	70.0		140	400
		150	6.54 {0.67}	60.0	75.0		150	410
		160	6.13 {0.63}	67.0	80.0		160	430
		170	5.77 {0.59}	68.0	85.0		170	440
		175	5.60 {0.57}	70.0	87.5		175	450
		180	5.45 {0.56}	72.0	90.0		180	455
		190	5.16 {0.53}	76.0	95.0		190	475
		200	4.90 {0.50}	80.0	100.0		200	480
		250	3.92 {0.40}	100.0	125.0		250	555
		300	3.27 {0.33}	120.0	150.0		300	630
37	26	35	33.62 {3.43}	14.0	17.5	588.4 {60.0}	SWR 37— 35	280
		40	29.42 {3.00}	16.0	20.0		40	290
		45	26.15 {2.67}	18.0	22.5		45	300
		50	23.54 {2.40}	20.0	25.0		50	310
		55	21.40 {2.18}	22.0	27.5		55	320
		60	19.61 {2.00}	24.0	30.0		60	330
		65	18.10 {1.85}	26.0	32.5		65	340
		70	16.81 {1.71}	28.0	35.0		70	350
		75	15.69 {1.60}	30.0	37.5		75	360
		80	14.71 {1.50}	32.0	40.0		80	365
		90	13.08 {1.33}	36.0	45.0		90	380
		100	11.77 {1.20}	40.0	50.0		100	400
		110	10.70 {1.09}	44.0	55.0		110	410
		120	9.81 {1.00}	48.0	60.0		120	420
		125	9.41 {0.96}	50.0	62.5		125	430
		130	9.05 {0.92}	52.0	65.0		130	440
		140	8.41 {0.86}	56.0	70.0		140	450
		150	7.85 {0.80}	60.0	75.0		150	455
		160	7.35 {0.75}	64.0	80.0		160	465
		170	6.92 {0.71}	68.0	85.0		170	475
		175	6.72 {0.69}	70.0	87.5		175	480
		180	6.54 {0.67}	72.0	90.0		180	490
		190	6.19 {0.63}	76.0	95.0		190	500
		200	5.88 {0.60}	80.0	100.0		200	510
		250	4.71 {0.48}	100.0	125.0		250	600
		300	3.92 {0.40}	120.0	150.0		300	690
43	31	50	33.34 {3.40}	20.0	25.0	833.6 {85.0}	SWR 43— 50	375
		60	27.79 {2.83}	24.0	30.0		60	380
		70	23.82 {2.43}	28.0	35.0		70	390
		80	20.84 {2.13}	32.0	40.0		80	400
		90	18.52 {1.89}	36.0	45.0		90	410
		100	16.67 {1.70}	40.0	50.0		100	420
		110	15.16 {1.55}	44.0	55.0		110	430
		120	13.89 {1.42}	48.0	60.0		120	445
		130	12.82 {1.31}	52.0	65.0		130	460
		140	11.91 {1.21}	56.0	70.0		140	470
		150	11.11 {1.13}	60.0	75.0		150	480
		160	10.42 {1.06}	64.0	80.0		160	490
		170	9.81 {1.00}	68.0	85.0		170	500
		180	9.26 {0.94}	72.0	90.0		180	520
		190	8.77 {0.89}	76.0	95.0		190	540
		200	8.34 {0.85}	80.0	100.0		200	560
		225	7.41 {0.76}	90.0	112.5		225	605
		250	6.67 {0.68}	100.0	125.0		250	655
		275	6.06 {0.62}	110.0	137.5		275	700
		300	5.56 {0.57}	120.0	150.0		300	740
46	33	50	43.15 {4.40}	20.0	25.0	1079 {110}	SWR 46— 50	380
		60	35.96 {3.67}	24.0	30.0		60	390
		70	30.82 {3.14}	28.0	35.0		70	400
		80	26.97 {2.75}	32.0	40.0		80	410
		90	23.97 {2.44}	36.0	45.0		90	420
		100	21.57 {2.20}	40.0	50.0		100	430
		110	19.61 {2.00}	44.0	55.0		110	440
		120	17.98 {1.83}	48.0	60.0		120	450
		125	17.26 {1.76}	50.0	62.5		125	455
		130	16.60 {1.69}	52.0	65.0		130	465
		140	15.41 {1.57}	56.0	70.0		140	475
		150	14.38 {1.47}	60.0	75.0		150	480
		175	12.33 {1.26}	70.0	87.5		175	510
		200	10.79 {1.10}	80.0	100.0		200	540
		225	9.59 {0.98}	90.0	112.5		225	565
		250	8.63 {0.88}	100.0	125.0		250	590
		275	7.85 {0.80}	110.0	137.5		275	620
		300	7.19 {0.73}	120.0	150.0		300	645
50	36	50	52.96 {5.40}	20.0	25.0	1324 {135}	SWR 50— 50	455
		60	44.13 {4.50}	24.0	30.0		60	475
		70	37.83 {3.86}	28.0	35.0		70	485
		80	33.10 {3.38}	32.0	40.0		80	500
		90	29.42 {3.00}	36.0	45.0		90	515
		100	26.48 {2.70}	40.0	50.0		100	530
		110	24.07 {2.45}	44.0	55.0		110	550
		120	22.06 {2.25}	48.0	60.0		120	570
		130	20.37 {2.08}	52.0	65.0		130	605
		140	18.91 {1.93}	56.0	70.0		140	665
		150	17.65 {1.80}	60.0	75.0		150	695
		175	15.13 {1.54}	70.0	87.5		175	785
		200	13.24 {1.35}	80.0	100.0		200	880
		225	11.77 {1.20}	90.0	112.5		225	970
		250	10.59 {1.08}	100.0	125.0		250	1,060
		275	9.63 {0.98}	110.0	137.5		275	1,145
		300	8.83 {0.90}	120.0	150.0		300	1,235
		350	7.57 {0.77}	140.0	175.0		350	1,425
		400	6.62 {0.68}	160.0	200.0		400	1,615

M SWOSC—V

●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

- The solid height values are reference only. There may be some variations depending on lots.
- Operation frequency : 1 million times. (L×55% is 300,000 times.)
- Product Outline P.1056
- Directions and precautions for coil springs P.1057
- Load-deflection diagram P.1094

Order Catalog No. SWR 37—40

Delivery 1 Day

Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

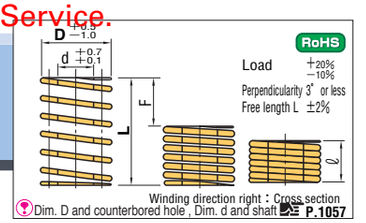
Alterations (NT) — Catalog No. NT — SWR 31—60 5 Days

Alteration	Code	Spec.	Price
No painting	NT	**Paint peeling** Peel the coating by shot peening. Since the springs which have undergone the painting peeling are easy to rust, be careful in handling. A rusty spring could cause early breakage. Compared to painted springs, there may be some variations, etc. depending on the lot.	Details P.1093

COIL SPRINGS
—MIDDLE DEFLECTION SWS—

Light — Load — Heavy

SWS



D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×40% Fmm	F=L×40% Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty : 1~19
10.5	5.5	20	10.90 {1.11}	10.0	8.0	87.2 {8.9}	SWS10.5— 20	110
		25	8.72 {0.89}	12.5	10.0		25	120
		30	7.27 {0.74}	15.0	12.0		30	130
		35	6.23 {0.64}	17.5	14.0		35	140
		40	5.45 {0.56}	20.0	16.0		40	150
		45	4.84 {0.49}	22.5	18.0		45	160
		50	4.36 {0.44}	25.0	20.0		50	160
		55	3.96 {0.40}	27.5	22.0		55	165
		60	3.63 {0.37}	30.0	24.0		60	175
		65	3.35 {0.34}	32.5	26.0		65	185
		70	3.11 {0.32}	35.0	28.0		70	190
		75	2.91 {0.30}	37.5	30.0		75	195
		80	2.73 {0.28}	40.0	32.0		80	205
12.5	6.5	20	15.25 {1.56}	10.0	8.0	122.0 {12.4}	SWS12.5— 20	130
		25	12.20 {1.24}	12.5	10.0		25	140
		30	10.17 {1.04}	15.0	12.0		30	150
		35	8.71 {0.89}	17.5	14.0		35	160
		40	7.63 {0.78}	20.0	16.0		40	170
		45	6.78 {0.69}	22.5	18.0		45	180
		50	6.10 {0.62}	25.0	20.0		50	190
		55	5.55 {0.57}	27.5	22.0		55	195
		60	5.08 {0.52}	30.0	24.0		60	205
		65	4.69 {0.48}	32.5	26.0		65	215
		70	4.36 {0.44}	35.0	28.0		70	225
		75	4.07 {0.41}	37.5	30.0		75	235
		80	3.81 {0.39}	40.0	32.0		80	245
14.5	8.5	20	24.50 {2.50}	10.0	8.0	196.0 {20.0}	SWS14.5— 20	140
		25	19.61 {2.00}	12.5	10.0		25	150
		30	16.33 {1.67}	15.0	12.0		30	160
		35	14.00 {1.43}	17.5	14.0		35	170
		40	12.25 {1.25}	20.0	16.0		40	180
		45	10.89 {1.11}	22.5	18.0		45	185
		50	9.80 {1.00}	25.0	20.0		50	190
		55	8.91 {0.91}	27.5	22.0		55	200
		60	8.17 {0.83}	30.0	24.0		60	210
		65	7.54 {0.77}	32.5	26.0		65	230
		70	7.00 {0.71}	35.0	28.0		70	240
		75	6.53 {0.67}	37.5	30.0		75	250
		80	6.13 {0.62}	40.0	32.0		80	260
		90	5.44 {0.56}	45.0	36.0		90	275
		100	4.90 {0.50}	50.0	40.0		100	290
		125	3.92 {0.40}	62.5	50.0		125	320
		150	3.27 {0.33}	75.0	60.0		150	350

M SWOSC—V

●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

- The solid height values are reference only. There may be some variations depending on lots.
- Operation frequency : 1 million times. (L×45% is 300,000 times.)
- Product Outline P.1056
- Directions and precautions for coil springs P.1057
- Load-deflection diagram P.1094

Order Catalog No. SWS 21—100

Delivery 1 Day

Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×40% Fmm	F=L×40% Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty : 1~19
17	10.5	25	29.42 {3.00}	12.5	10.0	294.2 {30.0}	SWS 17— 25	160
		30	24.52 {2.50}	15.0	12.0		30	170
		35	21.01 {2.14}	17.5	14.0		35	180
		40	18.39 {1.88}	20.0	16.0		40	185
		45	16.34 {1.67}	22.5	18.0		45	190
		50	14.71 {1.50}	25.0	20.0		50	200
		55	13.37 {1.36}	27.5	22.0		55	210
		60	12.26 {1.25}	30.0	24.0		60	220
		65	11.32 {1.15}	32.5	26.0		65	230
		70	10.51 {1.07}	35.0	28.0		70	240
		75	9.81 {1.00}	37.5	30.0		75	250
		80	9.19 {0.94}	40.0	32.0		80	260
		90	8.17 {0.83}	45.0	36.0		90	275
		100	7.35 {0.75}	50.0	40.0		100	290
		125	5.88 {0.60}	62.5	50.0		125	320
		150	4.90 {0.50}	75.0	60.0		150	350
21	13.5	30	35.17 {3.59}	15.0	12.0	422.0 {43.0}	SWS 21— 30	185
		35	30.14 {3.07}	17.5	14.0		35	190
		40	26.38 {2.69}	20.0	16.0		40	200
		45	23.44 {2.39}	22.5	18.0		45	210
		50	21.10 {2.15}	25.0	20.0		50	220
		55	19.18 {1.96}	27.5	22.0		55	230
		60	17.58 {1.79}	30.0	24.0		60	240
		65	16.23 {1.66}	32.5	26.0		65	250
		70	15.07 {1.54}	35.0	28.0		70	260
		75	14.07 {1.43}	37.5	30.0		75	270
		80	13.19 {1.34}	40.0	32.0		80	275
		90	11.72 {1.20}	45.0	36.0		90	290
		100	10.55 {1.08}	50.0	40.0		100	310
		110	9.59 {0.98}	55.0	44.0		110	320
		120	8.79 {0.90}	60.0	48.0		120	330
		125	8.44 {0.86}	62.5	50.0		125	340
		130	8.12 {0.83}	65.0	52.0		130	350
		140	7.54 {0.77}	70.0	56.0		140	360
		150	7.03 {0.72}	75.0	60.0		150	365
		175	6.03 {0.61}	87.5	70.0		175	400
		200	5.28 {0.54}	100.0	80.0		200	445
26	16.5	30	47.42 {4.84}	15.0	12.0	569.0 {58.0}	SWS 26— 30	220
		35	40.64 {4.14}	17.5	14.0		35	230
		40	35.56 {3.63}	20.0	16.0		40	240
		45	31.61 {3.22}	22.5	18.0		45	250
		50	28.45 {2.90}	25.0	20.0		50	260
		55	25.86 {2.64}	27.5	22.0		55	270
		60	23.71 {2.42}	30.0	24.0		60	275
		65	21.88 {2.23}	32.5	26.0		65	285
		70	20.32 {2.07}	35.0	28.0		70	290
		75	18.97 {1.93}	37.5	30.0		75	300
		80	17.78 {1.81}	40.0	32.0		80	310
		90	15.81 {1.61}	45.0	36.0		90	330
		100	14.23 {1.45}	50.0	40.0		100	350
		110	12.93 {1.32}	55.0	44.0		110	360
		120	11.85 {1.21}	60.0	48.0		120	365
		125	11.38 {1.16}	62.5	50.0		125	375
		130	10.94 {1.12}	65.0	52.0		130	380
		140	10.16 {1.04}	70.0	56.0		140	390
		150	9.48 {0.97}	75.0	60.0		150	400
		175	8.13 {0.83}	87.5	70.0		175	455
		200	7.11 {0.73}	100.0	80.0		200	510
		225	6.32 {0.64}	112.5	90.0		225	550
		250	5.69 {0.58}	125.0	100.0		250	605

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×40% Fmm	F=L×40% Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty : 1~19
31	21	40	49.00 {5.00}	20.0	16.0	784.0 {79.9}	SWS 31— 40	260
		45	43.56 {4.44}	22.5	18.0		45	270
		50	39.20 {4.00}	25.0	20.0		50	275
		55	35.64 {3.63}	27.5	22.0		55	285
		60	32.67 {3.33}	30.0	24.0		60	290
		65	30.15 {3.07}	32.5	26.0		65	300
		70	28.00 {2.86}	35.0	28.0		70	310
		75	26.13 {2.66}	37.5	30.0		75	320
		80	24.50 {2.50}	40.0	32.0		80	330
		90	21.78 {2.22}	45.0	36.0		90	350
		100	19.60 {2.00}	50.0	40.0		100	365
		110	17.82 {1.82}	55.0	44.0		110	380
		120	16.33 {1.67}	60.0	48.0		120	390
		125	15.68 {1.60}	62.5	50.0		125	400
		130	15.08 {1.54}	65.0	52.0		130	420
		140	14.00 {1.43}	70.0	56.0		140	430
		150	13.07 {1.33}	75.0	60.0		150	440
		160	12.25 {1.25}	80.0	64.0		160	455
		170	11.53 {1.18}	85.0	68.0		170	465
		175	11.20 {1.14}	87.5	70.0		175	475
		180	10.89 {1.11}	90.0	72.0		180	490
		190	10.32 {1.05}	95.0	76.0		190	500
		200	9.80 {1.00}	100.0	80.0		200	510
		250	7.84 {0.80}	125.0	100.0		250	580
		300	6.53 {0.67}	150.0	120.0		300	655
37	26	40	52.13 {5.32}	20.0	16.0	834.0 {85.0}	SWS 37— 40	350
		45	46.33 {4.72}	22.5	18.0		45	360
		50	41.70 {4.25}	25.0	20.0		50	375
		55	37.91 {3.87}	27.5	22.0		55	380
		60	34.75 {3.54}	30.0	24.0		60	390
		65	32.08 {3.27}	32.5	26.0		65	405
		70	29.79 {3.04}	35.0	28.0		70	415
		75	27.80 {2.83}	37.5	30.0		75	430
		80	26.06 {2.66}	40.0	32.0		80	440
		90	23.17 {2.36}	45.0	36.0		90	465
		100	20.85 {2.13}	50.0	40.0		100	480
		110	18.95 {1.93}	55.0	44.0		110	500
		120	17.38 {1.77}	60.0	48.0		120	510
		125	16.68 {1.70}	62.5	50.0		125	530
		130	16.04 {1.64}	65.0	52.0		130	545
		140	14.89 {1.52}	70.0	56.0		140	555
		150	13.90 {1.42}	75.0	60.0		150	570
		160	13.03 {1.33}	80.0	64.0		160	590
		170	12.26 {1.25}	85.0	68.0		170	600
		175	11.91 {1.21}	87.5	70.0		175	620
		180	11.58 {1.18}	90.0	72.0		180	635
		190	10.97 {1.12}	95.0	76.0		190	645
		200	10.43 {1.06}	100.0	80.0		200	665
		250	8.34 {0.85}	125.0	100.0		250	755
		300	6.95 {0.71}	150.0	120.0		300	845

Alterations (NT) — Catalog No. NT — SWS 31—70 5 Days

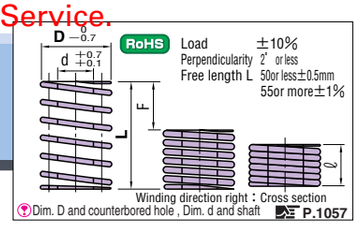
Alteration	Code	Spec.	Price
No painting	NT	**Paint peeling** Peel the coating by shot peening. Since the springs which have undergone the painting peeling are easy to rust, be careful in handling. A rusty spring could cause early breakage. Compared to painted springs, there may be some variations, etc. depending on the lot.	Details P.1093

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×40% Fmm	F=L×40% Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty : 1~19
44.5	31	50	50.15 {5.11}	25.0	20.0	1003 {102}	SWS 44.5-50	405
		60	41.79 {4.26}	30.0	24.0		60	425
		70	35.82 {3.65}	35.0	28.0		70	450
		80	31.34 {3.20}	40.0	32.0		80	470
		90	27.86 {2.84}	45.0	36.0		90	490
		100	25.08 {2.56}	50.0	40.0		100	510
		110	22.80 {2.32}	55.0	44.0		110	535
		120	20.90 {2.13}	60.0	48.0		120	555
		130	19.29 {1.97}	65.0	52.0		130	575
		140	17.91 {1.83}	70.0	56.0		140	595
		150	16.72 {1.70}	75.0	60.0		150	620
		160	15.67 {1.60}	80.0	64.0		160	640
		170	14.75 {1.50}	85.0	68.0		170	665
		180	13.93 {1.42}	90.0	72.0		180	685
		190	13.20 {1.35}	95.0	76.0		190	705
		200	12.54 {1.28}	100.0	80.0		200	730
		225	11.14 {1.14}	112.5	90.0		225	835
		250	10.03 {1.02}	125.0	100.0		250	940
		275	9.12 {0.93}	137.5	110.0		275	1,045
		300	8.36 {0.85}	150.0	120.0		300	1,145
46	33	50	63.74 {6.50}	25.0	20.0	1275 {130}	SWS 46— 50	455
		60	53.12 {5.42}	30.0	24.0		60	465
		70	45.53 {4.64}	35.0	28.0		70	475
		80	39.84 {4.06}	40.0	32.0		80	480
		90	35.41 {3.61}	45.0	36.0		90	500
		100	31.87 {3.25}	50.0	40.0		100	520
		110	28.97 {2.95}	55.0	44.0		110	545
		120	26.56 {2.71}	60.0	48.0		120	570
		125	25.50 {2.60}	62.5	50.0		125	610
		130	24.52 {2.50}	65.0	52.0		130	630
		140	22.77 {2.32}	70.0	56.0		140	670
		150	21.25 {2.17}	75.0	60.0		150	700
		175	18.21 {1.86}	87.5	70.0		175	790
		200	15.94 {1.63}	100.0	80.0		200	880
		225	14.17 {1.44}	112.5	90.0		225	970
		250	12.75 {1.30}	125.0	100.0		250	1,060
		275	11.59 {1.18}	137.5	110.0		275	1,135
		300	10.62 {1.08}	150.0	120.0		300	1,240
52	37	60	65.42 {6.67}	30.0	24.0	1570 {160}	SWS 52— 60	510
		70	56.07 {5.72}	35.0	28.0		70	530
		80	49.06 {5.00}	40.0	32.0		80	550
		90	43.61 {4.45}	45.0	36.0		90	570
		100	39.25 {4.00}	50.0	40.0		100	585
		110	35.68 {3.64}	55.0	44.0		110	605
		120	32.71 {3.34}	60.0	48.0		120	635
		130	30.19 {3.08}	65.0	52.0		130	670
		140	28.04 {2.86}	70.0	56.0		140	740
		150	26.17 {2.67}	75.0	60.0		150	770
		175	22.43 {2.29}	87.5	70.0		175	875
		200	19.63 {2.00}	100.0	80.0		200	975
		225	17.44 {1.78}	112.5	90.0		225	1,080
		250	15.70 {1.60}	125.0	100.0		250	1,175
		275	14.27 {1.46}	137.5	110.0		275	1,260
		300	13.08 {1.33}	150.0	120.0		300	1,365

Express service system P.38 MISUMI Press 2007 http://misumi.jp/press/ For inquiry, ordering and other information, refer to P.1269

COIL SPRINGS
—EXTRA MINIMAL LOAD SWC—

Light ← Load → Heavy
SWC



Dim. D and counterbored hole , Dim. d and shaft P.1057

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=Lx50% Fmm	F=Lx50% Load N{kgf}	F=Lx55% Fmm	F=Lx55% Load N{kgf}	F=Lx60% Fmm	F=Lx60% Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty : 1~19
6	3	15	3.60 {0.37}	6.5	7.5	27 {2.8}	8.3	30 {3.0}	Outside allowable range		SWC 6—15	150
		20	2.70 {0.28}	8.0	10.0		11.0		15.0	32 {3.3}	20	135
		25	2.16 {0.22}	9.0	12.5		13.8		18.0		25	135
		30	1.80 {0.18}	11.0	15.0		16.5		21.0		30	135
		35	1.54 {0.16}	13.0	17.5		19.3				35	135
		40	1.35 {0.14}	15.0	20.0		22.0				40	135
8	4.6	15	3.81 {0.39}	5.0	7.5	29 {2.9}	8.3	31 {3.2}	Outside allowable range		SWC 8—15	150
		20	2.86 {0.29}	6.6	10.0		11.0		12.0	34 {3.5}	20	135
		25	2.29 {0.23}	8.0	12.5		13.8		15.0		25	135
		30	1.91 {0.19}	9.3	15.0		16.5		18.0		30	135
		35	1.63 {0.17}	10.5	17.5		19.3		21.0		35	135
		40	1.43 {0.15}	11.8	20.0		22.0		24.0		40	135
		45	1.27 {0.13}	13.1	22.5		24.8		27.0		45	150
		50	1.14 {0.12}	14.4	25.0		27.5		30.0		50	150
		55	1.04 {0.11}	15.7	27.5		30.3		33.0		55	160
		60	0.95 {0.10}	16.7	30.0		33.0		36.0		60	160
		65	0.88 {0.09}	18.3	32.5		35.8		39.0		65	220
		70	0.82 {0.08}	19.5	35.0		38.5		42.0		70	220
		75	0.76 {0.08}	21.0	37.5		41.3		45.0		75	230
		80	0.72 {0.07}	22.2	40.0		44.0		48.0		80	230
10	5.8	15	6.10 {0.62}	6.0	7.5	46 {4.7}	8.3	50 {5.1}	Outside allowable range		SWC 10— 15	130
		20	4.58 {0.47}	7.5	10.0		11.0		12.0	55 {5.6}	20	130
		25	3.66 {0.37}	9.0	12.5		13.8		15.0		25	130
		30	3.05 {0.31}	10.5	15.0		16.5		18.0		30	130
		35	2.62 {0.27}	12.0	17.5		19.3		21.0		35	130
		40	2.29 {0.23}	13.4	20.0		22.0		24.0		40	130
		45	2.03 {0.21}	14.8	22.5		24.8		27.0		45	160
		50	1.83 {0.19}	16.2	25.0		27.5		30.0		50	160
		55	1.66 {0.17}	17.7	27.5		30.3		33.0		55	160
		60	1.53 {0.16}	19.1	30.0		33.0		36.0		60	160
		65	1.41 {0.14}	20.6	32.5		35.8		39.0		65	220
		70	1.31 {0.13}	22.0	35.0		38.5		42.0		70	220
		75	1.22 {0.12}	23.4	37.5		41.3		45.0		75	220
		80	1.14 {0.12}	24.9	40.0		44.0		48.0		80	220
		90	1.02 {0.10}	27.8	45.0		49.5		54.0		90	220
12	7.4	20	5.48 {0.56}	7.0	10.0	55 {5.6}	11.0	60 {6.1}	Outside allowable range		SWC 12— 20	130
		25	4.38 {0.45}	8.0	12.5		13.8		15.0	66 {6.7}	25	130
		30	3.65 {0.37}	10.0	15.0		16.5		18.0		30	130
		35	3.13 {0.32}	12.0	17.5		19.3		21.0		35	130
		40	2.74 {0.28}	14.0	20.0		22.0		24.0		40	150
		45	2.43 {0.25}	15.0	22.5		24.8		27.0		45	160
		50	2.19 {0.22}	16.0	25.0		27.5		30.0		50	160
		55	1.99 {0.20}	17.0	27.5		30.3		33.0		55	160
		60	1.83 {0.19}	18.0	30.0		33.0		36.0		60	160
		65	1.68 {0.17}	20.0	32.5		35.8		39.0		65	220
		70	1.56 {0.16}	21.0	35.0		38.5		42.0		70	220
		75	1.46 {0.15}	22.0	37.5		41.3		45.0		75	220
		80	1.37 {0.14}	24.0	40.0		44.0		48.0		80	220
		90	1.22 {0.12}	27.0	45.0		49.5		54.0		90	250
14	8.5	25	8.17 {0.83}	10.5	12.5	102 {10.4}	13.8	112 {11.4}	Outside allowable range		SWC 14— 25	150
		30	6.81 {0.69}	11.0	15.0		16.5		18.0	123 {12.5}	30	150
		35	5.84 {0.60}	13.0	17.5		19.3		21.0		35	180
		40	5.11 {0.52}	15.0	20.0		22.0		24.0		40	180
		45	4.54 {0.46}	16.7	22.5		24.8		27.0		45	180
		50	4.09 {0.42}	18.0	25.0		27.5		30.0		50	220
		55	3.71 {0.38}	20.0	27.5		30.3		33.0		55	220
		60	3.41 {0.35}	21.5	30.0		33.0		36.0		60	220
		65	3.14 {0.32}	23.0	32.5		35.8		39.0		65	220
		70	2.92 {0.30}	24.6	35.0		38.5		42.0		70	250
		75	2.72 {0.28}	26.2	37.5		41.3		45.0		75	250
		80	2.55 {0.26}	28.0	40.0		44.0		48.0		80	250
		90	2.27 {0.23}	31.0	45.5		49.5		54.0		90	250
		100	2.04 {0.21}	34.0	50.0		55.0		60.0		100	300
Operation frequency					1X10⁷ times		5X10⁶ times		3X10⁶ times			

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=Lx50% Fmm	F=Lx50% Load N{kgf}	F=Lx55% Fmm	F=Lx55% Load N{kgf}	F=Lx60% Fmm	F=Lx60% Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty : 1~19
16	9.5	25	9.15 {0.93}	10.0	12.5	114 {11.7}	13.8	126 {12.8}	Outside allowable range		SWC 16— 25	180
		30	7.63 {0.78}	11.0	15.0		16.5		18.0	137 {14.0}	30	180
		35	6.54 {0.67}	12.5	17.5		19.3		21.0		35	180
		40	5.72 {0.58}	13.9	20.0		22.0		24.0		40	180
		45	5.08 {0.52}	15.3	22.5		24.8		27.0		45	220
		50	4.58 {0.47}	16.7	25.0		27.5		30.0		50	220
		55	4.16 {0.42}	18.0	27.5		30.3		33.0		55	220
		60	3.81 {0.39}	19.4	30.0		33.0		36.0		60	220
		65	3.52 {0.36}	20.8	32.5		35.8		39.0		65	220
		70	3.27 {0.33}	22.2	35		38.5		42.0		70	250
		75	3.05 {0.31}	23.6	37.5		41.3		45.0		75	250
		80	2.86 {0.29}	25.0	40.0		44.0		48.0		80	250
		90	2.54 {0.26}	27.8	45.0		49.5		54.0		90	300
		100	2.29 {0.23}	30.5	50.0		55.0		60.0		100	300
		125	1.83 {0.19}	37.5	62.5		68.8		75.0		125	350
18	11	25	10.46 {1.07}	9.0	12.5	131 {13.3}	13.8	144 {14.7}	Outside allowable range		SWC 18— 25	180
		30	8.72 {0.89}	10.3	15.0		16.5		18.0	157 {16.0}	30	180
		35	7.47 {0.76}	11.5	17.5		19.3		21.0		35	180
		40	6.54 {0.67}	12.7	20.0		22.0		24.0		40	180
		45	5.81 {0.59}	14.0	22.5		24.8		27.0		45	220
		50	5.23 {0.53}	15.5	25.0		27.5		30.0		50	220
		55	4.75 {0.48}	16.5	27.5		30.3		33.0		55	220
		60	4.36 {0.44}	18.0	30.0		33.0		36.0		60	220
		65	4.02 {0.41}	19.0	32.5		35.8		39.0		65	220
		70	3.74 {0.38}	20.5	35.0		38.5		42.0		70	250
		75	3.49 {0.36}	22.0	37.5		41.3		45.0		75	250
		80	3.27 {0.33}	23.0	40.0		44.0		48.0		80	250
		90	2.91 {0.30}	25.5	45.0		49.5		54.0		90	300
		100	2.62 {0.27}	29.0	50.0		55.0		60.0		100	300
		125	2.09 {0.21}	35.0	62.5		68.8		75.0		125	350
20	12.5	25	14.38 {1.47}	9.0	12.5	180 {18.3}	13.8	198 {20.2}	Outside allowable range		SWC 20— 25	180
		30	11.99 {1.22}	11.0	15.0		16.5		18.0	216 {22.0}	30	180
		35	10.27 {1.05}	12.5	17.5		19.3		21.0		35	180
		40	8.99 {0.92}	14.0	20.0		22.0		24.0		40	180
		45	7.99 {0.81}	15.0	22.5		24.8		27.0		45	220
		50	7.19 {0.73}	16.5	25.0		27.5		30.0		50	220
		55	6.54 {0.67}	18.0	27.5		30.3		33.0		55	220
		60	5.99 {0.61}	19.2	30.0		33.0		36.0		60	220
		65	5.53 {0.56}	20.5	32.5		35.8		39.0		65	220
		70	5.14 {0.52}	21.7	35.0		38.5		42.0		70	250
		75	4.79 {0.49}	23.0	37.5		41.3		45.0		75	250
		80	4.49 {0.46}	24.2	40.0		44.0		48.0		80	250
		90	4.00 {0.41}	27.0	45.5		49.5		54.0		90	300
		100	3.60 {0.37}	30.0	50.0		55.0		60.0		100	300
		125	2.88 {0.29}	37.0	62.5		68.8		75.0		125	350
		150	2.40 {0.24}	44.0	75.0		82.5		90.0		150	400
22	13.5	25	19.61 {2.00}	10.0	12.5	245 {25.0}	13.8	270 {27.5}	Outside allowable range		SWC 22— 25	180
		30	16.34 {1.67}	11.0	15.0		16.5		18.0	294 {30.0}	30	200
		35	14.01 {1.43}	12.0	17.5		19.3		21.0		35	200
		40	12.26 {1.25}	14.0	20.0		22.0		24.0		40	200
		45	10.90 {1.11}	16.0	22.5		24.8		27.0		45	220
		50	9.81 {1.00}	18.0	25.0		27.5		30.0		50	220
		55	8.92 {0.91}	20.0	27.5		30.3		33.0		55	240
		60	8.17 {0.83}	22.0	30.0		33.0		36.0		60	240
		65	7.54 {0.77}	24.0	32.5		35.8		39.0		65	240
		70	7.00 {0.71}	26.0	35.0		38.5		42.0		70	260
		75	6.54 {0.67}	27.0	37.5		41.3		45.0		75	260
		80	6.13 {0.63}	29.0	40.0		44.0		48.0		80	260
		90	5.45 {0.56}	32.0	45.0		49.5		54.0		90	320
		100	4.90 {0.50}	35.0	50.0		55.0		60.0		100	320
		125	3.92 {0.40}	42.0	62.5		68.8		75.0		125	320
		150	3.27 {0.33}	50.0	75.0		82.5		90.0		150	400
Operation frequency					1X10⁷ times		5X10⁶ times		3X10⁶ times			

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=Lx50% Fmm	F=Lx50% Load N{kgf}	F=Lx55% Fmm	F=Lx55% Load N{kgf}	F=Lx60% Fmm	F=Lx60% Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty : 1~19
25	16	25	24.19 {2.47}	9.0	12.5	302 {30.8}	13.8	333 {33.9}	Outside allowable range		SWC 25— 25	200
		30	20.16 {2.06}	10.5	15.0		16.5		18.0	363 {37.0}	30	200
		35	17.28 {1.76}	12.7	17.5		19.3		21.0		35	220
		40	15.12 {1.54}	14.6	20.0		22.0		24.0		40	220
		45	13.44 {1.37}	16.6	22.5		24.8		27.0		45	220
		50	12.09 {1.23}	18.0	25.0		27.5		30.0		50	220
		55	11.00 {1.12}	20.0	27.5		30.3		33.0		55	240
		60	10.08 {1.03}	21.3	30.0		33.0		36.0		60	240
		65	9.30 {0.95}	22.5	32.5		35.8		39.0		65	240
		70	8.64 {0.88}	24.0	35.0		38.5		42.0		70	260
		75	8.06 {0.82}	25.3	37.5		41.3		45.0		75	260
		80	7.56 {0.77}	26.7	40.0		44.0		48.0		80	320
		90	6.72 {0.69}	29.5	45.0		49.5		54.0		90	320
		100	6.05 {0.62}	32.2	50.0		55.0		60.0		100	320
		125	4.84 {0.49}	39.0	62.5		68.8		75.0		125	320
		150	4.03 {0.41}	45.8	75.0		82.5		90.0		150	450
		175	3.46 {0.35}	52.6	87.5		96.3		105.0		175	550
		200	3.02 {0.31}	59.5	100.0		110.0		120.0		200	600
27	17.5	25	28.11 {2.87}	9.0	12.5	351 {35.8}	13.8	387 {39.4}	Outside allowable range		SWC 27— 25	220
		30	23.43 {2.39}	11.0	15.0		16.5		18.0	422 {43.0}	30	220
		35	20.08 {2.05}	13.0	17.5		19.3		21.0		35	220
		40	17.57 {1.79}	14.5	20.0		22.0		24.0		40	220
		45	15.62 {1.59}	17.0	22.5		24.8		27.0		45	240
		50	14.06 {1.43}	18.5	25.0		27.5		30.0		50	240
		55	12.78 {1.30}	20.0	27.5		30.3		33.0		55	240
		60	11.71 {1.19}	22.0	30.0		33.0		36.0		60	280
		65	10.81 {1.10}	23.5	32.5		35.8		39.0		65	280
		70	10.04 {1.02}	25.0	35.0		38.5		42.0		70	280
		75	9.37 {0.96}	26.5	37.5		41.3		45.0		75	280
		80	8.79 {0.90}	28.0	40.0		44.0		48.0		80	320
		90	7.81 {0.80}	30.5	45.0		49.5		54.0		90	350
		100	7.03 {0.72}	33.5	50.0		55.0		60.0		100	350
		125	5.62 {0.57}	40.5	62.5		68.8		75.0		125	450
		150	4.69 {0.48}	48.0	75.0		82.5		90.0		150	450
		175	4.02 {0.41}	55.0	87.5		96.3		105.0		175	550
		200	3.51 {0.36}	62.0	100.0		110.0		120.0		200	600
30	20	25	31.38 {3.20}	9.5	12.5	392 {40.0}	13.8	431 {44.0}	Outside allowable range		SWC 30— 25	220
		30	26.15 {2.67}	11.0	15.0		16.5		18.0	471 {48.0}	30	220
		35	22.42 {2.29}	13.0	17.5		19.3		21.0		35	220
		40	19.61 {2.00}	14.5	20.0		22.0		24.0		40	220
		45	17.43 {1.78}	16.5	22.5		24.8		27.0		45	240
		50	15.69 {1.60}	18.0	25.0		27.5		30.0		50	240
		55	14.26 {1.45}	19.5	27.5		30.3		33.0		55	240
		60	13.08 {1.33}	20.8	30.0		33.0		36.0		60	280
		65	12.07 {1.23}	22.0	32.5		35.8		39.0		65	280
		70	11.21 {1.14}	23.3	35.0		38.5		42.0		70	280
		75	10.46 {1.07}	24.5	37.5		41.3		45.0		75	280
		80	9.81 {1.00}	25.8	40.0		44.0		48.0		80	320
		90	8.72 {0.89}	28.3	45.0		49.5		54.0		90	350
		100	7.85 {0.80}	30.8	50.0		55.0		60.0		100	350
		125	6.28 {0.64}	37.0	62.5		68.8		75.0		125	450
		150	5.23 {0.53}	43.5	75.0		82.5		90.0		150	450
		175	4.48 {0.46}	50.0	87.5		96.3		105.0		175	550
		200	3.92 {0.40}	57.0	100.0		110.0		120.0		200	650
Operation frequency					1X10⁷ times		5X10⁶ times		3X10⁶ times			

Order — Catalog No. SWC 10—30

Delivery — 1 Day

Price — Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alterations — (NT)— Catalog No. NT — SWC 10—30 — 5 Days

Alteration	Paint peeling — No painting
Code	NT
Spec.	Peel the coating by shot peening. Since the springs which have undergone the painting peeling are easy to rust, be careful in handling. A rusty spring could cause early breakage. Compared to painted springs, there may be some variations, etc. depending on the lot.
Price	Details P.1093

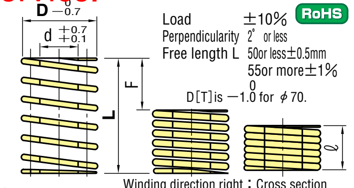
The solid height values are reference only. There may be some variations depending on lots.
Product Outline P.1056
Directions and precautions for coil springs P.1057
Load-deflection diagram P.1094
M SWOSC—V
●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

The maximum deflection of a spring that has an "Outside allowable range" is 55%. Do not use a spring that deflects by more than 55%.

PRESS ADD.SPEC. Printed in Red

COIL SPRINGS
—MINIMAL LOAD SWF—

Light — Load — Heavy: SWF



Load ±10%
Perpendicularity 2° or less
Free length L 50or less±0.5mm, 55or more±1%
D[T]is 0/−1.0 for ϕ70.
Winding direction right : Cross section
RoHS

Dim. D and counterbored hole , Dim. d and shaft P.1057

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓmin	F=LX40% Fmm	Load N{kgf}	F=LX45% Fmm	Load N{kgf}	F=LX50% Fmm	Load N{kgf}	Catalog No. Type D−L	U/Price Q'ty:1~19
6	3	15	7.8 {0.80}	7.1	6.0	47 {4.8}	6.8	53 {5.4}	7.5	59 {6.0}	SWF 6−15	90
		20	5.9 {0.60}	9.5	8.0		9.0		10.0		20	90
		25	4.7 {0.48}	11.9	10.0		11.3		12.5		25	105
		30	3.9 {0.40}	14.2	12.0		13.5		15.0		30	105
		35	3.4 {0.34}	16.6	14.0		15.8		17.5		35	105
		40	2.9 {0.30}	19.0	16.0		18.0		20.0		40	115
8	4	10	15.7 {1.60}	4.5	4.0	63 {6.4}	4.5	71 {7.2}	5.0	79 {8.0}	SWF 8−10	80
		15	10.5 {1.07}	6.8	6.0		6.8		7.5		15	75
		20	7.8 {0.80}	9.0	8.0		9.0		10.0		20	85
		25	6.3 {0.64}	11.3	10.0		11.2		12.5		25	95
		30	5.2 {0.53}	13.5	12.0		13.5		15.0		30	95
		35	4.5 {0.46}	15.8	14.0		15.7		17.5		35	105
		40	3.9 {0.40}	18.0	16.0		18.0		20.0		40	115
		45	3.5 {0.36}	20.3	18.0		20.2		22.5		45	125
		50	3.1 {0.32}	22.5	20.0		22.5		25.0		50	135
		55	2.9 {0.29}	24.8	22.0		24.7		27.5		55	145
		60	2.6 {0.27}	27.0	24.0		27.0		30.0		60	155
		65	2.4 {0.25}	30.8	26.0		29.3		32.5		65	165
		70	2.2 {0.23}	33.2	28.0		31.5		35.0		70	175
		75	2.1 {0.21}	35.6	30.0		33.8		37.5		75	185
		80	2.0 {0.20}	37.9	32.0		36.0		40.0		80	190
10	5	10	19.6 {2.00}	4.5	4.0	78 {8.0}	4.5	88 {9.0}	5.0	98 {10}	SWF 10−10	85
		15	13.1 {1.33}	6.8	6.0		6.8		7.5		15	80
		20	9.8 {1.00}	9.0	8.0		9.0		10.0		20	85
		25	7.8 {0.80}	11.3	10.0		11.2		12.5		25	85
		30	6.5 {0.67}	13.5	12.0		13.5		15.0		30	85
		35	5.9 {0.57}	15.8	14.0		15.7		17.5		35	85
		40	4.9 {0.50}	18.0	16.0		18.0		20.0		40	90
		45	4.4 {0.44}	20.3	18.0		20.2		22.5		45	95
		50	3.9 {0.40}	22.5	20.0		22.5		25.0		50	105
		55	3.6 {0.36}	24.8	22.0		24.7		27.5		55	115
		60	3.3 {0.33}	27.0	24.0		27.0		30.0		60	125
		65	3.0 {0.31}	29.3	26.0		29.2		32.5		65	135
		70	2.8 {0.29}	31.5	28.0		31.5		35.0		70	135
		75	2.6 {0.27}	33.8	30.0		33.7		37.5		75	155
		80	2.5 {0.25}	36.0	32.0		36.0		40.0		80	170
		90	2.2 {0.22}	40.5	36.0		40.5		45.0		90	190
12	6	15	18.3 {1.87}	6.8	6.0	110 {11}	6.8	124 {13}	7.5	137 {14}	SWF 12−15	90
		20	13.7 {1.40}	9.0	8.0		9.0		10.0		20	90
		25	11.0 {1.12}	11.3	10.0		11.2		12.5		25	95
		30	9.2 {0.93}	13.5	12.0		13.5		15.0		30	105
		35	7.8 {0.80}	15.8	14.0		15.7		17.5		35	105
		40	6.9 {0.70}	18.0	16.0		18.0		20.0		40	115
		45	6.1 {0.62}	20.3	18.0		20.2		22.5		45	125
		50	5.5 {0.56}	22.5	20.0		22.5		25.0		50	135
		55	5.0 {0.51}	24.8	22.0		24.7		27.5		55	145
		60	4.6 {0.47}	27.0	24.0		27.0		30.0		60	155
		65	4.2 {0.43}	29.3	26.0		29.2		32.5		65	160
		70	3.9 {0.40}	31.5	28.0		31.5		35.0		70	170
		75	3.7 {0.37}	33.8	30.0		33.7		37.5		75	180
		80	3.4 {0.35}	36.0	32.0		36.0		40.0		80	190
		90	3.1 {0.31}	40.5	36.0		40.5		45.0		90	210
14	7	20	17.7 {1.80}	9.0	8.0	141 {14}	9.0	159 {16}	10.0	177 {18}	SWF 14−20	125
		25	14.1 {1.44}	11.3	10.0		11.2		12.5		25	125
		30	11.8 {1.20}	13.5	12.0		13.5		15.0		30	135
		35	10.1 {1.03}	15.8	14.0		15.7		17.5		35	145
		40	8.8 {0.90}	18.0	16.0		18.0		20.0		40	155
		45	7.8 {0.80}	20.3	18.0		20.2		22.5		45	160
		50	7.1 {0.72}	22.5	20.0		22.5		25.0		50	170
		55	6.4 {0.65}	24.8	22.0		24.7		27.5		55	180
		60	5.9 {0.60}	27.0	24.0		27.0		30.0		60	185
		65	5.4 {0.55}	29.3	26.0		29.2		32.5		65	190
		70	5.0 {0.51}	31.5	28.0		31.5		35.0		70	190
		75	4.7 {0.48}	33.8	30.0		33.7		37.5		75	200
		80	4.4 {0.45}	36.0	32.0		36.0		40.0		80	210
		90	3.9 {0.40}	40.5	36.0		40.5		45.0		90	230
		100	3.5 {0.36}	45.0	40.0		45.0		50.0		100	250
Operation frequency					1X10^7 times		5X10^6 times		3X10^6 times			

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓmin	F=LX40% Fmm	Load N{kgf}	F=LX45% Fmm	Load N{kgf}	F=LX50% Fmm	Load N{kgf}	Catalog No. Type D−L	U/Price Q'ty:1~19
16	8	20	20.6 {2.10}	9.0	8.0	165 {17}	9.0	185 {19}	10.0	206 {21}	SWF 16−20	135
		25	16.5 {1.68}	11.3	10.0		11.2		12.5		25	135
		30	13.7 {1.40}	13.5	12.0		13.5		15.0		30	145
		35	11.8 {1.20}	15.8	14.0		15.7		17.5		35	155
		40	10.3 {1.05}	18.0	16.0		18.0		20.0		40	160
		45	9.2 {0.93}	20.3	18.0		20.2		22.5		45	170
		50	8.2 {0.84}	22.5	20.0		22.5		25.0		50	180
		55	7.5 {0.76}	24.8	22.0		24.7		27.5		55	190
		60	6.9 {0.70}	27.0	24.0		27.0		30.0		60	200
		65	6.3 {0.65}	29.3	26.0		29.2		32.5		65	210
		70	5.9 {0.60}	31.5	28.0		31.5		35.0		70	220
		75	5.5 {0.56}	33.8	30.0		33.7		37.5		75	230
		80	5.1 {0.53}	36.0	32.0		36.0		40.0		80	250
		90	4.6 {0.47}	40.5	36.0		40.5		45.0		90	270
		100	4.1 {0.42}	45.0	40.0		45.0		50.0		100	290
		125	3.3 {0.34}	56.3	50.0		56.3		62.5		125	310
18	9	20	25.5 {2.60}	9.0	8.0	204 {21}	9.0	229 {23}	10.0	255 {26}	SWF 18−20	135
		25	20.4 {2.08}	11.3	10.0		11.2		12.5		25	135
		30	17.0 {1.73}	13.5	12.0		13.5		15.0		30	145
		35	14.6 {1.49}	15.8	14.0		15.7		17.5		35	155
		40	12.7 {1.30}	18.0	16.0		18.0		20.0		40	160
		45	11.3 {1.16}	20.3	18.0		20.2		22.5		45	170
		50	10.2 {1.04}	22.5	20.0		22.5		25.0		50	185
		55	9.3 {0.95}	24.8	22.0		24.7		27.5		55	190
		60	8.5 {0.87}	27.0	24.0		27.0		30.0		60	200
		65	7.8 {0.80}	29.3	26.0		29.2		32.5		65	210
		70	7.3 {0.74}	31.5	28.0		31.5		35.0		70	220
		75	6.8 {0.69}	33.8	30.0		33.7		37.5		75	230
		80	6.4 {0.65}	36.0	32.0		36.0		40.0		80	250
		90	5.7 {0.58}	40.5	36.0		40.5		45.0		90	275
		100	5.1 {0.52}	45.0	40.0		45.0		50.0		100	300
		125	4.1 {0.42}	56.3	50.0		56.3		62.5		125	320
20	11	20	31.4 {3.20}	9.0	8.0	251 {26}	9.0	282 {29}	10.0	314 {32}	SWF 20−20	135
		25	25.1 {2.56}	11.3	10.0		11.2		12.5		25	135
		30	20.9 {2.13}	13.5	12.0		13.5		15.0		30	145
		35	17.9 {1.83}	15.8	14.0		15.7		17.5		35	155
		40	15.7 {1.60}	18.0	16.0		18.0		20.0		40	160
		45	13.9 {1.42}	20.3	18.0		20.2		22.5		45	180
		50	12.6 {1.28}	22.5	20.0		22.5		25.0		50	185
		55	11.4 {1.16}	24.8	22.0		24.7		27.5		55	190
		60	10.5 {1.07}	27.0	24.0		27.0		30.0		60	200
		65	9.7 {0.98}	29.3	26.0		29.2		32.5		65	210
		70	9.0 {0.91}	31.5	28.0		31.5		35.0		70	220
		75	8.4 {0.85}	33.8	30.0		33.7		37.5		75	230
		80	7.8 {0.80}	36.0	32.0		36.0		40.0		80	240
		90	7.0 {0.71}	40.5	36.0		40.5		45.0		90	260
		100	6.3 {0.64}	45.0	40.0		45.0		50.0		100	275
		125	5.0 {0.51}	56.3	50.0		56.2		62.5		125	290
		150	4.2 {0.43}	67.5	60.0		67.5		75.0		150	330
22	11	25	31.4 {3.20}	11.3	10.0	314 {32}	11.2	353 {36}	12.5	392 {40}	SWF 22−25	135
		30	26.2 {2.67}	13.5	12.0		13.5		15.0		30	145
		35	22.4 {2.29}	15.8	14.0		15.7		17.5		35	155
		40	19.6 {2.00}	18.0	16.0		18.0		20.0		40	160
		45	17.4 {1.78}	20.3	18.0		20.2		22.5		45	180
		50	15.7 {1.60}	22.5	20.0		22.5		25.0		50	185
		55	14.3 {1.45}	24.8	22.0		24.7		27.5		55	190
		60	13.1 {1.33}	27.0	24.0		27.0		30.0		60	200
		65	12.1 {1.23}	29.3	26.0		29.2		32.5		65	210
		70	11.2 {1.14}	31.5	28.0		31.5		35.0		70	220
		75	10.5 {1.07}	33.8	30.0		33.7		37.5		75	230
		80	9.8 {1.00}	36.0	32.0		36.0		40.0		80	240
		90	8.7 {0.89}	40.5	36.0		40.5		45.0		90	270
		100	7.8 {0.80}	45.0	40.0		45.0		50.0		100	275
		125	6.3 {0.64}	56.3	50.0		56.2		62.5		125	310
		150	5.2 {0.53}	67.5	60.0		67.5		75.0		150	340
Operation frequency					1X10^7 times		5X10^6 times		3X10^6 times			

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓmin	F=LX40% Fmm	Load N{kgf}	F=LX45% Fmm	Load N{kgf}	F=LX50% Fmm	Load N{kgf}	Catalog No. Type D−L	U/Price Q'ty:1~19
25	13.5	25	39.2 {4.00}	11.3	10.0	392 {40}	11.2	441 {45}	12.5	490 {50}	SWF 25−25	145
		30	32.7 {3.33}	13.5	12.0		13.5		15.0		30	155
		35	28.0 {2.86}	15.8	14.0		15.7		17.5		35	160
		40	24.5 {2.50}	18.0	16.0		18.0		20.0		40	170
		45	21.8 {2.22}	20.3	18.0		20.2		22.5		45	180
		50	19.6 {2.00}	22.5	20.0		22.5		25.0		50	185
		55	17.8 {1.82}	24.8	22.0		24.7		27.5		55	190
		60	16.3 {1.67}	27.0	24.0		27.0		30.0		60	200
		65	15.1 {1.54}	29.3	26.0		29.2		32.5		65	220
		70	14.0 {1.43}	31.5	28.0		31.5		35.0		70	230
		75	13.1 {1.33}	33.8	30.0		33.7		37.5		75	240
		80	12.3 {1.25}	36.0	32.0		36.0		40.0		80	250
		90	10.9 {1.11}	40.5	36.0		40.5		45.0		90	270
		100	9.8 {1.00}	45.0	40.0		45.0		50.0		100	285
		125	7.8 {0.80}	56.3	50.0		56.2		62.5		125	330
		150	6.5 {0.67}	67.5	60.0		67.5		75.0		150	360
		175	5.6 {0.57}	78.8	70.0		78.7		87.5		175	400
		200	4.9 {0.50}	90.0	80.0		90.0		100.0		200	445
27	13.5	25	47.1 {4.80}	11.3	10.0	471 {48}	11.2	530 {54}	12.5	588 {60}	SWF 27−25	145
		30	39.2 {4.00}	13.5	12.0		13.5		15.0		30	155
		35	33.6 {3.43}	15.8	14.0		15.7		17.5		35	160
		40	29.4 {3.00}	18.0	16.0		18.0		20.0		40	170
		45	26.2 {2.67}	20.3	18.0		20.2		22.5		45	180
		50	23.5 {2.40}	22.5	20.0		22.5		25.0		50	185
		55	21.4 {2.18}	24.8	22.0		24.7		27.5		55	190
		60	19.6 {2.00}	27.0	24.0		27.0		30.0		60	200
		65	18.1 {1.85}	29.3	26.0		29.2		32.5		65	220
		70	16.8 {1.71}	31.5	28.0		31.5		35.0		70	230
		75	15.7 {1.60}	33.8	30.0		33.7		37.5		75	240
		80	14.7 {1.50}	36.0	32.0		36.0		40.0		80	250
		90	13.1 {1.33}	40.5	36.0		40.5		45.0		90	270
		100	11.8 {1.20}	45.0	40.0		45.0		50.0		100	285
		125	9.4 {0.96}	56.3	50.0		56.2		62.5		125	330
		150	7.8 {0.80}	67.5	60.0		67.5		75.0		150	375
		175	6.7 {0.69}	78.8	70.0		78.7		87.5		175	430
		200	5.9 {0.60}	90.0	80.0		90.0		100.0		200	465
30	16	25	56.5 {5.76}	11.3	10.0	565 {58}	11.2	635 {65}	12.5	706 {72}	SWF 30−25	145
		30	47.1 {4.80}	13.5	12.0		13.5		15.0		30	155
		35	40.3 {4.11}	15.8	14.0		15.7		17.5		35	160
		40	35.3 {3.60}	18.0	16.0		18.0		20.0		40	170
		45	31.4 {3.20}	20.3	18.0		20.2		22.5		45	185
		50	28.2 {2.88}	22.5	20.0		22.5		25.0		50	190
		55	25.7 {2.62}	24.8	22.0		24.7		27.5		55	200
		60	23.5 {2.40}	27.0	24.0		27.0		30.0		60	210
		65	21.7 {2.22}	29.3	26.0		29.2		32.5		65	220
		70	20.2 {2.06}	31.5	28.0		31.5		35.0		70	230
		75	18.8 {1.92}	33.8	30.0		33.7		37.5		75	240
		80	17.7 {1.80}	36.0	32.0		36.0		40.0		80	250
		90	15.7 {1.60}	40.5	36.0		40.5		45.0		90	275
		100	14.1 {1.44}	45.0	40.0		45.0		50.0		100	290
		125	11.3 {1.15}	56.3	50.0		56.2		62.5		125	340
		150	9.4 {0.96}	67.5	60.0		67.5		75.0		150	380
		175	8.1 {0.82}	78.8	70.0		78.7		87.5		175	440
		200	7.1 {0.72}	90.0	80.0		90.0		100.0		200	480
35	19	40	48.0 {4.89}	18.0	16.0	768 {78}	18.0	864 {88}	20.0	960 {98}	SWF 35−40	185
		45	42.7 {4.35}	20.3	18.0		20.2		22.5		45	190
		50	38.4 {3.92}	22.5	20.0		22.5		25.0		50	210
		55	34.9 {3.56}	24.8	22.0		24.7		27.5		55	230
		60	32.0 {3.26}	27.0	24.0		27.0		30.0		60	240
		65	29.5 {3.01}	29.3	26.0		29.2		32.5		65	260
		70	27.4 {2.80}	31.5	28.0		31.5		35.0		70	270
		75	25.6 {2.61}	33.8	30.0		33.7		37.5		75	285
		80	24.0 {2.45}	36.0	32.0		36.0		40.0		80	290
		90	21.3 {2.18}	40.5	36.0		40.5		45.0		90	320
		100	19.2 {1.96}	45.0	40.0		45.0		50.0		100	350
		125	15.4 {1.57}	56.3	50.0		56.2		62.5		125	420
		150	12.8 {1.31}	67.5	60.0		67.5		75.0		150	490
		175	11.0 {1.12}	78.8	70.0		78.7		87.5		175	555
		200	9.6 {0.98}	90.0	80.0		90.0		100.0		200	630
Operation frequency					1X10^7 times		5X10^6 times		3X10^6 times			

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓmin	F=LX40% Fmm	Load N{kgf}	F=LX45% Fmm	Load N{kgf}	F=LX50% Fmm	Load N{kgf}	Catalog No. Type D−L	U/Price Q'ty:1~19
40	22	40	62.7 {6.39}	18.0	16.0	1003 {102}	18.0	1129 {115}	20.0	1254 {128}	SWF 40−40	230
		45	55.7 {5.68}	21.3	18.0		20.3		22.5		45	240
		50	50.2 {5.11}	22.5	20.0		22.5		25.0		50	250
		55	45.6 {4.65}	26.1	22.0		24.8		27.5		55	275
		60	41.8 {4.26}	27.0	24.0		27.0		30.0		60	285
		65	38.6 {3.93}	30.8	26.0		29.3		32.5		65	310
		70	35.8 {3.65}	31.5	28.0		31.5		35.0		70	330
		75	33.4 {3.41}	35.6	30.0		33.8		37.5		75	350
		80	31.4 {3.20}	36.0	32.0		36.0		40.0		80	360
		90	27.9 {2.84}	40.5	36.0		40.5		45.0		90	400
		100	25.1 {2.56}	45.0	40.0		45.0		50.0		100	440
		125	20.1 {2.05}	56.3	50.0		56.2		62.5		125	530
		150	16.7 {1.70}	67.5	60.0		67.5		75.0		150	630
		175	14.3 {1.46}	78.8	70.0		78.7		87.5		175	720
		200	12.5 {1.28}	90.0	80.0		90.0		100.0		200	815
		225	11.1 {1.14}	101.0	90.0		101.3		112.5		225	910
		250	10.0 {1.02}	112.5	100.0		112.5		125.0		250	995
		275	9.1 {0.93}	124.0	110.0		123.8		137.5		275	1,195
		300	8.4 {0.85}	142.2	120.0		135.0		150.0		300	1,290
50	27.5	50	78.4 {7.99}	22.5	20.0	1568 {160}	22.5	1764 {180}	25.0	1960 {200}	SWF 50−50	400
		55	71.3 {7.27}	24.8	22.0		24.8		27.5		55	415
		60	65.3 {6.66}	27.0	24.0		27.0		30.0		60	430
		65	60.3 {6.15}	29.3	26.0		29.3		32.5		65	460
		70	56.0 {5.71}	31.5	28.0		31.5		35.0		70	480
		75	52.3 {5.33}	33.8	30.0		33.8		37.5		75	505
		80	49.0 {5.00}	36.0	32.0		36.0		40.0		80	530
		90	43.6 {4.44}	40.5	36.0		40.5		45.0		90	580
		100	39.2 {4.00}	45.0	40.0		45.0		50.0		100	645
		125	31.4 {3.20}	56.3	50.0		56.2		62.5		125	770
		150	26.1 {2.66}	67.5	60.0		67.5		75.0		150	900
		175	22.4 {2.28}	78.8	70.0		78.7		87.5		175	1,035
		200	19.6 {2.00}	90.0	80.0		90.0		100.0		200	1,170
		225	17.4 {1.78}	101.0	90.0		101.3		112.5		225	1,310
		250	15.7 {1.60}	112.5	100.0		112.5		125.0		250	1,430
		275	14.3 {1.45}	124.0	110.0		123.8		137.5		275	1,570
		300	13.1 {1.33}	135.0	120.0		135.0		150.0		300	1,695
		350	11.2 {1.14}	165.9	140.0		157.5		175.0		350	2,040
		400	9.8 {1.00}	189.6	160.0		180.0		200.0		400	2,250
		450	8.7 {0.89}	213.3	180.0		202.5		225.0		450	2,430
		500	7.8 {0.80}	237.0	200.0		225.0		250.0		500	2,620
60	33	60	94.0 {9.59}	27.0	24.0	2256 {230}	27.0	2538 {259}	30.0	2820 {288}	SWF 60−60	710
		70	80.6 {8.22}	31.5	28.0		31.5		35.0		70	745
		80	70.5 {7.19}	36.0	32.0		36.0		40.0		80	760
		90	62.7 {6.39}	40.5	36.0		40.0		45.0		90	815
		100	56.4 {5.75}	45.0	40.0		45.0		50.0		100	890
		125	45.1 {4.60}	56.3	50.0		56.2		62.5		125	1,080
		150	37.6 {3.83}	67.5	60.0		67.5		75.0		150	1,275
		175	32.2 {3.29}	78.8	70.0		78.7		87.5		175	1,465
		200	28.2 {2.88}	90.0	80.0		90.0		100.0		200	1,665
		225	25.1 {2.56}	101.3	90.0		101.3		112.5		225	1,830
		250	22.6 {2.30}	112.5	100.0		112.5		125.0		250	2,005
		275	20.5 {2.09}	123.8	110.0		123.8		137.5		275	2,180
		300	18.8 {1.92}	135.0	120.0		135.0		150.0		300	2,360
		350	16.1 {1.64}	165.9	140.0		157.5		175.0		350	2,800
		400	14.1 {1.44}	189.6	160.0		180.0		200.0		400	3,105
		450	12.5 {1.28}	213.3	180.0		202.5		225.0		450	3,350
		500	11.3 {1.15}	237.0	200.0		225.0		250.0		500	3,620
70	38.5	70	112 {11.4}	33.2	28.0	3136 {320}	31.5	3528 {360}	35.0	3920 {400}	SWF 70−70	1,335
		80	98.0 {9.99}	37.9	32.0		36.0		40.0		80	1,380
		90	87.1 {8.88}	42.7	36.0		40.5		45.0		90	1,425
		100	78.4 {7.99}	47.4	40.0		45.0		50.0		100	1,520
		125	62.7 {6.40}	59.3	50.0		56.3		62.5		125	1,755
		150	52.3 {5.33}	71.1	60.0		67.5		75.0		150	2,040
		175	44.8 {4.57}	83.0	70.0		78.8		87.5		175	2,325
		200	39.2 {4.00}	94.8	80.0		90.0		100.0		200	2,660
		250	31.4 {3.20}	118.5	100.0		112.5		125.0		250	3,180
		300	26.1 {2.66}	142.2	120.0		135.0		150.0		300	3,800
		350	22.4 {2.28}	165.9	140.0		157.5		175.0		350	4,370
Operation frequency					1X10^7 times		5X10^6 times		3X10^6 times			

M SWOSC−V

●Load calculation method : N (load) = N/mm (spring constant) X F (deflection)
(International units) N=N/mmXFmm
kgf=kgf/mmXFmm
(kgf=NX0.101972)

Order Catalog No. SWF 10−30

Delivery 1 Day

Price ■Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The solid height values are reference only. There may be some variations depending on lots.
Product Outline P.1056
Directions and precautions for coil springs P.1057
Load-deflection diagram P.1094

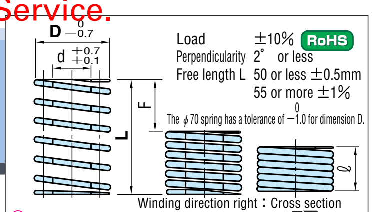
Alterations (NT)− Catalog No. / NT − SWF 30−80 — 5 Days

Alteration	Code	Spec.	Price
No painting	NT	**Paint peeling** Peel the coating by shot peening. Since the springs which have undergone the painting peeling are easy to rust, be careful in handling. A rusty spring could cause early breakage. Compared to painted springs, there may be some variations, etc. depending on the lot.	Details P.1093

PRESS ADD.SPEC. Printed in Red

COIL SPRINGS
—LIGHT LOAD SWL—

Light — Load — Heavy: SWL



Load ±10% RoHS
Perpendicularity 2° or less
Free length L 50 or less ±0.5mm, 55 or more ±1%
The ϕ70 spring has a tolerance of 0/−1.0 for dimension D.
Dim. D and counterbored hole, Dim. d and shaft P.1057

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×32% Fmm	Load N{kgf}	F=L×36% Fmm	Load N{kgf}	F=L×40% Fmm	Load N{kgf}	Catalog No. Type D−L	U/Price Q'ty: 1~19
6	3	15	13.1{1.33}	8.6	4.8	63{6.4}	5.4	71{7.2}	6.0	78{8.0}	SWL 6−15	85
		20	9.8{1.00}	11.5	6.4		7.2		8.0		20	90
		25	7.8{0.80}	14.4	8.0		9.0		10.0		25	95
		30	6.5{0.67}	17.2	9.6		10.8		12.0		30	105
		35	5.6{0.57}	20.1	11.2		12.6		14.0		35	105
		40	4.9{0.50}	23.0	12.8		14.4		16.0		40	115
8	4	10	24.5{2.50}	5.4	3.2	78{8.0}	3.6	88{9.0}	4.0	98{10}	SWL 8−10	80
		15	16.3{1.67}	8.1	4.8		5.4		6.0		15	75
		20	12.3{1.25}	10.8	6.4		7.2		8.0		20	85
		25	9.8{1.00}	13.5	8.0		9.0		10.0		25	85
		30	8.2{0.83}	16.2	9.6		10.8		12.0		30	90
		35	7.0{0.71}	18.9	11.2		12.6		14.0		35	95
		40	6.1{0.63}	21.6	12.8		14.4		16.0		40	105
		45	5.4{0.56}	24.3	14.4		16.2		18.0		45	115
		50	4.9{0.50}	27.0	16.0		18.0		20.0		50	125
		55	4.5{0.45}	29.7	17.6		19.8		22.0		55	135
		60	4.1{0.42}	32.4	19.2		21.6		24.0		60	145
		65	3.8{0.38}	37.3	20.8		23.4		26.0		65	155
		70	3.5{0.36}	40.2	22.4		25.2		28.0		70	165
		75	3.3{0.33}	43.1	24.0		27.0		30.0		75	175
		80	3.1{0.31}	45.9	25.6		28.8		32.0		80	185
10	5	10	34.3{3.50}	5.4	3.2	110{11}	3.6	124{13}	4.0	137{14}	SWL 10−10	85
		15	22.9{2.33}	8.1	4.8		5.4		6.0		15	80
		20	17.2{1.75}	10.8	6.4		7.2		8.0		20	85
		25	13.7{1.40}	13.5	8.0		9.0		10.0		25	85
		30	11.4{1.17}	16.2	9.6		10.8		12.0		30	85
		35	9.8{1.00}	18.9	11.2		12.6		14.0		35	85
		40	8.6{0.88}	21.6	12.8		14.4		16.0		40	90
		45	7.6{0.78}	24.3	14.4		16.2		18.0		45	95
		50	6.9{0.70}	27.0	16.0		18.0		20.0		50	105
		55	6.2{0.64}	29.7	17.6		19.8		22.0		55	115
		60	5.7{0.58}	32.4	19.2		21.6		24.0		60	125
		65	5.3{0.54}	35.1	20.8		23.4		26.0		65	135
		70	4.9{0.50}	37.8	22.4		25.2		28.0		70	135
		75	4.6{0.47}	40.5	24.0		27.0		30.0		75	155
		80	4.3{0.44}	43.2	25.6		28.8		32.0		80	170
		90	3.8{0.39}	48.6	28.8		32.4		36.0		90	190
12	6	15	34.3{3.50}	8.1	4.8	165{17}	5.4	185{19}	6.0	206{21}	SWL 12−15	90
		20	25.7{2.63}	10.8	6.4		7.2		8.0		20	90
		25	20.6{2.10}	13.5	8.0		9.0		10.0		25	95
		30	17.2{1.75}	16.2	9.6		10.8		12.0		30	105
		35	14.7{1.50}	18.9	11.2		12.6		14.0		35	105
		40	12.9{1.31}	21.6	12.8		14.4		16.0		40	115
		45	11.4{1.17}	24.3	14.4		16.2		18.0		45	125
		50	10.3{1.05}	27.0	16.0		18.0		20.0		50	135
		55	9.4{0.95}	29.7	17.6		19.8		22.0		55	145
		60	8.6{0.88}	32.4	19.2		21.6		24.0		60	155
		65	7.9{0.81}	35.1	20.8		23.4		26.0		65	160
		70	7.4{0.75}	37.8	22.4		25.2		28.0		70	170
		75	6.9{0.70}	40.5	24.0		27.0		30.0		75	180
		80	6.4{0.66}	43.2	25.6		28.8		32.0		80	190
		90	5.7{0.58}	48.6	28.8		32.4		36.0		90	210
14	7	20	34.3{3.50}	10.8	6.4	220{22}	7.2	247{25}	8.0	275{28}	SWL 14−20	125
		25	27.5{2.80}	13.5	8.0		9.0		10.0		25	125
		30	22.9{2.33}	16.2	9.6		10.8		12.0		30	135
		35	19.6{2.00}	18.9	11.2		12.6		14.0		35	145
		40	17.2{1.75}	21.6	12.8		14.4		16.0		40	155
		45	15.3{1.56}	24.3	14.4		16.2		18.0		45	160
		50	13.7{1.40}	27.0	16.0		18.0		20.0		50	170
		55	12.5{1.27}	29.7	17.6		19.8		22.0		55	180
		60	11.4{1.17}	32.4	19.2		21.6		24.0		60	185
		65	10.6{1.08}	35.1	20.8		23.4		26.0		65	190
		70	9.8{1.00}	37.8	22.4		25.2		28.0		70	190
		75	9.2{0.93}	40.5	24.0		27.0		30.0		75	200
		80	8.6{0.88}	43.2	25.6		28.8		32.0		80	210
		90	7.6{0.78}	48.6	28.8		32.4		36.0		90	230
		100	6.9{0.70}	54.0	32.0		36.0		40.0		100	250
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times			

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×32% Fmm	Load N{kgf}	F=L×36% Fmm	Load N{kgf}	F=L×40% Fmm	Load N{kgf}	Catalog No. Type D−L	U/Price Q'ty: 1~19
16	8	20	42.9{4.38}	10.8	6.4	275{28}	7.2	309{32}	8.0	343{35}	SWL 16−20	135
		25	34.3{3.50}	13.5	8.0		9.0		10.0		25	135
		30	28.6{2.92}	16.2	9.6		10.8		12.0		30	145
		35	24.5{2.50}	18.9	11.2		12.6		14.0		35	155
		40	21.5{2.19}	21.6	12.8		14.4		16.0		40	160
		45	19.1{1.94}	24.3	14.4		16.2		18.0		45	170
		50	17.2{1.75}	27.0	16.0		18.0		20.0		50	180
		55	15.6{1.59}	29.7	17.6		19.8		22.0		55	190
		60	14.3{1.46}	32.4	19.2		21.6		24.0		60	200
		65	13.2{1.35}	35.1	20.8		23.4		26.0		65	210
		70	12.3{1.25}	37.8	22.4		25.2		28.0		70	220
		75	11.4{1.17}	40.5	24.0		27.0		30.0		75	230
		80	10.7{1.09}	43.2	25.6		28.8		32.0		80	250
		90	9.5{0.97}	48.6	28.8		32.4		36.0		90	270
		100	8.6{0.88}	54.0	32.0		36.0		40.0		100	290
		125	6.9{0.70}	67.5	40.0		45.0		50.0		125	320
18	9	20	52.7{5.38}	10.8	6.4	337{34}	7.2	380{39}	8.0	422{43}	SWL 18−20	135
		25	42.2{4.30}	13.5	8.0		9.0		10.0		25	135
		30	35.1{3.58}	16.2	9.6		10.8		12.0		30	145
		35	30.1{3.07}	18.9	11.2		12.6		14.0		35	155
		40	26.4{2.69}	21.6	12.8		14.4		16.0		40	160
		45	23.4{2.39}	24.3	14.4		16.2		18.0		45	170
		50	21.1{2.15}	27.0	16.0		18.0		20.0		50	185
		55	19.2{1.95}	29.7	17.6		19.8		22.0		55	190
		60	17.6{1.79}	32.4	19.2		21.6		24.0		60	200
		65	16.2{1.65}	35.1	20.8		23.4		26.0		65	210
		70	15.1{1.54}	37.8	22.4		25.2		28.0		70	220
		75	14.1{1.43}	40.5	24.0		27.0		30.0		75	230
		80	13.2{1.34}	43.2	25.6		28.8		32.0		80	250
		90	11.7{1.19}	48.6	28.8		32.4		36.0		90	275
		100	10.5{1.08}	54.0	32.0		36.0		40.0		100	300
		125	8.4{0.86}	67.5	40.0		45.0		50.0		125	330
20	10	20	66.2{6.75}	10.8	6.4	424{43}	7.2	477{48}	8.0	530{54}	SWL 20−20	145
		25	53.0{5.40}	13.5	8.0		9.0		10.0		25	145
		30	44.1{4.50}	16.2	9.6		10.8		12.0		30	155
		35	37.8{3.86}	18.9	11.2		12.6		14.0		35	160
		40	33.1{3.38}	21.6	12.8		14.4		16.0		40	170
		45	29.4{3.00}	24.3	14.4		16.2		18.0		45	185
		50	26.5{2.70}	27.0	16.0		18.0		20.0		50	190
		55	24.1{2.45}	29.7	17.6		19.8		22.0		55	200
		60	22.1{2.25}	32.4	19.2		21.6		24.0		60	210
		65	20.4{2.08}	35.1	20.8		23.4		26.0		65	220
		70	18.9{1.93}	37.8	22.4		25.2		28.0		70	230
		75	17.7{1.80}	40.5	24.0		27.0		30.0		75	240
		80	16.5{1.69}	43.2	25.6		28.8		32.0		80	250
		90	14.7{1.50}	48.6	28.8		32.4		36.0		90	275
		100	13.2{1.35}	54.0	32.0		36.0		40.0		100	290
		125	10.6{1.08}	67.5	40.0		45.0		50.0		125	320
		150	8.8{0.90}	81.0	48.0		54.0		60.0		150	340
22	11	25	65.7{6.70}	13.5	8.0	526{54}	9.0	591{60}	10.0	657{67}	SWL 22−25	145
		30	54.8{5.58}	16.2	9.6		10.8		12.0		30	155
		35	46.9{4.79}	18.9	11.2		12.6		14.0		35	160
		40	41.1{4.19}	21.6	12.8		14.4		16.0		40	180
		45	36.5{3.72}	24.3	14.4		16.2		18.0		45	185
		50	32.9{3.35}	27.0	16.0		18.0		20.0		50	190
		55	29.9{3.05}	29.7	17.6		19.8		22.0		55	200
		60	27.4{2.79}	32.4	19.2		21.6		24.0		60	210
		65	25.3{2.58}	35.1	20.8		23.4		26.0		65	230
		70	23.5{2.39}	37.8	22.4		25.2		28.0		70	230
		75	21.9{2.23}	40.5	24.0		27.0		30.0		75	250
		80	20.5{2.09}	43.2	25.6		28.8		32.0		80	260
		90	18.3{1.86}	48.6	28.8		32.4		36.0		90	275
		100	16.4{1.68}	54.0	32.0		36.0		40.0		100	300
		125	13.1{1.34}	67.5	40.0		45.0		50.0		125	330
		150	11.0{1.12}	81.0	48.0		54.0		60.0		150	380
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times			

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×32% Fmm	Load N{kgf}	F=L×36% Fmm	Load N{kgf}	F=L×40% Fmm	Load N{kgf}	Catalog No. Type D−L	U/Price Q'ty: 1~19
25	12.5	25	82.4{8.40}	13.5	8.0	659{67}	9.0	741{76}	10.0	824{84}	SWL 25−25	155
		30	68.6{7.00}	16.2	9.6		10.8		12.0		30	160
		35	58.8{6.00}	18.9	11.2		12.6		14.0		35	170
		40	51.5{5.25}	21.6	12.8		14.4		16.0		40	180
		45	45.8{4.67}	24.3	14.4		16.2		18.0		45	190
		50	41.2{4.20}	27.0	16.0		18.0		20.0		50	190
		55	37.4{3.82}	29.7	17.6		19.8		22.0		55	210
		60	34.3{3.50}	32.4	19.2		21.6		24.0		60	220
		65	31.7{3.23}	35.1	20.8		23.4		26.0		65	230
		70	29.4{3.00}	37.8	22.4		25.2		28.0		70	240
		75	27.5{2.80}	40.5	24.0		27.0		30.0		75	250
		80	25.7{2.63}	43.2	25.6		28.8		32.0		80	260
		90	22.9{2.33}	48.6	28.8		32.4		36.0		90	285
		100	20.6{2.10}	54.0	32.0		36.0		40.0		100	310
		125	16.5{1.68}	67.5	40.0		45.0		50.0		125	350
		150	13.7{1.40}	81.0	48.0		54.0		60.0		150	390
		175	11.8{1.20}	94.5	56.0		63.0		70.0		175	430
		200	10.3{1.05}	108.0	64.0		72.0		80.0		200	465
27	13.5	25	98.1{10.0}	13.5	8.0	785{80}	9.0	883{90}	10.0	981{100}	SWL 27−25	155
		30	81.7{8.33}	16.2	9.6		10.8		12.0		30	160
		35	70.0{7.14}	18.9	11.2		12.6		14.0		35	180
		40	61.3{6.25}	21.6	12.8		14.4		16.0		40	185
		45	54.5{5.56}	24.3	14.4		16.2		18.0		45	190
		50	49.0{5.00}	27.0	16.0		18.0		20.0		50	210
		55	44.6{4.55}	29.7	17.6		19.8		22.0		55	220
		60	40.9{4.17}	32.4	19.2		21.6		24.0		60	230
		65	37.7{3.85}	35.1	20.8		23.4		26.0		65	250
		70	35.0{3.57}	37.8	22.4		25.2		28.0		70	260
		75	32.7{3.33}	40.5	24.0		27.0		30.0		75	275
		80	30.6{3.13}	43.2	25.6		28.8		32.0		80	275
		90	27.2{2.78}	48.6	28.8		32.4		36.0		90	300
		100	24.5{2.50}	54.0	32.0		36.0		40.0		100	330
		125	19.6{2.00}	67.5	40.0		45.0		50.0		125	375
		150	16.3{1.67}	81.0	48.0		54.0		60.0		150	430
		175	14.0{1.43}	94.5	56.0		63.0		70.0		175	480
		200	12.3{1.25}	108.0	64.0		72.0		80.0		200	530
30	15	25	119{12.1}	13.5	8.0	949{97}	9.0	1067{109}	10.0	1186{121}	SWL 30−25	155
		30	98.8{10.1}	16.2	9.6		10.8		12.0		30	170
		35	84.7{8.64}	18.9	11.2		12.6		14.0		35	185
		40	74.1{7.56}	21.6	12.8		14.4		16.0		40	190
		45	65.9{6.72}	24.3	14.4		16.2		18.0		45	210
		50	59.3{6.05}	27.0	16.0		18.0		20.0		50	220
		55	53.9{5.50}	29.7	17.6		19.8		22.0		55	240
		60	49.4{5.04}	32.4	19.2		21.6		24.0		60	250
		65	45.6{4.65}	35.1	20.8		23.4		26.0		65	270
		70	42.4{4.32}	37.8	22.4		25.2		28.0		70	275
		75	39.5{4.03}	40.5	24.0		27.0		30.0		75	290
		80	37.1{3.78}	43.2	25.6		28.8		32.0		80	310
		90	32.9{3.36}	48.6	28.8		32.4		36.0		90	330
		100	29.7{3.02}	54.0	32.0		36.0		40.0		100	360
		125	23.7{2.42}	67.5	40.0		45.0		50.0		125	430
		150	19.8{2.02}	81.0	48.0		54.0		60.0		150	500
		175	16.9{1.73}	94.5	56.0		63.0		70.0		175	580
		200	14.8{1.51}	108.0	64.0		72.0		80.0		200	665
35	17.5	40	101{10.3}	21.6	12.8	1294{132}	14.4	1455{148}	16.0	1617{165}	SWL 35−40	230
		45	89.8{9.16}	24.3	14.4		16.2		18.0		45	250
		50	80.9{8.24}	27.0	16.0		18.0		20.0		50	275
		55	73.5{7.49}	29.7	17.6		19.8		22.0		55	290
		60	67.4{6.87}	32.4	19.2		21.6		24.0		60	310
		65	62.2{6.34}	35.1	20.8		23.4		26.0		65	330
		70	57.8{5.89}	37.8	22.4		25.2		28.0		70	350
		75	53.9{5.50}	40.5	24.0		27.0		30.0		75	365
		80	50.5{5.15}	43.2	25.6		28.8		32.0		80	380
		90	44.9{4.58}	48.6	28.8		32.4		36.0		90	430
		100	40.4{4.12}	54.0	32.0		36.0		40.0		100	465
		125	32.3{3.30}	67.5	40.0		45.0		50.0		125	565
		150	27.0{2.75}	81.0	48.0		54.0		60.0		150	665
		175	23.1{2.36}	94.5	56.0		63.0		70.0		175	760
		200	20.2{2.06}	108.0	64.0		72.0		80.0		200	860
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times			

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×32% Fmm	Load N{kgf}	F=L×36% Fmm	Load N{kgf}	F=L×40% Fmm	Load N{kgf}	Catalog No. Type D−L	U/Price Q'ty: 1~19
40	20	40	132{13.5}	21.6	12.8	1694{173}	14.4	1905{194}	16.0	2117{216}	SWL 40−40	310
		45	118{12.0}	25.8	14.4		16.2		18.0		45	320
		50	106{10.8}	27.0	16.0		18.0		20.0		50	330
		55	96.2{9.81}	31.6	17.6		19.8		22.0		55	360
		60	88.2{8.99}	32.4	19.2		21.6		24.0		60	380
		65	81.4{8.30}	37.3	20.8		23.4		26.0		65	415
		70	75.6{7.71}	37.8	22.4		25.2		28.0		70	440
		75	70.6{7.20}	43.1	24.0		27.0		30.0		75	475
		80	66.2{6.75}	45.9	25.6		28.8		32.0		80	500
		90	58.8{6.00}	48.6	28.8		32.4		36.0		90	545
		100	52.9{5.40}	54.0	32.0		36.0		40.0		100	600
		125	42.3{4.32}	67.5	40.0		45.0		50.0		125	725
		150	35.3{3.60}	81.0	48.0		54.0		60.0		150	845
		175	30.2{3.08}	94.5	56.0		63.0		70.0		175	970
		200	26.5{2.70}	108.0	64.0		72.0		80.0		200	1,095
		225	23.5{2.40}	122.0	72.0		81.0		90.0		225	1,225
		250	21.2{2.16}	135.0	80.0		90.0		100.0		250	1,330
		275	19.2{1.96}	149.0	88.0		99.0		110.0		275	1,575
		300	17.6{1.80}	172.2	96.0		108.0		120.0		300	1,805
50	25	50	166{16.9}	27.0	16.0	2650{270}	18.0	2981{304}	20.0	3312{338}	SWL 50−50	555
		55	151{15.4}	29.7	17.6		19.8		22.0		55	575
		60	138{14.1}	32.4	19.2		21.6		24.0		60	590
		65	127{13.0}	35.1	20.8		23.4		26.0		65	635
		70	118{12.1}	37.8	22.4		25.2		28.0		70	670
		75	110{11.3}	40.5	24.0		27.0		30.0		75	710
		80	104{10.6}	43.2	25.6		28.8		32.0		80	745
		90	92.0{9.38}	48.6	28.8		32.4		36.0		90	825
		100	82.8{8.44}	54.0	32.0		36.0		40.0		100	900
		125	66.2{6.75}	67.5	40.0		45.0		50.0		125	1,080
		150	55.2{5.63}	81.0	48.0		54.0		60.0		150	1,260
		175	47.3{4.82}	94.5	56.0		63.0		70.0		175	1,430
		200	41.4{4.22}	108.0	64.0		72.0		80.0		200	1,615
		225	36.8{3.75}	122.0	72.0		81.0		90.0		225	1,805
		250	33.1{3.38}	135.0	80.0		90.0		100.0		250	1,975
		275	30.1{3.07}	149.0	88.0		99.0		110.0		275	2,155
		300	27.6{2.81}	172.2	96.0		108.0		120.0		300	2,325
		350	23.7{2.41}	200.9	112.0		126.0		140.0		350	2,800
		400	20.7{2.11}	216.0	128.0		144.0		160.0		400	3,370
		450	18.4{1.88}	243.0	144.0		162.0		180.0		450	4,050
		500	16.6{1.69}	270.0	160.0		180.0		200.0		500	4,860
60	30	60	199{20.3}	32.4	19.2	3816{389}	21.6	4293{438}	24.0	4770{486}	SWL 60−60	985
		70	170{17.4}	37.8	22.4		25.2		28.0		70	1,025
		80	149{15.2}	43.2	25.6		28.8		32.0		80	1,070
		90	133{13.5}	48.6	28.8		32.4		36.0		90	1,125
		100	119{12.2}	54.0	32.0		36.0		40.0		100	1,205
		125	95.4{9.73}	67.5	40.0		45.0		50.0		125	1,455
		150	79.5{8.11}	81.0	48.0		54.0		60.0		150	1,705
		175	68.1{6.95}	94.5	56.0		63.0		70.0		175	1,955
		200	59.6{6.08}	108.0	64.0		72.0		80.0		200	2,205
		225	53.0{5.40}	122.0	72.0		81.0		90.0		225	2,450
		250	47.7{4.86}	135.0	80.0		90.0		100.0		250	2,695
		275	43.4{4.42}	149.0	88.0		99.0		110.0		275	2,940
		300	39.8{4.05}	172.2	96.0		108.0		120.0		300	3,190
		350	34.1{3.47}	200.9	112.0		126.0		140.0		350	3,800
		400	29.8{3.04}	216.0	128.0		144.0		160.0		400	4,520
		450	26.5{2.70}	243.0	144.0		162.0		180.0		450	5,370
		500	23.9{2.43}	270.0	160.0		180.0		200.0		500	6,370
70	38.5	70	214{21.8}	40.2	22.4	4782{488}	25.2	5380{549}	28.0	5978{610}	SWL 70−70	1,650
		80	187{19.0}	45.9	25.6		28.8		32.0		80	1,705
		90	166{16.9}	51.7	28.8		32.4		36.0		90	1,755
		100	149{15.2}	57.4	32.0		36.0		40.0		100	1,945
		125	120{12.2}	71.8	40.0		45.0		50.0		125	2,230
		150	99.6{10.2}	86.1	48.0		54.0		60.0		150	2,565
		175	85.4{8.71}	100.5	56.0		63.0		70.0		175	2,945
		200	74.7{7.62}	114.8	64.0		72.0		80.0		200	3,465
		250	59.8{6.10}	143.5	80.0		90.0		100.0		250	4,180
		300	49.8{5.08}	172.2	96.0		108.0		120.0		300	4,985
		350	42.7{4.35}	200.9	112.0		126.0		140.0		350	5,700
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times			

M SWOSC−V
● Load calculation method : N (load) = N/mm (spring constant) × F (deflection)
(International units) N = N/mm × Fmm
kgf = kgf/mm × Fmm
(kgf = N × 0.101972)

Order Catalog No. SWL 22−100

Delivery 1 Day

Price ■Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

The solid height values are reference only. There may be some variations depending on lots.
Product Outline P.1056
Directions and precautions for coil springs P.1057
Load-deflection diagram P.1094

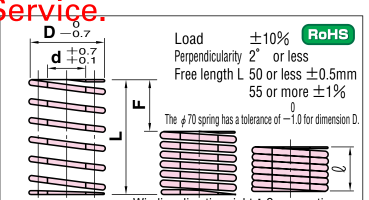
Alterations (NT) — Catalog No. NT — SWL 30−90 | 5 Days

Alteration	Code	Spec.	Price
No painting	NT	**Paint peeling** Peel the coating by shot peening. Since the springs which have undergone the painting peeling are easy to rust, be careful in handling. A rusty spring could cause early breakage. Compared to painted springs, there may be some variations, etc. depending on the lot.	Details P.1093

PRESS ADD.SPEC. Printed in Blue

COIL SPRINGS
—MEDIUM LOAD SWM—

Light — Load — Heavy: SWM



Load ±10%
Perpendicularity 2° or less
Free length L 50 or less ±0.5mm, 55 or more ±1%
The φ70 spring has a tolerance of $^{0}_{-1.0}$ for dimension D.
Winding direction right : Cross section

RoHS

Dim. D and counterbored hole , Dim. d and shaft P.1057

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×25.6% Fmm	Load N{kgf}	F=L×28.8% Fmm	Load N{kgf}	F=L×32% Fmm	Load N{kgf}	Catalog No. Type	D–L	U/Price Q'ty:1~19
6	3	15	20.4 {2.08}	9.8	3.8	79 {8.0}	4.3	88 {9.0}	4.8	98 {10}	SWM	6– 15	85
		20	15.3 {1.56}	13.1	5.1		5.8		6.4			20	90
		25	12.3 {1.25}	16.4	6.4		7.2		8.0			25	95
		30	10.2 {1.04}	19.6	7.7		8.6		9.6			30	105
		35	8.8 {0.89}	22.9	9.0		10.1		11.2			35	115
		40	7.7 {0.78}	26.2	10.2		11.5		12.8			40	115
		45	6.8 {0.69}	29.4	11.5		13.0		14.4			45	125
		50	6.1 {0.63}	32.7	12.8		14.4		16.0			50	135
		55	5.6 {0.57}	36.0	14.1		15.8		17.6			55	145
		60	5.1 {0.52}	39.2	15.4		17.3		19.2			60	155
8	4	10	42.9 {4.37}	6.6	2.6	110 {11}	2.9	123 {13}	3.2	137 {14}	SWM	8– 10	65
		15	28.6 {2.91}	9.4	3.8		4.3		4.8			15	65
		20	21.5 {2.18}	12.5	5.1		5.8		6.4			20	75
		25	17.2 {1.75}	15.7	6.4		7.2		8.0			25	75
		30	14.3 {1.46}	18.8	7.7		8.6		9.6			30	85
		35	12.2 {1.25}	21.9	9.0		10.1		11.2			35	90
		40	10.7 {1.09}	25.0	10.2		11.5		12.8			40	95
		45	9.5 {0.97}	28.2	11.5		13.0		14.4			45	115
		50	8.6 {0.87}	31.3	12.8		14.4		16.0			50	135
		55	7.8 {0.79}	34.4	14.1		15.8		17.6			55	155
		60	7.1 {0.73}	37.6	15.4		17.3		19.2			60	170
		65	6.6 {0.67}	42.5	16.6		18.7		20.8			65	190
		70	6.1 {0.62}	45.8	17.9		20.2		22.4			70	205
		75	5.7 {0.58}	49.1	19.2		21.6		24.0			75	225
		80	5.4 {0.55}	52.3	20.5		23.0		25.6			80	245
10	5	10	61.3 {6.25}	6.6	2.6	157 {16}	2.9	176 {18}	3.2	196 {20}	SWM	10– 10	65
		15	40.9 {4.17}	9.8	3.8		4.3		4.8			15	65
		20	30.6 {3.13}	12.5	5.1		5.8		6.4			20	65
		25	24.5 {2.50}	15.7	6.4		7.2		8.0			25	75
		30	20.4 {2.08}	18.8	7.7		8.6		9.6			30	85
		35	17.5 {1.79}	21.9	9.0		10.1		11.2			35	90
		40	15.3 {1.56}	25.0	10.2		11.5		12.8			40	95
		45	13.6 {1.39}	28.2	11.5		13.0		14.4			45	105
		50	12.3 {1.25}	31.3	12.8		14.4		16.0			50	115
		55	11.1 {1.14}	34.4	14.1		15.8		17.6			55	115
		60	10.2 {1.04}	37.6	15.4		17.3		19.2			60	125
		65	9.4 {0.96}	40.7	16.6		18.7		20.8			65	135
		70	8.8 {0.89}	43.8	17.9		20.2		22.4			70	135
		75	8.2 {0.83}	47.0	19.2		21.6		24.0			75	155
		80	7.7 {0.78}	50.1	20.5		23.0		25.6			80	170
		90	6.8 {0.69}	56.3	23.0		25.9		28.8			90	185
12	6	15	59.2 {6.04}	9.8	3.8	227 {23}	4.3	256 {26}	4.8	284 {29}	SWM	12– 15	90
		20	44.4 {4.53}	12.5	5.1		5.8		6.4			20	90
		25	35.5 {3.63}	15.7	6.4		7.2		8.0			25	95
		30	29.6 {3.02}	18.8	7.7		8.6		9.6			30	105
		35	25.4 {2.59}	21.9	9.0		10.1		11.2			35	115
		40	22.2 {2.27}	25.0	10.2		11.5		12.8			40	115
		45	19.7 {2.01}	28.2	11.5		13.0		14.4			45	125
		50	17.8 {1.81}	31.3	12.8		14.4		16.0			50	135
		55	16.2 {1.65}	34.4	14.1		15.8		17.6			55	145
		60	14.8 {1.51}	37.6	15.4		17.3		19.2			60	155
		65	13.7 {1.39}	40.7	16.6		18.7		20.8			65	160
		70	12.7 {1.29}	43.8	17.9		20.2		22.4			70	160
		75	11.8 {1.21}	47.0	19.2		21.6		24.0			75	180
		80	11.1 {1.13}	50.1	20.5		23.0		25.6			80	190
		90	9.9 {1.01}	56.3	23.0		25.9		28.8			90	210
14	7	20	59.8 {6.09}	13.1	5.1	306 {31}	5.8	345 {35}	6.4	383 {39}	SWM	14– 20	125
		25	47.9 {4.88}	15.7	6.4		7.2		8.0			25	125
		30	39.9 {4.08}	18.8	7.7		8.6		9.6			30	135
		35	34.2 {3.48}	21.9	9.0		10.1		11.2			35	145
		40	29.9 {3.05}	25.0	10.2		11.5		12.8			40	155
		45	26.6 {2.71}	28.2	11.5		13.0		14.4			45	160
		50	23.9 {2.44}	31.3	12.8		14.4		16.0			50	170
		55	21.8 {2.22}	34.4	14.1		15.8		17.6			55	180
		60	19.9 {2.03}	37.6	15.4		17.3		19.2			60	185
		65	18.4 {1.88}	40.7	16.6		18.7		20.8			65	190
		70	17.1 {1.74}	43.8	17.9		20.2		22.4			70	190
		75	16.0 {1.63}	47.0	19.2		21.6		24.0			75	200
		80	15.0 {1.52}	50.1	20.5		23.0		25.6			80	200
		90	13.3 {1.35}	56.3	23.0		25.9		28.8			90	230
		100	12.0 {1.22}	62.6	25.6		28.8		32.0			100	250
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times				

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×25.6% Fmm	Load N{kgf}	F=L×28.8% Fmm	Load N{kgf}	F=L×32% Fmm	Load N{kgf}	Catalog No. Type	D–L	U/Price Q'ty:1~19
16	8	20	78.1 {7.97}	13.1	5.1	400 {41}	5.8	450 {46}	6.4	500 {51}	SWM	16– 20	145
		25	62.5 {6.38}	15.7	6.4		7.2		8.0			25	145
		30	52.1 {5.31}	18.8	7.7		8.6		9.6			30	155
		35	44.7 {4.55}	21.9	9.0		10.1		11.2			35	160
		40	39.1 {3.98}	25.0	10.2		11.5		12.8			40	180
		45	34.7 {3.54}	28.2	11.5		13.0		14.4			45	185
		50	31.3 {3.19}	31.3	12.8		14.4		16.0			50	190
		55	28.4 {2.90}	34.4	14.1		15.8		17.6			55	210
		60	26.0 {2.66}	37.6	15.4		17.3		19.2			60	220
		65	24.0 {2.45}	40.7	16.6		18.7		20.8			65	230
		70	22.3 {2.28}	43.8	17.9		20.2		22.4			70	250
		75	20.8 {2.13}	47.0	19.2		21.6		24.0			75	260
		80	19.5 {1.99}	50.1	20.5		23.0		25.6			80	275
		90	17.4 {1.77}	56.3	23.0		25.9		28.8			90	285
		100	15.6 {1.59}	62.6	25.6		28.8		32.0			100	300
18	9	20	99.6 {10.2}	13.1	5.1	510 {52}	5.8	574 {59}	6.4	637 {65}	SWM	18– 20	155
		25	79.7 {8.13}	15.7	6.4		7.2		8.0			25	155
		30	66.4 {6.77}	18.8	7.7		8.6		9.6			30	160
		35	56.9 {5.80}	21.9	9.0		10.1		11.2			35	180
		40	49.8 {5.08}	25.0	10.2		11.5		12.8			40	185
		45	44.3 {4.51}	28.2	11.5		13.0		14.4			45	190
		50	39.8 {4.06}	31.3	12.8		14.4		16.0			50	210
		55	36.2 {3.69}	34.4	14.1		15.8		17.6			55	220
		60	33.2 {3.39}	37.6	15.4		17.3		19.2			60	230
		65	30.6 {3.13}	40.7	16.6		18.7		20.8			65	250
		70	28.5 {2.90}	43.8	17.9		20.2		22.4			70	260
		75	26.6 {2.71}	47.0	19.2		21.6		24.0			75	275
		80	24.9 {2.54}	50.1	20.5		23.0		25.6			80	285
		90	22.1 {2.26}	56.3	23.0		25.9		28.8			90	310
		100	19.9 {2.03}	62.6	25.6		28.8		32.0			100	330
20	10	20	123 {12.5}	13.1	5.1	628 {64}	5.8	706 {72}	6.4	784 {80}	SWM	20– 20	155
		25	98.0 {10.0}	15.7	6.4		7.2		8.0			25	155
		30	81.7 {8.33}	18.8	7.7		8.6		9.6			30	160
		35	70.0 {7.14}	21.9	9.0		10.1		11.2			35	180
		40	61.3 {6.25}	25.0	10.2		11.5		12.8			40	185
		45	54.4 {5.55}	28.2	11.5		13.0		14.4			45	190
		50	49.0 {5.00}	31.3	12.8		14.4		16.0			50	210
		55	44.5 {4.55}	34.4	14.1		15.8		17.6			55	220
		60	40.8 {4.17}	37.6	15.4		17.3		19.2			60	230
		65	37.7 {3.85}	40.7	16.6		18.7		20.8			65	250
		70	35.0 {3.57}	43.8	17.9		20.2		22.4			70	260
		75	32.7 {3.33}	47.0	19.2		21.6		24.0			75	275
		80	30.6 {3.13}	50.1	20.5		23.0		25.6			80	285
		90	27.2 {2.78}	56.3	23.0		25.9		28.8			90	310
		100	24.5 {2.50}	62.6	25.6		28.8		32.0			100	330
		125	19.6 {2.00}	78.3	32.0		36.0		40.0			125	365
		150	16.3 {1.67}	93.9	38.4		43.2		48.0			150	410
22	11	25	119 {12.1}	15.7	6.4	761 {78}	7.2	856 {87}	8.0	951 {97}	SWM	22– 25	160
		30	99.1 {10.1}	18.8	7.7		8.6		9.6			30	170
		35	84.9 {8.66}	21.9	9.0		10.1		11.2			35	180
		40	74.3 {7.58}	25.0	10.2		11.5		12.8			40	185
		45	66.1 {6.74}	28.2	11.5		13.0		14.4			45	190
		50	59.5 {6.06}	31.3	12.8		14.4		16.0			50	190
		55	54.0 {5.51}	34.4	14.1		15.8		17.6			55	200
		60	49.5 {5.05}	37.6	15.4		17.3		19.2			60	210
		65	45.7 {4.66}	40.7	16.6		18.7		20.8			65	220
		70	42.5 {4.33}	43.8	17.9		20.2		22.4			70	230
		75	39.6 {4.04}	47.0	19.2		21.6		24.0			75	240
		80	37.2 {3.79}	50.1	20.5		23.0		25.6			80	250
		90	33.0 {3.37}	56.3	23.0		25.9		28.8			90	270
		100	29.7 {3.03}	62.6	25.6		28.8		32.0			100	275
		125	23.8 {2.43}	78.3	32.0		36.0		40.0			125	320
		150	19.8 {2.02}	93.9	38.4		43.2		48.0			150	365
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times				

Order Catalog No. SWM 20−80

Delivery 1 Day

Price ■Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×25.6% Fmm	Load N{kgf}	F=L×28.8% Fmm	Load N{kgf}	F=L×32% Fmm	Load N{kgf}	Catalog No. Type	D–L	U/Price Q'ty:1~19
25	12.5	25	153 {15.6}	15.7	6.4	981 {100}	7.2	1103 {113}	8.0	1225 {125}	SWM	25– 25	155
		30	128 {13.0}	18.8	7.7		8.6		9.6			30	160
		35	109 {11.2}	21.9	9.0		10.1		11.2			35	180
		40	95.7 {9.77}	25.0	10.2		11.5		12.8			40	185
		45	85.1 {8.68}	28.2	11.5		13.0		14.4			45	190
		50	76.6 {7.81}	31.3	12.8		14.4		16.0			50	210
		55	69.6 {7.10}	34.4	14.1		15.8		17.6			55	220
		60	63.8 {6.51}	37.6	15.4		17.3		19.2			60	230
		65	58.9 {6.01}	40.7	16.6		18.7		20.8			65	250
		70	54.7 {5.58}	43.8	17.9		20.2		22.4			70	260
		75	51.0 {5.21}	47.0	19.2		21.6		24.0			75	275
		80	47.9 {4.88}	50.1	20.5		23.0		25.6			80	285
		90	42.5 {4.34}	56.3	23.0		25.9		28.8			90	310
		100	38.3 {3.91}	62.6	25.6		28.8		32.0			100	330
		125	30.6 {3.13}	78.3	32.0		36.0		40.0			125	380
		150	25.5 {2.60}	93.9	38.4		43.2		48.0			150	440
		175	21.9 {2.23}	109.6	44.8		50.4		56.0			175	490
27	13.5	25	179 {18.3}	15.7	6.4	1145 {117}	7.2	1288 {131}	8.0	1431 {146}	SWM	27– 25	170
		30	149 {15.2}	18.8	7.7		8.6		9.6			30	185
		35	128 {13.0}	21.9	9.0		10.1		11.2			35	190
		40	112 {11.4}	25.0	10.2		11.5		12.8			40	200
		45	99.4 {10.1}	28.2	11.5		13.0		14.4			45	220
		50	89.4 {9.13}	31.3	12.8		14.4		16.0			50	230
		55	81.3 {8.30}	34.4	14.1		15.8		17.6			55	240
		60	74.5 {7.60}	37.6	15.4		17.3		19.2			60	260
		65	68.8 {7.02}	40.7	16.6		18.7		20.8			65	270
		70	63.9 {6.52}	43.8	17.9		20.2		22.4			70	275
		75	59.6 {6.08}	47.0	19.2		21.6		24.0			75	290
		80	55.9 {5.70}	50.1	20.5		23.0		25.6			80	300
		90	49.7 {5.07}	56.3	23.0		25.9		28.8			90	330
		100	44.7 {4.56}	62.6	25.6		28.8		32.0			100	350
		125	35.8 {3.65}	78.3	32.0		36.0		40.0			125	410
		150	29.8 {3.04}	93.9	38.4		43.2		48.0			150	475
		175	25.6 {2.61}	109.6	44.8		50.4		56.0			175	530
30	15	25	221 {22.5}	15.7	6.4	1412 {144}	7.2	1589 {162}	8.0	1765 {180}	SWM	30– 25	185
		30	184 {18.8}	18.8	7.7		8.6		9.6			30	190
		35	158 {16.1}	21.9	9.0		10.1		11.2			35	210
		40	138 {14.1}	25.0	10.2		11.5		12.8			40	230
		45	123 {12.5}	28.2	11.5		13.0		14.4			45	250
		50	110 {11.3}	31.3	12.8		14.4		16.0			50	270
		55	100 {10.2}	34.4	14.1		15.8		17.6			55	275
		60	91.9 {9.38}	37.6	15.4		17.3		19.2			60	290
		65	84.9 {8.65}	40.7	16.6		18.7		20.8			65	310
		70	78.8 {8.04}	43.8	17.9		20.2		22.4			70	330
		75	73.5 {7.50}	47.0	19.2		21.6		24.0			75	340
		80	69.0 {7.03}	50.1	20.5		23.0		25.6			80	350
		90	61.3 {6.25}	56.3	23.0		25.9		28.8			90	380
		100	55.2 {5.63}	62.6	25.6		28.8		32.0			100	420
		125	44.1 {4.50}	78.3	32.0		36.0		40.0			125	500
		150	36.8 {3.75}	93.9	38.4		43.2		48.0			150	580
		175	31.5 {3.21}	109.6	44.8		50.4		56.0			175	670
		200	27.6 {2.81}	125.2	51.2		57.6		64.0			200	745
35	17.5	40	188 {19.1}	25.0	10.2	1921 {196}	11.5	2161 {220}	12.8	2401 {245}	SWM	35– 40	275
		45	167 {17.0}	28.2	11.5		12.9		14.4			45	300
		50	150 {15.3}	31.3	12.8		14.4		16.0			50	330
		55	136 {13.9}	34.4	14.1		15.8		17.6			55	350
		60	125 {12.8}	37.6	15.4		17.3		19.2			60	365
		65	115 {11.8}	40.7	16.6		18.7		20.8			65	390
		70	107 {10.9}	43.8	17.9		20.2		22.4			70	420
		75	100 {10.2}	47.0	19.2		21.6		24.0			75	440
		80	93.8 {9.57}	50.1	20.5		23.0		25.6			80	465
		90	83.4 {8.51}	56.3	23.0		25.9		28.8			90	500
		100	75.0 {7.66}	62.6	25.6		28.8		32.0			100	555
		125	60.0 {6.13}	78.3	32.0		36.0		40.0			125	670
		150	50.0 {5.10}	93.9	38.4		43.2		48.0			150	790
		175	42.9 {4.38}	109.6	44.8		50.4		56.0			175	900
		200	37.5 {3.83}	125.5	51.2		57.6		64.0			200	1,015
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times				

M SWOSC−V

●Load calculation method : N (load) = N/mm (spring constant) × F (deflection)
(International units) N = N/mm × Fmm
kgf = kgf/mm × Fmm
(kgf = N × 0.101972)

The solid height values are reference only. There may be some variations depending on lots.
Product Outline P.1056 Load-deflection diagram P.1094
Directions and precautions for coil springs P.1057

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×25.6% Fmm	Load N{kgf}	F=L×28.8% Fmm	Load N{kgf}	F=L×32% Fmm	Load N{kgf}	Catalog No. Type	D–L	U/Price Q'ty:1~19
40	20	40	245 {25.0}	25.0	10.2	2510 {256}	11.5	2824 {288}	12.8	3138 {320}	SWM	40– 40	330
		45	218 {22.2}	29.4	11.5		13.0		14.4			45	350
		50	196 {20.0}	31.3	12.8		14.4		16.0			50	365
		55	178 {18.2}	36.0	14.1		15.8		17.6			55	395
		60	163 {16.7}	37.6	15.4		17.3		19.2			60	420
		65	151 {15.4}	42.5	16.6		18.7		20.8			65	445
		70	140 {14.3}	43.8	17.9		20.2		22.4			70	470
		75	131 {13.3}	49.1	19.2		21.6		24.0			75	505
		80	123 {12.5}	50.1	20.5		23.0		25.6			80	525
		90	109 {11.1}	56.3	23.0		25.9		28.8			90	590
		100	98.1 {10.0}	62.6	25.6		28.8		32.0			100	640
		125	78.5 {8.00}	78.3	32.0		36.0		40.0			125	775
		150	65.4 {6.67}	93.9	38.4		43.2		48.0			150	915
		175	56.0 {5.71}	109.6	44.8		50.4		56.0			175	1,060
		200	49.0 {5.00}	125.5	51.2		57.6		64.0			200	1,200
		225	43.6 {4.44}	141.0	57.6		64.8		72.0			225	1,325
		250	39.2 {4.00}	156.5	64.0		72.0		80.0			250	1,440
		275	35.7 {3.64}	172.0	70.4		79.2		88.0			275	1,705
		300	32.7 {3.33}	196.2	76.8		86.4		96.0			300	1,950
50	25	50	306 {31.2}	31.3	12.8	3920 {400}	14.4	4410 {450}	16.0	4900 {500}	SWM	50– 50	600
		55	278 {28.4}	34.4	14.1		15.8		17.6			55	620
		60	255 {26.0}	37.6	15.4		17.3		19.2			60	630
		65	236 {24.0}	40.7	16.6		18.7		20.8			65	675
		70	219 {22.3}	43.8	17.9		20.2		22.4			70	715
		75	204 {20.8}	47.0	19.2		21.6		24.0			75	755
		80	191 {19.5}	50.1	20.5		23.0		25.6			80	785
		90	170 {17.3}	56.3	23.0		25.9		28.8			90	865
		100	153 {15.6}	62.6	25.6		28.8		32.0			100	945
		125	123 {12.5}	78.3	32.0		36.0		40.0			125	1,150
		150	102 {10.4}	93.9	38.4		43.2		48.0			150	1,365
		175	87.5 {8.92}	109.6	44.8		50.4		56.0			175	1,565
		200	76.6 {7.81}	125.2	51.2		57.6		64.0			200	1,780
		225	68.1 {6.94}	141.0	57.6		64.8		72.0			225	1,905
		250	61.3 {6.25}	156.5	64.0		72.0		80.0			250	2,150
		275	55.7 {5.68}	172.0	70.4		79.2		88.0			275	2,350
		300	51.0 {5.20}	187.8	76.8		86.4		96.0			300	2,540
		350	43.8 {4.46}	228.9	89.6		100.8		112.0			350	3,035
60	30	60	368 {37.5}	37.6	15.4	5645 {576}	17.3	6350 {648}	19.2	7056 {720}	SWM	60– 60	990
		70	315 {32.1}	43.8	17.9		20.2		22.4			70	1,000
		80	276 {28.1}	50.1	20.5		23.0		25.6			80	1,080
		90	245 {25.0}	56.3	23.0		25.9		28.8			90	1,175
		100	221 {22.5}	62.6	25.6		28.8		32.0			100	1,290
		125	176 {18.0}	78.3	32.0		36.0		40.0			125	1,565
		150	147 {15.0}	93.9	38.4		43.2		48.0			150	1,845
		175	126 {12.8}	109.6	44.8		50.4		56.0			175	2,125
		200	110 {11.2}	125.2	51.2		57.6		64.0			200	2,400
		225	98.0 {10.0}	141.0	57.6		64.8		72.0			225	2,670
		250	88.2 {8.99}	156.5	64.0		72.0		80.0			250	2,950
		275	80.2 {8.18}	172.0	70.4		79.2		88.0			275	3,190
		300	73.5 {7.49}	187.8	76.8		86.4		96.0			300	3,440
		350	63.0 {6.42}	228.9	89.6		100.8		112.0			350	4,020
70	38.5	70	372 {37.9}	45.8	17.9	6664 {680}	20.2	7497 {764}	22.4	8330 {850}	SWM	70– 70	1,770
		80	325 {33.2}	52.3	20.5		23.0		25.6			80	1,820
		90	289 {29.5}	58.9	23.0		25.9		28.8			90	1,885
		100	260 {26.5}	65.4	25.6		28.8		32.0			100	2,055
		125	208 {21.2}	81.8	32.0		36.0		40.0			125	2,480
		150	174 {17.7}	98.1	38.4		43.2		48.0			150	2,910
		175	149 {15.2}	114.5	44.8		50.4		56.0			175	3,250
		200	130 {13.3}	130.8	51.2		57.6		64.0			200	3,680
		250	104 {10.6}	163.5	64.0		72.0		80.0			250	4,450
		300	86.8 {8.85}	196.2	76.8		86.4		96.0			300	5,130
		350	74.4 {7.58}	228.9	89.6		100.8		112.0			350	5,900
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times				

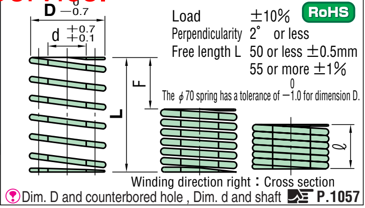
Alterations (NT) − Catalog No.
NT − SWM 30−40
5 Days

Alteration	Code	Spec.	Price
No painting	NT	**Paint peeling** Peel the coating by shot peening. Since the springs which have undergone the painting peeling are easy to rust, be careful in handling. A rusty spring could cause early breakage. Compared to painted springs, there may be some variations, etc. depending on the lot.	Details P.1093

PRESS ADD.SPEC. Printed in Red

COIL SPRINGS
—HEAVY LOAD SWH—

Light — Load — Heavy: SWH



Load ±10% RoHS
Perpendicularity 2° or less
Free length L 50 or less ±0.5mm
55 or more ±1%
The φ70 spring has a tolerance of $^{0}_{-1.0}$ for dimension D.

Dim. D and counterbored hole, Dim. d and shaft P.1057

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×19.2% Fmm	Load N{kgf}	F=L×21.6% Fmm	Load N{kgf}	F=L×24% Fmm	Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty:1~19
6	3	15	38.1 {3.9}	11.0	2.9	110 {11}	3.2	123 {13}	3.6	137 {14}	SWH 6— 15	110
		20	28.5 {2.9}	14.7	3.8		4.3		4.8		20	115
		25	22.8 {2.3}	18.4	4.8		5.4		6.0		25	115
		30	19.0 {1.9}	22.0	5.8		6.5		7.2		30	125
		35	16.3 {1.7}	25.7	6.7		7.6		8.4		35	135
		40	14.3 {1.5}	29.4	7.7		8.6		9.6		40	145
		45	12.7 {1.3}	33.0	8.6		9.7		10.8		45	155
		50	11.4 {1.2}	36.7	9.6		10.8		12.0		50	160
		55	10.4 {1.1}	40.4	10.6		11.9		13.2		55	170
		60	9.5 {1.0}	44.0	11.5		13.0		14.4		60	170
8	4	10	85.8 {8.8}	7.4	1.9	165 {17}	2.2	185 {19}	2.4	206 {21}	SWH 8— 10	75
		15	57.2 {5.8}	10.8	2.9		3.2		3.6		15	75
		20	42.9 {4.4}	14.4	3.8		4.3		4.8		20	85
		25	34.3 {3.5}	18.0	4.8		5.4		6.0		25	95
		30	28.6 {2.9}	21.6	5.8		6.5		7.2		30	115
		35	24.5 {2.5}	25.2	6.7		7.5		8.4		35	125
		40	21.5 {2.2}	28.8	7.7		8.6		9.6		40	135
		45	19.1 {1.9}	32.4	8.6		9.7		10.8		45	145
		50	17.2 {1.8}	36.0	9.6		10.8		12.0		50	155
		55	15.6 {1.6}	39.6	10.6		11.8		13.2		55	160
		60	14.3 {1.5}	43.2	11.5		13.0		14.4		60	170
		65	13.2 {1.3}	47.7	12.5		14.0		15.6		65	205
		70	12.3 {1.3}	51.4	13.4		15.1		16.8		70	225
		75	11.4 {1.2}	55.1	14.4		16.2		18.0		75	245
		80	10.7 {1.1}	58.7	15.4		17.3		19.2		80	265
10	5	10	123 {12.5}	7.4	1.9	235 {24}	2.2	265 {27}	2.4	294 {30}	SWH10— 10	80
		15	81.7 {8.3}	11.0	2.9		3.2		3.6		15	85
		20	61.3 {6.3}	14.4	3.8		4.3		4.8		20	85
		25	49.0 {5.0}	18.0	4.8		5.4		6.0		25	90
		30	40.8 {4.2}	21.6	5.8		6.5		7.2		30	95
		35	35.0 {3.6}	25.2	6.7		7.5		8.4		35	105
		40	30.6 {3.1}	28.8	7.7		8.6		9.6		40	115
		45	27.2 {2.8}	32.4	8.6		9.7		10.8		45	115
		50	24.5 {2.5}	36.0	9.6		10.8		12.0		50	125
		55	22.3 {2.3}	39.6	10.6		11.8		13.2		55	135
		60	20.4 {2.1}	43.2	11.5		13.0		14.4		60	145
		65	18.8 {1.9}	46.8	12.5		14.0		15.6		65	155
		70	17.5 {1.8}	50.4	13.4		15.1		16.8		70	155
		75	16.3 {1.7}	54.0	14.4		16.2		18.0		75	160
		80	15.3 {1.6}	57.6	15.4		17.3		19.2		80	170
		90	13.6 {1.4}	64.8	17.3		19.4		21.6		90	190
12	6	15	117 {11.9}	11.0	2.9	337 {34}	3.2	379 {38}	3.6	421 {43}	SWH12— 15	115
		20	87.7 {8.9}	14.4	3.8		4.3		4.8		20	115
		25	70.2 {7.2}	18.0	4.8		5.4		6.0		25	115
		30	58.5 {6.0}	21.6	5.8		6.5		7.2		30	125
		35	50.1 {5.1}	25.2	6.7		7.5		8.4		35	135
		40	43.9 {4.5}	28.8	7.7		8.6		9.6		40	145
		45	39.0 {4.0}	32.4	8.6		9.7		10.8		45	155
		50	35.1 {3.6}	36.0	9.6		10.8		12.0		50	160
		55	31.9 {3.3}	39.6	10.6		11.8		13.2		55	170
		60	29.2 {3.0}	43.2	11.5		13.0		14.4		60	170
		65	27.0 {2.8}	46.8	12.5		14.0		15.6		65	180
		70	25.1 {2.6}	50.4	13.4		15.1		16.8		70	180
		75	23.4 {2.4}	54.0	14.4		16.2		18.0		75	185
		80	21.9 {2.2}	57.6	15.4		17.3		19.2		80	200
		90	19.5 {2.0}	64.8	17.3		19.4		21.6		90	220
14	7	20	120 {12.3}	14.7	3.8	462 {47}	4.3	520 {53}	4.8	578 {59}	SWH14— 20	135
		25	96.3 {9.8}	18.0	4.8		5.4		6.0		25	135
		30	80.3 {8.2}	21.6	5.8		6.5		7.2		30	145
		35	68.8 {7.0}	25.2	6.7		7.5		8.4		35	155
		40	60.2 {6.1}	28.8	7.7		8.6		9.6		40	160
		45	53.5 {5.5}	32.4	8.6		9.7		10.8		45	170
		50	48.2 {4.9}	36.0	9.6		10.8		12.0		50	180
		55	43.8 {4.5}	39.6	10.6		11.8		13.2		55	185
		60	40.1 {4.1}	43.2	11.5		13.0		14.4		60	190
		65	37.1 {3.8}	46.8	12.5		14.0		15.6		65	190
		70	34.4 {3.5}	50.4	13.4		15.1		16.8		70	200
		75	32.1 {3.3}	54.0	14.4		16.2		18.0		75	210
		80	30.1 {3.1}	57.6	15.4		17.3		19.2		80	210
		90	26.8 {2.7}	64.8	17.3		19.4		21.6		90	230
		100	24.1 {2.5}	72.0	19.2		21.6		24.0		100	250
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times			

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×19.2% Fmm	Load N{kgf}	F=L×21.6% Fmm	Load N{kgf}	F=L×24% Fmm	Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty:1~19
16	8	20	157 {16.0}	14.7	3.8	604 {62}	4.3	680 {69}	4.8	755 {77}	SWH16— 20	155
		25	126 {12.8}	18.0	4.8		5.4		6.0		25	155
		30	105 {10.7}	21.6	5.8		6.5		7.2		30	160
		35	89.9 {9.2}	25.2	6.7		7.5		8.4		35	180
		40	78.6 {8.0}	28.8	7.7		8.6		9.6		40	185
		45	69.9 {7.1}	32.4	8.6		9.7		10.8		45	190
		50	62.9 {6.4}	36.0	9.6		10.8		12.0		50	210
		55	57.2 {5.8}	39.6	10.6		11.8		13.2		55	220
		60	52.4 {5.3}	43.2	11.5		13.0		14.4		60	230
		65	48.4 {4.9}	46.8	12.5		14.0		15.6		65	250
		70	44.9 {4.6}	50.4	13.4		15.1		16.8		70	260
		75	41.9 {4.3}	54.0	14.4		16.2		18.0		75	275
		80	39.3 {4.0}	57.6	15.4		17.3		19.2		80	285
		90	35.0 {3.6}	64.8	17.3		19.4		21.6		90	300
		100	31.5 {3.2}	72.0	19.2		21.6		24.0		100	330
18	9	20	198 {20.2}	14.7	3.8	761 {78}	4.3	856 {87}	4.8	951 {97}	SWH18— 20	155
		25	159 {16.2}	18.0	4.8		5.4		6.0		25	170
		30	132 {13.5}	21.6	5.8		6.5		7.2		30	185
		35	113 {11.5}	25.2	6.7		7.5		8.4		35	190
		40	99.1 {10.1}	28.8	7.7		8.6		9.6		40	200
		45	88.1 {9.0}	32.4	8.6		9.7		10.8		45	220
		50	79.3 {8.1}	36.0	9.6		10.8		12.0		50	230
		55	72.0 {7.3}	39.6	10.6		11.8		13.2		55	240
		60	66.0 {6.7}	43.2	11.5		13.0		14.4		60	260
		65	61.0 {6.2}	46.8	12.5		14.0		15.6		65	270
		70	56.6 {5.8}	50.4	13.4		15.1		16.8		70	275
		75	52.8 {5.4}	54.0	14.4		16.2		18.0		75	290
		80	49.5 {5.1}	57.6	15.4		17.3		19.2		80	300
		90	44.0 {4.5}	64.8	17.3		19.4		21.6		90	330
		100	39.6 {4.0}	72.0	19.2		21.6		24.0		100	350
20	10	20	245 {25.0}	14.7	3.8	941 {96}	4.3	1058 {108}	4.8	1176 {120}	SWH20— 20	155
		25	196 {20.0}	18.0	4.8		5.4		6.0		25	155
		30	163 {16.7}	21.6	5.8		6.5		7.2		30	160
		35	140 {14.3}	25.2	6.7		7.5		8.4		35	180
		40	123 {12.5}	28.8	7.7		8.6		9.6		40	185
		45	109 {11.1}	32.4	8.6		9.7		10.8		45	190
		50	98.0 {10.0}	36.0	9.6		10.8		12.0		50	210
		55	89.1 {9.1}	39.6	10.6		11.8		13.2		55	220
		60	81.7 {8.3}	43.2	11.5		13.0		14.4		60	230
		65	75.4 {7.7}	46.8	12.5		14.0		15.6		65	250
		70	70.0 {7.1}	50.4	13.4		15.1		16.8		70	260
		75	65.3 {6.7}	54.0	14.4		16.2		18.0		75	275
		80	61.3 {6.2}	57.6	15.4		17.3		19.2		80	285
		90	54.4 {5.6}	64.8	17.3		19.4		21.6		90	310
		100	49.0 {5.0}	72.0	19.2		21.6		24.0		100	330
		125	39.2 {4.0}	90.0	24.0		27.0		30.0		125	375
		150	32.7 {3.3}	108.0	28.8		32.4		36.0		150	430
22	11	25	237 {24.2}	18.0	4.8	1137 {116}	5.4	1279 {130}	6.0	1421 {145}	SWH22— 25	170
		30	197 {20.1}	21.6	5.8		6.5		7.2		30	180
		35	169 {17.3}	25.2	6.7		7.6		8.4		35	185
		40	148 {15.1}	28.8	7.7		8.6		9.6		40	190
		45	132 {13.4}	32.4	8.6		9.7		10.8		45	190
		50	118 {12.1}	36.0	9.6		10.8		12.0		50	200
		55	108 {11.0}	39.6	10.6		11.9		13.2		55	210
		60	98.7 {10.1}	43.2	11.5		13.0		14.4		60	220
		65	91.1 {9.3}	46.8	12.5		14.0		15.6		65	230
		70	84.6 {8.6}	50.4	13.4		15.1		16.8		70	240
		75	78.9 {8.1}	54.0	14.4		16.2		18.0		75	250
		80	74.0 {7.5}	57.6	15.4		17.3		19.2		80	260
		90	65.8 {6.7}	64.8	17.3		19.4		21.6		90	275
		100	59.2 {6.0}	72.0	19.2		21.6		24.0		100	300
		125	47.4 {4.8}	90.0	24.0		27.0		30.0		125	350
		150	39.5 {4.0}	108.0	28.8		32.4		36.0		150	400
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times			

Order Catalog No.: SWH 20—30

Delivery 1 Day

Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×19.2% Fmm	Load N{kgf}	F=L×21.6% Fmm	Load N{kgf}	F=L×24% Fmm	Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty:1~19
25	12.5	25	306 {31.2}	18.0	4.8	1466 {150}	5.4	1650 {168}	6.0	1833 {187}	SWH25— 25	180
		30	255 {26.0}	21.6	5.8		6.5		7.2		30	185
		35	218 {22.3}	25.2	6.7		7.6		8.4		35	190
		40	191 {19.5}	28.8	7.7		8.6		9.6		40	210
		45	170 {17.3}	32.4	8.6		9.7		10.8		45	220
		50	153 {15.6}	36.0	9.6		10.8		12.0		50	230
		55	139 {14.2}	39.6	10.6		11.9		13.2		55	250
		60	127 {13.0}	43.2	11.5		13.0		14.4		60	260
		65	118 {12.0}	46.8	12.5		14.0		15.6		65	275
		70	109 {11.1}	50.4	13.4		15.1		16.8		70	285
		75	102 {10.4}	54.0	14.4		16.2		18.0		75	290
		80	95.5 {9.7}	57.6	15.4		17.3		19.2		80	310
		90	84.9 {8.7}	64.8	17.3		19.4		21.6		90	330
		100	76.4 {7.8}	72.0	19.2		21.6		24.0		100	350
		125	61.1 {6.2}	90.0	24.0		27.0		30.0		125	420
		150	50.9 {5.2}	108.0	28.8		32.4		36.0		150	480
		175	43.6 {4.5}	126.0	33.6		37.8		42.0		175	545
27	13.5	25	358 {36.5}	18.0	4.8	1717 {175}	5.4	1931 {197}	6.0	2146 {219}	SWH27— 25	190
		30	298 {30.4}	21.6	5.8		6.5		7.2		30	200
		35	255 {26.1}	25.2	6.7		7.6		8.4		35	220
		40	224 {22.8}	28.8	7.7		8.6		9.6		40	230
		45	199 {20.3}	32.4	8.6		9.7		10.8		45	240
		50	179 {18.2}	36.0	9.6		10.8		12.0		50	260
		55	163 {16.6}	39.6	10.6		11.9		13.2		55	270
		60	149 {15.2}	43.2	11.5		13.0		14.4		60	275
		65	138 {14.0}	46.8	12.5		14.0		15.6		65	290
		70	128 {13.0}	50.4	13.4		15.1		16.8		70	300
		75	119 {12.2}	54.0	14.4		16.2		18.0		75	310
		80	112 {11.4}	57.6	15.4		17.3		19.2		80	330
		90	99.4 {10.1}	64.8	17.3		19.4		21.6		90	360
		100	89.4 {9.1}	72.0	19.2		21.6		24.0		100	400
		125	71.5 {7.3}	90.0	24.0		27.0		30.0		125	500
		150	59.6 {6.1}	108.0	28.8		32.4		36.0		150	580
		175	51.1 {5.2}	126.0	33.6		37.8		42.0		175	665
30	15	25	441 {45.0}	18.0	4.8	2117 {216}	5.4	2381 {243}	6.0	2646 {270}	SWH30— 25	210
		30	368 {37.5}	21.6	5.8		6.5		7.2		30	230
		35	315 {32.1}	25.2	6.7		7.6		8.4		35	250
		40	276 {28.1}	28.8	7.7		8.6		9.6		40	270
		45	245 {25.0}	32.4	8.6		9.7		10.8		45	275
		50	221 {22.5}	36.0	9.6		10.8		12.0		50	290
		55	200 {20.4}	39.6	10.6		11.9		13.2		55	310
		60	184 {18.7}	43.2	11.5		13.0		14.4		60	330
		65	170 {17.3}	46.8	12.5		14.0		15.6		65	340
		70	158 {16.1}	50.4	13.4		15.1		16.8		70	350
		75	147 {15.0}	54.0	14.4		16.2		18.0		75	365
		80	138 {14.1}	57.6	15.4		17.3		19.2		80	380
		90	123 {12.5}	64.8	17.3		19.4		21.6		90	430
		100	110 {11.2}	72.0	19.2		21.6		24.0		100	480
		125	88.2 {9.0}	90.0	24.0		27.0		30.0		125	580
		150	73.5 {7.5}	108.0	28.8		32.4		36.0		150	690
		175	63.0 {6.4}	126.0	33.6		37.8		42.0		175	810
		200	55.1 {5.6}	144.0	38.4		43.2		48.0		200	905
35	17.5	40	375 {38.2}	28.8	7.7	2878 {293}	8.6	3237 {330}	9.6	3597 {367}	SWH35— 40	310
		45	333 {34.0}	32.4	8.6		9.7		10.8		45	330
		50	300 {30.6}	36.0	9.6		10.8		12.0		50	360
		55	273 {27.8}	39.6	10.6		11.9		13.2		55	380
		60	250 {25.5}	43.2	11.5		13.0		14.4		60	420
		65	231 {23.5}	46.8	12.5		14.0		15.6		65	450
		70	214 {21.8}	50.4	13.4		15.1		16.8		70	475
		75	200 {20.4}	54.0	14.4		16.2		18.0		75	500
		80	187 {19.1}	57.6	15.4		17.3		19.2		80	520
		90	167 {17.0}	64.8	17.3		19.4		21.6		90	580
		100	150 {15.3}	72.0	19.2		21.6		24.0		100	635
		125	120 {12.2}	90.0	24.0		27.0		30.0		125	770
		150	99.9 {10.2}	108.0	28.8		32.4		36.0		150	905
		175	85.6 {8.7}	126.0	33.6		37.8		42.0		175	1,045
		200	74.9 {7.6}	144.0	38.4		43.2		48.0		200	1,185
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times			

M SWOSC—V

● Load calculation method : N (load) = N/mm (spring constant) × F (deflection)
(International units) N = N/mm × Fmm
kgf = kgf/mm × Fmm
(kgf = N × 0.101972)

The solid height values are reference only. There may be some variations depending on lots.

Product Outline P.1056 Load-deflection diagram P.1094
Directions and precautions for coil springs P.1057

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×19.2% Fmm	Load N{kgf}	F=L×21.6% Fmm	Load N{kgf}	F=L×24% Fmm	Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty:1~19
40	20	40	490 {50.0}	28.8	7.7	3763 {384}	8.6	4234 {432}	9.6	4704 {480}	SWH40— 40	345
		45	436 {44.4}	33.0	8.6		9.7		10.8		45	375
		50	392 {40.0}	36.0	9.6		10.8		12.0		50	405
		55	356 {36.3}	40.4	10.6		11.9		13.2		55	445
		60	327 {33.3}	43.2	11.5		13.0		14.4		60	460
		65	302 {30.7}	47.7	12.5		14.0		15.6		65	500
		70	280 {28.6}	50.4	13.4		15.1		16.8		70	525
		75	261 {26.6}	55.1	14.4		16.2		18.0		75	575
		80	245 {25.0}	57.6	15.4		17.3		19.2		80	600
		90	218 {22.2}	64.8	17.3		19.4		21.6		90	655
		100	196 {20.0}	72.0	19.2		21.6		24.0		100	720
		125	157 {16.0}	90.0	24.0		27.0		30.0		125	875
		150	131 {13.3}	108.0	28.8		32.4		36.0		150	1,025
		175	112 {11.4}	126.0	33.6		37.8		42.0		175	1,175
		200	98.0 {10.0}	144.0	38.4		43.2		48.0		200	1,330
		225	87.1 {8.9}	162.0	43.2		48.6		54.0		225	1,485
		250	78.4 {8.0}	180.0	48.0		54.0		60.0		250	1,635
		275	71.3 {7.3}	198.0	52.8		59.4		66.0		275	1,875
		300	65.3 {6.7}	220.2	57.6		64.8		72.0		300	2,095
50	25	50	613 {62.5}	36	9.6	5880 {600}	10.8	6615 {675}	12.0	7350 {750}	SWH50— 50	680
		55	557 {56.8}	39.6	10.6		11.9		13.2		55	700
		60	510 {52.0}	43.2	11.5		13.0		14.4		60	720
		65	471 {48.0}	46.8	12.5		14.0		15.6		65	765
		70	438 {44.6}	50.4	13.4		15.1		16.8		70	805
		75	408 {41.6}	54	14.4		16.2		18.0		75	855
		80	383 {39.0}	57.6	15.4		17.3		19.2		80	900
		90	340 {34.7}	64.8	17.3		19.4		21.6		90	990
		100	306 {31.2}	72	19.2		21.6		24.0		100	1,080
		125	245 {25.0}	90	24.0		27.0		30.0		125	1,305
		150	204 {20.8}	108	28.8		32.4		36.0		150	1,535
		175	175 {17.8}	126	33.6		37.8		42.0		175	1,770
		200	153 {15.6}	144	38.4		43.2		48.0		200	1,995
		225	136 {13.9}	162	43.2		48.6		54.0		225	2,225
		250	123 {12.5}	180	48.0		54.0		60.0		250	2,435
		275	111 {11.4}	198	52.8		59.4		66.0		275	2,685
		300	102 {10.4}	216	57.6		64.8		72.0		300	2,925
		350	87.5 {8.9}	256.9	67.2		75.6		84.0		350	3,375
60	30	60	735 {74.9}	43.2	11.5	8467 {863}	13.0	9526 {971}	14.4	10584 {1079}	SWH60— 60	1,060
		70	630 {64.2}	50.4	13.4		15.1		16.8		70	1,095
		80	551 {56.2}	57.6	15.4		17.3		19.2		80	1,220
		90	490 {50.0}	64.8	17.3		19.4		21.6		90	1,355
		100	441 {45.0}	72.0	19.2		21.6		24.0		100	1,475
		125	353 {36.0}	90.0	24.0		27.0		30.0		125	1,790
		150	294 {30.0}	108.0	28.8		32.4		36.0		150	2,105
		175	252 {25.7}	126.0	33.6		37.8		42.0		175	2,410
		200	221 {22.5}	144.0	38.4		43.2		48.0		200	2,730
		225	196 {20.0}	162.0	43.2		48.6		54.0		225	2,960
		250	176 {18.0}	180.0	48.0		54.0		60.0		250	3,195
		275	160 {16.4}	198.0	52.8		59.4		66.0		275	3,440
		300	147 {15.0}	216.0	57.6		64.8		72.0		300	3,685
		350	126 {12.8}	256.9	67.2		75.6		84.0		350	4,230
70	38.5	70	747 {76.2}	51.4	13.4	10046 {1024}	15.1	11301 {1152}	16.8	12557 {1280}	SWH70— 70	1,940
		80	654 {66.7}	58.7	15.4		17.3		19.2		80	2,000
		90	581 {59.3}	66.1	17.3		19.4		21.6		90	2,060
		100	523 {53.4}	72.0	19.2		21.6		24.0		100	2,130
		125	419 {42.7}	90.0	24.0		27.0		30.0		125	2,540
		150	349 {35.6}	108.0	28.8		32.4		36.0		150	2,975
		175	299 {30.5}	126.0	33.6		37.8		42.0		175	3,375
		200	262 {26.7}	144.0	38.4		43.2		48.0		200	3,765
		250	209 {21.3}	180.0	48.0		54.0		60.0		250	4,470
		300	174 {17.8}	216.0	57.6		64.8		72.0		300	5,285
		350	149 {15.2}	252.0	67.2		75.6		84.0		350	6,075
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times			

Alterations (NT)— Catalog No.
NT — SWH 30—50
5 Days

Alteration	Code	Spec.	Price
No painting	NT	**Paint peeling** Peel the coating by shot peening. Since the springs which have undergone the painting peeling are easy to rust, be careful in handling. A rusty spring could cause early breakage. Compared to painted springs, there may be some variations, etc. depending on the lot.	Details P.1093

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

PRESS ADD.SPEC. Printed in Red

COIL SPRINGS
—EXTRA HEAVY LOAD SWB—

Light — Load — Heavy: SWB

D $^{\ 0}_{-0.7}$ d $^{+0.7}_{+0.1}$

Load	±10%	RoHS
Perpendicularity	2° or less	
Free length L	50 or less ±0.5mm	
	55 or more ±1%	

The ϕ70 spring has a tolerance of $^{\ 0}_{-1.0}$ for dimension D.

Dim. D and counterbored hole , Dim. d and shaft P.1057

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×16% Fmm	F=L×16% Load N{kgf}	F=L×18% Fmm	F=L×18% Load N{kgf}	F=L×20% Fmm	F=L×20% Load N{kgf}	Catalog No. TypeD—L	U/Price Q'ty:1~19
6	3	15	59.0{6.0}	11.6	2.4	142{14}	2.7	159{16}	3.0	177{18}	SWB 6—15	140
		20	44.3{4.5}	15.5	3.2		3.6		4.0		20	145
		25	35.4{3.6}	19.4	4.0		4.5		5.0		25	155
		30	29.5{3.0}	23.2	4.8		5.4		6.0		30	155
		35	25.3{2.6}	27.1	5.6		6.3		7.0		35	160
		40	22.1{2.3}	31.0	6.4		7.2		8.0		40	170
		45	19.7{2.0}	34.8	7.2		8.1		9.0		45	185
		50	17.7{1.8}	38.7	8.0		9.0		10.0		50	190
		55	16.1{1.6}	42.6	8.8		9.9		11.0		55	200
		60	14.8{1.5}	46.4	9.6		10.8		12.0		60	210
8	4	10	162{16.5}	7.7	1.6	258{26}	1.8	291{30}	2.0	323{33}	SWB 8—10	105
		15	108{11.0}	11.6	2.4		2.7		3.0		15	105
		20	80.8{8.2}	15.9	3.2		3.6		4.0		20	115
		25	64.6{6.6}	19.4	4.0		4.5		5.0		25	125
		30	53.8{5.5}	23.2	4.8		5.4		6.0		30	135
		35	46.1{4.7}	27.1	5.6		6.3		7.0		35	145
		40	40.4{4.1}	31.0	6.4		7.2		8.0		40	155
		45	35.9{3.7}	34.8	7.2		8.1		9.0		45	160
		50	32.3{3.3}	38.7	8.0		9.0		10.0		50	170
		55	29.4{3.0}	42.6	8.8		9.9		11.0		55	180
		60	26.9{2.7}	46.4	9.6		10.8		12.0		60	185
		65	24.8{2.5}	50.3	10.4		11.7		13.0		65	215
		70	23.1{2.4}	54.2	11.2		12.6		14.0		70	235
		75	21.5{2.2}	58.1	12.0		13.5		15.0		75	255
		80	20.2{2.1}	61.9	12.8		14.4		16.0		80	275
10	5	10	221{22.5}	7.7	1.6	353{36}	1.8	397{41}	2.0	441{45}	SWB10—10	105
		15	147{15.0}	11.6	2.4		2.7		3.0		15	105
		20	110{11.2}	15.5	3.2		3.6		4.0		20	105
		25	88.2{9.0}	19.4	4.0		4.5		5.0		25	115
		30	73.5{7.5}	23.2	4.8		5.4		6.0		30	125
		35	63.0{6.4}	27.1	5.6		6.3		7.0		35	135
		40	55.1{5.6}	31.0	6.4		7.2		8.0		40	145
		45	49.0{5.0}	34.8	7.2		8.1		9.0		45	155
		50	44.1{4.5}	38.7	8.0		9.0		10.0		50	155
		55	40.1{4.1}	42.6	8.8		9.9		11.0		55	160
		60	36.8{3.7}	46.4	9.6		10.8		12.0		60	170
		65	33.9{3.5}	50.3	10.4		11.7		13.0		65	180
		70	31.5{3.2}	54.2	11.2		12.6		14.0		70	185
		75	29.4{3.0}	58.1	12.0		13.5		15.0		75	190
		80	27.6{2.8}	61.9	12.8		14.4		16.0		80	200
		90	24.5{2.5}	69.7	14.4		16.2		18.0		90	220
12	6	15	190{19.3}	11.6	2.4	455{46}	2.7	512{52}	3.0	569{58}	SWB12—15	145
		20	142{14.5}	15.5	3.2		3.6		4.0		20	145
		25	114{11.6}	19.4	4.0		4.5		5.0		25	155
		30	94.8{9.7}	23.2	4.8		5.4		6.0		30	155
		35	81.3{8.3}	27.1	5.6		6.3		7.0		35	160
		40	71.1{7.3}	31.0	6.4		7.2		8.0		40	170
		45	63.2{6.4}	34.8	7.2		8.1		9.0		45	185
		50	56.9{5.8}	38.7	8.0		9.0		10.0		50	190
		55	51.7{5.3}	42.6	8.8		9.9		11.0		55	200
		60	47.4{4.8}	46.4	9.6		10.8		12.0		60	210
		65	43.8{4.5}	50.3	10.4		11.7		13.0		65	220
		70	40.6{4.1}	54.2	11.2		12.6		14.0		70	230
		75	37.9{3.9}	58.1	12.0		13.5		15.0		75	240
		80	35.6{3.6}	61.9	12.8		14.4		16.0		80	260
		90	31.6{3.2}	69.7	14.4		16.2		18.0		90	280
14	7	20	184{18.8}	15.5	3.2	589{60}	3.6	662{68}	4.0	736{75}	SWB14—20	170
		25	147{15.0}	19.4	4.0		4.5		5.0		25	170
		30	123{12.5}	23.2	4.8		5.4		6.0		30	170
		35	105{10.7}	27.1	5.6		6.3		7.0		35	180
		40	92.0{9.4}	31.0	6.4		7.2		8.0		40	185
		45	81.8{8.3}	34.8	7.2		8.1		9.0		45	190
		50	73.6{7.5}	38.7	8.0		9.0		10.0		50	200
		55	66.9{6.8}	42.6	8.8		9.9		11.0		55	220
		60	61.3{6.3}	46.4	9.6		10.8		12.0		60	230
		65	56.6{5.8}	50.3	10.4		11.7		13.0		65	250
		70	52.6{5.4}	54.2	11.2		12.6		14.0		70	260
		75	49.1{5.0}	58.1	12.0		13.5		15.0		75	270
		80	46.0{4.7}	61.9	12.8		14.4		16.0		80	275
		90	40.9{4.2}	69.7	14.4		16.2		18.0		90	285
		100	36.8{3.8}	77.4	16.0		18.0		20.0		100	305
Operation frequency					1×10^5 times		5×10^5 times		3×10^5 times			

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×16% Fmm	F=L×16% Load N{kgf}	F=L×18% Fmm	F=L×18% Load N{kgf}	F=L×20% Fmm	F=L×20% Load N{kgf}	Catalog No. TypeD—L	U/Price Q'ty:1~19
16	8	20	245{25.0}	15.5	3.2	784{80}	3.6	882{90}	4.0	980{100}	SWB16—20	180
		25	196{20.0}	19.4	4.0		4.5		5.0		25	180
		30	163{16.7}	23.2	4.8		5.4		6.0		30	185
		35	140{14.3}	27.1	5.6		6.3		7.0		35	190
		40	123{12.5}	31.0	6.4		7.2		8.0		40	200
		45	109{11.1}	34.8	7.2		8.1		9.0		45	220
		50	98.0{10.0}	38.7	8.0		9.0		10.0		50	230
		55	89.1{9.1}	42.6	8.8		9.9		11.0		55	250
		60	81.7{8.3}	46.4	9.6		10.8		12.0		60	260
		65	75.4{7.7}	50.3	10.4		11.7		13.0		65	275
		70	70.0{7.1}	54.2	11.2		12.6		14.0		70	285
		75	65.3{6.7}	58.1	12.0		13.5		15.0		75	300
		80	61.3{6.3}	61.9	12.8		14.4		16.0		80	320
		90	54.4{5.6}	69.7	14.4		16.2		18.0		90	330
		100	49.0{5.0}	77.4	16.0		18.0		20.0		100	350
18	9	20	306{31.2}	15.5	3.2	980{100}	3.6	1103{113}	4.0	1225{125}	SWB18—20	180
		25	245{25.0}	19.4	4.0		4.5		5.0		25	180
		30	204{20.8}	23.2	4.8		5.4		6.0		30	185
		35	175{17.8}	27.1	5.6		6.3		7.0		35	200
		40	153{15.6}	31.0	6.4		7.2		8.0		40	210
		45	136{13.9}	34.8	7.2		8.1		9.0		45	230
		50	123{12.5}	38.7	8.0		9.0		10.0		50	240
		55	111{11.4}	42.6	8.8		9.9		11.0		55	260
		60	102{10.4}	46.4	9.6		10.8		12.0		60	270
		65	94.2{9.6}	50.3	10.4		11.7		13.0		65	285
		70	87.5{8.9}	54.2	11.2		12.6		14.0		70	290
		75	81.7{8.3}	58.1	12.0		13.5		15.0		75	310
		80	76.6{7.8}	61.9	12.8		14.4		16.0		80	330
		90	68.1{6.9}	69.7	14.4		16.2		18.0		90	360
		100	61.3{6.2}	77.4	16.0		18.0		20.0		100	390
20	10	20	392{40.0}	15.5	3.2	1254{128}	3.6	1411{144}	4.0	1568{160}	SWB20—20	180
		25	314{32.0}	19.4	4.0		4.5		5.0		25	180
		30	261{26.6}	23.2	4.8		5.4		6.0		30	185
		35	224{22.8}	27.1	5.6		6.3		7.0		35	190
		40	196{20.0}	31.0	6.4		7.2		8.0		40	210
		45	174{17.8}	34.8	7.2		8.1		9.0		45	230
		50	157{16.0}	38.7	8.0		9.0		10.0		50	250
		55	143{14.5}	42.6	8.8		9.9		11.0		55	270
		60	131{13.3}	46.4	9.6		10.8		12.0		60	275
		65	121{12.3}	50.3	10.4		11.7		13.0		65	290
		70	112{11.4}	54.2	11.2		12.6		14.0		70	310
		75	105{10.7}	58.1	12.0		13.5		15.0		75	330
		80	98.0{10.0}	61.9	12.8		14.4		16.0		80	340
		90	87.1{8.9}	69.7	14.4		16.2		18.0		90	365
		100	78.4{8.0}	77.4	16.0		18.0		20.0		100	400
		125	62.7{6.4}	96.8	20.0		22.5		25.0		125	475
		150	52.3{5.3}	116.1	24.0		27.0		30.0		150	545
22	11	25	382{39.0}	19.4	4.0	1530{156}	4.5	1721{175}	5.0	1912{195}	SWB22—25	180
		30	319{32.5}	23.2	4.8		5.4		6.0		30	190
		35	273{27.9}	27.1	5.6		6.3		7.0		35	200
		40	239{24.4}	31.0	6.4		7.2		8.0		40	220
		45	212{21.7}	34.8	7.2		8.1		9.0		45	240
		50	191{19.5}	38.7	8.0		9.0		10.0		50	260
		55	174{17.7}	42.6	8.8		9.9		11.0		55	275
		60	159{16.2}	46.4	9.6		10.8		12.0		60	285
		65	147{15.0}	50.3	10.4		11.7		13.0		65	300
		70	137{13.9}	54.2	11.2		12.6		14.0		70	320
		75	127{13.0}	58.1	12.0		13.5		15.0		75	330
		80	120{12.2}	61.9	12.8		14.4		16.0		80	350
		90	106{10.8}	69.7	14.4		16.2		18.0		90	375
		100	95.6{9.8}	77.4	16.0		18.0		20.0		100	410
		125	76.5{7.8}	96.8	20.0		22.5		25.0		125	490
		150	63.7{6.5}	116.1	24.0		27.0		30.0		150	565
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times			

Order — Catalog No.: SWB 20—80

Delivery — 1 Day

Price — ■Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×16% Fmm	F=L×16% Load N{kgf}	F=L×18% Fmm	F=L×18% Load N{kgf}	F=L×20% Fmm	F=L×20% Load N{kgf}	Catalog No. TypeD—L	U/Price Q'ty:1~19
25	12.5	25	481{49.0}	19.0	4.0	1922{196}	4.5	2162{220}	5.0	2403{245}	SWB25—25	185
		30	400{40.8}	22.8	4.8		5.4		6.0		30	190
		35	343{35.0}	26.6	5.6		6.3		7.0		35	210
		40	300{30.6}	30.4	6.4		7.2		8.0		40	230
		45	267{27.2}	34.2	7.2		8.1		9.0		45	250
		50	240{24.5}	38.0	8.0		9.0		10.0		50	270
		55	218{22.3}	41.8	8.8		9.9		11.0		55	275
		60	200{20.4}	45.6	9.6		10.8		12.0		60	290
		65	185{18.8}	49.4	10.4		11.7		13.0		65	310
		70	172{17.5}	53.2	11.2		12.6		14.0		70	330
		75	160{16.3}	57.0	12.0		13.5		15.0		75	340
		80	150{15.3}	60.8	12.8		14.4		16.0		80	350
		90	133{13.6}	68.4	14.4		16.2		18.0		90	380
		100	120{12.2}	76.0	16.0		18.0		20.0		100	420
		125	96.1{9.8}	95.0	20.0		22.5		25.0		125	500
		150	80.1{8.2}	114.0	24.0		27.0		30.0		150	580
		175	68.6{7.0}	133.0	28.0		31.5		35.0		175	670
27	13.5	25	569{58.0}	19.0	4.0	2275{232}	4.5	2560{261}	5.0	2844{290}	SWB27—25	200
		30	474{48.3}	22.8	4.8		5.4		6.0		30	220
		35	406{41.4}	26.6	5.6		6.3		7.0		35	240
		40	355{36.2}	30.4	6.4		7.2		8.0		40	260
		45	316{32.2}	34.2	7.2		8.1		9.0		45	275
		50	284{29.0}	38.0	8.0		9.0		10.0		50	285
		55	259{26.4}	41.8	8.8		9.9		11.0		55	300
		60	237{24.2}	45.6	9.6		10.8		12.0		60	320
		65	219{22.3}	49.4	10.4		11.7		13.0		65	330
		70	203{20.7}	53.2	11.2		12.6		14.0		70	350
		75	190{19.3}	57.0	12.0		13.5		15.0		75	360
		80	178{18.1}	60.8	12.8		14.4		16.0		80	375
		90	158{16.1}	68.4	14.4		16.2		18.0		90	430
		100	142{14.5}	76.0	16.0		18.0		20.0		100	475
		125	114{11.6}	95.0	20.0		22.5		25.0		125	580
		150	94.8{9.7}	114.0	24.0		27.0		30.0		150	680
		175	81.3{8.3}	133.0	28.0		31.5		35.0		175	790
30	15	25	706{72.0}	19.0	4.0	2824{288}	4.5	3177{324}	5.0	3530{360}	SWB30—25	220
		30	588{60.0}	22.8	4.8		5.4		6.0		30	240
		35	504{51.4}	26.6	5.6		6.3		7.0		35	270
		40	441{45.0}	30.4	6.4		7.2		8.0		40	275
		45	392{40.0}	34.2	7.2		8.1		9.0		45	300
		50	353{36.0}	38.0	8.0		9.0		10.0		50	320
		55	321{32.7}	41.8	8.8		9.9		11.0		55	340
		60	294{30.0}	45.6	9.6		10.8		12.0		60	350
		65	272{27.7}	49.4	10.4		11.7		13.0		65	375
		70	252{25.7}	53.2	11.2		12.6		14.0		70	390
		75	235{24.0}	57.0	12.0		13.5		15.0		75	420
		80	221{22.5}	60.8	12.8		14.4		16.0		80	430
		90	196{20.0}	68.4	14.4		16.2		18.0		90	475
		100	177{18.0}	76.0	16.0		18.0		20.0		100	500
		125	141{14.4}	95.0	20.0		22.5		25.0		125	610
		150	118{12.0}	114.0	24.0		27.0		30.0		150	710
		175	101{10.3}	133.0	28.0		31.5		35.0		175	815
		200	88.3{9.0}	152.0	32.0		36.0		40.0		200	915
35	17.5	40	600{61.2}	31.0	6.4	3842{392}	7.2	4322{441}	8.0	4802{490}	SWB35—40	330
		45	534{54.4}	34.8	7.2		8.1		9.0		45	350
		50	480{49.0}	38.7	8.0		9.0		10.0		50	380
		55	437{44.5}	42.6	8.8		9.9		11.0		55	420
		60	400{40.8}	46.4	9.6		10.8		12.0		60	450
		65	369{37.7}	50.3	10.4		11.7		13.0		65	480
		70	343{35.0}	54.2	11.2		12.6		14.0		70	500
		75	320{32.6}	58.1	12.0		13.5		15.0		75	540
		80	300{30.6}	61.9	12.8		14.4		16.0		80	570
		90	267{27.2}	69.7	14.4		16.2		18.0		90	635
		100	240{24.5}	77.4	16.0		18.0		20.0		100	690
		125	192{19.6}	96.8	20.0		22.5		25.0		125	835
		150	160{16.3}	116.1	24.0		27.0		30.0		150	970
		175	137{14.0}	135.5	28.0		31.5		35.0		175	1,115
		200	120{12.2}	154.8	32.0		36.0		40.0		200	1,250
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times			

M SWOSC—V

●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

The solid height values are reference only. There may be some variations depending on lots.

Product Outline P.1056 Load-deflection diagram P.1094

Directions and precautions for coil springs P.1057

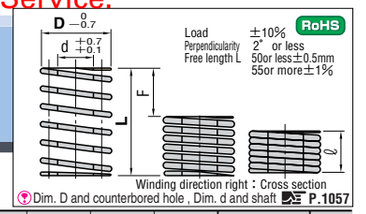
D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×16% Fmm	F=L×16% Load N{kgf}	F=L×18% Fmm	F=L×18% Load N{kgf}	F=L×20% Fmm	F=L×20% Load N{kgf}	Catalog No. TypeD—L	U/Price Q'ty:1~19
40	20	40	784{79.9}	31.0	6.4	5018{512}	7.2	5645{576}	8.0	6272{640}	SWB40—40	420
		45	697{71.1}	34.8	7.2		8.1		9.0		45	450
		50	627{64.0}	38.7	8.0		9.0		10.0		50	480
		55	570{58.1}	42.6	8.8		9.9		11.0		55	500
		60	523{53.3}	46.4	9.6		10.8		12.0		60	525
		65	482{49.2}	50.3	10.4		11.7		13.0		65	560
		70	448{45.7}	54.2	11.2		12.6		14.0		70	590
		75	418{42.6}	58.1	12.0		13.5		15.0		75	625
		80	392{40.0}	61.9	12.8		14.4		16.0		80	650
		90	348{35.5}	69.7	14.4		16.2		18.0		90	715
		100	314{32.0}	77.4	16.0		18.0		20.0		100	770
		125	251{25.6}	96.8	20.0		22.5		25.0		125	925
		150	209{21.3}	116.1	24.0		27.0		30.0		150	1,080
		175	179{18.3}	135.5	28.0		31.5		35.0		175	1,240
		200	157{16.0}	154.8	32.0		36.0		40.0		200	1,400
		225	139{14.2}	174.2	36.0		40.5		45.0		225	1,565
		250	125{12.8}	193.5	40.0		45.0		50.0		250	1,710
		275	114{11.6}	212.9	44.0		49.5		55.0		275	1,980
		300	105{10.7}	232.2	48.0		54.0		60.0		300	2,225
50	25	50	980{100.0}	38.7	8.0	7840{800}	9.0	8820{900}	10.0	9800{1000}	SWB50—50	730
		55	891{90.9}	42.6	8.8		9.9		11.0		55	750
		60	817{83.3}	46.4	9.6		10.8		12.0		60	765
		65	754{76.9}	50.3	10.4		11.7		13.0		65	820
		70	700{71.4}	54.2	11.2		12.6		14.0		70	875
		75	653{66.7}	58.1	12.0		13.5		15.0		75	935
		80	613{62.5}	61.9	12.8		14.4		16.0		80	975
		90	544{55.6}	69.7	14.4		16.2		18.0		90	1,080
		100	490{50.0}	77.4	16.0		18.0		20.0		100	1,185
		125	392{40.0}	96.8	20.0		22.5		25.0		125	1,430
		150	327{33.3}	116.1	24.0		27.0		30.0		150	1,690
		175	280{28.6}	135.5	28.0		31.5		35.0		175	1,935
		200	245{25.0}	154.8	32.0		36.0		40.0		200	2,185
		225	218{22.2}	174.2	36.0		40.5		45.0		225	2,435
		250	196{20.0}	193.5	40.0		45.0		50.0		250	2,670
		275	178{18.2}	212.9	44.0		49.5		55.0		275	2,925
		300	163{16.7}	232.2	48.0		54.0		60.0		300	3,160
		350	140{14.3}	270.9	56.0		63.0		70.0		350	3,765
60	30	60	1176{120.0}	46.4	9.6	11290{1152}	10.8	12701{1296}	12.0	14112{1440}	SWB60—60	1,265
		70	1008{102.9}	53.2	11.2		12.6		14.0		70	1,380
		80	882{90.0}	61.9	12.8		14.4		16.0		80	1,455
		90	784{80.0}	69.7	14.4		16.2		18.0		90	1,500
		100	706{72.0}	77.4	16.0		18.0		20.0		100	1,625
		125	564{57.6}	96.8	20.0		22.5		25.0		125	1,935
		150	470{48.0}	116.1	24.0		27.0		30.0		150	2,250
		175	403{41.1}	135.5	28.0		31.5		35.0		175	2,560
		200	353{36.0}	154.8	32.0		36.0		40.0		200	2,875
		225	314{32.0}	174.2	36.0		40.5		45.0		225	3,140
		250	282{28.8}	154.8	40.0		45.0		50.0		250	3,420
		275	257{26.2}	212.9	44.0		49.5		55.0		275	3,700
		300	235{24.0}	270.9	48.0		54.0		60.0		300	3,985
		350	202{20.6}	54.2	56.0		63.0		70.0		350	4,705
70	38.5	70	1219{124.3}	61.9	11.2	13655{1392}	12.6	15362{1567}	14.0	17069{1740}	SWB70—70	2,155
		80	1067{108.8}	69.7	12.8		14.4		16.0		80	2,225
		90	948{96.7}	77.4	14.4		16.2		18.0		90	2,295
		100	853{87.0}	96.8	16.0		18.0		20.0		100	2,420
		125	683{69.6}	116.1	20.0		22.5		25.0		125	2,825
		150	569{58.0}	135.5	24.0		27.0		30.0		150	3,300
		175	488{49.7}	154.8	28.0		31.5		35.0		175	3,745
		200	427{43.5}	193.5	32.0		36.0		40.0		200	4,185
		250	341{34.8}	232.2	40.0		45.0		50.0		250	4,975
		300	284{29.0}	270.9	48.0		54.0		60.0		300	5,900
		350	244{24.9}		56.0		63.0		70.0		350	6,780
Operation frequency					1×10^6 times		5×10^5 times		3×10^5 times			

Alterations — (NT)— Catalog No.: NT — SWB 30—60 — 5 Days

Alteration	Code	Spec.	Price
No painting	NT	**Paint peeling** Peel the coating by shot peening. Since the springs which have undergone the painting peeling are easy to rust, be careful in handling. A rusty spring could cause early breakage. Compared to painted springs, there may be some variations, etc. depending on the lot.	Details P.1093

COIL SPRINGS
—SUPER HEAVY LOAD TYPE SWG—

Light ← Load → Heavy
SWG



Dim. D and counterbored hole , Dim. d and shaft P.1057

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=LX16% Fmm	F=LX16% Load N{kgf}	F=LX18% Fmm	F=LX18% Load N{kgf}	F=LX20% Fmm	F=LX20% Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty :1~19
10	5	15	163 {16.7}	11.4	2.4		2.7		Outside allowable range		SWG 10— 15	155
		20	123 {12.5}	15.0	3.2		3.6		4.0		20	155
		25	98.1 {10.0}	19.0	4.0		4.5		5.0		25	165
		30	81.7 { 8.3}	22.8	4.8		5.4		6.0		30	175
		35	70.0 { 7.1}	26.6	5.6		6.3		7.0		35	185
		40	61.3 { 6.3}	30.4	6.4		7.2		8.0		40	195
		45	54.5 { 5.6}	34.2	7.2		8.1		9.0		45	205
		50	49.0 { 5 }	38.0	8.0	392	9.0	441	10.0	490	50	215
		55	44.6 { 4.5}	41.8	8.8	{40}	9.9	{45}	11.0	{50}	55	225
		60	40.9 { 4.2}	45.6	9.6		10.8		12.0		60	235
		65	37.7 { 3.8}	49.4	10.4		11.7		13.0		65	260
		70	35.0 { 3.6}	53.2	11.2		12.6		14.0		70	265
		75	32.7 { 3.3}	57.0	12.0		13.5		15.0		75	275
		80	30.6 { 3.1}	60.8	12.8		14.4		16.0		80	290
		90	27.2 { 2.8}	68.4	14.4		16.2		18.0		90	320
		100	24.5 { 2.5}	76.0	16.0		18.0		20.0		100	335
12	6	15	245 {25.0}	11.4	2.4		2.7		Outside allowable range		SWG 12— 15	210
		20	184 {18.8}	15.0	3.2		3.6		4.0		20	210
		25	147 {15.0}	19.0	4.0		4.5		5.0		25	215
		30	123 {12.5}	22.8	4.8		5.4		6.0		30	220
		35	105 {10.7}	26.6	5.6		6.3		7.0		35	225
		40	91.9 { 9.4}	30.4	6.4		7.2		8.0		40	235
		45	81.7 { 8.3}	34.2	7.2		8.1		9.0		45	250
		50	73.5 { 7.5}	38.0	8.0	588	9.0	662	10.0	735	50	265
		55	66.9 { 6.8}	41.8	8.8	{60}	9.9	{68}	11.0	{75}	55	280
		60	61.3 { 6.3}	45.6	9.6		10.8		12.0		60	295
		65	56.6 { 5.8}	49.4	10.4		11.7		13.0		65	315
		70	52.5 { 5.4}	53.2	11.2		12.6		14.0		70	330
		75	49.0 { 5.0}	57.0	12.0		13.5		15.0		75	345
		80	46.0 { 4.7}	60.8	12.8		14.4		16.0		80	370
		90	40.9 { 4.2}	68.4	14.4		16.2		18.0		90	395
		100	36.8 { 3.8}	76.0	16.0		18.0		20.0		100	420
14	7	20	238 {24.3}	15.2	3.2		3.6		Outside allowable range		SWG 14— 20	240
		25	190 {19.4}	19.0	4.0		4.5		5.0		25	240
		30	159 {16.2}	22.8	4.8		5.4		6.0		30	235
		35	136 {13.9}	26.6	5.6		6.3		7.0		35	245
		40	119 {12.1}	30.4	6.4		7.2		8.0		40	255
		45	106 {10.8}	34.2	7.2		8.1		9.0		45	265
		50	95.1 { 9.7}	38.0	8.0	761	9.0	856	10.0	951	50	280
		55	86.5 { 8.8}	41.8	8.8	{78}	9.9	{87}	11.0	{97}	55	300
		60	79.3 { 8.1}	45.6	9.6		10.8		12.0		60	320
		65	73.2 { 7.5}	49.4	10.4		11.7		13.0		65	350
		70	67.9 { 6.9}	53.2	11.2		12.6		14.0		70	365
		75	63.4 { 6.5}	57.0	12.0		13.5		15.0		75	380
		80	59.5 { 6.1}	60.8	12.8		14.4		16.0		80	385
		90	52.8 { 5.4}	68.4	14.4		16.2		18.0		90	400
		100	47.6 { 4.9}	76.0	16.0		18.0		20.0		100	430
16	8	20	319 {32.5}	15.2	3.2		3.6		Outside allowable range		SWG 16— 20	250
		25	255 {26.0}	19.0	4.0		4.5		5.0		25	250
		30	212 {21.7}	22.8	4.8		5.4		6.0		30	250
		35	182 {18.6}	26.6	5.6		6.3		7.0		35	265
		40	159 {16.3}	30.4	6.4		7.2		8.0		40	280
		45	142 {14.4}	34.2	7.2		8.1		9.0		45	300
		50	127 {13.0}	38.0	8.0		9.0		10.0		50	320
		55	116 {11.8}	41.8	8.8	1020	9.9	1147	11.0	1275	55	340
		60	106 {10.8}	45.6	9.6	{104}	10.8	{117}	12.0	{130}	60	360
		65	98.1 {10.0}	49.4	10.4		11.7		13.0		65	385
		70	91.1 { 9.3}	53.2	11.2		12.6		14.0		70	400
		75	85.0 { 8.7}	57.0	12.0		13.5		15.0		75	420
		80	79.7 { 8.1}	60.8	12.8		14.4		16.0		80	445
		90	70.8 { 7.2}	68.4	14.4		16.2		18.0		90	470
		100	63.7 { 6.5}	76.0	16.0		18.0		20.0		100	495
Operation frequency					1X10⁶ times		5X10⁵ times		3X10⁵ times			

The maximum deflection of a spring that has an "Outside allowable range" is 18%.
Do not use a spring that deflects by more than 18%.

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=LX16% Fmm	F=LX16% Load N{kgf}	F=LX18% Fmm	F=LX18% Load N{kgf}	F=LX20% Fmm	F=LX20% Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty :1~19
18	9	20	392 {40.0}	15.2	3.2		3.6		Outside allowable range		SWG 18— 20	255
		25	314 {32.0}	19.0	4.0		4.5		5.0		25	255
		30	262 {26.7}	22.8	4.8		5.4		6.0		30	255
		35	224 {22.9}	26.6	5.6		6.3		7.0		35	275
		40	196 {20.0}	30.4	6.4		7.2		8.0		40	295
		45	174 {17.8}	34.2	7.2		8.1		9.0		45	315
		50	157 {16.0}	38.0	8.0	1255	9.0	1412	10.0	1569	50	335
		55	143 {14.5}	41.8	8.8	{128}	9.9	{144}	11.0	{160}	55	355
		60	131 {13.3}	45.6	9.6		10.8		12.0		60	375
		65	121 {12.3}	49.4	10.4		11.7		13.0		65	400
		70	112 {11.4}	53.2	11.2		12.6		14.0		70	415
		75	105 {10.7}	57.0	12.0		13.5		15.0		75	435
		80	98.1 {10.0}	60.8	12.8		14.4		16.0		80	465
		90	87.2 { 8.9}	68.4	14.4		16.2		18.0		90	510
		100	78.5 { 8.0}	76.0	16.0		18.0		20.0		100	550
20	10	20	515 {52.5}	15.2	3.2		3.6		Outside allowable range		SWG 20— 20	260
		25	412 {42.0}	19.0	4.0		4.5		5.0		25	260
		30	343 {35.0}	22.8	4.8		5.4		6.0		30	260
		35	294 {30.0}	26.6	5.6		6.3		7.0		35	280
		40	257 {26.3}	30.4	6.4		7.2		8.0		40	300
		45	229 {23.3}	34.2	7.2		8.1		9.0		45	320
		50	206 {21.0}	38.0	8.0	1648	9.0	1853	10.0	2059	50	340
		55	187 {19.1}	41.8	8.8	{168}	9.9	{189}	11.0	{210}	55	360
		60	172 {17.5}	45.6	9.6		10.8		12.0		60	380
		65	158 {16.2}	49.4	10.4		11.7		13.0		65	405
		70	147 {15.0}	53.2	11.2		12.6		14.0		70	430
		75	137 {14.0}	57.0	12.0		13.5		15.0		75	455
		80	129 {13.1}	60.8	12.8		14.4		16.0		80	480
		90	114 {11.7}	68.4	14.4		16.2		18.0		90	510
		100	103 {10.5}	76.0	16.0		18.0		20.0		100	555
		125	82.4 { 8.4}	95.0	20.0		22.5		25.0		125	680
22	11	20	588 {60.0}	15.2	3.2		3.6		Outside allowable range		SWG 22— 20	265
		25	471 {48.0}	19.0	4.0		4.5		5.0		25	265
		30	392 {40.0}	22.8	4.8		5.4		6.0		30	265
		35	336 {34.3}	26.6	5.6		6.3		7.0		35	285
		40	294 {30.0}	30.4	6.4		7.2		8.0		40	305
		45	262 {26.7}	34.2	7.2		8.1		9.0		45	325
		50	235 {24.0}	38.0	8.0		9.0		10.0		50	345
		55	214 {21.8}	41.8	8.8	1883	9.9	2118	11.0	2354	55	365
		60	196 {20.0}	45.6	9.6	{192}	10.8	{216}	12.0	{240}	60	385
		65	181 {18.5}	49.4	10.4		11.7		13.0		65	410
		70	168 {17.1}	53.2	11.2		12.6		14.0		70	435
		75	157 {16.0}	57.0	12.0		13.5		15.0		75	460
		80	147 {15.0}	60.8	12.8		14.4		16.0		80	485
		90	131 {13.3}	68.4	14.4		16.2		18.0		90	515
		100	118 {12.0}	76.0	16.0		18.0		20.0		100	560
		125	94.1 { 9.6}	95.0	20.0		22.5		25.0		125	690
25	12.5	20	760 {77.5}	15.2	3.2		3.6		Outside allowable range		SWG 25— 20	270
		25	608 {62.0}	19.0	4.0		4.5		5.0		25	270
		30	507 {51.7}	22.8	4.8		5.4		6.0		30	275
		35	434 {44.3}	26.6	5.6		6.3		7.0		35	295
		40	380 {38.8}	30.4	6.4		7.2		8.0		40	320
		45	338 {34.4}	34.2	7.2		8.1		9.0		45	345
		50	304 {31.0}	38.0	8.0		9.0		10.0		50	370
		55	276 {28.2}	41.8	8.8	2432	9.9	2736	11.0	3040	55	395
		60	253 {25.8}	45.6	9.6	{248}	10.8	{279}	12.0	{310}	60	410
		65	234 {23.8}	49.4	10.4		11.7		13.0		65	430
		70	217 {22.1}	53.2	11.2		12.6		14.0		70	455
		75	203 {20.7}	57.0	12.0		13.5		15.0		75	470
		80	190 {19.4}	60.8	12.8		14.4		16.0		80	490
		90	169 {17.2}	68.4	14.4		16.2		18.0		90	530
		100	152 {15.5}	76.0	16.0		18.0		20.0		100	580
		125	121.6 {12.4}	95.0	20.0		22.5		25.0		125	690
Operation frequency					1X10⁶ times		5X10⁵ times		3X10⁵ times			

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=LX16% Fmm	F=LX16% Load N{kgf}	F=LX18% Fmm	F=LX18% Load N{kgf}	F=LX20% Fmm	F=LX20% Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty :1~19
27	13.5	20	907 {92.5}	15.2	3.2		3.6		Outside allowable range		SWG 27— 20	305
		25	726 {74.0}	19.0	4.0		4.5		5.0		25	305
		30	605 {61.7}	22.8	4.8		5.4		6.0		30	310
		35	518 {52.9}	26.6	5.6		6.3		7.0		35	335
		40	454 {46.3}	30.4	6.4		7.2		8.0		40	360
		45	403 {41.1}	34.2	7.2		8.1		9.0		45	375
		50	363 {37.0}	38.0	8.0		9.0		10.0		50	395
		55	330 {33.6}	41.8	8.8	2903	9.9	3266	11.0	3628	55	415
		60	302 {30.8}	45.6	9.6	{296}	10.8	{333}	12.0	{370}	60	435
		65	279 {28.5}	49.4	10.4		11.7		13.0		65	455
		70	259 {26.4}	53.2	11.2		12.6		14.0		70	475
		75	242 {24.7}	57.0	12.0		13.5		15.0		75	495
		80	227 {23.1}	60.8	12.8		14.4		16.0		80	515
		90	202 {20.6}	68.4	14.4		16.2		18.0		90	590
		100	181 {18.5}	76.0	16.0		18.0		20.0		100	650
		125	145 {14.8}	95.0	20.0		22.5		25.0		125	800
		150	121 {12.3}	114.0	24.0		27.0		30.0		150	940
30	15	20	1177 {120.0}	15.2	3.2		3.6		Outside allowable range		SWG 30— 20	330
		25	941 {96.0}	19.0	4.0		4.5		5.0		25	330
		30	785 {80.0}	22.8	4.8		5.4		6.0		30	345
		35	672 {68.6}	26.6	5.6		6.3		7.0		35	365
		40	588 {60.0}	30.4	6.4		7.2		8.0		40	390
		45	523 {53.3}	34.2	7.2		8.1		9.0		45	415
		50	471 {48.0}	38.0	8.0		9.0		10.0		50	440
		55	428 {43.6}	41.8	8.8		9.9		11.0		55	465
		60	392 {40.0}	45.6	9.6	3766	10.8	4236	12.0	4707	60	490
		65	362 {36.9}	49.4	10.4		11.7		13.0		65	520
		70	336 {34.3}	53.2	11.2	{384}	12.6	{432}	14.0	{480}	70	550
		75	314 {32.0}	57.0	12.0		13.5		15.0		75	580
		80	294 {30.0}	60.8	12.8		14.4		16.0		80	610
		90	262 {26.7}	68.4	14.4		16.2		18.0		90	650
		100	235 {24.0}	76.0	16.0		18.0		20.0		100	690
		125	188 {19.2}	95.0	20.0		22.5		25.0		125	840
		150	157 {16.0}	114.0	24.0		27.0		30.0		150	975
		175	134 {13.7}	133.0	28.0		31.5		35.0		175	1,100
		200	118 {12.0}	152.0	32.0		36.0		40.0		200	1,300
35	17.5	30	1030 {105.0}	22.8	4.8		5.4		6.0		SWG 35— 30	460
		35	883 {90.0}	26.6	5.6		6.3		7.0		35	460
		40	772 {78.8}	30.4	6.4		7.2		8.0		40	470
		45	686 {70.0}	34.2	7.2		8.1		9.0		45	480
		50	618 {63.0}	38.0	8.0		9.0		10.0		50	525
		55	562 {57.3}	41.8	8.8		9.9		11.0		55	580
		60	515 {52.5}	45.6	9.6		10.8		12.0		60	620
		65	475 {48.5}	49.4	10.4	4943	11.7	5560	13.0	6178	65	660
		70	441 {45.0}	53.2	11.2	{504}	12.6	{567}	14.0	{630}	70	695
		75	412 {42.0}	57.0	12.0		13.5		15.0		75	740
		80	386 {39.4}	60.8	12.8		14.4		16.0		80	790
		90	343 {35.0}	68.4	14.4		16.2		18.0		90	870
		100	309 {31.5}	76.0	16.0		18.0		20.0		100	950
		125	247 {25.2}	95.0	20.0		22.5		25.0		125	1,145
		150	206 {21.0}	114.0	24.0		27.0		30.0		150	1,335
		175	177 {18.0}	133.0	28.0		31.5		35.0		175	1,550
		200	154 {15.8}	152.0	32.0		36.0		40.0		200	1,740
Operation frequency					1X10⁶ times		5X10⁵ times		3X10⁵ times			

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=LX16% Fmm	F=LX16% Load N{kgf}	F=LX18% Fmm	F=LX18% Load N{kgf}	F=LX20% Fmm	F=LX20% Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty :1~19
40	20	35	1149 {117.1}	26.6	5.6		6.3		7.0		SWG 40— 35	660
		40	1005 {102.5}	30.4	6.4		7.2		8.0		40	660
		45	893 {91.1}	34.2	7.2		8.1		9.0		45	680
		50	804 {82.0}	38.0	8.0		9.0		10.0		50	710
		55	731 {74.5}	41.8	8.8		9.9		11.0		55	755
		60	670 {68.3}	45.6	9.6		10.8		12.0		60	800
		65	619 {63.1}	49.4	10.4		11.7		13.0		65	850
		70	574 {58.6}	53.2	11.2	6433	12.6	7237	14.0	8041	70	895
		75	536 {54.7}	57.0	12.0	{656}	13.5	{738}	15.0	{820}	75	950
		80	503 {51.3}	60.8	12.8		14.4		16.0		80	990
		90	447 {45.6}	68.4	14.4		16.2		18.0		90	1,090
		100	402 {41.0}	76.0	16.0		18.0		20.0		100	1,185
		125	322 {32.8}	95.0	20.0		22.5		25.0		125	1,400
		150	268 {27.3}	114.0	24.0		27.0		30.0		150	1,640
		175	230 {23.4}	133.0	28.0		31.5		35.0		175	1,950
		200	201 {20.5}	152.0	32.0		36.0		40.0		200	2,210
50	25	50	1226 {125.0}	39.0	8.0		9.0		10.0		SWG 50— 50	1,160
		55	1114 {113.6}	43.0	8.8		9.9		11.0		55	1,200
		60	1022 {104.2}	47.0	9.6		10.8		12.0		60	1,230
		65	943 {96.2}	51.0	10.4		11.7		13.0		65	1,300
		70	876 {89.3}	54.0	11.2		12.6		14.0		70	1,390
		75	817 {83.3}	58.0	12.0	9807	13.5	11032	15.0	12258	75	1,480
		80	766 {78.1}	61.0	12.8	{1000}	14.4	{1125}	16.0	{1250}	80	1,540
		90	681 {69.4}	66.0	14.4		16.2		18.0		90	1,710
		100	613 {62.5}	74.0	16.0		18.0		20.0		100	1,870
		125	490 {50.0}	89.0	20.0		22.5		25.0		125	2,260
		150	409 {41.7}	105.0	24.0		27.0		30.0		150	2,670
		175	350 {35.7}	133.0	28.0		31.5		35.0		175	3,130
		200	306 {31.3}	152.0	32.0		36.0		40.0		200	3,550
Operation frequency					1X10⁶ times		5X10⁵ times		3X10⁵ times			

M SWOSC—V

●Load calculation method : N(load) =N/mm(spring constant) ×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

The solid height values are reference only.
There may be some variations depending on lots.

Product Outline P.1056

Directions and precautions for coil springs P.1057

Load-deflection diagram P.1094

■Features

●This spring can bear heavier loads than SWB (P.1083) by 1.1 to 1.3 times with the same deflection. You can achieve savings in die space and number of springs.

●SWG has been electropainted and thus has an excellent corrosion resistance compared with regular painting. Electropaint is also more resistant to being stripped than regular painting.

Order — Catalog No. SWG 20—80

Delivery — 1 Day

Price

■Volume discount rate P.37

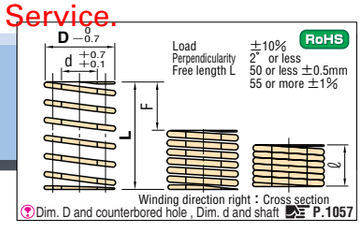
Quantity	1~19	20~49	50~199	200~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Express service system P.38 | MISUMI Press 2007 | http://misumi.jp/press/ | For inquiry, ordering and other information, refer to P.1269

COIL SPRINGS
—HYPER EXTRA HEAVY LOAD TYPE SWZ—

Light — Load — Heavy
SWZ



D	d	L	Spring constant N/mm(kgf/mm)	Solid height ℓ min	F=LX10.5% Fmm	(Load) N(kgf)	F=LX12% Fmm	(Load) N(kgf)	F=LX13% Fmm	(Load) N(kgf)	Catalog No. Type D—L	U/Price Q'ty : 1~19
10	5	25	158 (16)	21.2	2.6	416 (42)	3.0	475 (48)	3.3	515 (53)	SWZ 10— 25	340
		30	132 (13)	25.5	3.2		3.6		3.9		30	360
		35	113 (12)	29.8	3.7		4.2		4.6		35	370
		40	99 (10)	34.2	4.2		4.8		5.2		40	380
		45	88 { 9}	38.2	4.7		5.4		5.9		45	400
		50	79 { 8}	42.2	5.3		6.0		6.5		50	460
		55	72 { 7}	46.2	5.8		6.6		7.2		55	500
		60	66 { 7}	50.2	6.3		7.2		7.8		60	550
12	6	25	215 (22)	21.2	2.6	564 (57)	3.0	645 (66)	3.3	698 (71)	SWZ 12— 25	345
		30	179 (18)	25.5	3.2		3.6		3.9		30	365
		35	153 (16)	29.8	3.7		4.2		4.6		35	380
		40	134 (14)	34.2	4.2		4.8		5.2		40	390
		45	119 (12)	38.2	4.7		5.4		5.9		45	420
		50	107 (11)	42.2	5.3		6.0		6.5		50	480
		55	98 (10)	46.2	5.8		6.6		7.2		55	530
		60	89 { 9}	50.2	6.3		7.2		7.8		60	580
14	7	30	305 (31)	25.5	3.2	962 (98)	3.6	1099 (112)	3.9	1191 (121)	SWZ 14— 30	370
		35	262 (27)	29.8	3.7		4.2		4.6		35	390
		40	229 (23)	34.2	4.2		4.8		5.2		40	400
		45	204 (21)	38.2	4.7		5.4		5.9		45	470
		50	183 (19)	42.2	5.3		6.0		6.5		50	520
		55	167 (17)	46.2	5.8		6.6		7.2		55	560
		60	153 (16)	50.2	6.3		7.2		7.8		60	600
16	8	30	440 (45)	25.5	3.2	1385 (141)	3.6	1583 (161)	3.9	1715 (175)	SWZ 16— 30	390
		35	377 (38)	29.8	3.7		4.2		4.6		35	410
		40	330 (34)	34.2	4.2		4.8		5.2		40	430
		45	293 (30)	38.2	4.7		5.4		5.9		45	500
		50	264 (27)	42.2	5.3		6.0		6.5		50	540
		55	240 (24)	46.2	5.8		6.6		7.2		55	590
		60	220 (22)	50.2	6.3		7.2		7.8		60	630
18	9	30	553 (56)	25.5	3.2	1742 (178)	3.6	1991 (203)	3.9	2157 (220)	SWZ 18— 30	395
		35	474 (48)	29.8	3.7		4.2		4.6		35	415
		40	415 (42)	34.2	4.2		4.8		5.2		40	435
		45	369 (38)	38.2	4.7		5.4		5.9		45	505
		50	332 (34)	42.2	5.3		6.0		6.5		50	545
		55	302 (31)	46.2	5.8		6.6		7.2		55	595
		60	277 (28)	50.2	6.3		7.2		7.8		60	635
20	10	30	660 (67)	25.5	3.2	2080 (212)	3.6	2377 (242)	3.9	2575 (263)	SWZ 20— 30	400
		35	566 (58)	29.8	3.7		4.2		4.6		35	420
		40	495 (50)	34.2	4.2		4.8		5.2		40	460
		45	440 (45)	38.2	4.7		5.4		5.9		45	510
		50	396 (40)	42.2	5.3		6.0		6.5		50	550
		55	360 (37)	46.2	5.8		6.6		7.2		55	600
		60	330 (34)	50.2	6.3		7.2		7.8		60	640
		65	305 (31)	54.2	6.8		7.8		8.5		65	690
		70	283 (29)	58.2	7.4		8.4		9.1		70	730
		75	264 (27)	62.2	7.9		9.0		9.8		75	780
		80	248 (25)	65.5	8.4		9.6		10.4		80	820
		90	220 (22)	74.5	9.5		10.8		11.7		90	910
		100	198 (20)	82.5	10.5		12.0		13.0		100	1,000
22	11	35	735 (75)	29.8	3.7	2701 (275)	4.2	3087 (315)	4.6	3344 (341)	SWZ 22— 35	460
		40	643 (66)	34.2	4.2		4.8		5.2		40	490
		45	572 (58)	38.2	4.7		5.4		5.9		45	540
		50	514 (52)	42.2	5.3		6.0		6.5		50	580
		55	468 (48)	46.2	5.8		6.6		7.2		55	630
		60	429 (44)	50.2	6.3		7.2		7.8		60	670
		65	396 (40)	54.2	6.8		7.8		8.5		65	710
		70	367 (37)	58.2	7.4		8.4		9.1		70	790
		75	343 (35)	62.2	7.9		9.0		9.8		75	830
		80	322 (33)	65.5	8.4		9.6		10.4		80	870
		90	286 (29)	74.5	9.5		10.8		11.7		90	970
		100	257 (26)	82.5	10.5		12.0		13.0		100	1,060
Operation frequency					1X10⁶ times		5X10⁵ times		3X10⁵ times			

D	d	L	Spring constant N/mm(kgf/mm)	Solid height ℓ min	F=LX10.5% Fmm	(Load) N(kgf)	F=LX12% Fmm	(Load) N(kgf)	F=LX13% Fmm	(Load) N(kgf)	Catalog No. Type D—L	U/Price Q'ty : 1~19
25	12.5	40	922 { 94}	34.2	4.2	3873 (395)	4.8	4427 (451)	5.2	4796 (489)	SWZ 25— 40	500
		45	820 { 84}	38.2	4.7		5.4		5.9		45	550
		50	738 { 75}	42.2	5.3		6.0		6.5		50	600
		55	671 { 68}	46.2	5.8		6.6		7.2		55	650
		60	615 { 63}	50.2	6.3		7.2		7.8		60	690
		65	568 { 58}	54.2	6.8		7.8		8.5		65	740
		70	527 { 54}	58.2	7.4		8.4		9.1		70	790
		75	492 { 50}	62.2	7.9		9.0		9.8		75	840
		80	461 { 47}	65.5	8.4		9.6		10.4		80	880
		90	410 { 42}	74.5	9.5		10.8		11.7		90	980
		100	369 { 38}	82.5	10.5		12.0		13.0		100	1,070
		125	295 { 30}	102.0	12.6		14.4		15.6		125	1,310
27	13.5	40	1088 {111}	34.2	4.2	4571 (466)	4.8	5224 (533)	5.2	5659 (577)	SWZ 27— 40	590
		45	967 { 99}	38.2	4.7		5.4		5.9		45	650
		50	871 { 89}	42.2	5.3		6.0		6.5		50	700
		55	791 { 81}	46.2	5.8		6.6		7.2		55	760
		60	726 { 74}	50.2	6.3		7.2		7.8		60	810
		65	670 { 68}	54.2	6.8		7.8		8.5		65	870
		70	622 { 63}	58.2	7.4		8.4		9.1		70	930
		75	580 { 59}	62.2	7.9		9.0		9.8		75	980
		80	544 { 55}	65.5	8.4		9.6		10.4		80	1,040
		90	484 { 49}	74.5	9.5		10.8		11.7		90	1,150
		100	435 { 44}	82.5	10.5		12.0		13.0		100	1,260
		125	348 { 36}	102.0	13.1		15.0		16.3		125	1,540
30	15	35	1422 {145}	29.8	3.7	5227 (533)	4.2	5974 (609)	4.6	6472 (660)	SWZ 30— 35	680
		40	1245 {127}	34.2	4.2		4.8		5.2		40	710
		45	1106 {113}	38.2	4.7		5.4		5.9		45	740
		50	996 {102}	42.2	5.3		6.0		6.5		50	810
		55	905 { 92}	46.2	5.8		6.6		7.2		55	870
		60	830 { 85}	50.2	6.3		7.2		7.8		60	930
		65	766 { 78}	54.2	6.8		7.8		8.5		65	1,000
		70	711 { 73}	58.2	7.4		8.4		9.1		70	1,060
		75	664 { 68}	62.2	7.9		9.0		9.8		75	1,130
		80	622 { 63}	65.5	8.4		9.6		10.4		80	1,190
		90	553 { 56}	74.5	9.5		10.8		11.7		90	1,320
		100	498 { 51}	82.5	10.5		12.0		13.0		100	1,440
		125	398 { 41}	102.0	13.1		15.0		16.3		125	1,760
		150	332 { 34}	123.0	15.8		18.0		19.5		150	2,080
35	17.5	45	1291 {132}	38.2	4.7	6099 (622)	5.4	6970 (711)	5.9	7551 (770)	SWZ 35— 45	920
		50	1162 {118}	42.2	5.3		6.0		6.5		50	960
		55	1056 {108}	46.2	5.8		6.6		7.2		55	1,040
		60	968 { 99}	50.2	6.3		7.2		7.8		60	1,110
		65	894 { 91}	54.2	6.8		7.8		8.5		65	1,190
		70	830 { 85}	58.2	7.4		8.4		9.1		70	1,270
		75	774 { 79}	62.2	7.9		9.0		9.8		75	1,340
		80	726 { 74}	65.5	8.4		9.6		10.4		80	1,420
		90	645 { 66}	74.5	9.5		10.8		11.7		90	1,570
		100	581 { 59}	82.5	10.5		12.0		13.0		100	1,720
		125	465 { 47}	102.0	13.1		15.0		16.3		125	2,100
		150	387 { 39}	123.0	15.8		18.0		19.5		150	2,480
Operation frequency					1X10⁶ times		5X10⁵ times		3X10⁵ times			

D	d	L	Spring constant N/mm(kgf/mm)	Solid height ℓ min	F=LX10.5% Fmm	(Load) N(kgf)	F=LX12% Fmm	(Load) N(kgf)	F=LX13% Fmm	(Load) N(kgf)	Catalog No. Type D—L	U/Price Q'ty : 1~19
40	20	45	1752 (179)	38.2	4.7	8278 (844)	5.4	9460 (965)	5.9	10249 (1045)	SWZ 40— 45	1,200
		50	1577 (161)	42.2	5.3		6.0		6.5		50	1,240
		55	1433 (146)	46.2	5.8		6.6		7.2		55	1,280
		60	1314 (134)	50.2	6.3		7.2		7.8		60	1,320
		65	1213 (124)	54.2	6.8		7.8		8.5		65	1,400
		70	1126 (115)	58.2	7.4		8.4		9.1		70	1,490
		75	1051 (107)	62.2	7.9		9.0		9.8		75	1,580
		80	985 (100)	65.5	8.4		9.6		10.4		80	1,670
		90	876 { 89}	74.5	9.5		10.8		11.7		90	1,850
		100	788 { 80}	82.5	10.5		12.0		13.0		100	2,030
		125	631 { 64}	102.0	13.1		15.0		16.3		125	2,470
		150	526 { 54}	123.0	15.8		18.0		19.5		150	2,920
		175	451 { 46}	143.0	18.4		21.0		22.8		175	3,360
50	25	55	2244 (229)	46.2	5.8	12969 (1321)	6.6	14810 (1510)	7.2	16045 (1636)	SWZ 50— 55	1,950
		60	2057 (210)	50.2	6.3		7.2		7.8		60	2,000
		65	1899 (194)	54.2	6.8		7.8		8.5		65	2,180
		70	1763 (180)	58.2	7.4		8.4		9.1		70	2,250
		75	1646 (168)	62.2	7.9		9.0		9.8		75	2,310
		80	1543 (157)	65.5	8.4		9.6		10.4		80	2,430
		90	1371 (140)	74.5	9.5		10.8		11.7		90	2,670
		100	1234 (126)	82.5	10.5		12.0		13.0		100	3,060
		125	987 (101)	102.0	13.1		15.0		16.3		125	3,690
		150	823 { 84}	123.0	15.8		18.0		19.5		150	4,470
		175	705 { 72}	143.0	18.4		21.0		22.8		175	5,120
		200	617 { 63}	159.0	21.0		24.0		26.0		200	5,770
Operation frequency					1X10⁶ times		5X10⁵ times		3X10⁵ times			

M 52SiCrNi5 (European spring steel, equivalent to Italian standard UNI3545)
●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)
(N=kgf×9.80665)

- The solid height values are reference only. There may be some variations depending on lots.
- Product Outline P.1056
- Directions and precautions for coil springs P.1057
- Load-deflection diagram P.1094

Order Catalog No.
SWZ 25—80

Delivery 1 Day

Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Features

●This spring can bear heavier loads than SWB (P.1083) by 1.6 to 2 times with the same size and operation frequency.
The spring constant is 2.5 times of that for SWB. You can achieve savings in die space and number of springs.

●SWZ has been powder-painted and is thus resistant to being stripped.

●The dimension of this spring's inner and outer diameters is the same as that of SWH and SWB. Select this type when you wish to use higher duty springs with the same size.

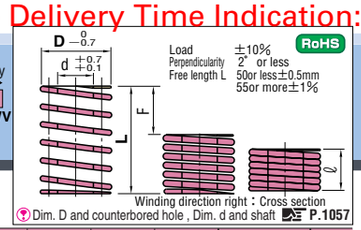
SWZ20-35 SWZ35-80

Express service system P.38 | MISUMI Press 2007 | http://misumi.jp/press/ | For inquiry, ordering and other information, refer to P.1269

PRESS ADD.SPEC. Printed in Blue

COIL SPRINGS —EXTRA HEAVY LOAD SWV—

Light — Load — Heavy → SWV



Dim. D and counterbored hole , Dim. d and shaft P.1057

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×10.5% Fmm	Load N{kgf}	F=L×12% Fmm	Load N{kgf}	F=L×13% Fmm	Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty : 1~19
10	5	30	204 {21}	24.9	3.2	644 {66}	3.6	736 {75}	3.9	797 {81}	SWV 10— 30	390
		35	175 {18}	29.1	3.7		4.2		4.6		35	410
		40	153 {16}	33.2	4.2		4.8		5.2		40	420
		45	136 {14}	37.4	4.7		5.4		5.9		45	500
		50	123 {13}	41.5	5.3		6.0		6.5		50	540
		55	111 {11}	45.7	5.8		6.6		7.2		55	560
		60	102 {10}	49.8	6.3		7.2		7.8		60	610
12	6	30	306 {31}	24.9	3.2	965 {98}	3.6	1103 {113}	3.9	1195 {122}	SWV 12— 30	400
		35	263 {27}	29.1	3.7		4.2		4.6		35	420
		40	230 {23}	33.2	4.2		4.8		5.2		40	430
		45	204 {21}	37.4	4.7		5.4		5.9		45	510
		50	184 {19}	41.5	5.3		6.0		6.5		50	560
		55	167 {17}	45.7	5.8		6.6		7.2		55	580
		60	153 {16}	49.8	6.3		7.2		7.8		60	640
14	7	30	396 {40}	24.9	3.2	1249 {127}	3.6	1427 {146}	3.9	1546 {158}	SWV 14— 30	410
		35	340 {35}	29.1	3.7		4.2		4.6		35	430
		40	297 {30}	33.2	4.2		4.8		5.2		40	450
		45	264 {27}	37.4	4.7		5.4		5.9		45	510
		50	238 {24}	41.5	5.3		6.0		6.5		50	570
		55	216 {22}	45.7	5.8		6.6		7.2		55	620
		60	198 {20}	49.8	6.3		7.2		7.8		60	660
16	8	35	455 {46}	29.1	3.7	1674 {171}	4.2	1913 {195}	4.6	2072 {211}	SWV 16— 35	440
		40	398 {41}	33.2	4.2		4.8		5.2		40	480
		45	354 {36}	37.4	4.7		5.4		5.9		45	540
		50	319 {33}	41.5	5.3		6.0		6.5		50	600
		55	290 {30}	45.7	5.8		6.6		7.2		55	640
		60	266 {27}	49.8	6.3		7.2		7.8		60	690
18	9	35	560 {57}	29.1	3.7	2060 {210}	4.2	2354 {240}	4.6	2550 {260}	SWV 18— 35	470
		40	490 {50}	33.2	4.2		4.8		5.2		40	500
		45	436 {44}	37.4	4.7		5.4		5.9		45	550
		50	392 {40}	41.5	5.3		6.0		6.5		50	600
		55	357 {36}	45.7	5.8		6.6		7.2		55	650
		60	327 {33}	49.8	6.3		7.2		7.8		60	700
20	10	40	619 {63}	33.2	4.2	2600 {265}	4.8	2971 {303}	5.2	3219 {328}	SWV 20— 40	520
		45	550 {56}	37.4	4.7		5.4		5.9		45	580
		50	495 {50}	41.5	5.3		6.0		6.5		50	620
		55	450 {46}	45.7	5.8		6.6		7.2		55	670
		60	413 {42}	49.8	6.3		7.2		7.8		60	730
		65	381 {39}	54.0	6.8		7.8		8.5		65	770
		70	354 {36}	58.1	7.4		8.4		9.1		70	810
		75	330 {34}	62.3	7.9		9.0		9.8		75	870
		80	310 {32}	66.4	8.4		9.6		10.4		80	900
		90	275 {28}	74.7	9.5		10.8		11.7		90	1,000
		100	248 {25}	83.0	10.5		12.0		13.0		100	1,100
22	11	40	765 {78}	33.2	4.2	3213 {328}	4.8	3672 {374}	5.2	3978 {406}	SWV 22— 40	540
		45	680 {69}	37.4	4.7		5.4		5.9		45	600
		50	612 {62}	41.5	5.3		6.0		6.5		50	640
		55	556 {57}	45.7	5.8		6.6		7.2		55	700
		60	510 {52}	49.8	6.3		7.2		7.8		60	740
		65	471 {48}	54.0	6.8		7.8		8.5		65	790
		70	437 {45}	58.1	7.4		8.4		9.1		70	870
		75	408 {42}	62.3	7.9		9.0		9.8		75	920
		80	383 {39}	66.4	8.4		9.6		10.4		80	960
		90	340 {35}	74.7	9.5		10.8		11.7		90	1,070
		100	306 {31}	83.0	10.5		12.0		13.0		100	1,170
25	12.5	50	848 {86}	41.5	5.3	4454 {454}	6.0	5091 {519}	6.5	5515 {562}	SWV 25— 50	680
		55	771 {79}	45.7	5.8		6.6		7.2		55	730
		60	707 {72}	49.8	6.3		7.2		7.8		60	780
		65	653 {67}	54.0	6.8		7.8		8.5		65	830
		70	606 {62}	58.1	7.4		8.4		9.1		70	870
		75	566 {58}	62.3	7.9		9.0		9.8		75	930
		80	530 {54}	66.4	8.4		9.6		10.4		80	1,000
		90	471 {48}	74.7	9.5		10.8		11.7		90	1,100
		100	424 {43}	83.0	10.5		12.0		13.0		100	1,200
		125	339 {35}	103.8	13.1		15.0		16.3		125	1,500
Operation frequency						1×10⁶ times		5×10⁵ times		3×10⁵ times		

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×10.5% Fmm	Load N{kgf}	F=L×12% Fmm	Load N{kgf}	F=L×13% Fmm	Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty : 1~19
27	13.5	55	910 {93}	45.7	5.8	5256 {536}	6.6	6007 {613}	7.2	6508 {664}	SWV 27— 55	840
		60	834 {85}	49.8	6.3		7.2		7.8		60	920
		65	770 {79}	54.0	6.8		7.8		8.5		65	990
		70	715 {73}	58.1	7.4		8.4		9.1		70	1,050
		75	667 {68}	62.3	7.9		9.0		9.8		75	1,080
		80	626 {64}	66.4	8.4		9.6		10.4		80	1,180
		90	556 {57}	74.7	9.5		10.8		11.7		90	1,300
		100	501 {51}	83.0	10.5		12.0		13.0		100	1,400
		125	400 {41}	103.8	13.1		15.0		16.3		125	1,700
30	15	55	1086 {111}	45.7	5.8	6273 {640}	6.6	7169 {731}	7.2	7766 {792}	SWV 30— 55	990
		60	996 {102}	49.8	6.3		7.2		7.8		60	1,050
		65	919 {94}	54.0	6.8		7.8		8.5		65	1,130
		70	853 {87}	58.1	7.4		8.4		9.1		70	1,190
		75	797 {81}	62.3	7.9		9.0		9.8		75	1,280
		80	747 {76}	66.4	8.4		9.6		10.4		80	1,350
		90	664 {68}	74.7	9.5		10.8		11.7		90	1,500
		100	597 {61}	83.0	10.5		12.0		13.0		100	1,630
		125	478 {49}	103.8	13.1		15.0		16.3		125	1,940
		150	398 {41}	124.5	15.8		18.0		19.5		150	2,290
35	17.5	55	1267 {129}	45.7	5.8	7319 {746}	6.6	8364 {853}	7.2	9061 {924}	SWV 35— 55	1,150
		60	1162 {118}	49.8	6.3		7.2		7.8		60	1,230
		65	1072 {109}	54.0	6.8		7.8		8.5		65	1,310
		70	996 {102}	58.1	7.4		8.4		9.1		70	1,400
		75	929 {95}	62.3	7.9		9.0		9.8		75	1,480
		80	871 {89}	66.4	8.4		9.6		10.4		80	1,570
		90	774 {79}	74.7	9.5		10.8		11.7		90	1,780
		100	697 {71}	83.0	10.5		12.0		13.0		100	1,900
		125	558 {57}	103.8	13.1		15.0		16.3		125	2,310
		150	465 {47}	124.5	15.8		18.0		19.5		150	2,730
40	20	55	1720 {175}	45.7	5.8	9934 {1013}	6.6	11353 {1158}	7.2	12299 {1254}	SWV 40— 55	1,410
		60	1577 {161}	49.8	6.3		7.2		7.8		60	1,460
		65	1456 {148}	54.0	6.8		7.8		8.5		65	1,540
		70	1352 {138}	58.1	7.4		8.4		9.1		70	1,640
		75	1261 {129}	62.3	7.9		9.0		9.8		75	1,740
		80	1183 {121}	66.4	8.4		9.6		10.4		80	1,840
		90	1051 {107}	74.7	9.5		10.8		11.7		90	2,040
		100	946 {96}	83.0	10.5		12.0		13.0		100	2,240
		125	757 {77}	103.8	13.1		15.0		16.3		125	2,720
		150	631 {64}	124.5	15.8		18.0		19.5		150	3,220
		175	541 {55}	145.3	18.4		21.0		22.8		175	3,700
50	25	60	2366 {241}	49.8	6.3	14904 {1228}	7.2	17033 {1737}	7.8	18452 {1882}	SWV 50— 60	2,180
		65	2184 {223}	54.0	6.8		7.8		8.5		65	2,300
		70	2028 {207}	58.1	7.4		8.4		9.1		70	2,470
		75	1893 {193}	62.3	7.9		9.0		9.8		75	2,630
		80	1774 {181}	66.4	8.4		9.6		10.4		80	2,680
		90	1577 {161}	74.7	9.5		10.8		11.7		90	2,940
		100	1419 {145}	83.0	10.5		12.0		13.0		100	3,470
		125	1136 {116}	103.8	13.1		15.0		16.3		125	4,170
		150	946 {97}	124.5	15.8		18.0		19.5		150	5,060
		175	811 {83}	145.3	18.4		21.0		22.8		175	5,640
		200	710 {72}	166.0	21.0		24.0		26.0		200	6,350
Operation frequency						1×10⁶ times		5×10⁵ times		3×10⁵ times		

M SWOSC—V

●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)
(N=kgf×9.80665)

The solid height values are reference only. There may be some variations depending on lots.

Product Outline P.1056

Directions and precautions for coil springs P.1057

Load diagram P.1094

Order — Catalog No. SWV 25—80

Delivery — 1 Day

Price

■Volume discount rate P.37

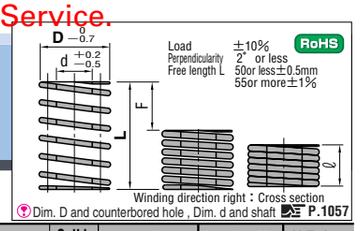
Quantity	1~19	20~49	50~199	200~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Features

- Can produce a load of 1.2 times that of the SWZ (P.1087) for the same size and number of operations.
  Permits the die to be made more compact and also the number of springs to be reduced.
- The price is 1.1 times that of a spring of the same size as that of the SWZ (P.1087).
  The load unit of the product (Load ÷ Unit price) is cheap, so cost performance is high.
- The internal and external diameters of the springs are the same as those of the SWH, SWB, and other series.
  These coil springs are easy to handle.

COIL SPRINGS —HIGH SPEED EXTRA HEAVY LOAD, NO PAINTING TYPE SWX—



Dim. D and counterbored hole , Dim. d and shaft P.1057

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×10% Fmm	Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty : 1~19
20	9.5	25	510 {52 }	20.0	2.5	1274.9 {130}	SWX 20—25	305
		30	425 {43.3}	24.0	3.0		30	315
		35	363 {37.1}	28.0	3.5		35	330
		40	319 {32.5}	32.0	4.0		40	360
		45	283 {28.9}	36.0	4.5		45	385
		50	255 {26 }	40.0	5.0		50	425
		55	231 {23.6}	44.0	5.5		55	455
		60	213 {21.7}	48.0	6.0		60	480
22	10.5	25	628 {64 }	20.0	2.5	1569.1 {160}	SWX 22—25	310
		30	523 {53.3}	24.0	3.0		30	330
		35	448 {45.7}	28.0	3.5		35	350
		40	392 {40 }	32.0	4.0		40	380
		45	349 {35.6}	36.0	4.5		45	405
		50	314 {32 }	40.0	5.0		50	445
		55	285 {29.1}	44.0	5.5		55	475
		60	262 {26.7}	48.0	6.0		60	500
25	12	25	785 {80 }	20.0	2.5	1961.3 {200}	SWX 25—25	320
		30	654 {66.7}	24.0	3.0		30	345
		35	560 {57.1}	28.0	3.5		35	370
		40	490 {50 }	32.0	4.0		40	395
		45	435 {44.4}	36.0	4.5		45	435
		50	392 {40 }	40.0	5.0		50	465
		55	357 {36.4}	44.0	5.5		55	490
		60	327 {33.3}	48.0	6.0		60	520
		70	280 {28.6}	59.0	7.0		70	550
		80	245 {25 }	68.0	8.0		80	580
27	13	25	941 {96 }	20.0	2.5	2353.6 {240}	SWX 27—25	345
		30	785 {80 }	24.0	3.0		30	375
		35	673 {68.6}	28.0	3.5		35	395
		40	588 {60 }	32.0	4.0		40	435
		45	523 {53.3}	36.0	4.5		45	465
		50	471 {48 }	40.0	5.0		50	490
		55	428 {43.6}	44.0	5.5		55	520
		60	392 {40 }	48.0	6.0		60	550
		70	336 {34.3}	59.0	7.0		70	585
		80	294 {30 }	68.0	8.0		80	620
Operation frequency					1×10⁷ times			

D	d	L	Spring constant N/mm{kgf/mm}	Solid height ℓ min	F=L×10% Fmm	Load N{kgf}	Catalog No. Type D—L	U/Price Q'ty : 1~19
30	14.6	25	1432 {146 }	20.0	2.5	3579.4 {365}	SWX 30—25	380
		30	1193 {121.7}	24.0	3.0		30	410
		35	1023 {104.3}	28.0	3.5		35	445
		40	895 { 91.3}	32.0	4.0		40	475
		45	795 { 81.1}	36.0	4.5		45	500
		50	716 { 73 }	40.0	5.0		50	530
		55	651 { 66.4}	44.0	5.5		55	560
		60	596 { 60.8}	48.0	6.0		60	585
		70	511 { 52.1}	59.0	7.0		70	660
		80	447 { 45.6}	68.0	8.0		80	735
		90	398 { 40.6}	76.0	9.0		90	810
		100	358 { 36.5}	85.0	10.0		100	885
35	18	40	1030 {105 }	34.0	4.0	4119 {420}	SWX 35—40	560
		45	915 { 93.3}	38.3	4.5		45	590
		50	824 { 84 }	42.5	5.0		50	650
		55	749 { 76.4}	46.8	5.5		55	710
		60	687 { 70 }	51.0	6.0		60	760
		70	588 { 60 }	59.5	7.0		70	860
		80	515 { 52.5}	68.0	8.0		80	970
		90	458 { 46.7}	76.5	9.0		90	1,080
		100	412 { 42 }	85.0	10.0		100	1,200
40	20.5	40	1300 {132.5}	34.0	4.0	5198 {530}	SWX 40—40	785
		45	1155 {117.8}	38.3	4.5		45	830
		50	1040 {106 }	42.5	5.0		50	875
		55	945 { 96.4}	46.8	5.5		55	925
		60	866 { 88.3}	51.0	6.0		60	985
		70	743 { 75.7}	59.5	7.0		70	1,100
		80	650 { 66.3}	68.0	8.0		80	1,215
		90	578 { 58.9}	76.5	9.0		90	1,335
		100	520 { 53 }	85.0	10.0		100	1,460
Operation frequency					1×10⁷ times			

M SWOSC—V

●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

The solid height values are reference only. There may be some variations depending on lots.

Product Outline P.1056

Directions and precautions for coil springs P.1057

Order — Catalog No. SWX 20—50

Delivery — 1 Day

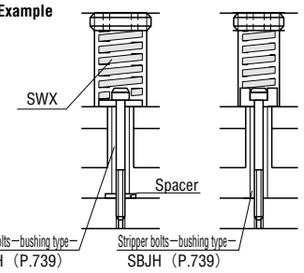
Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

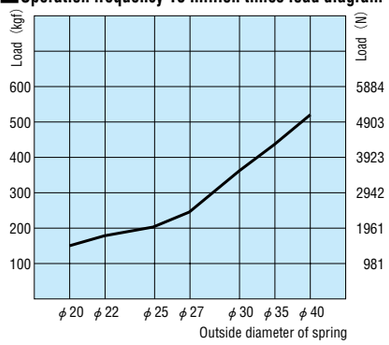
Example



■Features

- SWX is a spring that is developed for high-speed applications focusing the maximum times of operations (durability).
- Since no painting is applied to this type, you can use it in a clean room.
- Be sure to use the stripper bolts on which springs can be mounted as shown in the illustration. P.739
- Make the plate remain parallel with the bolts by using the stripper bolts ground at the same time.
- For long life : Please use springs as a maximum deflection (overall length L~solid height) ×50%=10% of overall length.

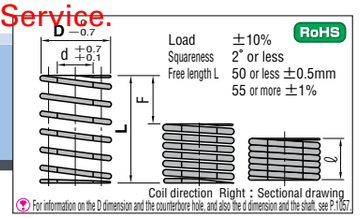
■Operation frequency 10 million times load diagram



PRESS NEW

COIL SPRINGS
—Stainless steel type—

SWUF / SWUL / SWUM / SWUH
＊mark（D10）
Release on September 1.



■SWUF

D	d	L	Spring constant N/mm{kgf/mm}	ℓ min (Solid height)	F=L×40% Fmm	F=L×40% N {kgf}	F=L×45% Fmm	F=L×45% N {kgf}	F=L×50% Fmm	F=L×50% N {kgf}	Catalog No. Type D- L	¥ U/Price 1～19
10	5	20	9.8 {1.00}	9.0	8.0	78 {8.0}	9.0	88 {9.0}	10.0	98 {10}	SWUF 10- 20*	250
		25	7.8 {0.80}	11.3	10.0		11.2		12.5		25*	250
		30	6.5 {0.67}	13.5	12.0		13.5		15.0		30*	250
		35	5.9 {0.57}	15.8	14.0		15.7		17.5		35*	250
		40	4.9 {0.50}	18.0	16.0		18.0		20.0		40*	270
		45	4.4 {0.44}	20.3	18.0		20.2		22.5		45*	280
		50	3.9 {0.40}	22.5	20.0		22.5		25.0		50*	310
		55	3.6 {0.36}	24.8	22.0		24.7		27.5		55*	340
		60	3.3 {0.33}	27.0	24.0		27.0		30.0		60*	370
20	11	25	25.1 {2.56}	11.3	10.0	251 {26}	11.2	282 {29}	12.5	314 {32}	SWUF 20- 25	400
		30	20.9 {2.13}	13.5	12.0		13.5		15.0		30	430
		35	17.9 {1.83}	15.8	14.0		15.7		17.5		35	450
		40	15.7 {1.60}	18.0	16.0		18.0		20.0		40	470
		45	13.9 {1.42}	20.3	18.0		20.2		22.5		45	530
		50	12.6 {1.28}	22.5	20.0		22.5		25.0		50	540
		55	11.4 {1.16}	24.8	22.0		24.7		27.5		55	560
		60	10.5 {1.07}	27.0	24.0		27.0		30.0		60	580
30	16	35	40.3 {4.11}	15.8	14.0	565 {58}	15.7	635 {65}	17.5	706 {72}	SWUF 30- 35	470
		40	35.3 {3.60}	18.0	16.0		18.0		20.0		40	500
		45	31.4 {3.20}	20.3	18.0		20.2		22.5		45	540
		50	28.2 {2.88}	22.5	20.0		22.5		25.0		50	560
		55	25.7 {2.62}	24.8	22.0		24.7		27.5		55	580
		60	23.5 {2.40}	27.0	24.0		27.0		30.0		60	610

■SWUM

D	d	L	Spring constant N/mm{kgf/mm}	ℓ min (Solid height)	F=L×25.6% Fmm	F=L×25.6% N {kgf}	F=L×28.8% Fmm	F=L×28.8% N {kgf}	F=L×32% Fmm	F=L×32% N {kgf}	Catalog No. Type D- L	¥ U/Price 1～19
10	5	20	30.6 { 3.13}	12.5	5.1	157 {16}	5.8	176 {18}	6.4	196 {20}	SWUM 10- 20*	250
		25	24.5 { 2.50}	15.7	6.4		7.2		8.0		25*	250
		30	20.4 { 2.08}	18.8	7.7		8.6		9.6		30*	250
		35	17.5 { 1.79}	21.9	9.0		10.1		11.2		35*	270
		40	15.3 { 1.56}	25.0	10.2		11.5		12.8		40*	280
		45	13.6 { 1.39}	28.2	11.5		13.0		14.4		45*	310
		50	12.3 { 1.25}	31.3	12.8		14.4		16.0		50*	340
		55	11.1 { 1.14}	34.4	14.1		15.8		17.6		55*	340
		60	10.2 { 1.04}	37.6	15.4		17.3		19.2		60*	370
20	10	25	98.0 {10.0}	15.7	6.4	628 {64}	7.2	706 {72}	8.0	784 {80}	SWUM 20- 25	450
		30	81.7 { 8.33}	18.8	7.7		8.6		9.6		30	470
		35	70.0 { 7.14}	21.9	9.0		10.1		11.2		35	530
		40	61.3 { 6.25}	25.0	10.2		11.5		12.8		40	540
		45	54.4 { 5.55}	28.2	11.5		13.0		14.4		45	560
		50	49.0 { 5.00}	31.3	12.8		14.4		16.0		50	610
		55	44.5 { 4.54}	34.4	14.1		15.8		17.6		55	640
		60	40.8 { 4.17}	37.6	15.4		17.3		19.2		60	670
30	15	35	158 {16.1}	21.9	9.0	1412 {144}	10.1	1589 {162}	11.2	1765 {180}	SWUM 30- 35	610
		40	138 {14.1}	25.0	10.2		11.5		12.8		40	670
		45	123 {12.5}	28.2	11.5		13.0		14.4		45	730
		50	110 {11.3}	31.3	12.8		14.4		16.0		50	790
		55	100 {10.2}	34.4	14.1		15.8		17.6		55	800
		60	91.9 { 9.38}	37.6	15.4		17.3		19.2		60	850

■SWUL

D	d	L	Spring constant N/mm{kgf/mm}	ℓ min (Solid height)	F=L×32% Fmm	F=L×32% N {kgf}	F=L×36% Fmm	F=L×36% N {kgf}	F=L×40% Fmm	F=L×40% N {kgf}	Catalog No. Type D- L	¥ U/Price 1～19
10	5	20	17.2 {1.75}	10.8	6.4	110 {11}	7.2	124 {13}	8.0	137 {14}	SWUL 10- 20*	250
		25	13.7 {1.40}	13.5	8.0		9.0		10.0		25*	250
		30	11.4 {1.17}	16.2	9.6		10.8		12.0		30*	250
		35	9.8 {1.00}	18.9	11.2		12.6		14.0		35*	250
		40	8.6 {0.88}	21.6	12.8		14.4		16.0		40*	270
		45	7.6 {0.78}	24.3	14.4		16.2		18.0		45*	280
		50	6.9 {0.70}	27.0	16.0		18.0		20.0		50*	310
		55	6.2 {0.64}	29.7	17.6		19.8		22.0		55*	340
		60	5.7 {0.58}	32.4	19.2		21.6		24.0		60*	370
20	10	25	53.0 {5.40}	13.5	8.0	424 {43}	9.0	477 {48}	10.0	530 {54}	SWUL 20- 25	430
		30	44.1 {4.50}	16.2	9.6		10.8		12.0		30	450
		35	37.8 {3.86}	18.9	11.2		12.6		14.0		35	470
		40	33.1 {3.38}	21.6	12.8		14.4		16.0		40	500
		45	29.4 {3.00}	24.3	14.4		16.2		18.0		45	540
		50	26.5 {2.70}	27.0	16.0		18.0		20.0		50	560
		55	24.1 {2.45}	29.7	17.6		19.8		22.0		55	580
		60	22.1 {2.25}	32.4	19.2		21.6		24.0		60	610
30	15	35	84.7 {8.64}	18.9	11.2	949 {97}	12.6	1067 {109}	14.0	1186 {121}	SWUL 30- 35	540
		40	74.1 {7.56}	21.6	12.8		14.4		16.0		40	560
		45	65.9 {6.72}	24.3	14.4		16.2		18.0		45	610
		50	59.3 {6.05}	27.0	16.0		18.0		20.0		50	640
		55	53.9 {5.50}	29.7	17.6		19.8		22.0		55	700
		60	49.4 {5.04}	32.4	19.2		21.6		24.0		60	730

■SWUH

D	d	L	Spring constant N/mm{kgf/mm}	ℓ min (Solid height)	F=L×19.2% Fmm	F=L×19.2% N {kgf}	F=L×21.6% Fmm	F=L×21.6% N {kgf}	F=L×24% Fmm	F=L×24% N {kgf}	Catalog No. Type D- L	¥ U/Price 1～19
10	5	20	61.3 { 6.3}	14.4	3.8	235 {24}	4.3	265 {27}	4.8	294 {30}	SWUH 10- 20*	250
		25	49.0 { 5.0}	18.0	4.8		5.4		6.0		25*	270
		30	40.8 { 4.2}	21.6	5.8		6.5		7.2		30*	280
		35	35.0 { 3.6}	25.2	6.7		7.6		8.4		35*	310
		40	30.6 { 3.1}	28.8	7.7		8.6		9.6		40*	340
		45	27.2 { 2.8}	32.4	8.6		9.7		10.8		45*	340
		50	24.5 { 2.5}	36.0	9.6		10.8		12.0		50*	370
		55	22.3 { 2.3}	39.6	10.6		11.8		13.2		55*	400
		60	20.4 { 2.1}	43.2	11.5		13.0		14.4		60*	430
20	10	30	163 {16.7}	21.6	5.8	941 {96}	6.5	1058 {108}	7.2	1176 {120}	SWUH 20- 30	470
		35	140 {14.3}	25.2	6.7		7.5		8.4		35	530
		40	123 {12.5}	28.8	7.7		8.6		9.6		40	540
		45	109 {11.1}	32.4	8.6		9.7		10.8		45	560
		50	98.0 {10.0}	36.0	9.6		10.8		12.0		50	610
		55	89.1 { 9.1}	39.6	10.6		11.8		13.2		55	640
		60	81.7 { 8.3}	43.2	11.5		13.0		14.4		60	670
30	15	40	276 {28.1}	28.8	7.7	2117 {216}	8.6	2381 {243}	9.6	2646 {270}	SWUH 30- 40	790
		45	245 {25.0}	32.4	8.6		9.7		10.8		45	800
		50	221 {22.5}	36.0	9.6		10.8		12.0		50	850
		55	200 {20.4}	39.6	10.6		11.9		13.2		55	900
		60	184 {18.7}	43.2	11.5		13.0		14.4		60	960

The products with＊(D10) of each type are to be released on September 1.

Order Catalog No. SWUF20－30

Delivery 1 Day

Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～199	200～500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

M High Strength Special Stainless Steel
●Load calculation method：Load＝Spring constant× Deflection
（International unit） N＝N/mm×Fmm
kgf＝kgf/mm×Fmm
（kgf＝N×0.101972）
The solid height values are reference only.
There may be some variations depending on lots.
Outline of products P.1055
Instructions and notes for coil springs P.1057

■COIL SPRINGS —Stainless steel type—

Features

1.Paintless-
These springs are excellent in anti-rust and corrosion resistance. Outer coating of paint that was required for its purpose so far is no longer necessary therefore coating paint does not come off.
Regarding the identification of type, the type name, external D dimension and free length L dimension are engraved by laser marking.（Fig.1）

2.Rust and corrosion resistance
These springs are made of stainless steel, so they have excellent rust and corrosion resistance compared to conventional irregular shaped wire coil springs.（Fig.2）
These springs are optimum for users who are troubled by rusting of currently used springs and adhesion of this rust to the product, mold, and/or facilities.

3.Heat resistance
When the conventional coil springs were used over its allowable temperature of 180℃ they degraded and lost its function（fatigue）.
These new springs can be used in a high temperature environment of up to 300℃ without significant functional impairment.（Fig.3）

4.Non-magnetic
These springs are completely non-magnetic, so they can be used in a highly magnetic environment.

5.High load
The conventional coil springs made of stainless steel were limited to be used in low-load level of wire coil spring due to its material characteristics. These springs are made of a newly developed type of stainless steel, enabling them to be used for high load of the irregular shaped wire spring level for the first time.

6.Compatibility
These springs are of the same size (diameter, free length), and have the same deflection, the same load, and the same durability as conventional coil springs (SWF, SWL, SWM and SWH), permitting smooth changeover from the existing coil springs that you are using.

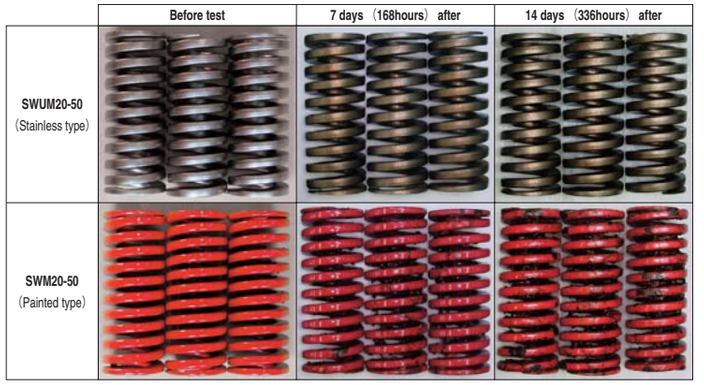
During long-term storage or depending upon the working environment, the springs may undergo a certain amount of discoloration. Note that this is not due to separation of the surface film. Also, discoloration does not affect the performance of the product.

（Fig.1） Identification of type by laser marking

"F3060" ⇨ SWUF30-60
The springs are stamped only on one end face.

（Fig.2） Corrosion resistance evaluation test（Methods of Salt Spray Testing JIS Z 2371）

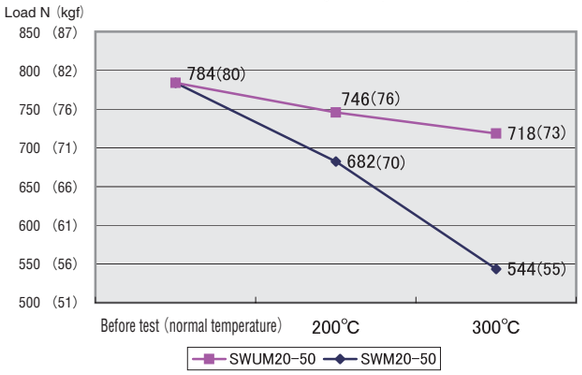
Test conditions: Uniformly spray the test piece in a test chamber maintained at 35℃, using a 5% solution of sodium chloride.



・SWUM：There is some discoloration, but no rust has occurred.
・SWM ：Rust is visible around the entire inner and outer peripheral surfaces.

（Fig.3） Heat resistance evaluation test

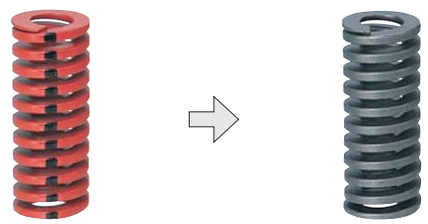
Test conditions: Measure the load after leaving the test piece in a compressed condition in a high temperature atmosphere continuously for 48 hours (deflection 32%).



ALTERATION OF PAINT-PEELING OF COIL SPRING

—GUIDE—

Misumi standard coils springs are, for the purpose of rust proofing and identification, all painted. To meet the needs of users who are trouble by coatings' coming off, we have started paint-peeling service.



Regular painted product　　Paint peeled product

Guide for alteration of paint-peeling

Alteration of paint-peening applies shot peening to the painted coil springs to peel off its painting, then grease is applied for rust prevention.
After the total processing, the paint for identification is completely peeled off, and the bare spring material is exposed.

<Painting peeling process : outline>

Painted coil springs (finish product) → Paint peeling by shot peening → Tempering → Applying antirust agent → Delivery

Applicable springs (It applies to the following Catalog No.)

SWY(P.1067)　SWU(P.1068)　SWR(P.1069)　SWS(P.1071)　SWC(P.1073)
SWF(P.1075)　SWL(P.1077)　SWM(P.1079)　SWH(P.1081)　SWB(P.1083)

⊗Coil spring SWG, SWZ, SWV, SWX, SWUF, SWUL, SWUM and SWUH not applicable.

Note on handling

- Although antirust agent is applied to the paint-peeled springs, silicon chrome steel oil temper line (SWOSC-V) painted on the coil springs is extremely vulnerable to rust. Please be careful in handling them.
- Since rusty springs could cause early breakage, we recommend customers to reduce the deflection rate of paint-peeled springs compared to the regular painted products and replace them periodically depending on the usage environment. Early use after purchasing is also recommended.
- Compared to regular painted springs, there may be some variations load and length, etc. depending on the lot.
- Since paint-peeled products are difficult to identify even from line thickness or the number of turns, please manage them carefully.

Order

When you order alteration of paint-peeling, please put NT before catalog No. on the ordering sheet.

NT — SWU26 — 80

Paint peeling　Regular catalog No.

Price

An alteration charge per unit is incurred depending on the order volume.

Ext.dia.D	¥/1Code		
	1~10	11~19	20~
6・8	600	500	To be quoted
10~35	500	400	
37~70	700	600	

Delivery

5 Days

LOAD-DEFLECTION DIAGRAM FOR COIL SPRINGS

■High deflection type

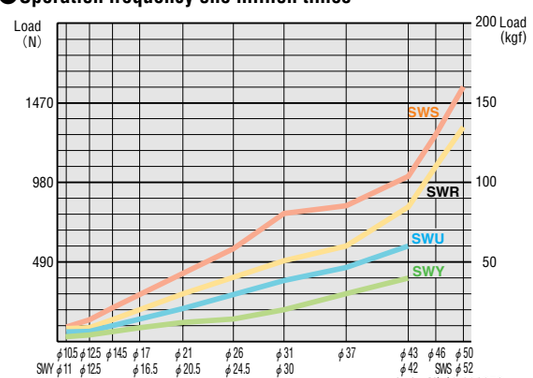
Operation frequency	1 million shots	300,000 times
Deflection rate	65%	70%

Operation frequency	1 million shots	300,000 times
Deflection rate	60%	65%

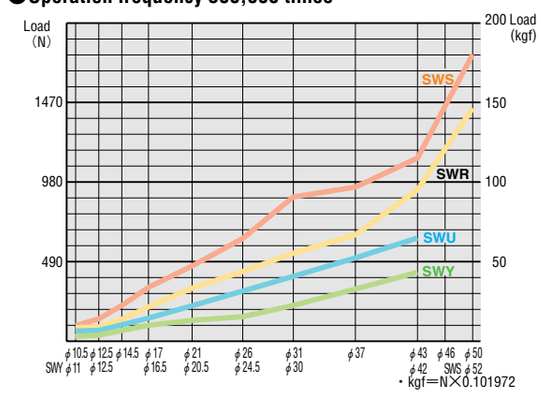
Operation frequency	1 million shots	300,000 times
Deflection rate	50%	55%

Operation frequency	1 million shots	300,000 times
Deflection rate	40%	45%

●Operation frequency one million times



●Operation frequency 300,000 times



■Heavy load type

Operation frequency	1 million shots	5×10⁶ times	300,000 times
Deflection rate	50%	55%	60%

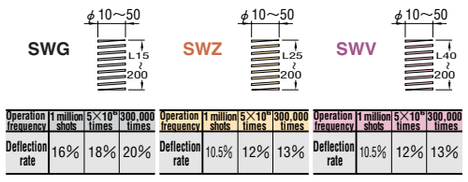
Operation frequency	1 million shots	5×10⁶ times	300,000 times
Deflection rate	40%	45%	50%

Operation frequency	1 million shots	5×10⁶ times	300,000 times
Deflection rate	32%	36%	40%

Operation frequency	1 million shots	5×10⁶ times	300,000 times
Deflection rate	25.6%	28.8%	32%

Operation frequency	1 million shots	5×10⁶ times	300,000 times
Deflection rate	19.2%	21.6%	24%

Operation frequency	1 million shots	5×10⁶ times	300,000 times
Deflection rate	16%	18%	20%

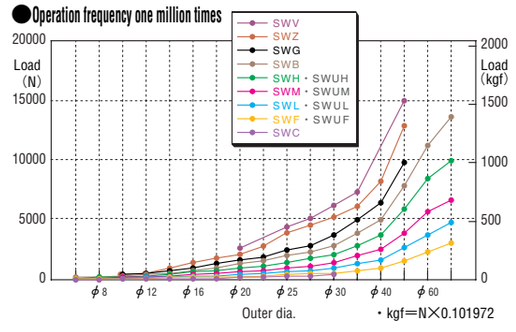


Operation frequency	1 million shots	5×10⁶ times	300,000 times
Deflection rate	16%	18%	20%

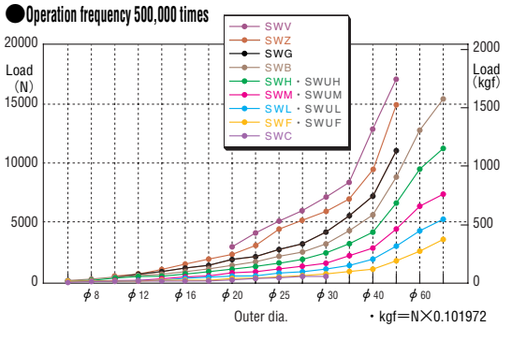
Operation frequency	1 million shots	5×10⁶ times	300,000 times
Deflection rate	10.5%	12%	13%

Operation frequency	1 million shots	5×10⁶ times	300,000 times
Deflection rate	10.5%	12%	13%

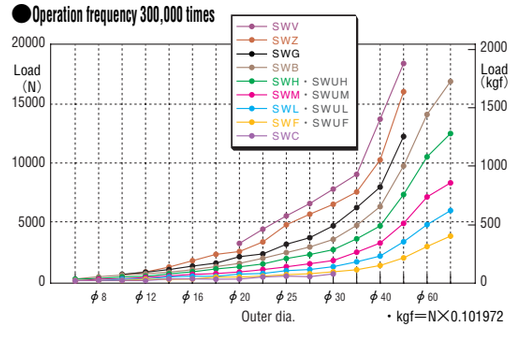
●Operation frequency one million times



●Operation frequency 500,000 times



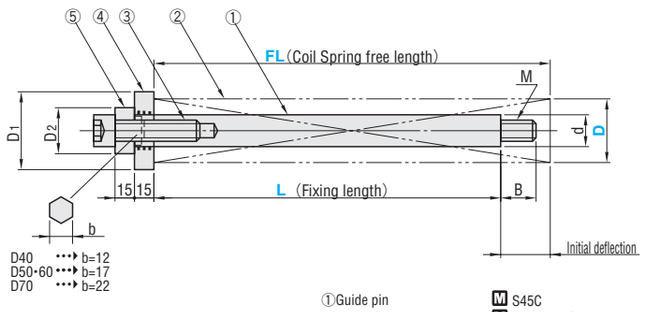
●Operation frequency 300,000 times



SPRING GUIDE UNITS

RoHS

CUK



①Guide pin — M S45C, H 50HRC～ (High frequency quenching)
②Coil spring
③Socket head cap screw — (D40：M12 D50·60：M16 D70：M20)
④Separate disks — M FC250 MoS_2 (Buried)
⑤Pressure disk — M SS400

When using for returning cam, P.1051

d	D1	D2	M×P	B	Catalog No.	② Type	D	① / ② FL	L 1mm increments 90	100	125	150	175	200	250	300	350	＊400	＊450	＊500
19	50	28	12×1.75	24	CUK	SWF	40		68 ～90	80 ～100	90 ～125	105 ～150	130 ～175	145 ～200	195 ～250	240 ～300	—	—	—	—
24	60	36	16×2.0	28		SWL	50											325 ～400	375 ～450	425 ～500
29	70	43	16×2.0			SWM	60		68 ～90	80 ～100	95 ～125	110 ～150	120 ～175	135 ～200	185 ～250	225 ～300	275 ～350			
35	80	48	20×2.5	33		SWH	(70)											—	—	—

D=(70) is available only for SWF and SWL. ＊FL400 or higher is available only for SWF.

Order

Catalog No.	Spring Type	D	FL	L
CUK	SWM	60	250	200

Delivery 3 Days

Price

■Volume discount rate P.37

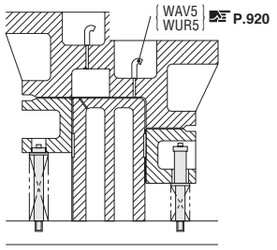
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

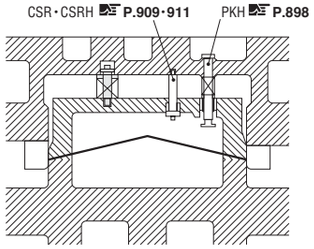
Spec. of coil springs
SWF P. 1075 SWM P.1079
SWL P. 1077 SWH P.1081

Catalog No.	② Spring Type	D	U/Price Q'ty:1～9 FL90	FL100	FL125	FL150	FL175	FL200	FL250	FL300	FL350	FL400	FL450	FL500
CUK	SWF	40	4,620	4,730	4,940	5,150	5,360	5,570	5,990	6,410	—	—	—	—
		50	5,360	5,460	5,780	6,090	6,410	6,620	6,930	7,250	7,660	8,460	8,670	8,880
		60	6,090	6,410	6,720	7,140	7,560	7,980	8,400	8,820	9,340	10,450	10,730	11,040
		70	6,860	7,120	7,650	8,230	8,700	9,390	10,240	11,350	12,310	—	—	—
	SWL	40	4,830	4,940	5,150	5,360	5,570	5,780	6,200	6,620	—			
		50	5,570	5,670	5,990	6,300	6,620	6,930	7,560	8,190	8,970	—	—	—
		60	6,510	6,720	7,140	7,560	7,980	8,400	9,240	10,100	11,100			
		70	7,280	7,660	8,660	8,890	9,500	10,400	11,480	12,840	13,970			
	SWM	40	5,040	5,150	5,360	5,570	5,780	5,990	6,410	6,830	—			
		50	5,880	5,990	6,300	6,620	6,930	7,250	7,880	8,510	9,240	—	—	—
		60	6,830	7,040	7,560	8,090	8,610	9,140	10,000	10,900	11,900			
	SWH	40	5,250	5,360	5,570	5,780	5,990	6,200	6,620	7,140	—			
		50	6,090	6,300	6,720	7,140	7,560	7,980	8,720	9,450	10,380	—	—	—
		60	7,140	7,350	7,880	8,400	8,930	9,450	10,300	11,200	12,400			

Example

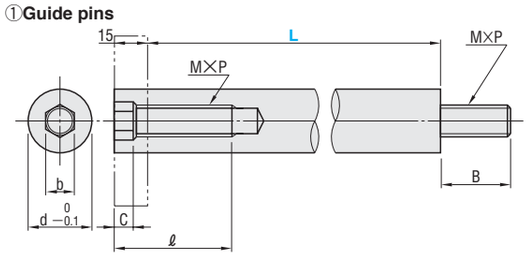


(When using as a cushion for drawing)



(When using as a pressure source for pad)

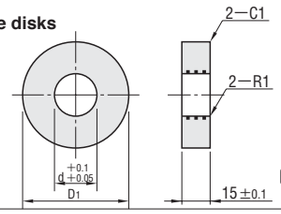
①Guide pins



Applicable coil spring Diameter D	d	b	C	M×P	B	ℓ ②Spring length (FL) 90	100	125	150	175	200	250	300	350	400	450	500
40	19	12	7	12×1.75	24	55	65	75	85	85	95	95	110	—	—	—	—
50	24	17	10	16×2.0	28	60	70	80	90	90	100	100	110	110	110	110	110
60	29	17	10	16×2.0	28	60	70	80	90	90	100	100	110	110	110	110	110
70	35	22	10	20×2.5	33	60	70	80	90	90	100	100	110	110	—	—	—

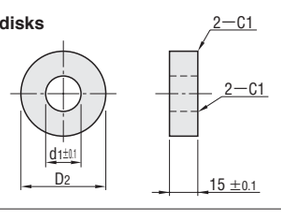
M S45C
H 50HRC～ (High frequency quenching)

④Separate disks



M FC250 MoS_2 (Buried)

⑤Pressure disks



M SS400

■Components of spring guide units

Applicable coil spring Diameter D	Catalog No. Type	No.	L 1mm increments FL 90	100	125	150	175	200	250	300	350	400	450	500	U/Price Q'ty:1～9 FL 90	100	125	150	175	200	250	300	350	400	450	500
40	①Guide pins CUKGP	40	68 ～90	80 ～100	90 ～125	105 ～150	130 ～175	145 ～200	195 ～250	240 ～300	—	—	—	—	4,150	4,220	4,320	4,420	4,520	4,620	4,830	5,040	—	—	—	—
50		50	68 ～90	80 ～100	95 ～125	110 ～150	120 ～175	135 ～200	185 ～250	225 ～300	275 ～350	325 ～400	375 ～450	425 ～500	4,680	4,710	4,880	5,040	5,200	5,260	5,260	5,280	5,500	5,660	5,760	5,860
60		60													5,140	5,370	5,460	5,650	5,850	6,040	6,060	6,070	6,200	6,650	6,750	6,850
70		70										—	—	—	5,400	5,580	5,620	5,810	5,970	6,120	6,200	6,350	6,510	—	—	—

Applicable coil spring Diameter D	D1	d	Catalog No. Type	No.	U/Price Q'ty:1～9
40	50	19	④Separate disks CUKSD	40	1,380
50	60	24		50	1,500
60	70	29		60	1,790
70	80	35		70	1,900

Adaptable spring Diameter D	D2	d1	Catalog No. Type	No.	U/Price Q'ty:1～9
40	28	13	⑤Pressure disks CUKPD	40	540
50	36	17		50	600
60	43			60	670
70	48	21		70	750

Order

Catalog No.	Spring FL	L
CUKGP 60 / CUKSD 60	250	200

Delivery 3 Days

Price

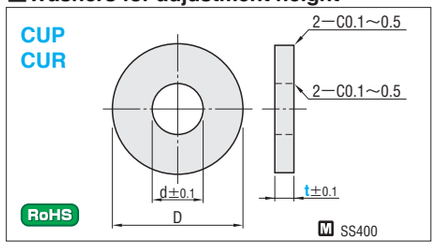
■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

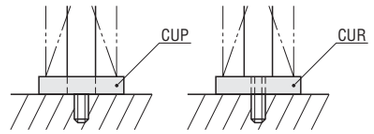
■Washers for adjustment height

CUP
CUR



RoHS

M SS400



D	d	Catalog No. Type	No.	t	U/Price Q'ty:1～9
45	20	CUP	40	1 2 5	470
55	25		50		630
65	30		60		790
75	36		70		1,220

D	d	Catalog No. Type	No.	t	U/Price Q'ty:1～9
45	12.5	CUR	40	5	520
55	16.5		50		680
65	16.5		60		840
75	20.5		70		1,490

Order

Catalog No.	t
CUR 40	5

Delivery 1 Day

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

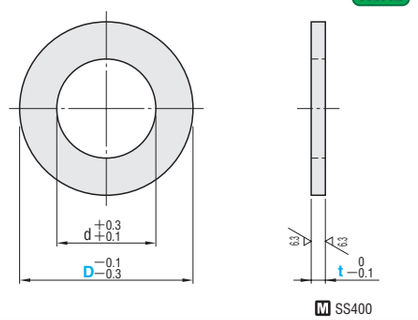
To be quoted on price & lead time above Max. Q'ty.

Express service system P.38 | MISUMI Press 2007 | http://misumi.jp/press/ | For inquiry, ordering and other information, refer to P.1269

WASHERS FOR COIL SPRINGS

SSWA

RoHS

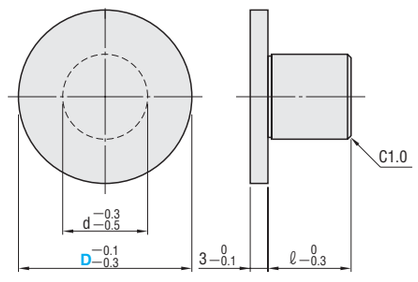


M SS400

d	Applicable spring	Catalog No. Type	Catalog No. D	t	U/Price Q'ty：1～19 t=1.0	t=2.0	t=3.0	t=4.0	t=5.0
3.0	6	SSWA	5	1.0	75	75	75	85	95
5.0	8		7						
6.0	10		9						
7.0	12		11.5						
8.0	14		13						
9.0	16		15	2.0	85	85	85	95	110
10.0	18		17						
12.0	20		19	3.0					
12.0	22		21		95	95	95	100	120
14.5	25		24	4.0					
15.0	27		26						
17.0	30		29	5.0	110	110	110	120	140
20.0	35		34						
23.0	40		39						

SSWB

RoHS



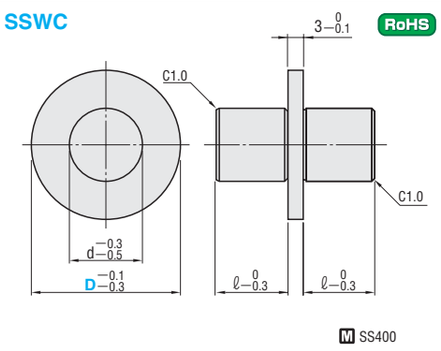
M SS400

d	ℓ	Applicable spring	Catalog No. Type	Catalog No. D	U/Price Q'ty：1～19
3.5	4.0	8	SSWB	7	190
4.5	5.0	10		9	
5.5	6.0	12		11	
6.5	7.0	14		13	
7.5	8.0	16		15	235
8.5	9.0	18		17	
9.5	10.0	20		19	
10.5	11.0	22		21	
12.0	12.0	25		24	
13.0	13.0	27		26	
14.5	15.0	30		29	275
17.0	17.0	35		34	
19.5	20.0	40		39	

⊗Not applied to SWC. SWX type.

SSWC

RoHS



M SS400

d	ℓ	Applicable spring	Catalog No. Type	Catalog No. D	U/Price Q'ty：1～19
3.5	4.0	8	SSWC	7	250
4.5	5.0	10		9	
5.5	6.0	12		11	
6.5	7.0	14		13	
7.5	8.0	16		15	310
8.5	9.0	18		17	
9.5	10.0	20		19	
10.5	11.0	22		21	
12.0	12.0	25		24	
13.0	13.0	27		26	
14.5	15.0	30		29	490
17.0	17.0	35		34	
19.5	20.0	40		39	590

Not applied to SWC. SWX type.

Order — Catalog No. — t

SSWA 15 — 2.0
SSWC 9

Delivery: 1 Day

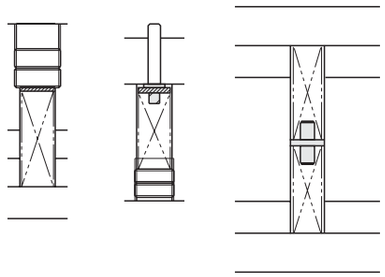
Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～199	200～500
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example

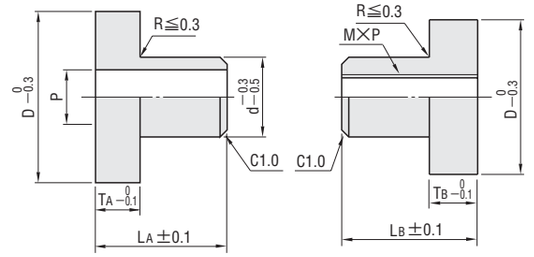


FLANGE FOR SPRING UNITS

The volume discount rate is also applicable to alteration cost. P.39

RoHS

WUNT



- Stripper bolt (MSB) P. 735
- Coil springs P.1055

M S45C
S Fe_3O_4 (Black oxide)

Adoptable spring D	Applicable bolt	P	M×P	TA · TB	LA	LB	D	d	Catalog No. Type	Catalog No. No.	U/Price Q'ty：1～9
25	MSB8	8	6×1.0	5	10	10	26	11.5	WUNT	25	420
27					11	11	28	12.5		27	470
30	MSB10	10	8×1.25		11	11	31	14		30	530
					13	13				30-13	
35					13	13	36	16.5		35	630
40	MSB12	12			13	13	41	19		40	800

The catalog No. is changed (specify the applicable spring diameter and LB length) along with the addition of WUNT30-13.
Cannot be used with SWC (is not compatible with the I.D. of the spring).

Order — Catalog No.: WUNT 25

Delivery: 3 Days
Express A 800/1Pc. P.38
A flat charge of 2,160 Yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alterations — Catalog No. — (LAC · LBC · TAC · TBC)
WUNT 35 — LAC7
⊗Express delivery cannot be applied.

Alterations	Code	Spec.	¥/1Code
LAC, LA	LAC	Changes dimension L 0.1mm increments 1.5+TA≦LAC＜LA When used in combination with TAC：1.5+TAC≦LAC＜LA−TAC	150
LBC, LB	LBC	Changes dimension L 0.1mm increments 1.5+TB≦LBC＜LB When used in combination with TBC：1.5+TBC≦LBC＜LB−TBC	150
TA, TAC	TAC	Changes flange thickness 0.1mm increments 3≦TAC＜TA Dimension LA is shorter in the (TA−TAC) portion. When used in combination with LAC, same as specification.	150
TBC, TB	TBC	Changes flange thickness 0.1mm increments 3≦TBC＜TB Dimension LB is shorter in the (TB−TBC) portion. When used in combination with LBC, same as specification.	150

If it is altered, surface treatment of alteration part may be removed.

■Features

①The initial load can be applied to the spring.
②The spring can be deflected beforehand, lightening the trouble involved in die assembly and adjustment.

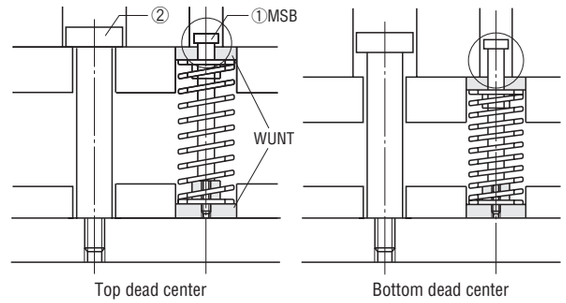
■Notes for users

- Unit example

Coil springs and stripper bolts are sold separately.

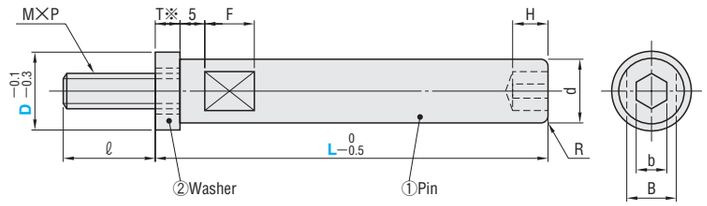
- Adjust the height of stripper bolt ② so that the collar of the stripper bolt ① does not hit against the flange when mounting to the die. (See the figure below.)
- Make a bolt relief hole as shown in the figure below.

Example



SPRING GUIDE PINS

SGA



①② M S45C
H 20～25HRC
S Fe_3O_4 (Black oxide)

※Dimension T changes depending on the dimension L.

M×P	ℓ	b	H	B	F	R	T	d	Applicable coil spring SW□ C	F	L·M·H·B·G·Z·V	X	Catalog No. Type	D	L 5mm increments
4×0.7	7	3	3	4	8	1	3	6	φ14	φ14	φ14	—	SGA	7	20～ 50
									φ16	φ16	φ16	—		8	
5×0.8	8	4	3	6	8	1.5	4	8	—	φ18	φ18	φ20		9	20～ 75
									φ18	—	φ20	φ22		10	
6×1.0	10	5	4	8	8	2	5	10	—	φ20·22	φ22	φ25		11	20～ 85
									φ20	—	φ25	φ27		12.5	
8×1.25	17 (12)	6	4	11	10	2.5	5 (10)	13	φ22	φ25·27	φ27	φ30		13.5	20～125
									φ25	—	φ30	—		15	
									φ27	φ30	—	—		16	
10×1.5	20 (15)	8	5	14	12	3	5 (10)	16	—	—	φ35	φ35		17.5	30～185
									—	φ35	—	—		19	
									φ30	—	φ40	φ40		20	
12×1.75	23 (18)	10	6	17	14	3	5 (10)	20	—	φ40	—	—		22	30～215
									—	—	φ50	—		25	
									—	φ50	—	—		27.5	
16×2.0	27 (22)	14	8	22	16	3	5 (10)	25	—	—	φ60	—		30	50～215
									—	φ60	—	—		33	

When length L is 20 for SGA7～12.5, 20～25 for SGA13.5～16, or 30～35 for SGA17.5～27.5, no spanner groove.
When length L is SGA 13.5 to 33 ending with 5 (L=25, 35, 45...), applicable values for dimensions T and ℓ are the ones shown in ( ).
Sizes of applicable coil spring present those of outside diameter.

Order Catalog No. — L
SGA 20 — 125

Delivery 1 Day

Example

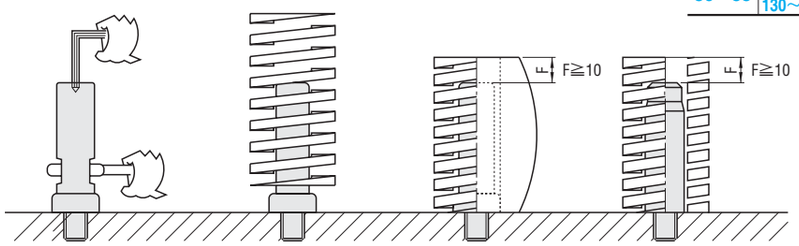
Price

Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	L	U/Price Q'ty : 1～19
7·8	20～ 50	190
9·10	20～ 75	190
11·12.5	20～ 85	240
13.5～16	20～ 85	290
	90～125	380
17.5～20	30～105	380
	110～185	480
22～27.5	30～125	480
	130～215	570
30・33	50～125	710
	130～215	860



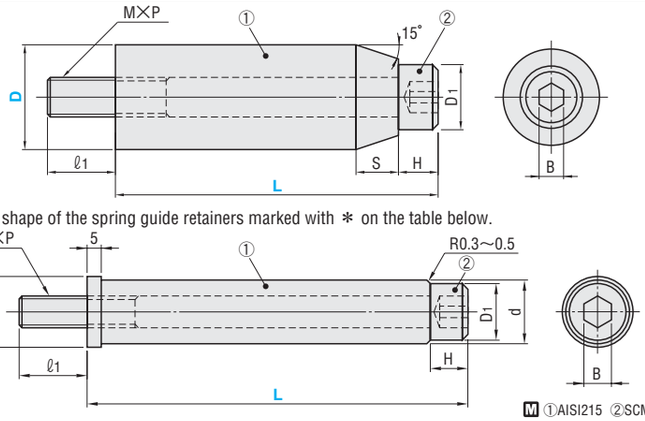
Fasten using the hexagonal hole in the end of the pin or the grooves on the side of the pin designed for using a spanner.

Position the spring correctly by installing it over the bushing.

Please select L assuming the allowance of 10mm or less on upper side of spring guide at bottom dead center.

SPRING GUIDE RETAINERS

SGC



M ①AISI215 ②SCM435

D	d	D1	B	M×P	H	S	ℓ1	Applicable coil spring C	F	L·M·H·B·G·Z·V	X	Catalog No. Type D—L	U/Price Q'ty : 1～19
6	—	4.5	2	M2.5×P0.45	2.5	2	9.5	φ12	φ12 φ14	φ14	—	SGC 6—18	140
												23	
												28	150
8	—	5.5	2.5	M3×P0.5	3	3	8	φ14	φ16 φ18	φ16 φ18	φ20 φ22	SGC 8—20	140
												30	
												40	150
												50	
10	—	7	3	M4×P0.7	4	4	9	φ18	φ20 φ22	φ20 φ22	φ25	SGC 10—20	140
												30	
												40	150
												50	200
												60	
12	—	8.5	4	M5×P0.8	5	4	10	φ22	φ25 φ27	φ27	—	SGC 12—20	140
												30	
												40	150
												50	200
												60	
14	—	10	4	M6×P1.0	4	4	12	—	φ30	φ30	—	SGC 14—12	130
			5		6		11					20	
												30	
												40	
												50	
												60	
16	—	13	6	M8×P1.25	8	5	15	φ27	φ35	φ35	φ35	SGC 16—18	130
							13					30	
												60	
												80	210

Order Catalog No.
SGC 20—23

Delivery 1 Day

Price

Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D	d	D1	B	M×P	H	S	ℓ1	Applicable coil spring C	F	L·M·H·B·G·Z·V	X	Catalog No. Type D—L	U/Price Q'ty : 1～19
19	—	16	8	M10×P1.5	10	5	17	φ30	—	φ40	φ40	SGC 19—28	220
							20					40	
	17					—						60	
												80	280
												100＊	330
20	—				10	5	17	—	φ40	—	—	SGC 20—23	220
							20					40	
	17					—						60	
												80	290
												100＊	350
23	—	18	10	M12×P1.75	12	8	22	—	—	φ50	—	SGC 23—30	280
												40	
	20					—						60	
												80	390
												100	
												120＊	490
26	—				12	8	24	—	φ50	—	—	SGC 26—28	280
							22					60	
	21					—						80	390
												100＊	490
												120＊	520
28	—				12	12	22	—	—	φ60	—	SGC 28—30	330
												40	
	23					—						60	
												80	440
												100＊	570
31	—				12	12	22	—	φ60	—	—	SGC 31—28	330
												40	
	25					—						60	
												80	440
												100＊	670
												120＊	710
36	—				12	15	22	—	φ70	φ70	—	SGC 36—40	390
												60	
	30					—						80	500
												100＊	710
												120＊	760

Sizes of applicable coil springs present those of outside diameter.

Express service system P.38

MISUMI Press 2007 http://misumi.jp/press/

For inquiry, ordering and other information, refer to P.1269

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

GAS SPRINGS

GAS SPRINGS

Add.

Price Cut Up to 16%

Price Cut Up to 10%

Name	—Compact heavy duty type—	—Plates for GSX—	—Compact type—	—Plates for GSM—	
Catalog No.	GSX	AM	GSM	HM	FM
Delivery	①	①	①	①	①
Page	1105	1106	1107	1108	1108

—Short type—	—Plates for GSC—	—Heavy load mini type—	—Mini type—	—Threaded type—
GSC	BM	MGSC	MGSA H F	MGSB
①	①	①	① ① ①	①
1109	1109	1110	1111	1112

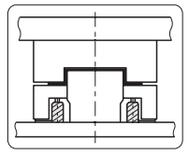
—ISO/CNOMO standard type—	—Plates for GSE—		—Slow return type—
GSE	SF	KF	GSSR
③	③	③	①
1113	1114	1114	1115

These gas springs occupy little space and generate high load.

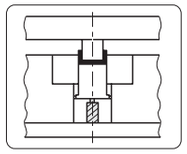
■Characteristics

1. Space-saving — Although these gas springs generate a high load and have a long stroke, they are very compact. It is possible to obtain a high load in a very small space.
2. High initial load — An initial maximum load of 73,900 N (approx. 7.5 t) from the first stroke. This is ideal for processing high tensile steel sheet and thick plate.
3. A wide range of strokes — These gas springs are available in stroke sizes of up to 200 mm, making them suitable for difficult forming work such as deep drawing.
4. Flat load — There is less difference between the initial load and the maximum load,which makes these springs effective for processing thin materials and for keeping a balance between the upper and lower dies.
5. No need for initial deflection — These gas springs can be fixed with bolts, so there is no need to set them with initial deflection. This simplifies the assembling process.

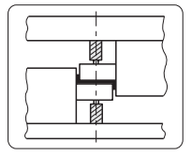
■Usage examples of Gas springs



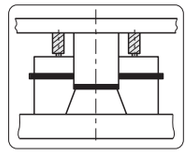
As a cushion for blank holder



As a source for padding in a bending die



For double-action bending



As a source for stripping in a punching die

Use guide pin, bushings and heel guides in order to avoid eccentric load.

GAS SPRINGS
—GUIDE—

■Gas spring selection

GSX

Page	P.1105
Allowable eccentricity	0.3/100mm
Lubrication method	Oil-free
Delivery	1 day

Features: New compact high-load type which has an allowable eccentricity of 15 times that of Misumi's conventional product

Standard table

O.D. D (mm)	Stroke S (mm) 10	15	25	38	50	63	80	Initial load N{kgf}	Max. load N{kgf}
32	●	●	●	●	●	●	●	4750{ 484}	8650{ 882}
38	●	●	●	●	●	●	●	9030{ 921}	18443{1881}
50	—	●	●	●	●	●	●	19000{1937}	28167{2872}
63	—	—	●	●	●	●	●	31000{3161}	48600{4956}

GSM

Page	P.1107
Allowable eccentricity	0.02/100mm
Lubrication method	Oil-free
Delivery	1 day

Features: The original of the compact high-load types with a wide lineup (0.2 to 5.5 t).

Standard table

O.D. D (mm)	Stroke S (mm) 10	15	25	38	50	63	80	Initial load N{kgf}	Max. load N{kgf}
19	—	●	●	●	●	●	●	1500{ 153}	2298{ 234}
25	—	●	●	●	●	●	●	3000{ 306}	4905{ 500}
32	●	●	●	●	●	●	●	5000{ 510}	8114{ 827}
38	●	●	●	●	●	●	●	10000{1020}	16714{1704}
50	●	●	●	●	●	●	●	20000{2039}	31400{3202}
63	●	●	●	●	●	●	●	30000{3059}	48428{4938}

GSC

Page	P.1109
Allowable eccentricity	0.02/100mm
Lubrication method	Oil-free
Delivery	1 day

Features: Super-compact type which boasts its short height

Standard table

O.D. D (mm)	Stroke S (mm) 10	15	25	38	50	80	Initial load N{kgf}	Max. load N{kgf}
32	●	●	●	●	●	●	3750{ 382}	8114{ 827}
38	●	●	●	●	●	●	7500{ 765}	16714{1704}
50	●	●	●	●	●	●	15000{1530}	31400{3202}

MGSC

Page	P.1110
Allowable eccentricity	0.02/100mm
Lubrication method	Oil-free
Delivery	1 day

Features: High-load mini-sized type: it's small, but generates high load

Standard table

O.D. D (mm)	Stroke S (mm) 10	15	25	38	Initial load N{kgf}	Max. load N{kgf}
16	●	●	●	●	1000{102}	1688{172}
19	●	●	●	●	1700{173}	2913{297}
25	●	●	●	●	3600{367}	6575{670}

MGSA

Page	P.1111
Allowable eccentricity	0.02/100mm
Lubrication method	Oil-free
Delivery	1 day

Features: Small diameter type with large choice of strokes (10 ~ 80 mm)

Standard table

O.D. D (mm)	Stroke S (mm) 10	15	25	38	50	80	Initial load N{kgf}	Max. load N{kgf}
19	●	●	●	●	●	●	800{ 82}	1270{130}
25	●	●	●	●	●	●	1600{163}	2600{265}

MGSB

Page	P.1112
Allowable eccentricity	0.02/100mm
Lubrication method	Requires periodic lubrication with grease.
Delivery	1 day

Features: Small diameter, screw-in type. Requires periodic lubrication with grease.

Standard table

O.D. M (Fine thread)	Stroke S (mm) 10	15	25	Initial load N{kgf}	Max. load N{kgf}
12	●	●	—	400{41}	640{ 65}
16	●	●	●	800{82}	1280{131}

GSE

Page	P.1113
Allowable eccentricity	0.3/100mm
Lubrication method	Oil-free
Delivery	3 days

Features: Conforms to ISO (international standard) and CNOMO (French standard). Available in a wide range of strokes (25 ~ 200 mm).

Standard table

O.D. D (mm)	Stroke S (mm) 25	50	80	100	125	160	200	Initial load N{kgf}	Max. load N{kgf}
38	●	●	●	●	—	—	—	2420{ 247}	3300{ 337}
45	●	●	●	●	●	●	—	4300{ 438}	6200{ 632}
50	●	●	●	●	●	●	●	7210{ 735}	11385{1161}
75	●	●	●	●	●	●	—	14900{1519}	22400{2284}
95	●	●	●	●	●	●	—	28800{2937}	45267{4616}
120	●	●	●	●	●	●	●	48800{4976}	73686{7514}
150	●	●	●	●	●	●	●	73900{7536}	116343{11864}

GSSR

Page	P.1115
Allowable eccentricity	0.02/100mm
Lubrication method	Oil-free
Delivery	1 day

Features: High-added-value type with slow return function

Standard table

O.D. D (mm)	Stroke S (mm) 25	38	50	80	Initial load N{kgf}	Max. load N{kgf}
50	●	●	●	●	5000{510}	9750{994}

The maximum load of each type is the mean value of all strokes. For the load of each stroke, refer to respective explanations.

Gas spring GSR has been discontinued.

PRECAUTIONS FOR USE OF GAS SPRINGS
—GUIDE—

■Precautions for use of gas springs
If a gas spring is used in the following ways, a major accident, such as an explosion, or product trouble may occur.

■Danger prevention
①Never disassemble, weld, fuse, heat or modify a gas spring.
A gas spring contains high-pressure gas. If you fail to heed this precaution, its parts may burst out.

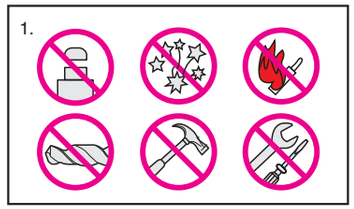
②You cannot recharge the gas or adjust its pressure.
If you attempt to do so, a major accident, such as an explosion, may to occur.

③The working ambient temperature (around a die) is 0 ~ 40˚ C (32 ~ 104˚ F).
Use a gas spring within this range.
If a gas spring is heated over 70℃, a major accident, such as an explosion, may occur. Also, the gas seal deteriorated by heat may result in gas leakage.

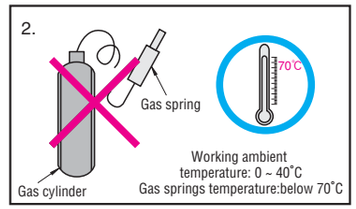
■Disposal method
④Wear protective goggles. Make a hole that passes through the bolt hole, bleed off the gas from the cylinder, and then dispose of the gas spring.
Make that the nitrogen gas has been bled off completely.

■Gas leakage prevention
⑤Do not use the gas spring in the following ways.
Failure to observe these precautions may result in gas leakage and other troubles. Also a major accident, such as an explosion, may occur.

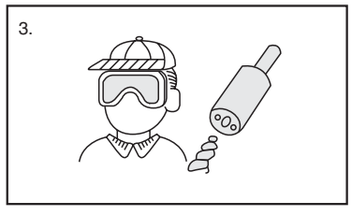
Usage that are considered problematical		Phenomena that may occur	Result
a	Application of an oblique load or a transverse load.	Eccentric load and/or Damage	Gas leakage
b	Gas spring is not fixed with bolts.		
c	No sub-guide components are not used, or lack of components.		
d	The load distribution at the front, rear, left and right of the inside the die is not equal.		
e	There is an obstacle touching the gas spring inside the die.		
f	Mounting gas spring by the tap hole on top of the piston rod.		
g	An extension pin is mounted on the piston rod end.		
h	The piston rod is not pushed flatly.		
i	Surface of the piston rod is deformed.		
j	Cutting the piston rod.		
k	Welding spatter clings to the piston rod.	Seal damage	
l	Cutting chips and metallic dust cling the piston rod.		
m	The piston rod is dented.		
n	Exceeding the shot limit.		
o	The gas spring is immersed in lubricating oil.		
p	The gas spring is exposed to moisture, steam or chemicals.		
q	Recharging the gas or adjusting its pressure.	Reduction of durability	Gas leakage, explosion, etc.
r	The gas spring is used at high temperature (40˚C or above) or low temperature (0˚C or below).		
s	Overstroking		
t	Grinding the cylinder.		
u	Releasing the piston rod abruptly.		
v	Use or strange of the gas spring outdoors or under humid condition.		
w	Disassembling, welding, fusing, heating or modifying the gas spring.	Unexpected problems	
x	Incorporating the gas spring into a building or a vehicle.		
y	Other unexpected use (other than in a die)		



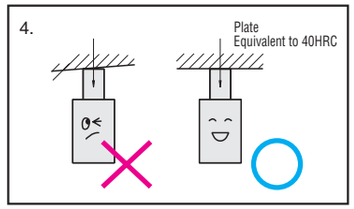
Never disassemble, weld, fuse, heat or modify a gas spring.



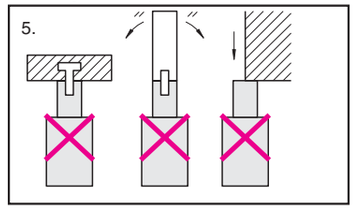
Do not recharge the gas , or adjust its pressure.
The working ambient temperature (around a die) is 0~40˚C.



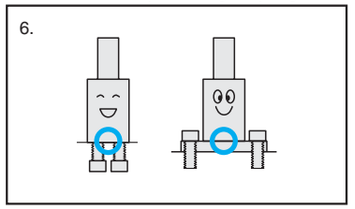
Wear protective goggles, bleed off the gas and then dispose the gas spring.



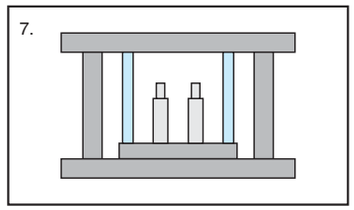
Do not apply oblique load or transverse load.



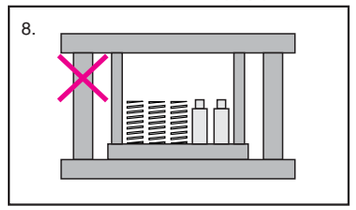
Do not mount gas spring by piston rod side, attach an extension pin, or apply partial load.



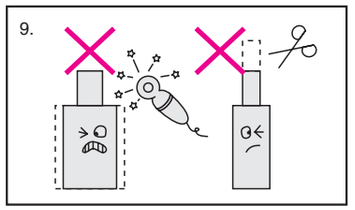
Fix the gas spring with bolts or a flange.



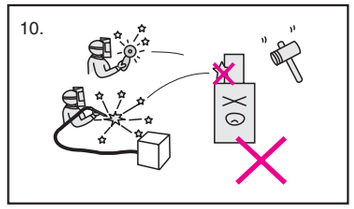
Use sub-guide pins to prevent the eccentric load.



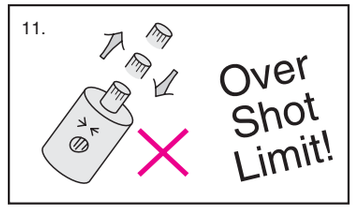
Apply load evenly.



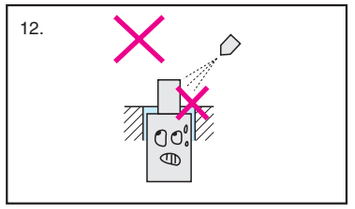
Never grind the cylinder or cut the piston rod.



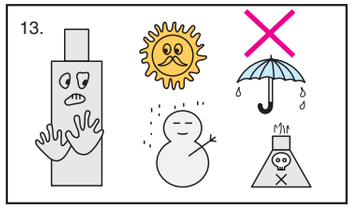
Prevent clinging of welding spatter, cutting chips and metalic dust.



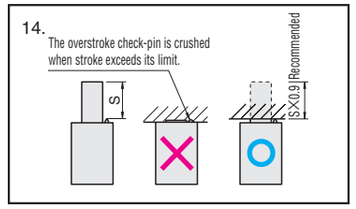
Do not exceed the shot limit.



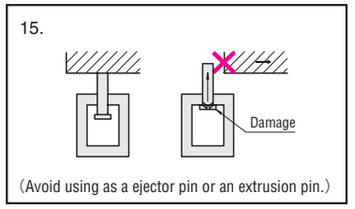
Do not immerse the gas spring in lubricating oil.



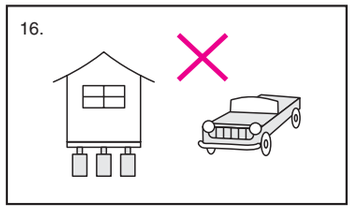
Never use or store the gas spring outdoors or under humid condition.



Do not use in exceeding stroke limit.



Do not release the piston rod abruptly.



Do not incorporate the gas spring into a building or a vehicle.

Do not use other than in a die.

■Allowable eccentricity

If you apply an eccentric load, gas leakage may occur.

Catalog No.	Allowable eccentricity
GSX GSE	0.3/100mm
GSM GSC MGSC MGSA MGSB GSSR	0.02/100mm

PRESS ADD.SPEC. Printed in Red

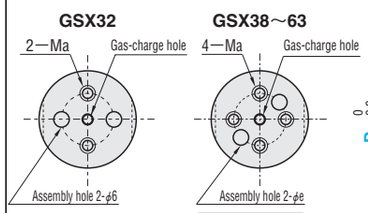
GAS SPRINGS
—COMPACT HEAVY DUTY—

Price Cut Up to 16%

: Reduced Price

RoHS

GSX

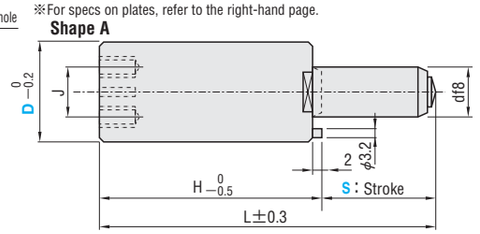


D	e
38	6
50	7
63	8

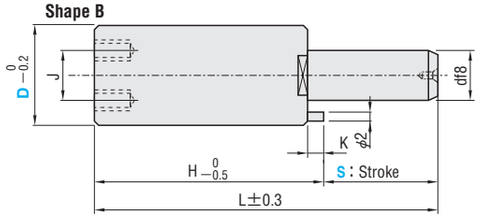
When a gas spring is used exceeding the range of stroke length (S), it will cause gas leakage and the piston rod will not return. Make sure to use a gas spring within the range of stroke length so that nothing makes contact with the overstroke check pin.

※For specs on plates, refer to the right-hand page.

Shape A



Shape B



You cannot use the gas-charge hole or the assembly hole for installing products.
The positional relationship of the assembly holes and the spanner groove is not necessarily the same.

Charged pressure of nitrogen gas	MPa{kgf/cm²}
GSX32	18.7{191}
GSX38	18.4{188}
GSX50	19.2{196}
GSX63	19.2{196}

Catalog No.	Components	Cylinder body	Piston rod (Contact face)	Piston rod
GSX32—10 GSX38—10 (Shape A)	M	S45C	NAK55	SCM435
	H	—	—	700HV～ (Surface)
	S	Fe_3O_4 (Black oxide)	37～43HRC	Nitriding+Grinding finish
GSX32～63 (Shape B)	M	S45C	—	SCM435
	H	—	—	750HV～ (Surface)
	S	Fe_3O_4 (Black oxide)	—	Hardening+Grinding finish

Shape	Weight (kg)	D	d	L	H	Ma Tapped holes for mounting	J	K	Load N{kgf} Initial load	Load N{kgf} Max. load	Catalog No. Type	Catalog No. D–S	U/Price Q'ty : 1～9
A	0.30			75	65					7200 { 734}		32—10	14,690
B	0.32			85	70					8000 { 816}		32—15	15,730
	0.36			105	80					8600 { 877}		32—25	16,730
	0.43	32	18	135	97	M6×9	15	2	4750 {484}	8850 { 902}		32—38	17,680
	0.46			155	105					9250 { 943}		32—50	18,570
	0.51			185	122					9300 { 948}		32—63	19,380
	0.57			220	140					9350 { 953}		32—80	20,280
A	0.43			75	65					15000 {1530}		38—10	19,440
B	0.46			85	70					17200 {1754}		38—15	20,380
	0.52			105	80					18400 {1876}		38—25	21,260
	0.61	38	25	135	97	M6×9	20	2	9030 {921}	19100 {1948}		38—38	22,220
	0.66			155	105					19700 {2009}		38—50	23,030
	0.73			185	122					19800 {2019}		38—63	24,080
	0.83			220	140					19900 {2029}		38—80	24,630
A	0.90			110	95					24000 {2447}		50—15	27,510
B	0.97			130	105					26000 {2651}		50—25	28,530
	1.08			155	117					28000 {2855}		50—38	29,690
	1.18	50	35	180	130	M8×11	25	3	19000 {1937}	29000 {2957}		50—50	30,590
	1.27			205	142					30500 {3110}		50—63	31,240
	1.42			240	160					31500 {3212}		50—80	31,820
A	1.70			130	105					43500 {4436}		63—25	40,690
B	1.85			155	117					47000 {4793}		63—38	42,540
	2.00	63	45	180	130	M8×11	35	3	31000 {3161}	49000 {4997}		63—50	44,830
	2.15			205	142					51000 {5201}		63—63	47,440
	2.35			240	160					52500 {5354}		63—80	50,430

GSX

The initial load and maximum load vary depending on the temperature and operation speed. The load tolerance for temperature variation is ±10%.
● kgf=N×0.101972 ●N=kgf×9.80665 ●Charged pressure of nitrogen gas kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665

Order **Catalog No.** GSX 32—38 AM—32 Delivery **1** Day

Price

Volume discount rate P.37

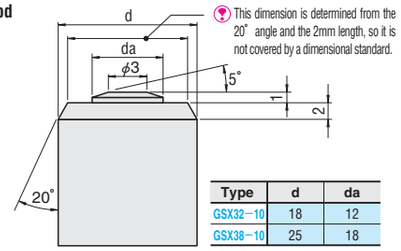
Quantity	1～9	10～19	20～39	40～99
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Detailed dimensions of the end of the piston rod

The end shape of the GSX32—10 and 38—10 piston rods are shape A, but they may be changed to shape B without prior notice. However, the L dimension remains unchanged. (The change date has not been decided.)

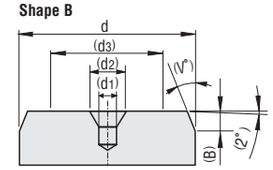
Shape A (GSX32—10,GSX38—10)



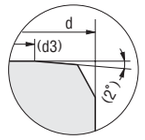
This dimension is determined from the 20° angle and the 2mm length, so it is not covered by a dimensional standard.

Type	d	da
GSX32—10	18	12
GSX38—10	25	18

Shape B



Detailed view of the end

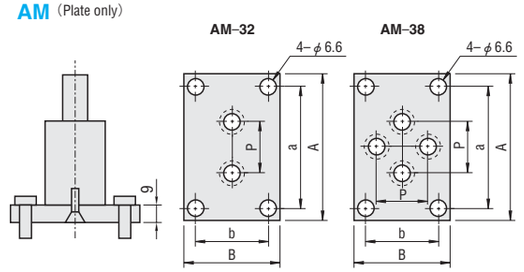


Type	(d1)	(d2)	(d3)	d	V	B
GSX32	2.5	5.3	12	18	20	3
GSX38	2.5	5.3	16	25	20	3
GSX50	3.0	6.5	22	35	15	4
GSX63	3.0	6.5	26	45	15	4

The parenthesized dimensions are reference values.

RoHS

AM (Plate only)

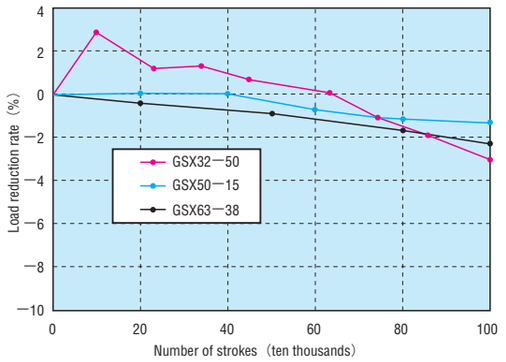


Bolt	A	B	a	b	P	Catalog No.		U/Price Q'ty : 1～9
FB6–16×2 pcs.	51	32	41	22	15	AM	32	1,380
FB6–16×4 pcs.	57	38	47	28	20		38	1,520

It is recommended that the bolts be coated with locking paint before use.

Endurance test result

	GSX32—50	GSX50—15	GSX63—38
Amplitude	48mm	13mm	35mm
Excitation speed	45spm	70spm	65spm
Mounting direction	Tilt 0.3/100	Tilt 0.3/100	Tilt 0.3/100
Cooling method	Forced air cooling	Forced air cooling	Forced air cooling



Allowable eccentricity

The life of the gas spring is affected by the eccentric load. If an eccentric load that exceeds the allowable value is applied, the life of the gas spring may be reduced.

The allowable eccentricity of GSX is 0.3/100 mm which is 15 times of that of other products. (The allowable eccentricity of other products is 0.02/100 mm.)
Consequently, GSX prevents reduction of life due to eccentric loading. (This also applies to GSE.)

Catalog No.	Allowable eccentricity
GSX	0.3/100mm
GSE	
GSM	0.02/100mm
GSC	
MGSC	
MGSA	
MGSB	
GSSR	

Shot limit

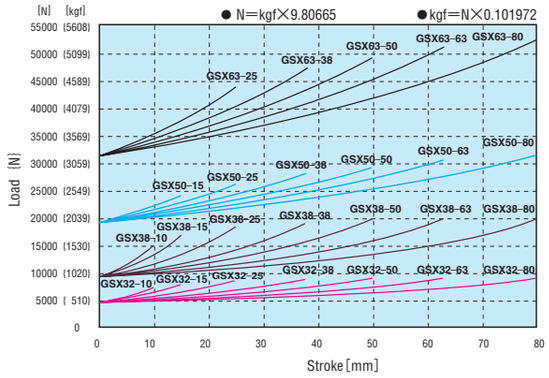
	Stroke (mm)	10	15	25	38	50	63	80
GSX	Shot count limit (spm)	220	165	100	65	50	40	35

Shot count limit: The number of shots per minute
The shot count limit is sometimes affected by the working environment.
The figures shown here are reference values.

Gas spring temperature range

The working ambient temperature is 0 to 40℃. Ensure that the temperature of the gas spring does not exceed 70℃.

Load characteristics graph of GSX



This graph shows the quasi-static characteristics.
Actual characteristics vary depending on temperature and operation speed.

GAS SPRINGS
—COMPACT TYPE—

Price Cut Up to 10%
: Reduced Price

RoHS

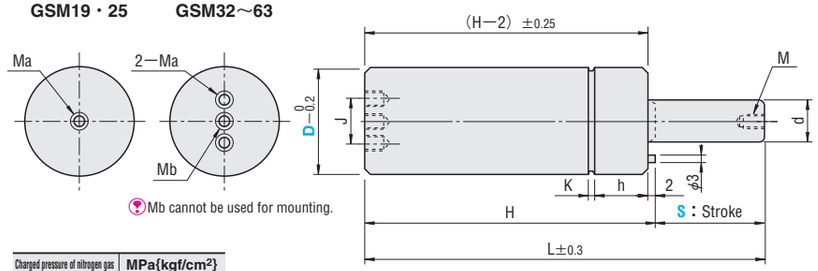
GSM (Main body)
GSMH (HM plate set)
GSMF (FM plate set)

When a gas spring is used exceeding the range of stroke length (S), it will cause gas leakage and the piston rod will not return. Make sure to use a gas spring within the range of stroke length so that nothing makes contact with the overstroke check pin.

※For specs on plates, refer to the right-hand page.

Do not fix the gas spring using the screw hole at the end or, install an extension pin. P.1104

GSM19・25 **GSM32～63**



Mb cannot be used for mounting.

Charged pressure of nitrogen gas	MPa{kgf/cm²}
GSM 19	19.1{195}
GSM 25	19.5{199}
GSM 32	19.7{201}
GSM 38	20.5{209}
GSM 50	20.9{213}
GSM 63	18.9{193}

Cylinder body
M SCM440 or equivalent
S Fe3O4 (Black oxide)

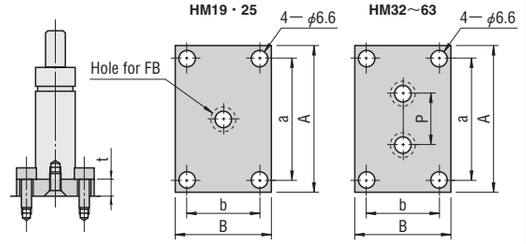
Piston rod
M SACM645
H 1000HV～ (Surface)
S Nitriding+Barrel finishing

Weight (kg)	D	d	M	L	H	h	K	Ma Tapped holes for mounting	Mb	J	Load N{kgf} Initial load	Load N{kgf} Max. load	Catalog No. Type	Catalog No. D—S	U/Price Q'ty : 1～9 GSM	GSMH	GSMF
0.10	19	10	M5× 7	85	70	23	2 (R1)	M6× 8	—	—	1500 {153}	2100{ 214}	GSM	19—15	11,640	12,410	13,770
0.11				105	80							2180{ 222}		19—25	12,340	13,110	14,470
0.14				135	97							2250{ 229}		19—38	13,530	14,300	15,660
0.16				160	110							2330{ 238}		19—50	14,730	15,500	16,860
0.19				190	127							2420{ 247}		19—63	15,590	16,360	17,720
0.21				220	140							2510{ 256}		19—80	16,120	16,890	18,250
0.21	25	14	M6× 8	85	70	23	2 (R1)	M6× 8	—	—	3000 {306}	4500{ 459}		25—15	13,230	14,070	15,490
0.23				105	80							4800{ 489}		25—25	13,360	14,170	15,550
0.26				135	97							4800{ 489}		25—38	14,620	15,430	16,880
0.29				160	110							4950{ 505}		25—50	15,680	16,490	17,940
0.35				190	127							5100{ 520}		25—63	16,620	17,430	18,880
0.38				225	145							5280{ 538}		25—80	17,250	18,060	19,510
0.32	32	18	M8×12	75	65	26	2 (R1)	M6× 8	M4× 8	15	5000 {510}	7500{ 765}		32—10	15,160	16,440	18,370
0.32				85	70							7750{ 790}		32—15	16,240	17,520	19,450
0.36				105	80							8000{ 816}		32—25	17,260	18,540	20,470
0.43				135	97							8000{ 816}		32—38	18,250	19,540	21,460
0.48				160	110							8250{ 841}		32—50	19,170	20,460	22,390
0.58				195	132							8500{ 867}		32—63	20,010	21,300	23,230
0.64				230	150							8800{ 897}		32—80	20,930	22,220	24,150
0.44	38	25	M8×12	75	65	12	2 (R1)	M6× 8	M8× 8	20	10000 {1020}	15500{1581}		38—10	20,490	21,880	23,980
0.46				85	70							16000{1632}		38—15	21,470	22,860	24,960
0.52				105	80							16500{1683}		38—25	22,400	23,800	25,900
0.61				135	97							16500{1683}		38—38	23,410	24,800	26,900
0.68				160	110							17000{1733}		38—50	24,260	25,660	27,760
0.83				205	142							17500{1785}		38—63	25,370	26,770	28,870
0.98				240	160							18000{1835}		38—80	25,960	27,360	29,460
1.05	50	35	M8×12	90	80	13	4 (R2)	M8×12	M8×12	20	20000 {2039}	28000{2855}		50—10	28,270	29,780	32,110
1.10				115	100							29200{2978}		50—15	29,100	30,610	32,940
1.19				135	110							30000{3059}		50—25	30,190	31,720	34,080
1.28				165	127							32000{3263}		50—38	31,420	32,950	35,310
1.40				190	140							33000{3365}		50—50	32,360	33,890	36,250
1.66				220	157							33600{3426}		50—63	33,070	34,600	36,960
1.90				255	175							34000{3467}		50—80	33,670	35,200	37,560
1.66	63	45	M8×12	95	85	12	5 (R2.5)	M8×12	M8×12	20	30000 {3059}	42900{4375}		63—10	38,140	39,840	42,740
1.80				115	100							44700{4558}		63—15	39,040	40,740	43,640
1.94				135	110							46200{4711}		63—25	39,850	41,550	44,450
2.18				165	127							48300{4925}		63—38	41,660	43,360	46,260
2.34				190	140							51000{5200}		63—50	43,900	45,600	48,500
2.65				220	157							52200{5323}		63—63	46,460	48,160	51,060
2.95				255	175							53700{5476}		63—80	49,390	51,090	53,990

The initial load and maximum load vary depending on the temperature and operation speed. The load tolerance for temperature variation is ±10%.
● kgf=N×0.101972 ● N=kgf×9.80665
● Charged pressure of nitrogen gas kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665
When mount GSM32, 38, 50, or 63, be sure to use mounting holes of Ma and two bolts.

RoHS

GSMH (Set parts) **HM** (Plate only)

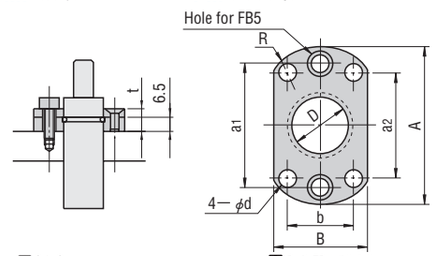


M SS400
S Fe3O4 (Black oxide)

A Bolt	A	B	a	b	P	t	Catalog No.		U/Price Q'ty : 1～9
FB6—16×1 pc	38	28	28	18	—	9	HM	19	1,000
	44	28	34	18				25	1,100
FB6—16×2 pcs.	51	32	41	22	15			32	1,380
	57	38	47	28				38	1,520
FB8—20×2 pcs.	69	50	59	40	20			50	1,690
	84	65	70	50				63	1,830

RoHS

GSMF (Set parts) **FM** (Plate only)



M S45C
S Fe3O4 (Black oxide)
A Bolt FB5-10 : 2pcs.
Semicircle ring : 2 pcs.

A	B	a1	a2	b	d	D	t	R	Catalog No.		U/Price Q'ty : 1～9
44	28	33	28	18	6.6	19	11	22.0	FM	19	2,500
50	30	38	34	18		25		25.0		25	2,600
57	39	46	40	22		32		28.5		32	3,460
63	46	53	45	26		38		31.5		38	3,820
75	58	64	54	34		50		37.5		50	4,310
98	76	86	74	40	9.0	63	13	49.0		63	4,950

Order

Catalog No.
GSM 32—25
GSMH 38—38
HM — 32

Delivery

1 Day

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～39	40～99
Rate	—	5%	10%	15%

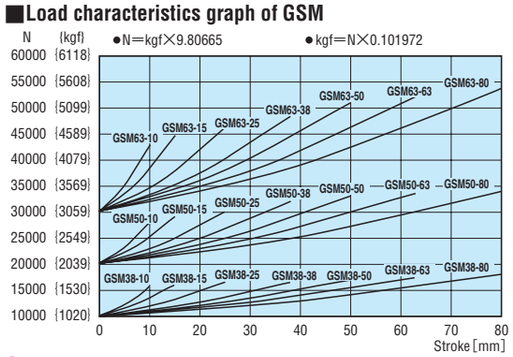
To be quoted on price & lead time above Max. Q'ty.

■Shot limit

	Stroke (mm)	10	15	25	38	50	63	80
GSM	Shot count limit (spm)	250	165	100	65	50	40	30

Shot count limit : The number of shots per minute
The shot count limit is sometimes affected by the working environment.
The figures shown here are reference value.

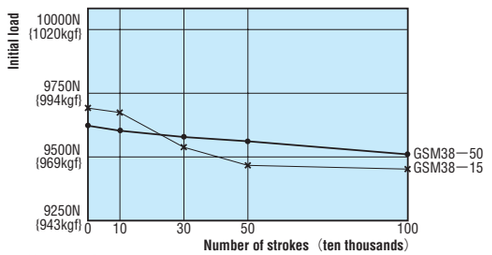
■Load characteristics graph of GSM



This graph shows the quasi-static characteristics.Actual characteristics vary depending on temperature and operation speed.

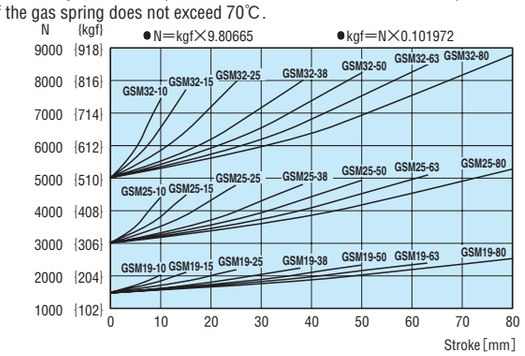
■Endurance test result

Catalog No.	GSM38—15	GSM38—50
Amplitude	15mm	50mm
Excitation speed	200	60
Mounting direction	Erect	Erect



■Gas spring temperature range

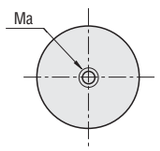
The working ambient temperature is 0 to 40℃. Ensure that the temperature of the gas spring does not exceed 70℃.



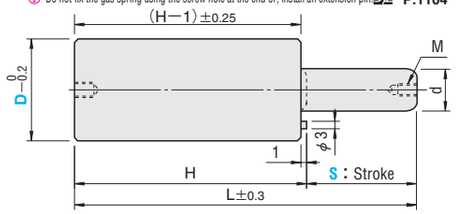
GAS SPRINGS
—SHORT TYPE—

RoHS

GSC (Main body)
GSCB (BM plate set)



When a gas spring is used exceeding the range of stroke length(S), it will cause gas leakage and the piston rod will not return. Make sure to use a gas spring within the range of stroke length so that nothing makes contact with the overstroke check pin.
Do not fix the gas spring using the screw hole at the end or, install an extension pin. P.1104



Charged pressure of nitrogen gas	MPa{kgf/cm²}
GSC 32	14.7{150}
GSC 38	19.7{201}
GSC 50	21.2{216}

Cylinder body
M SCM440 or equivalent
S Fe_3O_4 (Black oxide)

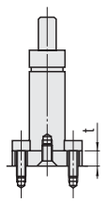
Piston rod
M SACM645
H 1000HV～(Surface)
S Nitriding+Barrel finishing

Weight (kg)	D	d	M	L	H	Ma Tapped holes for mounting	Load N{kgf} Initial load	Load N{kgf} Max. load	Catalog No. Type	Catalog No. D−S	U/Price Q'ty：1～9 GSC	U/Price Q'ty：1～9 GSCB
0.23	32	18	—	55	45	M 6× 8	3750 {382}	6710{ 684}	GSC (Main body) GSCB (BM plate set)	32—10	17,910	19,190
0.23			M6× 8	65	50			6750{ 688}		32—15	18,370	19,650
0.24				85	60			6860{ 700}		32—25	19,450	20,730
0.26				111	73			6940{ 708}		32—38	20,570	21,860
0.28				135	85			6980{ 712}		32—50	21,600	22,890
0.47				195	115			7000{ 714}		32—80	22,320	23,610
0.26	38	22	—	55	45	M 8×12	7500 {765}	13500{1377}		38—10	23,620	25,020
0.28			M6× 8	65	50			13880{1415}		38—15	24,200	25,590
0.36				85	60			14030{1431}		38—25	25,250	26,650
0.40				111	73			14100{1438}		38—38	26,390	27,780
0.46				135	85			14250{1453}		38—50	27,350	28,750
0.65				195	115			14320{1460}		38—80	28,640	30,040
0.60	50	30	M8×12	60	50	M10×12	15000 {1530}	27750{2830}		50—10	32,130	33,640
0.62				70	55			28500{2906}		50—15	32,800	34,310
0.71				90	65			28950{2952}		50—25	34,020	35,550
0.82				116	78			29400{2998}		50—38	35,410	36,940
0.92				140	90			29500{3008}		50—50	36,480	38,010
1.15				200	120			29700{3029}		50—80	37,990	39,520

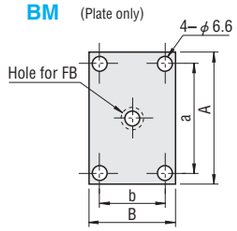
The initial load and maximum load vary depending on the operation speed. The load tolerance for temperature variation is ±10%. ・kgf=N×0.101972 ・N=kgf×9.80665
・Charged pressure of nitrogen gas kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665

RoHS

GSCB (Set parts)



BM (Plate only)



M SS400
S Fe_3O_4 (Black oxide)

A Bolt	A	B	a	b	t	Catalog No.		U/Price Q'ty：1～9
FB 6—16×1pc.	51	32	41	22	9	BM	32	1,380
FB 8—20×1pc.	57	38	47	28			38	1,520
FB10—20×1pc.	69	50	59	40			50	1,690

Order — Catalog No.
GSC 32—25
GSCB 38—38
BM — 32

Delivery — 1 Day

Price

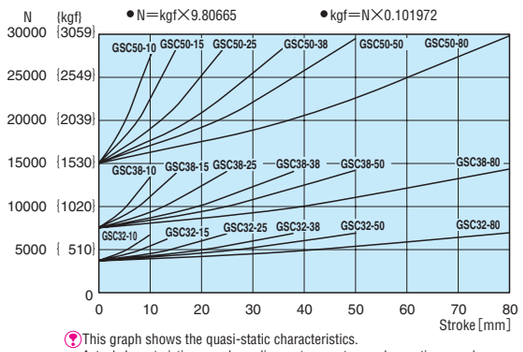
■Shot limit

	Stroke (mm)	10	15	25	38	50	80
GSC	Shot count limit (spm)	250	165	100	65	50	30

Shot count limit : The number of shots per minute
The shot count limit is sometimes affected by the working environment.
The figures shown here are reference values.

■Gas spring temperature range
The working ambient temperature is 0 to 40℃. Ensure that the temperature of the gas spring does not exceed 70℃.

■Load characteristics graph of GSC



This graph shows the quasi-static characteristics.
Actual characteristics vary depending on temperature and operation speed.

■Volume discount rate P.37

Quantity	1～9	10～19	20～39	40～99
Rate	—	5%	10%	15%

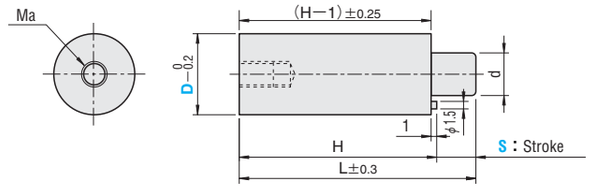
To be quoted on price & lead time above Max. Q'ty.

GAS SPRINGS
—HEAVY LOAD MINI TYPE—

RoHS

MGSC

When a gas spring is used exceeding the range of stroke length(S), it will cause gas leakage and the piston rod will not return. Make sure to use a gas spring within the range of stroke length so that nothing makes contact with the overstroke check pin.



Charged pressure of nitrogen gas	MPa{kgf/cm²}
MGSC 16	20.0{204}
MGSC 19	21.6{220}
MGSC 25	20.4{208}

Cylinder body
M SCM440 or equivalent
S Fe_3O_4 (Black oxide)

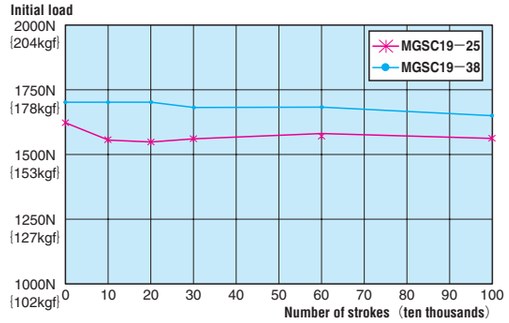
Piston rod
M SACM645
H 900HV～(Surface)
S Nitriding+Grinding finish

Weight (kg)	D	d	L	H	Ma Tapped holes for mounting	Load N{kgf} Initial load	Load N{kgf} Max. load	Catalog No. Type	Catalog No. D−S	U/Price Q'ty：1～9
0.06	16	8	55	45	M5×7	1000 {102}	1550{158}	MGSC	16—10	6,400
0.06			65	50			1650{168}		16—15	6,810
0.07			85	60			1750{178}		16—25	7,200
0.07			111	73			1800{184}		16—38	7,860
0.08	19	10	55	45	M5×7	1700 {173}	2750{280}		19—10	6,600
0.09			65	50			2850{291}		19—15	6,970
0.10			85	60			2950{301}		19—25	7,530
0.11			111	73			3100{316}		19—38	7,860
0.14	25	15	55	45	M6×8	3600 {367}	6000{612}		25—10	7,970
0.15			65	50			6550{668}		25—15	8,330
0.16			85	60			6800{693}		25—25	8,690
0.18			111	73			6950{709}		25—38	9,190

The initial load and maximum load vary depending on the temperature and operation speed. The load tolerance for temperature variation is ±10%. ・kgf=N×0.101972 ・N=kgf×9.80665
・Charged pressure of nitrogen gas kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665

■Endurance test result

Catalog No.	MGSC19—25	MGSC19—38
Amplitude	23mm	35mm
Excitation speed	120spm	65spm
Mounting direction	Erect	Erect



Order — Catalog No. MGSC 19—25

Delivery — 1 Day

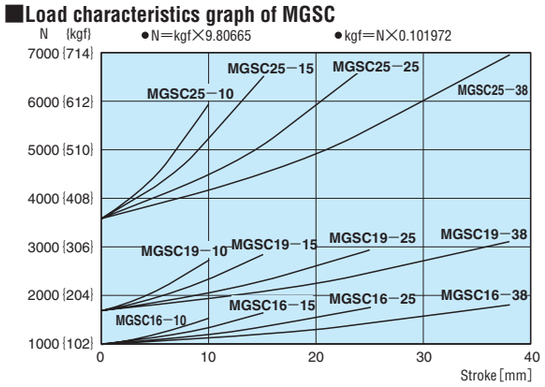
Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～39	40～99
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Load characteristics graph of MGSC



This graph shows the quasi-static characteristics.
Actual characteristics vary depending on temperature and operation speed.

■Shot limit

	Stroke (mm)	10	15	25	38
MGSC	Shot count limit (spm)	170	150	90	50

Shot count limit : The number of shots per minute
The shot count limit is sometimes affected by the working environment.
The figures shown here are reference values.

■Gas spring temperature range
The working ambient temperature is 0 to 40℃. Ensure that the temperature of the gas spring does not exceed 70℃.

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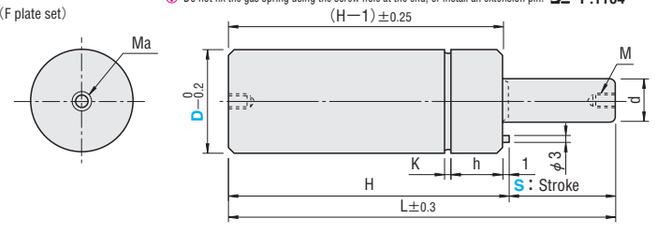
GAS SPRINGS —MINI TYPE—

MGSA (Main body : regular type)
MGSAH (H plate set)
MGSAF (F plate set)

When a gas spring is used exceeding the range of stroke length (S), it will cause gas leakage and the piston rod will not return. Make sure to use a gas spring within the range of stroke length so that nothing makes contact with the overstroke check pin.

Do not fix the gas spring using the screw hole at the end, or install an extension pin. P.1104



Charged pressure of nitrogen gas	MPa{kgf/cm²}
MGSA 19	10.2{104}
MGSA 25	

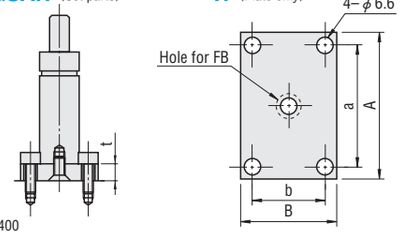
Cylinder body
M S45C
S Fe3O4 (Black oxide)

Piston rod
M SACM645
H 1000HV～ (Surface)
S Nitriding+Barrel finishing

Weight (kg)	D	d	M	L	H	h	K	Ma Tapped holes for mounting	Load N{kgf} Initial load	Load N{kgf} Max.load	Catalog No. Type	Catalog No. D—S
0.08	19	10	M5×7	65	55	18	2 (R1)	M6×6	800{ 82}	1200{122}	MGSA (Main body)	19—10
0.08				75	60					1260{128}		19—15
0.11				95	70					1270{130}		19—25
0.11				121	83					1280{131}		19—38
0.13				145	95					1290{132}		19—50
0.17				205	125					1300{133}	MGSAH (H plate set)	19—80
0.15	25	14	M6×8	65	55	18	2 (R1)	M6×6	1600{163}	2520{257}		25—10
0.16				75	60					2560{261}		25—15
0.19				95	70					2600{265}	MGSAF (F plate set)	25—25
0.22				121	83					2620{267}		25—38
0.25				145	95					2640{269}		25—50
0.33				205	125					2660{271}		25—80

The initial load and maximum load vary depending on operation speed. The load tolerance for temperature variation is ±10%.
・Charged pressure of nitrogen gas kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665
・kgf=N×0.101972 ・N=kgf×9.80665

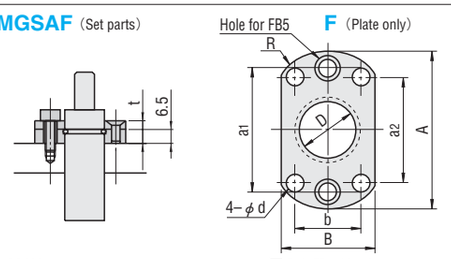
MGSAH (Set parts) **H** (Plate only)



M SS400
S Fe3O4 (Black oxide)

A Bolt	A	B	a	b	t	Catalog No.		U/Price Q'ty : 1～9
FB6—16×1pc.	38	28	28	18	9	H	19	1,000
FB6—16×1pc.	44		34				25	1,100

MGSAF (Set parts) **F** (Plate only)



M SS400
S Fe3O4 (Black oxide)
A Bolt FB5-10 : 2pcs.
Semicircle ring

A	B	a1	a2	b	d	D	t	R	Catalog No.		U/Price Q'ty : 1～9
44	28	33	28	18	6.6	19	11	22	F	19	2,500
50	30	38	34			25		25		25	2,600

Order — Catalog No.
MGSA 19—80
MGSAH 25—10
F—25

Delivery — 1 Day

Price — Volume discount rate P.37

Quantity	1～9	10～19	20～39	40～99
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

D—S	U/Price Q'ty : 1～9 Main Body MGSA	H Plate Set MGSAH	F Plate Set MGSAF
19—10	12,200	13,100	14,500
19—15	12,800	13,700	15,100
19—25	13,500	14,400	15,800
19—38	14,900	15,800	17,200
19—50	16,200	17,100	18,500
19—80	17,500	18,400	19,800
25—10	14,200	15,200	16,600
25—15	14,900	15,900	17,300
25—25	15,500	16,500	17,900
25—38	16,900	17,900	19,300
25—50	18,200	19,200	20,600
25—80	19,500	20,500	21,900

■Shot limit

	Stroke (mm)	10	15	25	38	50	80
MGSA	Shot count limit (spm)	250	165	100	65	50	30

Shot count limit: The number of shots per minute
The shot count limit is sometimes affected by the working environment.
The figures shown here are reference values.

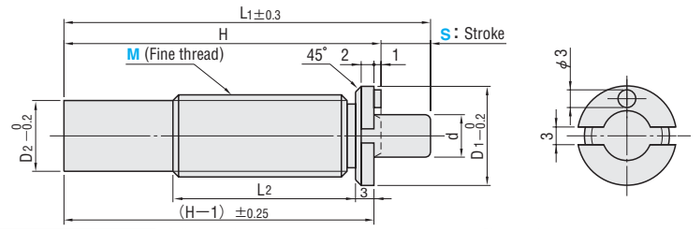
■Gas spring temperature range

The working ambient temperature is 0 to 40°C. Ensure that the temperature of the gas spring does not exceed 70°C.

GAS SPRINGS —THREADED TYPE—

MGSB

When a gas spring is used exceeding the range of stroke length (S), it will cause gas leakage and the piston rod will not return. Make sure to use a gas spring within the range of stroke length so that nothing makes contact with the overstroke check pin.



Charged pressure of nitrogen gas	MPa{kgf/cm²}
MGSB 12	12.0{122}
MGSB 16	10.1{103}

Cylinder body
M SACM645
S Nitriding+Fe3O4 (Black oxide)

Piston rod
M SACM645
H 1000HV～ (Surface)
S Nitriding+Barrel finishing

Weight (kg)	D1	D2	d	L1	H	M×P (Fine thread)	L2	Load N{kgf} Initial load	Load N{kgf} Max. load	Catalog No. Type	Catalog No. M—S	U/Price Q'ty : 1～9
0.03	14	10.2	5	75	65	M12×P1.25	27	400{41}	640{ 65}	MGSB	12—10	12,800
0.04				90	75						12—15	13,500
0.05	18	14.2	8	75	65	M16×P1.5	37	800{82}	1280{131}		16—10	11,500
0.06				90	75						16—15	12,200
0.07				120	95						16—25	13,500

The initial load and maximum load vary depending on the temperature and operation speed. The load tolerance for temperature variation is ±10%.
・Charged pressure of nitrogen gas kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665
・kgf=N×0.101972 ・N=kgf×9.80665

Order — Catalog No.
MGSB 12—15

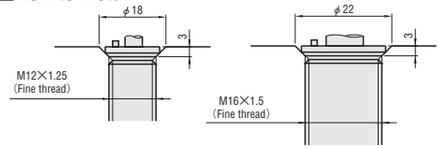
Delivery — 1 Day

Price — Volume discount rate P.37

Quantity	1～9	10～19	20～39	40～99
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■How to Install



Prepare a tapped hole for the MGSB gas cushion as shown in the diagrams above to make the cushion's flange remain fit with the hole's surface. The flange not only protects the cushion from excessive tightening, but it also helps prevent it from loosening.

Applicable wrench : Use a PJG series spring plunger wrench (P.781)

■Limit shot

	Stroke (mm)	10	15	25
MGSB	Shot count limit (spm)	200	130	80

Shot count limit: The number of shots per minute
The shot count limit is sometimes affected by the working environment.
The figures shown here are reference values.

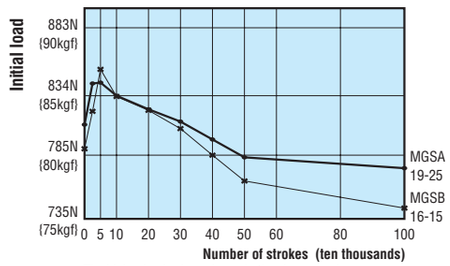
■Gas spring temperature range

The working ambient temperature is 0 to 40°C. Ensure that the temperature of the gas spring does not exceed 70°C.

MGSB is not an oil-free product.
After applying running-in grease, grease the piston rod every 50,000 shots. Molybdenum disulfide (MoS_2) grease is recommended for greasing.

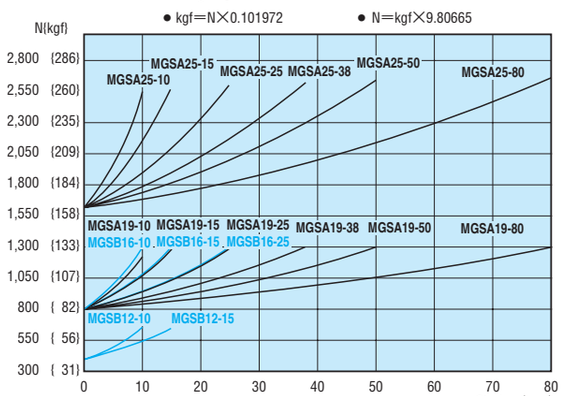
■Endurance test result

Catalog No.	MGSA 19—25	MGSB 16—15
Amplitude	25mm	15mm
Excitation speed	120SPM	135SPM
Mounting direction	Erect	Erect



The higher load values shown in the above graph (up to repeated use of approximately 300,000 times) are due to friction between the rod and special urethane seal.

■Load characteristic graph for MGSA・MGSB



This graph shows the quasi-static characteristics.
Actual characteristics vary depending on temperature and operation speed.

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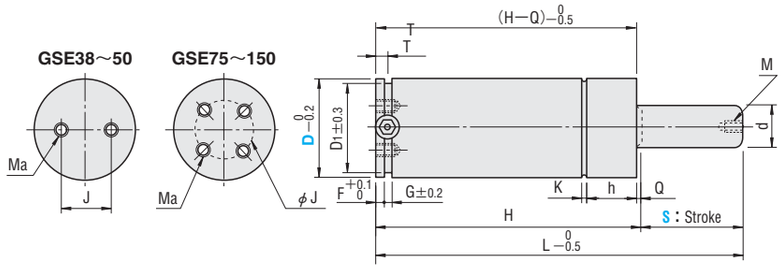
GAS SPRINGS
—ISO/CNOMO STANDARD TYPE—

RoHS

GSE

When a gas spring is used exceeding the range of stroke length (S), it will cause gas leakage and the piston rod will not return. Make sure to use a gas spring within the range of stroke length.

Do not fix the gas spring using the screw hole at the end, or install an extension pin. P.1104



Cylinder body
M S45C or equivalent
S Black coating

Piston rod
M SCM435
H 800HV～(Surface)
S Hard chrome plating+Special finish
(Finishing may be changed to nitriding without prior notice.)

Charged pressure of nitrogen gas	MPa {kgf/cm²}
GSE38～150	15.0 {153}

Weight (kg)	D	D1	d	M	L	H	h	K	T	F	G	Ma Tapped holes for mounting	J	Q	Load N {kgf} Initial load	Load N {kgf} Max. load	Catalog No. Type	Catalog No. D—S	U/Price Q'ty:1～19
0.5	38	33	15	M6×11	100	75	9.5	2 (R1)	10.5	4	4	2—M6×10	25	2	2650 {270}	3650{ 372}	GSE	38— 25	12,250
0.6					150	100										3590{ 366}		38— 50	12,820
0.7					210	130										3570{ 364}		38— 80	14,150
0.8					250	150										3560{ 363}		38—100	16,430
1.1	45	40	20	M8×8	135	110	13.5	2 (R1)	15.5	4	4	2—M8×10	20	2	4710 {481}	6520{ 665}		45— 25	21,750
1.2					185	135										6730{ 687}		45— 50	23,100
1.5					245	165										6820{ 696}		45— 80	24,320
1.6					285	185										6860{ 699}		45—100	25,530
1.8					335	210										6880{ 702}		45—125	27,050
2.0					405	245										6910{ 704}		45—160	28,720
1.4	50	43	25	M8×13	145	120	12.5	4 (R2)	12.5	8	7	2—M8×10	20	3	7360 {751}	10980{ 1120}		50— 25	24,700
1.7					195	145										11460{ 1168}		50— 50	26,220
1.9					255	175										11670{ 1190}		50— 80	28,025
2.1					295	195										11750{ 1198}		50—100	29,165
2.4					345	220										11810{ 1204}		50—125	30,305
2.7					415	255										11870{ 1210}		50—160	32,680
3.1					495	295										11910{ 1214}		50—200	34,200
3.6	75	67	36	M8×13	160	135	15.5	5 (R2.5)	12	8	7	4—M8×15	40	3	15270 {1557}	21010{ 2142}		75— 25	33,250
4.1					210	160										22150{ 2259}		75— 50	35,340
4.7					270	190										22700{ 2315}		75— 80	37,050
5.1					310	210										22910{ 2336}		75—100	38,000
5.6					360	235										23080{ 2354}		75—125	39,805
6.4					430	270										23240{ 2370}		75—160	42,805
6.2	95	87	50	M8×13	170	145	18.5	5 (R2.5)	12	8	7	4—M8×15	60	3	29450 {3003}	38960{ 3973}		95— 25	40,800
7.2					220	170										43000{ 4385}		95— 50	43,900
8.2					280	200										45570{ 4647}		95— 80	45,500
8.9					320	220										46660{ 4758}		95—100	49,700
9.9					370	245										47640{ 4858}		95—125	52,800
11.1					440	280										48590{ 4955}		95—160	58,300
10.7	120	112	65	M8×13	190	165	20	5 (R2.5)	12	8	7	4—M10×18	80	3	49770 {5076}	61070{ 6228}		120— 25	51,300
12.2					240	190										67740{ 6907}		120— 50	54,000
14.0					300	220										72840{ 7428}		120— 80	59,500
15.2					340	240										75260{ 7674}		120—100	65,200
16.7					390	265										77580{ 7911}		120—125	68,990
18.9					460	300										80000{ 8157}		120—160	72,600
21.3					540	340										82000{ 8361}		120—200	84,600
20.5	150	141	80	M8×13	205	180	22	5 (R2.5)	12	8	7	4—M10×18	100	3	75400 {7689}	102950{10498}		150— 25	67,700
22.8					255	205										113220{11545}		150— 50	72,100
25.4					315	235										119370{12172}		150— 80	75,000
27.3					355	255										121890{12429}		150—100	81,900
29.6					405	280										124120{12657}		150—125	86,200
32.7					475	315										126260{12875}		150—160	91,900
36.4					555	355										127910{13043}		150—200	99,800

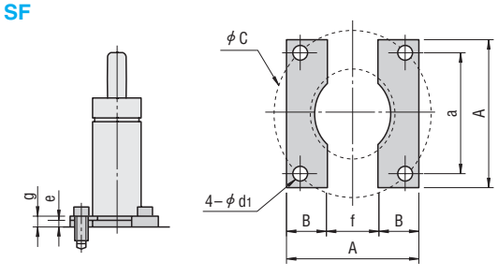
The initial load and maximum load vary depending on the temperature and operation speed. The load tolerance for temperature variation is ±10%.

●kgf=N×0.101972 ●N=kgf×9.80665

●Charged pressure of nitrogen gas kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665

RoHS

SF



M S45C
S Fe3O4 (Black oxide)

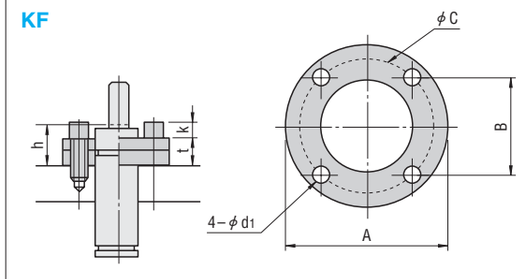
A Bolt with hex socket (CB) : 4 pcs.
Spring washer : 4 pcs.

A Bolt 4pcs.	A	a	B	C	d1	e	f	g	Catalog No.	U/Price Q'ty : 1～19
CB 6—18	55	40	19	56.5	7	4	17	6	38	2,800
CB 8—18	70	50	25	70.7	9	4	20	6	45	3,400
CB12—30	75	56.5	22	80	14	8	31	12	50	3,800
CB12—30	100	73.5	32	104	14	8	36	12	75	4,300
CB16—35	120	92	44	130	18	8	32	12	95	4,800
CB16—35	140	109.5	50	155	18	8	40	12	120	5,200
CB20—40	190	138	75	195	18	8	40	12	150	6,700

SF

RoHS

KF



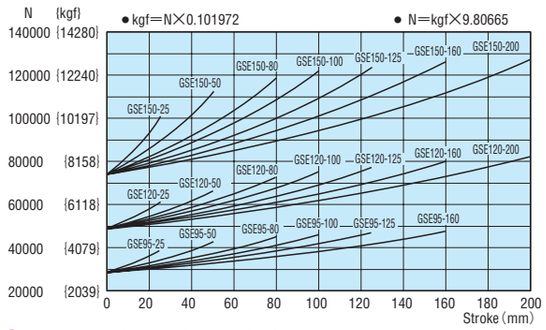
M S45C
S Fe3O4 (Black oxide)

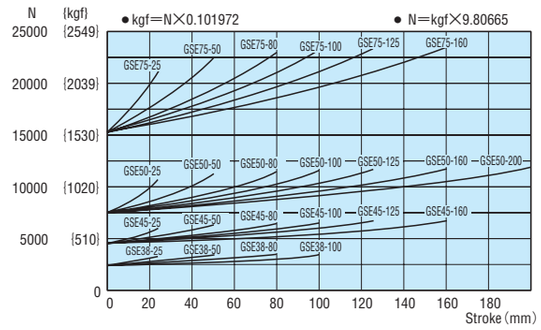
A Bolt with hex socket (CB) : 4 pcs.
Spring washer : 4 pcs.
Semicircle ring : 2 pcs.

A Bolt 4pcs.	A	B	C	d1	h	k	t	Catalog No.	U/Price Q'ty : 1～19
CB 6—20	68	40	56.5	7	17	7.5	9	38	2,800
CB 8—25	86	50	70.7	9	23	10	13	45	3,400
CB 8—25	95	56.5	80	9	24	10	13	50	3,800
CB10—30	122	73.5	104	11	29	12.5	16	75	4,300
CB12—35	150	92	130	14	33	15	18	95	4,800
CB12—35	175	109.5	155	14	36	15	21	120	5,200
CB16—50	220	138	195	18	41	20	27	150	6,700

KF

■Load characteristics graph of GSE





This graph shows the quasi-static characteristics.
Actual characteristics vary depending on temperature and operation speed.

■Shot limit

	Stroke (mm)	25	50	80	100	125	160	200
GSE	Shot count limit (spm)	100	50	35	30	25	20	15

Shot count limit : The number of shots per minute
The shot count limit is sometimes affected by the working environment.
The figures shown here are reference values.

■Gas spring temperature range

The working ambient temperature is 0 to 40℃. Ensure that the temperature of the gas spring does not exceed 70℃.

Order — Catalog No.
GSE 75—80
KF75

Delivery — 3 Days

Price

■Volume discount rate P.37

Quantity	1～19	20～39	40～99	100～199
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Express service system P.38 MISUMI Press 2007 http://misumi.jp/press/ For inquiry, ordering and other information, refer to P.1269

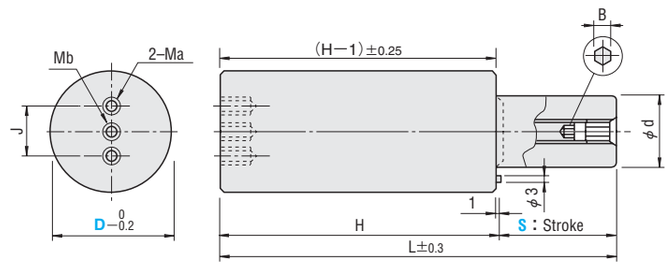
GAS SPRINGS
—SLOW RETURN TYPE—

PATENT PENDING

RoHS

GSSR

When a gas spring is used exceeding the range of stroke length(S), it will cause gas leakage and the piston rod will not return. Make sure to use a gas spring within the range of stroke length so that nothing makes contact with the overstroke check pin.



Mb cannot be used for mounting.

Charged pressure of nitrogen gas	MPa {kgf/cm²}
GSSR50	7.0 {72}

Cylinder body
M SACM645
S Nitriding+Fe3O4(Black oxide)

Piston rod
M SACM645
H 1000HV～(Surface)
S Nitriding+Barrel finishing

Weight (kg)	D	d	B	L	H	Ma Tapped holes for mounting	J	Mb	Load N{kgf} Initial load	Load N{kgf} Max. load	Catalog No. Type	Catalog No. D−S	U/Price Q'ty：1～9
1.22	50	30	4	135	110	M8×12	20	M8×12	5000 {510}	9750 {994}	GSSR	50−25	78,000
1.33				161	123							50−38	80,000
1.45				185	135							50−50	81,500
1.57				245	165							50−80	87,500

Order Catalog No. GSSR 50−50

Delivery 1 Day

Price

Volume discount rate P.37

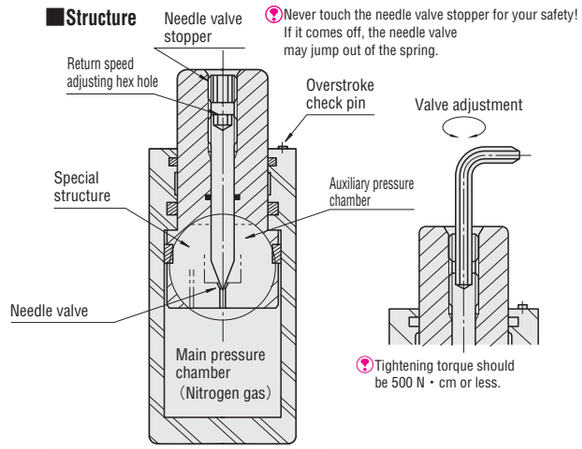
Quantity	1～9	10～19	20～39	40～99
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■Features

- You can adjust the return time (speed) of the piston rod by using the needle valve. (Insert an Allen wrench into the return speed adjusting hex hole to adjust the needle valve.)
  Clockwise：The valve closes and the piston rod returns slower.
  Counterclockwise：The clearance of the valve is enlarged and the piston rod returns faster as the nitrogen gas is encouraged to move from the auxiliary pressure chamber to the main pressure chamber.
- Since the piston rod can be adjusted to return slower, you can prevent the projecting rod from damaging your product during drawing process.
- HM-50 on P.1108 can be used as a mounting plate.

■Structure



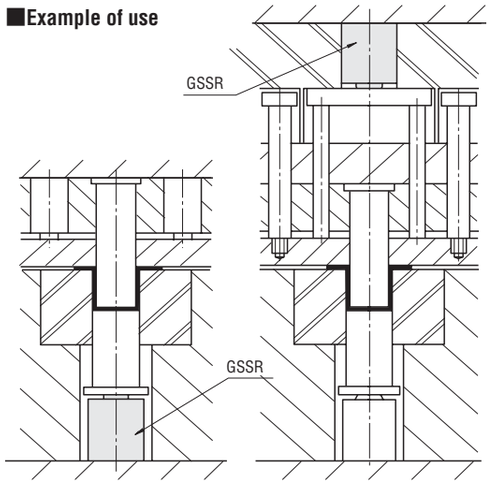
Never touch the needle valve stopper for your safety! If it comes off, the needle valve may jump out of the spring.

Tightening torque should be 500 N・cm or less.

When the piston rod goes down, nitrogen gas flows into the auxiliary pressure chamber.

As the nitrogen gas in the auxiliary pressure chamber reduces the pressure in the main pressure chamber, the return speed of the piston rod slows down.

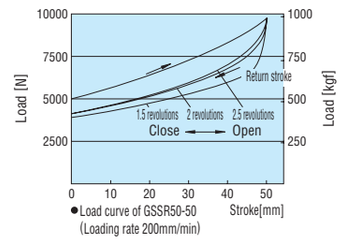
■Example of use



■Notes

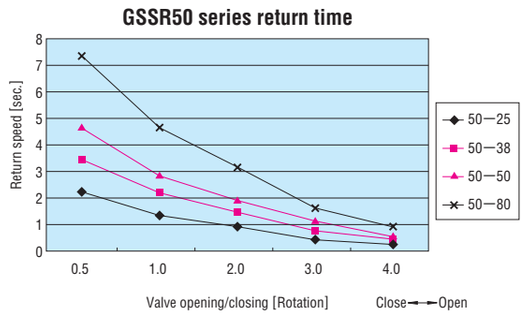
- Do not use two or more gas springs, either on the die side or punch side. As it is difficult to synchronize the return timings of plural gas springs, the die guide may burn out or the die may be damaged.
- If the needle valve is tightened too much, the valve may be deformed, which leads to a malfunction of the spring.
- Do not turn the needle valve stopper. Although it has been bonded with adhesives, turning it forcefully may cause gas leakage.
- When GSSR is used with the slow return setting, use it at 10spm or less.
- The working ambient temperature is 0 to 40℃. Ensure that the temperature of the gas spring does not exceed 70℃.
- GSSR can be used without oiling.
- For the precautions for use, refer to P.1103.

■Load curve



Load curve of GSSR50-50 (Loading rate 200mm/min)

■Relationship between the return time of the piston rod of the GSSR and the needle valve



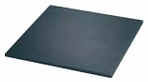
This graph shows the mean value for 10 piston rods. Therefore, use it only as a reference.

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

URETHANE SPRINGS

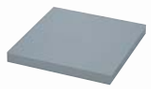
URETHANE SPRINGS

Name / Catalog No.	URETHANES FOR HEAVY LOAD EX	SQUARE URETHANES FOR HEAVY LOAD QX	URETHANE STOCK BLOCKS EST · ESBT · ESU · ESUB · S · SU	URETHANES FOR HEAVY LOAD A
Delivery	①③TA	①	①	①
Page	1121	1122	1122	1123



URETHANE STOCK BLOCKS E EL	URETHANES FOR HEAVY LOAD LA · C AX · CX	URETHANES WITH COUNTERBORE HOLE AZ AZX	URETHANE SHEETS UT UTH	URETHANE DIE PADS UD UDH
①③TA ③TA	① ③TA	① ③TA	① ③A	① ③A
1124	1125	1126	1127	1128

ECONOMY URETHANES AE · LAE · CE · AEX · CEX	HIGH DEFLECTION TYPE URETHANE FOAM (POROUS) PA PLA	URETHANES —Low repulsion type— AN · LAN · CNN ANX · CNX	—With counterbore hole, Low repulsion type— AZN AZNX
③TA	① ①	① ③TA	① ③TA
1131·1132	1133	1134	1135



URETHANE SHEETS —Low repulsion type— UTN	URETHANE DIE PADS —Low repulsion type— UDN
①	①
1136	1136

〔PRODUCTS INFORMATION〕 URETHANE SPRINGS —GUIDE—

Physical properties and features

Item	Urethane springs for heavy loads					High deflection type urethane foam (porous)	Low repulsion urethane
	H type	M type	S type	L type	Economy type		
Hardness (Shore A)	95	90	80	70	90	Not applicable	70
Catalog No.	TUS·US·USN	EX·QX·EST ESBT·ESU ESUB·A·E·EL LA·C·AX·CX AZ·AZX·UT UTH·UD·UDH	—	—	AE·LAE·CE AEX·CEX	PA·PLA	AN·LAN·CNN ANX·CNX·AZN AZNX·UTN UDN
page	P.685～P.688	P.1121～P.1128	—	—	P.1131～P.1132	P.1133	P.1134～P.1136
Tensile strength (N/cm²){kgf/cm²}	4511{460}	4462{455}	2941{300}	3138{320}	2452{250}	490{50}	1176{120}
Elongation (%)	450	550	500	650	540	250	250
300% Modulus (N/cm²){kgf/cm²}	1755{179}	1304{133}	931{95}	372{38}	1225{125}	—	—
Coefficient of restitution (%)	23	28	56	51	42	50	6
Tensile strength (N/cm²){kgf/cm²}	1206{123}	1147{117}	539{55}	451{46}	686{70}	294{30}	343{35}
Specific gravity	1.28		1.27	1.26		1.16	1.02
Permanent Strain (%)*	26	24	27	25	27	25	1
Working ambient temperature (℃)	−20～+70					−5～+80	−20～+70
Melting temperature (℃)	220		200		180	230～250	200
Embrittlement temperature (℃)	−70			−60	−45	−70	−50
Pyrophoric point (℃)	500					450	400
Characteristics: Weather resistance	Each type is excellent in weather resistance, and is superior to regular rubbers.						
Characteristics: Water resistance	Water resistant to small amount of water. (Do not use while being locked.)						
Characteristics: Oil resistance	Oil resistant to small amount of cutting oil. (Do not use while being locked.)						
Characteristics: Discoloration	Discolors when exposed to ultraviolet rays (including sunlight), but do not affect the usage. Discoloring of High deflection type urethane is relatively higher than the other types.						
Features	Although deflection is lower, it has an excellent capability in load bearing.	Possesses middle physical properties between H and S types, and suitable for general purposes.	Although the allowable load is lower, higher deflection allows deeper formability.	The hardness is as same as normal rubber but is excellent in abrasion resistance and mechanical strength.	The allowance load and permanent strain are somewhat lower than that of M type, however the cost is lowered.	• Possesses both high deflection (maximum of 40%) and high allowance load. • The deflection is the same but horizontal bulging is half of M type. • Good heat radiation	Lower compressed permanent strain, excellent performance in shock absorbing and vibration proof.
Usage (reference)	Thin stainless steel plates or about 2mm thickness steel plates machining.	Machining of thin plates, aluminum or brass.	• Hydroforming • Shallow drawing	• Drawing • Guerin method • Wheelon method	Suitable for less amount production than M type.	Pad cushion, cam return cushion etc.	• Vibration proof • Soft material machining such as films.

The above figure is the actual data measured at room temperature 23℃, and not guaranteed.

＊Measuring method of permanent strain〔JIS K7312〕
1) 70℃×24H 25% compression
2) Cooled for 30 min. in the laboratory of room temperature 23℃
3) Deformation measurement

Comparison of urethane springs, coil springs, and gas cushions

◎ : Excellent ○ : Average △ : Fair × : Poor

Item	Cost performance	Machinability	High speed endurance	Load stability	Permanent strain	Initial pressure	Working ambient temperature
Urethane spring	◎	○	△	△	△	○	○
Coil spring	○	×	◎	◎	◎	△	◎
Gas cushions	△	×	△	◎	◎	◎	△

〔PRODUCTS INFORMATION〕 OPTIMAL USAGE / PROCESSING METHOD

〔DATA〕 Relation between compression ratio and strokes per minute

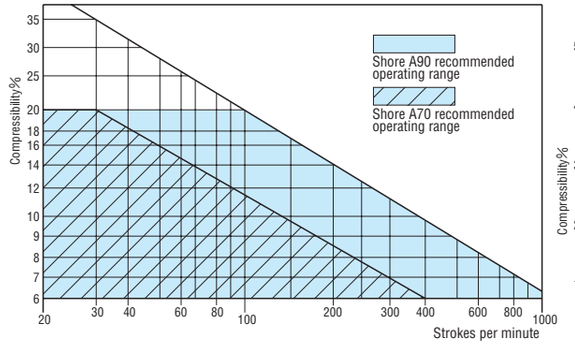
In order to control heat generation and accumulation as well as to increase durability of the urethane spring, pay attention to compression ratio and strokes per minute.
The following figures show the relation between various compression ratio and allowable strokes per minute, maintaining normal heat generation.

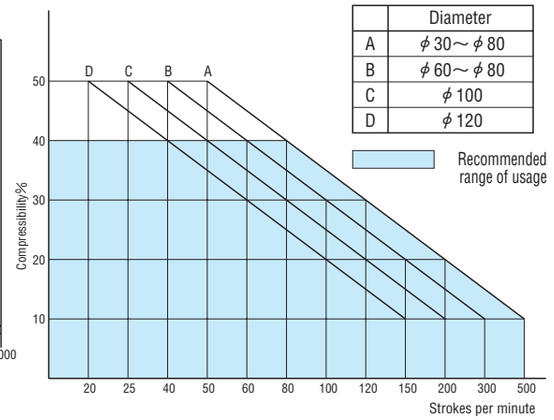
●Urethane springs for heavy loads Shore A70/90

Heavy load type urethane shore A70 and 90 generate heat through internal friction when deforming (Hysteresis effect). This phenomenon occurs when heavy load Urethane is pressurized rapidly. When machining with high speed, it is required to adjust deflection against strokes per minutes as shown below.

●High deflection type urethane foam (porous)

High deflection Urethane foam (Porous) is less deformable than heavy load Urethane. Its horizontal bulging when compressed is as half of heavy load Urethane, less heat reserve and is high in heat generation. However, the amount of pressure and number of strokes cause deterioration as for heavy load Urethane.





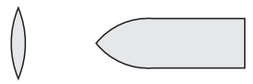
Low repulsion type urethanes should be used within the range recommended for Shore A70.

Machining methods and cautions

①Move the material (urethane) as rapidly as possible so that heat will not build up internally.
②Slow machining causes heating up the material (Urethane), which resulting its elasticity loss and saw teeth or blades being stuck into the material.
③Be sure to give the cutting edge an acute angle and make the cutter as narrow as possible.

A. Cutting

1.Urethane can be easily cut with saws or band saws in the same manner as steel.
2.When cutting with a lathe, set the speed high, the point at an acute angle and use thin blades.
(This is the best methods to have the work's parallelism.)



B. Surface processing

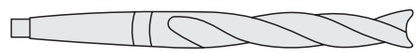
1.Urethane can be processed by millers, shapers, etc.
2.Cutting speed
The circumferential speed of the milling cutter should be 40～60m/min.
The cutting speed of shapers or planers should be at its maximum.

C. Grinding

1.Cool while grinding and the appropriate circumferential speed of grindstone is 100m/min.
2.The best grindstone material is GC with hardness K. The suitable grain size is 30～60.

D. Drilling

1.Drilling can be done in the same manner as for steel.
2.When the tip of the drill is shaped as shown below, drilling can be accomplished without deforming the material (urethane).
3.When machining holes, the internal diameter is contracted.



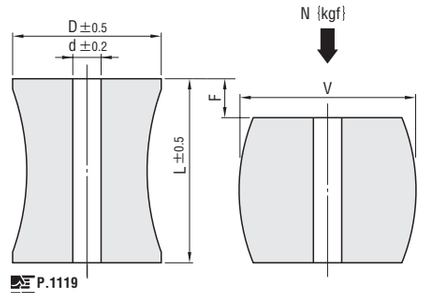
URETHANES FOR HEAVY LOAD

SQUARE URETHANES FOR HEAVY LOAD / URETHANE STOCK BLOCKS

The volume discount rate is also applicable to alteration cost. P.39

RoHS

EX



Product guide P.1119
Products information P.1137

Shore A90

F=L×20% F mm	F=L×20% Load N {kgf}	F=L×25% F mm	F=L×25% Load N {kgf}	F=L×30% F mm	F=L×30% Load N {kgf}	V	D	d	L	Catalog No.	U/Price Q'ty : 1~19
12	6865 {700}	15	8924 {910}	18	12749 {1300}	58	50	14	62	EX 5146	870
16		20		24					82	EX 5148	1,140
12	9807 {1000}	15	13239 {1350}	18	18633 {1900}	70	60	20	62	EX 6206	1,310
16		20		24					82	EX 6208	1,670
16	19123 {1950}	20	26478 {2700}	24	39227 {4000}	92	80	20	82	EX 8208	2,970
20		25		30					103	EX 82010	3,670
16	27949 {2850}	20	38736 {3950}	24	54427 {5550}	114	100	20	82	EX 10208	4,630
20		25		30					103	EX 102010	5,600
24		30		36					123	EX 102012	6,680

● kgf=N×0.101972

Order — Catalog No. EX 8208

Delivery — 1 Day

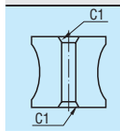
Price

Volume discount rate P.37

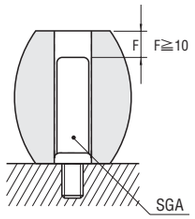
Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alterations — Catalog No. — (C1) / EX 8208 — C1 / 3 Days

Alteration	Code	Spec.	¥/1Code
	C1	C1 chamfering on the inner diameter	100

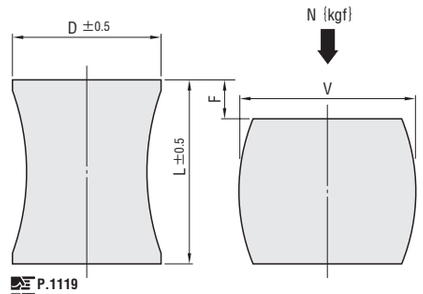
Example



P.1099

RoHS

EX



Product guide P.1119
Products information P.1137

Shore A90

F=L×20% F mm	F=L×20% Load N {kgf}	F=L×25% F mm	F=L×25% Load N {kgf}	F=L×30% F mm	F=L×30% Load N {kgf}	V	D	L	Catalog No.	U/Price Q'ty : 1~19
12	7551 {770}	15	9807 {1000}	18	14710 {1500}	58	50	62	EX 5060	870
16		20		24				82	EX 5080	1,140
12	11082 {1130}	15	15004 {1530}	18	21575 {2200}	70	60	62	EX 6060	1,310
16		20		24				82	EX 6080	1,670
16	20104 {2050}	20	27753 {2830}	24	41188 {4200}	92	80	82	EX 8080	2,970
20		25		30				103	EX 80100	3,670
16	29420 {3000}	20	41188 {4200}	24	61292 {6250}	114	100	82	EX 10080	4,630
20		25		30				103	EX 100100	5,600
24		30		36				123	EX 100120	6,680

● kgf=N×0.101972

Order — Catalog No. EX 100100

Delivery — 3 Days

Express T	1,600/1Pc.
Express A	800/1Pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size. (excluding Express T)

Price

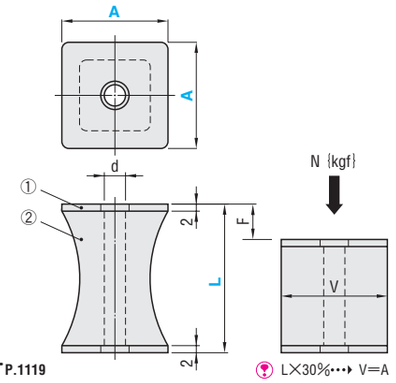
Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

RoHS

QX



Product guide P.1119

L×30%⋯▸ V=A

① M SS400
② M Urethane
Shore A90

F=L×20% F mm	F=L×20% Load N {kgf}	F=L×25% F mm	F=L×25% Load N {kgf}	F=L×30% F mm	F=L×30% Load N {kgf}	d	Catalog No. Type	A	L	U/Price Q'ty : 1~19
12	9807 {1000}	15	13239 {1350}	18	18633 {1900}	14	QX	60	62	2,380
16		20		24					82	2,970
12	13729 {1400}	15	18633 {1900}	18	25497 {2600}	20		70	62	3,350
16		20		24					82	3,950
18		23		27					92	4,490
16	25497 {2600}	20	35304 {3600}	24	49033 {5000}			95	82	6,970
20		25		30					103	8,320
24		30		36					123	9,720
20	39227 {4000}	25	53937 {5500}	30	73550 {7500}			120	103	11,700
24		30		36					123	13,800
28		35		42					143	15,500

● kgf=N×0.101972

Order — Catalog No. QX 70—92

Delivery — 1 Day

Price

Volume discount rate P.37

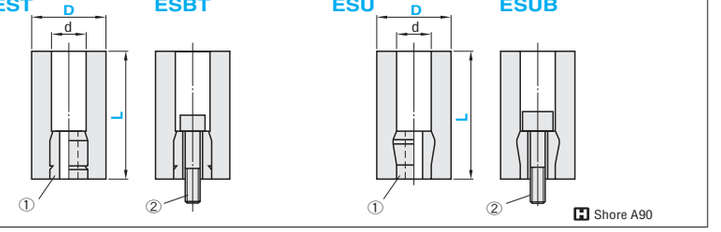
Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Urethane stock blocks

RoHS

EST ESBT ESU ESUB



d	Urethane	① EST·ESBT	① ESU·ESUB	②	Catalog No. Type	Catalog No. D—L	U/Price Q'ty : 1~9 EST·ESU	U/Price Q'ty : 1~9 ESBT·ESUB
14	E40—80	S14	SU14	CB8—45 (1pc.)	EST	* 40— 80	710	720
	E50—110				ESBT	50—110	1,350	1,360
	E70—140				* ESU	70—140	2,890	2,900
22	E7022110	S22	SU22	CB12—55 (1pc.)	* ESUB	* 7022110	2,390	2,420
	E7022140					* 7022140	2,930	2,960
	E90—120					90—120	3,730	3,860
	E90—140					* 90—140	4,330	4,360
	E100—140					100—140	6,770	6,800

ESU and ESUB are available only for the sizes marked with *. For applicable urethane P.1124

Order — Catalog No. EST 40—80

Delivery — 1 Day

Price

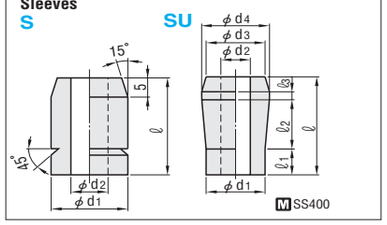
Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Sleeves

S SU



d_1	d_2	d_3	d_4	ℓ	ℓ_1	ℓ_2	ℓ_3	Urethane d	Catalog No.	U/Price Q'ty : 1~19
16	9	—	—	30	—	—	—	14	S14	130
24	13	—	—	35	—	—	—	22	S22	170
24	13	—	—	100	—	—	—	22 (L170 or more)	S22—100	500
14	9	13	19	30	7	10	3	14	SU14	130
22	13	20	27					22	SU22	170

Order — Catalog No. S 14

Delivery — 1 Day

Price

Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

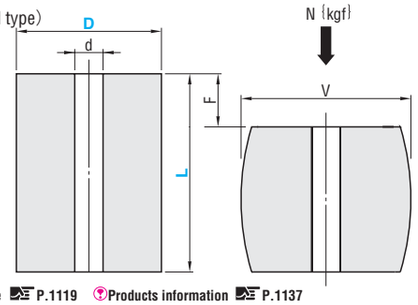
URETHANES FOR HEAVY LOAD

URETHANE STOCK BLOCKS

The volume discount rate is also applicable to alteration cost. P.39

RoHS

A (Standard type)



D	D T	d T	L T
15	±0.2	±0.2	±0.3
20			
25			
30			
40			
50	±0.3	±0.2	±0.5
60			
80	±0.4	±0.2	±0.5
100			

Product guide P.1119 Products information P.1137

Shore A90

F=L×15%		F=L×20%		F=L×25%			d	Catalog No.	U/Price
F mm	Load N {kgf}	F mm	Load N {kgf}	F mm	Load N {kgf}	V		Type D — L	Q'ty : 1~19
3.8	588 {60}	5	785 {80}	6.3	981 {100}	18	7	A 15 — 25	40
4.5		6		7.5				30	40
5.3		7		8.8				35	40
6		8		10				40	40
3.8	1128 {115}	5	1422 {145}	6.3	1765 {180}	24	8.5	A 20 — 25	70
4.5		6		7.5				30	70
5.3		7		8.8				35	70
6		8		10				40	70
3.8	1667 {170}	5	2157 {220}	6.3	2648 {270}	30	11	A 25 — 25	120
4.5		6		7.5				30	120
5.3		7		8.8				35	120
6		8		10				40	120
6.8		9		11.3				45	120
7.5		10		12.5				50	120
3.8	2599 {265}	5	3040 {310}	6.3	3531 {360}	37	14	A 30 — 25	130
4.5		6		7.5				30	130
5.3		7		8.8				35	150
6		8		10				40	170
6.8		9		11.3				45	190
7.5		10		12.5				50	205
8.3		11		13.8				55	235
9		12		15				60	255
6	4560 {465}	8	5394 {550}	10	6276 {640}	48	14	A 40 — 40	310
7.5		10		12.5				50	385
9		12		15				60	475
7.5	7747 {790}	10	9218 {940}	12.5	10787 {1100}	60	14	A 50 — 50	625
9		12		15				60	740
12		16		20				80	995
7.5	13042 {1330}	10	15102 {1540}	12.5	17652 {1800}	72	14	A 60 — 50	890
9		12		15				60	1,070
12		16		20				80	1,430
9	21378 {2180}	12	25399 {2590}	15	29420 {3000}	95	22	A 80 — 60	1,900
12		16		20				80	2,530
15		20		25				100	3,150
12	35990 {3670}	16	42659 {4350}	20	49720 {5070}	119	22	A 100 — 80	3,950
15		20		25				100	4,930
18		24		30				120	5,720

● kgf=N×0.101972

Order Catalog No. A 25—40

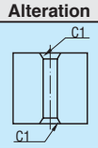
Delivery 1 Day

Price Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~400
Rate	—	5%	10%	15%

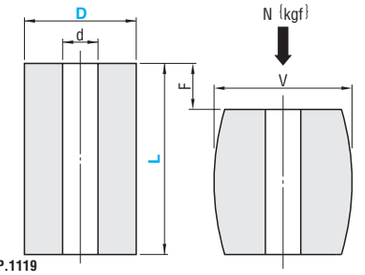
To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — (C1) e.g. A 60—80 — C1 — 3 Days

Alteration	Code	Spec.	¥/1Code
	C1	C1 chamfering on the inner diameter	100

RoHS

E



D	D T	d T	L T
40	±0.2	±0.2	±0.3
50	±0.3	±0.2	±0.5
70			
90	±0.4	±0.2	±0.5
100			
110			

Product guide P.1119

Shore A90

F=L×15%		F=L×20%		F=L×25%			D	d	L	Catalog No.	U/Price
F mm	Load N {kgf}	F mm	Load N {kgf}	F mm	Load N {kgf}	V				Type D — L	Q'ty : 1~19
12	4560 {465}	16	5394 {550}	20	6276 {640}	47	40	14	80	E 40— 80	550
16.5	7747 {790}	22	9218 {940}	27.5	10787 {1100}	59	50		110	50—110	1,160
16.5	18633 {1900}	22	22555 {2300}	27.5	24517 {2500}	81	70		110	70—110	2,110
21		28		35			70		140	70—140	2,620
25.5		34		42.5			70		170	70—170	3,140
16.5		22		27.5			70	22	110	7022110	2,110
21		28		35			70		140	7022140	2,620
25.5		34		42.5			70		170	7022170	3,140
21	27459 {2800}	28	33342 {3400}	35	40207 {4100}	105	90		140	90—140	3,950
25.5		34		42.5			90		170	90—170	5,080
30		40		50			90		200	90—200	6,000
21	35990 {3670}	28	42659 {4350}	35	49720 {5070}	117	100		140	100—140	6,270
21	39226 {4000}	28	47072 {4800}	35	56878 {5800}	129	110		140	110—140	7,340
25.5		34		42.5			110		170	110—170	9,190
30		40		50			110		200	110—200	10,830
37.5		50		62.5			110		250	110—250	13,490

● kgf=N×0.101972

Order Catalog No. E 7022110

Delivery ● ϕD40~100 1 Day ● ϕD110 3 Days

Price Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

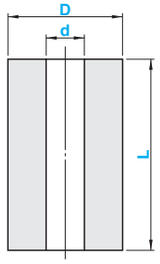
To be quoted on price & lead time above Max. Q'ty.

Express T 1,600/1Pc. Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

RoHS

EL (Full length specified type)



D	D T	d T	L T
40	±0.2	±0.2	±0.3
50	±0.3	±0.2	±0.5
70			
90	±0.4	±0.2	±0.5
100			
110			

Product guide P.1119

Shore A90

Catalog No.			L	U/Price Q'ty : 1~9							
Type	D	d	1mm increments	L15~20	L21~40	L41~60	L61~80	L81~100	L101~150	L151~200	L201~250
EL	40	14	15~200	230	380	570	760	950	1,430	1,900	—
	50			380	670	950	1,240	1,520	2,280	3,040	—
	70	14 · 22		740	1,160	1,540	1,900	2,190	3,040	4,370	—
	90			1,220	1,940	2,570	3,150	3,630	5,320	6,650	—
	100	22	50~250	—	—	4,280	4,280	5,040	7,410	8,740	11,120
	110			—	—	5,230	5,230	6,460	9,220	11,880	14,730

Order Catalog No. — L e.g. EL 70—22 — 155

Delivery 3 Days

Price Volume discount rate P.37

Quantity	1~9	10~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

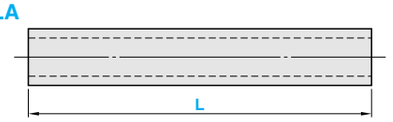
Express T 1,600/1Pc. Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size (excluding Express T).

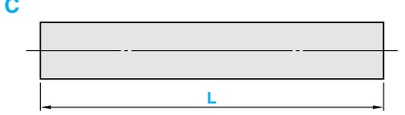
URETHANES FOR HEAVY LOAD

RoHS

LA



C



D	D T	d T
8	±0.2	—
10		±0.2
15		
20		
25		
30		
40		
50	±0.3	
60		
80	±0.4	
100		

Product guide P.1119

Shore A90

d	Catalog No. Type D — L	Catalog No. Type D — L	U/Price Q'ty : 1~19
——	——	C 8—200	280
——	——	C 10—200	280
7	LA 15—200	C 15—200	280
8.5	LA 20—200	C 20—200	410
11	LA 25—200	C 25—200	660
14	LA 30—500	C 30—500	2,350
	LA 40—500	C 40—500	4,200
	LA 50—500	C 50—500	6,440
	LA 60—500	C 60—500	9,300
22	LA 80—500	C 80—500	15,620
	LA 100—500	C 100—500	24,370

Order — Catalog No. LA 60—500

Delivery — 1 Day

Price

■Volume discount rate P.37

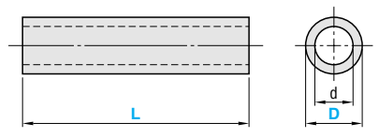
Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

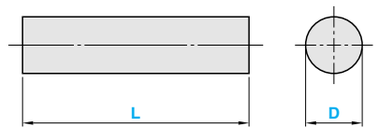
Full length specified type

RoHS

AX



CX



D	D T	d T	L T
8	±0.2	—	±0.3
10		±0.2	
15			
20			
25			
30			
40			
50	±0.3		±0.5
60			
80	±0.4		
100			

Product guide P.1119

Shore A90

d	Catalog No. Type	D	L 1mm increments	U/Price Q'ty : 1~19 L10~20	L21~40	L41~60	L61~80	L81~100	L101~150	L151~200
—	CX	8	10~200	90	95	110	145	180	270	350
—		10		90	95	110	145	180	270	350
7	AX CX	15		90	90	100	140	180	275	360
8.5		20		90	95	130	190	245	370	490
11		25		130	150	195	275	330	490	655
14		30		160	205	300	385	480	720	955
		40		215	360	540	720	900	1,355	1,805
		50		360	635	900	1,175	1,440	2,165	2,885
		60		540	900	1,260	1,620	1,985	2,980	3,970
22		80		860	1,490	2,165	2,885	3,610	5,415	7,220
		100		1,355	2,260	3,245	4,330	5,415	8,120	10,830

Order — Catalog No. AX D 20 — L 45

Delivery — 3 Days

Express	T	600/1Pc.
Express	A	300/1Pc.

P.38

A flat charge of 810 yen for 3 pieces or more of the same size. (excluding Express T)

Price

■Volume discount rate P.37

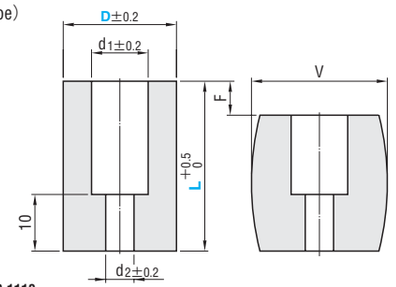
Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

URETHANES WITH COUNTERBORE HOLE

RoHS

AZ (Standard type)



Product guide P.1119

Shore A90

F=L×10% F mm	Load N {kgf}	F=L×15% F mm	Load N {kgf}	F=L×20% F mm	Load N {kgf}	V	D	d1	d2	M	L	Catalog No. Type D—L	U/Price Q'ty : 1~19
2.5	883 {90}	3.7	1079 {110}	5.0	1275 {130}	24	20	11	7	M6	25	AZ 20— 25	285
3.0		4.5		6.0							30	30	
3.5		5.2		7.0							35	35	
4.0		6.0		8.0							40	40	
2.5	1177 {120}	3.7	1569 {160}	5.0	1765 {180}	29	25	11	7	M6	25	AZ 25— 25	380
3.0		4.5		6.0							30	30	
3.5		5.2		7.0							35	35	
4.0		6.0		8.0							40	40	
3.0	2550 {260}	4.5	3040 {310}	6.0	3530 {360}	35	30	14	9	M8	30	AZ 30— 30	570
3.5		5.2		7.0							35	35	
4.0		6.0		8.0							40	40	
3.0	4119 {420}	4.5	5099 {520}	6.0	5884 {600}	46	40	18	11	M10	30	AZ 40— 30	710
3.5		5.2		7.0							35	35	
4.0		6.0		8.0							40	40	

● kgf=N×0.101972

Order — Catalog No. AZ 20—30

Delivery — 1 Day

Price

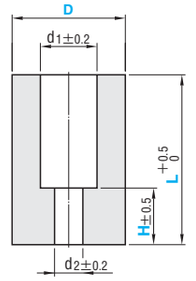
■Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~400
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

RoHS

AZX (Full length specified type)



D	D T
25	±0.2
30	
40	
50	±0.3
60	
80	±0.4
100	

Product guide P.1119

Shore A90

Catalog No. Type	D	L 1mm increments	M	H 1mm increments
AZX	25	20 ~ 80	M 6	5≦H<L
	30		M 8	
	40	25 ~ 150	M10	
	50		M12	
	60			
	80	25 ~ 200	M12	
	100		M16	

M	d1	d2
M 6	11	7
M 8	14	9
M10	18	11
M12	20	14
M16	26	18

Order — Catalog No. AZX 25 — 42 — M6 — 15

Delivery — 3 Days

Express	T	1,600/1Pc.
Express	A	800/1Pc.

P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size. (excluding Express T)

Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

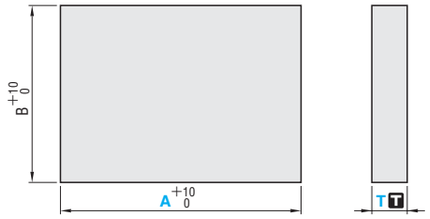
To be quoted on price & lead time above Max. Q'ty.

Catalog No.	D \ L	L20~40	L41~60	L61~80	L81~100	L101~150	L151~200
		U/Price Q'ty : 1~19					
AZX	25	570	665	760	—	—	—
	30	665	760	855	—	—	—
	40	950	1,140	1,330	1,520	1,995	—
	50	1,235	1,520	1,805	2,090	2,850	—
	60	1,615	1,995	2,470	3,040	4,085	—
	80	2,375	3,230	4,085	5,035	7,030	9,025
	100	3,325	4,370	5,605	6,935	9,880	12,825

URETHANE SHEETS

RoHS

UT



T	T
1～ 4	±0.3
5～10	±0.4
15～25	±0.5
30～50	±1

Product guide P.1119

Shore A90

A	B	T	Catalog No. Type T — A	U/Price Q'ty : 1～9
300	300	5	UT 5 — 300	3,600
		6	6 — 300	4,400
		8	8 — 300	5,800
		10	10 — 300	6,300
		15	15 — 300	9,500
		20	20 — 300	12,600
		25	25 — 300	15,100
		30	30 — 300	17,200
500	500	1	UT 1 — 500	1,800
		2	2 — 500	3,400
		3	3 — 500	5,200
		4	4 — 500	6,700
		5	5 — 500	8,400
		6	6 — 500	10,100
		8	8 — 500	13,400
		10	10 — 500	15,900
		15	15 — 500	23,900
		20	20 — 500	31,800
		25	25 — 500	39,800
		30	30 — 500	47,700
		50	50 — 500	79,500

Order — Catalog No.: UT 8—500

Delivery — 1 Day

Price

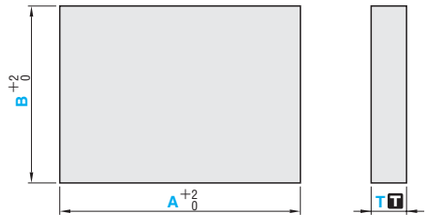
Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

RoHS

UTH (Size specified type)



T	T
1～ 4	±0.3
5～10	±0.4
15～25	±0.5
30～50	±1

Product guide P.1119

Shore A90

Catalog No. Type	T	1mm increments A	B
UTH	1	20～500	20～500
	2		
	3		
	4		
	5		
	6		
	8		

Catalog No. Type	T	1mm increments A	B
UTH	10	20～500	20～500
	15		
	20		
	25		
	30		
	40		
	50		

Order — Catalog No. — A — B: UTH 8 — 351 — 200

Delivery — 3 Days; Express A 800/1Pc. P.38

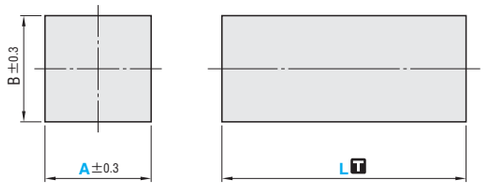
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price P.1129

URETHANE DIE PADS

RoHS

UD



Product guide P.1119

Shore A90

A	B	L	T	Catalog No. Type A — L	U/Price Q'ty : 1～9
25	25	50	±1	UD 25 — 50	250
		100		100	500
		300	+5 0	300	1,300
		500		500	2,200
		800		800	3,500
		1000		1000	4,300
50	50	50	±1	UD 50 — 50	1,000
		100		100	1,700
		300	+5 0	300	5,200
		500		500	8,400
		800		800	13,000
		1000		1000	15,900
75	50	50	±1	UD 75 — 50	1,300
		100		100	2,600
		300	+5 0	300	7,500
		500		500	12,600
		800		800	19,000
		1000		1000	24,000

Order — Catalog No.: UD 75— 1000

Delivery — 1 Day

Price

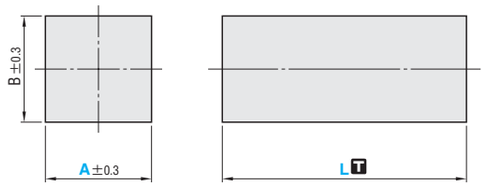
Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

RoHS

UDH (Full length specified type)



L	T
25 ～ 200	+1 0
201 ～ 500	+2 0
501 ～ 1000	+3 0

Product guide P.1119

Shore A90

A	B	Catalog No. Type A	L 1mm increments	U/Price Q'ty : 1～9
25	25	UDH 25	25 ～ 50	300
			51 ～ 100	600
			101 ～ 300	1,560
			301 ～ 500	2,640
			501 ～ 800	4,200
			801 ～1000	5,160
50	50	UDH 50	25 ～ 50	1,200
			51 ～ 100	2,040
			101 ～ 300	6,240
			301 ～ 500	10,080
			501 ～ 800	15,600
			801 ～1000	19,080
75	50	UDH 75	25 ～ 50	1,560
			51 ～ 100	3,120
			101 ～ 300	9,000
			301 ～ 500	15,120
			501 ～ 800	22,800
			801 ～1000	28,800

Order — Catalog No. — L: UDH 50 — 355

Delivery — 3 Days; Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

URETHANE SHEETS
—PRICE—

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

■UTH U/Price (Q'ty：1～9), Dimension A 20～300

A	B \ T	1	2	3	4	5	6	8
20～100	20～100	1,400	1,400	1,400	1,400	1,400	1,400	1,400
	101～150	1,400	1,400	1,400	1,400	1,400	1,400	1,980
	151～200	1,400	1,400	1,400	1,400	1,400	1,980	2,550
	201～250	1,400	1,400	1,400	1,400	2,030	2,390	3,060
	251～300	1,400	1,400	1,400	1,980	2,390	2,760	3,600
	301～350	1,400	1,400	1,740	2,270	2,630	3,090	4,040
	351～400	1,400	1,400	1,950	2,550	2,880	3,460	4,520
	401～450	1,400	1,400	2,190	2,810	3,110	3,650	4,860
	451～500	1,400	1,400	2,390	3,060	3,380	3,960	5,160
101～150	20～100	1,400	1,400	1,400	1,400	1,400	1,400	1,980
	101～150	1,400	1,400	1,400	1,400	1,830	2,190	2,810
	151～200	1,400	1,400	1,400	1,980	2,390	2,760	3,600
	201～250	1,400	1,400	1,860	2,390	2,820	3,240	4,230
	251～300	1,400	1,400	2,190	2,810	3,110	3,650	4,860
	301～350	1,400	1,740	2,510	3,220	3,470	4,070	5,300
	351～400	1,400	1,950	2,760	3,530	3,690	4,430	5,760
	401～450	1,400	2,150	3,040	3,890	3,950	4,740	6,160
	451～500	1,400	2,300	3,310	4,230	4,170	5,000	6,480
151～200	20～100	1,400	1,400	1,400	1,400	1,400	1,980	2,550
	101～150	1,400	1,400	1,400	1,980	2,390	2,760	3,600
	151～200	1,400	1,400	1,950	2,550	2,880	3,460	4,520
	201～250	1,400	1,400	2,390	3,060	3,380	3,960	5,160
	251～300	1,400	1,950	2,760	3,530	3,690	4,430	5,760
	301～350	1,400	2,230	3,150	4,040	3,990	4,790	6,220
	351～400	1,400	2,450	3,530	4,420	4,200	5,040	6,720
	401～450	1,400	2,650	3,810	4,860	4,460	5,190	7,130
	451～500	1,400	2,820	4,050	5,160	4,950	5,760	7,680
201～250	20～100	1,400	1,400	1,400	1,400	2,030	2,390	3,060
	101～150	1,400	1,400	1,860	2,390	2,820	3,240	4,230
	151～200	1,400	1,400	2,390	3,060	3,830	3,960	5,160
	201～250	1,400	2,030	2,870	3,680	3,750	4,500	5,850
	251～300	1,400	2,300	3,310	4,230	4,170	5,000	6,480
	301～350	1,400	2,580	3,710	4,730	4,470	5,200	6,930
	351～400	1,400	2,820	4,050	5,160	4,950	5,760	7,680
	401～450	1,740	3,100	4,460	5,670	5,400	6,480	8,640
	451～500	1,820	3,300	4,730	6,000	6,000	7,200	9,600
251～300	20～100	1,400	1,400	1,400	1,980	2,390	2,760	3,600
	101～150	1,400	1,400	2,190	2,810	3,110	3,650	4,860
	151～200	1,400	1,950	2,760	3,530	3,690	4,430	5,760
	201～250	1,400	2,300	3,310	4,230	4,170	5,000	6,480
	251～300	1,400	2,650	3,810	4,860	4,460	5,350	7,130
	301～350	1,740	2,970	4,260	5,420	5,040	6,050	8,070
	351～400	1,770	3,240	4,650	5,910	5,760	6,920	9,220
	401～450	1,920	3,490	4,990	6,320	6,480	7,540	10,050
	451～500	2,030	3,690	5,270	6,840	7,200	8,370	11,160

A	B \ T	10	15	20	25	30	40	50
20～100	20～100	1,400	2,480	3,120	3,750	4,590	6,120	7,500
	101～150	2,430	3,450	4,320	5,290	6,480	8,820	10,580
	151～200	3,060	4,320	5,400	6,750	8,100	11,280	13,500
	201～250	3,680	5,070	6,450	7,880	9,680	13,500	15,750
	251～300	4,230	5,810	7,380	9,230	11,070	15,480	18,000
	301～350	4,730	6,460	8,190	10,240	12,290	17,220	19,950
	351～400	5,160	7,020	8,880	11,100	13,680	18,720	21,600
	401～450	5,540	7,500	9,450	12,150	14,990	20,520	23,630
	451～500	6,450	7,880	10,200	13,130	15,750	21,600	24,750
101～150	20～100	2,430	3,450	4,320	5,290	6,480	8,820	10,580
	101～150	3,380	4,760	6,080	7,430	8,910	12,420	14,520
	151～200	4,230	5,810	7,380	9,230	11,070	15,480	18,000
	201～250	4,950	6,590	8,550	10,690	13,170	18,000	20,820
	251～300	5,540	7,500	9,450	12,150	14,990	20,520	23,630
	301～350	6,150	8,270	10,710	13,390	16,070	22,050	25,990
	351～400	6,660	9,180	11,520	14,850	17,280	24,480	27,900
	401～450	7,090	9,420	12,560	15,700	18,840	25,110	29,370
	451～500	7,430	10,130	13,500	16,880	19,580	27,900	31,500
151～200	20～100	3,060	4,320	5,400	6,750	8,100	11,280	13,500
	101～150	4,230	5,810	7,380	9,230	11,070	15,480	18,000
	151～200	5,160	7,020	8,880	11,100	13,680	18,720	21,600
	201～250	6,450	7,880	10,200	13,130	15,750	21,600	24,750
	251～300	6,660	9,180	11,520	14,850	17,280	24,480	27,900
	301～350	7,140	9,770	13,020	16,280	18,900	26,040	30,450
	351～400	7,680	10,440	14,400	17,400	20,880	28,800	33,600
	401～450	8,370	11,340	15,120	18,230	22,680	30,240	36,450
	451～500	9,600	12,600	16,200	20,250	25,200	33,600	39,000
201～250	20～100	3,680	5,070	6,450	7,880	9,680	13,500	15,750
	101～150	4,950	6,590	8,550	10,690	13,170	18,000	20,820
	151～200	6,450	7,880	10,200	13,130	15,750	21,600	24,750
	201～250	6,750	9,250	12,000	15,470	17,440	24,750	28,130
	251～300	7,430	10,130	13,500	16,880	19,580	27,900	31,500
	301～350	8,140	11,420	14,700	17,720	22,840	30,450	35,440
	351～400	9,600	12,600	16,200	20,250	25,200	33,600	39,000
	401～450	10,130	13,670	18,230	22,790	27,340	36,450	43,880
	451～500	11,250	15,190	20,250	24,380	30,380	39,000	48,750
251～300	20～100	4,230	5,810	7,380	9,230	11,070	15,480	18,000
	101～150	5,540	7,500	9,450	12,150	14,990	20,520	23,630
	151～200	6,660	9,180	11,520	14,850	17,280	24,480	27,900
	201～250	7,430	10,130	13,500	16,880	19,580	27,900	31,500
	251～300	8,370	11,340	15,120	18,230	22,680	30,240	36,450
	301～350	9,450	13,230	17,640	21,270	26,460	34,020	40,950
	351～400	10,800	14,580	20,160	23,400	29,160	37,440	45,000
	401～450	12,150	16,410	21,870	26,330	32,810	41,000	50,700
	451～500	13,500	18,230	23,400	29,250	35,100	45,000	51,750

■UTH U/Price (Q'ty：1～9), Dimension A 301～500

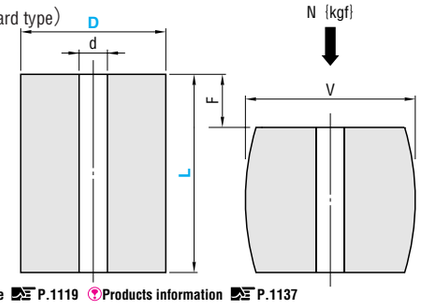
A	B \ T	1	2	3	4	5	6	8
20～100	20～100	1,400	1,400	1,740	2,270	2,630	3,090	4,040
	101～150	1,400	1,740	2,510	3,220	3,470	4,070	5,300
	151～200	1,400	2,230	3,150	4,040	3,990	4,790	6,220
	201～250	1,400	2,580	3,710	4,730	4,470	5,200	6,930
	251～300	1,740	2,970	4,260	5,420	5,040	6,050	8,070
	301～350	1,780	3,240	4,730	6,000	5,150	7,060	9,410
	351～400	1,940	3,620	5,170	6,560	6,720	7,820	10,420
	401～450	2,080	3,780	5,390	7,000	7,560	8,790	11,720
	451～500	2,210	3,890	5,670	7,350	8,140	9,770	13,020
101～150	20～100	1,400	1,400	1,950	2,550	2,880	3,460	4,520
	101～150	1,400	1,950	2,760	3,530	3,690	4,430	5,760
	151～200	1,400	2,450	3,530	4,420	4,200	5,040	6,720
	201～250	1,400	2,820	4,050	5,160	4,950	5,760	7,680
	251～300	1,770	3,240	4,650	5,910	5,760	6,920	9,220
	301～350	1,940	3,620	5,170	6,560	6,720	7,820	10,420
	351～400	2,080	3,820	5,480	7,110	7,680	8,930	11,910
	401～450	2,270	4,000	5,670	7,560	8,370	10,050	13,400
	451～500	2,340	4,080	5,940	7,920	9,300	11,160	14,400
151～200	20～100	1,400	1,400	2,190	2,810	3,110	3,650	4,860
	101～150	1,400	2,150	3,040	3,890	3,950	4,740	6,160
	151～200	1,400	2,650	3,810	4,860	4,460	5,190	7,130
	201～250	1,740	3,110	4,460	5,670	5,400	6,480	8,640
	251～300	1,920	3,490	4,990	6,320	6,480	7,540	10,050
	301～350	2,080	3,780	5,390	7,000	7,560	8,790	11,720
	351～400	2,270	4,000	5,670	7,560	8,370	10,050	13,400
	401～450	2,370	4,140	6,020	8,020	9,420	11,300	14,580
	451～500	2,500	4,320	6,480	8,100	10,470	12,560	16,200
201～250	20～100	1,400	1,400	2,390	3,060	3,380	3,960	5,160
	101～150	1,400	2,300	3,310	4,230	4,170	5,000	6,480
	151～200	1,400	2,820	4,050	5,160	4,950	5,760	7,680
	201～250	1,820	3,300	4,730	6,000	6,000	7,200	9,600
	251～300	2,030	3,690	5,270	6,840	7,200	8,370	11,160
	301～350	2,210	3,890	5,670	7,350	8,140	9,770	13,020
	351～400	2,340	4,080	5,940	7,920	9,300	11,160	14,400
	401～450	2,500	4,320	6,480	8,100	10,470	12,560	16,200
	451～500	2,670	4,350	6,750	9,000	11,250	13,500	18,000

A	B \ T	10	15	20	25	30	40	50
20～100	20～100	4,730	6,460	8,190	10,240	12,290	17,220	19,950
	101～150	6,150	8,270	10,710	13,390	16,070	22,050	25,990
	151～200	7,140	9,770	13,020	16,280	18,900	26,040	30,450
	201～250	8,140	11,420	14,700	17,720	22,840	30,450	35,440
	251～300	9,450	13,230	17,640	21,270	26,460	34,020	40,950
	301～350	11,030	14,890	19,850	23,890	29,770	38,220	47,780
	351～400	12,600	17,010	22,680	27,300	34,020	42,000	50,400
	401～450	14,180	19,140	24,570	30,720	36,860	47,250	54,340
	451～500	15,230	20,480	26,250	32,820	39,380	50,400	60,380
101～150	20～100	5,160	7,020	8,880	11,100	13,680	18,720	21,600
	101～150	6,660	9,180	11,520	14,850	17,280	24,480	27,900
	151～200	7,680	10,440	14,400	17,400	20,880	28,800	33,600
	201～250	9,600	12,600	16,200	20,250	25,200	33,600	39,000
	251～300	10,800	14,580	20,160	23,400	29,160	37,440	45,000
	301～350	12,600	17,010	22,680	27,300	34,020	42,000	50,400
	351～400	14,400	19,440	24,960	31,200	37,440	48,000	55,200
	401～450	15,660	21,060	27,000	33,750	40,500	52,000	62,100
	451～500	17,400	22,500	30,000	36,000	45,000	55,200	69,000
151～200	20～100	5,540	7,500	9,450	12,150	14,990	20,520	23,630
	101～150	7,090	9,420	12,560	15,700	18,840	25,110	29,370
	151～200	8,370	11,340	15,120	18,230	22,680	30,240	36,450
	201～250	10,130	13,670	18,230	22,790	27,340	36,450	43,880
	251～300	12,150	16,410	21,870	26,330	32,810	41,000	50,700
	301～350	14,180	19,410	24,570	30,720	36,860	47,250	54,340
	351～400	15,660	21,060	27,000	33,750	40,500	52,000	62,100
	401～450	17,620	22,790	30,380	36,450	45,570	55,890	69,870
	451～500	19,580	25,320	32,400	40,500	48,600	62,100	77,630
201～250	20～100	6,450	7,880	10,200	13,130	15,750	21,600	24,750
	101～150	7,430	10,130	13,500	16,880	19,580	27,900	31,500
	151～200	9,600	12,600	16,200	20,250	25,200	33,600	39,000
	201～250	11,250	15,190	20,250	24,380	30,380	39,000	48,750
	251～300	13,500	18,230	23,400	29,250	35,100	45,000	51,750
	301～350	15,230	20,480	26,250	32,820	39,380	50,400	60,380
	351～400	17,400	22,500	30,000	36,000	45,000	55,200	69,000
	401～450	19,580	25,320	32,400	40,500	48,600	62,100	77,630
	451～500	22,500	27,000	34,500	43,130	51,750	69,000	86,250

ECONOMY URETHANES

RoHS

AE (Standard type)



D	D T	d T	L T
15			
20			
25	±0.2	±0.2	±0.3
30			
40			
50	±0.3		±0.5
60			

Product guide P.1119 Products information P.1137

Shore A90

F=L×15% F mm	F=L×15% Load N {kgf}	F=L×20% F mm	F=L×20% Load N {kgf}	F=L×25% F mm	F=L×25% Load N {kgf}	V	d	Catalog No. Type D — L	U/Price Q'ty : 1~19
3.8		5		6.3				AE 15 — 25	35
4.5	539	6	735	7.5	932	18	7	30	35
5.3	{55}	7	{75}	8.8	{95}			35	35
6		8		10				40	35
3.8		5		6.3				AE 20 — 25	55
4.5	1079	6	1373	7.5	1667	24	8.5	30	55
5.3	{110}	7	{140}	8.8	{170}			35	55
6		8		10				40	55
3.8		5		6.3				AE 25 — 25	100
4.5		6		7.5				30	100
5.3	1569	7	2059	8.8	2550	30	11	35	100
6	{160}	8	{210}	10	{260}			40	100
6.8		9		11.3				45	100
7.5		10		12.5				50	100
4.5		6		7.5				AE 30 — 30	105
5.3		7		8.8				35	120
6		8		10				40	130
6.8	2452	9	2844	11.3	3334	37	14	45	150
7.5	{250}	10	{290}	12.5	{340}			50	160
8.3		11		13.8				55	180
9		12		15				60	200
6	4315	8	5099	10	5982	48	14	AE 40 — 40	230
7.5	{440}	10	{520}	12.5	{610}			50	300
9		12		15				60	360
7.5	7355	10	8728	12.5	10297	60	14	AE 50 — 50	480
9	{750}	12	{890}	15	{1050}			60	570
12		16		20				80	770
7.5	12356	10	14318	12.5	16769	72	14	AE 60 — 50	690
9	{1260}	12	{1460}	15	{1710}			60	820
12		16		20				80	1,100

● kgf=N×0.101972

Order — Catalog No. AE 15—25

Delivery — 3 Days — Express T 400/1Pc. / Express A 200/1Pc. — P.38

A flat charge of 540 yen for 3 pieces or more of the same size (excluding Express T).

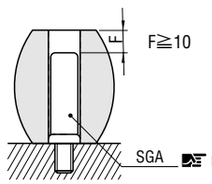
Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~400
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example

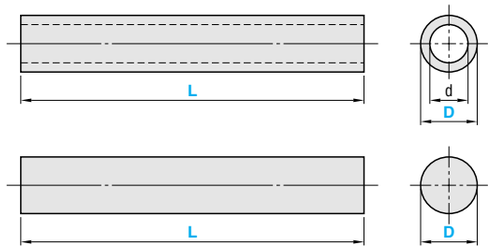


P.1099

RoHS

LAE

CE



D	D T	d T
8		—
10		
15		
20	±0.2	
25		±0.2
30		
40		
50	±0.3	
60		

Product guide P.1119

Shore A90

d	Catalog No. Type D — L	Catalog No. Type D — L	U/Price Q'ty : 1~19
—	—	CE 8—200	210
—	—	CE 10—200	210
7	LAE 15—200	CE 15—200	210
8.5	LAE 20—200	CE 20—200	320
11	LAE 25—200	CE 25—200	500
14	LAE 30—500	CE 30—500	1,820
	LAE 40—500	CE 40—500	3,250
	LAE 50—500	CE 50—500	4,990
	LAE 60—500	CE 60—500	7,190

Order — Catalog No. LAE 30—500

Delivery — 3 Days — Express T 400/1Pc. / Express A 200/1Pc. — P.38

A flat charge of 540 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

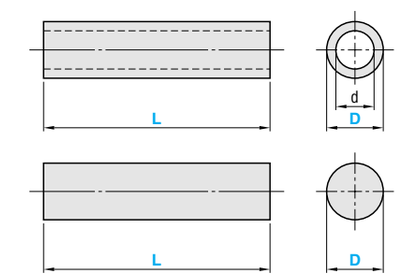
To be quoted on price & lead time above Max. Q'ty.

Full length specified type

RoHS

AEX

CEX



D	D T	d T	L T
8		—	
10			
15			
20	±0.2		±0.3
25		±0.2	
30			
40			
50	±0.3		±0.5
60			

Product guide P.1119

Shore A90

d	Catalog No.	D	L 1mm increments	U/Price Q'ty : 1~19 L10~20	L21~40	L41~60	L61~80	L81~100	L101~150	L151~200
—	CEX	8	10~200	75	80	95	125	155	230	300
—		10		75	80	95	125	155	230	300
7	AEX CEX	15		80	80	95	130	160	250	330
8.5		20		80	90	120	170	220	330	440
11		25		120	140	180	250	300	440	590
14		30		150	190	270	350	440	650	860
		40		200	330	490	650	810	1,220	1,620
		50		330	570	810	1,060	1,290	1,940	2,590
		60		490	810	1,130	1,460	1,780	2,670	3,560

Order — Catalog No. AEX D 20 — L 52

Delivery — 3 Days — Express T 400/1Pc. / Express A 200/1Pc. — P.38

A flat charge of 540 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

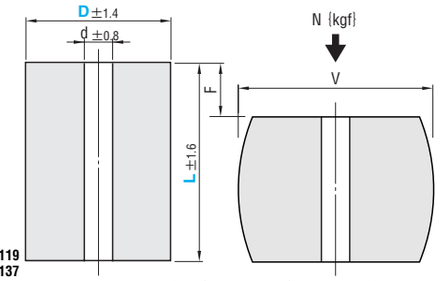
To be quoted on price & lead time above Max. Q'ty.

HIGH DEFLECTION TYPE URETHANE FOAM (POROUS)

URETHANES
—LOW REPULSION TYPE—

RoHS

PA (Standard type)



Product guide P.1119
Products information P.1137
Although urethane springs are discolored when exposed to ultraviolet rays (including sunlight), it will not affect the usage.

F=L×20% F mm	F=L×20% Load N {kgf}	F=L×30% F mm	F=L×30% Load N {kgf}	F=L×40% F mm	F=L×40% Load N {kgf}	V	d	Catalog No. Type D — L	U/Price Q'ty : 1~19
6	981 {100}	9	1177 {120}	12	1471 {150}	36	14	PA 30 — 30	150
8		12		16				40	190
8	1961 {200}	12	2452 {250}	16	3040 {310}	48		PA 40 — 40	340
10		15		20				50	430
12		18		24				60	520
8	3481 {355}	12	4413 {450}	16	5541 {565}	60		PA 50 — 40	560
10		15		20				50	690
12		18		24				60	820
16		24		32				80	1,120
10	4609 {470}	15	5737 {585}	20	7257 {740}	72		PA 60 — 50	990
12		18		24				60	1,180
16		24		32				80	1,580
20		30		40				100	1,980
12	8532 {870}	18	10787 {1100}	24	13729 {1400}	96	22	PA 80 — 60	2,100
16		24		32				80	2,800
20		30		40				100	3,490
26		39		52				130	4,550
16	13925 {1420}	24	17652 {1800}	32	21771 {2220}	120		PA 100 — 80	4,370
20		30		40				100	5,460
24		36		48				120	6,330
32		48		64				160	8,540
16	19907 {2030}	24	24909 {2540}	32	30793 {3140}	144		PA 120 — 80	6,070
20		30		40				100	7,590
24		36		48				120	9,100
32		48		64				160	12,000

●kgf=N×0.101972

Order — Catalog No. PA 50—50

Delivery — 1 Day

Price

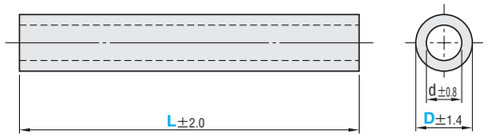
Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~400
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

RoHS

PLA



Product guide P.1119 Please use by cutting. P.1137
Although urethane springs are discolored when exposed to ultraviolet rays (including sunlight), it will not affect the usage.

d	Catalog No. Type D — L	U/Price Q'ty : 1~19
14	PLA 30—200	1,040
	PLA 40—200	1,860
	PLA 50—200	2,860
	PLA 60—200	4,110
22	PLA 80—200	6,920
	PLA 100—200	10,800
	PLA 120—200	15,600

Please use by cutting.

Order — Catalog No. PLA 80—200

Delivery — 1 Day

Price

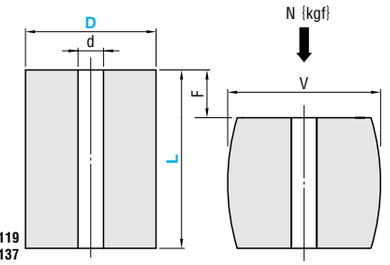
Volume discount rate P.37

Quantity	1~19	20~49	50~199	200~400
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

RoHS

AN (Standard type)



D	D T	d T	L T
20	±0.2	±0.2	±0.3
25			
30			
40			
50	±0.3		±0.5
60			

Product guide P.1119
Products information P.1137
Shore A70

F=L×15% F mm	F=L×15% Load N {kgf}	F=L×20% F mm	F=L×20% Load N {kgf}	F=L×25% F mm	F=L×25% Load N {kgf}	V	d	Catalog No. Type D — L	U/Price Q'ty : 1~19
3.75	343 {35}	5	451 {46}	6.25	617 {63}	24	8.5	AN 20—25	160
4.5		6		7.5				30	160
5.25		7		8.75				35	170
6		8		10				40	170
3.75	470 {48}	5	686 {70}	6.25	912 {93}	30	11	AN 25—25	250
4.5		6		7.5				30	250
5.25		7		8.75				35	250
6		8		10				40	300
6.75		9		11.3				45	300
7.5		10		12.5				50	300
4.5	666 {68}	6	941 {96}	7.5	1245 {127}	37	14	AN 30—30	330
5.25		7		8.75				35	330
6		8		10				40	440
6.75		9		11.3				45	440
7.5		10		12.5				50	460
8.3		11		13.8				55	500
9		12		15				60	550
6	1343 {137}	8	1914 {195}	10	2549 {260}	48	14	AN 40—40	580
7.5		10		12.5				50	850
9		12		15				60	950
7.5	2081 {212}	10	2983 {304}	12.5	4028 {410}	59	14	AN 50—50	1,400
9		12		15				60	1,600
12		16		20				80	1,900
7.5	3089 {315}	10	4481 {457}	12.5	5962 {608}	71	14	AN 60—50	1,900
9		12		15				60	2,250
12		16		20				80	2,600

●kgf=N×0.101972

Order — Catalog No. AN 25—40

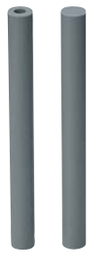
Delivery — 1 Day

Price

Volume discount rate P.37

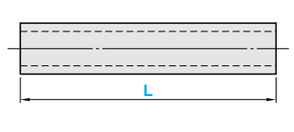
Quantity	1~19	20~49	50~199	200~400
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

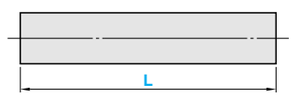


RoHS

LAN
ANX (Full length Specified)



CNN
CNX (Full length Specified)



● LAN ● CNN

D	D T	d T
20	±0.2	±0.2
25		
30		
40		
50	±0.3	
60		

● ANX ● CNX

D	D T	d T	L T
20	±0.2	±0.2	±0.3
25			
30			
40			
50	±0.3		±0.5
60			

Product guide P.1119
Shore A70

d	Catalog No. Type	Catalog No. D — L	U/Price Q'ty : 1~19
8.5	LAN	20—200	700
11		25—200	940
14		30—200	1,390
	CNN	40—300	3,910
		50—300	6,240
		60—300	8,580

d	Catalog No.	D	L 1mm increments	U/Price Q'ty : 1~19 L10~20	L21~40	L41~60	L61~80	L81~100	L101~150	L151~200
8.5	ANX	20	10~200	150	170	230	310	400	600	780
11		25		230	250	320	440	530	780	1,040
14		30		270	330	480	620	770	1,160	1,540
	CNX	40		350	580	870	1,160	1,450	2,170	2,890
		50		580	1,020	1,450	1,880	2,310	3,470	4,620
		60		870	1,450	2,020	2,600	3,180	4,770	6,360

Order — Catalog No. LAN / ANX — D — L: LAN 60 — 300; ANX 20 — 150

Delivery — ●LAN ●CNN 1 Day; ●ANX ●CNX 3 Days

Express T 600/1Pc.
Express A 300/1Pc.
P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

Volume discount rate P.37

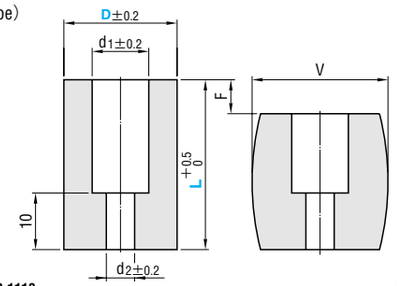
Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

URETHANES WITH COUNTERBORE HOLE
—LOW REPULSION TYPE—

RoHS

AZN (Standard type)



Product guide P.1119

H Shore A70

F=L×10%		F=L×15%		F=L×20%			D	d_1	d_2	M	L	Catalog No.	U/Price
F mm	Load N {kgf}	F mm	Load N {kgf}	F mm	Load N {kgf}	V						Type D — L	Q'ty : 1~19
2.5	304 {31}	3.7	442 {45}	5.0	647 {66}	29	25	11	7	M6	25	AZN25 — 25	730
3.0		4.5		6.0							30	30	730
3.5		5.2		7.0							35	35	730
4.0		6.0		8.0							40	40	730
3.0	362 {37}	4.5	627 {64}	6.0	892 {91}	35	30	14	9	M8	30	AZN30 — 30	850
3.5		5.2		7.0							35	35	850
4.0		6.0		8.0							40	40	850
3.0	735 {75}	4.5	1274 {130}	6.0	1814 {185}	46	40	18	11	M10	30	AZN40 — 30	1,220
3.5		5.2		7.0							35	35	1,220
4.0		6.0		8.0							40	40	1,220
3.0	1117 {114}	4.5	1971 {201}	6.0	2824 {288}	57	50	20	14	M12	30	AZN50 — 30	1,600
3.5		5.2		7.0							35	35	1,600
4.0		6.0		8.0							40	40	1,700
5.0		7.5		10.0							50	50	1,700

Order — Catalog No. — AZN 25—30

Delivery — 1 Day

Price

Volume discount rate P.37

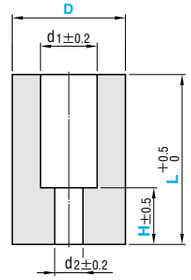
Quantity	1~19	20~49	50~199	200~400
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

● kgf=N×0.101972

RoHS

AZNX (Full length specified type)



D	D T
25	±0.2
30	
40	
50	±0.3

Product guide P.1119

H Shore A70

Catalog No. Type	D	L 1mm increments	M	H 1mm increments
AZNX	25	20 ~ 60	M 6 M 8	5≦H<L
	30			
	40	25 ~ 100	M10 M12	
	50			

Deta

M	M6	M8	M10	M12
d_1	11	14	18	20
d_2	7	9	11	14

Order — Catalog No. — AZNX 25 — 42 — M6 — 15

Delivery — 3 Days — Express T 600/1Pc. / Express A 300/1Pc. P.38

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

Volume discount rate P.37

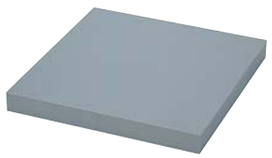
Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

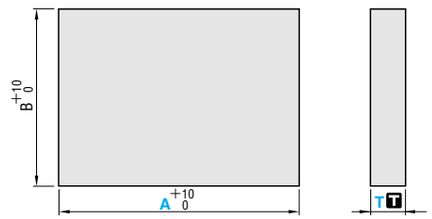
D \ L	L20~40	L41~60	L61~80	L81~100
	U/Price Q'ty : 1~19			
25	870	1,010	—	—
30	1,000	1,160	—	—
40	1,450	1,740	2,020	2,310
50	1,880	2,310	2,750	3,190

URETHANE SHEETS/URETHANE DIE PADS
—LOW REPULSION TYPE—

RoHS



UTN (Urethane sheet)



T	T
5	±0.4
10	
15	±0.5
20	
25	
30	±1

Product guide P.1119

H Shore A70

A	B	T	Catalog No. Type T — A	U/Price Q'ty : 1~9
250	250	5	UTN 5 — 250	6,800
		10	10 — 250	13,500
		15	15 — 250	19,700
		20	20 — 250	26,400
		25	25 — 250	32,900
		30	30 — 250	39,300

Order — Catalog No. — UTN 25 — 250

Delivery — 1 Day

Price

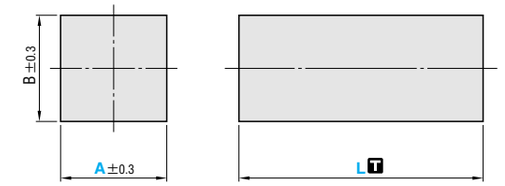
Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

RoHS

UDN (Urethane die pad)



Product guide P.1119

H Shore A70

A	B	L	T	Catalog No. Type A — L	U/Price Q'ty : 1~9
25	25	50	±1	UDN 25 — 50	520
		100		100	1,040
		300	+5 0	300	2,770
50	50	50	±1	UDN 50 — 50	2,080
		100		100	3,540
		300	+5 0	300	10,810

Order — Catalog No. — UDN 25 — 300

Delivery — 1 Day

Price

Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

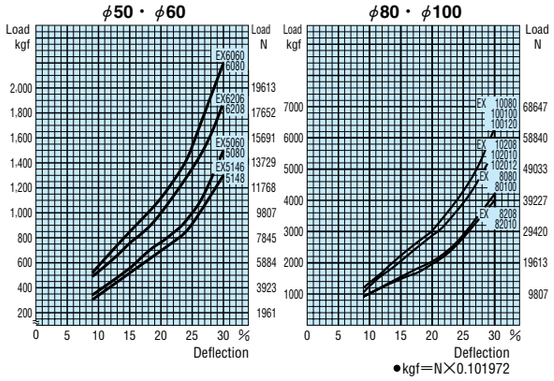
To be quoted on price & lead time above Max. Q'ty.

Express service system P.38 | MISUMI Press 2007 | http://misumi.jp/press/ | For inquiry, ordering and other information, refer to P.1269

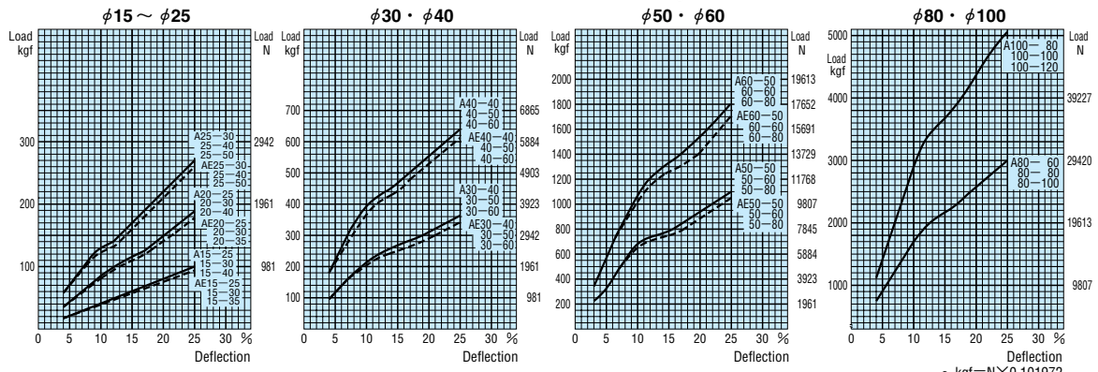
〔PRODUCTS INFORMATION〕
URETHANE LOAD / DEFLECTION GRAPH

■Heavy load type urethane（Shore A90）

•EX type

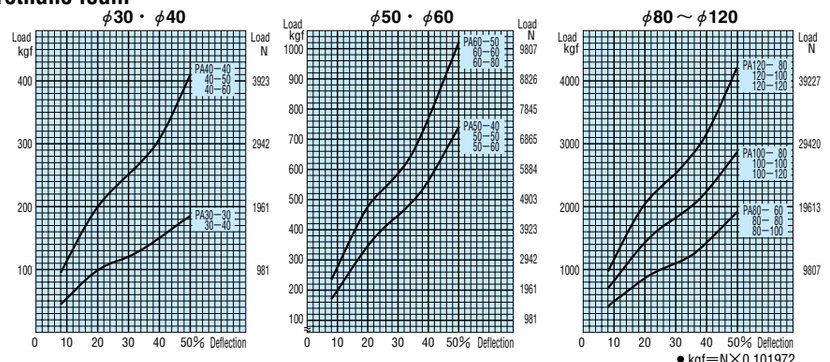


•A・AE type



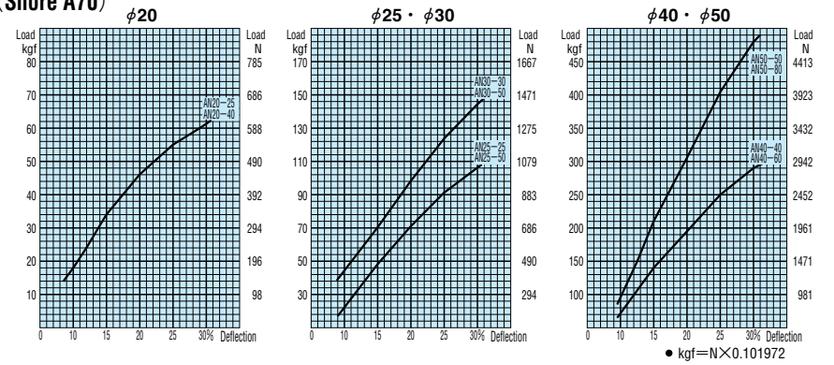
■High deflection type urethane foam

•PA type



■Low repulsion urethane（Shore A70）

•AN type

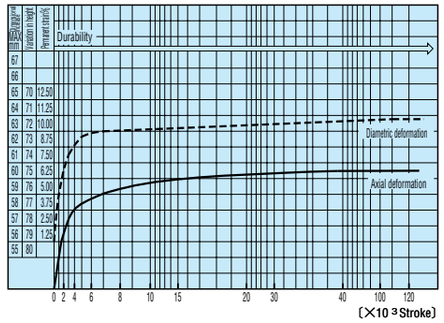


〔PRODUCTS INFORMATION〕
DURABILITY / PERMANENT STRAIN OF URETHANE

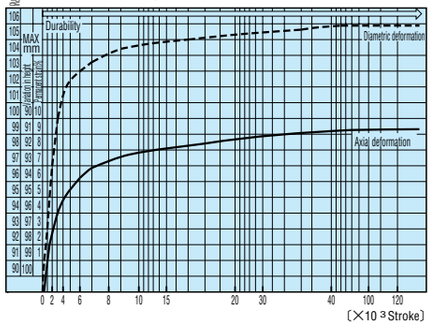
■Heavy load type urethane（Shore A90）

•EX type

EX6080
（φ60×80L）Compression 30% 80SPM not lubricated

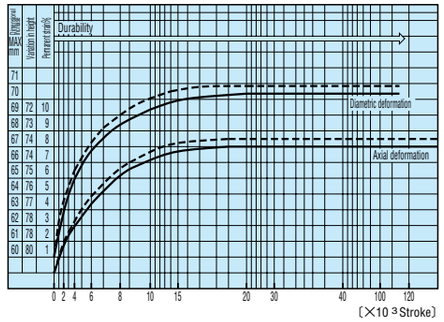


EX100100
（φ100×100L）Compression 30% 80SPM not lubricated

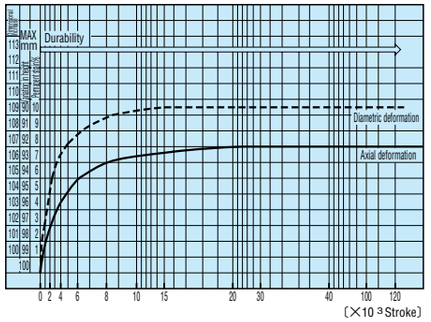


•A・AE type

A60—80・AE60—80 （—— Atype, ---- AEtype ）
（φ60×80L）Compression 25% 98SPM not lubricated



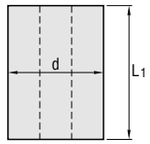
A100—100
（φ100×100L）Compression 25% 45SPM not lubricated



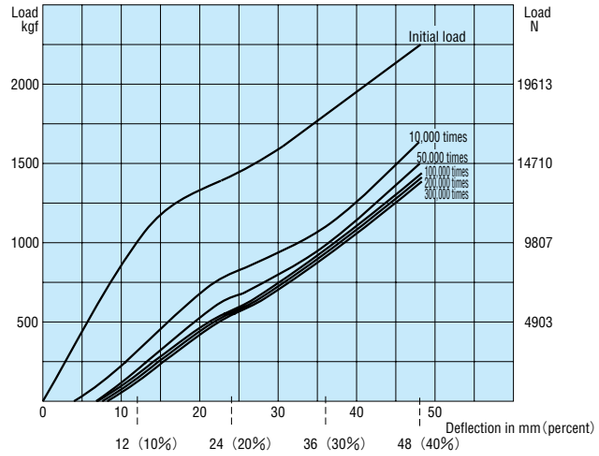
■High deflection type urethane foam

•PA type

Change in load and full length by operation frequency



Operation frequency	Deflection=L×10% Deflection mm	Load N(kgf)	Deflection=L×20% Deflection mm	Load N(kgf)	Deflection=L×30% Deflection mm	Load N(kgf)	Deflection=L×40% Deflection mm	Load N(kgf)	L_1	d	Permanent strain mm
First time	12	9611 (980)	24	13925 (1420)	36	17750 (1810)	48	22065 (2250)	120.0	101.1	—
10,000 times		3138 (320)		7845 (800)		10787 (1100)		16181 (1650)	115.8	104.9	4.2
50,000 times		1961 (200)		6423 (655)		9512 (970)		14612 (1490)	113.3	105.8	6.7
100,000 times		1569 (160)		5688 (580)		8973 (915)		14024 (1430)	112.5	106.7	7.5
200,000 times		1373 (140)		5492 (560)		8826 (900)		13925 (1420)	112.2	106.7	7.8
300,000 times		1177 (120)		5296 (540)		8777 (895)		13827 (1410)	112.0	106.7	8.0



● kgf=N×0.101972

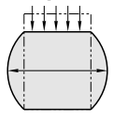
〔PRODUCTS INFORMATION〕

CALCULATIONS OF URETHANE LOAD CHARACTERISTICS

If urethane is used as a pressure medium, it is extremely important to know how much deflection will be caused at how much load. Especially, in limited space setting, it is necessary to design a die appropriate for the conditions in consideration with load and deformation.The shape coefficient and elastic modulus are necessary for determining the load and the amount of deflection.

A urethane spring, regardless of its shape, has a characteristic that it bulges on both sides when load is applied.This does not change its overall volume; however, this bulging caused by load application must be taken into consideration in designing a die. (Fig.1)

(Fig. 1)



●Shape alteration and load

A. Shape coefficient

The shape coefficient is defined mathematically as the surface area of one load bearing surface divided by the surface area of all the sides not being subjected to the load directly.

$$\text{Shape coefficient(SF)} = \frac{\text{Surface area of load surface } (S_1)}{\text{Surface area of all sides } (S_2)}$$

On a block shape or pillar (cylinder) shape, it can be thought to be divided to each surface respectively. (See Fig. 2).

a) Block shape

$$SF = \frac{L \times W}{2H(L+W)} \quad \cdots\cdots(1)$$

b) Pillar shape

$$SF = \frac{\pi D^2}{4\pi DH} = \frac{D}{4H} \quad \cdots\cdots(2)$$

π : Circularity=3.14

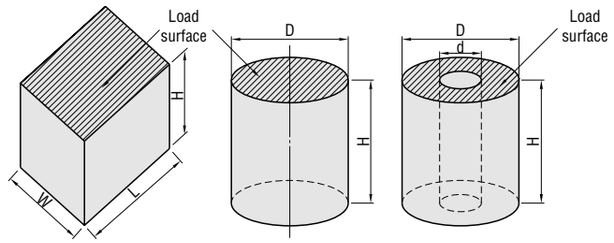
c) Cylinder shape

$$SF = \frac{D-d}{4H} \quad \cdots\cdots(3)$$

However, this formula must fulfill below conditions.

① If load is received, the load should bear vertically and horizontally against the axis.
② The width, length or diameter dimension of load surface must be over half of the length or the thickness.

(Fig. 2)



a) Block shape b) Pillar shape c) Cylinder shape

B. Elastic modulus

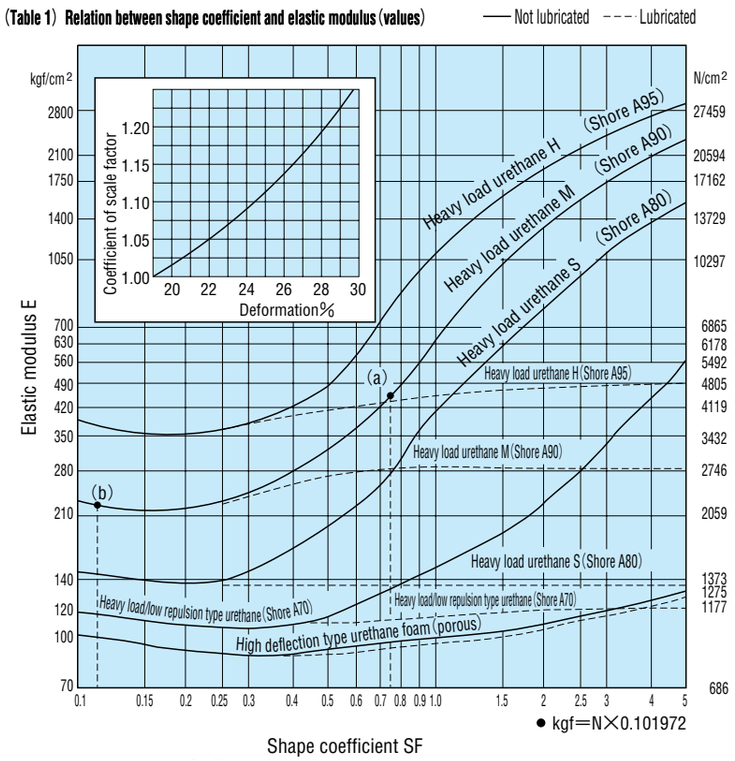
The elastic modulus (E) is defined as the force (stress) per unit of surface area divided by the percentage of height deformation (distortion).From Table 1, it can be understood that under non-lubricated conditions, the elastic modulus changes greatly depending on the shape coefficient.

Under the above 2 limitations, the elastic modulus (E) can be determined as shown below.

$$\text{Elastic modulus (E)} = \frac{F/S}{\Delta H/H} \quad \cdots\cdots(4)$$

(F : Load, S : Load area, ΔH : Change in height, H : Initial height (free height))

(Table 1) Relation between shape coefficient and elastic modulus (values)



Shape coefficient SF

Coefficient of scale factor needs to be considered when the deformation rate is 20% or more.

C. Load and deformation amount

The load can be determined by using formula (4).

$$\text{Load (F)} = \frac{\Delta H \times S \times E}{H} \quad \cdots\cdots(5)$$

Also, the amount of change in the height can be determined in the same way.

$$\text{Amount of deformation in height } \Delta = \frac{F \times H}{S \times E} \quad \cdots\cdots(6)$$

〔Example 1〕

Suppose the length L be 100mm, the width W 80mm and the height H 30mm. How much force is necessary in this case to cause a 5mm deformation in the urethane's thickness?(Conditions : Heavy load urethane M is used and it is in the non-lubricated state.) (1cm=10mm)

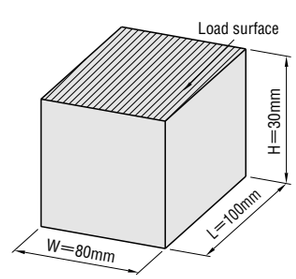
First, consider the shape coefficient (SF). From Formula (1),

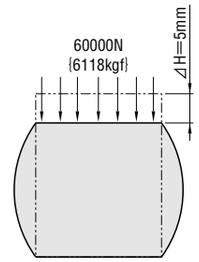
$$\text{Shape coefficient(SF)} = \frac{L \times W}{2H(L+W)} = \frac{10 \times 8}{2 \times 3 \times (10+8)} = \frac{80}{108} = 0.74$$

Take SF=0.74 from Table 1 and from intersection point (a) of heavy load urethane M, the elastic modulus (E) turns out to be approximately 4500N/cm² {459kgf} . If we calculate the load by using formula (5),

$$\text{Load(F)} = \frac{\Delta H \times S \times E}{H} = \frac{\Delta H \times L \times W \times E}{H} = \frac{0.5[\text{cm}] \times 80[\text{cm}^2] \times 4500[\text{N/cm}^2]}{3\text{cm}} = 60000\text{N } \{6118\text{kgf}\}$$

Therefore, to cause 5mm of deformation in the height of the urethane, 60000N {6118kgf} of force is necessary.





〔Example 2〕

How much is the height of the urethane deformed in the case where a 10000N {1020kgf} of force is applied to a piece with a diameter D of ϕ50mm, and a height H of 100mm?(Conditions : Heavy load urethane M is used and it is in the non-lubricated state.) (1cm=10mm)

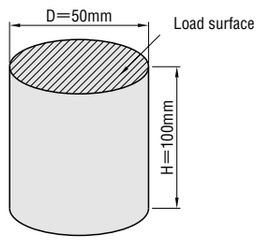
First, determine the shape coefficient (SF) by using formula (2),

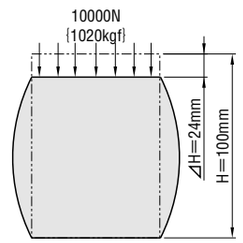
$$\text{Shape coefficient(SF)} = \frac{D}{4H} = \frac{5}{4 \times 10} = 0.125$$

From the intersection point (b) of the SF (=0.125) and the curve for heavy load urethane M, the elastic modulus (E) becomes approximately 2100N/cm² {214kgf} , and to determine the amount of deformation (ΔH) from Formula (6),

$$\text{Amount of deformation in height}(\Delta H) = \frac{F \times H}{S \times E} = \frac{F \times H}{\pi \times \left(\frac{D}{2}\right)^2 \times E} = \frac{4F \times H}{\pi E D^2} = \frac{4 \times 10000[\text{N}] \times 10[\text{cm}]}{3.14 \times 2100[\text{N/cm}^2] \times 5^2[\text{cm}^2]} = 2.4\text{cm}$$

Therefore, when 10000 {1020kgf} load is applied, the amount of deformation in height of the urethane is 24mm.





Note) Figures calculated with the formula is for references.

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

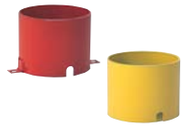
COMPONENTS FOR LIFTING · DIE STORING

COMPONENTS FOR LIFTING · DIE STORING

Name / Catalog No.	LIFTING BARS HLFB	LIFTING EYE BOLTS CHI	CAST-IN LIFTING BUSHES CSN	HOOKS—Bolt type— CHN
Delivery	①	①	①	①
Page	1142	1143	1143	1144

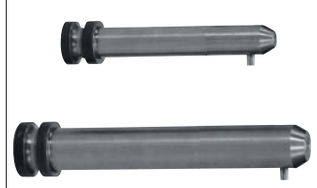
—Large head bolt type— CHNL	HOOKS—Plate type— CHP	—Large head plate type— CHPL	HOOKS—Insert type— CHU	HOOKS CHF
①	①	①	①	①
1144	1145	1146	1147	1148

—Large head bolt type— CHFL	LIFTING T-SHAPED BOLTS TB	FIXING PLATES DKP DKPL	HOLDING PIPES DYP□	BUSHES FOR RETAINING KPB
①	①	③ⓉⒶ	③ⓉⒶ	③Ⓐ
1148	1148	1149	1149	1150



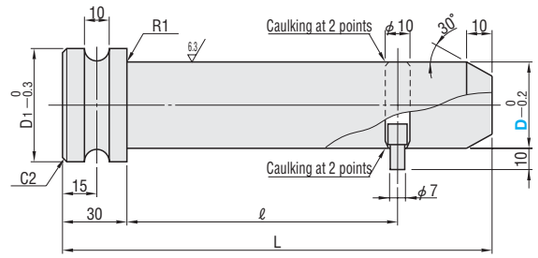
URETHANE STOCK BLOCK SETS PHBT PHBTN PHUB PHUBN	STROKE END PIPES PH PHN	URETHANE STOCK BLOCKS EST ESBT ESU ESUB	ABSORBERS DUSA	PADS DURP
①	①	①	①	①
1151 1152	1153	1154	1154	1154

LIFTING BARS



RoHS

HLFB



M S45C
With Drop-off prevention stopper

D1	L	ℓ	Allowable load N {kgf} at the use of 4 pcs.	Catalog No. Type	Catalog No. D	U/Price Q'ty : 1~9
34	185	135	29420 { 3000}	HLFB	25	1,350
44	240	190	49033 { 5000}		35	2,100
50	260	210	88260 { 9000}		40	2,500
60	290	240	137293 {14000}		50	4,300
75	335	285	166712 {17000}		65	4,800

• {kgf} =N×0.101972

Order — Catalog No. HLFB 25

Price

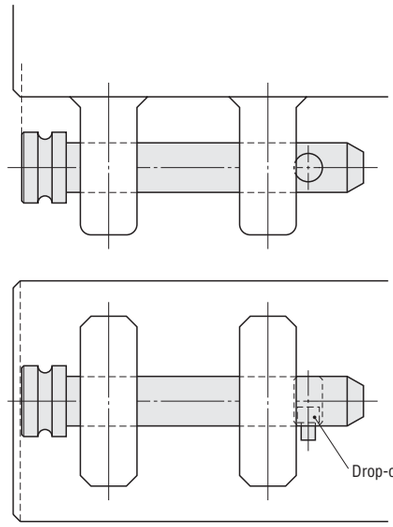
■Volume discount rate P.37

Quantity	1~9	10~29	30~49	50~99
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Delivery — 1 Day

Example — Be sure to set the Drop-off prevention stopper downwards. And its collar should not protrude from the die.

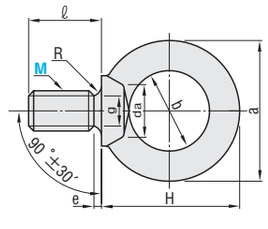


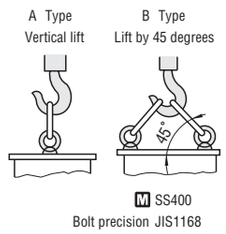
LIFTING EYE BOLTS / CAST-IN LIFTING BUSHES

Lifting eye bolts—For vertical lifting—

RoHS

CHI





M SS400
Bolt precision JIS1168

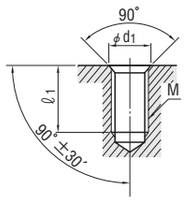
M×P	a	b	C	D	H	ℓ	e	g	R	da	Maximum allowable loadN {kgf} A : Vertical 1pc.	Maximum allowable loadN {kgf} B : 45° 2pcs.	Catalog No. Type	Catalog No. M	U/Price Q'ty : 1~19
6×1.0	24.9	14.5	5.2	12.8	28.45	15	3	4.7	1.0	7.9	392 { 40}	392 { 40}	CHI	6	100
8×1.25	32.6	20	6.3	16	33.3	15	3	6	1.0	9.2	785 { 80}	785 { 80}		8	80
10×1.5	41	25	8	20	41.5	18	4	7.7	1.2	11.2	1471 { 150}	1471 { 150}		10	90
12×1.75	50	30	10	25	51	22	5	9.4	1.4	14.2	2157 { 220}	2157 { 220}		12	100
16×2.0	60	35	12.5	30	60	27	5	13	1.6	18.2	4413 { 450}	4413 { 450}		16	140
20×2.5	72	40	16	35	71	30	6	16.4	2	22.4	6178 { 630}	6178 { 630}		20	210
24×3.0	90	50	20	45	90	38	8	19.6	2.5	26.4	9316 { 950}	9316 { 950}		24	420
30×3.5	110	60	25	60	110	45	8	25	3	33.4	14710 {1500}	14710 {1500}		30	790
36×4.0	133	70	31.5	70	131.5	55	10	30.3	3	39.4	22555 {2300}	22555 {2300}		36	1,520
42×4.5	151	80	35.5	80	150.5	65	12	35.6	3.5	45.6	33342 {3400}	33342 {3400}		42	2,850
48×5.0	170	90	40	90	170	70	12	41	4	52.6	44130 {4500}	44130 {4500}		48	5,040

● {kgf}=N×0.101972

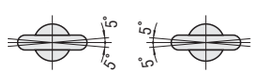
■How to install

Fasten the eye bolt lightly so that the seat of the bolt is firmly in contact with the plate.

Catalog No.		d1	ℓ1
CHI	6	9	17
	8	11	17
	10	13	20
	12	16	24
	16	20	30
	20	24	34
	24	28	42
	30	36	50
	36	42	60
	42	48	70
	48	56	76

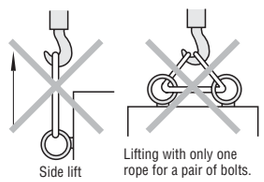


Set the eye bolts in the same direction when a pair of the bolts are used.



Caution

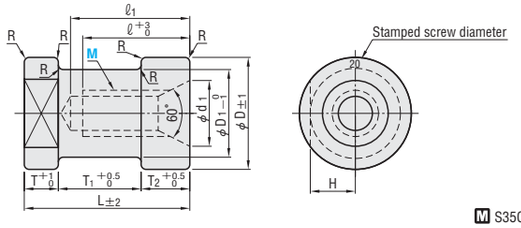
Never use the bolts as shown below.



Cast-in lifting bushes

RoHS

CSN



M S35C

Maximum allowable load N {kgf} Hook 2pcs.	Maximum allowable load N {kgf} Eye bolt Vertical lift/1pc.	Maximum allowable load N {kgf} Eye bolt Lift by 45 degrees/2pcs.	M×P	D	D1	d1	ℓ	ℓ1	L	T	T1	T2	H	R	Catalog No. Type	Catalog No. M	U/Price Q'ty : 1~19
3730 { 380}	2160 { 220}	2160 { 220}	12×1.75	38	28	18	30	40	55	10	30	15	14	2	CSN	12	430
6620 { 675}	4410 { 450}	4410 { 450}	16×2.0	46	36	22	35	45	55	10	30	15	18	2		16	510
8830 { 900}	5880 { 600}	5880 { 600}	20×2.5	48	38	28	45	55	70	15	35	20	19	2		20	700
13340 {1360}	9810 {1000}	9810 {1000}	24×3.0	55	45	36	55	65	85	20	45	20	22.5	2		24	850
19810 {2020}	16670 {1700}	16670 {1700}	30×3.5	65	52	42	65	75	95	25	50	20	26	3		30	1,270
58450 {5960}	22560 {2300}	22560 {2300}	36×4.0	85	70	48	75	90	110	30	55	25	35	3		36	1,740

● {kgf}=N×0.101972

Order — Catalog No.
CHI 10
CSN 24

Delivery — 1 Day

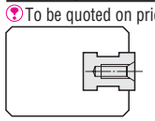
Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

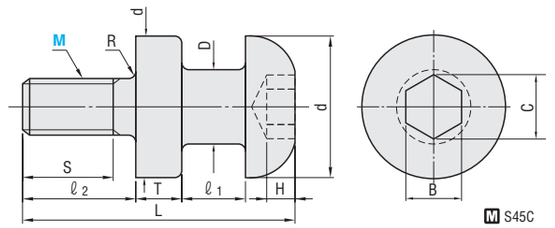
Example



HOOKS
—BOLT TYPE / LARGE HEAD BOLT TYPE—

RoHS

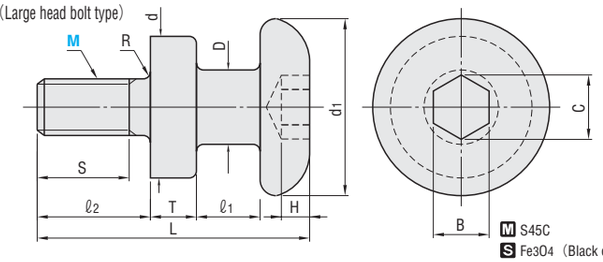
CHN



M S45C
S Fe3O4 (Black oxide)

RoHS

CHNL (Large head bolt type)



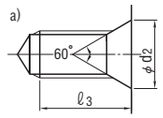
M S45C
S Fe3O4 (Black oxide)

M×P	D	d	d1	ℓ1 CHN	ℓ1 CHNL	ℓ2	S	T	L CHN	L CHNL	R	H	B	C	N/1pc. {kgf/1pc.} (Steel safety coefficient 10)	Catalog No. Type	Catalog No. M	U/Price Q'ty : 1~19 CHN	U/Price Q'ty : 1~19 CHNL
10×1.5	13	32	42	10	18	20	16	8	46	54	1.5	5	8	9.2	2452 { 250}	CHN CHNL	10	520	600
12×1.75	16	36	48	13	20	24	20	10	57	64	1.5	6	10	11.7	3530 { 360}		12	570	660
16×2.0	20	40	52	18	25	30	25	13	75	82	2	9	14	16.3	6669 { 680}		16	710	820
20×2.5	25	48	62	20	28	37	32	16	90	98	2	12	17	19.8	10395 {1060}		20	950	1,090
24×3.0	32	58	76	25	33	47	40	20	111	119	2.5	13	19	22.1	15004 {1530}		24	1,380	1,580
30×3.5	36	68	88	30	40	56	48	22	131	141	3	16	22	25.6	23830 {2430}		30	2,330	2,660
36×4.0	40	78	100	30	40	68	58	25	148	158	3	18	27	31.4	34814 {3550}		36	3,280	3,760

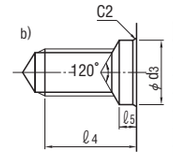
● {kgf}=N×0.101972

■How to Install

The screw holes for the CHN/CHNL should be finished as shown in a) or b) below. Screw head of CHN/CHNL must be firmly in contact with the surface of the die set.



M	d2	ℓ3
10	15	22
12	18	26
16	23	32
20	27	40
24	35	50
30	42	60
36	50	72



M	d3	ℓ4	ℓ5
10	12	22	5
12	14	26	6
16	18	32	6
20	22	40	6
24	28	50	8
30	34	60	9
36	40	72	11

Order — Catalog No.
CHNL 20

Delivery — 1 Day

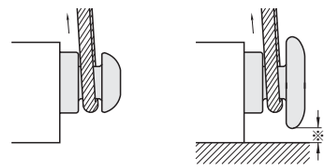
Price

■Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example

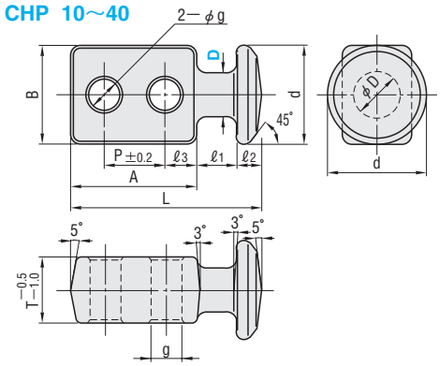


※ <Large head bolt type>
Be sure to have sufficient space for the wire.

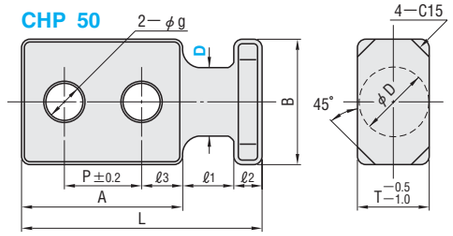
HOOKS
—PLATE TYPE—

RoHS

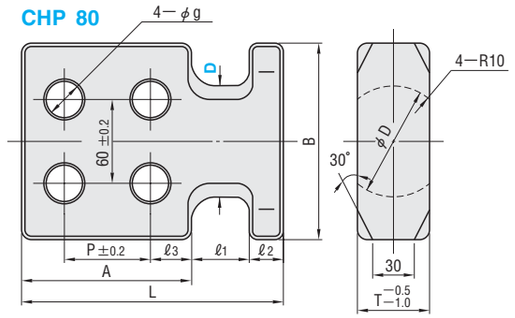
CHP 10～40



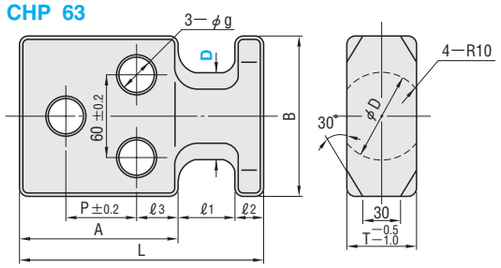
CHP 50



CHP 80



CHP 63



M SS400

d	B	T	L	A	ℓ1	ℓ2	ℓ3	P	g	N/1pc. {kgf/1pc.} (Steel safety coefficient 10)	Catalog No. Type	Catalog No. D	U/Price Q'ty：1～19
28	28	18	50	32	10	8	8	16	7	1569{ 160}	CHP	10	620
32	32	20	56	38	10	8	10	18	9	3530{ 360}		12	670
36	36	24	67	46	13	8	12	22	11	4511{ 460}		16	730
40	40	26	88	60	18	10	15	30	14	5492{ 560}		20	840
48	48	35	92	60	20	12	15	30	14	6570{ 670}		25	1,000
55	55	40	118	80	25	13	20	40	18	12160{1240}		32	1,310
70	70	50	138	93	30	15	24	45	22	19123{1950}		40	2,190
—	90	50	170	115	35	20	30	55	26	27459{2800}		50	3,090
—	115	50	175	115	40	20	30	55	26	39227{4000}		63	4,030
—	140	50	185	120	40	25	30	60	26	50995{5200}		80	5,180

●{kgf}=N×0.101972

Order Catalog No. CHP 25

Delivery 1 Day

Price

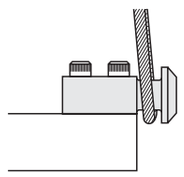
Example

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Make sure that the direction of lifting is in line with the axes of the mounting bolts.



■Bolts for CHP 50・63・80 (Strength rank 10.9)

Screw length	Catalog No. Type M—L	U/Price Less※	U/Price Over※	※ Quantity
Full threads	CB 24 — 80	246	243	15
60	90	262	259	10
	100	284	281	
	110	307	303	
	120	328	324	

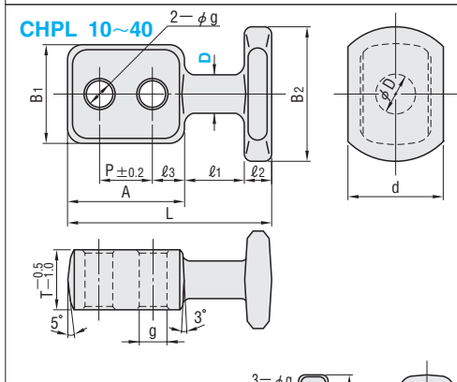
●Please use bolts belonging to the strength rank 12.9 or 10.9 of JIS B 1176 or B 1180.

Details P.721

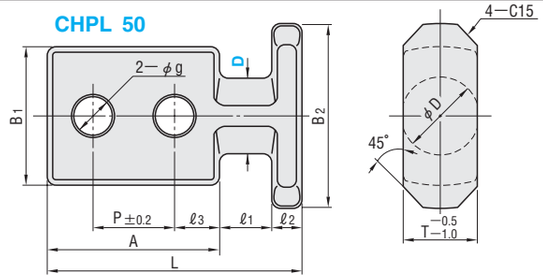
HOOKS
—LARGE HEAD PLATE TYPE—

RoHS

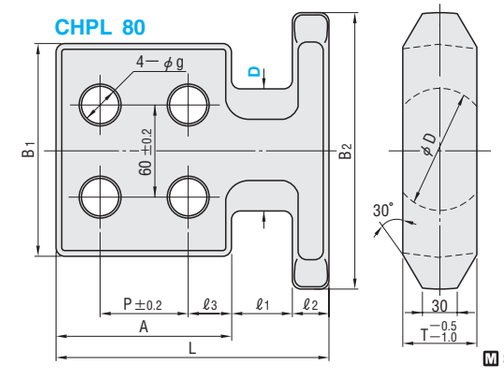
CHPL 10～40



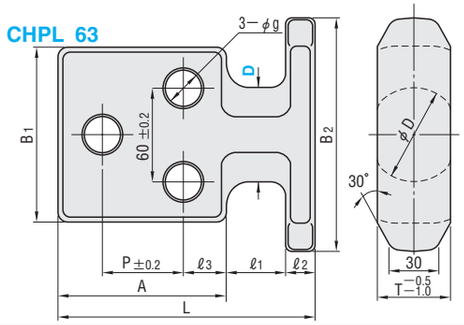
CHPL 50



CHPL 80



CHPL 63



M SS400

d	B1	B2	T	L	A	ℓ1	ℓ2	ℓ3	P	g	N/1pc. {kgf/1pc.} (Steel safety coefficient 10)	Catalog No. Type	Catalog No. D	U/Price Q'ty：1～19
28	28	38	18	61	32	20	9	8	16	7	1569{ 160}	CHPL	10	710
32	32	44	20	67	38	20	9	10	18	9	3530{ 360}		12	770
36	36	50	24	78	46	20	12	12	22	11	4511{ 460}		16	850
40	40	56	26	97	60	25	12	15	30	14	5492{ 560}		20	960
48	48	68	35	98	60	25	13	15	30	14	6570{ 670}		25	1,150
55	55	77	40	125	80	30	15	20	40	18	12160{1240}		32	1,510
70	70	100	50	143	93	35	15	24	45	22	19123{1950}		40	2,530
—	90	120	50	170	115	35	20	30	55	26	27459{2800}		50	3,400
—	115	155	50	175	115	40	20	30	55	26	39227{4000}		63	4,440
—	140	180	50	185	120	40	25	30	60	26	50995{5200}		80	5,700

※□：Dimensions that are different from **CHP**.

●{kgf}=N×0.101972

Order Catalog No. CHPL 25

Delivery 1 Day

Price

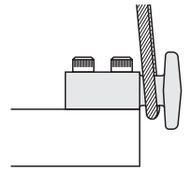
Example

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Make sure that the direction of lifting is in line with the axes of the mounting bolts.



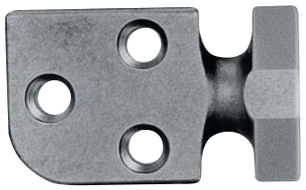
■Bolts for CHPL 50・63・80 (Strength rank 10.9)

Screw length	Catalog No. Type M—L	U/Price Less※	U/Price Over※	※ Quantity
Full threads	CB 24 — 80	246	243	15
60	90	262	259	10
	100	284	281	
	110	307	303	
	120	328	324	

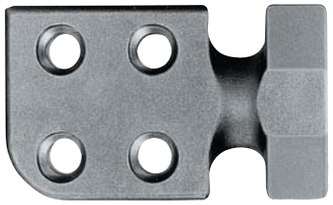
●Please use bolts belonging to the strength rank 12.9 or 10.9 of JIS B 1176 or B 1180.

Details P.721

HOOKS
—INSERT TYPE—

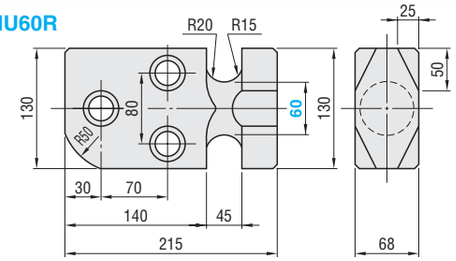


RoHS

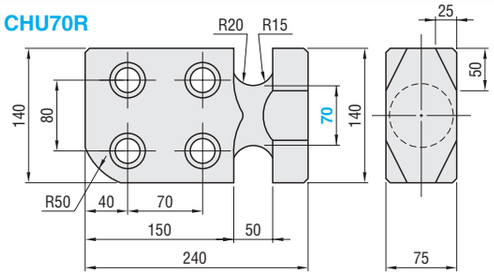


RoHS

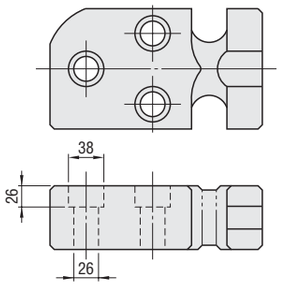
CHU60R



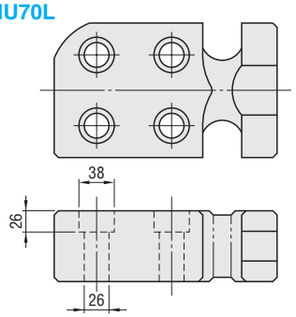
CHU70R



CHU60L



CHU70L



M SS400

M SS400

N{kgf}/1pc. (Steel safety coefficient 10)	Catalog No.		U/Price Q'ty : 1~19
42170 {4300}	CHU	60R	6,710
		60L	
47070 {4800}		70R	8,470
		70L	

● {kgf}=N×0.101972

Bolts for CHU (Strength rank 10.9)

Screw length	Catalog No. Type M — L	U/Price Less※	U/Price Over※	※ Quantity
Full threads	CB 24 — 80	246	243	15
60	90	262	259	10
	100	284	281	
	110	307	303	
	120	328	324	

Details P.721

● Please use bolts belonging to the strength rank 12.9 or 10.9 of JIS B 1176 or B 1180.

Order Catalog No. CHU 60R

Delivery 1 Day

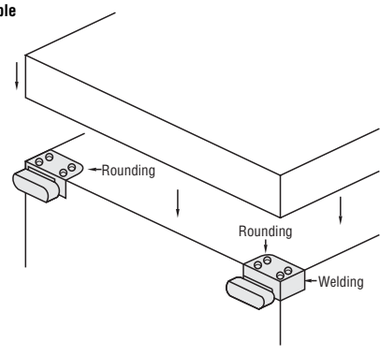
Price

Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

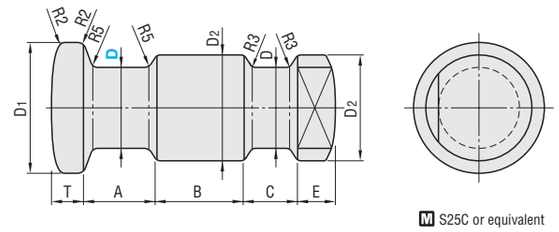
To be quoted on price & lead time above Max. Q'ty.

Example



RoHS

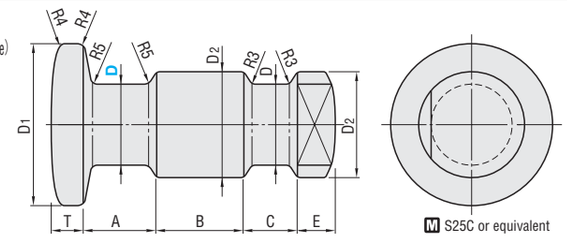
CHF



M S25C or equivalent

RoHS

CHFL (Large head bolt type)



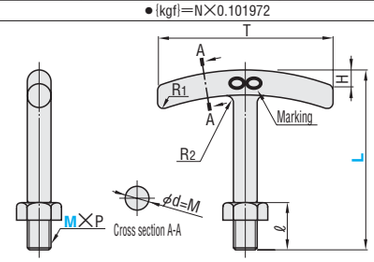
M S25C or equivalent

D	D1 CHF	D1 CHFL	D2	T	A	B	C	E	N/1pc. {kgf/1pc.}	Catalog No. Type	Catalog No. D	U/Price Q'ty : 1~19 CHF	U/Price Q'ty : 1~19 CHFL
25	46	60	36	12.6	25	30	15	16.6	7940 { 810}	CHF CHFL	25	730	810
32	55	70	42	13.1	30	40	20	16.8	13140 {1340}		32	940	1,040
36	60	80	46	18.5	35	45	25	17	16570 {1690}		36	1,250	1,380
40	70	90	55	18.9	35	60	30	17.4	20500 {2090}		40	1,570	1,730
50	90	120	70	25.2	35	70	40	18.1	32070 {3270}		50	2,610	2,880
70	120	140	100	31.1	40	80	40	19.4	62860 {6410}		70	4,700	5,180

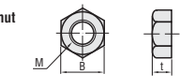
● {kgf}=N×0.101972

RoHS

TB



Hex nut



M	B	t
8	13	6.5
10	17	8
12	19	10
16	24	13
20	30	16

M SS400
Bolt precision JIS1168
A Hex nut

M×P	H	R1	R2	T	ℓ	N/1pc. {kgf/1pc.}	Catalog No. Type	Catalog No. M	L	U/Price Q'ty : 1~19
8×1.25	8	2	3	80	22	686 { 70}	TB	8	100	600
10×1.5	8	3	5	80	28	981 {100}		10	110	660
12×1.75	8	3	5	90	34	1471 {150}		12	125	720
16×2.0	10	5	6	100	45	2942 {300}		16	135	900
20×2.5	10	5	8	120	50	3923 {400}		20	160	1,200

● {kgf}=N×0.101972

Order Catalog No. — L
CHF 50
TB 12 — 125

Delivery 1 Day

Price

Volume discount rate P.37

Quantity	1~19	20~49	50~99	100~200
Rate	—	5%	10%	15%

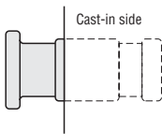
To be quoted on price & lead time above Max. Q'ty.

T-shaped bolt

How to install

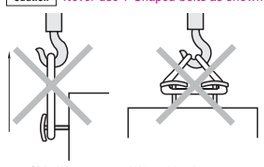
Screw the bolt into the plate with your hand, and then tighten the hex nut firmly to fix the bolt.
※Tightening the nut this way allows you to freely adjust the T-bar orientation.

Example



Caution

Caution Never use T-Shaped bolts as shown below. (TB)

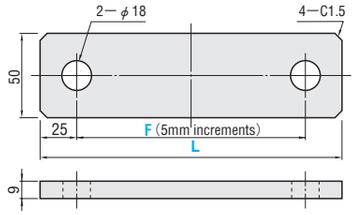


FIXING PLATES / HOLDING PIPES

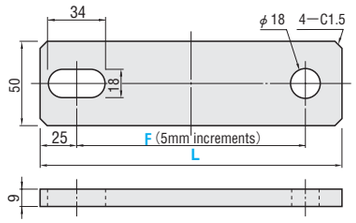
Fixing plates

RoHS

DKP



DKPL (Single oval hole type)



M SS400

Catalog No. Type	L	5mm increments F	U/Price Q'ty : 1～9
DKP	200	95～150	780
	250	145～200	940
	300	195～250	1,070

Catalog No. Type	L	5mm increments F	U/Price Q'ty : 1～9
DKPL (Single oval hole type)	200	120～150	1,380
	250	170～200	1,530
	300	220～250	1,690
	350	270～300	1,840
	400	320～350	2,000

Order

Catalog No.	—	F
DKP 200	—	F95
DKPL 250	—	F180

Delivery

3 Days P.38

Express	T	600/1pc.
Express	A	300/1pc.

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

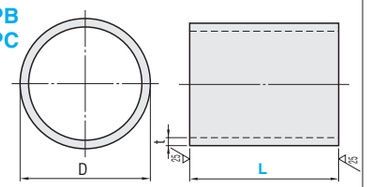
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Holding pipes

RoHS

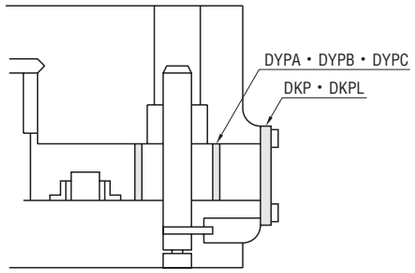
DYPA DYPB DYPC



M SGP

D	t	Catalog No. Type	L	U/Price Q'ty : 1～9
139.8	4.5	DYPA	100	980
			150	1,260
			200	1,520
165.2	5	DYPB	100	1,230
			150	1,580
			200	1,920
190.7	5.3	DYPC	100	1,690
			150	2,140
			200	2,600

Example



Order

Catalog No.
DYPA 150

Delivery

3 Days P.38

Express	T	600/1pc.
Express	A	300/1pc.

A flat charge of 810 yen for 3 pieces or more of the same size (excluding Express T).

Price

■Volume discount rate P.37

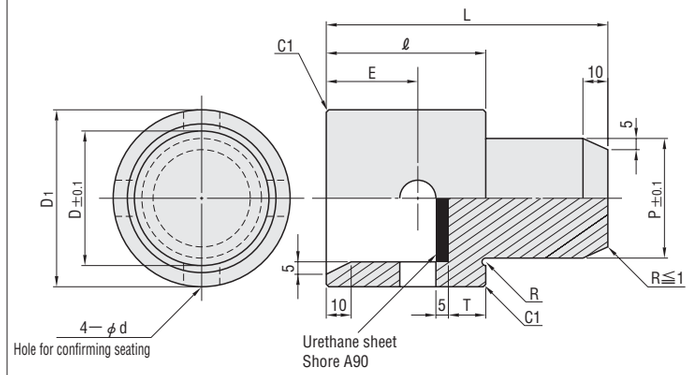
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

BUSHES FOR RETAINING

RoHS

KPB



M SS400
S Painting (Yellow)
Painted area : Outer circumference of ℓ

Applicable post diameter, bushing inner diameter	D	D1	P	L	ℓ	T	E	d	R	Catalog No. Type	No.	U/Price Q'ty : 1～9
25	27	40	24	58	33	8	15	10	1.0	KPB	25	1,800
32	34	47	31	74	42	10	22	10	1.0		32	2,220
38	40	56	37	88	50	12	25.5	15	1.5		38	2,880
50	52	70	49	115	65	15	37.5	15	1.5		50	3,750
60	62	82	59	138	78	18	47.5	15	1.5		60	4,830

■Notes for users

- Use this bush for retaining the die when it is not in use.
- Urethane sheet is pasted as a cushioning material.
- 4 holes for confirming seating are provided around the circumference of the bush.

■Notes

- Do not use this bush when conveying or shipping the dies.
- Do not use this bush with the double-layer die.

Order

Catalog No.
KPB 50

Delivery

3 Days | Express A 800/1pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

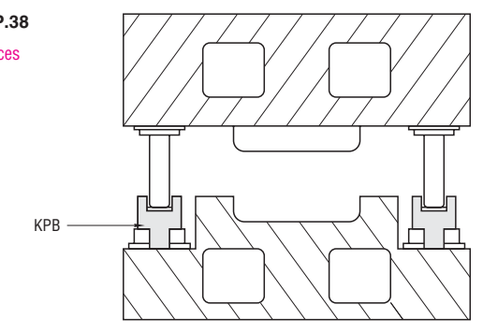
Price

■Volume discount rate P.37

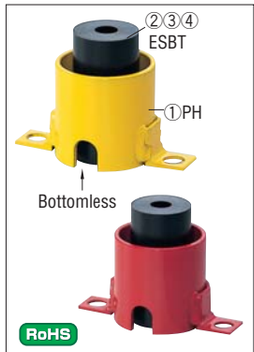
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

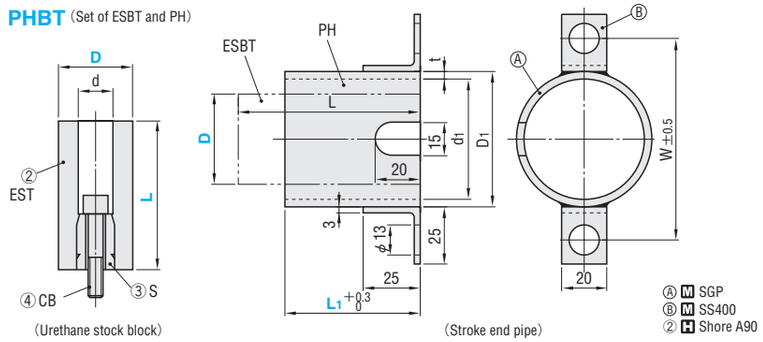
Example



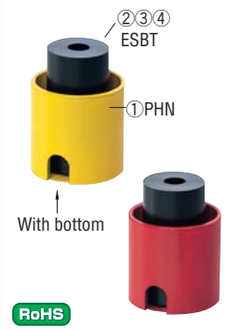
URETHANE STOCK BLOCK SETS



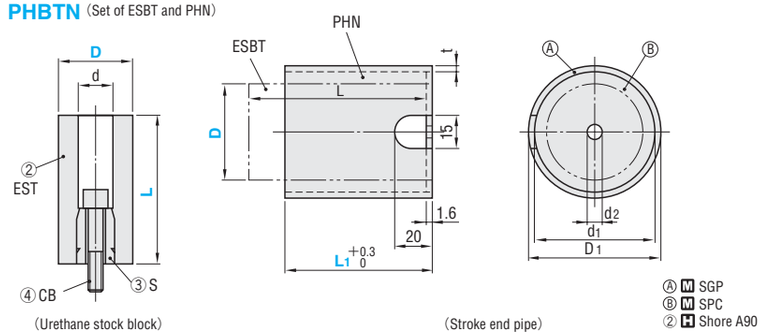
PHBT (Set of ESBT and PH)



Urethane stock block ②③④ESBT			Stroke end pipe ①PH					Sleeve ③S	Bolt ④	Catalog No.		L	L1	Color	U/Price
D	L	d	D1	L1	d1	t	W			Type	D				Q'ty : 1~9Sets
40	80	14	60.5	60	52.9	3.8	91	S14	CB8—45 (Q'ty : 1)	PHBT	40	80	60	R(Red) Y(Yellow)	1,660
50	110		89.1	85	80.7	4.2	119				50	110	85		2,520
70	140		101.6	90	93.2		132				70	140	90		4,060
				100									100		
				110									110		4,090
90	140	22	139.8	90	130.8	4.5	170	S22	CB12—55 (Q'ty : 1)		90	140	90		5,640
				100									100		
				110									110		5,680
100	140	22	165.2	90	155.2	5.0	195	S22	CB12—55 (Q'ty : 1)		100	140	90		8,270
				100									100		
				110									110		8,360



PHBTN (Set of ESBT and PHN)



Urethane stock block ②③④ESBT			Stroke end pipe ①PHN					Sleeve ③S	Bolt ④	Catalog No.		L	L1	Color	U/Price
D	L	d	D1	L1	d1	d2	t			Type	D				Q'ty : 1~9Sets
40	80	14	60.5	60	52.9	9	3.8	S14	CB8—45 (Q'ty : 1)	PHBTN	40	80	60	R(Red) Y(Yellow)	1,880
50	110		89.1	85	80.7		4.2				50	110	85		2,680
70	140		101.6	110	93.2	13					70	140	110		4,330
90		22	139.8		130.8		4.5	S22	CB12—55 (Q'ty : 1)		90				5,940
100			152.5		142.5		5.0				100				8,470

Order

Catalog No.	—	L	—	L1	—	R・Y
PHBT 50	—	110	—	85	—	R
PHBTN 70	—	140	—	110	—	Y
PHUB 40	—	80	—	60	—	R
PHUBN 90	—	140	—	110	—	Y

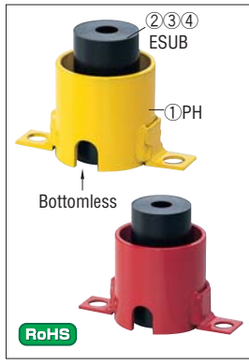
Delivery: 1 Day

Price

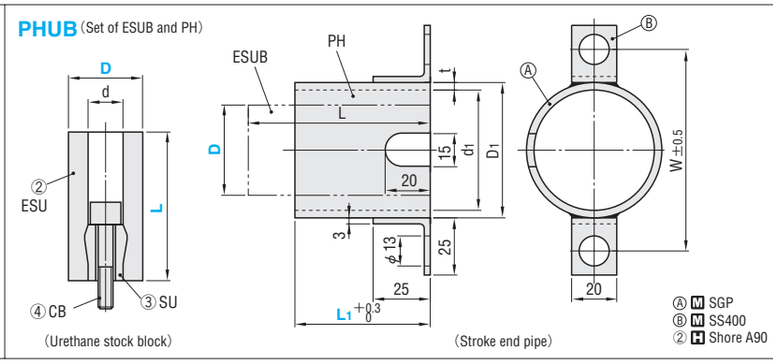
■Volume discount rate P.37

Quantity	1~9	10~19	20~49	50~100
Rate	—	5%	10%	15%

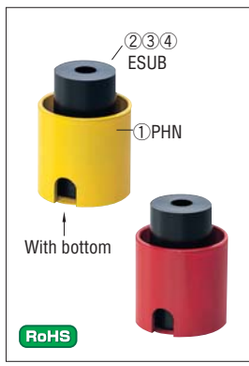
To be quoted on price & lead time above Max. Q'ty.



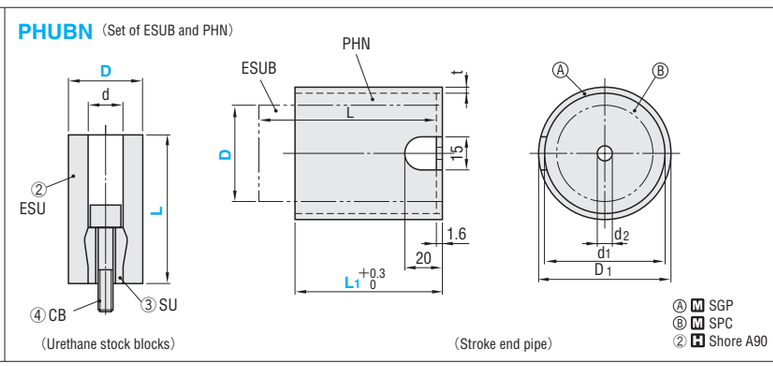
PHUB (Set of ESUB and PH)



Urethane stock block ②③④ESUB			Stroke end pipe ①PH					Sleeve ③SU	Bolt ④	Catalog No.		L	L1	Color	U/Price
D	L	d	D1	L1	d1	t	W			Type	D				Q'ty : 1~9Sets
40	80	14	60.5	60	52.9	3.8	91	SU14	CB8—45 (Q'ty : 1)	PHUB	40	80	60	R(Red) Y(Yellow)	1,660
90	140	22	139.8	90	130.8	4.5	170	SU22	CB12—55 (Q'ty : 1)		90	140	90		5,640



PHUBN (Set of ESUB and PHN)



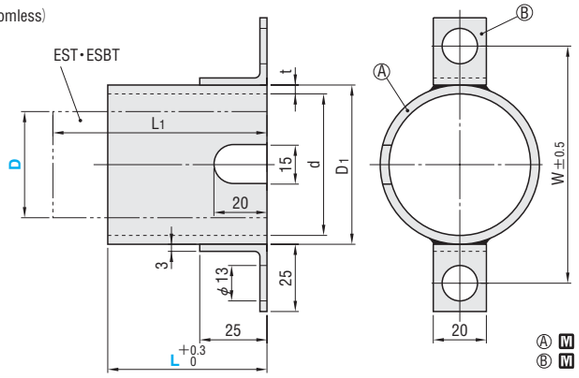
Urethane stock block ②③④ESUB			Stroke end pipe ①PHN					Sleeve ③SU	Bolt ④	Catalog No.		L	L1	Color	U/Price
D	L	d	D1	L1	d1	d2	t			Type	D				Q'ty : 1~9Sets
40	80	14	60.5	60	52.9	9	3.8	SU14	CB8—45 (Q'ty : 1)	PHUBN	40	80	60	R(Red) Y(Yellow)	1,880
70	110	22	101.6	85	93.2	13	4.2	SU22	CB12—55 (Q'ty : 1)		70	110	85		3,820
90	140	22	139.8	110	130.8	13	4.5	SU22	CB12—55 (Q'ty : 1)		90	140	110		5,940

■The combination list of stroke end pipes and urethane stock blocks

Set name	Stroke end pipe	Urethane stock block			
			Components		
①②③④	①	②③④	②Urethane	③Sleeve	④Bolt
PHBT	PH (P.1153)	ESBT (P.1154)	EST (P.1154)	S (P.1154)	CB (P.721)
PHBTN	PHN (P.1153)				
PHUB	PH (P.1153)	ESUB (P.1154)	ESU (P.1154)	SU (P.1154)	
PHUBN	PHN (P.1153)				

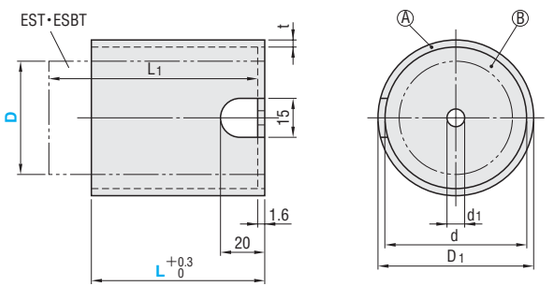
STROKE END PIPES

PH (Bottomless)



EST・ESBT D	EST・ESBT L1	D1	d	t	W	Catalog No. Type	Catalog No. D	L	Color	U/Price Q'ty：1～9
40	80	60.5	52.9	3.8	91	PH	40	60	R(Red)	980
50	110	89.1	80.7	4.2	119		50	85		1,230
70	140	101.6	93.2	4.2	132		70	90・100		1,300
								110		1,340
90	140	139.8	130.8	4.5	170		90	90・100		1,500
								110		1,540
100	140	165.2	155.2	5	195		100	90・100	Y(Yellow)	1,810
								110		1,900
110	140	190.7	180.1	5.3	220		110	90・100		2,140
								110		2,280

PHN (With bottom)



EST・ESBT D	EST・ESBT L1	D1	d	d1	t	Catalog No. Type	Catalog No. No.	L	Color	U/Price Q'ty：1～9
40	80	60.5	52.9	9	3.8	PHN	40	60	R(Red)	1,200
50	110	89.1	80.7		4.2		50	85		1,390
70	110	101.6	93.2	13	4.2		70	85		1,520
70	140	101.6	93.2	9	4.2		70	110		1,580
70	140	101.6	93.2	13	4.2		7022	110	Y(Yellow)	1,620
90	140	139.8	130.8		4.5		90	110		1,800
100	140	152.5	142.5		5		100	110		2,010
110	140	190.7	180.1		5.3		110	110		2,390

Order: Catalog No. PH 70 — L 110 — R・Y

Delivery: 1 Day

Price

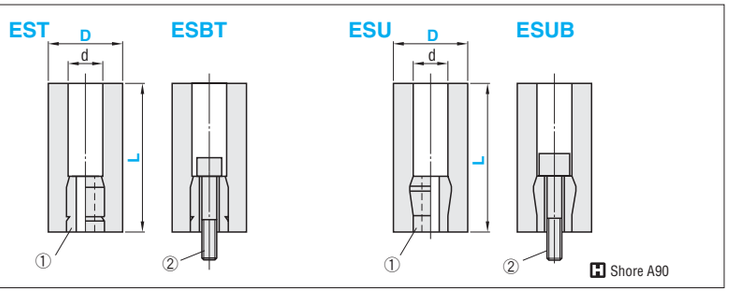
■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

STOCK BLOCKS / ABSORBERS / PADS

Urethane stock blocks



d	Urethane	① EST・ESBT	① ESU・ESUB	②	Catalog No. Type	Catalog No. D—L	U/Price Q'ty：1～9 EST・ESU	U/Price Q'ty：1～9 ESBT・ESUB
14	E40—80	S14	SU14	CB8—45 (Q'ty：1)	EST ESBT ＊ESU ＊ESUB	＊40— 80	710	720
	E50—110					50—110	1,350	1,360
	E70—140					70—140	2,890	2,900
22	E7022110	S22	SU22	CB12—55 (Q'ty：1)		＊7022110	2,390	2,420
	E7022140					＊7022140	2,930	2,960
	E90—120					90—120	3,730	3,860
	E90—140					＊90—140	4,330	4,360
	E100—140					100—140	6,770	6,800

ESU and ESUB are available only in the sizes marked with an ＊. For applicable urethane P.1124

Order: Catalog No. EST 40—80

Delivery: 1 Day

Price

■Volume discount rate P.37

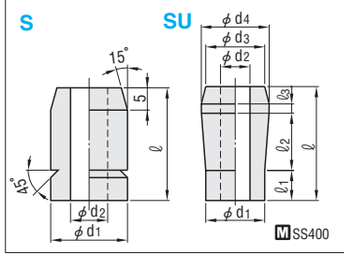
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Sleeves

S

SU



d1	d2	d3	d4	ℓ	ℓ1	ℓ2	ℓ3	Urethane d	Catalog No.	U/Price Q'ty：1～19
16	9	—	—	30	—	—	—	14	S14	130
24	13	—	—	35	—	—	—	22	S22	170
24	13	—	—	100	—	—	—	22 (L170 or more)	S22—100	500
14	9	13	19	30	7	10	3	14	SU14	130
22	13	20	27					22	SU22	170

Order: Catalog No. S 14

Delivery: 1 Day

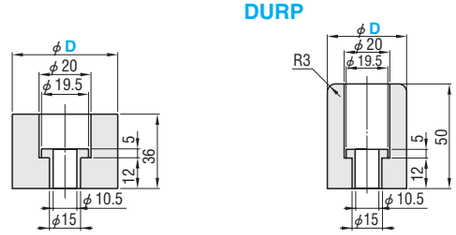
Price

■Volume discount rate P.37

Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Urethane absorbers Urethane pads



Catalog No. Type	Catalog No. D	U/Price Q'ty：1～9
DUSA	50	550
	70	900
DURP	40	740
	50	1,060

Order: Catalog No. DUSA 50

Delivery: 1 Day

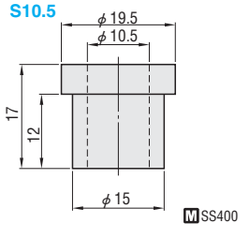
Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Sleeve S10.5



Catalog No.	U/Price Q'ty：1～19
S10.5	150

Order: Catalog No. S10.5

Delivery: 1 Day

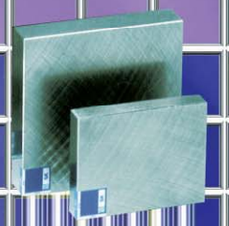
Price

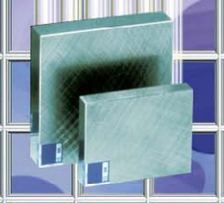
■Volume discount rate P.37

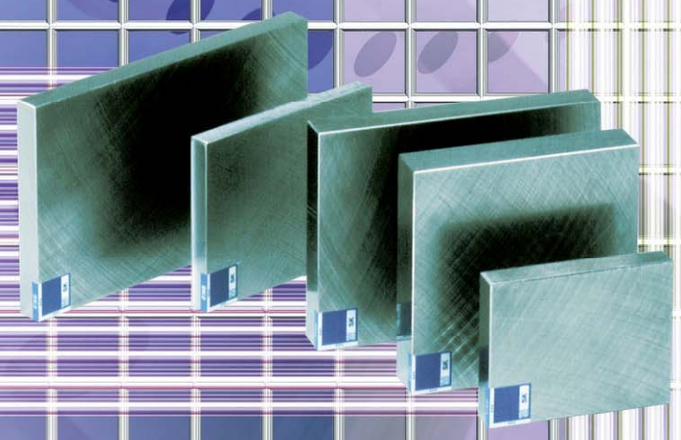
Quantity	1～19	20～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.



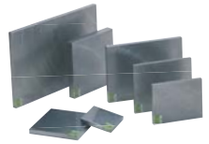




FINISHED PLATES／FINISHED BLOCKS

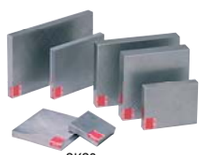
FINISHED PLATES
FINISHED BLOCKS

SKD11



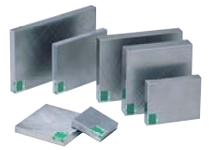
DC53

Name	FINISHED PLATES	
Catalog No.	SKD・S-SKD・E-SKD	DC・S-DC・E-DC
Delivery	③Ⓐ	③Ⓐ
Page	1159	1161



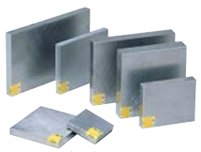
SKS3

SKS93



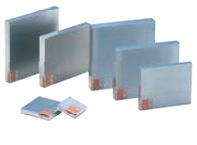
HPM2T

FINISHED PLATES		
SKS・S-SKS・E-SKS	SK・S-SK・E-SK	HPM・S-HPM・E-HPM
③Ⓐ	③Ⓐ	③Ⓐ
1163	1165	1167



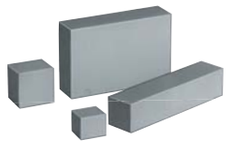
S50C

SS400

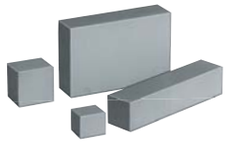


A7075P-T651

FINISHED PLATES		
SC・S-SC・E-SC	SS・S-SS・E-SS	ALP
③Ⓐ	③Ⓐ	③Ⓐ
1169	1171	1173



SKH51



SKD11 DC53 SKS3 SKS93 S50C

FINISHED BLOCKS					
FB-SKH	FB-SKD	FB-DC	FB-SKS	FB-SK	FB-SC
		③Ⓐ			
1175	1175	1175	1175	1175	1175

HARDENED PLATES		CARBIDE BLOCK MATERIALS
HPSH	HPHE	Z
①	①	①
1181		1182

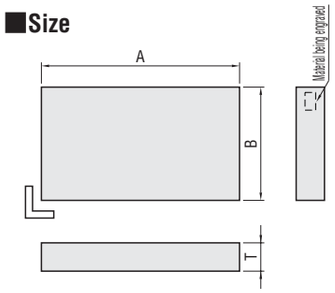
FINISHED PLATES
—GUIDE—

■Characteristics of materials

Name: Plate	Name: Block	Name: Hardened plate	Name: Carbide block materials	Page	Material	Chemical composition (%)	Features	Characteristics of comparison※: Abrasion resistance	Strength for hot working	Toughness	Hardenability	Distortion by heat treatment	Machinability
SKD S—SKD E—SKD	FB—SKD	—	—	P.1159 P.1175	SKD11	C 1.40～1.60 Si 0.15～0.35 Mn 0.30～0.60 P ～0.025 S ～0.010 Cr 11.00～13.00 Mo 0.80～1.20 V 0.20～0.50	● Possesses high hardenability with air hardening and vacuum hardening capabilities ● Minimal and stable rate of distortion by heat treatment. ● Superior in abrasion resistance.	A	B	B	A	A	C
DC S—DC E—DC	FB—DC	—	—	P.1161 P.1175	DC53	C, Si, Mn, P, S, Cr — Patented steel : SKD11 group	● More toughness than die steel SKD11. ● Possesses equivalent hardness as SKD11 when low temperature tempered, and 62HRC when high temperature tempered. ● Superior in machinability and grindability due to its even texture by carbide adjustment.	A	B	A	A	B	B
SKS S—SKS E—SKS	FB—SKS	—	—	P.1163 P.1175	SKS3	C 0.90～1.00 Si 0.15～0.35 Mn 0.90～1.20 P ～0.025 S ～0.010 Cr 0.50～1.00 W 0.50～1.00	● Spheroidizing annealing offers good machinability. ● Higher hardenability than SK and its oil hardening capability offers lower heat treatment deformation.	C	D	B	C	D	A
SK S—SK E—SK	FB—SK	—	—	P.1165 P.1175	SKS93	C 1.00～1.10 Si 0.15～0.35 Mn ～1.10 P ～0.030 S ～0.030 Cr 0.20～0.60	● Spheroidizing annealing offers good machinability. ● Higher hardenability than SK and its oil hardening capability offers lower heat treatment deformation.	D	D	C	D	D	A
HPM S—HPM E—HPM	—	—	—	P.1167	HPM2T	C, Si, Mn, P, S, Cr — Patented steel : Cr—Mo group	● No heat treatment required as it's prehardened steel (40HRC). ● Good machinability as S50C (20HRC). ● Great nitration property. ● Possess even hardness and strength. (Note) Free cutting agents are used. Specify polishing or crimping according to the usage.	D	D	C	—	—	A
SC S—SC E—SC	FB—SC	—	—	P.1169 P.1175	S50C	C 0.47～0.53 Si 0.15～0.35 Mn 0.60～0.90 P ～0.030 S ～0.035	● Generally used for induction hardening parts such as gears and shafts. ● Possesses moderate hardness and good machinability.	E	E	B	E	E	AA
SS S—SS E—SS	—	—	—	P.1171	SS400	P ～0.050 S ～0.050	● C and Mn are not contained and possesses good bending, elongation, and welding capabilities.	F	E	B	E	E	AA
ALP	—	—	—	P.1173	A7075P—T651 (Ultra high strength duralumin)	Si ～0.400 Fe ～0.500 Cu 1.2～2.0 Mn ～0.300 Mg 2.1～2.9 Cr 0.18～0.28 Zn 5.1～6.1 Ti ～0.020	● The best tensile strength and bearing force among the aluminum material and suitable for weight saving of press dies. (Ultra high strength duralumin)	—	—	—	—	—	—
—	FB—SKH	HPSH HPHE	—	P.1175 P.1181	SKH51	C 0.80～0.90 Si 0.15～0.35 Mn 0.25～0.40 P ～0.025 S ～0.010 Cr 3.80～4.50 W 6.00～7.00 Mo 4.80～5.80 V 1.80～2.30	● No softening occurs even when used as a high alloy tool at a high temperature. Used for general cutting purposes that requires toughness.	A	A	A	B	B	B
—	—	—	Z	P.1182	V30 (Carbide)	Co 8～16	● Carbide Products information for carbide materials for tools P.1226	AA	C	D	—	—	E

※The degree of excellence is shown in the order of AA, A, B, C, D, E, F. (AA is the best.)

■Size



Standard size Dimensions A, B and T are standardized. Frequently used 6000 sizes are the basic size. The price is lower than the free size.

Free size Dimension A can be specified by 1mm increment up to maximum of 500mm. Alternation is available for dimension B and T change by 1mm increment.

Economy type Dimension specification is as same as Free size type. 6-face milling cutter finished and lower price than Free size type.

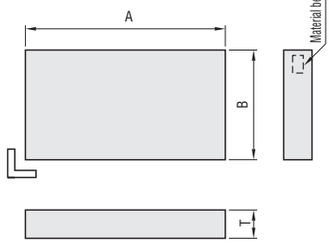
Alteration

Alterations are available only for free size type and economy type.

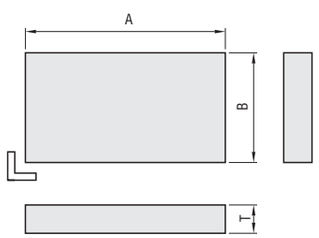
- ●Dimension B……Standard dimension B can be specified in 1mm increments, allowing for a minimum of 30mm.
- ●Dimension T……Plate thickness dimension T can be specified in 1mm increments, allowing for a minimum of 5mm.
- ●Dimension T tolerance……An additional 0.3mm allowance for machining can be added to the standard tolerance in order to make it easier to correct warpage caused by heat treatment.
- ●Chamfering……Circumferential chamfering (C0.5mm～C1.0mm) can be altered to C0.1mm or less.

■Tolerance for finished plates

(Standard size)	(Free size)	(Economy type)
SKD	S—SKD	E—SKD
DC	S—DC	E—DC
SKS	S—SKS	E—SKS
SK	S—SK	E—SK
HPM	S—HPM	E—HPM
SC	S—SC	E—SC
SS	S—SS	E—SS



ALP

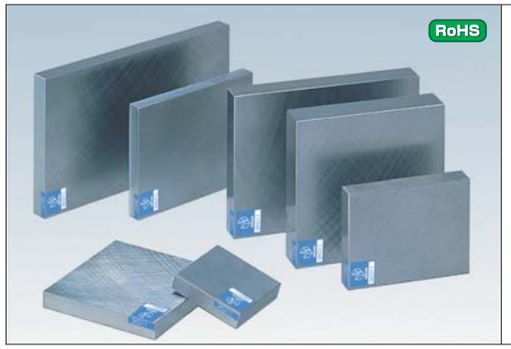


Precision standards						
Parallelism of upper and lower planes						
Standard and free size	Max. 0.012 per 100mm					
Economy type	Max. 0.05 per 100mm					
Flatness of upper and lower planes	T	Less than 8	8～15	16～25	26 or more	
Standard and free size	Per 100mm	0.05	0.03	0.015	0.012	
Economy type	Per 100mm	0.1	0.07	0.05	0.05	
	For HPM(T=8mm) : 0.05(0.1) ( ) is for economy type					
Tolerance of dimension T	HPM2T	S50C	SS400	SKD11	DC53	SKS3	SKS93
Standard and free size	+0.3 +0.1			+0.5 +0.2			
Economy type	+0.4 +0.2			+0.6 +0.3			
Tolerance of dimension A/B	99mm or less		100～250mm		251mm or more		
Standard and free size	+0.4 0		+0.5 0		+0.8 0		
Economy type							
Perpendicular of reference plane				Alteration of circumferential chamfering			
Standard and free size Economy type	Max. 0.015 per 100mm			Standard and free size Economy type	C0.5～C1.0		
Roughness of surface	Refereence plane	Upper and lower surface	Others				
Standard and free size	1.6a (6S)	3.2a (12S)	6.3a (25S)				
Economy type	1.6a (6S)	6.3a (12S)	6.3a (25S)				

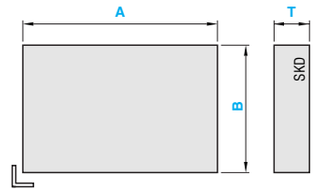
Precision standards						
Parallelism of upper and lower planes	T	10	15	20	25	30～50
	Per 100mm	0.03	0.05	0.07	0.09	0.11
Flatness of upper and lower planes	Max. 0.75 per 1,000mm					
Tolerance of dimension T	+0.5 +0.3					
Tolerance of dimension A/B	99mm or less		100～250mm		251mm or more	
	+0.4 0		+0.5 0		+0.8 0	
Perpendicular of reference plane	Max. 0.015 per 100mm					
Alteration of circumferential chamfering	C0.2～0.3					
Roughness of surface	Refereence plane	Upper and lower surface	Others			
	1.6a (6S)	3.2a (12S)	6.3a (25S)			

FINISHED PLATES —SKD—
—STANDARD · SIZE SPECIFIED · ECONOMY TYPE—

Heat treatment data P.1184



SKD (Standard type)
S—SKD (Size specified type)
E—SKD (Economy type)



Type	Dimension tolerance A · B		T	
Standard Size specified	99mm or less	+0.4 0		
	100~250mm	+0.5 0	+0.5 +0.2	
	251mm or more	+0.8 0		
Economy	99mm or less	+0.4 0		
	100~250mm	+0.5 0	+0.6 +0.3	
	251mm or more	+0.8 0		

Precision standards P.1158

M SKD11 (Raw material)

Order

Catalog No.	A	B	T
SKD	100	80	10
S—SKD	230	100	16
E—SKD	365	250	13

Delivery

3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1~9	10~30
Rate	—	5%

A (dimension A) ×Price coefficient=Unit price
(ex) S—SKD—230—100—16
230 × 28 =¥6,440

To be quoted on price & lead time above Max. Q'ty.

Alteration

P.1174 (B and T dimension changeable)

Alterations are available for size specified and economy type.

A	B \ T	U/Price 40	50	60	70
250	160	16,200	19,890	24,470	28,960

U/Price (Standard type)

A	B \ T	10	13	15	16	20	22	25	30	35
60	60	1,320	1,190	1,240	1,280	1,460	1,500	1,760		
80		1,540	1,460	1,500	1,540	1,720	1,810	2,120		
500		7,880	7,220	8,060	8,100	9,020	10,340	11,220		
80	80	1,810	1,630	1,720	1,760	1,980	2,070	2,160	2,600	2,730
100		2,120	1,900	1,980	2,030	2,290	2,380	2,560	3,000	3,130
125		2,420	2,200	2,380	2,420	2,690	2,860	3,000	3,480	3,700
150		3,000	2,780	3,040	3,130	3,610	3,830	4,140	4,620	5,280
160		3,170	2,860	3,130	3,220	3,700	3,920	4,230	4,710	5,460
200		3,570	3,350	3,880	3,920	4,360	4,580	4,890	5,640	6,520
250		4,140	3,960	4,710	4,800	5,200	5,550	5,860	6,600	7,750
500		7,880	7,750	9,160	9,290	9,460	10,920	11,580	13,160	15,400
100	100	2,380	2,290	2,380	2,420	2,690	2,860	3,000	3,480	3,700
125		2,950	2,690	2,820	2,910	3,300	3,390	3,520	4,490	4,800
150		3,390	3,080	3,170	3,300	3,740	3,960	4,100	5,110	5,330
160		3,610	3,300	3,520	3,660	4,180	4,400	4,580	5,640	6,120
180		3,880	3,700	4,230	4,400	4,930	5,240	5,500	6,520	6,960
200		4,140	3,960	4,540	4,620	5,420	5,550	5,720	6,910	7,260
210		4,400	4,270	4,670	4,760	5,550	5,680	5,900	7,130	7,400
250		4,890	4,670	5,550	5,720	6,560	6,780	7,000	8,410	8,940
300		5,810	5,680	6,600	6,740	7,700	8,010	8,320	9,860	10,610
350		6,690	6,520	7,310	7,480	8,850	9,240	9,640	11,360	12,280
400		7,530	7,350	8,230	8,360	9,990	10,480	10,920	12,810	13,950
450		8,410	8,230	9,420	9,600	11,180	11,710	12,320	14,350	15,670
500		9,240	9,070	10,740	10,920	12,320	12,900	13,560	15,800	17,300
125	125	3,260	3,220	3,260	3,350	3,610	3,740	4,230	4,930	5,200
150		3,880	3,700	3,790	3,880	4,270	4,580	4,890	5,680	6,120
160		4,100	3,920	4,140	4,320	4,760	5,110	5,460	6,250	6,690
180		4,540	4,360	4,580	4,760	5,020	5,550	5,990	6,870	7,570
200		4,980	4,800	5,110	5,240	5,420	5,990	6,600	7,400	8,450
210		5,200	5,020	5,330	5,460	5,720	6,250	6,960	7,660	8,890
250		6,080	5,900	5,990	6,120	6,340	6,870	7,570	8,850	10,520
300		7,220	7,040	7,400	7,570	8,500	9,550	10,520	12,240	13,380
350		8,360	8,190	8,580	8,800	9,680	10,740	12,020	13,780	15,760
400		9,510	9,330	9,770	10,040	10,870	11,930	13,070	14,830	16,770
450		10,740	10,480	10,960	11,270	12,500	13,120	14,830	16,680	19,320
500		11,880	11,620	11,970	12,320	13,160	14,130	15,760	18,130	21,120

U/Price (Standard type)

A	B \ T	10	13	15	16	20	22	25	30	35
150	150	4,670	4,450	4,800	4,890	5,420	5,900	6,470	7,570	8,540
180		5,280	5,020	5,640	5,770	6,250	7,000	7,570	8,540	9,900
200		5,720	5,500	6,300	6,470	6,910	7,880	8,410	9,240	10,920
210		6,080	5,810	6,600	6,820	7,400	8,280	8,850	9,860	11,580
250		7,310	7,040	8,010	8,320	9,240	9,860	10,480	12,240	14,170
300		8,800	8,500	9,510	9,770	11,360	11,750	12,680	14,610	17,160
350		10,300	9,950	10,830	11,220	13,070	13,640	14,480	16,460	19,450
400		11,880	11,440	12,370	12,760	13,600	15,620	16,370	18,400	21,830
450		13,380	12,940	13,730	14,220	15,930	17,520	18,130	20,240	24,120
500		14,880	14,350	15,100	15,540	18,220	19,230	19,940	22,000	26,400
160	160	4,580	4,360	4,710	4,800	5,330	5,810	6,380	7,480	8,450
200		5,460	5,240	6,030	6,210	6,650	7,620	8,140	8,980	10,650
250		6,960	6,690	7,700	7,970	8,890	9,510	10,120	11,880	13,820
300		8,450	8,140	9,160	9,420	11,000	11,400	12,320	14,260	16,810
350		9,950	9,600	10,520	10,870	12,720	13,290	14,130	16,110	19,100
400		11,440	11,050	11,970	12,320	13,160	15,180	15,930	17,960	21,390
450		12,940	12,500	13,340	13,780	15,490	17,080	17,690	19,800	23,680
500		14,440	13,910	14,700	15,100	17,780	18,790	19,500	21,560	25,960
200	200		7,400	7,530	7,840	8,940	9,600	10,740	12,940	13,950
250			8,890	9,000	9,380	12,060	12,720	13,730	15,980	17,960
300			10,390	10,500	10,920	14,220	14,390	16,460	18,970	21,480
350			11,880	12,000	12,460	15,540	16,060	18,920	21,740	24,690
400			13,380	13,500	14,000	16,860	17,740	20,990	23,940	27,420
450			14,880	15,000	15,540	18,180	19,410	22,620	25,660	29,480
500			16,280	16,380	16,990	19,410	21,080	23,370	26,400	30,450
250	250		10,650	11,370	11,800	13,290	14,440	15,760	18,220	20,990
300			12,320	13,500	14,000	16,370	17,690	18,920	22,270	25,520
350			14,000	15,120	15,670	18,530	19,540	21,960	25,610	28,600
400			15,670	16,630	17,340	20,380	21,390	24,420	28,520	31,680
450			17,340	18,250	19,010	21,560	23,240	26,450	30,940	34,760
500			18,880	20,870	20,600	22,710	24,950	27,990	32,740	37,840
300	300		16,460	16,500	16,550	18,040	20,460	21,210	25,660	28,250
350			18,920	19,020	19,190	20,950	24,510	26,140	30,500	34,850
400			21,390	21,540	21,830	23,850	28,560	30,630	35,730	40,660
450			24,290	24,350	24,470	26,760	32,610	34,590	40,310	45,760
500			26,360	26,850	27,060	33,180	36,610	37,840	44,090	49,900

Price calculation formula (A×Price coefficient) Upper : Size specified type Lower : Economy type

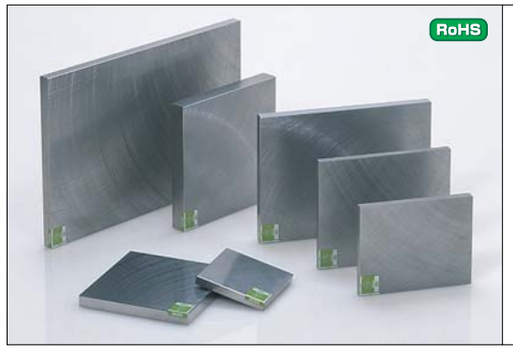
A (1mm incr.)	B \ T	10	13	15	16	20	22	25	30	35
30~ 60	60	AX31	AX30	AX32	AX32	AX35	AX36	AX40		
		AX28	AX27	AX29	AX29	AX32	AX33	AX36		
61~ 80		AX25	AX24	AX25	AX25	AX29	AX30	AX34		
		AX23	AX22	AX23	AX23	AX27	AX27	AX31		
81~100		AX25	AX24	AX25	AX25	AX29	AX30	AX34		
		AX23	AX22	AX23	AX23	AX27	AX27	AX31		
101~200		AX24	AX23	AX24	AX24	AX26	AX28	AX30		
		AX22	AX21	AX22	AX22	AX24	AX26	AX27		
201~300		AX24	AX23	AX24	AX24	AX26	AX28	AX30		
		AX22	AX21	AX22	AX22	AX24	AX26	AX27		
301~400		AX21	AX20	AX21	AX21	AX23	AX25	AX28		
		AX19	AX18	AX19	AX19	AX21	AX23	AX26		
401~500		AX21	AX20	AX21	AX21	AX23	AX25	AX28		
		AX19	AX18	AX19	AX19	AX21	AX23	AX26		
30~ 80	80	AX32	AX31	AX33	AX33	AX36	AX37	AX41	AX46	AX50
		AX29	AX28	AX30	AX30	AX33	AX34	AX37	AX42	AX45
81~100		AX25	AX25	AX25	AX25	AX30	AX32	AX33	AX40	AX43
		AX23	AX23	AX23	AX23	AX27	AX29	AX30	AX36	AX39
101~125		AX24	AX23	AX25	AX25	AX29	AX30	AX32	AX40	AX43
		AX22	AX21	AX23	AX23	AX27	AX27	AX29	AX36	AX39
126~150		AX24	AX23	AX25	AX25	AX29	AX30	AX32	AX40	AX43
		AX22	AX21	AX23	AX23	AX27	AX27	AX29	AX36	AX39
151~160		AX24	AX23	AX25	AX25	AX29	AX30	AX32	AX40	AX43
		AX22	AX21	AX23	AX23	AX27	AX27	AX29	AX36	AX39
161~200		AX24	AX23	AX25	AX25	AX29	AX30	AX32	AX40	AX43
		AX22	AX21	AX23	AX23	AX27	AX27	AX29	AX36	AX39
201~250		AX24	AX22	AX25	AX25	AX25	AX28	AX30	AX35	AX40
		AX22	AX20	AX23	AX23	AX23	AX26	AX27	AX32	AX36
251~500		AX24	AX22	AX25	AX25	AX25	AX28	AX30	AX33	AX37
		AX22	AX20	AX23	AX23	AX23	AX26	AX27	AX30	AX34
30~100	100	AX33	AX32	AX34	AX34	AX40	AX42	AX45	AX52	AX55
		AX30	AX29	AX31	AX31	AX36	AX38	AX41	AX47	AX50
101~125		AX28	AX26	AX29	AX29	AX33	AX35	AX35	AX45	AX47
		AX26	AX24	AX27	AX27	AX30	AX32	AX32	AX41	AX43
126~150		AX26	AX25	AX29	AX29	AX33	AX35	AX35	AX45	AX47
		AX24	AX23	AX27	AX27	AX30	AX32	AX32	AX41	AX43
151~160		AX26	AX25	AX29	AX29	AX33	AX35	AX35	AX45	AX47
		AX24	AX23	AX27	AX27	AX30	AX32	AX32	AX41	AX43
161~180		AX26	AX25	AX29	AX29	AX33	AX35	AX35	AX45	AX47
		AX24	AX23	AX27	AX27	AX30	AX32	AX32	AX41	AX43
181~200		AX26	AX25	AX29	AX29	AX33	AX35	AX35	AX45	AX47
		AX24	AX23	AX27	AX27	AX30	AX32	AX32	AX41	AX43
201~210		AX26	AX25	AX28	AX28	AX32	AX33	AX34	AX43	AX45
		AX24	AX23	AX26	AX26	AX29	AX30	AX31	AX39	AX41
211~250		AX26	AX25	AX28	AX28	AX32	AX33	AX34	AX43	AX45
		AX24	AX23	AX26	AX26	AX29	AX30	AX31	AX39	AX41
251~300		AX26	AX25	AX28	AX28	AX32	AX33	AX34	AX43	AX45
		AX24	AX23	AX26	AX26	AX29	AX30	AX31	AX39	AX41
301~350		AX25	AX25	AX28	AX28	AX32	AX33	AX34	AX43	AX45
		AX23	AX23	AX26	AX26	AX29	AX30	AX31	AX39	AX41
351~400		AX25	AX25	AX28	AX28	AX32	AX33	AX34	AX43	AX45
		AX23	AX23	AX26	AX26	AX29	AX30	AX31	AX39	AX41
401~450		AX25	AX25	AX28	AX28	AX31	AX32	AX34	AX41	AX44
		AX23	AX23	AX26	AX26	AX28	AX29	AX31	AX37	AX40
451~500		AX25	AX25	AX28	AX28	AX31	AX32	AX34	AX41	AX44
		AX23	AX23	AX26	AX26	AX28	AX29	AX31	AX37	AX40
50~125	125	AX37	AX36	AX42	AX42	AX45	AX48	AX53	AX59	AX65
		AX34	AX33	AX38	AX38	AX41	AX44	AX48	AX54	AX59
126~150		AX30	AX29	AX33	AX33	AX35	AX39	AX43	AX50	AX54
		AX27	AX27	AX30	AX30	AX32	AX36	AX39	AX45	AX49
151~160		AX30	AX29	AX33	AX33	AX35	AX39	AX43	AX50	AX54
		AX27	AX27	AX30	AX30	AX32	AX36	AX39	AX45	AX49
161~180		AX30	AX29	AX32	AX32	AX34	AX36	AX40	AX46	AX52
		AX27	AX27	AX29	AX29	AX31	AX33	AX36	AX42	AX47
181~200		AX29	AX28	AX32	AX32	AX34	AX36	AX40	AX46	AX52
		AX27	AX26	AX29	AX29	AX31	AX33	AX36	AX42	AX47
201~210		AX29	AX28	AX32	AX32	AX34	AX36	AX40	AX46	AX52
		AX27	AX26	AX29	AX29	AX31	AX33	AX36	AX42	AX47
211~250		AX29	AX28	AX32	AX32	AX34	AX36	AX40	AX46	AX52
		AX27	AX26	AX29	AX29	AX31	AX33	AX36	AX42	AX47
251~300		AX28	AX26	AX32	AX32	AX34	AX36	AX40	AX46	AX52
		AX26	AX24	AX29	AX29	AX31	AX33	AX36	AX42	AX47
301~350		AX28	AX26	AX31	AX31	AX34	AX36	AX40	AX46	AX52
		AX26	AX24	AX28	AX28	AX31	AX33	AX36	AX42	AX47
351~400		AX28	AX26	AX31	AX31	AX32	AX35	AX40	AX45	AX51
		AX26	AX24	AX28	AX28	AX29	AX32	AX36	AX41	AX46
401~450		AX28	AX26	AX31	AX31	AX32	AX35	AX39	AX45	AX51
		AX26	AX24	AX28	AX28	AX29	AX32	AX36	AX41	AX46
451~500		AX28	AX26	AX31	AX31	AX32	AX35	AX39	AX45	AX51
		AX26	AX24	AX28	AX28	AX29	AX32	AX36	AX41	AX46

Price calculation formula (A×Price coefficient) Upper : Size specified type Lower : Economy type

A (1mm incr.)	B \ T	10	13	15	16	20	22	25	30	35
101~150	150	AX45	AX45	AX46	AX46	AX52	AX55	AX59	AX67	AX74
		AX41	AX41	AX42	AX42	AX47	AX50	AX54	AX61	AX67
151~180		AX45	AX45	AX46	AX46	AX52	AX55	AX59	AX67	AX74
		AX41	AX41	AX42	AX42	AX47	AX50	AX54	AX61	AX67
181~200		AX41	AX40	AX42	AX42	AX45	AX50	AX55	AX64	AX74
		AX37	AX36	AX38	AX38	AX41	AX45	AX50	AX58	AX67
201~210		AX39	AX37	AX40	AX40	AX45	AX50	AX55	AX64	AX74
		AX36	AX34	AX36	AX36	AX41	AX45	AX50	AX58	AX67
211~250		AX39	AX37	AX40	AX40	AX45	AX50	AX55	AX64	AX74
		AX36	AX34	AX36	AX36	AX41	AX45	AX49	AX58	AX67
251~300		AX39	AX37	AX40	AX40	AX45	AX50	AX54	AX64	AX74
		AX36	AX34	AX36	AX36	AX41	AX45	AX49	AX58	AX67
301~350		AX39	AX37	AX40	AX40	AX45	AX50	AX52	AX64	AX74
		AX36	AX34	AX36	AX36	AX41	AX45	AX47	AX58	AX67
351~400		AX39	AX37	AX40	AX40	AX45	AX48	AX52	AX63	AX73
		AX36	AX34	AX36	AX36	AX41	AX44	AX47	AX57	AX66
401~450		AX39	AX37	AX40	AX40	AX45	AX48	AX52	AX63	AX73
		AX36	AX34	AX36	AX36	AX41	AX44	AX47	AX57	AX66
451~500		AX39	AX37	AX40	AX40	AX45	AX48	AX58	AX63	AX73
		AX36	AX34	AX36	AX36	AX41	AX44	AX53	AX57	AX66
101~160	160	AX44	AX43	AX45	AX45	AX51	AX54	AX54	AX65	AX73
		AX40	AX39	AX41	AX41	AX46	AX49	AX49	AX59	AX66
161~200		AX39	AX37	AX41	AX41	AX45	AX48	AX54	AX63	AX73
		AX36	AX34	AX37	AX37	AX41	AX44	AX49	AX57	AX66
201~250		AX36	AX35	AX41	AX41	AX45	AX48	AX52	AX63	AX73
		AX33	AX32	AX37	AX37	AX41	AX44	AX47	AX57	AX66
251~300		AX36	AX35	AX41	AX41	AX45	AX48	AX52	AX63	AX73
		AX33	AX32	AX37	AX37	AX41	AX44	AX47	AX57	AX66
301~350		AX36	AX35	AX40	AX40	AX45	AX48	AX51	AX63	AX73
		AX33	AX32	AX36	AX36	AX41	AX44	AX46	AX57	AX66
351~400		AX36	AX35	AX39	AX39	AX44	AX47	AX51	AX62	AX72
		AX33	AX32	AX36	AX36	AX40	AX43	AX46	AX56	AX65
401~450		AX36	AX35	AX39	AX39	AX44	AX47	AX70	AX62	AX72
		AX33	AX32	AX36	AX36	AX40	AX43	AX63	AX56	AX65
451~500		AX36	AX35	AX39	AX39	AX44	AX47	AX70	AX62	AX72
		AX33	AX32	AX36	AX36	AX40	AX43	AX63	AX56	AX65
101~200	200		AX55	AX57	AX57	AX62	AX65	AX66	AX83	AX85
			AX50	AX52	AX52	AX56	AX59	AX60	AX75	AX77
201~250			AX50	AX53	AX53	AX59	AX61	AX66	AX76	AX85
			AX45	AX48	AX48	AX54	AX55	AX60	AX69	AX77
251~300			AX50	AX53	AX53	AX59	AX61	AX66	AX76	AX85
			AX45	AX48	AX48	AX54	AX55	AX60	AX69	AX77
301~350			AX46	AX50	AX50	AX57	AX61	AX63	AX76	AX85
			AX42	AX45	AX45	AX52	AX55	AX57	AX69	AX77
351~400			AX44	AX46	AX46	AX53	AX56	AX59	AX73	AX81
			AX40	AX42	AX42	AX48	AX51	AX54	AX66	AX73
401~450			AX44	AX46	AX46	AX53	AX55	AX59	AX69	AX81
			AX40	AX42	AX42	AX48	AX50	AX54	AX63	AX73
451~500			AX44	AX46	AX46	AX53	AX55	AX59	AX69	AX81
			AX40	AX42	AX42	AX48	AX50	AX54	AX63	AX73
101~200	250		AX56	AX59	AX59	AX65	AX69	AX78	AX89	AX96
			AX51	AX54	AX54	AX59	AX63	AX71	AX81	AX87
201~250			AX51	AX54	AX54	AX63	AX66	AX73	AX86	AX96
			AX46	AX49	AX49	AX57	AX60	AX66	AX78	AX87
251~300			AX51	AX54	AX54	AX63	AX66	AX73	AX86	AX96
			AX46	AX49	AX49	AX57	AX60	AX66	AX78	AX87
301~350			AX51	AX54	AX54	AX63	AX66	AX73	AX86	AX96
			AX46	AX49	AX49	AX57	AX60	AX66	AX78	AX87
351~400			AX45	AX51	AX51	AX63	AX66	AX73	AX85	AX94
			AX41	AX46	AX46	AX57	AX60	AX66	AX77	AX85
401~450			AX45	AX51	AX51	AX57	AX61	AX69	AX85	AX90
			AX41	AX46	AX46	AX52	AX55	AX63	AX77	AX81
451~500			AX45	AX48	AX48	AX55	AX58	AX66	AX81	AX90
			AX41	AX44	AX44	AX50	AX53	AX60	AX73	AX81
101~200	300		AX73	AX77	AX77	AX86	AX95	AX102	AX122	AX128
			AX66	AX70	AX70	AX78	AX86	AX92	AX110	AX116
201~300			AX68	AX69	AX69	AX78	AX85	AX90	AX117	AX124
			AX62	AX63	AX63	AX71	AX77	AX81	AX106	AX112
301~350			AX65	AX65	AX65	AX77	AX85	AX89	AX109	AX119
			AX59	AX59	AX59	AX70	AX77	AX81	AX99	AX108
351~400			AX65	AX65	AX65	AX77	AX85	AX89	AX109	AX119
			AX59	AX59	AX59	AX70	AX77	AX81	AX99	AX108
401~450			AX63	AX64	AX64	AX76	AX84	AX88	AX105	AX116
			AX57	AX58	AX58	AX69	AX76	AX80	AX95	AX105
451~500			AX63	AX64	AX64	AX76	AX84	AX88	AX105	AX116
			AX57	AX58	AX58	AX69	AX76	AX80	AX95	AX105

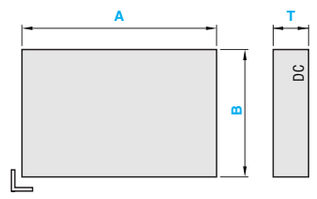
FINISHED PLATES —DC—
—STANDARD · SIZE SPECIFIED · ECONOMY TYPE—

Heat treatment data P.1185



RoHS

DC (Standard type)
S—DC (Size specified type)
E—DC (Economy type)



Type	Dimension tolerance A · B		T	
Standard Size specified	99mm or less	+0.4 0		
	100~250mm	+0.5 0	+0.5 +0.2	
	251mm or more	+0.8 0		
Economy	99mm or less	+0.4 0		
	100~250mm	+0.5 0	+0.6 +0.3	
	251mm or more	+0.8 0		

Precision standards P.1158

M DC53 (Raw material)

Order

Catalog No.	—	A	—	B	—	T
DC	—	100	—	80	—	10
S—DC	—	230	—	100	—	16
E—DC	—	365	—	250	—	13

Delivery

3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1~9	10~30
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

A (dimension A) ×Price coefficient=Unit price

(ex) S—DC—230—100—16

230 × 28 =¥6,440

Alteration

P.1174 (B and T dimension changeable)

Alterations are available for size specified and economy type.

A	B \ T	U/Price (Standard type) 10	13	15	16	20	22	25	30	35
60	60	1,320	1,190	1,240	1,280	1,460	1,500	1,760		
80		1,540	1,460	1,500	1,540	1,720	1,810	2,120		
500		7,880	7,220	8,060	8,100	9,020	10,340	11,220		
80	80	1,810	1,630	1,720	1,760	1,980	2,070	2,160	2,600	2,730
100		2,120	1,900	1,980	2,030	2,290	2,380	2,560	3,000	3,130
125		2,420	2,200	2,380	2,420	2,690	2,860	3,000	3,480	3,700
150		3,000	2,780	3,040	3,130	3,610	3,830	4,140	4,620	5,280
160		3,170	2,860	3,130	3,220	3,700	3,920	4,230	4,710	5,460
200		3,570	3,350	3,880	3,920	4,360	4,580	4,890	5,640	6,520
250		4,140	3,960	4,710	4,800	5,200	5,550	5,860	6,600	7,750
500		7,880	7,750	9,160	9,290	9,460	10,920	11,580	13,160	15,400
100	100	2,380	2,290	2,380	2,420	2,690	2,860	3,000	3,480	3,700
125		2,950	2,690	2,820	2,910	3,300	3,390	3,520	4,490	4,800
150		3,390	3,080	3,170	3,300	3,740	3,960	4,100	5,110	5,330
160		3,610	3,300	3,520	3,660	4,180	4,400	4,580	5,640	6,120
180		3,880	3,700	4,230	4,400	4,930	5,240	5,500	6,520	6,960
200		4,140	3,960	4,540	4,620	5,420	5,550	5,720	6,910	7,260
210		4,400	4,270	4,670	4,760	5,550	5,680	5,900	7,130	7,400
250		4,890	4,670	5,550	5,720	6,560	6,780	7,000	8,410	8,940
300		5,810	5,680	6,600	6,740	7,700	8,010	8,320	9,860	10,610
350		6,690	6,520	7,310	7,480	8,850	9,240	9,640	11,360	12,280
400		7,530	7,350	8,230	8,360	9,990	10,480	10,920	12,810	13,950
450		8,410	8,230	9,420	9,600	11,180	11,710	12,320	14,350	15,670
500		9,240	9,070	10,740	10,920	12,320	12,900	13,560	15,800	17,300
125	125	3,260	3,220	3,260	3,350	3,610	3,740	4,230	4,930	5,200
150		3,880	3,700	3,790	3,880	4,270	4,580	4,890	5,680	6,120
160		4,100	3,920	4,140	4,320	4,760	5,110	5,460	6,250	6,690
180		4,540	4,360	4,580	4,760	5,020	5,550	5,990	6,870	7,570
200		4,980	4,800	5,110	5,240	5,420	5,990	6,600	7,400	8,450
210		5,200	5,020	5,330	5,460	5,720	6,250	6,960	7,660	8,890
250		6,080	5,900	5,990	6,120	6,340	6,870	7,570	8,850	10,520
300		7,220	7,040	7,400	7,570	8,500	9,550	10,520	12,240	13,380
350		8,360	8,190	8,580	8,800	9,680	10,740	12,020	13,780	15,760
400		9,510	9,330	9,770	10,040	10,870	11,930	13,070	14,830	16,770
450		10,740	10,480	10,960	11,270	12,500	13,120	14,830	16,680	19,320
500		11,880	11,620	11,970	12,320	13,160	14,130	15,760	18,130	21,120

A	B \ T	U/Price (Standard type) 10	13	15	16	20	22	25	30	35
150	150	4,670	4,450	4,800	4,890	5,420	5,900	6,470	7,570	8,540
180		5,280	5,020	5,640	5,770	6,250	7,000	7,570	8,540	9,900
200		5,720	5,500	6,300	6,470	6,910	7,880	8,410	9,240	10,920
210		6,080	5,810	6,600	6,820	7,400	8,280	8,850	9,860	11,580
250		7,310	7,040	8,010	8,320	9,240	9,860	10,480	12,240	14,170
300		8,800	8,500	9,510	9,770	11,360	11,750	12,680	14,610	17,160
350		10,300	9,950	10,830	11,220	13,070	13,640	14,480	16,460	19,450
400		11,880	11,440	12,370	12,760	13,600	15,620	16,370	18,400	21,830
450		13,380	12,940	13,730	14,220	15,930	17,520	18,130	20,240	24,120
500		14,880	14,350	15,100	15,540	18,220	19,230	19,940	22,000	26,400
160	160	4,580	4,360	4,710	4,800	5,330	5,810	6,380	7,480	8,450
200		5,460	5,240	6,030	6,210	6,650	7,620	8,140	8,980	10,650
250		6,960	6,690	7,700	7,970	8,890	9,510	10,120	11,880	13,820
300		8,450	8,140	9,160	9,420	11,000	11,400	12,320	14,260	16,810
350		9,950	9,600	10,520	10,870	12,720	13,290	14,130	16,110	19,100
400		11,440	11,050	11,970	12,320	13,160	15,180	15,930	17,960	21,390
450		12,940	12,500	13,340	13,780	15,490	17,080	17,690	19,800	23,680
500		14,440	13,910	14,700	15,100	17,780	18,790	19,500	21,560	25,960
200	200		7,400	7,530	7,840	8,940	9,600	10,740	12,940	13,950
250			8,890	9,000	9,380	12,060	12,720	13,730	15,980	17,960
300			10,390	10,500	10,920	14,220	14,390	16,460	18,970	21,480
350			11,880	12,000	12,460	15,540	16,060	18,920	21,740	24,690
400			13,380	13,500	14,000	16,860	17,740	20,990	23,940	27,420
450			14,880	15,000	15,540	18,180	19,410	22,620	25,660	29,480
500			16,280	16,380	16,990	19,410	21,080	23,370	26,400	30,450
250	250		10,650	11,370	11,800	13,290	14,440	15,760	18,220	20,990
300			12,320	13,500	14,000	16,370	17,690	18,920	22,270	25,520
350			14,000	15,120	15,670	18,530	19,540	21,960	25,610	28,600
400			15,670	16,630	17,340	20,380	21,390	24,420	28,520	31,680
450			17,340	18,250	19,010	21,560	23,240	26,450	30,940	34,760
500			18,880	20,870	20,600	22,710	24,950	27,990	32,740	37,840
300	300		16,460	16,500	16,550	18,040	20,460	21,210	25,660	28,250
350			18,920	19,020	19,190	20,950	24,510	26,140	30,500	34,850
400			21,390	21,540	21,830	23,850	28,560	30,630	35,730	40,660
450			24,290	24,350	24,470	26,760	32,610	34,590	40,310	45,760
500			26,360	26,850	27,060	33,180	36,610	37,840	44,090	49,900

Price calculation formula (A×Price coefficient) Upper : Size specified type / Lower : Economy type

A (1mm incr.)	B \ T	10	13	15	16	20	22	25	30	35
30~ 60	60	AX31	AX30	AX32	AX32	AX35	AX36	AX40		
		AX28	AX27	AX29	AX29	AX32	AX33	AX36		
61~ 80		AX25	AX24	AX25	AX25	AX29	AX30	AX34		
		AX23	AX22	AX23	AX23	AX27	AX27	AX31		
81~100		AX25	AX24	AX25	AX25	AX29	AX30	AX34		
		AX23	AX22	AX23	AX23	AX27	AX27	AX31		
101~200		AX24	AX23	AX24	AX24	AX26	AX28	AX30		
		AX22	AX21	AX22	AX22	AX24	AX26	AX27		
201~300		AX24	AX23	AX24	AX24	AX26	AX28	AX30		
		AX22	AX21	AX22	AX22	AX24	AX26	AX27		
301~400		AX21	AX20	AX21	AX21	AX23	AX25	AX28		
		AX19	AX18	AX19	AX19	AX21	AX23	AX26		
401~500		AX21	AX20	AX21	AX21	AX23	AX25	AX28		
		AX19	AX18	AX19	AX19	AX21	AX23	AX26		
30~ 80	80	AX32	AX31	AX33	AX33	AX36	AX37	AX41	AX46	AX50
		AX29	AX28	AX30	AX30	AX33	AX34	AX37	AX42	AX45
81~100		AX25	AX25	AX25	AX25	AX30	AX32	AX33	AX40	AX43
		AX23	AX23	AX23	AX23	AX27	AX29	AX30	AX36	AX39
101~125		AX24	AX23	AX25	AX25	AX29	AX30	AX32	AX40	AX43
		AX22	AX21	AX23	AX23	AX27	AX27	AX29	AX36	AX39
126~150		AX24	AX23	AX25	AX25	AX29	AX30	AX32	AX40	AX43
		AX22	AX21	AX23	AX23	AX27	AX27	AX29	AX36	AX39
151~160		AX24	AX23	AX25	AX25	AX29	AX30	AX32	AX40	AX43
		AX22	AX21	AX23	AX23	AX27	AX27	AX29	AX36	AX39
161~200		AX24	AX23	AX25	AX25	AX29	AX30	AX32	AX40	AX43
		AX22	AX21	AX23	AX23	AX27	AX27	AX29	AX36	AX39
201~250		AX24	AX22	AX25	AX25	AX25	AX28	AX30	AX35	AX40
		AX22	AX20	AX23	AX23	AX23	AX26	AX27	AX32	AX36
251~500		AX24	AX22	AX25	AX25	AX25	AX28	AX30	AX33	AX37
		AX22	AX20	AX23	AX23	AX23	AX26	AX27	AX30	AX34
30~100	100	AX33	AX32	AX34	AX34	AX40	AX42	AX45	AX52	AX55
		AX30	AX29	AX31	AX31	AX36	AX38	AX41	AX47	AX50
101~125		AX28	AX26	AX29	AX29	AX33	AX35	AX35	AX45	AX47
		AX26	AX24	AX27	AX27	AX30	AX32	AX32	AX41	AX43
126~150		AX26	AX25	AX29	AX29	AX33	AX35	AX35	AX45	AX47
		AX24	AX23	AX27	AX27	AX30	AX32	AX32	AX41	AX43
151~160		AX26	AX25	AX29	AX29	AX33	AX35	AX35	AX45	AX47
		AX24	AX23	AX27	AX27	AX30	AX32	AX32	AX41	AX43
161~180		AX26	AX25	AX29	AX29	AX33	AX35	AX35	AX45	AX47
		AX24	AX23	AX27	AX27	AX30	AX32	AX32	AX41	AX43
181~200		AX26	AX25	AX29	AX29	AX33	AX35	AX35	AX45	AX47
		AX24	AX23	AX27	AX27	AX30	AX32	AX32	AX41	AX43
201~210		AX26	AX25	AX28	AX28	AX32	AX33	AX34	AX43	AX45
		AX24	AX23	AX26	AX26	AX29	AX30	AX31	AX39	AX41
211~250		AX26	AX25	AX28	AX28	AX32	AX33	AX34	AX43	AX45
		AX24	AX23	AX26	AX26	AX29	AX30	AX31	AX39	AX41
251~300		AX26	AX25	AX28	AX28	AX32	AX33	AX34	AX43	AX45
		AX24	AX23	AX26	AX26	AX29	AX30	AX31	AX39	AX41
301~350		AX25	AX25	AX28	AX28	AX32	AX33	AX34	AX43	AX45
		AX23	AX23	AX26	AX26	AX29	AX30	AX31	AX39	AX41
351~400		AX25	AX25	AX28	AX28	AX32	AX33	AX34	AX43	AX45
		AX23	AX23	AX26	AX26	AX29	AX30	AX31	AX39	AX41
401~450		AX25	AX25	AX28	AX28	AX31	AX32	AX34	AX41	AX44
		AX23	AX23	AX26	AX26	AX28	AX29	AX31	AX37	AX40
451~500		AX25	AX25	AX28	AX28	AX31	AX32	AX34	AX41	AX44
		AX23	AX23	AX26	AX26	AX28	AX29	AX31	AX37	AX40
50~125	125	AX37	AX36	AX42	AX42	AX45	AX48	AX53	AX59	AX65
		AX34	AX33	AX38	AX38	AX41	AX44	AX48	AX54	AX59
126~150		AX30	AX29	AX33	AX33	AX35	AX39	AX43	AX50	AX54
		AX27	AX27	AX30	AX30	AX32	AX36	AX39	AX45	AX49
151~160		AX30	AX29	AX33	AX33	AX35	AX39	AX43	AX50	AX54
		AX27	AX27	AX30	AX30	AX32	AX36	AX39	AX45	AX49
161~180		AX30	AX29	AX32	AX32	AX34	AX36	AX40	AX46	AX52
		AX27	AX27	AX29	AX29	AX31	AX33	AX36	AX42	AX47
181~200		AX29	AX28	AX32	AX32	AX34	AX36	AX40	AX46	AX52
		AX27	AX26	AX29	AX29	AX31	AX33	AX36	AX42	AX47
201~210		AX29	AX28	AX32	AX32	AX34	AX36	AX40	AX46	AX52
		AX27	AX26	AX29	AX29	AX31	AX33	AX36	AX42	AX47
211~250		AX29	AX28	AX32	AX32	AX34	AX36	AX40	AX46	AX52
		AX27	AX26	AX29	AX29	AX31	AX33	AX36	AX42	AX47
251~300		AX28	AX26	AX32	AX32	AX34	AX36	AX40	AX46	AX52
		AX26	AX24	AX29	AX29	AX31	AX33	AX36	AX42	AX47
301~350		AX28	AX26	AX31	AX31	AX34	AX36	AX40	AX46	AX52
		AX26	AX24	AX28	AX28	AX31	AX33	AX36	AX42	AX47
351~400		AX28	AX26	AX31	AX31	AX32	AX35	AX40	AX45	AX51
		AX26	AX24	AX28	AX28	AX29	AX32	AX36	AX41	AX46
401~450		AX28	AX26	AX31	AX31	AX32	AX35	AX39	AX45	AX51
		AX26	AX24	AX28	AX28	AX29	AX32	AX36	AX41	AX46
451~500		AX28	AX26	AX31	AX31	AX32	AX35	AX39	AX45	AX51
		AX26	AX24	AX28	AX28	AX29	AX32	AX36	AX41	AX46

Price calculation formula (A×Price coefficient) Upper : Size specified type / Lower : Economy type

A (1mm incr.)	B \ T	10	13	15	16	20	22	25	30	35
101~150	150	AX45	AX45	AX46	AX46	AX52	AX55	AX59	AX67	AX74
		AX41	AX41	AX42	AX42	AX47	AX50	AX54	AX61	AX67
151~180		AX45	AX45	AX46	AX46	AX52	AX55	AX59	AX67	AX74
		AX41	AX41	AX42	AX42	AX47	AX50	AX54	AX61	AX67
181~200		AX41	AX40	AX42	AX42	AX45	AX50	AX55	AX64	AX74
		AX37	AX36	AX38	AX38	AX41	AX45	AX50	AX58	AX67
201~210		AX39	AX37	AX40	AX40	AX45	AX50	AX55	AX64	AX74
		AX36	AX34	AX36	AX36	AX41	AX45	AX50	AX58	AX67
211~250		AX39	AX37	AX40	AX40	AX45	AX50	AX55	AX64	AX74
		AX36	AX34	AX36	AX36	AX41	AX45	AX50	AX58	AX67
251~300		AX39	AX37	AX40	AX40	AX45	AX50	AX54	AX64	AX74
		AX36	AX34	AX36	AX36	AX41	AX45	AX49	AX58	AX67
301~350		AX39	AX37	AX40	AX40	AX45	AX50	AX54	AX64	AX74
		AX36	AX34	AX36	AX36	AX41	AX45	AX49	AX58	AX67
351~400		AX39	AX37	AX40	AX40	AX45	AX48	AX52	AX63	AX73
		AX36	AX34	AX36	AX36	AX41	AX44	AX47	AX57	AX66
401~450		AX39	AX37	AX40	AX40	AX45	AX48	AX52	AX63	AX73
		AX36	AX34	AX36	AX36	AX41	AX44	AX47	AX57	AX66
451~500		AX39	AX37	AX40	AX40	AX45	AX48	AX52	AX63	AX73
		AX36	AX34	AX36	AX36	AX41	AX44	AX47	AX57	AX66
101~160	160	AX44	AX43	AX45	AX45	AX51	AX54	AX58	AX65	AX73
		AX40	AX39	AX41	AX41	AX46	AX49	AX53	AX59	AX66
161~200		AX39	AX37	AX41	AX41	AX45	AX48	AX54	AX63	AX73
		AX36	AX34	AX37	AX37	AX41	AX44	AX49	AX57	AX66
201~250		AX36	AX35	AX41	AX41	AX45	AX48	AX54	AX63	AX73
		AX33	AX32	AX37	AX37	AX41	AX44	AX49	AX57	AX66
251~300		AX36	AX35	AX41	AX41	AX45	AX48	AX52	AX63	AX73
		AX33	AX32	AX37	AX37	AX41	AX44	AX47	AX57	AX66
301~350		AX36	AX35	AX40	AX40	AX45	AX48	AX52	AX63	AX73
		AX33	AX32	AX36	AX36	AX41	AX44	AX47	AX57	AX66
351~400		AX36	AX35	AX39	AX39	AX44	AX47	AX51	AX62	AX72
		AX33	AX32	AX36	AX36	AX40	AX43	AX46	AX56	AX65
401~450		AX36	AX35	AX39	AX39	AX44	AX47	AX51	AX62	AX72
		AX33	AX32	AX36	AX36	AX40	AX43	AX46	AX56	AX65
451~500		AX36	AX35	AX39	AX39	AX44	AX47	AX51	AX62	AX72
		AX33	AX32	AX36	AX36	AX40	AX43	AX46	AX56	AX65
101~200	200		AX55	AX57	AX57	AX62	AX65	AX70	AX83	AX85
			AX50	AX52	AX52	AX56	AX59	AX63	AX75	AX77
201~250			AX50	AX53	AX53	AX59	AX61	AX66	AX76	AX85
			AX45	AX48	AX48	AX54	AX55	AX60	AX69	AX77
251~300			AX50	AX53	AX53	AX59	AX61	AX66	AX76	AX85
			AX45	AX48	AX48	AX54	AX55	AX60	AX69	AX77
301~350			AX46	AX50	AX50	AX57	AX61	AX66	AX76	AX85
			AX42	AX45	AX45	AX52	AX55	AX60	AX69	AX77
351~400			AX44	AX46	AX46	AX53	AX56	AX63	AX73	AX81
			AX40	AX42	AX42	AX48	AX51	AX57	AX66	AX73
401~450			AX44	AX46	AX46	AX53	AX55	AX59	AX69	AX81
			AX40	AX42	AX42	AX48	AX50	AX54	AX63	AX73
451~500			AX44	AX46	AX46	AX53	AX55	AX59	AX69	AX81
			AX40	AX42	AX42	AX48	AX50	AX54	AX63	AX73
101~200	250		AX56	AX59	AX59	AX65	AX69	AX78	AX89	AX96
			AX51	AX54	AX54	AX59	AX63	AX71	AX81	AX87
201~250			AX51	AX54	AX54	AX63	AX66	AX73	AX86	AX96
			AX46	AX49	AX49	AX57	AX60	AX66	AX78	AX87
251~300			AX51	AX54	AX54	AX63	AX66	AX73	AX86	AX96
			AX46	AX49	AX49	AX57	AX60	AX66	AX78	AX87
301~350			AX51	AX54	AX54	AX63	AX66	AX73	AX86	AX96
			AX46	AX49	AX49	AX57	AX60	AX66	AX78	AX87
351~400			AX45	AX51	AX51	AX63	AX66	AX73	AX85	AX94
			AX41	AX46	AX46	AX57	AX60	AX66	AX77	AX85
401~450			AX45	AX51	AX51	AX57	AX61	AX69	AX85	AX90
			AX41	AX46	AX46	AX52	AX55	AX63	AX77	AX81
451~500			AX45	AX46	AX48	AX55	AX58	AX66	AX81	AX90
			AX41	AX42	AX44	AX50	AX53	AX60	AX73	AX81
101~200	300		AX73	AX77	AX77	AX86	AX95	AX102	AX122	AX128
			AX66	AX70	AX70	AX78	AX86	AX92	AX110	AX116
201~300			AX68	AX69	AX69	AX78	AX85	AX90	AX117	AX124
			AX62	AX63	AX63	AX71	AX77	AX81	AX106	AX112
301~350			AX65	AX65	AX65	AX77	AX85	AX89	AX109	AX119
			AX59	AX59	AX59	AX70	AX77	AX81	AX99	AX108
351~400			AX65	AX65	AX65	AX77	AX85	AX89	AX109	AX119
			AX59	AX59	AX59	AX70	AX77	AX81	AX99	AX108
401~450			AX63	AX64	AX64	AX76	AX84	AX88	AX105	AX116
			AX57	AX58	AX58	AX69	AX76	AX80	AX95	AX105
451~500			AX63	AX64	AX64	AX76	AX84	AX88	AX105	AX116
			AX57	AX58	AX58	AX69	AX76	AX80	AX95	AX105

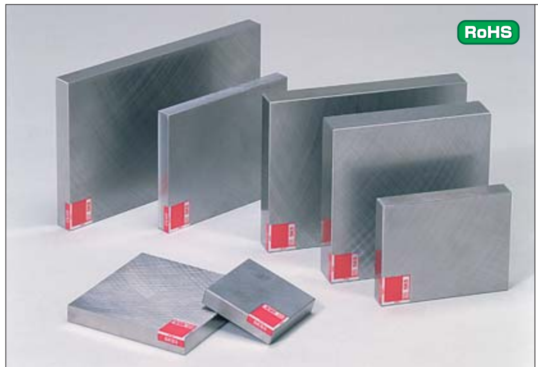
Express service system P.38

MISUMI Press 2007 http://misumi.jp/press/

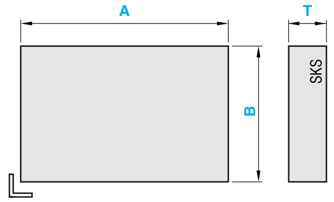
For inquiry, ordering and other information, refer to P.1269

FINISHED PLATES —SKS—
—STANDARD · SIZE SPECIFIED · ECONOMY TYPE—

Heat treatment data P.1186



SKS (Standard type)
S—SKS (Size specified type)
E—SKS (Economy type)



Type	Dimension tolerance A · B		Dimension tolerance T
Standard Size specified	99mm or less	+0.4 / 0	+0.5 / +0.2
	100~250mm	+0.5 / 0	
	251mm or more	+0.8 / 0	
Economy	99mm or less	+0.4 / 0	+0.6 / +0.3
	100~250mm	+0.5 / 0	
	251mm or more	+0.8 / 0	

Precision standards P.1158

M SKS3 (Raw material)

Order

Catalog No.	—	A	—	B	—	T
SKS	—	500	—	200	—	25
S—SKS	—	320	—	250	—	40
E—SKS	—	365	—	250	—	20

Delivery

3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1~9	10~30
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

A (dimension A) ×Price coefficient=Unit price
(ex) S—SKS—320—100—30
320 × 32 =¥10,240

Alteration

P.1174 (B and T dimension changeable)

Alterations are available for size specified and economy type.

U/Price (Standard type)

A	B	8	10	13	15	16	20	22	25	30	35	40	50
250	25	1,760	1,940										
400	40	3,080	3,390										
60	60	1,190	1,280	1,100	1,190	1,190	1,190	1,280	1,370				
80		1,320	1,410	1,240	1,320	1,320	1,410	1,500	1,630				
500		5,640	6,250	5,810	6,870	6,870	7,130	7,750	8,630				
80	80	1,410	1,540	1,370	1,500	1,500	1,590	1,720	1,850	2,030	2,340		
100		1,500	1,590	1,500	1,760	1,760	1,810	1,940	2,120	2,200	2,780		
125		1,850	1,980	1,760	1,900	1,940	2,120	2,290	2,470	2,780	3,000		
150		2,340	2,510	2,340	2,470	2,510	2,860	3,040	3,300	3,700	3,960		
160		2,510	2,640	2,510	2,640	2,730	3,040	3,220	3,570	4,010	4,270		
200		3,080	3,260	2,860	3,130	3,130	3,570	4,010	4,360	4,620	5,110		
250		3,790	4,100	3,660	3,960	4,050	4,360	4,760	5,110	5,770	6,600		
500		6,560	7,180	6,780	7,920	7,970	8,140	8,760	9,640	11,530	12,320		
100	100	1,900	1,980	1,760	1,900	1,940	2,120	2,290	2,470	2,780	3,000		
125		2,200	2,250	2,070	2,200	2,250	2,470	2,640	2,910	3,440	3,830		
150		2,470	2,510	2,290	2,470	2,510	2,860	3,040	3,350	4,140	4,540		
160		2,600	2,780	2,510	2,780	2,860	3,130	3,350	3,700	4,360	4,930		
180		3,080	3,080	2,780	2,950	3,040	3,480	3,700	4,100	4,760	5,240		
200		3,350	3,390	3,040	3,350	3,350	3,740	4,140	4,450	5,150	5,550		
210		3,480	3,480	3,130	3,390	3,440	3,830	4,270	4,620	5,460	5,990		
250		4,400	4,540	4,050	4,540	4,620	5,110	5,500	6,030	6,910	7,350		
300		5,020	5,420	4,710	5,200	5,240	5,940	6,470	7,000	8,230	8,630		
350		5,640	6,340	5,940	6,470	6,600	7,260	7,440	8,540	9,680	10,170		
400		6,250	7,130	6,080	6,690	6,740	7,480	8,410	8,940	10,260	11,180		
450		7,000	8,010	7,040	7,750	7,840	8,630	9,380	10,210	11,440	12,460		
500		7,750	8,890	8,010	8,670	8,760	9,510	10,170	11,140	12,410	13,560		
125	125	2,510	2,560	2,380	2,470	2,560	2,910	3,130	3,390	4,050	4,360	5,720	7,040
150		2,860	2,910	2,640	2,860	2,950	3,350	3,610	3,920	4,670	5,200	6,160	7,570
160		3,080	3,220	2,860	3,350	3,480	3,880	4,180	4,540	5,110	5,640	6,520	8,010
180		3,520	3,570	3,000	3,390	3,520	4,050	4,320	4,670	5,330	6,030	7,220	8,890
200		3,880	3,920	3,480	3,880	3,920	4,400	4,710	5,240	6,080	6,600	7,920	9,770
210		4,140	4,050	3,520	3,960	4,050	4,580	4,890	5,500	6,380	7,000	8,280	10,210
250		4,490	4,580	3,960	4,400	4,490	5,110	5,460	5,990	7,220	8,320	9,510	11,880
300		5,370	5,680	5,370	6,030	6,120	6,960	7,530	8,190	9,680	10,780	14,000	16,280
350		6,520	6,780	6,470	7,130	7,310	8,190	8,450	9,640	11,220	12,150	15,140	17,960
400		6,910	7,880	6,910	7,750	7,840	8,720	9,380	10,520	12,100	13,250	16,280	19,630
450		7,750	8,980	7,750	8,540	8,720	9,900	10,300	11,620	13,640	15,180	17,430	21,300
500		8,320	9,950	8,140	9,110	9,200	10,480	11,180	12,280	14,440	16,280	18,480	22,880

U/Price (Standard type)

A	B	8	10	13	15	16	20	22	25	30	35	40	50
150	150		3,790	3,610	3,920	4,010	4,360	4,670	4,980	6,210	6,870	8,910	10,720
180			4,400	4,180	4,490	4,580	5,060	5,550	5,990	7,090	7,920	9,930	11,840
200			4,710	4,450	4,760	4,840	5,420	6,030	6,600	7,570	8,500	11,010	13,360
210			5,020	4,710	4,980	5,150	5,770	6,430	7,000	8,060	9,020	12,420	14,980
250			6,120	5,770	6,080	6,250	7,090	7,840	8,580	9,860	11,000	13,320	16,170
300			7,400	7,000	7,480	7,660	8,580	9,460	10,300	11,880	13,420	15,050	18,740
350			8,320	8,060	8,720	8,940	9,990	10,960	11,880	13,780	15,490	17,180	21,570
400			9,330	8,800	9,330	9,550	10,700	11,880	13,070	15,100	16,940	19,500	24,730
450			10,260	9,820	10,830	11,140	12,370	13,470	14,520	16,860	19,320	21,620	27,150
500			11,050	10,390	11,620	11,840	13,160	14,260	15,360	17,870	20,600	23,910	30,010
160	160		3,700	3,520	3,880	3,920	4,270	4,580	4,890	6,120	6,780	8,720	10,560
200			4,450	4,180	4,490	4,580	5,150	5,770	6,340	7,310	8,230	10,650	12,980
250			5,770	5,420	5,720	5,900	6,740	7,480	8,230	9,510	10,650	12,760	15,760
300			7,040	6,650	7,130	7,310	8,230	9,110	9,950	11,530	13,070	14,880	18,480
350			7,970	7,700	8,320	8,580	9,640	10,610	11,530	13,420	15,140	16,990	21,260
400			8,890	8,360	8,800	9,110	10,260	11,440	12,630	14,660	16,500	19,100	24,030
450			9,820	9,380	10,430	10,700	11,930	13,030	14,080	16,420	18,880	21,210	26,800
500			10,610	9,950	11,180	11,400	12,720	13,820	14,920	17,430	20,160	23,320	29,480
200	200		6,080	5,770	6,090	6,120	6,960	7,700	8,410	9,640	11,050	12,630	16,110
250			7,180	6,820	7,530	7,620	8,450	9,330	10,170	11,880	13,510	15,400	19,280
300			8,410	8,140	8,900	9,160	10,170	11,220	12,240	14,300	16,240	18,530	22,360
350			9,380	9,330	10,310	10,520	11,750	12,940	14,130	16,550	18,750	21,390	25,440
400			10,340	10,390	11,690	11,750	13,120	14,440	15,760	18,440	20,950	23,900	28,520
450			11,310	11,220	12,500	12,760	14,220	15,670	17,120	20,020	22,750	25,960	31,600
500			12,280	11,840	13,300	13,470	15,050	16,590	18,130	21,210	24,070	27,500	34,590
250	250		8,450	8,100	8,700	8,800	10,480	11,360	12,680	14,830	16,810	19,140	23,630
300			10,170	9,900	10,620	10,830	12,590	13,560	15,050	17,160	19,800	22,440	29,040
350			11,180	10,920	11,850	12,020	14,170	15,580	16,940	19,760	22,400	25,570	30,720
400			12,540	12,150	13,000	13,380	15,670	16,990	18,750	21,920	25,000	28,470	34,150
450			13,910	13,470	14,510	14,920	17,300	18,970	20,600	24,070	27,330	31,160	38,330
500			15,180	14,440	15,850	16,060	18,480	19,800	21,920	25,570	29,620	33,750	42,160
300	300					13,640	15,580	16,900	18,660	21,870	24,730	27,570	32,780
350						16,110	18,840	20,640	22,440	26,450	29,040	31,890	37,820
400						17,820	20,950	22,710	25,220	29,750	33,360	36,200	42,980
450						21,700	23,850	25,880	27,860	32,610	37,620	40,530	48,080
500						25,000	26,050	27,720	29,750	34,590	46,820	49,100	53,180

Price calculation formula (A×Price coefficient) — Upper : Size specified type / Lower : Economy type

A (1mm incr.)	B	8	10	13	15	16	20	22	25	30	35	40	50
25~100	25	AX14	AX15										
		AX13	AX14										
101~250		AX10	AX11										
		AX 9	AX10										
30~100	40	AX17	AX18										
		AX15	AX16										
101~200		AX13	AX14										
		AX12	AX13										
201~400		AX11	AX12										
		AX10	AX11										
30~ 60	60	AX25	AX25	AX25	AX25	AX25	AX28	AX29	AX30				
		AX23	AX23	AX23	AX23	AX23	AX25	AX26	AX27				
61~ 80		AX23	AX25	AX22	AX23	AX23	AX24	AX25	AX25				
		AX21	AX23	AX20	AX21	AX21	AX22	AX23	AX23				
81~100		AX23	AX25	AX22	AX23	AX23	AX24	AX25	AX25				
		AX21	AX23	AX20	AX21	AX21	AX22	AX23	AX23				
101~200		AX15	AX18	AX17	AX20	AX20	AX21	AX22	AX25				
		AX14	AX16	AX15	AX18	AX18	AX19	AX20	AX23				
201~300		AX15	AX18	AX17	AX20	AX20	AX21	AX22	AX25				
		AX14	AX16	AX15	AX18	AX18	AX19	AX20	AX23				
301~400		AX15	AX18	AX17	AX20	AX20	AX21	AX22	AX25				
		AX14	AX16	AX15	AX18	AX18	AX19	AX20	AX23				
401~500		AX15	AX15	AX15	AX19	AX19	AX20	AX21	AX24				
		AX14	AX14	AX14	AX17	AX17	AX18	AX19	AX22				
30~ 80	80	AX25	AX28	AX25	AX26	AX26	AX28	AX31	AX33	AX36	AX41		
		AX23	AX25	AX23	AX23	AX23	AX25	AX28	AX30	AX32	AX37		
81~100		AX22	AX24	AX22	AX23	AX23	AX24	AX25	AX28	AX32	AX35		
		AX20	AX22	AX20	AX21	AX21	AX22	AX23	AX25	AX29	AX32		
101~125		AX18	AX19	AX18	AX21	AX21	AX22	AX23	AX25	AX30	AX34		
		AX16	AX17	AX16	AX19	AX19	AX20	AX21	AX23	AX27	AX31		
126~150		AX18	AX19	AX18	AX21	AX21	AX22	AX23	AX25	AX30	AX34		
		AX16	AX17	AX16	AX19	AX19	AX20	AX21	AX23	AX27	AX31		
151~160		AX18	AX19	AX18	AX21	AX21	AX22	AX23	AX25	AX30	AX34		
		AX16	AX17	AX16	AX19	AX19	AX20	AX21	AX23	AX27	AX31		
161~200		AX18	AX19	AX18	AX21	AX21	AX22	AX23	AX25	AX30	AX34		
		AX16	AX17	AX16	AX19	AX19	AX20	AX21	AX23	AX27	AX31		
201~250		AX18	AX19	AX18	AX21	AX21	AX22	AX23	AX25	AX30	AX34		
		AX16	AX17	AX16	AX19	AX19	AX20	AX21	AX23	AX27	AX31		
251~500		AX18	AX19	AX18	AX21	AX21	AX22	AX23	AX25	AX30	AX34		
		AX16	AX17	AX16	AX19	AX19	AX20	AX21	AX23	AX27	AX31		
30~100	100	AX28	AX29	AX26	AX30	AX30	AX33	AX35	AX37	AX41	AX44		
		AX25	AX26	AX23	AX27	AX27	AX30	AX32	AX33	AX37	AX40		
101~125		AX24	AX25	AX23	AX25	AX25	AX28	AX30	AX32	AX35	AX37		
		AX22	AX23	AX21	AX23	AX23	AX25	AX27	AX29	AX32	AX33		
126~150		AX23	AX24	AX22	AX25	AX25	AX25	AX28	AX30	AX33	AX35		
		AX21	AX22	AX20	AX23	AX23	AX23	AX25	AX27	AX30	AX32		
151~160		AX23	AX24	AX22	AX25	AX25	AX25	AX28	AX30	AX33	AX35		
		AX21	AX22	AX20	AX23	AX23	AX23	AX25	AX27	AX30	AX32		
161~180		AX23	AX24	AX22	AX25	AX25	AX25	AX28	AX30	AX33	AX35		
		AX21	AX22	AX20	AX23	AX23	AX23	AX25	AX27	AX30	AX32		
181~200		AX23	AX24	AX22	AX25	AX25	AX25	AX28	AX30	AX33	AX35		
		AX21	AX22	AX20	AX23	AX23	AX23	AX25	AX27	AX30	AX32		
201~210		AX21	AX22	AX20	AX23	AX23	AX24	AX25	AX28	AX32	AX35		
		AX19	AX20	AX18	AX21	AX21	AX22	AX23	AX25	AX29	AX32		
211~250		AX21	AX22	AX20	AX23	AX23	AX24	AX25	AX28	AX32	AX35		
		AX19	AX20	AX18	AX21	AX21	AX22	AX23	AX25	AX29	AX32		
251~300		AX21	AX22	AX20	AX23	AX23	AX24	AX25	AX28	AX32	AX35		
		AX19	AX20	AX18	AX21	AX21	AX22	AX23	AX25	AX29	AX32		
301~350		AX21	AX22	AX20	AX23	AX23	AX24	AX25	AX28	AX32	AX35		
		AX19	AX20	AX18	AX21	AX21	AX22	AX23	AX25	AX29	AX32		
351~400		AX21	AX22	AX20	AX23	AX23	AX24	AX25	AX28	AX32	AX35		
		AX19	AX20	AX18	AX21	AX21	AX22	AX23	AX25	AX29	AX32		
401~450		AX21	AX22	AX20	AX23	AX23	AX24	AX25	AX28	AX32	AX35		
		AX19	AX20	AX18	AX21	AX21	AX22	AX23	AX25	AX29	AX32		
451~500		AX21	AX22	AX20	AX23	AX23	AX24	AX25	AX28	AX32	AX35		
		AX19	AX20	AX18	AX21	AX21	AX22	AX23	AX25	AX29	AX32		
50~125	125	AX29	AX30	AX28	AX31	AX31	AX35	AX39	AX42	AX45	AX54	AX57	AX67
		AX26	AX27	AX25	AX28	AX28	AX32	AX35	AX38	AX41	AX49	AX51	AX60
126~150		AX25	AX25	AX24	AX26	AX26	AX30	AX34	AX35	AX40	AX46	AX55	AX65
		AX23	AX23	AX22	AX23	AX23	AX27	AX31	AX32	AX36	AX41	AX50	AX59
151~160		AX25	AX25	AX24	AX26	AX26	AX30	AX34	AX35	AX40	AX46	AX55	AX65
		AX23	AX23	AX22	AX23	AX23	AX27	AX31	AX32	AX36	AX41	AX50	AX59
161~180		AX24	AX25	AX23	AX25	AX25	AX29	AX32	AX35	AX37	AX46	AX54	AX63
		AX22	AX23	AX21	AX23	AX23	AX26	AX29	AX32	AX33	AX41	AX49	AX57
181~200		AX24	AX25	AX23	AX25	AX25	AX29	AX32	AX35	AX37	AX46	AX54	AX63
		AX22	AX23	AX21	AX23	AX23	AX26	AX29	AX32	AX33	AX41	AX49	AX57
201~210		AX24	AX25	AX23	AX25	AX25	AX29	AX32	AX35	AX37	AX43	AX54	AX63
		AX22	AX23	AX21	AX23	AX23	AX26	AX29	AX32	AX33	AX39	AX49	AX57
211~250		AX24	AX25	AX23	AX25	AX25	AX29	AX32	AX35	AX37	AX43	AX54	AX63
		AX22	AX23	AX21	AX23	AX23	AX26	AX29	AX32	AX33	AX39	AX49	AX57
251~300		AX24	AX25	AX23	AX25	AX25	AX29	AX32	AX35	AX37	AX43	AX54	AX63
		AX22	AX23	AX21	AX23	AX23	AX26	AX29	AX32	AX33	AX39	AX49	AX57
301~350		AX22	AX23	AX21	AX24	AX24	AX26	AX29	AX32	AX37	AX42	AX54	AX63
		AX20	AX21	AX19	AX22	AX22	AX23	AX26	AX29	AX33	AX38	AX49	AX57
351~400		AX22	AX23	AX21	AX24	AX24	AX26	AX29	AX32	AX36	AX42	AX50	AX59
		AX20	AX21	AX19	AX22	AX22	AX23	AX26	AX29	AX32	AX38	AX45	AX53
401~450		AX22	AX23	AX21	AX24	AX24	AX26	AX29	AX32	AX36	AX42	AX50	AX59
		AX20	AX21	AX19	AX22	AX22	AX23	AX26	AX29	AX32	AX38	AX45	AX53
451~500		AX22	AX23	AX21	AX24	AX24	AX26	AX29	AX32	AX36	AX42	AX50	AX59
		AX20	AX21	AX19	AX22	AX22	AX23	AX26	AX29	AX32	AX38	AX45	AX53

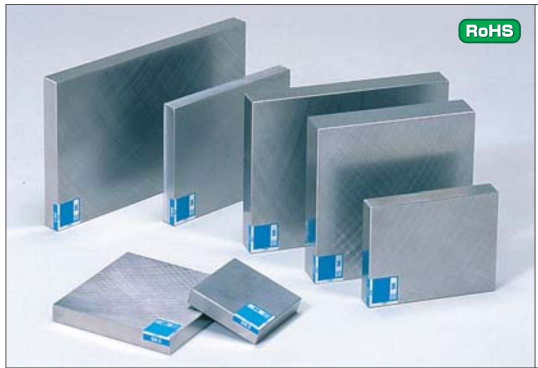
Price calculation formula (A×Price coefficient) — Upper : Size specified type / Lower : Economy type

A (1mm incr.)	B	8	10	13	15	16	20	22	25	30	35	40	50
101~150	150		AX33	AX31	AX36	AX36	AX41	AX45	AX48	AX56	AX63	AX68	AX84
			AX30	AX28	AX32	AX32	AX37	AX41	AX43	AX50	AX57	AX61	AX76
151~180			AX33	AX31	AX36	AX36	AX41	AX45	AX48	AX56	AX63	AX68	AX84
			AX30	AX28	AX32	AX32	AX37	AX41	AX43	AX50	AX57	AX61	AX76
181~200			AX30	AX29	AX34	AX34	AX37	AX41	AX45	AX53	AX57	AX65	AX79
			AX27	AX26	AX31	AX31	AX33	AX37	AX41	AX48	AX51	AX59	AX71
201~210			AX30	AX29	AX34	AX34	AX37	AX41	AX45	AX53	AX57	AX65	AX79
			AX27	AX26	AX31	AX31	AX33	AX37	AX41	AX48	AX51	AX59	AX71
211~250			AX30	AX29	AX34	AX34	AX37	AX41	AX45	AX53	AX57	AX65	AX79
			AX27	AX26	AX31	AX31	AX33	AX37	AX41	AX48	AX51	AX59	AX71
251~300			AX29	AX28	AX32	AX32	AX35	AX39	AX43	AX50	AX55	AX62	AX76
			AX26	AX25	AX29	AX29	AX32	AX35	AX39	AX45	AX50	AX56	AX68
301~350			AX29	AX28	AX30	AX30	AX34	AX36	AX41	AX46	AX52	AX58	AX74
			AX26	AX25	AX27	AX27	AX31	AX32	AX37	AX41	AX47	AX52	AX67
351~400			AX28	AX28	AX30	AX30	AX34	AX36	AX41	AX46	AX52	AX58	AX74
			AX25	AX25	AX27	AX27	AX31	AX32	AX37	AX41	AX47	AX52	AX67
401~450			AX28	AX25	AX30	AX30	AX34	AX36	AX41	AX46	AX52	AX58	AX74
			AX25	AX23	AX27	AX27	AX31	AX32	AX37	AX41	AX47	AX52	AX67
451~500			AX25	AX25	AX30	AX30	AX34	AX36	AX41	AX46	AX52	AX58	AX74
			AX23	AX23	AX27	AX27	AX31	AX32	AX37	AX41	AX47	AX52	AX67
101~160	160		AX32	AX30	AX35	AX35	AX40	AX44	AX47	AX55	AX61	AX67	AX83
			AX29	AX27	AX32	AX32	AX36	AX40	AX42	AX50	AX55	AX60	AX75
161~200			AX29	AX28	AX33	AX33	AX36	AX40	AX44	AX52	AX56	AX64	AX78
			AX26	AX25	AX30	AX30	AX32	AX36	AX40	AX47	AX50	AX58	AX70
201~250			AX29	AX28	AX33	AX33	AX36	AX40	AX44	AX52	AX56	AX64	AX78
			AX26	AX25	AX30	AX30	AX32	AX36	AX40	AX47	AX50	AX58	AX70
251~300			AX26	AX25	AX31	AX31	AX35	AX37	AX42	AX48	AX54	AX61	AX75
			AX23	AX23	AX28	AX28	AX32	AX33	AX38	AX43	AX49	AX55	AX68
301~350			AX26	AX25	AX29	AX29	AX33	AX35	AX40	AX45	AX51	AX57	AX73
			AX23	AX23	AX26	AX26	AX30	AX32	AX36	AX41	AX46	AX51	AX66
351~400			AX25	AX25	AX29	AX29	AX33	AX35	AX40	AX45	AX51	AX57	AX73
			AX23	AX23	AX26	AX26	AX30	AX32	AX36	AX41	AX46	AX51	AX66
401~450			AX25	AX24	AX29	AX29	AX33	AX35	AX40	AX45	AX51	AX57	AX73
			AX23	AX22	AX26	AX26	AX30	AX32	AX36	AX41	AX46	AX51	AX66
451~500			AX25	AX24	AX29	AX29	AX33	AX35	AX40	AX45	AX51	AX57	AX73
			AX23	AX22	AX26	AX26	AX30	AX32	AX36	AX41	AX46	AX51	AX66
101~200	200		AX40	AX39	AX43	AX43	AX47	AX51	AX56	AX64	AX70	AX79	AX97
			AX36	AX35	AX39	AX39	AX42	AX46	AX50	AX58	AX63	AX71	AX87
201~250			AX35	AX35	AX39	AX39	AX43	AX45	AX51	AX57	AX65	AX74	AX94
			AX32	AX32	AX35	AX35	AX39	AX41	AX46	AX51	AX59	AX67	AX85
251~300			AX35	AX35	AX39	AX39	AX43	AX45	AX51	AX57	AX65	AX74	AX94
			AX32	AX32	AX35	AX35	AX39	AX41	AX46	AX51	AX59	AX67	AX85
301~350			AX33	AX32	AX35	AX35	AX39	AX43	AX46	AX55	AX65	AX70	AX90
			AX30	AX29	AX32	AX32	AX35	AX39	AX41	AX50	AX59	AX63	AX81
351~400			AX33	AX32	AX35	AX35	AX39	AX43	AX46	AX55	AX65	AX70	AX90
			AX30	AX29	AX32	AX32	AX35	AX39	AX41	AX50	AX59	AX63	AX81
401~450			AX32	AX31	AX35	AX35	AX37	AX42	AX45	AX53	AX59	AX68	AX88
			AX29	AX28	AX32	AX32	AX33	AX38	AX41	AX48	AX53	AX61	AX79
451~500			AX32	AX31	AX35	AX35	AX37	AX42	AX45	AX53	AX59	AX68	AX88
			AX29	AX28	AX32	AX32	AX33	AX38	AX41	AX48	AX53	AX61	AX79
101~200	250		AX42	AX41	AX46	AX46	AX51	AX55	AX64	AX75	AX85	AX94	AX117
			AX38	AX37	AX41	AX41	AX46	AX50	AX58	AX68	AX77	AX85	AX105
201~250			AX39	AX37	AX42	AX42	AX47	AX52	AX57	AX67	AX77	AX86	AX111
			AX35	AX33	AX38	AX38	AX42	AX47	AX51	AX60	AX69	AX77	AX100
251~300			AX39	AX37	AX42	AX42	AX47	AX52	AX57	AX67	AX77	AX86	AX111
			AX35	AX33	AX38	AX38	AX42	AX47	AX51	AX60	AX69	AX77	AX100
301~350			AX39	AX37	AX42	AX42	AX47	AX52	AX57	AX67	AX77	AX86	AX111
			AX35	AX33	AX38	AX38	AX42	AX47	AX51	AX60	AX69	AX77	AX100
351~400			AX37	AX36	AX42	AX42	AX46	AX51	AX57	AX67	AX77	AX86	AX111
			AX33	AX32	AX38	AX38	AX41	AX46	AX51	AX60	AX69	AX77	AX100
401~450			AX35	AX35	AX40	AX40	AX46	AX51	AX55	AX65	AX73	AX81	AX99
			AX32	AX32	AX36	AX36	AX41	AX46	AX50	AX59	AX66	AX73	AX89
451~500			AX35	AX35	AX37	AX37	AX44	AX47	AX54	AX63	AX70	AX79	AX99
			AX32	AX32	AX33	AX33	AX40	AX42	AX49	AX57	AX63	AX71	AX89
101~200	300					AX65	AX75	AX79	AX85	AX95	AX119	AX121	AX144
						AX59	AX68	AX71	AX77	AX86	AX107	AX109	AX130
201~300						AX61	AX68	AX73	AX77	AX89	AX116	AX119	AX135
						AX55	AX61	AX66	AX69	AX80	AX104	AX107	AX122
301~350						AX57	AX65	AX69	AX76	AX85	AX112	AX116	AX135
						AX51	AX59	AX62	AX68	AX77	AX101	AX104	AX122
351~400						AX57	AX65	AX69	AX76	AX85	AX112	AX115	AX135
						AX51	AX59	AX62	AX68	AX77	AX101	AX104	AX122
401~450						AX56	AX65	AX68	AX74	AX84	AX109	AX110	AX125
						AX50	AX59	AX61	AX67	AX76	AX98	AX99	AX113
451~500						AX56	AX65	AX68	AX74	AX84	AX109	AX110	AX125
						AX50	AX59	AX61	AX67	AX76	AX98	AX99	AX113

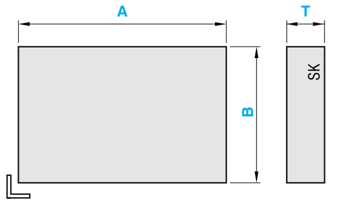
Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

FINISHED PLATES —SK—
—STANDARD · SIZE SPECIFIED · ECONOMY TYPE—

Heat treatment data P.1186



SK (Standard type)
S—SK (Size specified type)
E—SK (Economy type)



Type	Dimension tolerance A・B		Dimension tolerance T
Standard Size specified	99mm or less	+0.4 / 0	+0.5 / +0.2
	100~250mm	+0.5 / 0	
	251mm or more	+0.8 / 0	
Economy	99mm or less	+0.4 / 0	+0.6 / +0.3
	100~250mm	+0.5 / 0	
	251mm or more	+0.8 / 0	

Precision standards P.1158

M SKS93 (For oil hardening・Raw material)

Order

Catalog No.	—	A	—	B	—	T
SK	—	300	—	100	—	10
S—SK	—	180	—	40	—	10
E—SK	—	120	—	40	—	10

Delivery

3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1~9	10~30
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

A (dimension A) ×Price coefficient=Unit price
(ex) S—SK—180—40—10
180 × 12 =¥2,160

Alteration

P.1174 (B and T dimension changeable)

Alterations are available for size specified and economy type.

U/Price (Standard type)

A	B	T=5	8	10	13	15	16	20	22	25	30	35
250	25		1,590	1,760								
400	40		2,690	3,000								
60	60	930	1,020	1,100	930	970	970	1,100	1,190	1,280	1,500	
80		1,020	1,100	1,190	1,020	1,060	1,060	1,280	1,410	1,500	1,540	
500		4,450	5,020	5,460	5,330	5,900	5,900	6,740	7,040	7,660	8,190	
80	80	1,060	1,240	1,280	1,100	1,190	1,190	1,280	1,410	1,540	1,680	2,070
100		1,100	1,280	1,320	1,240	1,410	1,410	1,500	1,590	1,680	1,900	2,120
125		1,280	1,500	1,630	1,410	1,500	1,500	1,630	1,980	2,070	2,290	2,510
150		1,460	1,810	1,940	1,760	1,850	1,850	2,030	2,120	2,560	2,910	3,260
160		1,540	1,900	2,070	1,900	1,980	1,980	2,250	2,420	2,690	3,130	3,520
200		1,850	2,340	2,510	2,250	2,420	2,420	2,820	3,040	3,300	3,570	4,050
250		2,340	2,640	2,950	2,780	3,040	3,040	3,390	3,830	4,010	4,840	5,460
500		4,710	5,240	5,640	5,420	6,080	6,080	6,870	7,350	7,790	8,360	10,650
100	100	1,280	1,500	1,630	1,370	1,500	1,500	1,630	1,980	2,070	2,290	2,510
125		1,410	1,680	1,810	1,540	1,680	1,680	1,900	2,250	2,380	2,640	3,040
150		1,500	1,850	1,980	1,720	1,810	1,810	2,030	2,340	2,470	3,000	3,440
160		1,630	2,030	2,160	1,900	1,980	1,980	2,340	2,470	2,730	3,260	3,700
180		1,900	2,250	2,470	2,200	2,420	2,420	2,780	2,950	3,170	3,740	4,230
200		1,940	2,340	2,560	2,290	2,510	2,510	2,860	3,130	3,390	4,100	4,760
210		1,980	2,380	2,600	2,340	2,560	2,560	2,910	3,350	3,610	4,230	4,930
250		2,510	2,780	3,170	2,860	3,130	3,130	3,610	3,880	4,180	4,620	5,330
300		3,170	3,440	3,880	3,520	3,660	3,660	4,180	4,800	5,110	5,590	6,560
350		3,880	4,140	4,670	4,230	4,580	4,580	5,330	5,720	6,210	6,740	7,790
400		4,400	4,620	5,150	4,580	5,020	5,020	5,770	6,300	7,000	7,530	9,020
450		4,760	5,020	5,900	5,280	5,720	5,720	6,600	7,220	7,700	8,500	10,260
500		5,020	5,240	6,340	5,720	6,210	6,210	7,180	7,750	8,320	9,110	11,400
125	125	1,540	1,900	2,030	1,760	1,900	1,900	2,070	2,340	2,510	3,000	3,480
150		1,720	1,980	2,160	1,940	2,120	2,120	2,380	2,560	3,000	3,520	4,010
160		1,940	2,200	2,380	2,120	2,290	2,290	2,560	2,780	3,170	3,700	4,320
180		2,030	2,420	2,600	2,340	2,510	2,510	2,820	3,040	3,300	3,920	4,620
200		2,070	2,470	2,820	2,510	2,730	2,730	2,950	3,130	3,480	4,450	5,150
210		2,120	2,510	2,910	2,640	2,860	2,860	3,220	3,390	3,880	4,710	5,370
250		2,470	2,910	3,170	2,820	3,080	3,080	3,440	3,740	5,020	5,500	6,120
300		3,440	3,960	4,320	3,830	4,230	4,230	4,800	5,150	5,770	7,260	8,100
350		4,050	4,670	5,150	4,580	5,060	5,060	5,640	6,030	6,740	7,880	9,330
400		4,670	4,930	5,680	5,020	5,460	5,460	5,860	6,740	7,000	8,500	10,560
450		5,110	5,860	6,520	5,810	6,340	6,340	7,000	7,440	8,360	9,110	11,800
500		5,460	6,300	7,000	6,250	6,820	6,820	7,570	8,060	8,940	9,640	12,940

U/Price (Standard type)

A	B	T=5	8	10	13	15	16	20	22	25	30	35
150	150	2,730	3,040	3,300	3,040	3,390	3,390	3,700	3,920	4,140	4,930	6,740
180		3,390	3,660	3,570	3,260	3,610	3,610	4,140	4,400	4,620	5,810	7,790
200		3,700	3,920	3,660	3,390	3,740	3,740	4,360	4,670	4,890	6,250	8,320
210		3,830	4,050	3,880	3,570	3,920	3,920	4,490	4,800	5,060	6,520	8,580
250		4,230	4,400	4,710	4,180	4,450	4,450	4,980	5,280	5,590	7,440	9,600
300		4,980	5,150	5,500	4,930	5,280	5,280	5,940	6,340	6,650	9,200	12,460
350		5,810	5,990	6,470	5,720	6,120	6,120	6,820	7,260	7,660	9,990	13,160
400		6,600	6,910	7,260	6,560	7,000	7,000	7,790	8,320	8,800	11,310	14,480
450		7,310	7,620	8,230	7,310	7,790	7,790	8,720	9,290	9,820	12,370	16,150
500		8,010	8,360	9,110	8,010	8,630	8,630	9,600	10,260	10,830	13,420	16,990
160	160	2,640	2,950	3,220	2,950	3,300	3,300	3,610	3,830	4,050	4,840	6,650
200		3,440	3,520	3,390	3,130	3,480	3,480	4,100	4,400	4,620	5,990	8,060
250		3,880	4,050	4,360	3,830	4,100	4,100	4,620	4,930	5,240	7,090	9,240
300		4,620	4,800	5,150	4,580	4,930	4,930	5,590	5,990	6,300	8,850	12,100
350		5,460	5,640	6,120	5,370	5,770	5,770	6,470	6,910	7,310	9,640	12,810
400		6,160	6,470	6,820	6,120	6,560	6,560	7,350	7,880	8,360	10,870	14,040
450		6,870	7,180	7,790	6,870	7,350	7,350	8,280	8,850	9,380	11,930	15,710
500		7,570	7,920	8,670	7,570	8,190	8,190	9,160	9,820	10,390	12,980	16,550
200	200		3,740	4,140	3,830	4,230	4,230	4,760	4,980	5,280	6,250	8,320
250			4,320	4,800	4,360	4,760	4,760	5,330	5,720	6,250	7,750	10,080
300			5,150	5,720	5,150	5,680	5,680	6,470	6,960	7,480	9,330	11,750
350			5,990	6,690	6,030	6,650	6,650	7,480	7,970	8,720	9,900	13,420
400			6,820	7,660	6,910	7,570	7,570	8,540	9,020	9,950	12,100	15,270
450			7,570	8,500	7,700	8,540	8,540	9,510	10,120	11,140	13,600	17,650
500			8,580	9,380	8,450	9,330	9,330	10,430	11,090	12,280	14,830	18,620
250	250		4,930	5,640	5,020	5,550	5,550	6,160	6,650	7,260	10,560	11,970
300			5,990	6,690	6,120	6,820	6,820	7,530	8,060	8,890	12,940	14,350
350			7,000	7,880	6,870	7,750	7,750	8,540	9,380	10,120	13,820	16,680
400			7,920	8,980	7,880	8,850	8,850	9,770	10,700	11,580	14,790	19,230
450			8,980	9,680	8,940	9,990	9,990	10,920	11,930	12,980	15,710	21,780
500			9,950	11,090	9,900	11,050	11,050	12,190	13,250	14,390	16,640	23,900
300	300		8,800	9,240	8,630	10,040	10,040	11,310	11,970	13,030	14,960	16,720
350			9,600	9,770	10,340	10,870	10,870	12,100	12,760	13,860	15,710	19,450
400			10,390	11,090	11,580	12,190	12,190	13,640	14,700	15,930	18,040	22,180
450			11,090	12,460	12,590	13,290	13,290	15,270	16,370	17,740	20,110	24,910
500			11,710	13,560	14,000	14,610	14,610	16,990	17,960	19,540	22,360	27,460

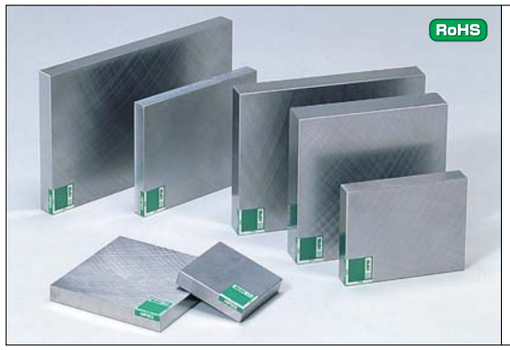
Price calculation formula (A×Price coefficient) — Upper : Size specified type / Lower : Economy type

A (1mm incr.)	B	T=5	8	10	13	15	16	20	22	25	30	35
25~100	25		A×12	A×13								
			A×11	A×12								
101~250			A× 9	A×10								
			A× 9	A× 9								
30~100	40		A×14	A×15								
			A×13	A×14								
101~200			A×11	A×12								
			A×10	A×11								
201~400			A× 9	A×10								
			A× 9	A× 9								
30~60	60	A×19	A×21	A×22	A×21	A×23	A×23	A×24	A×25	A×28	A×30	
		A×18	A×19	A×20	A×19	A×21	A×21	A×22	A×23	A×26	A×27	
61~80		A×19	A×21	A×22	A×21	A×23	A×23	A×24	A×25	A×28	A×30	
		A×18	A×19	A×20	A×19	A×21	A×21	A×22	A×23	A×26	A×27	
81~100		A×15	A×17	A×18	A×17	A×18	A×18	A×20	A×21	A×22	A×24	
		A×14	A×16	A×17	A×16	A×17	A×17	A×18	A×19	A×20	A×22	
101~200		A×13	A×15	A×18	A×17	A×18	A×18	A×20	A×21	A×22	A×24	
		A×12	A×14	A×17	A×16	A×17	A×17	A×18	A×19	A×20	A×22	
201~300		A×13	A×15	A×15	A×15	A×15	A×15	A×18	A×20	A×21	A×22	
		A×12	A×14	A×14	A×14	A×14	A×14	A×17	A×18	A×19	A×20	
301~400		A×13	A×15	A×15	A×15	A×15	A×15	A×18	A×20	A×21	A×22	
		A×12	A×14	A×14	A×14	A×14	A×14	A×17	A×18	A×19	A×20	
401~500		A×12	A×13	A×14	A×13	A×15	A×15	A×17	A×19	A×20	A×21	
		A×11	A×12	A×13	A×12	A×14	A×14	A×16	A×18	A×18	A×19	
30~80	80	A×20	A×22	A×23	A×22	A×24	A×24	A×25	A×26	A×29	A×33	A×35
		A×18	A×20	A×21	A×20	A×22	A×22	A×23	A×24	A×27	A×30	A×32
81~100		A×19	A×19	A×20	A×19	A×21	A×21	A×22	A×25	A×26	A×28	A×31
		A×18	A×18	A×18	A×18	A×19	A×19	A×20	A×23	A×24	A×26	A×28
101~125		A×14	A×15	A×17	A×15	A×17	A×17	A×19	A×21	A×22	A×25	A×28
		A×13	A×14	A×16	A×14	A×16	A×16	A×18	A×19	A×20	A×23	A×26
126~150		A×14	A×15	A×17	A×15	A×17	A×17	A×19	A×21	A×22	A×25	A×28
		A×13	A×14	A×16	A×14	A×16	A×16	A×18	A×19	A×20	A×23	A×26
151~160		A×14	A×15	A×17	A×15	A×17	A×17	A×19	A×21	A×22	A×25	A×28
		A×13	A×14	A×16	A×14	A×16	A×16	A×18	A×19	A×20	A×23	A×26
161~200		A×14	A×15	A×17	A×15	A×17	A×17	A×19	A×21	A×22	A×25	A×28
		A×13	A×14	A×16	A×14	A×16	A×16	A×18	A×19	A×20	A×23	A×26
201~250		A×14	A×15	A×17	A×15	A×17	A×17	A×19	A×21	A×22	A×25	A×28
		A×13	A×14	A×16	A×14	A×16	A×16	A×18	A×19	A×20	A×23	A×26
251~500		A×14	A×15	A×17	A×15	A×17	A×17	A×19	A×21	A×22	A×25	A×28
		A×13	A×14	A×16	A×14	A×16	A×16	A×18	A×19	A×20	A×23	A×26
30~100	100	A×21	A×24	A×25	A×24	A×25	A×25	A×29	A×33	A×34	A×35	A×37
		A×19	A×22	A×23	A×22	A×23	A×23	A×27	A×30	A×31	A×32	A×34
101~125		A×15	A×19	A×20	A×19	A×21	A×21	A×23	A×26	A×28	A×31	A×34
		A×14	A×18	A×18	A×18	A×19	A×19	A×21	A×24	A×26	A×28	A×31
126~150		A×15	A×17	A×18	A×15	A×18	A×18	A×20	A×22	A×23	A×26	A×30
		A×14	A×16	A×17	A×14	A×17	A×17	A×18	A×20	A×21	A×24	A×27
151~160		A×15	A×17	A×18	A×15	A×18	A×18	A×20	A×22	A×23	A×26	A×30
		A×14	A×16	A×17	A×14	A×17	A×17	A×18	A×20	A×21	A×24	A×27
161~180		A×15	A×17	A×18	A×15	A×18	A×18	A×20	A×22	A×23	A×26	A×30
		A×14	A×16	A×17	A×14	A×17	A×17	A×18	A×20	A×21	A×24	A×27
181~200		A×15	A×17	A×18	A×15	A×18	A×18	A×20	A×22	A×23	A×26	A×30
		A×14	A×16	A×17	A×14	A×17	A×17	A×18	A×20	A×21	A×24	A×27
201~210		A×15	A×17	A×18	A×15	A×18	A×18	A×20	A×22	A×23	A×26	A×30
		A×14	A×16	A×17	A×14	A×17	A×17	A×18	A×20	A×21	A×24	A×27
211~250		A×15	A×17	A×18	A×15	A×18	A×18	A×20	A×22	A×23	A×26	A×30
		A×14	A×16	A×17	A×14	A×17	A×17	A×18	A×20	A×21	A×24	A×27
251~300		A×15	A×17	A×18	A×15	A×18	A×18	A×20	A×22	A×23	A×26	A×30
		A×14	A×16	A×17	A×14	A×17	A×17	A×18	A×20	A×21	A×24	A×27
301~350		A×15	A×15	A×17	A×15	A×17	A×17	A×19	A×21	A×22	A×25	A×29
		A×14	A×14	A×16	A×14	A×16	A×16	A×18	A×19	A×20	A×23	A×27
351~400		A×15	A×15	A×17	A×15	A×17	A×17	A×19	A×21	A×22	A×25	A×29
		A×14	A×14	A×16	A×14	A×16	A×16	A×18	A×19	A×20	A×23	A×27
401~450		A×15	A×15	A×17	A×15	A×17	A×17	A×19	A×21	A×22	A×25	A×29
		A×14	A×14	A×16	A×14	A×16	A×16	A×18	A×19	A×20	A×23	A×27
451~500		A×15	A×15	A×17	A×15	A×17	A×17	A×19	A×21	A×22	A×25	A×29
		A×14	A×14	A×16	A×14	A×16	A×16	A×18	A×19	A×20	A×23	A×27
50~125	125	A×23	A×25	A×26	A×25	A×26	A×26	A×30	A×31	A×32	A×36	A×39
		A×21	A×23	A×24	A×23	A×24	A×24	A×27	A×28	A×29	A×33	A×36
126~150		A×17	A×19	A×20	A×19	A×21	A×21	A×22	A×25	A×26	A×32	A×33
		A×16	A×18	A×18	A×18	A×19	A×19	A×20	A×23	A×24	A×29	A×30
151~160		A×17	A×19	A×20	A×19	A×21	A×21	A×22	A×25	A×26	A×32	A×33
		A×16	A×18	A×18	A×18	A×19	A×19	A×20	A×23	A×24	A×27	A×30
161~180		A×15	A×17	A×19	A×18	A×19	A×19	A×21	A×25	A×25	A×30	A×32
		A×14	A×16	A×18	A×17	A×18	A×18	A×19	A×23	A×23	A×27	A×29
181~200		A×15	A×17	A×19	A×18	A×19	A×19	A×21	A×25	A×25	A×30	A×32
		A×14	A×16	A×18	A×17	A×18	A×18	A×19	A×23	A×23	A×27	A×29
201~210		A×15	A×17	A×18	A×17	A×18	A×18	A×20	A×22	A×24	A×29	A×31
		A×14	A×16	A×17	A×16	A×17	A×17	A×18	A×20	A×22	A×27	A×28
211~250		A×15	A×17	A×18	A×17	A×18	A×18	A×20	A×22	A×24	A×29	A×31
		A×14	A×16	A×17	A×16	A×17	A×17	A×18	A×20	A×22	A×27	A×28
251~300		A×15	A×17	A×18	A×17	A×18	A×18	A×20	A×22	A×24	A×29	A×31
		A×14	A×16	A×17	A×16	A×17	A×17	A×18	A×20	A×22	A×27	A×28
301~350		A×15	A×17	A×18	A×17	A×18	A×18	A×20	A×22	A×24	A×29	A×31
		A×14	A×16	A×17	A×16	A×17	A×17	A×18	A×20	A×22	A×27	A×28
351~400		A×15	A×17	A×18	A×17	A×18	A×18	A×20	A×22	A×24	A×29	A×31
		A×14	A×16	A×17	A×16	A×17	A×17	A×18	A×20	A×22	A×27	A×28
401~450		A×15	A×17	A×18	A×17	A×18	A×18	A×20	A×22	A×24	A×29	A×31
		A×14	A×16	A×17	A×16	A×17	A×17	A×18	A×20	A×22	A×27	A×28
451~500		A×15	A×17	A×18	A×17	A×18	A×18	A×20	A×22	A×24	A×29	A×31
		A×14	A×16	A×17	A×16	A×17	A×17	A×18	A×20	A×22	A×27	A×28

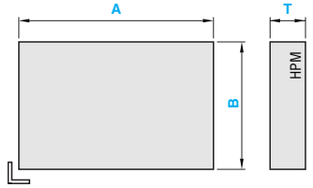
Price calculation formula (A×Price coefficient) — Upper : Size specified type / Lower : Economy type

A (1mm incr.)	B	T=5	8	10	13	15	16	20	22	25	30	35
101~150	150	A×25	A×26	A×29	A×26	A×29	A×29	A×33	A×34	A×35	A×37	A×53
		A×23	A×24	A×27	A×24	A×27	A×27	A×30	A×31	A×32	A×34	A×48
151~180		A×25	A×25	A×25	A×24	A×25	A×25	A×29	A×30	A×32	A×37	A×53
		A×23	A×23	A×23	A×22	A×23	A×23	A×27	A×27	A×29	A×34	A×48
181~200		A×25	A×25	A×25	A×24	A×25	A×25	A×29	A×30	A×32	A×36	A×50
		A×23	A×23	A×23	A×22	A×23	A×23	A×27	A×27	A×29	A×33	A×45
201~210		A×22	A×23	A×24	A×22	A×24	A×24	A×26	A×29	A×30	A×36	A×50
		A×20	A×21	A×22	A×20	A×22	A×22	A×24	A×27	A×27	A×33	A×45
211~250		A×22	A×23	A×24	A×22	A×24	A×24	A×26	A×29	A×30	A×36	A×50
		A×20	A×21	A×22	A×20	A×22	A×22	A×24	A×27	A×27	A×33	A×45
251~300		A×22	A×23	A×24	A×22	A×24	A×24	A×26	A×29	A×30	A×35	A×47
		A×20	A×21	A×22	A×20	A×22	A×22	A×24	A×27	A×27	A×32	A×43
301~350		A×20	A×21	A×22	A×20	A×21	A×21	A×24	A×25	A×26	A×35	A×47
		A×18	A×19	A×20	A×18	A×19	A×19	A×22	A×23	A×24	A×32	A×43
351~400		A×20	A×21	A×22	A×20	A×21	A×21	A×24	A×25	A×26	A×33	A×44
		A×18	A×19	A×20	A×18	A×19	A×19	A×22	A×23	A×24	A×30	A×40
401~450		A×20	A×21	A×22	A×20	A×21	A×21	A×24	A×25	A×26	A×33	A×44
		A×18	A×19	A×20	A×18	A×19	A×19	A×22	A×23	A×24	A×30	A×40
451~500		A×20	A×21	A×22	A×20	A×21	A×21	A×24	A×25	A×26	A×33	A×44
		A×18	A×19	A×20	A×18	A×19	A×19	A×22	A×23	A×24	A×30	A×40
101~160	160	A×24	A×25	A×28	A×25	A×28	A×28	A×32	A×33	A×34	A×36	A×52
		A×22	A×23	A×26	A×23	A×26	A×26	A×29	A×30	A×31	A×33	A×47
161~200		A×20	A×21	A×23	A×22	A×24	A×24	A×26	A×29	A×30	A×35	A×47
		A×18	A×19	A×21	A×20	A×22	A×22	A×24	A×27	A×27	A×32	A×43
201~250		A×20	A×21	A×22	A×21	A×23	A×23	A×25	A×28	A×29	A×35	A×46
		A×18	A×19	A×20	A×19	A×21	A×21	A×23	A×26	A×27	A×32	A×42
251~300		A×18	A×19	A×20	A×19	A×23	A×23	A×25	A×28	A×29	A×34	A×46
		A×17	A×18	A×18	A×18	A×21	A×21	A×23	A×26	A×27	A×31	A×42
301~350		A×18	A×19	A×20	A×19	A×20	A×20	A×23	A×24	A×25	A×34	A×46
		A×17	A×18	A×18	A×18	A×18	A×18	A×21	A×22	A×23	A×31	A×42
351~400		A×18	A×19	A×20	A×19	A×20	A×20	A×23	A×24	A×25	A×32	A×43
		A×17	A×18	A×18	A×18	A×18	A×18	A×21	A×22	A×23	A×29	A×39
401~450		A×18	A×19	A×20	A×19	A×20	A×20	A×23	A×24	A×25	A×32	A×43
		A×17	A×18	A×18	A×18	A×18	A×18	A×21	A×22	A×23	A×29	A×39
451~500		A×18	A×19	A×20	A×19	A×20	A×20	A×23	A×24	A×25	A×32	A×43
		A×17	A×18	A×18	A×18	A×18	A×18	A×21	A×22	A×23	A×29	A×39
101~200	200		A×26	A×30	A×26	A×30	A×30	A×34	A×35	A×37	A×37	A×53
			A×24	A×27	A×24	A×27	A×27	A×31	A×32	A×34	A×34	A×48
201~250			A×23	A×25	A×23	A×25	A×25	A×29	A×31	A×34	A×35	A×48
			A×21	A×23	A×21	A×23	A×23	A×27	A×28	A×31	A×32	A×44
251~300			A×23	A×25	A×23	A×25	A×25	A×29	A×31	A×34	A×35	A×48
			A×21	A×23	A×21	A×23	A×23	A×27	A×28	A×31	A×32	A×44
301~350			A×21	A×24	A×21	A×23	A×23	A×26	A×29	A×31	A×35	A×48
			A×19	A×22	A×19	A×21	A×21	A×24	A×27	A×28	A×32	A×44
351~400			A×21	A×24	A×21	A×23	A×23	A×26	A×29	A×31	A×35	A×45
			A×19	A×22	A×19	A×21	A×21	A×24	A×27	A×28	A×32	A×41
401~450			A×20	A×23	A×20	A×22	A×22	A×25	A×28	A×30	A×35	A×45
			A×18	A×21	A×18	A×20	A×20	A×23	A×26	A×27	A×32	A×41
451~500			A×20	A×23	A×20	A×22	A×22	A×25	A×28	A×30	A×35	A×45
			A×18	A×21	A×18	A×20	A×20	A×23	A×26	A×27	A×32	A×41
101~200	250		A×29	A×32	A×30	A×34	A×34	A×36	A×39	A×41	A×53	A×57
			A×27	A×29	A×27	A×31	A×31	A×33	A×36	A×37	A×48	A×52
201~250			A×25	A×29	A×26	A×30	A×30	A×33	A×35	A×36	A×50	A×56
			A×23	A×27	A×24	A×27	A×27	A×30	A×32	A×33	A×45	A×51
251~300			A×25	A×29	A×26	A×30	A×30	A×33	A×35	A×36	A×50	A×56
			A×23	A×27	A×24	A×27	A×27	A×30	A×32	A×33	A×45	A×51
301~350			A×25	A×29	A×26	A×30	A×30	A×33	A×35	A×36	A×50	A×56
			A×23	A×27	A×24	A×27	A×27	A×30	A×32	A×33	A×45	A×51
351~400			A×25	A×29	A×26	A×30	A×30	A×33	A×35	A×36	A×50	A×56
			A×23	A×27	A×24	A×27	A×27	A×30	A×32	A×33	A×45	A×51
401~450			A×24	A×26	A×25	A×28	A×28	A×31	A×33	A×35	A×47	A×55
			A×22	A×24	A×23	A×26	A×26	A×28	A×30	A×32	A×43	A×50
451~500			A×23	A×25	A×24	A×26	A×26	A×30	A×32	A×34	A×46	A×55
			A×21	A×23	A×22	A×24	A×24	A×27	A×29	A×31	A×42	A×50
101~200	300		A×41	A×43	A×40	A×45	A×45	A×53	A×55	A×62	A×63	A×67
			A×37	A×39	A×36	A×41	A×41	A×48	A×50	A×56	A×57	A×61
201~300			A×35	A×39	A×39	A×41	A×41	A×46	A×50	A×55	A×56	A×65
			A×32	A×36	A×36	A×37	A×37	A×42	A×45	A×50	A×51	A×59
301~350			A×34	A×36	A×36	A×39	A×39	A×44	A×45	A×50	A×56	A×65
			A×31	A×33	A×33	A×36	A×36	A×40	A×41	A×45	A×51	A×59
351~400			A×34	A×36	A×36	A×39	A×39	A×44	A×45	A×50	A×53	A×65
			A×31	A×33	A×33	A×36	A×36	A×40	A×41	A×45	A×48	A×59
401~450			A×30	A×35	A×35	A×36	A×36	A×43	A×45	A×48	A×52	A×64
			A×27	A×32	A×32	A×33	A×33	A×39	A×41	A×44	A×47	A×58
451~500			A×30	A×35	A×35	A×36	A×36	A×43	A×45	A×48	A×52	A×64
			A×27	A×32	A×32	A×33	A×33	A×39	A×41	A×44	A×47	A×58

FINISHED PLATES —HPM—
—STANDARD · SIZE SPECIFIED · ECONOMY TYPE—



HPM (Standard type)
S—HPM (Size specified type)
E—HPM (Economy type)



Type	Dimension tolerance A · B		T
Standard Size specified	99mm or less	+0.4 0	+0.3 +0.1
	100~250mm	+0.5 0	
	251mm or more	+0.8 0	
Economy	99mm or less	+0.4 0	+0.4 +0.2
	100~250mm	+0.5 0	
	251mm or more	+0.8 0	

M HPM2T
H 37~41HRC

Precision standards P.1158

Order

Catalog No.	—	A	—	B	—	T
HPM	—	125	—	125	—	20
S—HPM	—	440	—	160	—	20
E—HPM	—	320	—	160	—	20

Delivery

3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1~9	10~30
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

A (dimension A) ×Price coefficient=Unit price

(ex) S—HPM—440—100—10

440 × 22 =¥9,680

Alterations

P.1174 (B and T dimension changeable)

Alterations are available for size specified and economy type.

U/Price (Standard type)

A	B \ T	8	10	13	15	16	20	22	25	30	35	40	50
60	60	1,280	1,280	1,150	1,280	1,280	1,410	1,500					
80		1,680	1,500	1,410	1,500	1,500	1,680	1,760					
500		7,480	7,480	7,220	8,100	8,100	8,980	10,040					
80	80	1,680	1,680	1,590	1,760	1,760	1,940	2,030	2,120				
100		1,850	1,850	1,850	2,030	2,030	2,290	2,380	2,560				
125		2,290	2,290	2,200	2,380	2,380	2,640	2,820	3,000				
150		2,470	2,780	2,690	3,040	3,040	3,440	3,570	3,830				
160		2,560	2,950	2,780	3,080	3,080	3,660	3,790	4,050				
200		3,080	3,300	3,300	3,880	3,880	4,320	4,580	4,760				
250		4,540	4,140	3,960	4,760	4,760	5,200	5,550	5,810				
500		7,310	7,840	7,750	9,240	9,240	9,420	10,120	11,000				
100	100	2,200	2,200	2,290	2,380	2,380	2,560	2,640	2,820	3,440			
125		2,560	2,510	2,640	2,730	2,730	3,080	3,170	3,390	4,400			
150		3,040	3,040	2,910	3,300	3,300	3,700	3,830	4,100	5,110			
160		3,260	3,220	3,170	3,520	3,520	3,920	4,050	4,360	5,640			
180		3,660	3,610	3,520	3,960	3,960	4,400	4,580	4,890	6,160			
200		4,050	4,050	3,880	4,400	4,400	4,930	5,110	5,460	6,870			
210		4,100	4,050	4,050	4,400	4,400	4,980	5,150	5,550	7,130			
250		4,840	4,840	4,670	5,280	5,280	5,940	6,160	6,600	8,360			
300		5,810	5,810	5,640	6,340	6,340	7,130	7,400	7,920	9,860			
350		6,780	6,600	6,520	7,400	7,400	8,320	8,630	9,240	11,360			
400		7,750	7,750	7,310	8,360	8,360	9,510	9,860	10,560	12,760			
450		8,720	8,360	8,190	9,510	9,510	10,700	11,090	11,880	14,350			
500		9,680	9,240	9,070	10,560	10,560	11,880	12,320	13,200	15,760			
125	125	2,860	2,860	2,950	3,170	3,170	3,520	3,610	4,050	4,710	5,720	7,530	9,240
150		3,440	3,440	3,570	3,830	3,830	4,230	4,360	4,890	5,640	6,160	8,100	9,950
160		3,660	3,660	3,700	4,050	4,050	4,490	4,620	5,200	6,120	6,870	8,540	10,520
180		4,140	4,100	4,140	4,580	4,580	5,020	5,200	5,860	6,690	8,100	9,460	11,660
200		4,230	4,230	4,400	4,580	4,580	5,280	5,460	5,990	7,180	8,720	10,390	12,810
210		4,450	4,400	4,620	4,800	4,800	5,550	5,720	6,250	7,440	8,980	10,830	13,380
250		5,060	5,060	5,280	5,500	5,500	6,340	6,600	7,260	8,800	10,830	12,500	15,580
300		6,080	6,080	6,340	6,600	6,600	7,660	7,920	8,720	11,090	13,120	18,400	21,390
350		7,090	7,090	7,400	7,700	7,700	8,940	9,240	10,170	12,850	15,050	19,890	23,590
400		8,100	8,100	8,450	8,800	8,800	10,210	10,560	11,620	14,610	17,120	21,390	25,790
450		9,110	9,110	9,510	9,900	9,900	11,490	11,880	13,070	16,460	19,190	22,880	27,990
500		10,120	10,120	10,560	11,000	11,000	12,760	13,200	14,520	18,040	21,120	24,290	30,100

U/Price (Standard type)

A	B \ T	8	10	13	15	16	20	22	25	30	35	40	50
150	150	4,580	4,580	4,450	4,890	4,890	5,370	5,900	6,430	7,570	9,770	12,540	15,540
180		5,460	5,280	5,020	5,720	5,720	6,250	6,960	7,570	8,540	11,050	14,960	17,560
200		5,900	5,720	5,460	6,430	6,430	6,870	7,840	8,360	9,240	11,710	15,540	18,920
210		6,120	6,080	5,810	6,780	6,780	7,400	8,140	8,800	9,860	12,280	15,950	19,810
250		6,960	6,960	6,740	7,840	7,840	8,940	9,380	10,260	12,240	14,440	18,800	22,800
300		7,750	7,750	7,480	9,070	9,070	10,120	10,650	11,710	14,610	17,080	21,360	26,880
350		8,980	8,980	8,670	10,520	10,520	11,750	12,370	13,600	16,460	19,720	24,580	30,800
400		10,300	10,300	9,950	12,060	12,060	13,470	14,170	15,580	18,400	22,440	27,520	35,200
450		11,530	11,530	11,140	13,510	13,510	15,100	15,890	17,470	20,240	25,080	30,960	39,600
500		12,760	12,760	12,320	14,960	14,960	16,720	17,600	19,360	22,000	27,720	34,400	48,000
160	160	4,490	4,490	4,360	4,760	4,760	5,280	5,810	6,340	7,480	9,680	12,460	15,100
200		5,640	5,460	5,200	6,160	6,160	6,600	7,570	8,100	8,980	11,440	15,230	18,480
250		6,600	6,600	6,380	7,480	7,480	8,580	9,020	9,900	11,880	14,080	18,220	22,440
300		7,400	7,400	7,130	8,720	8,720	9,770	10,300	11,360	14,260	16,720	21,210	26,320
350		8,630	8,630	8,320	10,170	10,170	11,400	12,020	13,250	16,110	19,360	24,200	30,230
400		9,860	9,860	9,510	11,620	11,620	13,030	13,730	15,140	17,960	22,000	27,200	33,710
450		11,090	11,090	10,700	13,070	13,070	14,660	15,450	17,030	19,800	24,640	30,190	37,580
500		12,320	12,320	11,880	14,520	14,520	16,280	17,160	18,920	21,560	27,280	33,180	47,440
200	200		6,340	6,340	7,040	7,040	8,100	8,630	9,330	12,760	14,960	17,080	21,830
250			7,920	7,920	8,800	8,800	10,120	10,780	11,660	15,400	17,600	20,820	26,100
300			9,510	9,510	10,560	10,560	12,150	12,940	14,000	18,040	21,560	25,040	30,280
350			9,860	9,860	11,090	11,090	12,940	13,560	14,790	20,160	24,200	28,870	34,410
400			10,920	10,920	12,320	12,320	14,080	14,790	16,200	22,270	26,840	32,260	38,550
450			12,280	12,280	13,860	13,860	15,840	16,640	18,220	24,200	29,480	35,030	42,680
500			13,640	13,640	15,400	15,400	17,600	18,480	20,240	26,400	31,680	37,050	46,730
250	250		8,800	8,800	9,680	9,680	11,000	11,440	12,680	17,600	21,120	24,030	29,700
300			10,560	10,560	11,620	11,620	13,200	13,730	15,050	22,000	27,280	30,890	36,520
350			11,400	11,400	12,630	12,630	14,480	15,580	16,940	25,080	30,360	35,120	38,640
400			13,030	13,030	14,440	14,440	16,550	17,600	19,010	28,160	33,440	39,080	42,950
450			14,260	14,260	15,840	15,840	18,220	19,010	20,990	31,240	36,520	42,770	48,230
500			15,840	15,840	17,600	17,600	20,240	21,120	23,320	32,560	39,600	46,290	53,020
300	300					16,370	18,040	19,540	20,860	24,730	29,920	31,200	38,660
350						18,180	20,640	21,870	24,030	29,920	34,320	36,400	40,820
400						20,770	23,590	25,000	27,460	33,880	38,720	41,220	44,120
450						22,970	26,140	27,720	29,700	37,840	43,120	47,400	50,360
500						25,520	27,020	30,800	33,000	40,480	47,520	50,200	56,590

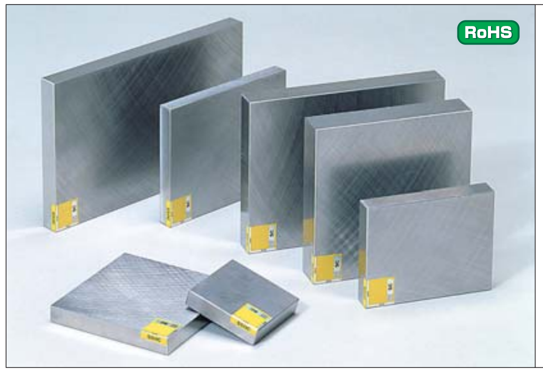
Price calculation formula (A×Price coefficient) Upper : Size specified type Lower : Economy type

A (1mm incr.)	B \ T	8	10	13	15	16	20	22	25	30	35	40	50
30~ 60	60	AX28	AX25	AX28	AX30	AX30	AX32	AX34					
		AX26	AX23	AX26	AX27	AX27	AX29	AX31					
61~ 80		AX25	AX25	AX25	AX25	AX25	AX28	AX30					
		AX23	AX23	AX23	AX23	AX23	AX26	AX27					
81~100		AX25	AX25	AX25	AX25	AX25	AX28	AX30					
		AX23	AX23	AX23	AX23	AX23	AX26	AX27					
101~200		AX20	AX19	AX20	AX22	AX22	AX24	AX25					
		AX18	AX18	AX18	AX20	AX20	AX22	AX23					
201~300		AX20	AX19	AX20	AX22	AX22	AX24	AX25					
		AX18	AX18	AX18	AX20	AX20	AX22	AX23					
301~400		AX20	AX19	AX20	AX22	AX22	AX24	AX25					
		AX18	AX18	AX18	AX20	AX20	AX22	AX23					
401~500		AX18	AX17	AX18	AX20	AX20	AX22	AX23					
		AX17	AX16	AX17	AX18	AX18	AX20	AX21					
30~ 80	80	AX30	AX29	AX30	AX31	AX31	AX33	AX35	AX36				
		AX27	AX27	AX27	AX28	AX28	AX30	AX32	AX33				
81~100		AX25	AX24	AX25	AX25	AX25	AX29	AX30	AX33				
		AX23	AX22	AX23	AX23	AX23	AX27	AX27	AX30				
101~125		AX22	AX21	AX22	AX23	AX23	AX25	AX26	AX29				
		AX20	AX19	AX20	AX21	AX21	AX23	AX24	AX27				
126~150		AX22	AX21	AX22	AX23	AX23	AX25	AX26	AX29				
		AX20	AX19	AX20	AX21	AX21	AX24	AX24	AX27				
151~160		AX22	AX21	AX22	AX23	AX23	AX25	AX26	AX29				
		AX20	AX19	AX20	AX21	AX21	AX23	AX24	AX27				
161~200		AX22	AX21	AX22	AX23	AX23	AX25	AX26	AX29				
		AX20	AX19	AX20	AX21	AX21	AX23	AX24	AX27				
201~250		AX22	AX21	AX22	AX23	AX23	AX25	AX26	AX29				
		AX20	AX19	AX20	AX21	AX21	AX23	AX24	AX27				
251~500		AX22	AX21	AX22	AX23	AX23	AX25	AX26	AX29				
		AX20	AX19	AX20	AX21	AX21	AX23	AX24	AX27				
30~100	100	AX32	AX30	AX32	AX33	AX33	AX34	AX35	AX37	AX45			
		AX29	AX27	AX29	AX30	AX30	AX31	AX32	AX34	AX41			
101~125		AX26	AX25	AX26	AX28	AX28	AX29	AX30	AX32	AX41			
		AX24	AX23	AX24	AX26	AX26	AX27	AX27	AX29	AX37			
126~150		AX24	AX23	AX24	AX25	AX25	AX28	AX29	AX31	AX41			
		AX22	AX21	AX22	AX23	AX23	AX26	AX27	AX28	AX37			
151~160		AX24	AX23	AX24	AX25	AX25	AX28	AX29	AX31	AX41			
		AX22	AX21	AX22	AX23	AX23	AX26	AX27	AX28	AX37			
161~180		AX24	AX23	AX24	AX25	AX25	AX28	AX29	AX31	AX41			
		AX22	AX21	AX22	AX23	AX23	AX26	AX27	AX28	AX37			
181~200		AX24	AX23	AX24	AX25	AX25	AX28	AX29	AX31	AX41			
		AX22	AX21	AX22	AX23	AX23	AX26	AX27	AX28	AX37			
201~210		AX23	AX22	AX23	AX24	AX24	AX26	AX28	AX30	AX40			
		AX21	AX20	AX21	AX22	AX22	AX24	AX26	AX27	AX36			
211~250		AX23	AX22	AX23	AX24	AX24	AX26	AX28	AX30	AX40			
		AX21	AX20	AX21	AX22	AX22	AX24	AX26	AX27	AX36			
251~300		AX23	AX22	AX23	AX24	AX24	AX26	AX28	AX30	AX40			
		AX21	AX20	AX21	AX22	AX22	AX24	AX26	AX27	AX36			
301~350		AX23	AX22	AX23	AX24	AX24	AX26	AX28	AX30	AX40			
		AX21	AX20	AX21	AX22	AX22	AX24	AX26	AX27	AX36			
351~400		AX23	AX22	AX23	AX24	AX24	AX26	AX28	AX30	AX40			
		AX21	AX20	AX21	AX22	AX22	AX24	AX26	AX27	AX36			
401~450		AX23	AX22	AX23	AX24	AX24	AX26	AX28	AX30	AX40			
		AX21	AX20	AX21	AX22	AX22	AX24	AX26	AX27	AX36			
451~500		AX23	AX22	AX23	AX24	AX24	AX26	AX28	AX30	AX40			
		AX21	AX20	AX21	AX22	AX22	AX24	AX26	AX27	AX36			
50~125	125	AX35	AX33	AX35	AX35	AX41	AX43	AX45	AX50	AX59	AX75	AX85	
		AX32	AX30	AX32	AX32	AX32	AX37	AX39	AX41	AX45	AX54	AX68	AX77
126~150		AX26	AX25	AX26	AX29	AX29	AX32	AX33	AX36	AX44	AX53	AX69	AX85
		AX24	AX23	AX24	AX27	AX27	AX29	AX30	AX33	AX40	AX48	AX63	AX77
151~160		AX26	AX25	AX26	AX29	AX29	AX32	AX33	AX36	AX44	AX52	AX69	AX81
		AX24	AX23	AX24	AX27	AX27	AX29	AX30	AX33	AX40	AX47	AX63	AX73
161~180		AX26	AX25	AX26	AX29	AX29	AX32	AX33	AX36	AX44	AX52	AX69	AX81
		AX24	AX23	AX24	AX27	AX27	AX29	AX30	AX33	AX40	AX47	AX63	AX73
181~200		AX26	AX25	AX26	AX29	AX29	AX32	AX33	AX36	AX44	AX52	AX69	AX81
		AX24	AX23	AX24	AX27	AX27	AX29	AX30	AX33	AX40	AX47	AX63	AX73
201~210		AX25	AX24	AX25	AX25	AX30	AX31	AX34	AX43	AX51	AX69	AX81	
		AX23	AX22	AX23	AX23	AX27	AX28	AX31	AX39	AX46	AX63	AX73	
211~250		AX25	AX24	AX25	AX25	AX25	AX30	AX31	AX34	AX43	AX51	AX69	AX81
		AX23	AX22	AX23	AX23	AX23	AX27	AX28	AX31	AX39	AX46	AX63	AX73
251~300		AX24	AX23	AX24	AX25	AX25	AX29	AX30	AX33	AX43	AX51	AX69	AX81
		AX22	AX21	AX22	AX23	AX23	AX27	AX27	AX30	AX39	AX46	AX63	AX73
301~350		AX24	AX23	AX24	AX25	AX25	AX29	AX30	AX33	AX43	AX51	AX69	AX81
		AX22	AX21	AX22	AX23	AX23	AX27	AX27	AX30	AX39	AX46	AX63	AX73
351~400		AX24	AX23	AX24	AX25	AX25	AX29	AX30	AX33	AX42	AX50	AX65	AX76
		AX22	AX21	AX22	AX23	AX23	AX27	AX27	AX30	AX38	AX45	AX59	AX69
401~450		AX24	AX23	AX24	AX25	AX25	AX29	AX30	AX33	AX42	AX50	AX65	AX76
		AX22	AX21	AX22	AX23	AX23	AX27	AX27	AX30	AX38	AX45	AX59	AX69
451~500		AX24	AX23	AX24	AX25	AX25	AX29	AX30	AX33	AX42	AX50	AX65	AX76
		AX22	AX21	AX22	AX23	AX23	AX27	AX27	AX30	AX38	AX45	AX59	AX69

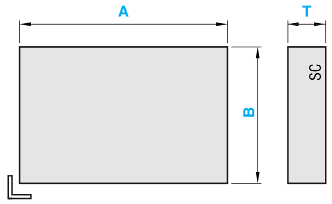
Price calculation formula (A×Price coefficient) Upper : Size specified type Lower : Economy type

A (1mm incr.)	B \ T	8	10	13	15	16	20	22	25	30	35	40	50
101~150	150	AX39	AX37	AX36	AX42	AX42	AX46	AX50	AX53	AX62	AX79	AX92	AX117
		AX36	AX34	AX33	AX38	AX38	AX42	AX45	AX48	AX56	AX72	AX83	AX106
151~180		AX37	AX36	AX36	AX41	AX41	AX45	AX47	AX51	AX59	AX75	AX90	AX115
		AX34	AX33	AX33	AX37	AX37	AX41	AX43	AX46	AX54	AX68	AX81	AX104
181~200		AX35	AX34	AX33	AX37	AX37	AX43	AX45	AX47	AX55	AX69	AX89	AX112
		AX32	AX31	AX30	AX34	AX34	AX39	AX41	AX43	AX50	AX63	AX81	AX101
201~210		AX35	AX34	AX33	AX37	AX37	AX43	AX45	AX47	AX55	AX69	AX89	AX112
		AX32	AX31	AX30	AX34	AX34	AX39	AX41	AX43	AX50	AX63	AX81	AX101
211~250		AX35	AX34	AX33	AX37	AX37	AX43	AX45	AX47	AX55	AX69	AX89	AX112
		AX32	AX31	AX30	AX34	AX34	AX39	AX41	AX43	AX50	AX63	AX81	AX101
251~300		AX35	AX34	AX33	AX37	AX37	AX43	AX45	AX47	AX55	AX69	AX89	AX112
		AX32	AX31	AX30	AX34	AX34	AX39	AX41	AX43	AX50	AX63	AX81	AX101
301~350		AX31	AX30	AX29	AX35	AX35	AX39	AX41	AX45	AX55	AX69	AX86	AX110
		AX28	AX27	AX27	AX32	AX32	AX36	AX37	AX41	AX50	AX63	AX78	AX99
351~400		AX31	AX30	AX29	AX35	AX35	AX39	AX41	AX45	AX55	AX65	AX86	AX110
		AX28	AX27	AX27	AX32	AX32	AX36	AX37	AX41	AX50	AX59	AX78	AX99
401~450		AX31	AX30	AX29	AX35	AX35	AX39	AX41	AX45	AX55	AX65	AX86	AX110
		AX28	AX27	AX27	AX32	AX32	AX36	AX37	AX41	AX50	AX59	AX78	AX99
451~500		AX31	AX30	AX29	AX35	AX35	AX39	AX41	AX45	AX55	AX65	AX86	AX110
		AX28	AX27	AX27	AX32	AX32	AX36	AX37	AX41	AX50	AX59	AX78	AX99
101~160	160	AX35	AX35	AX35	AX40	AX40	AX45	AX46	AX51	AX58	AX68	AX88	AX112
		AX32	AX32	AX32	AX36	AX36	AX41	AX42	AX46	AX53	AX62	AX80	AX101
161~200		AX33	AX32	AX31	AX36	AX36	AX41	AX43	AX46	AX55	AX68	AX86	AX109
		AX30	AX29	AX28	AX33	AX33	AX37	AX39	AX42	AX50	AX62	AX78	AX99
201~250		AX33	AX32	AX31	AX36	AX36	AX41	AX43	AX46	AX55	AX65	AX86	AX109
		AX30	AX29	AX28	AX33	AX33	AX37	AX39	AX42	AX50	AX59	AX78	AX99
251~300		AX33	AX30	AX29	AX35	AX35	AX39	AX41	AX45	AX55	AX65	AX86	AX109
		AX30	AX27	AX27	AX32	AX32	AX36	AX37	AX41	AX50	AX59	AX78	AX99
301~350		AX29	AX28	AX26	AX33	AX33	AX36	AX39	AX43	AX55	AX65	AX81	AX107
		AX27	AX26	AX24	AX30	AX30	AX33	AX36	AX39	AX48	AX57	AX73	AX97
351~400		AX29	AX28	AX26	AX33	AX33	AX36	AX39	AX43	AX53	AX63	AX81	AX107
		AX27	AX26	AX24	AX30	AX30	AX33	AX36	AX39	AX48	AX57	AX73	AX97
401~450		AX29	AX28	AX26	AX33	AX33	AX36	AX39	AX43	AX53	AX63	AX81	AX107
		AX27	AX26	AX24	AX30	AX30	AX33	AX36	AX39	AX48	AX57	AX73	AX97
451~500		AX29	AX28	AX26	AX33	AX33	AX36	AX39	AX43	AX53	AX63	AX81	AX107
		AX27	AX26	AX24	AX30	AX30	AX33	AX36	AX39	AX48	AX57	AX73	AX97
101~200	200		AX41	AX41	AX45	AX45	AX52	AX55	AX59	AX75	AX86	AX97	AX124
			AX37	AX37	AX41	AX41	AX47	AX50	AX54	AX68	AX78	AX88	AX112
201~250			AX36	AX35	AX40	AX40	AX45	AX48	AX53	AX75	AX86	AX97	AX124
			AX33	AX32	AX36	AX36	AX41	AX44	AX48	AX68	AX78	AX88	AX112
251~300			AX36	AX35	AX40	AX40	AX45	AX48	AX53	AX70	AX83	AX95	AX119
			AX33	AX32	AX36	AX36	AX41	AX44	AX48	AX63	AX75	AX86	AX108
301~350			AX36	AX35	AX40	AX40	AX45	AX48	AX53	AX68	AX83	AX95	AX119
			AX33	AX32	AX36	AX36	AX41	AX44	AX48	AX62	AX75	AX86	AX108
351~400			AX33	AX32	AX35	AX35	AX42	AX44	AX47	AX68	AX83	AX95	AX119
			AX30	AX29	AX32	AX32	AX38	AX40	AX43	AX62	AX75	AX86	AX108
401~450			AX32	AX31	AX35	AX35	AX40	AX42	AX45	AX64	AX76	AX89	AX114
			AX29	AX28	AX32	AX32	AX36	AX38	AX41	AX58	AX69	AX81	AX103
451~500			AX32	AX31	AX35	AX35	AX40	AX42	AX45	AX64	AX76	AX89	AX114
			AX29	AX28	AX32	AX32	AX36	AX38	AX41	AX58	AX69	AX81	AX103
101~200	250		AX45	AX45	AX48	AX48	AX55	AX57	AX64	AX88	AX105	AX117	AX138
			AX41	AX41	AX44	AX44	AX50	AX52	AX58	AX80	AX95	AX106	AX125
201~250			AX41	AX40	AX44	AX44	AX50	AX52	AX57	AX84	AX103	AX117	AX138
			AX37	AX36	AX40	AX40	AX45	AX47	AX52	AX76	AX93	AX106	AX125
251~300			AX41	AX40	AX44	AX44	AX50	AX52	AX57	AX84	AX103	AX117	AX138
			AX37	AX36	AX40	AX40	AX45	AX47	AX52	AX76	AX93	AX106	AX125
301~350			AX41	AX40	AX44	AX44	AX50	AX52	AX57	AX84	AX103	AX117	AX138
			AX37	AX36	AX40	AX40	AX45	AX47	AX52	AX76	AX93	AX106	AX125
351~400			AX37	AX36	AX41	AX41	AX46	AX52	AX55	AX84	AX103	AX114	AX133
			AX34	AX33	AX37	AX37	AX42	AX47	AX50	AX76	AX93	AX103	AX120
401~450			AX37	AX36	AX41	AX41	AX46	AX50	AX54	AX80	AX98	AX114	AX133
			AX34	AX33	AX37	AX37	AX42	AX45	AX49	AX72	AX89	AX103	AX120
451~500			AX36	AX35	AX40	AX40	AX45	AX47	AX53	AX80	AX92	AX109	AX129
			AX33	AX32	AX36	AX36	AX41	AX43	AX48	AX72	AX83	AX99	AX117
101~200	300					AX65	AX75	AX80	AX86	AX97	AX114	AX124	AX145
						AX59	AX68	AX72	AX78	AX88	AX103	AX112	AX131
201~300						AX62	AX69	AX74	AX78	AX97	AX114	AX124	AX145
						AX56	AX63	AX67	AX71	AX88	AX103	AX112	AX131
301~350						AX58	AX66	AX70	AX77	AX97	AX113	AX120	AX142
						AX53	AX60	AX63	AX70	AX88	AX102	AX108	AX128
351~400						AX58	AX66	AX70	AX77	AX97	AX113	AX120	AX142
						AX53	AX60	AX63	AX70	AX88	AX102	AX108	AX128
401~450						AX57	AX65	AX69	AX75	AX96	AX108	AX118	AX138
						AX52	AX59	AX63	AX68	AX87	AX98	AX107	AX125
451~500						AX57	AX65	AX69	AX75	AX96	AX108	AX118	AX138
						AX52	AX59	AX63	AX68	AX87	AX98	AX107	AX125

FINISHED PLATES —SC—
—STANDARD · SIZE SPECIFIED · ECONOMY TYPE—



SC (Standard type)
S—SC (Size specified type)
E—SC (Economy type)



Type	Dimension tolerance A · B		Dimension tolerance T
Standard / Size specified	99mm or less	+0.4 / 0	+0.3 / +0.1
	100~250mm	+0.5 / 0	
	251mm or more	+0.8 / 0	
Economy	99mm or less	+0.4 / 0	+0.4 / +0.2
	100~250mm	+0.5 / 0	
	251mm or more	+0.8 / 0	

Precision standards P.1158

M S50C (Raw material)

Order

Catalog No.	—	A	—	B	—	T
SC	—	100	—	100	—	8
S—SC	—	380	—	200	—	30
E—SC	—	210	—	150	—	22

Delivery

3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1~9	10~30
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

A (dimension A) ×Price coefficient=Unit price

(ex) S—SC—300—200—30

300 × 25 =¥7,500

Alteration

P.1174 (B and T dimension changeable)

Alterations are available for size specified and economy type.

U/Price (Standard type)

A	B	8	10	13	15	16	20	22	25	30	35	40	50
60	60	930	970	840	840	840	970						
80	60	1,020	1,020	880	880	880	1,060						
500	60	3,960	4,100	3,610	3,790	3,790	4,320						
80	80	1,020	1,100	930	930	930	1,100	1,150	1,280	1,500	1,850		
100	80	1,060	1,100	1,020	1,150	1,150	1,320	1,410	1,460	1,680	2,030		
125	80	1,150	1,190	1,100	1,190	1,190	1,370	1,460	1,500	1,760	2,200		
150	80	1,280	1,370	1,240	1,320	1,320	1,410	1,500	1,590	1,850	2,290		
160	80	1,320	1,410	1,280	1,410	1,410	1,460	1,540	1,630	1,940	2,380		
200	80	1,590	1,680	1,460	1,590	1,590	1,720	1,940	2,120	2,380	2,820		
250	80	2,030	2,160	1,940	2,030	2,030	2,290	2,420	2,560	2,820	3,260		
500	80	4,010	4,180	3,700	3,880	3,880	4,360	4,620	4,980	5,460	6,250		
100	100	1,150	1,190	1,100	1,190	1,190	1,320	1,370	1,500	1,760	1,940	2,040	2,390
125	100	1,280	1,320	1,150	1,240	1,240	1,370	1,410	1,540	1,850	2,290	2,420	2,840
150	100	1,370	1,410	1,240	1,320	1,320	1,410	1,500	1,590	1,900	2,340	2,830	3,320
160	100	1,500	1,540	1,370	1,460	1,460	1,540	1,630	1,720	2,030	2,470	2,970	3,470
180	100	1,590	1,680	1,460	1,540	1,540	1,630	1,720	1,900	2,200	2,640	3,300	3,860
200	100	1,680	1,760	1,590	1,680	1,680	1,850	1,980	2,070	2,380	2,820	3,620	4,240
210	100	1,760	1,850	1,630	1,760	1,760	1,940	2,070	2,380	2,730	3,300	3,760	4,390
250	100	2,160	2,290	2,030	2,160	2,160	2,420	2,510	2,640	3,000	3,570	4,380	5,130
300	100	2,510	2,640	2,290	2,560	2,560	2,690	3,000	3,080	3,480	4,050	4,780	5,920
350	100	2,950	3,130	2,690	2,950	2,950	3,300	3,440	3,740	4,180	4,840	5,590	6,820
400	100	3,390	3,610	3,080	3,350	3,350	3,700	3,920	4,140	4,580	5,240	5,940	7,100
450	100	3,830	4,100	3,520	3,740	3,740	4,180	4,400	4,760	5,240	5,940	6,510	7,950
500	100	4,230	4,450	3,880	4,100	4,100	4,620	4,800	5,240	5,770	6,520	7,420	8,810
125	125	1,370	1,410	1,280	1,370	1,370	1,410	1,500	1,590	1,980	2,470	3,040	4,010
150	125	1,460	1,680	1,320	1,410	1,410	1,590	1,680	1,760	2,160	2,640	3,220	4,180
160	125	1,590	1,810	1,460	1,540	1,540	1,680	1,760	1,940	2,340	2,820	3,390	4,360
180	125	1,630	1,850	1,500	1,590	1,590	1,720	1,810	1,980	2,420	2,910	3,480	4,450
200	125	1,760	1,900	1,680	1,810	1,810	1,900	2,030	2,250	2,690	3,220	3,830	4,890
210	125	1,850	1,940	1,720	1,900	1,900	2,030	2,200	2,380	2,820	3,350	3,960	5,020
250	125	2,290	2,380	2,120	2,200	2,200	2,380	2,470	2,640	3,130	3,700	4,360	5,500
300	125	2,640	2,730	2,380	2,640	2,640	2,780	3,040	3,170	3,660	4,230	4,890	6,030
350	125	3,130	3,220	2,860	3,130	3,130	3,350	3,520	3,830	4,360	4,980	5,680	6,910
400	125	3,610	3,700	3,350	3,520	3,520	3,790	4,050	4,230	4,760	5,370	6,080	7,310
450	125	4,100	4,180	3,830	4,010	4,010	4,230	4,540	4,800	5,370	6,030	6,780	8,100
500	125	4,580	4,670	4,180	4,450	4,450	4,670	5,020	5,460	6,080	6,780	7,570	8,980

U/Price (Standard type)

A	B	8	10	13	15	16	20	22	25	30	35	40	50
150	150	1,900	1,940	1,720	1,810	1,810	1,980	2,070	2,200	2,470	3,040	3,780	4,890
180	150	2,160	2,200	1,980	2,120	2,120	2,380	2,560	2,730	3,170	3,740	4,150	4,990
200	150	2,290	2,380	2,160	2,290	2,290	2,600	2,820	3,040	3,520	4,140	4,520	5,290
210	150	2,420	2,510	2,290	2,420	2,420	2,690	2,910	3,130	3,660	4,270	4,920	5,780
250	150	2,910	3,040	2,730	2,950	2,950	3,000	3,170	3,350	3,960	4,620	5,760	6,520
300	150	3,480	3,610	3,220	3,440	3,440	3,520	3,660	3,960	4,670	5,330	6,270	7,380
350	150	4,050	4,180	3,700	3,920	3,920	4,010	4,180	4,490	5,330	6,030	6,790	8,260
400	150	4,710	4,840	4,270	4,490	4,490	4,580	4,800	5,150	6,120	6,820	7,410	8,810
450	150	5,240	5,420	4,760	4,980	4,980	5,110	5,330	5,770	6,820	7,570	8,230	9,750
500	150	5,460	5,810	5,110	5,420	5,420	5,590	5,860	6,300	7,530	8,320	9,080	10,730
160	160	1,810	1,850	1,630	1,720	1,720	1,900	1,980	2,120	2,380	2,950	3,610	4,760
200	160	2,030	2,120	1,900	2,030	2,030	2,340	2,560	2,780	3,260	3,880	4,230	5,020
250	160	2,560	2,690	2,380	2,600	2,600	2,640	2,820	3,000	3,610	4,270	5,020	5,990
300	160	3,130	3,260	2,860	3,080	3,080	3,170	3,300	3,610	4,320	4,980	5,720	7,040
350	160	3,700	3,830	3,350	3,570	3,570	3,660	3,830	4,140	4,980	5,680	6,470	7,880
400	160	4,270	4,400	3,830	4,050	4,050	4,140	4,360	4,710	5,680	6,380	7,180	8,580
450	160	4,800	4,980	4,320	4,540	4,540	4,670	4,890	5,330	6,380	7,130	7,970	9,460
500	160	5,020	5,370	4,670	4,980	4,980	5,150	5,420	5,860	7,090	7,880	8,760	10,340
200	200	2,640	2,780	2,510	2,690	2,690	2,910	3,040	3,260	3,700	4,050	4,400	5,200
250	200	3,170	3,350	3,000	3,170	3,170	3,440	3,610	3,920	4,360	4,840	5,370	6,300
300	200	3,610	3,830	3,440	3,700	3,700	4,010	4,230	4,540	5,280	5,680	6,250	7,400
350	200	4,140	4,400	3,920	4,230	4,230	4,580	4,800	5,200	5,810	6,520	7,180	8,450
400	200	4,670	4,980	4,400	4,980	4,980	5,420	5,720	6,160	6,870	7,620	8,360	10,170
450	200	5,200	5,590	4,890	5,680	5,680	6,030	6,520	6,740	7,790	8,360	9,600	11,180
500	200	5,680	6,120	5,330	5,770	5,770	6,300	6,870	7,350	8,410	9,240	10,700	12,150
250	250	4,230	4,540	4,010	4,580	4,580	4,840	5,280	5,590	5,640	5,990	6,600	7,700
300	250	4,930	5,060	4,710	4,930	4,930	5,420	5,720	6,210	6,470	6,960	7,660	9,020
350	250	5,500	5,720	5,240	5,500	5,500	6,120	6,470	7,000	7,400	7,970	8,800	10,700
400	250	6,080	6,380	5,770	6,340	6,340	7,090	7,530	8,100	8,320	9,240	10,520	12,280
450	250	6,650	7,040	6,300	7,040	7,040	8,140	8,580	9,240	9,730	10,390	11,530	13,600
500	250	7,090	7,530	6,780	7,480	7,480	8,410	8,890	9,600	10,300	11,140	12,720	14,300
300	300	4,890	5,200	4,710	5,420	5,420	6,380	6,740	7,260	7,840	8,230	13,360	15,470
350	300	5,640	5,940	5,420	6,210	6,210	7,180	7,570	8,230	9,290	10,040	15,340	17,750
400	300	6,380	6,690	6,120	7,130	7,130	8,140	8,630	9,330	10,520	11,180	17,320	20,050
450	300	7,130	7,440	6,820	7,840	7,840	8,980	9,510	10,300	11,800	12,410	19,280	22,290
500	300	7,700	8,100	7,480	8,010	8,010	9,240	9,950	10,830	12,590	13,640	21,280	24,580

Price calculation formula (A×Price coefficient) Upper : Size specified type / Lower : Economy type

A (1mm incr.)	B	8	10	13	15	16	20	22	25	30	35	40	50
30~ 60	60	A×18	A×19	A×15	A×17	A×17	A×19						
		A×17	A×18	A×14	A×16	A×16	A×18						
61~ 80	60	A×18	A×19	A×15	A×17	A×17	A×19						
		A×17	A×18	A×14	A×16	A×16	A×18						
81~100	60	A×15	A×17	A×15	A×17	A×17	A×18						
		A×14	A×16	A×14	A×16	A×16	A×17						
101~200	60	A×12	A×13	A×12	A×12	A×12	A×13						
		A×11	A×12	A×11	A×11	A×11	A×12						
201~300	60	A×11	A×12	A×11	A×11	A×11	A×12						
		A×10	A×11	A×10	A×10	A×10	A×11						
301~400	60	A×11	A×12	A×11	A×11	A×11	A×12						
		A×10	A×11	A×10	A×10	A×10	A×11						
401~500	60	A×11	A×12	A×11	A×11	A×11	A×12						
		A×10	A×11	A×10	A×10	A×10	A×11						
30~ 80	80	A×18	A×19	A×15	A×17	A×17	A×19	A×19	A×22	A×24	A×26		
		A×17	A×18	A×14	A×16	A×16	A×18	A×18	A×20	A×22	A×24		
81~100	80	A×18	A×19	A×15	A×17	A×17	A×19	A×19	A×22	A×24	A×26		
		A×17	A×18	A×14	A×16	A×16	A×18	A×18	A×20	A×22	A×24		
101~125	80	A×13	A×13	A×12	A×15	A×15	A×17	A×18	A×19	A×21	A×24		
		A×12	A×12	A×11	A×14	A×14	A×16	A×17	A×18	A×19	A×22		
126~150	80	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×18	A×21		
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×19		
151~160	80	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×18	A×21		
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×19		
161~200	80	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×18	A×21		
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×19		
201~250	80	A×11	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×19		
		A×10	A×11	A×10	A×10	A×10	A×11	A×12	A×13	A×16	A×18		
251~500	80	A×11	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×19		
		A×10	A×11	A×10	A×10	A×10	A×11	A×12	A×13	A×16	A×18		
30~100	100	A×19	A×19	A×17	A×18	A×18	A×19	A×20	A×23	A×25	A×29	A×32	A×37
		A×18	A×18	A×16	A×17	A×17	A×18	A×18	A×21	A×23	A×27	A×29	A×34
101~125	100	A×15	A×15	A×14	A×15	A×15	A×17	A×18	A×19	A×22	A×26	A×30	A×35
		A×14	A×14	A×13	A×14	A×14	A×16	A×17	A×18	A×20	A×24	A×27	A×32
126~150	100	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×18	A×21	A×26	A×30
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×19	A×24	A×27
151~160	100	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×18	A×21	A×26	A×30
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×19	A×24	A×27
161~180	100	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×18	A×21	A×24	A×27
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×19	A×22	A×25
181~200	100	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×18	A×21	A×24	A×27
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×19	A×22	A×25
201~210	100	A×12	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×18	A×21	A×24	A×27
		A×11	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×19	A×22	A×25
211~250	100	A×12	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×18	A×20	A×23	A×26
		A×11	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×18	A×21	A×24
251~300	100	A×12	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×18	A×20	A×23	A×26
		A×11	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×18	A×21	A×24
301~350	100	A×12	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×18	A×20	A×23	A×26
		A×11	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×18	A×21	A×24
351~400	100	A×12	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×18	A×20	A×23	A×26
		A×11	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×18	A×21	A×24
401~450	100	A×12	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×18	A×20	A×23	A×26
		A×11	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×18	A×21	A×24
451~500	100	A×12	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×18	A×20	A×23	A×26
		A×11	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×17	A×18	A×21	A×24
50~125	125	A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×22	A×28	A×31	A×36
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×20	A×26	A×28	A×33
126~150	125	A×14	A×14	A×13	A×13	A×13	A×14	A×14	A×15	A×20	A×24	A×28	A×36
		A×13	A×13	A×12	A×12	A×12	A×13	A×13	A×14	A×18	A×22	A×26	A×33
151~160	125	A×14	A×14	A×13	A×13	A×13	A×14	A×14	A×15	A×20	A×24	A×28	A×32
		A×13	A×13	A×12	A×12	A×12	A×13	A×13	A×14	A×18	A×22	A×26	A×29
161~180	125	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×19	A×22	A×25	A×28
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×18	A×20	A×23	A×26
181~200	125	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×19	A×22	A×25	A×28
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×18	A×20	A×23	A×26
201~210	125	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×19	A×22	A×25	A×28
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×18	A×20	A×23	A×26
211~250	125	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×19	A×22	A×25	A×28
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×18	A×20	A×23	A×26
251~300	125	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×19	A×22	A×25	A×28
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×18	A×20	A×23	A×26
301~350	125	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×19	A×22	A×25	A×28
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×18	A×20	A×23	A×26
351~400	125	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×19	A×22	A×25	A×28
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×18	A×20	A×23	A×26
401~450	125	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×19	A×22	A×25	A×28
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×18	A×20	A×23	A×26
451~500	125	A×13	A×13	A×12	A×12	A×12	A×13	A×14	A×15	A×19	A×22	A×25	A×28
		A×12	A×12	A×11	A×11	A×11	A×12	A×13	A×14	A×18	A×20	A×23	A×26

Price calculation formula (A×Price coefficient) Upper : Size specified type / Lower : Economy type

A (1mm incr.)	B	8	10	13	15	16	20	22	25	30	35	40	50
101~150	150	A×18	A×18	A×17	A×18	A×18	A×19	A×20	A×21	A×24	A×28	A×34	A×41
		A×17	A×17	A×16	A×17	A×17	A×18	A×18	A×19	A×22	A×26	A×31	A×37
151~180	150	A×18	A×18	A×17	A×18	A×18	A×19	A×20	A×21	A×24	A×28	A×34	A×41
		A×17	A×17	A×16	A×17	A×17	A×18	A×18	A×19	A×22	A×26	A×31	A×37
181~200	150	A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×22	A×25	A×30	A×36
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×20	A×23	A×27	A×33
201~210	150	A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×22	A×25	A×30	A×36
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×20	A×23	A×27	A×33
211~250	150	A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×22	A×25	A×30	A×36
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×20	A×23	A×27	A×33
251~300	150	A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×22	A×25	A×30	A×36
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×20	A×23	A×27	A×33
301~350	150	A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×22	A×25	A×30	A×36
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×20	A×23	A×27	A×33
351~400	150	A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×22	A×25	A×30	A×36
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×20	A×23	A×27	A×33
401~450	150	A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×22	A×25	A×30	A×36
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×20	A×23	A×27	A×33
451~500	150	A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×22	A×25	A×30	A×36
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×20	A×23	A×27	A×33
101~160	160	A×18	A×17	A×15	A×18	A×18	A×19	A×20	A×21	A×23	A×26	A×33	A×41
		A×17	A×16	A×14	A×17	A×17	A×18	A×18	A×19	A×21	A×24	A×30	A×37
161~200	160	A×15	A×14	A×13	A×15	A×15	A×15	A×17	A×18	A×21	A×25	A×30	A×35
		A×14	A×13	A×12	A×14	A×14	A×14	A×16	A×17	A×19	A×23	A×27	A×32
201~250	160	A×15	A×14	A×13	A×15	A×15	A×15	A×17	A×18	A×21	A×25	A×30	A×35
		A×14	A×13	A×12	A×14	A×14	A×14	A×16	A×17	A×19	A×23	A×27	A×32
251~300	160	A×15	A×14	A×13	A×15	A×15	A×15	A×17	A×18	A×21	A×25	A×28	A×31
		A×14	A×13	A×12	A×14	A×14	A×14	A×16	A×17	A×19	A×23	A×26	A×28
301~350	160	A×15	A×14	A×13	A×15	A×15	A×15	A×17	A×18	A×21	A×25	A×28	A×31
		A×14	A×13	A×12	A×14	A×14	A×14	A×16	A×17	A×19	A×23	A×26	A×28
351~400	160	A×15	A×14	A×13	A×15	A×15	A×15	A×17	A×18	A×21	A×25	A×28	A×31
		A×14	A×13	A×12	A×14	A×14	A×14	A×16	A×17	A×19	A×23	A×26	A×28
401~450	160	A×15	A×14	A×13	A×15	A×15	A×15	A×17	A×18	A×21	A×25	A×28	A×31
		A×14	A×13	A×12	A×14	A×14	A×14	A×16	A×17	A×19	A×23	A×26	A×28
451~500	160	A×15	A×14	A×13	A×15	A×15	A×15	A×17	A×18	A×21	A×25	A×28	A×31
		A×14	A×13	A×12	A×14	A×14	A×14	A×16	A×17	A×19	A×23	A×26	A×28
101~200	200	A×23	A×22	A×21	A×23	A×23	A×24	A×25	A×25	A×28	A×33	A×34	A×37
		A×21	A×20	A×19	A×21	A×21	A×22	A×23	A×23	A×26	A×30	A×31	A×34
201~250	200	A×19	A×18	A×17	A×19	A×19	A×20	A×21	A×22	A×25	A×29	A×31	A×35
		A×18	A×17	A×16	A×18	A×18	A×18	A×19	A×20	A×23	A×27	A×28	A×32
251~300	200	A×19	A×18	A×17	A×19	A×19	A×20	A×21	A×22	A×25	A×29	A×31	A×35
		A×18	A×17	A×16	A×18	A×18	A×18	A×19	A×20	A×23	A×27	A×28	A×32
301~350	200	A×19	A×18	A×17	A×19	A×19	A×20	A×21	A×22	A×25	A×29	A×31	A×33
		A×18	A×17	A×16	A×18	A×18	A×18	A×19	A×20	A×23	A×27	A×28	A×30
351~400	200	A×17	A×17	A×15	A×17	A×17	A×18	A×19	A×20	A×23	A×28	A×29	A×33
		A×16	A×16	A×14	A×16	A×16	A×17	A×18	A×18	A×21	A×26	A×27	A×30
401~450	200	A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×22	A×28	A×29	A×33
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×20	A×26	A×27	A×30
451~500	200	A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×22	A×28	A×29	A×33
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×20	A×26	A×27	A×30
101~200	250	A×25	A×25	A×24	A×25	A×25	A×29	A×30	A×32	A×34	A×35	A×36	A×41
		A×23	A×23	A×22	A×23	A×23	A×27	A×27	A×29	A×31	A×32	A×33	A×37
201~250	250	A×21	A×21	A×19	A×21	A×21	A×23	A×25	A×25	A×28	A×31	A×33	A×37
		A×19	A×19	A×18	A×19	A×19	A×21	A×23	A×23	A×26	A×28	A×30	A×34
251~300	250	A×21	A×21	A×19	A×21	A×21	A×23	A×25	A×25	A×28	A×31	A×33	A×37
		A×19	A×19	A×18	A×19	A×19	A×21	A×23	A×23	A×26	A×28	A×30	A×34
301~350	250	A×20	A×20	A×18	A×20	A×20	A×23	A×24	A×25	A×28	A×31	A×33	A×35
		A×18	A×18	A×17	A×18	A×18	A×21	A×22	A×23	A×26	A×28	A×30	A×32
351~400	250	A×19	A×19	A×18	A×19	A×19	A×21	A×22	A×24	A×25	A×30	A×31	A×35
		A×18	A×18	A×17	A×18	A×18	A×19	A×20	A×22	A×23	A×27	A×28	A×32
401~450	250	A×19	A×19	A×17	A×19	A×19	A×21	A×22	A×24	A×25	A×30	A×31	A×35
		A×18	A×18	A×16	A×18	A×18	A×19	A×20	A×22	A×23	A×27	A×28	A×32
451~500	250	A×19	A×19	A×17	A×19	A×19	A×21	A×22	A×24	A×25	A×30	A×31	A×35
		A×18	A×18	A×16	A×18	A×18	A×19	A×20	A×22	A×23	A×27	A×28	A×32
101~200	300	A×32	A×32	A×30	A×33	A×33	A×36	A×39	A×42	A×45	A×48	A×60	A×67
		A×29	A×29	A×27	A×30	A×30	A×33	A×36	A×38	A×41	A×44	A×54	A×61
201~300	300	A×25	A×25	A×24	A×26	A×26	A×31	A×33	A×35	A×40	A×43	A×57	A×65
		A×23	A×23	A×22	A×24	A×24	A×28	A×30	A×32	A×36	A×39	A×52	A×59
301~350	300	A×25	A×25	A×23	A×25	A×25	A×30	A×32	A×35	A×39	A×42	A×57	A×63
		A×23	A×23	A×21	A×23	A×23	A×27	A×29	A×32	A×36	A×38	A×52	A×57
351~400	300	A×25	A×25	A×23	A×25	A×25	A×30	A×32	A×35	A×39	A×42	A×57	A×63
		A×23	A×23	A×21	A×23	A×23	A×27	A×29	A×32	A×36	A×38	A×52	A×57
401~450	300	A×23	A×23	A×21	A×24	A×24	A×26	A×29	A×32	A×35	A×39	A×55	A×61
		A×21	A×21	A×19	A×22	A×22	A×24	A×27	A×29	A×32	A×36	A×50	A×55
451~500	300	A×23	A×23	A×21	A×24	A×24	A×26	A×29	A×32	A×35	A×39	A×55	A×61
		A×21	A×21	A×19	A×22	A×22	A×24	A×27	A×29	A×32	A×36	A×50	A×55

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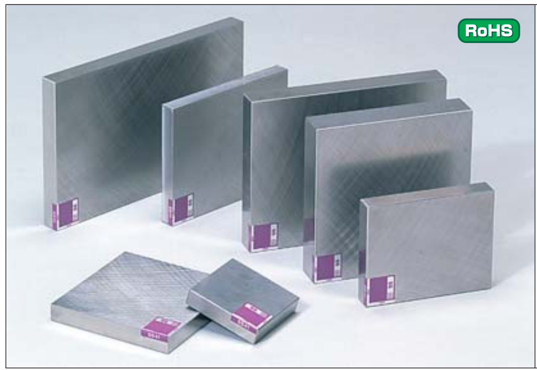

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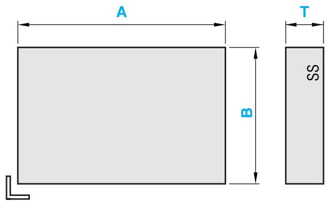


Type	Dimension tolerance A · B		Dimension tolerance T
Standard Size specified	99mm or less	+0.4 / 0	+0.3 / +0.1
	100~250mm	+0.5 / 0	
	251mm or more	+0.8 / 0	
Economy	99mm or less	+0.4 / 0	+0.4 / +0.2
	100~250mm	+0.5 / 0	
	251mm or more	+0.8 / 0	

Precision standards P.1158

M SS400 (Raw material)

Order

Catalog No.	—	A	—	B	—	T
SS	—	250	—	125	—	22
S—SS	—	480	—	300	—	35
E—SS	—	150	—	80	—	15

Delivery

3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1~9	10~30
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

A (dimension A) ×Price coefficient=Unit price

(ex) S—SS—480—300—35

480 × 33 =¥15,840

Alteration

P.1174 (B and T dimension changeable)

Alterations are available for size specified and economy type.

U/Price (Standard type)

A	B \ T	8	10	13	15	16	20	22	25	30	35	40	50
60	60	880	930	800	800	800	930	1,050	1,150				
80		930	1,020	840	840	840	1,020	1,180	1,240				
500		3,660	3,700	3,520	3,700	3,700	4,230	4,270	4,320				
80	80	970	1,020	880	880	880	1,060	1,150	1,280	1,410	1,760		
100		1,020	1,060	970	1,060	1,060	1,150	1,280	1,370	1,590	1,940		
125		1,100	1,150	1,100	1,150	1,150	1,240	1,320	1,410	1,680	2,070		
150		1,280	1,370	1,240	1,320	1,320	1,370	1,410	1,590	1,760	2,200		
160		1,320	1,370	1,280	1,370	1,370	1,460	1,540	1,630	2,030	2,290		
200		1,590	1,680	1,410	1,590	1,590	1,680	1,720	1,810	2,380	2,640		
250		1,940	2,030	1,850	1,980	1,980	2,200	2,250	2,380	2,640	3,080		
500		3,610	3,700	3,610	3,790	3,790	4,320	4,580	4,840	5,060	6,250		
100	100	1,150	1,190	1,100	1,190	1,190	1,280	1,370	1,460	1,590	1,760	1,880	2,290
125		1,280	1,320	1,150	1,240	1,240	1,320	1,410	1,500	1,680	2,120	2,220	2,750
150		1,320	1,370	1,240	1,320	1,320	1,410	1,500	1,590	1,760	2,200	2,590	3,120
160		1,460	1,500	1,320	1,410	1,410	1,460	1,540	1,680	1,940	2,380	2,720	3,280
180		1,500	1,630	1,460	1,500	1,500	1,590	1,630	1,760	2,120	2,560	3,030	3,620
200		1,590	1,720	1,500	1,630	1,630	1,760	1,810	2,070	2,290	2,730	3,320	3,960
210		1,680	1,760	1,540	1,680	1,680	1,810	1,980	2,200	2,640	3,170	3,450	4,110
250		1,980	2,030	1,980	2,120	2,120	2,200	2,380	2,470	2,780	3,440	4,000	4,790
300		2,250	2,380	2,290	2,380	2,380	2,560	2,860	2,910	2,950	3,700	4,720	5,630
350		2,640	2,780	2,560	2,820	2,820	3,080	3,260	3,350	3,520	4,670	5,450	6,460
400		3,040	3,170	3,000	3,260	3,260	3,520	3,700	3,960	4,400	5,110	6,150	7,290
450		3,440	3,520	3,440	3,700	3,700	4,100	4,320	4,580	4,980	5,810	6,870	8,130
500		3,700	3,790	3,790	4,050	4,050	4,490	4,670	5,020	5,370	6,520	7,580	8,950
125	125	1,320	1,410	1,240	1,320	1,320	1,370	1,410	1,540	1,980	2,380	2,660	3,200
150		1,370	1,500	1,320	1,410	1,410	1,590	1,680	1,760	2,160	2,560	3,080	3,790
160		1,500	1,720	1,410	1,500	1,500	1,630	1,720	1,900	2,340	2,730	3,240	3,990
180		1,590	1,810	1,500	1,590	1,590	1,680	1,760	1,940	2,380	2,820	3,590	4,380
200		1,720	1,850	1,590	1,720	1,720	1,850	2,030	2,200	2,640	3,170	3,910	4,790
210		1,810	1,900	1,630	1,810	1,810	1,940	2,120	2,290	2,820	3,260	4,090	4,990
250		2,030	2,200	2,070	2,160	2,160	2,290	2,420	2,510	2,950	3,520	4,780	5,780
300		2,510	2,600	2,340	2,470	2,470	2,600	2,950	3,000	3,130	4,050	5,590	6,780
350		2,910	3,000	2,780	2,860	2,860	3,220	3,390	3,440	3,660	4,760	6,420	7,790
400		3,170	3,260	3,260	3,480	3,480	3,610	4,010	4,180	4,580	5,200	7,290	8,790
450		3,520	3,700	3,660	3,880	3,880	4,140	4,400	4,670	5,060	5,900	8,110	9,760
500		3,880	4,010	3,960	4,320	4,320	4,580	4,760	5,200	5,720	6,690	8,950	10,760

U/Price (Standard type)

A	B \ T	8	10	13	15	16	20	22	25	30	35	40	50
150	150	1,760	1,850	1,720	1,810	1,810	1,940	2,070	2,200	2,470	2,910	4,050	4,910
180		2,030	2,120	1,980	2,070	2,070	2,340	2,510	2,690	3,000	3,350	4,520	5,290
200		2,200	2,290	2,160	2,290	2,290	2,560	2,730	2,950	3,260	3,960	4,810	5,820
210		2,340	2,420	2,290	2,380	2,380	2,600	2,820	3,040	3,350	4,140	5,010	6,000
250		2,730	2,820	2,640	2,860	2,860	2,910	3,080	3,300	3,570	4,400	5,890	8,160
300		3,170	3,260	3,080	3,350	3,350	3,440	3,520	3,790	4,140	5,200	7,060	8,380
350		3,700	3,790	3,520	3,790	3,790	3,960	4,100	4,400	4,760	5,770	8,020	9,510
400		4,230	4,320	4,050	4,320	4,320	4,490	4,710	5,060	5,460	6,690	9,380	11,070
450		4,760	4,840	4,580	4,840	4,840	5,020	5,240	5,640	6,080	7,440	10,170	12,090
500		4,980	5,240	4,980	5,280	5,280	5,550	5,720	6,160	6,650	8,060	11,420	13,320
160	160	1,680	1,760	1,630	1,720	1,720	1,850	1,980	2,120	2,380	2,820	3,950	4,830
200		1,940	2,030	1,900	2,030	2,030	2,290	2,470	2,690	3,000	3,700	4,760	5,790
250		2,380	2,470	2,290	2,510	2,510	2,560	2,730	2,950	3,220	4,050	5,790	7,000
300		2,820	2,910	2,730	3,000	3,000	3,080	3,170	3,440	3,790	4,840	6,800	8,180
350		3,350	3,440	3,170	3,440	3,440	3,610	3,740	4,050	4,400	5,420	7,830	9,380
400		3,790	3,880	3,610	3,880	3,880	4,050	4,270	4,620	5,020	6,250	8,860	10,590
450		4,320	4,400	4,140	4,400	4,400	4,580	4,800	5,200	5,640	7,000	9,860	11,780
500		4,540	4,800	4,540	4,840	4,840	5,110	5,280	5,720	6,210	7,620	10,880	12,990
200	200	2,510	2,640	2,340	2,470	2,470	2,600	2,730	2,910	3,260	3,880	5,990	7,950
250		3,080	3,130	2,860	3,080	3,080	3,260	3,520	3,700	4,140	4,670	7,250	8,370
300		3,480	3,610	3,170	3,610	3,610	3,880	4,100	4,320	4,840	5,640	8,490	9,780
350		4,010	4,180	3,610	3,960	3,960	4,270	4,400	4,580	5,110	6,380	9,720	11,220
400		4,540	4,760	4,050	4,760	4,760	4,930	5,150	5,330	5,810	7,310	10,990	12,640
450		5,110	5,150	4,490	5,150	5,150	5,550	5,720	5,990	6,520	8,280	12,220	14,080
500		5,280	5,460	4,890	5,550	5,550	6,120	6,300	6,470	7,350	8,890	13,470	15,500
250	250	3,350	3,390	3,260	3,520	3,520	3,700	3,960	4,050	4,270	5,240	8,720	10,080
300		3,660	3,920	3,570	3,960	3,960	4,320	4,710	4,930	5,370	5,810	9,720	11,800
350		4,270	4,710	4,270	4,760	4,760	5,020	5,460	5,720	6,250	6,910	11,750	13,510
400		4,890	5,500	4,980	5,550	5,550	5,810	6,080	6,250	6,870	7,480	13,250	15,240
450		5,500	6,300	5,680	6,340	6,340	6,600	6,780	6,960	7,570	8,360	14,740	16,850
500		5,990	6,520	6,250	6,520	6,520	7,040	7,400	7,700	8,280	9,510	16,240	18,660
300	300	4,710	5,200	4,670	5,370	5,370	6,080	6,520	7,040	7,350	7,570	11,990	13,800
350		5,240	5,680	5,280	5,990	5,990	6,160	6,650	7,400	8,280	8,890	13,750	15,820
400		5,770	6,160	5,900	6,470	6,470	6,910	7,660	8,320	9,420	9,950	15,510	17,840
450		6,300	6,820	6,520	7,090	7,090	7,790	8,500	9,420	10,560	12,150	17,250	19,820
500		6,780	7,040	6,960	7,480	7,480	8,580	9,420	10,210	11,880	13,200	19,030	21,830

Price calculation formula (**A×Price coefficient**) — Upper : Size specified type / Lower : Economy type

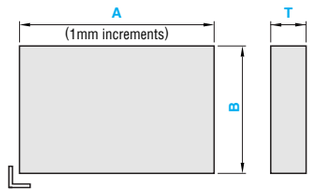
A (1mm incr.)	B \ T	8	10	13	15	16	20	22	25	30	35	40	50
30~ 60	60	A×17	A×18	A×15	A×15	A×15	A×18	A×20	A×22				
		A×16	A×17	A×14	A×14	A×14	A×17	A×18	A×20				
61~ 80		A×17	A×18	A×15	A×15	A×15	A×18	A×20	A×22				
		A×16	A×17	A×14	A×14	A×14	A×17	A×18	A×20				
81~100		A×14	A×15	A×14	A×15	A×15	A×17	A×18	A×20				
		A×13	A×14	A×13	A×14	A×14	A×16	A×17	A×18				
101~200		A×11	A×11	A×11	A×12	A×12	A×13	A×14	A×14				
		A×10	A×10	A×10	A×11	A×11	A×12	A×13	A×13				
201~300		A×11	A×11	A×11	A×11	A×11	A×12	A×14	A×14				
		A×10	A×10	A×10	A×10	A×10	A×11	A×13	A×13				
301~400		A×11	A×11	A×11	A×11	A×11	A×12	A×14	A×14				
		A×10	A×10	A×10	A×10	A×10	A×11	A×13	A×13				
401~500		A×11	A×11	A×11	A×11	A×11	A×12	A×14	A×14				
		A×10	A×10	A×10	A×10	A×10	A×11	A×13	A×13				
30~ 80	80	A×18	A×15	A×14	A×15	A×15	A×17	A×18	A×19	A×21	A×25	A×25	
		A×17	A×14	A×13	A×14	A×14	A×16	A×17	A×18	A×19	A×23	A×23	
81~100		A×15	A×15	A×14	A×15	A×15	A×17	A×18	A×19	A×21	A×25	A×25	
		A×14	A×14	A×13	A×14	A×14	A×16	A×17	A×18	A×19	A×23	A×23	
101~125		A×12	A×13	A×12	A×13	A×13	A×14	A×15	A×15	A×19	A×23	A×23	
		A×11	A×12	A×11	A×12	A×12	A×13	A×14	A×14	A×18	A×21	A×21	
126~150		A×12	A×12	A×12	A×12	A×12	A×13	A×14	A×15	A×17	A×19	A×19	
		A×11	A×11	A×11	A×11	A×11	A×12	A×13	A×14	A×16	A×18	A×18	
151~160		A×12	A×12	A×12	A×12	A×12	A×13	A×14	A×15	A×17	A×19	A×19	
		A×11	A×11	A×11	A×11	A×11	A×12	A×13	A×14	A×16	A×18	A×18	
161~200		A×12	A×12	A×12	A×12	A×12	A×13	A×14	A×15	A×17	A×19	A×19	
		A×11	A×11	A×11	A×11	A×11	A×12	A×13	A×14	A×16	A×18	A×18	
201~250		A×10	A×10	A×11	A×11	A×11	A×13	A×13	A×14	A×15	A×18	A×18	
		A×9	A×9	A×10	A×10	A×10	A×12	A×12	A×13	A×14	A×17	A×17	
251~500		A×10	A×10	A×11	A×11	A×11	A×12	A×13	A×14	A×15	A×18	A×18	
		A×9	A×9	A×10	A×10	A×10	A×11	A×12	A×13	A×14	A×17	A×17	
30~100	100	A×18	A×15	A×14	A×15	A×15	A×17	A×18	A×19	A×22	A×25	A×25	A×32
		A×17	A×14	A×13	A×14	A×14	A×16	A×17	A×18	A×20	A×23	A×23	A×29
101~125		A×14	A×14	A×13	A×14	A×14	A×15	A×15	A×17	A×19	A×25	A×25	A×32
		A×13	A×13	A×12	A×13	A×13	A×14	A×14	A×16	A×18	A×23	A×23	A×29
126~150		A×12	A×12	A×12	A×12	A×12	A×13	A×14	A×15	A×17	A×20	A×20	A×29
		A×11	A×11	A×11	A×11	A×11	A×12	A×13	A×14	A×16	A×18	A×18	A×27
151~160		A×12	A×12	A×12	A×12	A×12	A×13	A×14	A×15	A×17	A×20	A×20	A×29
		A×11	A×11	A×11	A×11	A×11	A×12	A×13	A×14	A×16	A×18	A×18	A×27
161~180		A×12	A×12	A×12	A×12	A×12	A×13	A×14	A×15	A×17	A×20	A×20	A×29
		A×11	A×11	A×11	A×11	A×11	A×12	A×13	A×14	A×16	A×18	A×18	A×27
181~200		A×12	A×12	A×12	A×12	A×12	A×13	A×14	A×15	A×17	A×20	A×20	A×29
		A×11	A×11	A×11	A×11	A×11	A×12	A×13	A×14	A×16	A×18	A×18	A×27
201~210		A×12	A×12	A×12	A×12	A×12	A×13	A×14	A×15	A×17	A×20	A×20	A×29
		A×11	A×11	A×11	A×11	A×11	A×12	A×13	A×14	A×16	A×18	A×18	A×27
211~250		A×12	A×12	A×12	A×12	A×12	A×13	A×14	A×15	A×17	A×19	A×19	A×27
		A×11	A×11	A×11	A×11	A×11	A×12	A×13	A×14	A×16	A×18	A×18	A×25
251~300		A×12	A×12	A×12	A×12	A×12	A×13	A×14	A×15	A×17	A×19	A×19	A×27
		A×11	A×11	A×11	A×11	A×11	A×12	A×13	A×14	A×16	A×18	A×18	A×25
301~350		A×12	A×12	A×12	A×12	A×12	A×13	A×14	A×15	A×17	A×19	A×19	A×27
		A×11	A×11	A×11	A×11	A×11	A×12	A×13	A×14	A×16	A×18	A×18	A×25
351~400		A×12	A×12	A×12	A×12	A×12	A×13	A×14	A×15	A×17	A×19	A×19	A×27
		A×11	A×11	A×11	A×11	A×11	A×12	A×13	A×14	A×16	A×18	A×18	A×25
401~450		A×12	A×12	A×12	A×12	A×12	A×13	A×14	A×15	A×17	A×19	A×19	A×27
		A×11	A×11	A×11	A×11	A×11	A×12	A×13	A×14	A×16	A×18	A×18	A×25
451~500		A×12	A×12	A×12	A×12	A×12	A×13	A×14	A×15	A×17	A×19	A×19	A×27
		A×11	A×11	A×11	A×11	A×11	A×12	A×13	A×14	A×16	A×18	A×18	A×25
50~125	125	A×18	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×21	A×25	A×25	A×34
		A×17	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×19	A×23	A×23	A×31
126~150		A×15	A×13	A×12	A×13	A×13	A×14	A×15	A×17	A×19	A×22	A×22	A×32
		A×14	A×12	A×11	A×12	A×12	A×13	A×14	A×16	A×18	A×20	A×20	A×29
151~160		A×13	A×13	A×12	A×13	A×13	A×14	A×15	A×17	A×19	A×22	A×22	A×32
		A×12	A×12	A×11	A×12	A×12	A×13	A×14	A×16	A×18	A×20	A×20	A×29
161~180		A×12	A×13	A×11	A×12	A×12	A×13	A×14	A×15	A×18	A×21	A×21	A×28
		A×11	A×12	A×10	A×11	A×11	A×12	A×13	A×14	A×17	A×19	A×19	A×26
181~200		A×12	A×13	A×11	A×12	A×12	A×13	A×14	A×15	A×18	A×21	A×21	A×28
		A×11	A×12	A×10	A×11	A×11	A×12	A×13	A×14	A×17	A×19	A×19	A×26
201~210		A×12	A×13	A×11	A×12	A×12	A×13	A×14	A×15	A×18	A×21	A×21	A×28
		A×11	A×12	A×10	A×11	A×11	A×12	A×13	A×14	A×17	A×19	A×19	A×26
211~250		A×12	A×13	A×11	A×12	A×12	A×13	A×14	A×15	A×18	A×21	A×21	A×28
		A×11	A×12	A×10	A×11	A×11	A×12	A×13	A×14	A×17	A×19	A×19	A×26
251~300		A×12	A×13	A×11	A×12	A×12	A×13	A×14	A×15	A×18	A×21	A×21	A×28
		A×11	A×12	A×10	A×11	A×11	A×12	A×13	A×14	A×17	A×19	A×19	A×26
301~350		A×12	A×13	A×11	A×12	A×12	A×13	A×14	A×15	A×18	A×21	A×21	A×28
		A×11	A×12	A×10	A×11	A×11	A×12	A×13	A×14	A×17	A×19	A×19	A×26
351~400		A×12	A×13	A×11	A×12	A×12	A×13	A×14	A×15	A×18	A×21	A×21	A×28
		A×11	A×12	A×10	A×11	A×11	A×12	A×13	A×14	A×17	A×19	A×19	A×26
401~450		A×12	A×13	A×11	A×12	A×12	A×13	A×14	A×15	A×18	A×21	A×21	A×28
		A×11	A×12	A×10	A×11	A×11	A×12	A×13	A×14	A×17	A×19	A×19	A×26
451~500		A×12	A×13	A×11	A×12	A×12	A×13	A×14	A×15	A×18	A×21	A×21	A×28
		A×11	A×12	A×10	A×11	A×11	A×12	A×13	A×14	A×17	A×19	A×19	A×26

Price calculation formula (**A×Price coefficient**) — Upper : Size specified type / Lower : Economy type

A (1mm incr.)	B \ T	8	10	13	15	16	20	22	25	30	35	40	50
101~150	150	A×17	A×18	A×17	A×18	A×18	A×19	A×20	A×21	A×24	A×26	A×26	A×36
		A×16	A×17	A×16	A×17	A×17	A×18	A×18	A×19	A×22	A×24	A×24	A×33
151~180		A×17	A×18	A×17	A×18	A×18	A×19	A×20	A×21	A×24	A×26	A×26	A×36
		A×16	A×17	A×16	A×17	A×17	A×18	A×18	A×19	A×22	A×24	A×24	A×33
181~200		A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×21	A×24	A×24	A×32
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×19	A×22	A×22	A×29
201~210		A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×21	A×24	A×24	A×32
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×19	A×22	A×22	A×29
211~250		A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×21	A×24	A×24	A×32
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×19	A×22	A×22	A×29
251~300		A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×21	A×24	A×24	A×32
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×19	A×22	A×22	A×29
301~350		A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×21	A×24	A×24	A×32
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×19	A×22	A×22	A×29
351~400		A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×21	A×24	A×24	A×32
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×19	A×22	A×22	A×29
401~450		A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×21	A×24	A×24	A×32
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×19	A×22	A×22	A×29
451~500		A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×21	A×24	A×24	A×32
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×19	A×22	A×22	A×29
101~160	160	A×15	A×17	A×15	A×17	A×17	A×18	A×19	A×20	A×23	A×25	A×25	A×35
		A×14	A×16	A×14	A×16	A×16	A×17	A×18	A×18	A×21	A×23	A×23	A×32
161~200		A×14	A×14	A×13	A×15	A×15	A×15	A×17	A×18	A×20	A×23	A×23	A×35
		A×13	A×13	A×12	A×14	A×14	A×14	A×16	A×17	A×18	A×21	A×21	A×32
201~250		A×14	A×14	A×13	A×15	A×15	A×15	A×17	A×18	A×20	A×23	A×23	A×32
		A×13	A×13	A×12	A×14	A×14	A×14	A×16	A×17	A×18	A×21	A×21	A×29
251~300		A×14	A×14	A×13	A×15	A×15	A×15	A×17	A×18	A×20	A×23	A×23	A×32
		A×13	A×13	A×12	A×14	A×14	A×14	A×16	A×17	A×18	A×21	A×21	A×29
301~350		A×14	A×14	A×13	A×15	A×15	A×15	A×17	A×18	A×20	A×23	A×23	A×30
		A×13	A×13	A×12	A×14	A×14	A×14	A×16	A×17	A×18	A×21	A×21	A×27
351~400		A×14	A×14	A×13	A×15	A×15	A×15	A×17	A×18	A×20	A×23	A×23	A×30
		A×13	A×13	A×12	A×14	A×14	A×14	A×16	A×17	A×18	A×21	A×21	A×27
401~450		A×14	A×14	A×13	A×15	A×15	A×15	A×17	A×18	A×20	A×23	A×23	A×30
		A×13	A×13	A×12	A×14	A×14	A×14	A×16	A×17	A×18	A×21	A×21	A×27
451~500		A×14	A×14	A×13	A×15	A×15	A×15	A×17	A×18	A×20	A×23	A×23	A×30
		A×13	A×13	A×12	A×14	A×14	A×14	A×16	A×17	A×18	A×21	A×21	A×27
101~200	200	A×21	A×21	A×20	A×21	A×21	A×22	A×23	A×25	A×28	A×32	A×32	A×38
		A×19	A×19	A×18	A×19	A×19	A×20	A×21	A×23	A×26	A×29	A×29	A×35
201~250		A×18	A×18	A×17	A×18	A×18	A×19	A×20	A×21	A×24	A×28	A×28	A×36
		A×17	A×17	A×16	A×17	A×17	A×18	A×18	A×19	A×22	A×26	A×26	A×33
251~300		A×18	A×18	A×17	A×18	A×18	A×19	A×20	A×21	A×24	A×28	A×28	A×36
		A×17	A×17	A×16	A×17	A×17	A×18	A×18	A×19	A×22	A×26	A×26	A×33
301~350		A×18	A×18	A×17	A×18	A×18	A×19	A×20	A×21	A×24	A×28	A×28	A×34
		A×17	A×17	A×16	A×17	A×17	A×18	A×18	A×19	A×22	A×26	A×26	A×31
351~400		A×15	A×17	A×15	A×17	A×17	A×18	A×19	A×20	A×23	A×26	A×26	A×33
		A×14	A×16	A×14	A×16	A×16	A×17	A×18	A×18	A×21	A×24	A×24	A×30
401~450		A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×22	A×25	A×25	A×33
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×20	A×23	A×24	A×30
451~500		A×15	A×15	A×15	A×15	A×15	A×17	A×18	A×19	A×22	A×25	A×25	A×33
		A×14	A×14	A×14	A×14	A×14	A×16	A×17	A×18	A×20	A×23	A×23	A×30
101~200	250	A×21	A×22	A×21	A×22	A×22	A×23	A×25	A×28	A×30	A×33	A×33	A×43
		A×19	A×20	A×19	A×20	A×20	A×21	A×23	A×26	A×27	A×30	A×30	A×39
201~250		A×19	A×19	A×18	A×20	A×20	A×21	A×23	A×25	A×26	A×30	A×30	A×40
		A×18	A×18	A×17	A×18	A×18	A×19	A×21	A×23	A×24	A×27	A×27	A×36
251~300		A×19	A×19	A×18	A×20	A×20	A×21	A×23	A×25	A×26	A×30	A×30	A×40
		A×18	A×18	A×17	A×18	A×18	A×19	A×21	A×23	A×24	A×27	A×27	A×36
301~350		A×19	A×19	A×18	A×20	A×20	A×21	A×23	A×25	A×26	A×30	A×30	A×40
		A×18	A×18	A×17	A×18	A×18	A×19	A×21	A×23	A×24	A×27	A×27	A×36
351~400		A×18	A×18	A×17	A×19	A×19	A×20	A×21	A×24	A×25	A×29	A×29	A×39
		A×17	A×17	A×16	A×18	A×18	A×18	A×19	A×22	A×23	A×27	A×27	A×36
401~450		A×18	A×18	A×17	A×19	A×19	A×20	A×21	A×24	A×25	A×29	A×29	A×39
		A×17	A×17	A×16	A×18	A×18	A×18	A×19	A×22	A×23	A×27	A×27	A×36
451~500		A×18	A×18	A×17	A×19	A×19	A×20	A×21	A×24	A×25	A×29	A×29	A×39
		A×17	A×17	A×16	A×18	A×18	A×18	A×19	A×22	A×23	A×27	A×27	A×36
101~200	300	A×28	A×29	A×28	A×29	A×29	A×31	A×34	A×35	A×39	A×44	A×44	A×55
		A×26	A×27	A×26	A×27	A×27	A×28	A×31	A×32	A×36	A×40	A×40	A×50
201~300		A×24	A×25	A×24	A×25	A×25	A×28	A×30	A×32	A×35	A×37	A×37	A×52
		A×22	A×23	A×22	A×23	A×23	A×26	A×27	A×29	A×32	A×34	A×34	A×47
301~350		A×21	A×22	A×21	A×22	A×22	A×24	A×25	A×29	A×32	A×35	A×35	A×49
		A×19	A×20	A×19	A×20	A×20	A×22	A×23	A×27	A×29	A×32	A×32	A×45
351~400		A×21	A×22	A×21	A×22	A×22	A×24	A×25	A×29	A×32	A×35	A×35	A×49
		A×19	A×20	A×19	A×20	A×20	A×22	A×23	A×27	A×29	A×32	A×32	A×45
401~450		A×20	A×21	A×20	A×21	A×21	A×23	A×25	A×26	A×30	A×33	A×33	A×48
		A×18	A×19	A×18	A×19	A×19	A×21	A×23	A×24	A×27	A×30	A×30	A×44
451~500		A×20	A×21	A×20	A×21	A×21	A×23	A×25	A×26	A×30	A×33	A×33	A×48
		A×18	A×19	A×18	A×19	A×19	A×21	A×23	A×24	A×27	A×30	A×30	A×44

FINISHED PLATES —ALP— —SIZE SPECIFIED TYPE—

ALP (Size specified type)



Dimension tolerance		99mm or less	100~250mm	251mm or more
	A・B	+0.4 0	+0.5 0	+0.8 0
	T	+0.5 +0.3		

Precision standards P.1158

M A7075P-T651 (Ultra high strength duralumin plate)

Order Catalog No. — A — B — T

ALP — 120 — 60 — 25

Delivery 3 Days | Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

Volume discount rate P.37

Quantity	1~9	10~30
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

Alteration P.1174 (Dimension B changeable)

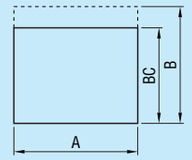
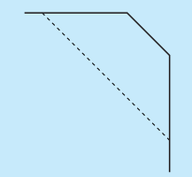
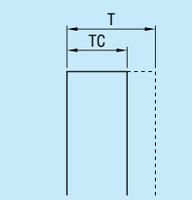
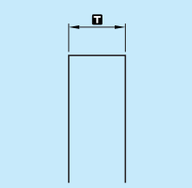
A(1mm incr.)	B \ T	10	15	20	25	30	35	40	50
		U/Price							
25~100	25	4,700	4,700	4,700					
101~250		5,140	5,140	5,140					
30~100	40	4,700	4,700	4,700					
101~200		5,000	5,000	5,000					
201~400		5,440	5,440	5,820					
30~ 60	60	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
61~ 80		5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
81~100		5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,140
101~200		5,000	5,000	5,000	5,000	5,000	6,270	6,870	8,080
201~300		5,800	5,880	5,880	7,420	8,310	9,200	10,100	11,880
301~400		6,460	7,090	8,280	9,460	10,650	11,840	13,030	15,400
401~500		6,930	8,410	9,890	11,380	12,850	14,340	15,820	18,780
30~ 80	80	5,440	5,440	5,440	5,440	5,440	5,440	5,440	5,770
81~100		5,440	5,440	5,440	5,440	5,440	5,440	5,740	6,540
101~125		5,440	5,440	5,440	5,440	5,520	6,010	6,510	7,500
126~150		5,440	5,440	5,440	5,460	6,100	6,680	7,280	8,460
151~160		5,440	5,440	5,440	5,650	6,330	6,960	7,580	8,840
161~200		5,440	5,440	5,630	6,410	7,250	8,030	8,820	10,380
201~250		6,760	6,760	6,400	7,360	8,410	9,390	10,360	12,300
251~500		8,850	10,770	12,700	14,620	16,700	18,630	20,550	24,400
30~100	100	5,720	5,720	5,720	5,720	5,780	6,270	6,770	7,780
101~125		5,720	5,720	5,720	5,890	6,490	7,100	7,720	8,970
126~150		5,720	5,720	5,750	6,480	7,210	7,940	8,660	10,160
151~160		5,720	5,720	5,940	6,710	7,500	8,270	9,040	10,640
161~180		5,720	5,720	6,320	7,190	8,060	8,930	9,790	11,590
181~200		5,720	5,750	6,700	7,670	8,630	9,590	10,550	12,530
201~210		5,880	6,030	7,040	8,050	9,060	10,070	11,080	13,160
211~250		6,160	6,900	8,100	9,300	10,490	11,690	12,890	15,350
251~300		6,760	8,210	9,640	11,070	12,500	13,930	15,360	18,320
301~350		7,590	9,370	11,040	12,700	14,360	16,030	17,690	21,140
351~400		8,510	10,520	12,420	14,330	16,230	18,120	20,020	23,950
401~450		9,270	11,530	13,680	15,810	17,950	20,080	22,210	26,610
451~500		10,180	12,700	15,060	17,440	19,800	22,170	24,550	29,430
50~125	125	5,880	5,880	5,990	6,760	7,520	8,280	9,050	10,560
126~150		5,880	5,880	6,580	7,480	8,400	9,310	10,210	12,040
151~160		5,880	5,880	6,810	7,780	8,750	9,720	10,690	12,620
161~180		5,880	6,200	7,290	8,360	9,450	10,540	11,620	13,800
181~200		5,880	6,550	7,750	8,960	10,160	11,360	12,570	14,960
201~210		6,160	7,020	8,280	9,540	10,810	12,060	13,330	15,840
211~250		6,520	8,010	9,510	11,000	12,500	14,000	15,490	18,480
251~300		7,550	9,330	11,130	12,920	14,700	16,490	18,290	21,860
301~350		8,720	10,810	12,890	14,960	17,050	19,130	21,210	25,380
351~400		9,750	12,130	14,500	16,880	19,250	21,630	24,010	28,760
401~450		10,630	13,290	15,970	18,640	21,300	23,970	26,650	31,980
451~500		11,650	14,610	17,580	20,540	23,500	26,470	29,430	35,360

A(1mm incr.)	B \ T	10	15	20	25	30	35	40	50
		U/Price							
100~150	150	5,880	6,220	7,260	8,350	9,440	10,530	11,630	13,810
151~180		5,880	6,850	8,100	9,400	10,710	12,010	13,300	15,910
181~200		5,880	7,280	8,650	10,100	11,540	12,980	14,430	17,320
201~210		5,970	7,480	8,940	10,440	11,960	13,480	14,990	18,010
211~250		6,530	8,330	10,050	11,840	13,640	15,440	17,230	20,820
251~300		8,550	10,710	12,760	14,910	17,050	19,200	21,360	25,650
301~350		9,700	12,200	14,600	17,100	19,600	22,090	24,590	29,590
351~400		10,990	13,840	16,580	19,430	22,280	25,130	27,980	33,690
401~450		11,840	15,040	18,120	21,320	24,520	27,720	30,930	37,340
451~500		13,130	16,690	20,100	23,650	27,210	30,760	34,310	41,430
100~160	160	5,880	6,620	7,870	9,090	10,300	11,550	12,760	15,240
161~200		6,010	7,520	9,080	10,580	12,080	13,640	15,150	18,220
201~250		6,760	8,630	10,580	12,450	14,320	16,250	18,120	21,940
251~300		8,830	11,060	13,390	15,620	17,860	20,190	22,420	26,990
301~350		10,010	12,620	15,330	17,920	20,530	23,240	25,840	31,160
351~400		11,350	14,320	17,410	20,380	23,350	26,440	29,410	35,470
401~450		12,240	15,580	19,050	22,390	25,720	29,190	32,530	39,340
451~500		13,580	17,290	21,140	24,830	28,540	32,390	36,100	43,650
100~200	200	7,020	8,950	10,820	12,730	14,600	16,530	18,450	22,240
201~250		7,950	10,340	12,670	15,050	17,370	19,770	22,160	26,880
251~300		10,330	13,200	15,980	18,840	21,610	24,480	27,340	32,970
301~350		11,850	15,180	18,410	21,740	24,970	28,310	31,630	38,200
351~400		13,220	17,020	20,700	24,500	28,190	31,980	35,790	43,270
401~450		14,430	18,700	22,840	27,110	31,240	35,520	39,790	48,200
451~500		15,790	20,540	25,130	29,870	34,460	39,200	43,940	53,280
100~200	250	8,280	10,620	12,970	15,320	17,730	20,070	22,410	27,160
201~250		9,430	12,360	15,270	18,190	21,180	24,090	27,020	32,930
251~300		12,360	15,840	19,330	22,830	26,400	29,890	33,380	40,450
301~350		13,950	18,010	22,080	26,140	30,310	34,370	38,430	46,660
351~400		15,700	20,330	24,960	29,610	34,360	38,990	43,620	53,000
401~450		17,000	22,210	27,420	32,620	37,970	43,170	48,370	58,910
451~500		18,750	24,520	30,310	36,080	42,010	47,790	53,560	65,270
100~200	300	9,480	12,300	15,130	17,960	20,780	23,610	26,440	32,080
201~300		12,240	16,440	20,640	24,840	29,060	33,260	37,460	45,870
301~350		16,110	20,990	25,890	30,780	35,680	40,570	45,470	55,260
351~400		17,920	23,500	29,090	34,680	40,250	45,840	51,430	62,590
401~450		19,600	25,870	32,140	38,420	44,690	50,960	57,240	69,780
451~500		21,410	28,370	35,340	42,300	49,260	56,230	63,190	77,110

FINISHED PLATES —ALTERATION GUIDE—

The volume discount rate is also applicable to alteration cost. P.39

Alteration Available for size specified and economy type only.

Alterations	Code	Spec.	¥/1Code BC	¥/1P
	BC	Changes width (Dimension B) 20≦BC≦299 When BC≦29, A is 250 or less. 1mm increments (ex.) B=195 ⋯› BC195 Catalog No. — A — B — T — (BC) S—SKD — 305 — 200 — 20 — BC195 E—SKD — 365 — 250 — 13 — BC248	20~ 59 61~ 79 81~ 99 101~199 201~299	400 500 600 800 1,000
	CNC	Changes all around chamfering C0.5~C1.0 ⇨ ~C0.1 ⊗Not applicable to ALP (ex.) Catalog No. — A — B — T — (CNC) S—SKD — 305 — 200 — 20 — CNC E—SKD — 365 — 250 — 13 — CNC	B 25~ 60 61~ 80 81~100 101~200 201~300	¥/1P 800 1,000 1,200 1,600 2,000
	TC	Changes the thickness 5≦TC<Tmax 1mm increments ⊗Not applicable to ALP (ex.) T=18 ⋯› TC18 Catalog No. — A — B — T — (TC) S—SKD — 305 — 200 — 20 — TC18 E—SKD — 365 — 250 — 13 — TC12	B 25~ 60 61~ 80 81~100 101~200 201~300	¥/1P 1,000 1,250 1,500 1,750 2,000
	TKC	Changes the thickness tolerance • HPM・SC・SS ····· T +0.3 +0.1 • SKD・DC・SKS・SK ····· T +0.5 +0.2 ⇨ +0.80 +0.51 ⊗Not applicable to ALP (ex.) Catalog No. — A — B — T — (TKC) S—SKD — 305 — 200 — 20 — TKC E—SKD — 365 — 250 — 13 — TKC	B 25~ 60 61~ 80 81~100 101~200 201~300	¥/1P 400 500 600 800 1,000

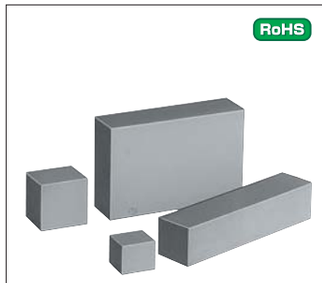
Delivery 3 Days | Express A 800/1Pc. P.38

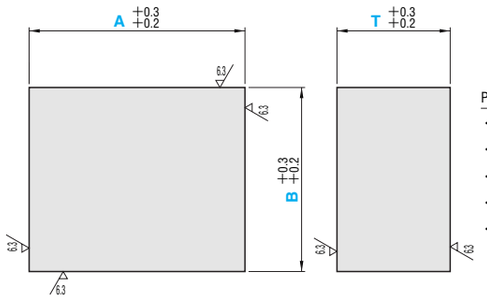
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price Price=Unit price of size specified type+Alteration fee

FINISHED BLOCKS

The volume discount rate is also applicable to alteration cost. P.39





Precision standards
- Perpendicularity : Max. 0.02 per 100mm
- Parallelism between upper and lower surface : Max. 0.02 per 100mm
- Flatness of upper and lower surface : Max. 0.04 per 100mm
- Alteration of circumferential chamfering Co (no chamfering)
- Surface roughness : Max. 6.3a (Milling)

M	Catalog No.	1mm increments A	B	T
SKH51 (Raw material)	FB—SKH	30～100	30～100	8～60
SKD11 (Raw material)	FB—SKD	30～200	30～200	35～60
DC53 (Raw material)	FB—DC			
SKS3 (Raw material)	FB—SKS			
SKS93 (Raw material)	FB—SK			
S50C (Raw material)	FB—SC			

Order Catalog No. — A — B — T
FB—SKD — 150 — 170 — 55

Delivery 3 Days | Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

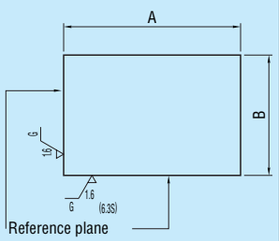
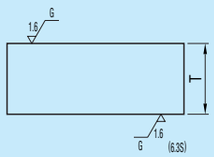
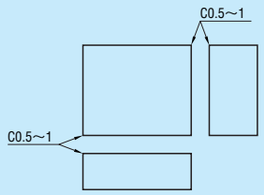
Alteration

Order Catalog No. — A — B — T — (KAC·TAC·CAC)

	A	B	T	
FB—SKD	80	95	45	CAC
FB—SKS	110	76	52	KAC
FB—SKH	30	59	16	TAC

Delivery 3 Days | Express A 800/1Pc. P.38
A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price Finished blocks Unit price + Alteration fee (¥/1Code)

Alterations	Adds reference plane	Grinds upper and lower surface	Changes all around chamfering
			
Code	KAC	TAC	CAC
Spec.	Reference plane is added to the direction of the dimension A and B. Perpendicularity of reference plane Max. 0.015 per 100mm	Upper and lower surface is finished by grinding. Parallelism between upper and lower surface : Max. 0.012 per 100mm Flatness of upper and lower surface : T Max. 25 Min. 26; Per 100mm 0.015 0.012	Chamfers the all circumferences by C0.5～1.0
¥/1Code	1,500	1,300	1,000

Price

FB—SKH	P.1176
FB—SKD · FB—DC	P.1177
FB—SKS	P.1178
FB—SK	P.1179
FB—SC	P.1180

FINISHED BLOCKS —PRICE—

Price

■FB—SKH (SKH51) U/Price

■Volume discount rate P.37

Quantity	1～9	10～30
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

A	T \ B	U/Price 30～40	41～50	51～60	61～70	71～80	81～90	91～100
30～40	8～13	5,450	5,940	6,430	6,900	7,190	7,560	7,830
	14～16	5,560	6,090	6,610	7,100	7,420	7,830	8,120
	17～20	5,680	6,230	6,780	7,300	7,650	8,090	8,400
	21～25	5,800	6,380	6,960	7,510	7,880	8,350	8,690
	26～30	6,030	6,670	7,300	7,910	8,350	8,870	9,270
	31～40	6,150	6,920	7,920	8,250	8,820	9,400	9,900
	41～50	6,670	7,500	8,520	8,820	9,680	10,580	11,300
	51～60	7,200	8,020	9,400	9,680	10,580	12,150	13,200
41～50	8～13	5,940	6,810	7,130	7,510	7,880	8,090	8,400
	14～16	6,090	6,960	7,300	7,710	8,120	8,350	8,690
	17～20	6,230	7,100	7,480	7,910	8,350	8,610	8,980
	21～25	6,380	7,250	7,650	8,120	8,580	8,870	9,270
	26～30	6,670	7,680	8,170	8,720	9,270	9,650	10,140
	31～40	6,920	8,100	8,370	8,660	9,500	10,070	11,090
	41～50	7,500	8,930	9,230	9,500	10,800	11,580	12,820
	51～60	8,020	9,800	10,280	10,690	12,420	13,390	14,360
51～60	8～13	6,430	7,130	7,650	7,910	8,120	8,350	8,690
	14～16	6,610	7,300	8,000	8,320	8,580	8,870	9,270
	17～20	6,780	7,480	8,170	8,520	8,810	9,130	9,560
	21～25	6,960	7,650	8,350	8,720	9,040	9,390	9,850
	26～30	7,300	8,170	8,870	9,330	9,740	10,170	11,020
	31～40	7,920	8,370	9,220	9,500	10,150	11,770	12,090
	41～50	8,520	9,230	9,800	10,850	11,930	13,600	14,040
	51～60	9,400	10,280	10,850	12,150	13,470	15,740	17,110
61～70	8～13	6,900	7,510	7,910	8,120	8,350	8,610	8,980
	14～16	7,100	7,710	8,320	8,520	8,810	9,130	9,560
	17～20	7,300	7,910	8,520	8,930	9,740	9,650	10,140
	21～25	7,510	8,120	8,720	9,740	10,200	10,700	11,310
	26～30	7,910	8,720	9,330	10,140	10,670	11,220	11,890
	31～40	8,250	8,660	9,500	10,890	11,740	12,250	12,600
	41～50	8,820	9,500	10,850	11,820	13,500	13,720	14,500
	51～60	9,680	10,690	12,150	13,470	15,750	16,450	16,600
71～80	8～13	7,190	7,880	8,120	8,350	8,810	8,870	9,270
	14～16	7,420	8,120	8,580	8,810	9,510	9,650	10,140
	17～20	7,650	8,350	8,810	9,740	9,970	10,170	10,730
	21～25	7,880	8,580	9,040	10,200	10,900	11,220	11,890
	26～30	8,350	9,270	9,740	10,670	11,360	11,740	12,470
	31～40	8,820	9,500	10,150	11,740	12,170	13,070	14,250
	41～50	9,680	10,800	11,930	13,500	14,170	15,250	16,420
	51～60	10,580	12,420	13,470	15,750	16,200	17,420	18,620
81～90	8～13	7,560	8,090	8,350	8,610	8,870	9,130	9,560
	14～16	7,830	8,350	8,870	9,130	9,650	9,910	10,440
	17～20	8,090	8,610	9,130	9,650	10,170	10,440	11,020
	21～25	8,350	8,870	9,390	10,700	11,220	11,480	12,180
	26～30	8,870	9,650	10,170	11,220	11,740	12,000	12,760
	31～40	9,400	10,070	11,770	12,250	13,070	14,570	15,020
	41～50	10,580	11,580	13,600	13,720	15,250	17,050	17,920
	51～60	12,150	13,390	15,740	16,450	17,420	19,450	20,270
91～100	8～13	7,830	8,400	8,690	8,980	9,270	9,560	9,850
	14～16	8,120	8,690	9,270	9,560	10,140	10,440	10,730
	17～20	8,400	8,980	9,560	10,140	10,730	11,020	11,310
	21～25	8,690	9,270	9,850	11,310	11,890	12,180	12,470
	26～30	9,270	10,140	11,020	11,890	12,470	12,760	13,050
	31～40	9,900	11,090	12,090	12,600	14,250	15,020	15,550
	41～50	11,300	12,820	14,040	14,500	16,420	17,920	17,870
	51～60	13,200	14,360	17,110	16,600	18,620	20,270	20,570

FINISHED BLOCKS
—PRICE—

Price

■FB—SKD (SKD11) U/Price
■FB—DC (DC53) U/Price

■Volume discount rate P.37

Quantity	1~9	10~30
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

A	B \ T	U/Price																
		30~ 40	41~ 50	51~ 60	61~ 70	71~ 80	81~ 90	91~ 100	101~ 110	111~ 120	121~ 130	131~ 140	141~ 150	151~ 160	161~ 170	171~ 180	181~ 190	191~ 200
30~ 40	35~40	2,460	2,770	2,880	3,000	3,210	3,420	3,600	3,660	4,060	4,180	4,350	4,560	4,780	4,930	4,980	5,130	5,910
	41~50	2,670	3,000	3,100	3,210	3,520	3,850	4,110	4,420	4,560	4,930	5,260	5,550	5,620	5,850	5,880	6,060	6,910
	51~60	2,880	3,210	3,420	3,520	3,850	4,420	4,800	4,990	5,260	5,580	6,040	6,180	6,370	6,610	6,670	6,900	7,920
41~ 50	35~40	2,770	3,000	3,100	3,210	3,520	3,730	4,110	4,530	4,560	5,040	5,260	5,470	5,680	5,730	5,980	6,210	6,520
	41~50	3,000	3,310	3,420	3,520	4,000	4,290	4,750	5,320	5,430	5,910	6,370	6,520	6,700	6,780	7,000	7,230	7,920
	51~60	3,210	3,630	3,810	3,960	4,600	4,960	5,320	6,000	6,180	6,690	7,450	7,540	7,650	7,750	,8,010	8,260	8,820
51~ 60	35~40	2,880	3,100	3,210	3,520	3,760	4,360	4,480	4,930	5,280	5,820	5,890	6,420	6,480	6,690	6,840	6,910	7,320
	41~50	3,100	3,420	3,630	4,020	4,420	5,040	5,200	5,770	6,180	6,780	6,880	7,300	7,600	7,800	8,040	8,100	8,610
	51~60	3,420	3,810	4,020	4,500	4,990	5,830	6,340	6,640	7,240	7,770	7,890	8,400	8,710	8,850	9,030	9,190	9,780
61~ 70	35~40	3,000	3,210	3,520	3,630	4,270	4,900	5,040	5,670	6,010	6,450	6,780	6,910	7,420	7,590	7,750	7,840	8,230
	41~50	3,210	3,520	4,020	4,300	5,050	5,490	5,800	6,630	7,200	7,500	8,110	8,200	8,640	8,920	9,120	9,220	9,690
	51~60	3,520	3,960	4,500	4,900	5,730	6,580	6,640	7,590	7,990	8,080	8,950	9,180	9,880	10,090	10,350	10,500	11,070
71~ 80	35~40	3,210	3,520	3,760	4,270	4,870	5,230	5,700	6,370	6,630	7,020	7,170	7,620	8,370	8,620	8,760	8,880	9,400
	41~50	3,520	4,000	4,420	5,050	5,670	6,100	6,570	7,200	7,480	8,250	8,380	8,890	9,640	10,000	10,200	10,360	10,860
	51~60	3,850	4,600	4,990	5,730	6,480	6,970	7,450	8,250	8,560	9,460	9,720	10,260	11,110	11,280	11,440	11,530	11,700
81~ 90	35~40	3,420	3,730	4,360	4,900	5,230	5,830	6,010	6,870	7,270	7,840	8,340	8,800	8,890	9,150	9,480	9,810	10,120
	41~50	3,850	4,290	5,040	5,490	6,100	6,820	7,170	7,930	8,550	9,180	9,580	10,260	10,380	10,600	10,900	11,490	11,830
	51~60	4,420	4,960	5,830	6,580	6,970	7,780	8,110	9,090	9,720	10,480	10,960	11,730	11,830	12,130	12,480	13,050	13,440
91~100	35~40	3,600	4,110	4,480	5,040	5,700	6,010	6,220	7,480	7,900	8,670	9,060	9,780	9,990	10,330	10,590	10,720	10,860
	41~50	4,110	4,750	5,200	5,800	6,570	7,170	7,150	8,800	9,130	10,080	10,710	11,310	11,460	12,030	12,310	12,450	12,640
	51~60	4,800	5,320	6,340	6,640	7,450	8,110	8,230	9,910	10,660	11,500	12,280	12,780	13,020	13,590	13,900	14,190	14,430
101~110	35~40	3,660	4,530	4,930	5,670	6,370	6,870	7,480	8,010	8,700	9,370	9,990	10,300	10,720	11,100	11,410	11,790	12,400
	41~50	4,420	5,320	5,770	6,630	7,200	7,930	8,800	9,330	10,140	10,920	11,620	12,000	12,480	12,850	13,330	13,740	14,410
	51~60	4,990	6,000	6,640	7,590	8,250	9,090	9,910	10,590	11,580	12,540	13,290	13,680	14,250	14,670	15,540	15,690	16,120
111~120	35~40	4,060	4,560	5,280	6,010	6,630	7,270	7,900	8,700	9,060	9,780	10,200	10,920	11,550	11,920	12,210	12,400	13,120
	41~50	4,560	5,430	6,180	7,200	7,480	8,550	9,130	10,140	10,770	11,830	12,210	13,050	13,500	13,810	14,200	14,490	15,270
	51~60	5,260	6,180	7,240	7,990	8,560	9,720	10,660	11,580	12,450	13,560	13,900	14,880	15,370	15,820	16,200	16,500	17,490
121~130	35~40	4,180	5,040	5,820	6,450	7,020	7,840	8,670	9,370	9,780	10,080	10,530	11,550	12,160	12,720	13,140	13,410	13,750
	41~50	4,930	5,910	6,780	7,500	8,250	9,180	10,080	10,920	11,830	11,850	12,300	13,380	14,160	14,560	15,090	15,600	15,790
	51~60	5,580	6,690	7,770	8,080	9,460	10,480	11,500	12,540	13,560	13,750	14,070	15,520	16,150	16,650	17,170	17,790	18,450
131~140	35~40	4,350	5,260	5,890	6,780	7,170	8,340	9,060	9,990	10,200	10,530	11,320	12,010	13,030	13,260	13,930	14,320	14,830
	41~50	5,260	6,370	6,880	8,110	8,380	9,580	10,710	11,620	12,210	12,300	13,180	14,080	15,150	15,450	16,240	16,690	17,520
	51~60	6,040	7,450	7,890	8,950	9,720	10,960	12,280	13,290	13,900	14,070	15,040	15,780	17,320	17,580	18,540	19,080	19,950
141~150	35~40	4,560	5,470	6,420	6,910	7,620	8,800	9,780	10,300	10,920	11,550	12,010	12,900	13,500	13,930	14,550	14,860	15,570
	41~50	5,550	6,520	7,300	8,200	8,890	10,260	11,310	12,000	13,050	13,380	14,080	15,190	15,730	16,180	16,500	17,350	18,490
	51~60	6,180	7,540	8,400	9,180	10,260	11,730	12,780	13,680	14,880	15,520	15,780	16,680	17,950	18,580	19,350	19,750	21,240
151~160	35~40	4,780	5,680	6,480	7,420	8,370	8,890	9,990	10,720	11,550	12,160	13,030	13,500	14,370	15,240	15,540	15,840	16,240
	41~50	5,620	6,700	7,600	8,640	9,640	10,380	11,460	12,480	13,500	14,160	15,150	15,730	16,690	17,740	18,060	18,430	19,600
	51~60	6,370	7,650	8,710	9,880	11,110	11,830	13,020	14,250	15,370	16,150	17,320	17,950	19,090	20,160	20,530	21,000	22,360
161~170	35~40	4,930	5,730	6,690	7,590	8,620	9,150	10,330	11,100	11,920	12,720	13,260	13,930	15,240	15,940	16,390	16,510	17,530
	41~50	5,850	6,780	7,800	8,920	10,000	10,600	12,030	12,850	13,810	14,560	15,450	16,180	17,740	18,150	18,430	19,240	20,370
	51~60	6,610	7,750	8,850	10,090	11,280	12,130	13,590	14,670	15,820	16,650	17,580	18,580	20,160	20,430	20,790	21,970	23,200
171~180	35~40	4,980	5,980	6,840	7,750	8,760	9,480	10,590	11,410	12,210	13,140	13,930	14,550	15,540	16,390	16,560	17,490	18,330
	41~50	5,880	7,000	8,040	9,120	10,200	10,900	12,310	13,330	14,200	15,090	16,240	16,500	18,060	18,430	18,480	20,310	21,240
	51~60	6,670	8,010	9,030	10,350	11,440	12,480	13,900	15,540	16,200	17,170	18,540	19,350	20,530	20,790	21,030	23,130	24,210
181~190	35~40	5,130	6,210	6,910	7,840	8,880	9,810	10,720	11,790	12,400	13,410	14,320	14,860	15,840	16,510	17,490	18,120	19,000
	41~50	6,060	7,230	8,100	9,220	10,360	11,490	12,450	13,740	14,490	15,600	16,690	17,350	18,430	19,240	20,310	21,090	22,120
	51~60	6,900	8,260	9,190	10,500	11,530	13,050	14,190	15,690	16,500	17,790	19,080	19,750	21,000	21,970	23,130	24,040	25,270
191~200	35~40	5,910	6,520	7,320	8,230	9,400	10,120	10,860	12,400	13,120	13,750	14,830	15,570	16,240	17,530	18,330	19,000	19,950
	41~50	6,910	7,920	8,610	9,690	10,860	11,830	12,640	14,410	15,270	15,790	17,520	18,490	19,600	20,370	21,240	22,120	23,160
	51~60	7,920	8,820	9,780	11,070	11,700	13,440	14,430	16,120	17,490	18,450	19,950	21,240	22,360	23,200	24,210	25,270	26,410

Price

■FB—SKS (SKS3) U/Price

■Volume discount rate P.37

Quantity	1~9	10~30
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

A	B \ T	U/Price																
		30~ 40	41~ 50	51~ 60	61~ 70	71~ 80	81~ 90	91~ 100	101~ 110	111~ 120	121~ 130	131~ 140	141~ 150	151~ 160	161~ 170	171~ 180	181~ 190	191~ 200
30~ 40	35~40	1,640	1,850	1,920	2,000	2,140	2,280	2,400	2,440	2,710	2,790	2,900	3,040	3,190	3,290	3,320	3,420	3,940
	41~50	1,780	2,000	2,070	2,140	2,350	2,570	2,740	2,950	3,040	3,290	3,510	3,700	3,750	3,900	3,920	4,040	4,610
	51~60	1,920	2,140	2,280	2,350	2,570	2,950	3,200	3,330	3,510	3,720	4,030	4,120	4,250	4,410	4,450	4,600	5,280
41~ 50	35~40	1,850	2,000	2,070	2,140	2,350	2,490	2,740	3,020	3,040	3,360	3,510	3,650	3,790	3,820	3,990	4,140	4,350
	41~50	2,000	2,210	2,280	2,350	2,670	2,860	3,170	3,550	3,620	3,940	4,250	4,350	4,470	4,520	4,670	4,820	5,280
	51~60	2,140	2,420	2,540	2,640	3,070	3,310	3,550	4,000	4,120	4,460	4,970	5,030	5,100	5,170	5,340	5,510	5,880
51~ 60	35~40	1,920	2,070	2,140	2,350	2,510	2,910	2,990	3,290	3,520	3,880	3,930	4,280	4,320	4,460	4,560	4,610	4,880
	41~50	2,070	2,280	2,420	2,680	2,950	3,360	3,470	3,850	4,120	4,520	4,590	4,870	5,070	5,200	5,360	5,400	5,740
	51~60	2,280	2,540	2,680	3,000	3,330	3,890	4,230	4,430	4,830	5,180	5,260	5,600	5,810	5,900	6,020	6,130	6,520
61~ 70	35~40	2,000	2,140	2,350	2,420	2,850	3,270	3,360	3,780	4,010	4,300	4,520	4,610	4,950	5,060	5,170	5,230	5,490
	41~50	2,140	2,350	2,680	2,870	3,370	3,660	3,870	4,420	4,800	5,000	5,410	5,470	5,760	5,950	6,080	6,150	6,460
	51~60	2,350	2,640	3,000	3,270	3,820	4,390	4,430	5,060	5,330	5,390	5,970	6,120	6,590	6,730	6,900	7,000	7,380
71~ 80	35~40	2,140	2,350	2,510	2,850	3,250	3,490	3,800	4,250	4,420	4,680	4,780	5,080	5,580	5,750	5,840	5,920	6,270
	41~50	2,350	2,670	2,950	3,370	3,780	4,070	4,380	4,800	4,990	5,500	5,590	5,930	6,430	6,670	6,800	6,910	7,240
	51~60	2,570	3,070	3,330	3,820	4,320	4,650	4,970	5,500	5,710	6,310	6,480	6,840	7,410	7,520	7,630	7,690	7,800
81~ 90	35~40	2,280	2,490	2,910	3,270	3,490	3,890	4,010	4,580	4,850	5,230	5,560	5,870	5,930	6,100	6,320	6,540	6,750
	41~50	2,570	2,860	3,360	3,660	4,070	4,550	4,780	5,290	5,700	6,120	6,390	6,840	6,920	7,070	7,270	7,660	7,890
	51~60	2,950	3,310	3,890	4,390	4,650	5,190	5,410	6,060	6,480	6,990	7,310	7,820	7,890	8,090	8,320	8,700	8,960
91~100	35~40	2,400	2,740	2,990	3,360	3,800	4,010	4,150	4,990	5,270	5,780	6,040	6,520	6,660	6,890	7,060	7,150	7,240
	41~50	2,740	3,170	3,470	3,870	4,380	4,780	4,770	5,870	6,090	6,720	7,140	7,540	7,640	8,020	8,210	8,300	8,430
	51~60	3,200	3,550	4,230	4,430	4,970	5,410	5,490	6,610	7,110	7,670	8,190	8,520	8,680	9,060	9,270	9,460	9,620
101~110	35~40	2,440	3,020	3,290	3,780	4,250	4,580	4,990	5,340	5,800	6,250	6,660	6,870	7,150	7,400	7,610	7,860	8,270
	41~50	2,950	3,550	3,850	4,420	4,800	5,290	5,870	6,220	6,760	7,280	7,750	8,000	8,320	8,570	8,890	9,160	9,610
	51~60	3,330	4,000	4,430	5,060	5,500	6,060	6,610	7,060	7,720	8,360	8,860	9,120	9,500	9,780	10,360	10,460	10,750
111~120	35~40	2,710	3,040	3,520	4,010	4,420	4,850	5,270	5,800	6,040	6,520	6,800	7,280	7,700	7,950	8,140	8,270	8,750
	41~50	3,040	3,620	4,120	4,800	4,990	5,700	6,090	6,760	7,180	7,890	8,140	8,700	9,000	9,210	9,470	9,660	10,180
	51~60	3,510	4,120	4,830	5,330	5,710	6,480	7,110	7,720	8,300	9,040	9,270	9,920	10,250	10,550	10,800	11,000	11,660
121~130	35~40	2,790	3,360	3,880	4,300	4,680	5,230	5,780	6,250	6,520	6,720	7,020	7,700	8,110	8,480	8,760	8,940	9,170
	41~50	3,290	3,940	4,520	5,000	5,500	6,120	6,720	7,280	7,890	7,900	8,200	8,920	9,440	9,710	10,060	10,400	10,530
	51~60	3,720	4,460	5,180	5,390	6,310	6,990	7,670	8,360	9,040	9,170	9,380	10,350	10,770	11,100	11,450	11,860	12,300
131~140	35~40	2,900	3,510	3,930	4,520	4,780	5,560	6,040	6,660	6,800	7,020	7,550	8,010	8,690	8,840	9,290	9,550	9,890
	41~50	3,510	4,250	4,590	5,410	5,590	6,390	7,140	7,750	8,140	8,200	8,790	9,390	10,100	10,300	10,830	11,130	11,680
	51~60	4,030	4,970	5,260	5,970	6,480	7,310	8,190	8,860	9,270	9,380	10,030	10,520	11,550	11,720	12,360	12,720	13,300
141~150	35~40	3,040	3,650	4,280	4,610	5,080	5,870	6,520	6,870	7,280	7,700	8,010	8,600	9,000	9,290	9,700	9,910	10,380
	41~50	3,700	4,350	4,870	5,470	5,930	6,840	7,540	8,000	8,700	8,920	9,390	10,130	10,490	10,790	11,000	11,570	12,330
	51~60	4,120	5,030	5,600	6,120	6,840	7,820	8,520	9,120	9,920	10,350	10,520	11,120	11,970	12,390	12,900	13,170	14,160
151~160	35~40	3,190	3,790	4,320	4,950	5,580	5,930	6,660	7,150	7,700	8,110	8,690	9,000	9,580	10,160	10,360	10,560	10,830
	41~50	3,750	4,470	5,070	5,760	6,430	6,920	7,640	8,320	9,000	9,440	10,100	10,490	11,130	11,830	12,040	12,290	13,070
	51~60	4,250	5,100	5,810	6,590	7,410	7,890	8,680	9,500	10,250	10,770	11,550	11,970	12,730	13,440	13,690	14,000	14,910
161~170	35~40	3,290	3,820	4,460	5,060	5,750	6,100	6,890	7,400	7,950	8,480	8,840	9,290	10,160	10,630	10,930	11,010	11,690
	41~50	3,900	4,520	5,200	5,950	6,670	7,070	8,020	8,570	9,210	9,710	10,300	10,790	11,830	12,100	12,290	12,830	13,580
	51~60	4,410	5,170	5,900	6,730	7,520	8,090	9,060	9,780	10,550	11,100	11,722	12,390	13,440	13,620	13,860	14,650	15,470
171~180	35~40	3,320	3,990	4,560	5,170	5,840	6,320	7,060	7,610	8,140	8,760	9,290	9,700	10,360	10,930	11,040	11,660	12,220
	41~50	3,920	4,670	5,360	6,080	6,800	7,270	8,210	8,890	9,470	10,060	10,830	11,000	12,040	12,290	12,320	13,540	14,160
	51~60	4,450	5,340	6,020	6,900	7,630	8,320	9,270	10,360	10,800	11,450	12,360	12,900	13,690	13,860	14,020	15,420	16,140
181~190	35~40	3,420	4,140	4,610	5,230	5,920	6,540	7,150	7,860	8,270	8,940	9,550	9,910	10,560	11,010	11,660	12,080	12,670
	41~50	4,040	4,820	5,400	6,150	6,910	7,660	8,300	9,160	9,660	10,400	11,130	11,570	12,290	12,830	13,540	14,060	14,750
	51~60	4,600	5,510	6,130	7,000	7,690	8,700	9,460	10,460	11,000	11,860	12,720	13,170	14,000	14,650	15,420	16,030	16,850
191~200	35~40	3,940	4,350	4,880	5,490	6,270	6,750	7,240	8,270	8,750	9,170	9,890	10,380	10,830	11,690	12,220	12,670	13,300
	41~50	4,610	5,280	5,740	6,460	7,240	7,890	8,430	9,610	10,180	10,530	11,680	12,330	13,070	13,580	14,160	14,750	15,440
	51~60	5,280	5,880	6,520	7,380	7,800	8,960	9,620	10,750	11,660	12,300	13,300	14,160	14,910	15,470	16,140	16,850	17,610

FINISHED BLOCKS
—PRICE—

Price

■FB—SK (SKS93) U/Price

■Volume discount rate P.37

Quantity	1~9	10~30
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

A	T \ B	30~40	41~50	51~60	61~70	71~80	81~90	91~100	101~110	111~120	121~130	131~140	141~150	151~160	161~170	171~180	181~190	191~200
		U/Price																
30~40	35~40	1,140	1,290	1,340	1,400	1,490	1,590	1,680	1,700	1,890	1,950	2,030	2,120	2,230	2,300	2,320	2,390	2,750
	41~50	1,240	1,400	1,440	1,490	1,640	1,790	1,910	2,060	2,120	2,300	2,450	2,590	2,620	2,730	2,740	2,820	3,220
	51~60	1,340	1,490	1,590	1,640	1,790	2,060	2,240	2,330	2,450	2,600	2,820	2,880	2,970	3,080	3,110	3,220	3,690
41~50	35~40	1,290	1,400	1,440	1,490	1,640	1,740	1,910	2,110	2,120	2,350	2,450	2,550	2,650	2,670	2,790	2,890	3,040
	41~50	1,400	1,540	1,590	1,640	1,860	2,000	2,210	2,480	2,530	2,750	2,970	3,040	3,120	3,160	3,260	3,370	3,690
	51~60	1,490	1,690	1,770	1,840	2,140	2,310	2,480	2,800	2,880	3,120	3,470	3,520	3,570	3,610	3,730	3,850	4,110
51~60	35~40	1,340	1,440	1,490	1,640	1,750	2,030	2,090	2,300	2,460	2,710	2,750	2,990	3,020	3,120	3,190	3,220	3,410
	41~50	1,440	1,590	1,690	1,870	2,060	2,350	2,420	2,690	2,880	3,160	3,210	3,400	3,540	3,640	3,750	3,780	4,010
	51~60	1,590	1,770	1,870	2,100	2,330	2,720	2,960	3,100	3,380	3,620	3,680	3,920	4,060	4,130	4,210	4,290	4,560
61~70	35~40	1,400	1,490	1,640	1,690	1,990	2,280	2,350	2,640	2,800	3,010	3,160	3,220	3,460	3,540	3,610	3,660	3,840
	41~50	1,490	1,640	1,870	2,000	2,350	2,560	2,700	3,090	3,360	3,500	3,780	3,820	4,030	4,160	4,250	4,300	4,520
	51~60	1,640	1,840	2,100	2,280	2,670	3,070	3,100	3,540	3,730	3,770	4,170	4,280	4,610	4,710	4,830	4,900	5,160
71~80	35~40	1,490	1,640	1,750	1,990	2,270	2,440	2,660	2,970	3,090	3,270	3,340	3,550	3,900	4,020	4,080	4,140	4,380
	41~50	1,640	1,860	2,060	2,350	2,640	2,840	3,060	3,360	3,490	3,850	3,910	4,150	4,500	4,660	4,760	4,830	5,060
	51~60	1,790	2,140	2,330	2,670	3,020	3,250	3,470	3,850	3,990	4,410	4,530	4,780	5,180	5,260	5,340	5,380	5,460
81~90	35~40	1,590	1,740	2,030	2,280	2,440	2,720	2,800	3,200	3,390	3,660	3,890	4,100	4,150	4,270	4,420	4,570	4,720
	41~50	1,790	2,000	2,350	2,560	2,840	3,180	3,340	3,700	3,990	4,280	4,470	4,780	4,840	4,940	5,080	5,360	5,520
	51~60	2,060	2,310	2,720	3,070	3,250	3,630	3,780	4,240	4,530	4,890	5,110	5,470	5,520	5,660	5,820	6,090	6,270
91~100	35~40	1,680	1,910	2,090	2,350	2,660	2,800	2,900	3,490	3,680	4,040	4,220	4,560	4,660	4,820	4,940	5,000	5,060
	41~50	1,910	2,210	2,420	2,700	3,060	3,340	3,330	4,100	4,260	4,700	4,990	5,270	5,340	5,610	5,740	5,810	5,900
	51~60	2,240	2,480	2,960	3,100	3,470	3,780	3,840	4,620	4,970	5,360	5,730	5,960	6,070	6,340	6,480	6,620	6,730
101~110	35~40	1,700	2,110	2,300	2,640	2,970	3,200	3,490	3,730	4,060	4,370	4,660	4,800	5,000	5,180	5,320	5,500	5,780
	41~50	2,060	2,480	2,690	3,090	3,360	3,700	4,100	4,350	4,730	5,090	5,420	5,600	5,820	5,990	6,220	6,410	6,720
	51~60	2,330	2,800	3,100	3,540	3,850	4,240	4,620	4,940	5,400	5,850	6,200	6,380	6,650	6,840	7,250	7,320	7,520
111~120	35~40	1,890	2,120	2,460	2,800	3,090	3,390	3,680	4,060	4,220	4,560	4,760	5,090	5,390	5,560	5,690	5,780	6,120
	41~50	2,120	2,530	2,880	3,360	3,490	3,990	4,260	4,730	5,020	5,520	5,690	6,090	6,300	6,440	6,620	6,760	7,120
	51~60	2,450	2,880	3,380	3,730	3,990	4,530	4,970	5,400	5,810	6,320	6,480	6,940	7,170	7,380	7,560	7,700	8,160
121~130	35~40	1,950	2,350	2,710	3,010	3,270	3,660	4,040	4,370	4,560	4,700	4,910	5,390	5,670	5,930	6,130	6,250	6,410
	41~50	2,300	2,750	3,160	3,500	3,850	4,280	4,700	5,090	5,520	5,530	5,740	6,240	6,600	6,790	7,040	7,280	7,370
	51~60	2,600	3,120	3,620	3,770	4,410	4,890	5,360	5,850	6,320	6,410	6,560	7,240	7,530	7,770	8,010	8,300	8,610
131~140	35~40	2,030	2,450	2,750	3,160	3,340	3,890	4,220	4,660	4,760	4,910	5,280	5,600	6,080	6,180	6,500	6,680	6,920
	41~50	2,450	2,970	3,210	3,780	3,910	4,470	4,990	5,420	5,690	5,740	6,150	6,570	7,070	7,210	7,580	7,790	8,170
	51~60	2,820	3,470	3,680	4,170	4,530	5,110	5,730	6,200	6,480	6,560	7,020	7,360	8,080	8,200	8,650	8,900	9,310
141~150	35~40	2,120	2,550	2,990	3,220	3,550	4,100	4,560	4,800	5,090	5,390	5,600	6,020	6,300	6,500	6,790	6,930	7,260
	41~50	2,590	3,040	3,400	3,820	4,150	4,780	5,270	5,600	6,090	6,240	6,570	7,090	7,340	7,550	7,700	8,090	8,630
	51~60	2,880	3,520	3,920	4,280	4,780	5,470	5,960	6,380	6,940	7,240	7,360	7,780	8,370	8,670	9,030	9,210	9,910
151~160	35~40	2,230	2,650	3,020	3,460	3,900	4,150	4,660	5,000	5,390	5,670	6,080	6,300	6,700	7,110	7,250	7,390	7,580
	41~50	2,620	3,120	3,540	4,030	4,500	4,840	5,340	5,820	6,300	6,600	7,070	7,340	7,790	8,280	8,420	8,600	9,140
	51~60	2,970	3,570	4,060	4,610	5,180	5,520	6,070	6,650	7,170	7,530	8,080	8,370	8,910	9,400	9,580	9,800	10,430
161~170	35~40	2,300	2,670	3,120	3,540	4,020	4,270	4,820	5,180	5,560	5,930	6,180	6,500	7,110	7,440	7,650	7,700	8,180
	41~50	2,730	3,160	3,640	4,160	4,660	4,940	5,610	5,990	6,440	6,790	7,210	7,550	8,280	8,470	8,600	8,980	9,500
	51~60	3,080	3,610	4,130	4,710	5,260	5,660	6,340	6,840	7,380	7,770	8,200	8,670	9,400	9,530	9,700	10,250	10,820
171~180	35~40	2,320	2,790	3,190	3,610	4,080	4,420	4,940	5,320	5,690	6,130	6,500	6,790	7,250	7,650	7,720	8,160	8,550
	41~50	2,740	3,260	3,750	4,250	4,760	5,080	5,740	6,220	6,620	7,040	7,580	7,700	8,420	8,600	8,620	9,470	9,910
	51~60	3,110	3,730	4,210	4,830	5,340	5,820	6,480	7,250	7,560	8,010	8,650	9,030	9,580	9,700	9,810	10,790	11,290
181~190	35~40	2,390	2,890	3,220	3,660	4,140	4,570	5,000	5,500	5,780	6,250	6,680	6,930	7,390	7,700	8,160	8,450	8,860
	41~50	2,820	3,370	3,780	4,300	4,830	5,360	5,810	6,410	6,760	7,280	7,790	8,090	8,600	8,980	9,470	9,840	10,320
	51~60	3,220	3,850	4,290	4,900	5,380	6,090	6,620	7,320	7,700	8,300	8,900	9,210	9,800	10,250	10,790	11,220	11,790
191~200	35~40	2,750	3,040	3,410	3,840	4,380	4,720	5,060	5,780	6,120	6,410	6,920	7,260	7,580	8,180	8,550	8,860	9,310
	41~50	3,220	3,690	4,010	4,520	5,060	5,520	5,900	6,720	7,120	7,370	8,170	8,630	9,140	9,500	9,910	10,320	10,800
	51~60	3,690	4,110	4,560	5,160	5,460	6,270	6,730	7,520	8,160	8,610	9,310	9,910	10,430	10,820	11,290	11,790	12,320

Price

■FB—SC (S50C) U/Price

■Volume discount rate P.37

Quantity	1~9	10~30
Rate	—	5%

To be quoted on price & lead time above Max. Q'ty.

A	T \ B	30~40	41~50	51~60	61~70	71~80	81~90	91~100	101~110	111~120	121~130	131~140	141~150	151~160	161~170	171~180	181~190	191~200
		U/Price																
30~40	35~40	1,140	1,290	1,340	1,400	1,430	1,520	1,600	1,630	1,700	1,750	1,820	1,910	1,970	2,030	2,050	2,080	2,360
	41~50	1,240	1,400	1,440	1,490	1,570	1,720	1,830	1,850	1,910	2,070	2,210	2,330	2,340	2,410	2,430	2,460	2,760
	51~60	1,340	1,490	1,590	1,640	1,720	1,970	2,140	2,160	2,210	2,340	2,530	2,590	2,630	2,730	2,750	2,800	3,160
41~50	35~40	1,290	1,400	1,440	1,470	1,570	1,660	1,830	1,900	1,910	2,110	2,210	2,260	2,340	2,360	2,430	2,480	2,560
	41~50	1,400	1,540	1,590	1,620	1,780	1,910	2,120	2,230	2,280	2,480	2,670	2,690	2,770	2,800	2,840	2,890	3,110
	51~60	1,490	1,690	1,770	1,820	2,050	2,210	2,370	2,520	2,590	2,800	3,130	3,140	3,160	3,200	3,250	3,300	3,460
51~60	35~40	1,340	1,440	1,490	1,570	1,680	1,940	2,000	2,070	2,210	2,440	2,470	2,650	2,670	2,720	2,730	2,760	2,830
	41~50	1,440	1,590	1,690	1,790	1,970	2,250	2,320	2,420	2,590	2,840	2,890	3,010	3,140	3,170	3,210	3,240	3,320
	51~60	1,590	1,770	1,870	2,010	2,230	2,600	2,830	2,790	3,040	3,260	3,310	3,470	3,600	3,590	3,610	3,670	3,780
61~70	35~40	1,400	1,430	1,570	1,620	1,900	2,190	2,250	2,380	2,520	2,700	2,800	2,850	3,010	3,030	3,050	3,080	3,120
	41~50	1,490	1,570	1,790	1,920	2,250	2,450	2,590	2,780	3,020	3,150	3,350	3,390	3,510	3,570	3,580	3,620	3,680
	51~60	1,640	1,760	2,010	2,190	2,550	2,940	2,960	3,180	3,350	3,390	3,700	3,790	4,010	4,030	4,070	4,130	4,200
71~80	35~40	1,430	1,570	1,680	1,900	2,170	2,330	2,540	2,670	2,780	2,940	2,960	3,090	3,340	3,390	3,410	3,430	3,510
	41~50	1,570	1,780	1,970	2,250	2,530	2,720	2,930	3,020	3,140	3,460	3,520	3,610	3,850	3,930	3,940	4,000	4,050
	51~60	1,720	2,050	2,230	2,550	2,890	3,110	3,320	3,460	3,590	3,970	4,010	4,170	4,370	4,430	4,500	4,530	4,600
81~90	35~40	1,520	1,660	1,940	2,190	2,330	2,600	2,680	2,880	3,050	3,290	3,390	3,460	3,490	3,530	3,600	3,660	3,710
	41~50	1,720	1,910	2,250	2,450	2,720	3,040	3,100	3,330	3,590	3,850	3,890	4,030	4,080	4,100	4,140	4,280	4,330
	51~60	1,970	2,210	2,600	2,940	3,110	3,470	3,620	3,810	4,080	4,400	4,450	4,610	4,650	4,690	4,740	4,870	4,920
91~100	35~40	1,600	1,830	2,000	2,250	2,540	2,680	2,780	3,140	3,320	3,520	3,620	3,840	3,860	3,920	3,950	4,000	4,050
	41~50	1,830	2,120	2,320	2,590	2,930	3,100	3,190	3,690	3,830	4,090	4,280	4,440	4,430	4,570	4,590	4,640	4,720
	51~60	2,140	2,370	2,830	2,960	3,320	3,620	3,670	4,160	4,470	4,670	4,910	5,020	5,030	5,160	5,190	5,290	5,380
101~110	35~40	1,630	1,900	2,070	2,380	2,670	2,880	3,140	3,360	3,530	3,750	3,920	3,980	4,070	4,140	4,180	4,240	4,380
	41~50	1,850	2,230	2,420	2,780	3,020	3,330	3,690	3,910	4,120	4,360	4,570	4,640	4,740	4,790	4,880	4,940	5,090
	51~60	2,160	2,520	2,790	3,180	3,460	3,810	4,160	4,440	4,700	5,010	5,220	5,280	5,410	5,470	5,690	5,750	5,910
111~120	35~40	1,700	1,910	2,210	2,520	2,780	3,050	3,320	3,530	3,620	3,840	3,940	4,140	4,310	4,370	4,390	4,420	4,550
	41~50	1,910	2,280	2,590	3,020	3,140	3,590	3,830	4,120	4,300	4,570	4,720	4,950	5,040	5,060	5,110	5,160	5,290
	51~60	2,210	2,590	3,040	3,350	3,590	4,080	4,470	4,700	4,980	5,240	5,370	5,650	5,740	5,800	5,830	5,880	6,060
121~130	35~40	1,750	2,110	2,440	2,700	2,940	3,290	3,520	3,750	3,840	3,890	4,000	4,310	4,460	4,570	4,640	4,690	4,760
	41~50	2,070	2,480	2,840	3,150	3,460	3,850	4,090	4,360	4,570	4,660	4,750	4,990	5,190	5,240	5,330	5,400	5,470
	51~60	2,340	2,800	3,260	3,390	3,970	4,400	4,670	5,010	5,240	5,310	5,440	5,790	5,920	5,990	6,060	6,160	6,390
131~140	35~40	1,820	2,210	2,470	2,800	2,960	3,390	3,620	3,920	3,940	4,000	4,220	4,400	4,690	4,720	4,830	4,960	5,040
	41~50	2,210	2,670	2,890	3,350	3,520	3,890	4,280	4,570	4,720	4,750	4,920	5,160	5,450	5,510	5,630	5,780	5,950
	51~60	2,530	3,130	3,310	3,700	4,010	4,450	4,910	5,220	5,370	5,440	5,610	5,890	6,230	6,270	6,420	6,610	6,780
141~150	35~40	1,910	2,260	2,650	2,850	3,090	3,460	3,840	3,980	4,140	4,310	4,400	4,640	4,770	4,830	5,040	5,050	5,290
	41~50	2,330	2,690	3,010	3,390	3,610	4,030	4,440	4,640	4,950	4,990	5,160	5,470	5,550	5,610	5,720	5,900	6,280
	51~60	2,590	3,140	3,470	3,790	4,170	4,610	5,020	5,280	5,650	5,790	5,890	6,000	6,340	6,440	6,700	6,710	7,220
151~160	35~40	1,970	2,340	2,670	3,010	3,340	3,490	3,860	4,070	4,310	4,460	4,690	4,770	4,980	5,280	5,330	5,380	5,410
	41~50	2,340	2,770	3,140	3,510	3,850	4,080	4,430	4,740	5,040	5,190	5,450	5,550	5,780	6,150	6,200	6,260	6,530
	51~60	2,630	3,160	3,600	4,010	4,370	4,650	5,030	5,410	5,740	5,920	6,230	6,340	6,610	6,980	7,050	7,140	7,450
161~170	35~40	2,030	2,360	2,720	3,030	3,390	3,530	3,920	4,140	4,370	4,570	4,720	4,830	5,280	5,420	5,570	5,610	5,840
	41~50	2,410	2,800	3,170	3,570	3,930	4,100	4,570	4,790	5,060	5,240	5,510	5,610	6,150	6,170	6,260	6,540	6,790
	51~60	2,730	3,200	3,590	4,030	4,430	4,690	5,160	5,470	5,800	5,990	6,270	6,440	6,980	6,940	7,060	7,470	7,730
171~180	35~40	2,050	2,430	2,730	3,050	3,410	3,600	3,950	4,180	4,390	4,640	4,830	5,040	5,330	5,570	5,630	5,830	6,110
	41~50	2,430	2,840	3,210	3,580	3,940	4,140	4,590	4,880	5,110	5,330	5,630	5,720	6,200	6,260	6,280	6,770	7,080
	51~60	2,750	3,250	3,610	4,070	4,500	4,740	5,190	5,690	5,830	6,060	6,420	6,700	7,050	7,060	7,150	7,710	8,070
181~190	35~40	2,080	2,480	2,760	3,080	3,430	3,660	4,000	4,240	4,420	4,690	4,960	5,050	5,380	5,610	5,830	6,040	6,330
	41~50	2,460	2,890	3,240	3,620	4,000	4,280	4,640	4,940	5,160	5,400	5,780	5,900	6,260	6,540	6,770	7,030	7,370
	51~60	2,800	3,300	3,670	4,130	4,530	4,870	5,290	5,750	5,880	6,160	6,610	6,710	7,140	7,470	7,710	8,010	8,420
191~200	35~40	2,360	2,560	2,830	3,120	3,510	3,710	4,050	4,380	4,550	4,760	5,040	5,290	5,410	5,840	6,110	6,330	6,650
	41~50	2,760	3,110	3,320	3,680	4,050	4,330	4,720	5,090	5,290	5,470	5,950	6,280	6,530	6,790	7,080	7,370	7,720
	51~60	3,160	3,460	3,780	4,200	4,600	4,920	5,380	5,910	6,060	6,390	6,780	7,220	7,450	7,730	8,070	8,420	8,800

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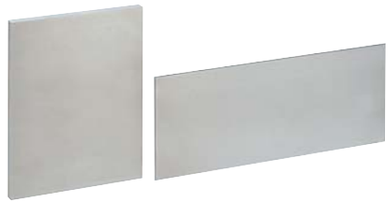
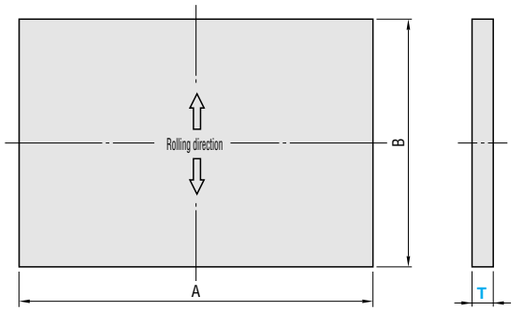
HARDENED PLATES



HPSH
HPHE



Catalog No.	M	H	T	Finishing of A/B/T	Precision standard
HPSH	SKH51	57～63HRC	$T^{+0.05}_{+0.03}$	Finishing of A/B/T 1.6G	Perpendicularity of surfaces A and B 0.02/100mm or less Flatness of top and bottom surfaces 0.02/100mm or less
HPHE			When T≦0.8 : $T^{+0.05}_{+0.02}$ When T≧1.0 : $T^{+0.3}_{+0.1}$	Finishing of A/B/T 1.6G	Perpendicularity of surfaces A and B 0.05/100mm or less Flatness of top and bottom surfaces When T≦1.5 : 0.2/100mm or less When T≧2.0 : 0.1/100mm or less

A		B		T		Catalog No. Type	T	U/Price Q'ty : 1～4	5～9	10～29	30～50
80	$^{+0.3}_{+0.1}$	70	$^{+0.3}_{+0.1}$	1	$^{+0.05}_{+0.03}$	HPSH	1	5,020	4,770	4,520	4,270
				1.3			1.3	4,840	4,590	4,350	4,110
				1.5			1.5	4,740	4,510	4,270	4,040
				1.8			1.8	4,650	4,420	4,190	3,950
				2			2	4,560	4,330	4,100	3,880
				3			3				
100		80		4			4	4,650	4,420	4,190	3,950
				5			5	4,740	4,510	4,270	4,040
				6			6	4,840	4,590	4,350	4,110

A		B		T		Catalog No. Type	T	U/Price Q'ty : 1～4	5～9	10～29	30～50
80	$^{+1.0}_{0}$	70	$^{+1.0}_{0}$	0.5	$^{+0.05}_{+0.02}$	HPHE	0.5	2,840	2,750	2,700	2,560
				0.6			0.6	2,650	2,570	2,520	2,380
				0.8			0.8	2,460	2,380	2,340	2,210
150	$^{+1.0}_{0}$	60	$^{+1.0}_{0}$	1	$^{+0.3}_{+0.1}$		1	2,750	2,660	2,610	2,470
				1.5			1.5	2,840	2,750	2,700	2,560
				2			2	2,940	2,850	2,790	2,640
				3			3	3,220	3,130	3,060	2,900
				4			4	3,510	3,400	3,330	3,150
				5			5	3,980	3,860	3,780	3,580
				6			6	4,460	4,320	4,240	4,010

Order — Catalog No. HPSH 1

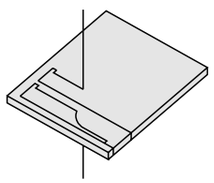
Delivery — 1 Day

Price — To be quoted on price & lead time above Max. Q'ty. P.37

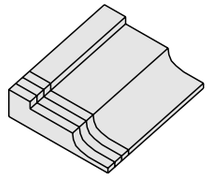
Example
- Block punch material for tie bar cut, etc.
- Backing plate, etc.

(1) Processing method

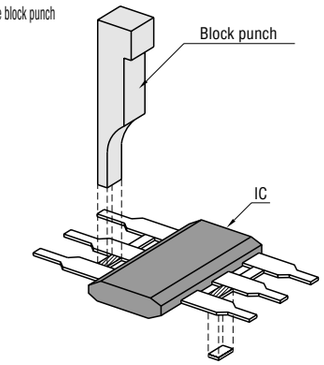
- WEDM



- Cutting after the shape machining.

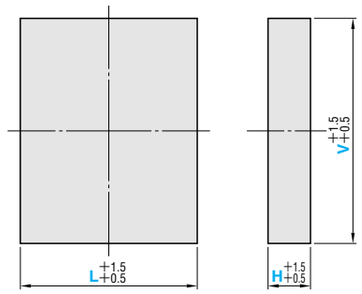


(2) Example of use of the block punch



CARBIDE BLOCK MATERIALS

Z



M V30 (HIP)
H 88～89HRA

Catalog No.	H \ V	3	4	5	6	8	10	13	16	20	100	L
Z	3	○	○	○	○	○	○	○	○	○	○	
	4		○	○	○	○	○	○	○	○	○	
	5			○	○	○	○	○	○	○	○	
	6				○	○	○	○	○	○	○	40
	8					○	○	○	○	○	○	50
	10						○	○	○	○	○	60
	13							○	○	○	○	70
	16								○	○	○	
	20									○	○	
	22										○	
	25										○	

Order — Catalog No. Z 20 H 08 — L 70

Delivery — 1 Day

Price — Volume discount rate P.37

Quantity	1～4	5～9	10～14	15～20
Rate	—	5%	10%	15%

M	Catalog No.	V	H	U/Price Q'ty : 1～4 L 40L	50L	60L	70L
V30	Z	3	3	380	380	380	470
		4	3	380	380	500	580
			4	420	530	620	740
		5	3	410	500	600	720
			4	530	620	740	880
			5	600	770	910	1,050
		6	3	470	580	720	830
			4	600	740	880	1,020
			5	720	880	1,050	1,240
			6	830	1,050	1,240	1,430
		8	3	570	720	860	980
			4	720	880	1,060	1,240
			5	860	1,060	1,260	1,500
			6	1,010	1,240	1,500	1,730
			8	1,300	1,600	1,910	2,220
		10	3	670	850	1,000	1,180
			4	850	1,050	1,260	1,470
			5	1,020	1,280	1,500	1,750
			6	1,180	1,470	1,750	2,040
			8	1,520	1,890	2,250	2,620
			10	1,850	2,320	2,780	3,220
		13	3	850	1,060	1,280	1,500
			4	1,070	1,340	1,600	1,870
			5	1,300	1,600	1,930	2,220
			6	1,500	1,870	2,250	2,600
			8	1,950	2,390	2,860	3,340
			10	2,370	2,940	3,510	4,100
			13	3,020	3,740	4,460	5,210

M	Catalog No.	V	H	U/Price Q'ty : 1～4 L 40L	50L	60L	70L
V30	Z	16	3	1,010	1,260	1,490	1,740
			4	1,260	1,570	1,880	2,190
			5	1,510	1,880	2,240	2,620
			6	1,760	2,190	2,620	3,060
			8	2,260	2,820	3,370	3,920
			10	2,770	3,440	4,120	4,790
			13	3,520	4,380	5,260	6,100
			16	4,300	5,320	6,360	7,420
		20	3	1,210	1,490	1,790	2,060
			4	1,510	1,860	2,220	2,600
			5	1,820	2,220	2,660	3,110
			6	2,100	2,600	3,110	3,650
			8	2,690	3,350	4,020	4,660
			10	3,300	4,110	4,900	5,710
			13	4,200	5,220	6,240	7,270
			16	5,110	6,340	7,590	8,820
			20	6,300	7,830	9,380	10,920
		100	3	5,780	7,170	8,600	9,990
			4	7,220	8,970	10,730	12,500
			5	8,660	10,780	12,890	14,980
			6	10,100	12,560	15,020	17,490
			8	12,980	16,140	19,320	22,470
			10	15,260	19,010	22,740	24,610
			13	19,460	24,190	28,940	31,330
			16	23,610	29,380	35,130	38,040
			20	29,160	36,290	43,400	46,980
			22	31,950	39,740	47,540	51,460
			25	36,110	44,920	53,730	58,180

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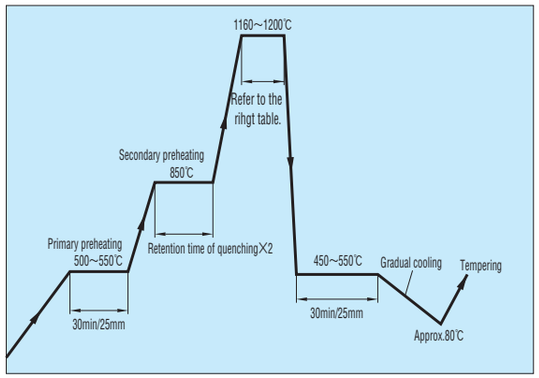
HEAT TREATMENT
—SKH51—

■Summary of quenching for SKH51



Preheating time

Primary preheating：500～550℃, 30minutes/25mm thickness

Secondary preheating：850℃
Retention time of hardening×2
Tertiary preheating：1050℃
Retention time of hardening×2

For simple shaped parts with the thickness of 50mm or less or there is a limitation of equipment→900℃ Retention time of quenching×2. For small parts→primary preheating may be omitted.

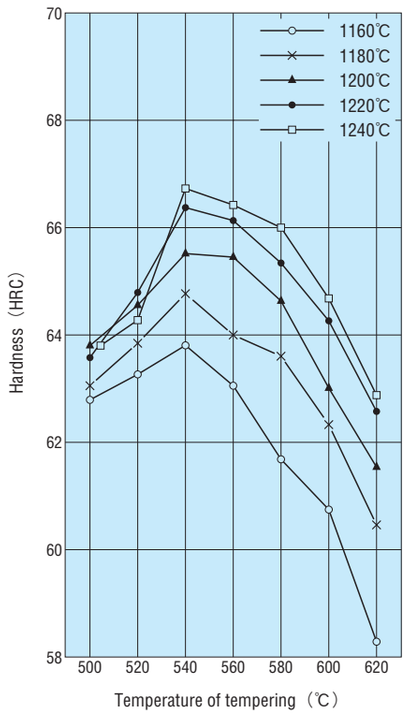
■Standard time of heating

Method	Standard time of heating	
	Thickness (mm)	Immersed period (minutes)
Salt bath	5	60
	10	90
	20	160
	30	240
	40	280
	50	300
	60	390
	70	420
	80	440
	90	495

■Retention time of tempering

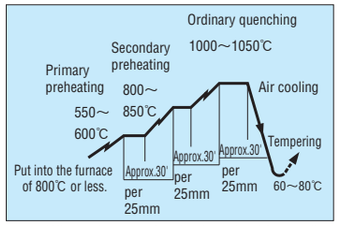
Retention time of tempering	
Thickness (mm)	Retention time of tempering (hr.)
～ 25	1
26～ 35	1.5
36～ 64	2
65～ 84	3
85～124	4
125～184	5
185～249	6
250～349	7
350～499	8

■Tempering hardness curve for SKH51

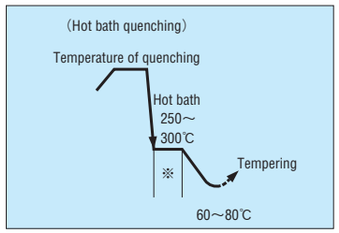


HEAT TREATMENT
—SKD11—

■Summary of ordinary quenching and hot bath quenching for SKD11



When primary preheating is omitted for small parts, preheat at 600 to 800℃ (700 to 750℃) after gradual heating.

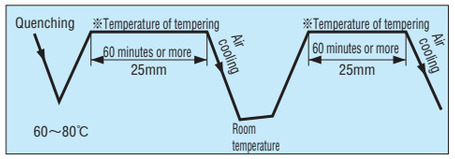


※Until inside / outside temperature to become even.

■Summary of tempering for SKD11

※Temperature of tempering (℃)

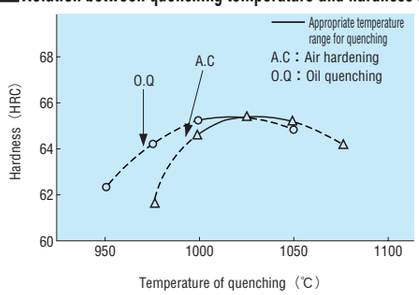
1) When abrasion proof is concerned：150～200℃, 60～63HRC
2) When abrasion proof and toughness are required：200～250℃, 57～60HRC
3) When especially toughness is required：500℃～, 57HRC or less



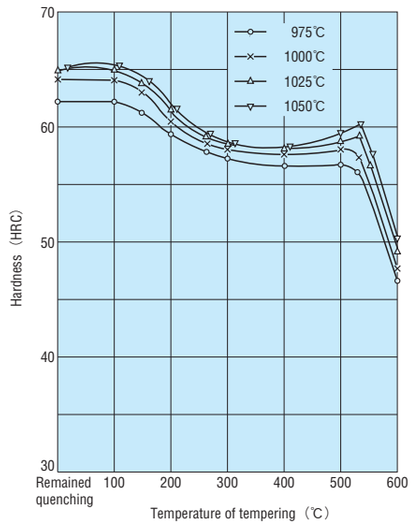
■Appropriate temperature range of quenching SKD11 (℃)

Air hardening	Oil quenching
1000～1050	980～1030

■Relation between quenching temperature and hardness for SKD11



■Tempering hardness curve for SKD11

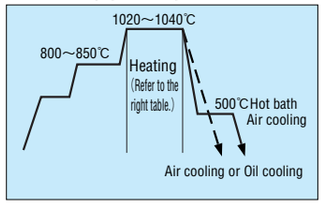


Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

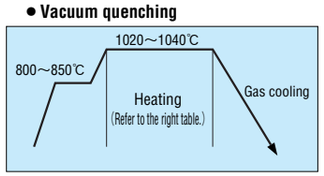
HEAT TREATMENT
—DC53—

■Summary of quenching

● Ordinary quenching



● Vacuum quenching



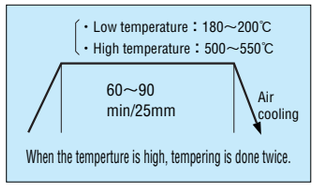
Standard time of heating

Method	Standard time of heating	
Salt bath	Diameter/Thickness (mm)	Immersed period (minutes)
	5	5～ 8
	10	8～10
	20	10～15
	30	15～20
	50	20～25
	100	30～40
Electric furnace Gas furnace	Thickness	Average temperature time
	100 or less	20～30min./25mm thickness
	Over 100	10～20min./25mm thickness
Box packed heating	Average temperature time 30～45min./ Box thickness of 25mm	

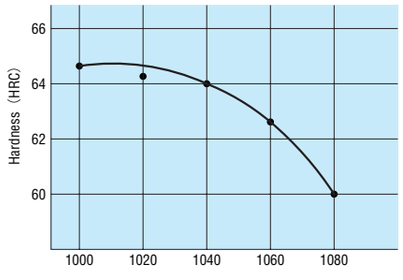
Standard time of heating

Thickness	Average temperature time
100mm or less	20～30min. /25mm thickness
Over 100mm	10～20min. /25mm thickness

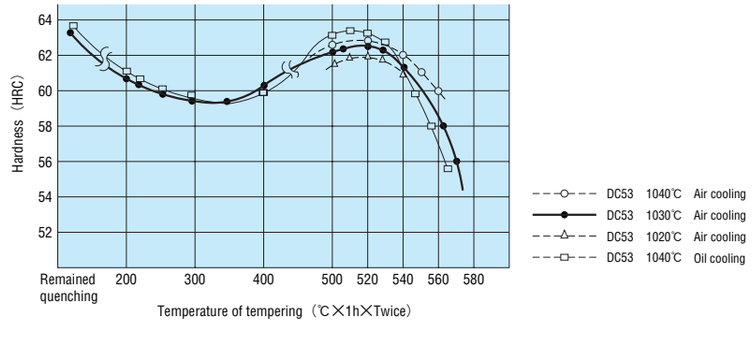
■Summary of tempering



■Relation between quenching temperature and hardness



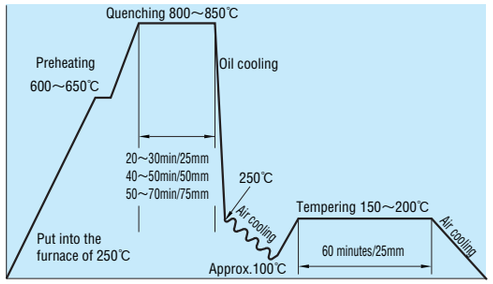
■Tempering hardness curve



HEAT TREATMENT
—SKS3・SKS93—

Heat treatment SKS3

■Summary of ordinary quenching/tempering



Temperature of quenching

For objects of considerable thickness, select upper limit temperature. For thin objects or reducing hardening crack and strain, select lower limit temperature.

Maintaining quenching temperature time period

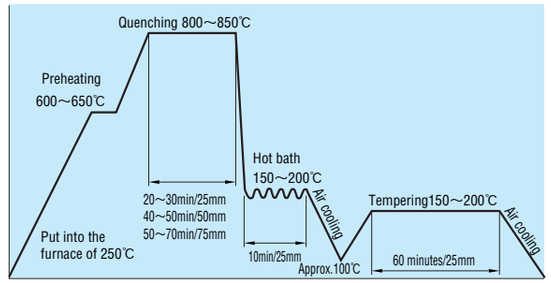
1. Retention time in the left diagram is the standard for bare heating（electric funace and heavy oil furnace）.
2. When the thickness is uneven, keep the exact heating time by partial heating or covering the thin part.

Talking out of oil

Approximately 250℃ is fine, but in the following cases, the temperature can be raised.

1. Due to remarkable uneven thickness, formation of cracks becomes easier.
2. When curved deformation easily occurs.
3. When you wish to reform curve as soon as it is taken out.
4. When surface hardness is not concerned.

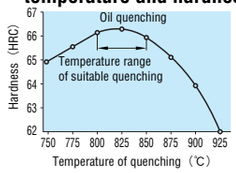
■Summary of hot bath quenching/tempering



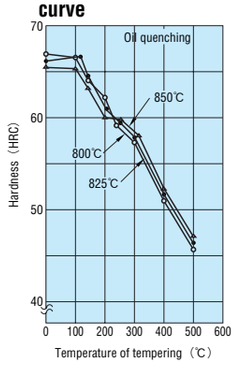
Marquench

This method is suitable for the objects requiring precision finishing by avoiding deformation or bends, or objects with uneven thickness, many holds, or remarkably complicated shapes.

■Relation between quenching temperature and hardness

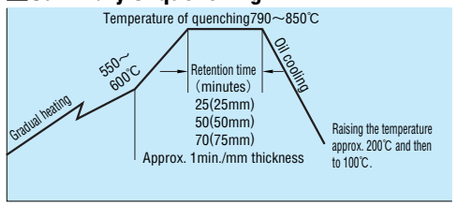


■Tempering hardness curve



Heat treatment SKS93（For oil quenching）

■Summary of quenching



■Summary of tempering

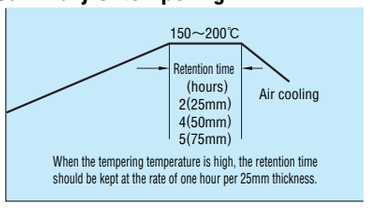
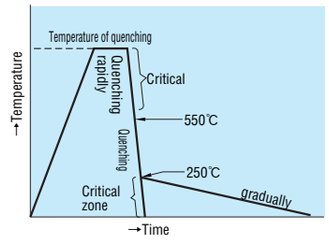
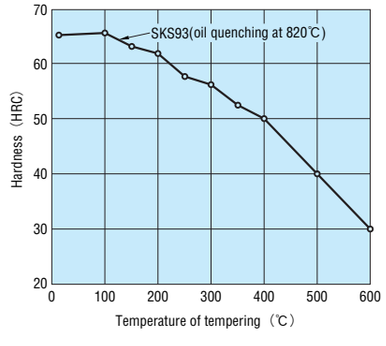


Diagram of hardening for "no crack and hardening"



■Tempering hardness curve



Price Indication: EUR = YEN / 100 · Delivery Time Indication: Catalogue Delivery Time + 5 to 7 days · Please contact Customer Service.

JIGS & FIXTURES SERIES FOR INSPECTION

Name	PRECISION CARBIDE LIMIT GAUGES		PRECISION CARBIDE LIMIT GAUGES		LIMIT GAUGES		PRECISION CARBIDE LIMIT GAUGES
Catalog No.	VGSA	VGWA	VGSB	VGWB	SGSA	SGWA	VGOA
Delivery	⑤	⑤	⑧ⓒ	⑧ⓒ	③Ⓐ	③Ⓐ	⑤
Page	1189	1189	1190	1190	1191	1191	1192

PRECISION CARBIDE LIMIT GAUGES	PLUG GAUGES FOR CHECKING FIXTURE					
VGOB	BGQ · BGQH · BGQT · BGQTH	BGQEH · BGOEH	BGO · BGOH	BGU · BGUH	BGQPH	BGUPH
⑧ⓒ	③	⑤	③	③	③	③
1192	1193	1194	1195	1195	1196	1196

LOCATING PINS FOR CHECKING FIXTURE	TAPER LOCATING PINS FOR CHECKING FIXTURE		BUSHINGS FOR CHECKING FIXTURE		
BGTDSH · BGTA · BGTAH · BGTD · BGTDH	BGMA	BGMD	JBA JBAM JBH JBHM	KJBS KJBST	KJBSK KJBSTK
③	③	③	①	③	③
1197	1198	1198	1199	1199	1200

BUSHINGS FOR CHECKING FIXTURE	MARKING-OFF PINS FOR CHECKING FIXTURE	LOCATING BARS FOR TAPPING POSITION	SHIM PLATES FOR CHECKING FIXTURE—Round type—	SHIM PLATES FOR CHECKING FIXTURE—Square type—
KJBSC KJBSTC	BGK BGKS	BGM	KGSPM	KGSP
③	③	③	①	①
1200	1201	1201	1202	1202

SHIM PLATES FOR CHECKING FIXTURE—Square type with hole—
KGZ
①
1202

Limit gauges

●Limit gauges

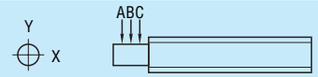
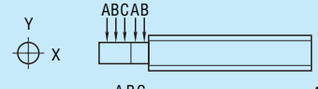
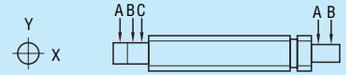
It is standardized for inspection of precision press products and precision holes.
It is excellent in abrasion-resistance and dimension precision guaranteed for mass production.

●Guarantee of accuracy

Each Limit gauge is measured during the machining, and re-measured after the machining in a controlled temperature room at certain period of time for quality assurance purpose. Quality assurance certificate with the actual measurement value of the outside diameter is attached to each product.（Traceability system table/measurement instruments table is not available）.

●Quality assurance certificate

●Measurement of gauges

Inspection item	Measuring point	Accuracy	Method
Outside diameter		Go end $^{+2\mu}_{0}$ Not-go end $\pm 1\mu$	Comparison measurement with block gauge by using measuring instruments.
Circularity		1 μ or less	Measuring through outside diameter.
Cylindricality	 Go end：6 points as A, B and C in two directions of X and Y. Not-go end：4 points as A and B in two directions of X and Y. Not-measured：1mm from the both ends of gauge.	1 μ or less	

●List of measuring instruments

	Name of measuring instrument	Manufacturer	Model
Dimension	● Tool microscope	Nikon	MM—22
	● All purpose end-measuring machine	Carl Zeiss	UHM
	● Horizontal type end-measuring machine	Kuroda Seiko	SM—3
		Tsugami	UL—5D
	● Digital caliper	Mitsutoyo	CD series
	● Micrometer	Mitsutoyo	MDC series
	● Pin gauge	Aizen	EMC1.00～25.00
	● Block gauge	Mitsutoyo	Code No.100.516 Set BM1—24SC—0/KM
Shape	● Roundness measuring device	Tokyo Seimitsu	RONDCOM 45A
	● All purpose measurement microscope	Mashprivolintorque	UIM21
	● Surface roughness measuring machine	Mitsutoyo	Surfcotest SV400
		Tokyo Seimitsu	Surfcom 2B E-MD-S10A

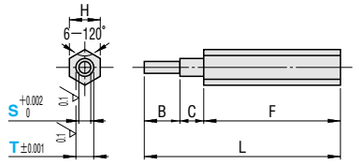
PRECISION CARBIDE LIMIT GAUGES
—ONE END STEPPED · BOTH ENDS STEPPED TYPE—

¥ The volume discount rate is also applicable to alteration cost. P.39

Quality assurance certificate is attached to these products.

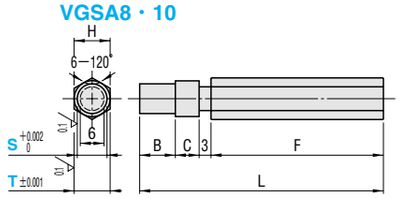
RoHS

VGSA1.6～6



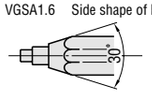
S+0.003＜T

VGSA8・10



S+0.003＜T

VGSA1.6 Side shape of knob part

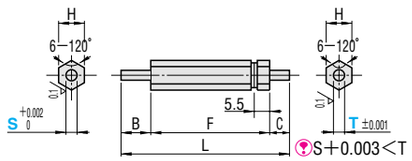


①Knob part
M Aluminum
S Black alumite

②Gauge part
M V20
H 88～89HRA

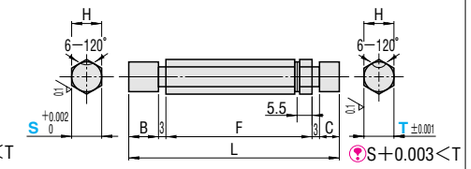
RoHS

VGWA1.6～6



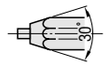
S+0.003＜T

VGWA8・10



S+0.003＜T

VGWA1.6 Side shape of knob part

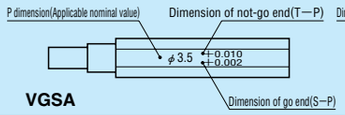


①Knob part
M Aluminum
S Black alumite

②Gauge part
M V20
H 88～89HRA

L VGSA	L VGWA	B	C	F	H	Catalog No. Type	Catalog No. No.	P(Applicable nominal value) 0.001mm increments	S・T 0.001mm increments	U/Price Q'ty：1～4 VGSA	U/Price Q'ty：1～4 VGWA
40	40	3	2	35	5	VGSA VGWA	1.6	0.300 ～ 1.600	0.300 ～ 1.700	20,000	23,100
48	48	5	3	40	8		2.0	1.601 ～ 2.000	1.501 ～ 2.100	18,500	20,800
50	50	6	4				2.5	2.001 ～ 2.500	1.901 ～ 2.600	16,500	17,900
57	57	10	7				3	2.501 ～ 3.000	2.401 ～ 3.100		
67	67			50	10		4	3.001 ～ 4.000	2.901 ～ 4.100	16,800	
70	73						5	4.001 ～ 5.000	3.901 ～ 5.100		
							6	5.001 ～ 6.000	4.901 ～ 6.100	16,900	18,100
							8	6.001 ～ 8.000	5.901 ～ 8.100	17,200	
							10	8.001 ～ 10.000	7.901 ～ 10.100	17,500	18,600

Tolerance marking
The difference with P dimension is engraved instead of S and T values as shown.



- S+0.003＜T
- P dimension is applicable nominal value (basic dimension measured).

Order
Catalog No. — P — S — T
VGSA 4 — P3.500 — S3.502 — T3.510

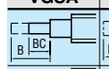
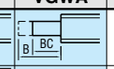
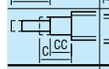
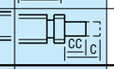
Alteration
Catalog No. — P — S — T — (BC・CC・MC)
VGSA 4 —P3.500—S3.502—T3.510—BC8—MC—S5011

Delivery
5 Days

Price
Volume discount rate P.37

Quantity	1～4	5～9	10～19	20～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alterations VGSA	Alterations VGWA	Code	Spec.	¥/1Code
		BC	1≦BC＜B 0.1mm increments The full length L is shortened by (B—BC).	1,200
		CC	1≦CC＜C 0.1mm increments The full length L is shortened by (C—CC).	1,200
		MC	Marked on the opposite side of tolerance marking. Order code MC—S5011 <Working range> ・Maximum number of characters：12 characters (Numbers only ; 8 characters.) ・Printable：Alphabet, number, hyphen, slash, plus, asterisk, period	800

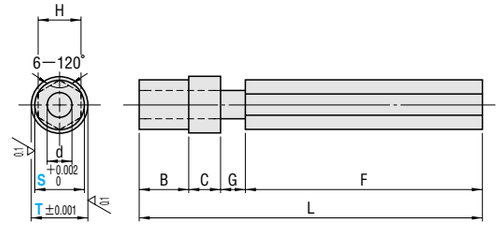
PRECISION CARBIDE LIMIT GAUGES
—ONE END STEPPED · BOTH ENDS STEPPED TYPE—

¥ The volume discount rate is also applicable to alteration cost. P.39

Quality assurance certificate is attached to these products.

RoHS

VGSB



T−S≦1
S+0.003＜T
A clearance groove of about 1mm is provided at the joint of B and C.

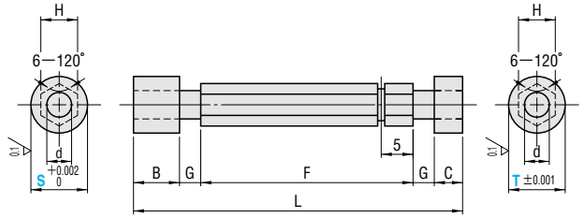
①Knob part
M Aluminum
S Black alumite

②Gauge part
M V20
H 88～89HRA

③Neck part of gauge
M SKS3

RoHS

VGWB



S+0.003＜T

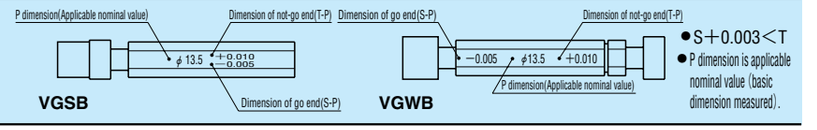
①Knob part
M Aluminum
S Black alumite

②Gauge part
M V20
H 88～89HRA

③Neck part of gauge
M SKS3

L VGSB	L VGWB	B	C	d	F	G	H	Catalog No. Type	Catalog No. No.	P(Applicable nominal value) 0.001mm increments	S・T 0.001mm increments	U/Price Q'ty：1～4 VGSB	U/Price Q'ty：1～4 VGWB
86	92	12	8	7	60	6	12	VGSB VGWB	14	10.000～ 14.000	9.901～ 14.100	22,300	20,900
104	112	16	10	9	70	8	14		18	14.001～ 18.000	13.901～ 18.100	27,900	26,900
108	120			12		12	17		24	18.001～ 24.000	17.901～ 24.100	31,900	31,200

Tolerance marking
The difference with P dimension is engraved instead of S and T values as shown.



- S+0.003＜T
- P dimension is applicable nominal value (basic dimension measured).

Order
Catalog No. — P — S — T
VGSB 14 — P13.500 — S13.495 — T13.510

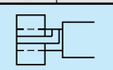
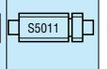
Delivery
8 Days
Express C 1,000/1Pc. P.38
A flat charge of 2,700 yen for 3 pieces or more of the same size.

Price
Volume discount rate P.37

Quantity	1～4	5～9	10～19	20～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration
Catalog No. — P — S — T — (AC・MC)
VGSB 14 —P13.500—S13.495—T13.510 —AC—MC—S5011

Alterations VGSB	Alterations VGWB	Code	Spec.	¥/1Code
		AC	Air-vent φ 2 is drilled into the neck of gauge.	2,000
		MC	Marked on the opposite side of tolerance marking. Order code MC—S5011 <Working range> ・Maximum number of characters：12 characters (Numbers only ; 8 characters.) ・Printable：Alphabet, number, hyphen, slash, plus, asterisk, period	800

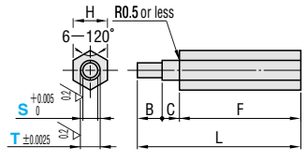
LIMIT GAUGES
—STANDARD ONE END · STANDARD TWO ENDS TYPE—

The volume discount rate is also applicable to alteration cost. P.39

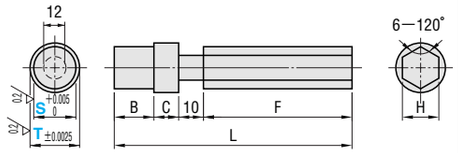
Quality assurance certificate is attached to these products.

RoHS

SGSA3～13



SGSA16·20



S+0.007<T

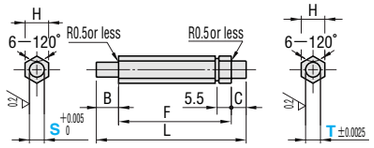
A clearance groove of about 1mm is provided at the joint of B and C.

①Knob part
M SS400
S Fe_3O_4 (Black oxide)

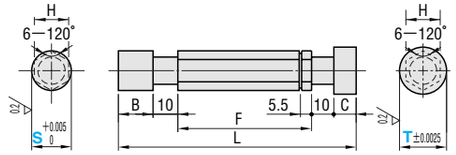
②Gauge part
M SKS3
H 58HRC～

RoHS

SGWA3～13



SGWA16 · 20



S+0.007<T

①Knob part
M SS400
S Fe_3O_4 (Black oxide)

②Gauge part
M SKS3
H 58HRC～

L		B	C	F	H	Catalog No.		S・T 0.001mm increments	U/Price Q'ty：1～9	
SGSA	SGWA					Type	No.		SGSA	SGWA
40	40	4	6	30	8	SGSA SGWA	3	1.000 ～ 3.000	3,420	3,780
55	55	8	7	40			4	2.500 ～ 4.000		
							5	3.500 ～ 5.000		
65	65			50	10		6	4.500 ～ 6.000	3,570	4,070
67	67	10					8	5.500 ～ 8.000	4,030	4,440
					16		10	7.500 ～ 10.000	4,400	5,260
80	80	12	8	60			13	9.500 ～ 13.000	4,600	5,590
96	106	16	10				16	12.500 ～ 16.000	5,750	6,900
							20	15.500 ～ 20.000	7,710	8,400

S+0.007<T

Order Catalog No. — S — T
SGSA 13 — S10.450 — T10.500

Delivery 3 Days

Express A 800/1Pc. P.38

A flat charge of 2,160 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — S — T — (MC)
SGSA 13 — S10.450 — T10.500 — MC — S5011

Alterations SGSA	Alterations SGWA	Code	Spec.	¥/1Code
S5011	S5011	MC	Marked on the opposite side of tolerance marking. Order code MC—S5011 <Working range> ・Maximum number of characters：12 characters (Numbers only ; 8 characters.) ・Printable：Alphabet, number, hyphen, slash, plus, asterisk, period	1,000

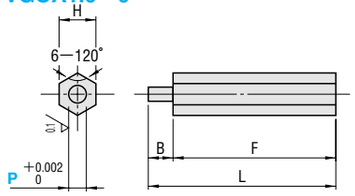
PRECISION CARBIDE LIMIT GAUGES

The volume discount rate is also applicable to alteration cost. P.39

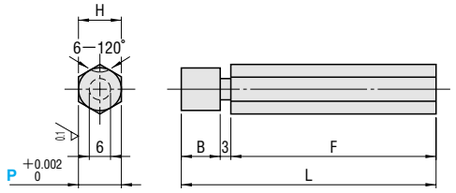
Quality assurance certificate is attached to these products.

RoHS

VGOA1.6～6



VGOA8·10



VGOA1.6 Side shape of knob part

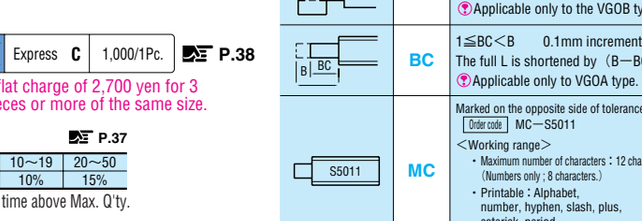
①Knob part
M Aluminum
S Black alumite

②Gauge part
M V20
H 88～89H RA

Large diameter type

RoHS

VGOB



①Knob part
M Aluminum
S Black alumite

②Gauge part
M V20
H 88～89HRA

③Neck part of gauge
M SKS3

L	B	F	H	Catalog No. Type	Catalog No. No.	P 0.001mm increments	U/Price Q'ty：1～4
38	3	35	5	VGOA	1.6	0.300 ～ 1.600	16,900
45	5	40	8		2.0	1.601 ～ 2.000	15,400
46	6				2.5	2.001 ～ 2.500	13,400
					3	2.501 ～ 3.000	13,700
50	10	50			4	3.001 ～ 4.000	
60			10		5	4.001 ～ 5.000	13,800
63					6	5.001 ～ 6.000	
					8	6.001 ～ 8.000	14,200
					10	8.001 ～ 10.000	14,500

L	B	G	d	F	H	Catalog No. Type	Catalog No. No.	P 0.001mm increments	U/Price Q'ty：1～4
78	12	6	7	60	12	VGOB (Large diameter type)	14	10.000～ 14.000	15,800
94	16	8	9	70	14		18	14.001～ 18.000	20,400
98		12	12		17		24	18.001～ 24.000	23,700

Order Catalog No. — P
VGOA 4 — P3.500
VGOB 14 — P13.500

Delivery
•VGOA 5 Days
•VGOB 8 Days

Express C 1,000/1Pc. P.38

A flat charge of 2,700 yen for 3 pieces or more of the same size.

Price

■Volume discount rate P.37

Quantity	1～4	5～9	10～19	20～50
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration Catalog No. — P — (AC・BC・MC)
VGOA 4 — P3.500 — BC8 — MC — S5011
VGOB 14 — P13.500 — AC — MC — S5011

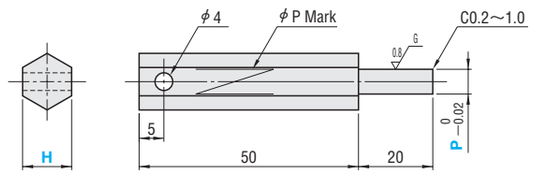
Alterations	Code	Spec.	¥/1Code
	AC	Air-vent ϕ 2 is drilled into the neck of gauge. Applicable only to the VGOB type.	2,000
B BC	BC	1≦BC<B 0.1mm increments The full L is shortened by (B—BC). Applicable only to VGOA type.	1,200
S5011	MC	Marked on the opposite side of tolerance marking. Order code MC—S5011 <Working range> ・Maximum number of characters：12 characters (Numbers only ; 8 characters.) ・Printable：Alphabet, number, hyphen, slash, plus, asterisk, period	800

PLUG GAUGES FOR CHECKING FIXTURE
—STRAIGHT TYPE—

¥ The volume discount rate is also applicable to alteration cost. P.39

RoHS

BGQ
BGQH (Hardened type)

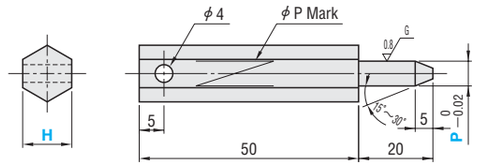


①Knob part
M SS400
S Fe3O4 (Black oxide)

②Gauge part
M SKS3
H Hardened type 40～45HRC

RoHS

BGQT (Tapered type)
BGQTH (Tapered/Hardened type)



①Knob part
M SS400
S Fe3O4 (Black oxide)

②Gauge part
M SKS3
H Hardened type 40～45HRC

Catalog No.		P	U/Price Q'ty：1～9	
Type	H	0.01mm increments	BGQ	BGQH
BGQ BGQH (Hardened type)	10	1.20～ 8.00	1,080	1,530
	13	8.01～10.00	1,170	1,660
	16	10.01～13.00	1,260	1,790
	21	13.01～17.00	1,350	1,910

Catalog No.		P	U/Price Q'ty：1～9	
Type	H	0.01mm increments	BGQT	BGQTH
BGQT (Tapered type) BGQTH (Tapered/Hardened type)	10	4.00～ 8.00	1,170	1,680
	13	8.01～10.00	1,260	1,800
	16	10.01～13.00	1,350	1,940
	21	13.01～17.00	1,440	2,060

Order
Catalog No. — P
BGQ 16 — P12.00

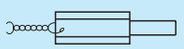
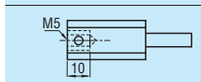
Delivery
3 Days

Price
■Volume discount rate P.37

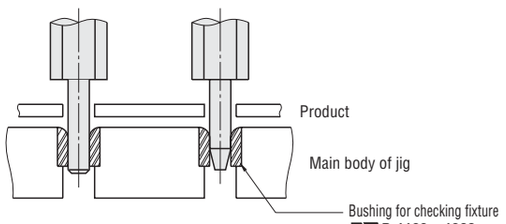
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration
Catalog No. — P — (CH・MH)
BGQ 16 — P12.00 — CH

Alterations	Code	Spec.	¥/1Code
	CH	Sets the chain (length 600mm) for preventing loss to the gauge main body.	500
	MH	Adds tapped hole (M5).	300

Example

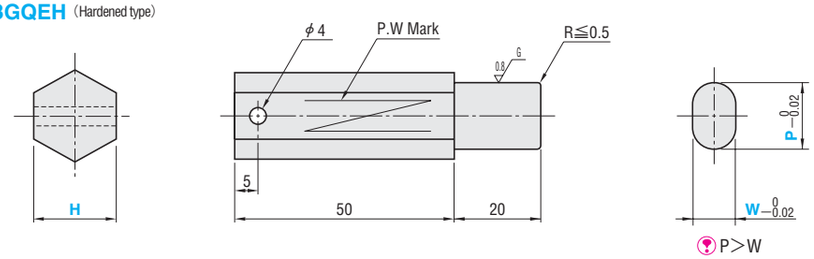


PLUG GAUGES FOR CHECKING FIXTURE
—OVAL TYPE—

¥ The volume discount rate is also applicable to alteration cost. P.39

RoHS

BGQEH (Hardened type)

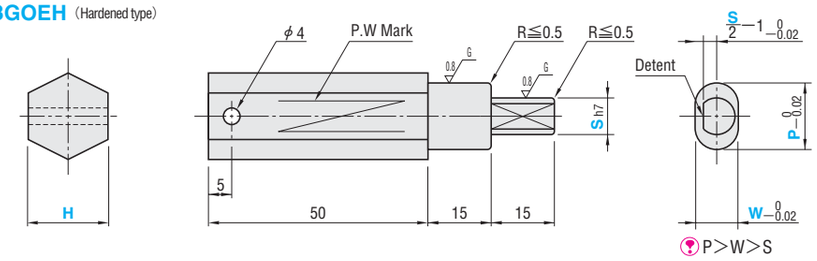


①Knob part
M SS400
S Fe3O4 (Black oxide)

②Gauge part
M SKD11
H 60HRC～

RoHS

BGOEH (Hardened type)



①Knob part
M SS400
S Fe3O4 (Black oxide)

②Gauge part
M SKD11
H 60HRC～

Catalog No.		0.01mm increments		U/Price
Type	H	P·Wmax.	P·Wmin.	Q'ty：1～9
BGQEH (Hardened type)	10	8.00	3.00	3,800
	13	10.00	6.00	4,060
	16	13.00	8.00	4,420
	21	17.00	10.00	5,220

Catalog No.		0.01mm increments		S	U/Price
Type	H	P·Wmax.	P·Wmin.	0.1mm increments	Q'ty：1～9
BGOEH (Hardened type)	10	8.00	4.00	3.0～ 7.9	4,990
	13	10.00	6.00	3.0～ 9.9	5,250
	16	13.00	8.00	5.0～12.9	5,610
	21	17.00	10.00	9.0～16.9	6,410
	26	21.00	16.00	9.0～20.9	7,130
	32	28.00	20.00	9.0～27.9	7,940

Order
Catalog No. — P — W — S
BGQEH 10 — P6.50 — W4.00
BGOEH 10 — P6.50 — W4.50 — S3.0

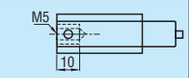
Alteration
Catalog No. — P — W — S — (CH・MH)
BGQEH 10 — P6.50 — W4.00 — CH
BGOEH 10 — P7.00 — W4.00 — S3.0 — CH

Delivery
5 Days

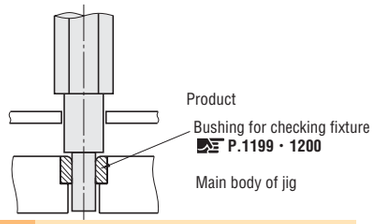
Price
■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alterations	Code	Spec.	¥/1Code
	CH	Sets the chain (length 600mm) for preventing loss to the gauge main body.	500
	MH	Adds tapped hole (M5).	300

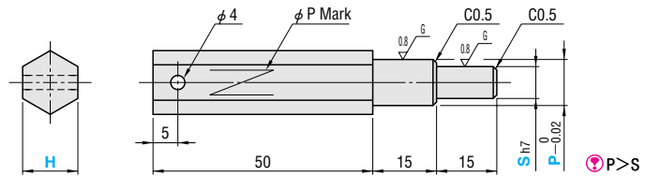
Example



PLUG GAUGES FOR CHECKING FIXTURE
—STEPPED/GAUGE LENGTH FIXED TYPE—

The volume discount rate is also applicable to alteration cost. P.39

BGO
BGOH (Hardened type)

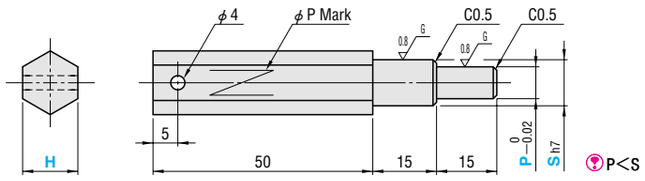


Undercut of about 1mm is provided at the joint of steps.

①Knob part
M SS400
S Fe3O4 (Black oxide)

②Gauge part
M SKS3
H (Hardened type) 40～45HRC

BGU
BGUH (Hardened type)



Undercut of about 1mm is provided at the joint of steps.

①Knob part
M SS400
S Fe3O4 (Black oxide)

②Gauge part
M SKS3
H (Hardened type) 40～45HRC

Catalog No.		P 0.01mm increments		S 1mm increments		U/Price Q'ty：1～9			
Type	H	BGO・BGOH	BGU・BGUH	BGO・BGOH	BGU・BGUH	BGO	BGOH	BGU	BGUH
BGO BGOH (Hardened type)	10	4.00～ 8.00	4.00～ 7.00	3～ 7	5～ 8	1,260	1,730	1,260	1,730
	13	8.01～10.00	7.01～ 9.00	6～ 9	8～10	1,350	1,860	1,350	1,860
	16	10.01～13.00	9.01～12.00	8～12	10～13	1,440	1,980	1,440	1,980
BGU BGUH (Hardened type)	21	13.01～17.00	12.01～15.00	10～15	14～17	1,530	2,120	1,530	2,120
	26	17.01～21.00	15.01～17.00	10～17	18～21	1,620	2,260	1,620	2,260
	32	21.01～28.00	17.01～24.00	10～24	21～28	1,710	2,400	1,710	2,400

BGO・BGOH：P>S　BGU・BGUH：P<S

Order: Catalog No. — P — S
BGO 16 — P12.00 — S10

Delivery: 3 Days

Alteration: Catalog No. — P — S(SCH) — (CH・MH)
BGO 16 — P12.00 — S10 — CH
BGU 21 — P13.01 — SCH12.55 — MH

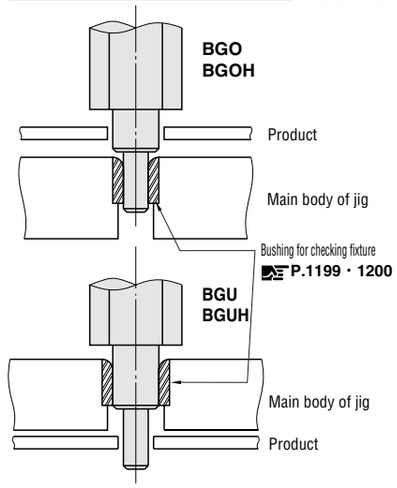
Price

Example

Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

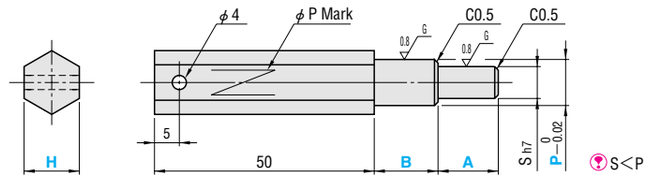


Alterations	Code	Spec.	¥/1Code
	CH	Sets the chain (length 600mm) for preventing loss to the gauge main body.	500
M5 10	MH	Adds tapped hole (M5).	300
BGO□ BGU□ SCH SCH	SCH	S dimension unit change 0.01mm increments The applicable range is as same as the standard table.	300

PLUG GAUGES FOR CHECKING FIXTURE
—STEPPED/GAUGE LENGTH SPECIFIED TYPE—

The volume discount rate is also applicable to alteration cost. P.39

BGOPH

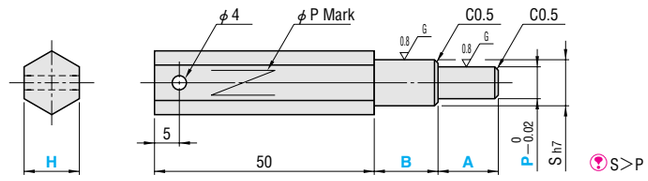


Undercut of about 1mm is provided at the joint of steps.

①Knob part
M SS400
S Fe3O4 (Black oxide)

②Gauge part
M SKS3
H 40～45HRC

BGUPH



Undercut of about 1mm is provided at the joint of steps.

①Knob part
M SS400
S Fe3O4 (Black oxide)

②Gauge part
M SKS3
H 40～45HRC

S		Catalog No.		P 0.01mm increments		A 1mm increments	B 1mm increments	U/Price Q'ty：1～9	
BGOPH	BGUPH	Type	H	BGOPH	BGUPH			BGOPH	BGUPH
4	8	BGOPH BGUPH	10	4.01～ 8.00	4.00～ 7.00	5～15	5～15	2,180	2,180
6	10		13	8.01～10.00	7.01～ 9.00	8～20	8～20	2,420	2,420
8	13		16	10.01～13.00	9.01～12.00			2,580	2,580

BGOPH：S<P　BGUPH：S>P

Order: Catalog No. — P — A — B
BGOPH 16 — P10.05 — A15 — B20

Delivery: 3 Days

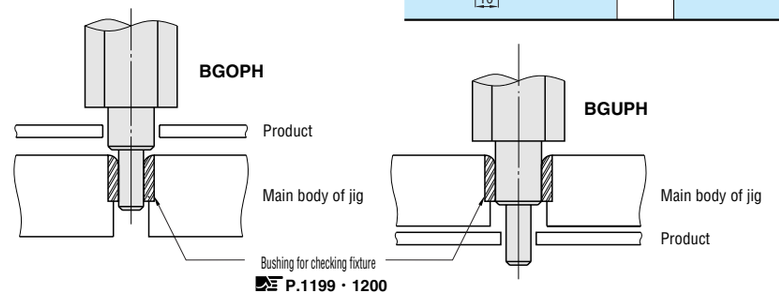
Price

Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example



Alteration: Catalog No. — P — A — B — (CH・MH)
BGOPH 16 — P10.05 — A15 — B20 — CH

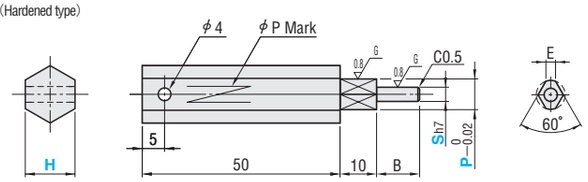
Alterations	Code	Spec.	¥/1Code
	CH	Sets the chain (length 600mm) for preventing loss to the gauge main body.	500
M5 10	MH	Adds tapped hole (M5).	300

LOCATING PINS FOR CHECKING FIXTURE

The volume discount rate is also applicable to alteration cost. P.39

RoHS

BGTDSH (Hardened type)



S < √3/2 {E + √((P²−E²)/3)}

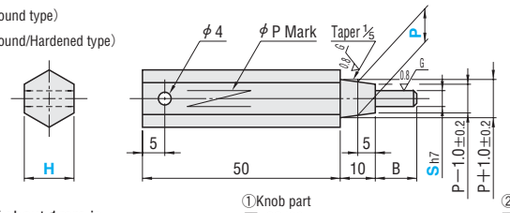
Undercut of about 1mm is provided at the joint of steps.

①Knob part
M SS400
S Fe3O4 (Black oxide)

②Gauge part
M SKS3
H 40～45HRC

RoHS

BGTA (Round type)
BGTAH (Round/Hardened type)



S < P−1

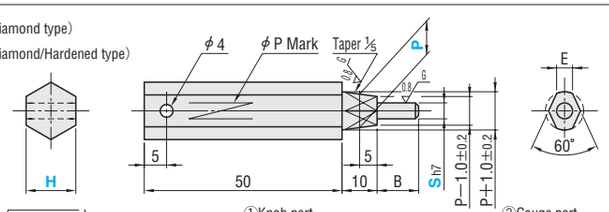
Undercut of about 1mm is provided at the joint of steps.

①Knob part
M SS400
S Fe3O4 (Black oxide)

②Gauge part
M SKS3
H 40～45HRC (Hardened type)

RoHS

BGTD (Diamond type)
BGTDH (Diamond/Hardened type)



S < √3/2 {E + √((P−1)²−E²)/3}

Undercut of about 1mm is provided at the joint of steps.

①Knob part
M SS400
S Fe3O4 (Black oxide)

②Gauge part
M SKS3
H 40～45HRC (Hardened type)

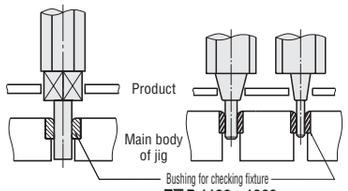
B	E	Catalog No. Type	H	P 0.01mm increments	S 0.1mm increments	U/Price Q'ty：1～9
15	3	BGTDSH (Hardened type)	13	6.00～ 9.00	3.0～ 6.0	2,780
17	4		16	9.01～ 12.00	5.0～ 8.0	2,930
19	6		21	12.01～ 16.00	9.0～12.0	3,210
24	8		26	16.01～ 20.00	9.0～15.0	3,510
30	10		32	20.01～ 27.00	9.0～20.0	4,180

B	E (BGTD/BGTDH only)	Catalog No. Type	H	P 0.01mm increments	S 1mm increments	U/Price Q'ty：1～9 BGTA	BGTAH	BGTD	BGTDH
15	3	BGTA (Round type)	13	6.00～ 9.00	3～ 6	1,530	2,150	1,800	2,850
17	4	BGTAH (Round/Hardened type)	16	9.01～ 12.00	5～ 8	1,800	2,270	1,890	3,010
19	6	BGTD (Diamond type)	21	12.01～ 16.00	9～12	1,800	2,400	2,070	3,300
24	8	BGTDH (Diamond/Hardened type)	26	16.01～ 20.00	9～15	1,890	2,670	2,340	3,610
30	10		32	20.01～ 27.00	9～20	2,160	3,160	2,700	4,280

Order — Catalog No. — P — S
BGTDSH 16 — P10.00 — S5.0
BGTD 16 — P12.00 — S5

Delivery — 3 Days

Example



P.1199・1200

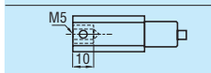
Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration — Catalog No. — P — S — (CH・MH)
BGTDSH 16 — P12.00 — S6.0 — CH
BGTA 16 — P12.00 — S5 — CH

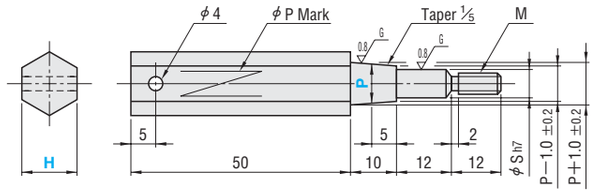
Alterations	Code	Spec.	¥/1Code
	CH	Sets the chain (length 600mm) for preventing loss to the gauge main body.	500
	MH	Adds tapped hole (M5).	300

TAPER LOCATING PINS FOR CHECKING FIXTURE
—WITH SCREW TYPE—

The volume discount rate is also applicable to alteration cost. P.39

RoHS

BGMA (Round/Hardened type)



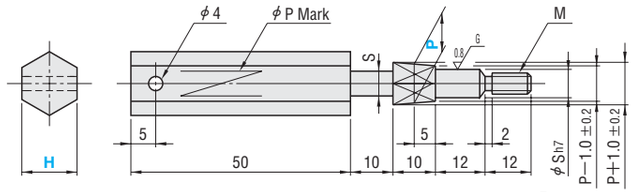
Undercut of about 1mm is provided at the joint of steps.

①Knob part
M SS400
S Fe3O4 (Black oxide)

②Gauge part
M SKS3
H 40～45HRC

RoHS

BGMD (Diamond/Hardened type)



①Knob part
M SS400
S Fe3O4 (Black oxide)

②Gauge part
M SKS3
H 40～45HRC

Undercut of about 1mm is provided at the joint of steps.

S	E (BGMD only)	M×P	Catalog No. Type	H	P 0.01mm increments	U/Price Q'ty：1～9 BGMA	BGMD
6	3	5 × 0.8	BGMA (Round/Hardened type) BGMD (Diamond/Hardened type)	13	7.20 ～ 9.00	2,780	5,560
8	4	6 × 1.0		16	9.01 ～ 12.00	3,010	6,170
10	6	8 × 1.25		21	12.01 ～ 16.00	3,160	6,770
	8			26	16.01 ～ 20.00	3,610	7,520
	10			32	20.01 ～ 27.00	3,910	8,270

Order — Catalog No. — P
BGMD 16 — P10.00

Delivery — 3 Days

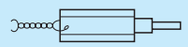
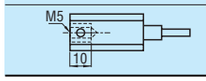
Price

■Volume discount rate P.37

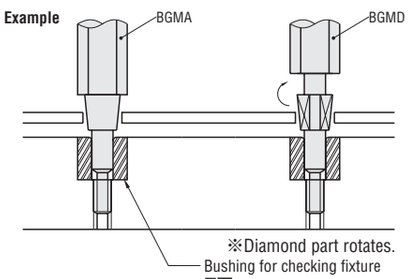
Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration — Catalog No. — P — (CHT・MH)
BGMD 13 — P8.00 — CHT

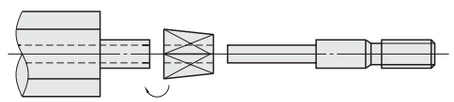
Alterations	Code	Spec.	¥/1Code
	CHT	Sets the chain (length 600mm) for preventing loss to the gauge main body. (With anti-twisting)	500
	MH	Adds tapped hole (M5).	300

Example



P.1199・1200

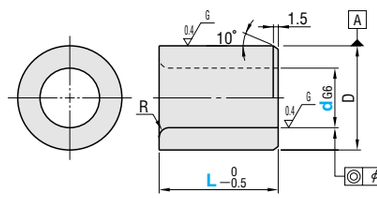
■BGMD Structure：Diamond part rotates.



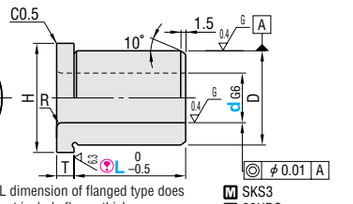
BUSHING FOR CHECKING FIXTURE

Round/Fixed type RoHS

JBA (p6) **JBAM** (m6)



JBH (p6/flanged type) **JBHM** (m6/flanged type)



L dimension of flanged type does not include flange thickness.

M SKS3
H 60HRC～

R	H	T	D	D tolerance p6	D tolerance m6	Catalog No. Type	d	G6	L	U/Price Q'ty：1～29 JBA・JBAM	JBH・JBHM
0.8	9	2.5	5	+0.020 +0.012	+0.012 +0.004	JBA (p6) JBAM (m6)	2	+0.008	5 6 8 10 12	880	1,330
	11		7				3	+0.002		790	1,150
1.0	12	3	8	+0.024 +0.015	+0.015 +0.006		4	+0.012 +0.004	5 6 8 10 12 15 16 20	700	970
	14		10				5			610	880
							6		5 6 8 10 12 15 16 20 25	570	880
2.0	16	4	12	+0.029 +0.018	+0.018 +0.007		8	+0.014		570	880
	19		15				10	+0.005	6 8 10 12 15 16 20 25	610	970
	22		18			(Head type) JBH (p6) JBHM (m6)	12		8 10 12 15 16 20 25 30	700	970
	26	5	22				13	+0.017 +0.006	10 12 15 16 20 25 30	790	1,230
	30		25	+0.035 +0.022	+0.021 +0.008		15			880	1,410
			26				16		12 15 16 20 25 30	880	1,410
3.0	35	6	30				20	+0.020		970	1,590
	40		35	+0.042 +0.026	+0.025 +0.009		25	+0.007	16 20 25 30 35	1,050	1,760

Catalog No. — L
JBA 10 — 16
JBH 8 — 12

1 Day

● JBA ● JBAM — Volume discount rate P.37

Quantity	1～29	30～49	50～99	100～199
Rate	—	5%	10%	15%

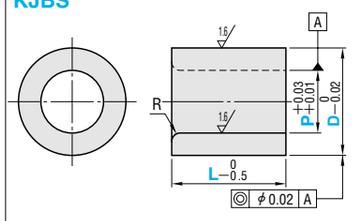
● JBH ● JBHM — Volume discount rate P.37

Quantity	1～29	30～49	50～79	80～99
Rate	—	5%	10%	15%

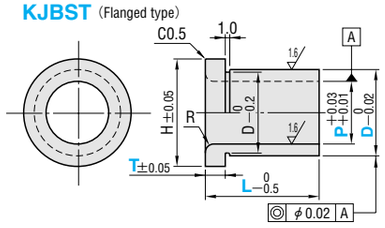
To be quoted on price & lead time above Max. Q'ty.

Round/Specified type RoHS

KJBS



KJBST (Flanged type)



M SKS93 H 50～60HRC

R	H	Catalog No. Type	D	P 0.01mm increments	L 1mm increments	T Selection	U/Price Q'ty：1～4 KJBS	KJBST
1.0	D+4	KJBS KJBST	8	2.00～ 6.00	5～40 (when P≦3.59 L≦P×2.5 when P≧3.60 L≦P×3)	2 3 5	950	1,100
			10	2.00～ 8.00			950	1,100
2.0			12	4.00～10.00			980	1,150
			16	8.00～14.00			1,060	1,340
			20	10.00～18.00			1,210	1,630
			25	15.00～23.00			1,350	1,820

Order: Catalog No. — P — L — T
KJBS10 — P3.00 — L6
KJBST10 — P3.00 — L6 — T2

Delivery: 3 Days

Price — Volume discount rate P.37

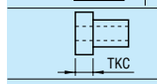
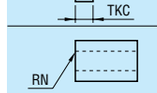
Quantity	1～4	5～19	20～49	50～99
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

R is 0.5 when (D−P) /2≦2.

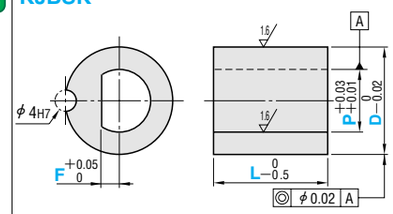
Alteration: Catalog No. — P — L — T — (FC・PKC・NC…etc.)
KJBS10 — P3.00 — L6 — FC

Alterations	Code	Spec.	¥/1Code
	FC	Adds adhesive pool groove. D≧P+3	200
	NC	Adds loose prevention groove. D≧P+3	300

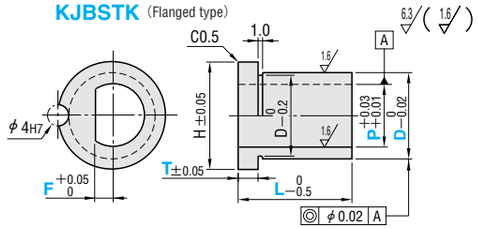
Alterations	Code	Spec.	¥/1Code
	PKC	Change P dimension tolerance to H7.	200
	TKC	Change flange thickness tolerance to ±0.01. Applicable only to KJBST.	400
	RN	R is C-chamfered (less than 0.5).	0

Segment type RoHS

KJBSK



KJBSTK (Flanged type)



M SKS93 H 50～60HRC

H	Catalog No. Type	D	P 0.01mm increments	F 0.1mm increments	L 1mm increments	T Selection	U/Price Q'ty：1～4 KJBSK	KJBSTK
D+4	KJBSK KJBSTK	8	3.00～ 5.00	0.3～ 3.0	5～20 (when P≦3.59 L≦P×2.5 when P≧3.60 L≦P×3)	2 3 5	2,000	2,200
		10	3.00～ 7.00	0.3～ 3.0			2,000	2,200
		12	3.00～ 9.00	0.5～ 4.0			2,200	2,400
		16	4.00～13.00	0.5～ 6.0			2,700	2,900
		20	6.00～17.00	1.0～ 8.0			3,200	3,400
		25	8.00～21.00	2.0～10.0			3,500	3,700

KJBSK：D/2−F≧3

Order: Catalog No. — P — F — L — T
KJBSK12 — P8.00 — F2.0 — L10
KJBSTK12 — P8.00 — F3.0 — L10 — T3

Delivery: 3 Days

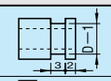
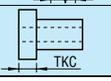
Price — Volume discount rate P.37

Quantity	1～4	5～19	20～49	50～99
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

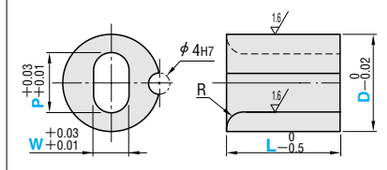
Alteration: Catalog No. — P — F — L — T — (FC・PKC・NC・TKC)
KJBSK12 — P8.00 — F2.0 — L10 — FC

Alterations	Code	Spec.	¥/1Code
	FC	Adds adhesive pool groove.	200
	PKC	Change P dimension tolerance to H7.	200

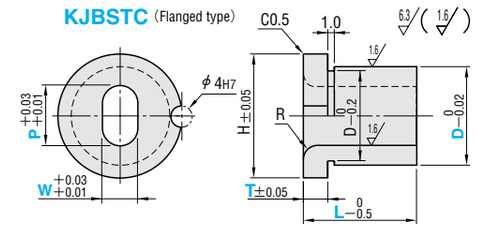
Alterations	Code	Spec.	¥/1Code
	NC	Adds loose prevention groove. D≧P+3	300
	TKC	Change flange thickness tolerance to ±0.01. Applicable only to KJBSTK.	400

Oval type RoHS

KJBSC



KJBSTC (Flanged type)



M SKS93 H 50～60HRC

R	H	Catalog No. Type	D	P 0.01mm increments	W 0.01mm increments	L 1mm increments	T Selection	U/Price Q'ty：1～4 KJBSC	KJBSTC
2.0	D+4	KJBSC KJBSTC	(8)	4.00～ 6.00	P＞W (W≧3.00)	5～20 (L≦P×2.5) 15～20 (KJBSTC only)	2 3 5	—	4,800
			10	4.00～ 8.00				4,500	4,800
			12	4.00～10.00				4,800	5,030
			16	8.00～14.00				5,600	5,800
			20	10.00～18.00				6,500	6,900
			25	15.00～22.00				8,100	8,500

R is 0.5 when (D−P) /2≦2. (D−W) /2 }−2≧1 (KJBSC only) D8 is the standard only for KJBSTC.

Order: Catalog No. — P — W — L — T
KJBSC12 — P8.50 — W3.50 — L15
KJBSTC12 — P9.50 — W4.50 — L15 — T2

Delivery: 3 Days

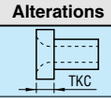
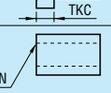
Price — Volume discount rate P.37

Quantity	1～4	5～19	20～49	50～99
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Alteration: Catalog No. — P — W — L — T — (FC・PKC・NC…etc.)
KJBSC12 — P8.50 — W3.50 — L15 — FC

Alterations	Code	Spec.	¥/1Code
	FC	Adds adhesive pool groove. D≧P+3 L≧15 (Only L=20 for KJBSTC)	200
	PKC	Change P dimension tolerance to H7.	200
	NC	Adds loose prevention groove. D≧P+3	300

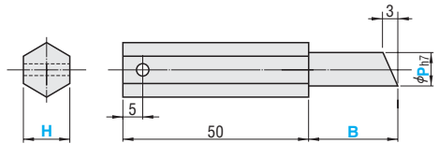
Alterations	Code	Spec.	¥/1Code
	TKC	Change flange thickness tolerance to ±0.01. Applicable only to KJBSTC	400
	RN	R is C-chamfered (less than 0.5).	−100

MARKING-OFF PINS FOR CHECKING FIXTURE/LOCATING BARS FOR TAPPING POSITION

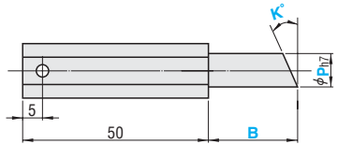
¥ The volume discount rate is also applicable to alteration cost. P.39

Marking pins RoHS

BGK



BGKS (P dimension specified type)



①Knob part
M SS400
S Fe3O4 (Black oxide)

②Gauge part
M SKS3
H 58HRC～

Catalog No. Type	H	P	B 1mm increments	U/Price Q'ty : 1～9
BGK	16	10	20 ～ 50	1,750
	21	16		1,880
	26	20		2,000
	32	25		2,170

Catalog No. Type (P dimension specified type)	H	P 0.1mm increments	B 1mm increments	K° Selection	U/Price Q'ty : 1～9
BGKS	16	6.0～14.0	20 ～ 50	10	2,870
	21	14.1～18.0		20	3,160
	26	18.1～20.0		30	3,440
	32	20.1～25.0			4,070

Order: Catalog No. — P — B — K°
BGK 16 — P10 — B30
BGKS 21 — P16.0 — B40 — K20

Alteration: Catalog No. — P — B — K° — (CH・MH)
BGKS 16 — P10.0 — B30 — K10 — CH

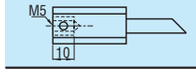
Delivery: 3 Days

Price

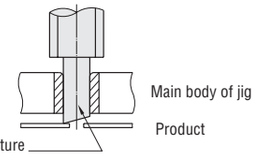
■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

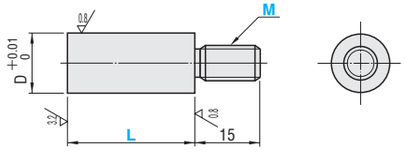
Alterations	Code	Spec.	¥/1Code
	CH	Sets the chain(length 600mm)for preventing loss to the gauge main body.	500
	MH	Adds tapped hole (M5).	300

Example



Location bars for tapping position RoHS

BGM



Alignment of the screw part to the shank is under 0.1.

M SKS3
H 55～60HRC

D	M×P	Catalog No. Type	M	L	U/Price Q'ty : 1～9
8	3 × 0.5	BGM	3	10 20 30	3,010
	4 × 0.7		4		3,170
	5 × 0.8		5		3,510
14	6 × 1.0		6		3,840
	8 × 1.25		8		4,180
	10 × 1.5		10		4,510
	12 × 1.75		12		4,680

Order: Catalog No. — L
BGM 4 — L20

Delivery: 3 Days

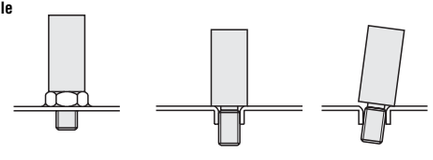
Price

■Volume discount rate P.37

Quantity	1～9	10～19	20～49	50～100
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example

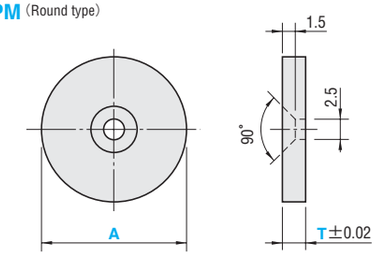


※Make sure that nut and barring screw are vertical against the surface.

SHIM PLATES FOR CHECKING FIXTURE (ZERO PLATE)
ROUND・SQUARE・SQUARE WITH HOLE TYPE

RoHS

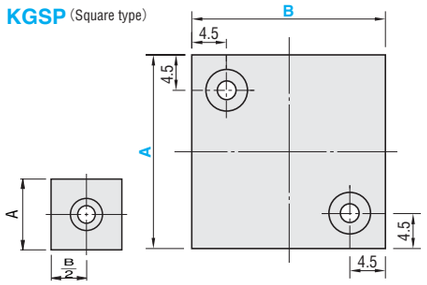
KGSPM (Round type)



M SS400
S Fe3O4 (Black oxide)
A Cross-recessed countersunk screw 1Pc. (M2×15)

RoHS

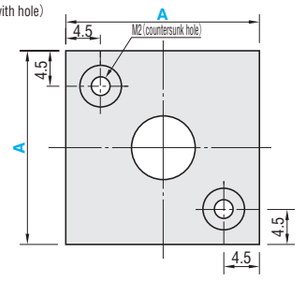
KGSP (Square type)



M SS400
S Fe3O4 (Black oxide)
A Cross-recessed countersunk screw 2Pcs. (M2×15)
When A・B=15 1Pc.

RoHS

KGZ (Square type with hole)



M SS400
S Fe3O4 (Black oxide)

Catalog No. Type	A	T	U/Price Q'ty : 1～29
KGSPM	20	2・3・5	140

Catalog No. Type	A	B	T	U/Price Q'ty : 1～29
KGSP	10	20	2	180
	15	＊15		190
		20		200
		25	3	210
	20	20		220
		25	5	230
	25	25		240

＊Only one countersunk hole for 15-15 available.

d	Catalog No. Type	A	T	U/Price Q'ty : 1～29
8	KGZ	20	2	250
12		25	3	280
18		30	5	310

Order: Catalog No. — B — T

	B	T
KGSPM20		3
KGSP15	20	3
KGZ25		5

Delivery: 1 Day

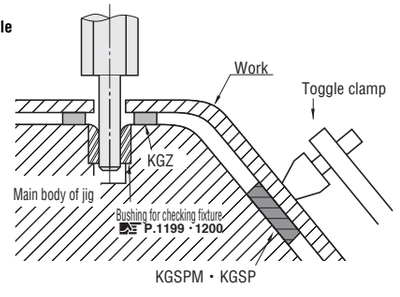
Price

■Volume discount rate P.37

Quantity	1～29	30～49	50～99	100～200
Rate	—	5%	10%	15%

To be quoted on price & lead time above Max. Q'ty.

Example



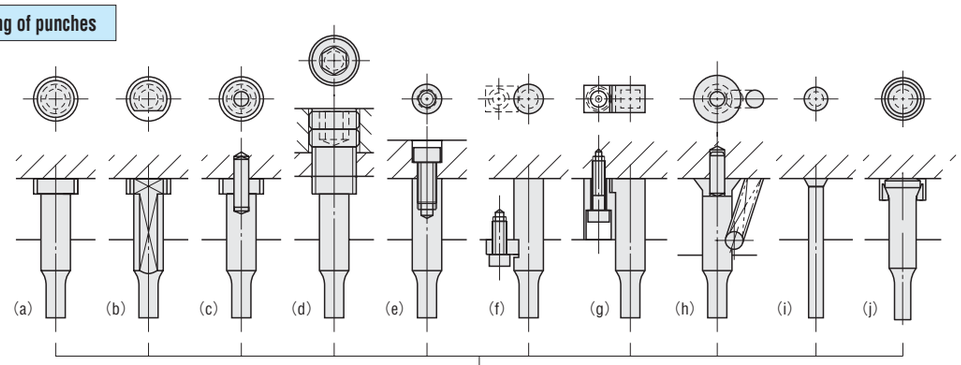
KGSPM・KGSP

PRODUCTS DATA

- HOW TO MOUNT PUNCHES & DIES ····· 1205
- CHARACTERISTICS OF PUNCHING TOOLS ····· 1207
- SHAPES AND DIMENSIONS OF PUNCHES & DIES ····· 1208
- CALCULATION OF PUNCH STRENGTH ····· 1209
- DURABILITY OF PUNCHES ····· 1213
- DICOAT® PUNCH ····· 1215
- QUALITY IMPROVEMENT COATING PUNCHES ····· 1217
- COATING PUNCHES —TiCN— ····· 1220
- WPC® PUNCH • HW COATING ····· 1221
- PUNCHES FOR HEAVY LOAD ····· 1223
- CONDITIONS UNDER WHICH FRACTURE, BREAKAGE AND ABNORMAL WEAR ARE APT TO OCCUR ····· 1225
- CEMENTED CARBIDE TOOL MATERIALS FOR WEAR RESISTANCE ····· 1226
- SELECTION OF BUTTON DIES ····· 1227
- SCRAP RETENTION BUTTON DIES ····· 1229
- BUTTON DIES FOR PREVENTING CLOGGING OF SCRAP ····· 1231
- PRECAUTIONS ON ASSEMBLING STRIPPER GUIDE ····· 1233

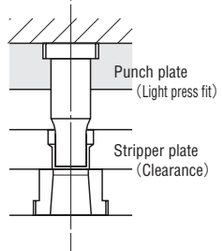
HOW TO MOUNT PUNCHES & DIES

■Mounting of punches

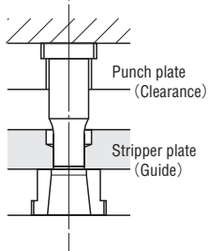


■Holding of punches

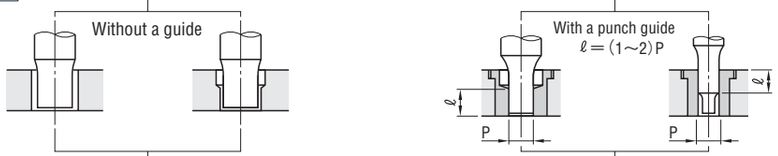
Based on punch plate (Fig. 1)



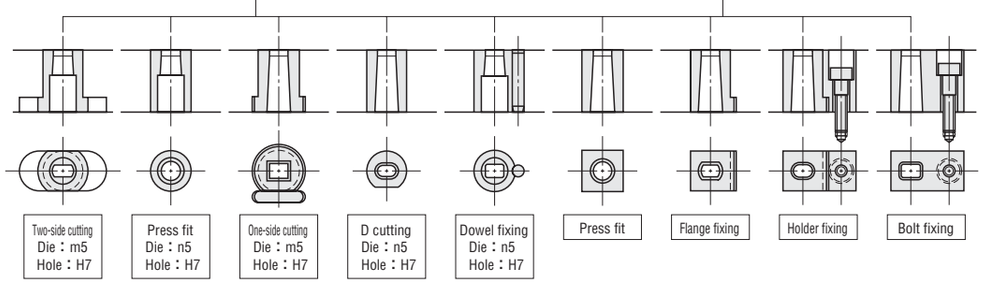
Based on stripper plate (Fig. 2)



■Guiding of punches



■Mounting of dies



■Mounting of punches

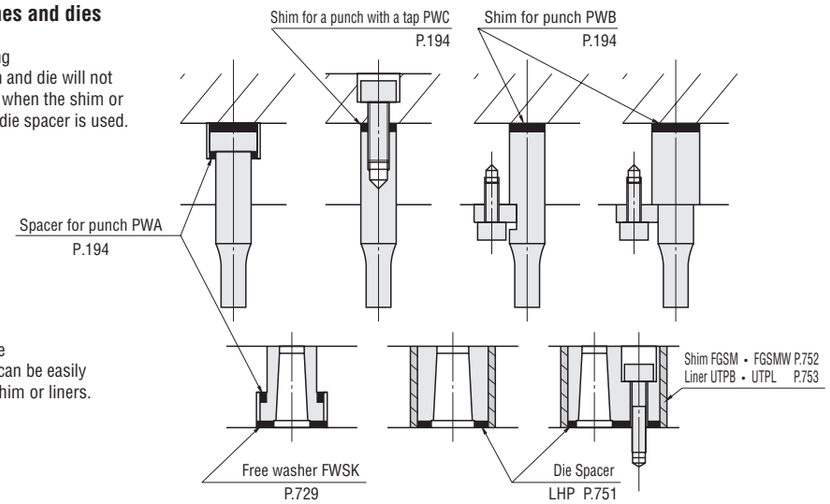
	Category	How to mount	Notes	Page
a	Flange fixing	The position and perpendicularity of the punch need to be maintained at the shank, and the head prevents the punch from coming off.	A standard method for round punches. It is reliable for preventing the punch from coming off.	P. 53～
b	Flange（positioning with a segment）	The position and perpendicularity of the punch need to be maintained at the shank, and the head prevents the punch from coming off.	The position is determined by the segmental shank inserted into the hole machined with WEDM.	P. 85～
c	Positioning with dowel pin	Positional accuracy is achieved with the dowel pin, and the head of the punch is fixed.	As the dowel hole is made in the NC process,positioning is easy. This is often used for the dies for automobiles.	P. 93～
d	Fixing with adjust pin	The position and perpendicularity of the punch need to be maintained at the shank, and the head is fastened with a screw.	It allows the punch to be replaced easily.	P.743～
e	Bolt fixing（tapping）	The position and perpendicularity of the punch need to be maintained with the punch plate, and the bolt prevents the punch from coming off.	It is reliable for maintaining accuracy and preventing the punch from coming off, but not suitable for thin punches and punching thick plates.	P.153～
f	Key fixing	The groove of the punch is fixed with a key.	It allows the punch to be mounted and replaced easily.It is often used for precision dies based on stripper plates.	P.165～
g	Holder fixing	The head of the punch is screwed with a holder.	It allows the punch to be replaced easily. It is used in case the clearance between the punch plate and stripper is small.	P.393～
h	Ball lock	The punch is fixed with a steel ball in the dedicated retainer which locks the groove of the punch.	The punch can be set and removed quickly by raising the steel ball with a pin. This is often used for the dies for automobiles.	P.691～
i	Tapering for preventing the punch from coming off	The tapering part prevents the punch from coming off.	The cost is reduced because the head is produced with a header. It is used for small diameter punches.	P.183～
j	Taper＋Ring	Support the tapered part with the dedicated ring.	A dedicated ring enables the tapered head punch which has a robust head to be installed easily.	P.135～

■Holding of punches

- Punch plate standard (Fig. 1) : The most typical method is used for the press fit of the punch in the punch plate, facilitating the production of dies. It is not suitable for the punch and die with a small clearance. When the accuracy of the concentricity of the punch or machined hole of the punch plate is low, the clearance between the punch and die is often uneven.
- Relative to stripper plate (Fig. 2) : This method is mainly used for thin, high precision dies.The end of the punch blade is guided by the stripper plate near the punch and die, minimizing the precision error. The punch is held in the punch plate with clearance fit

■Adjustments of punches and dies

- Adjustment in regrinding
  The height of the punch and die will not change with regrinding when the shim or spacer for punches, or die spacer is used.
- Adjustment of clearance
  The position of the die can be easily adjusted by using the shim or liners.



CHARACTERISTICS OF PUNCHING TOOLS

■Characteristics required for punching tools include：

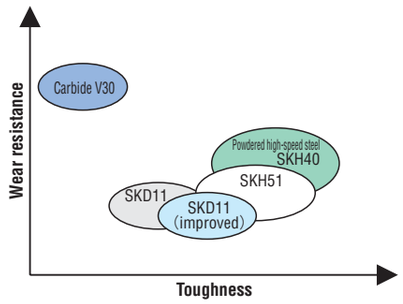
Good wear resistance, compression resistance, impact resistance and toughness, and fatigue strength.
Punching tools should be selected according to the punching conditions such as the quantity of production, machining materials and lubrication.

■Characteristics of tool steel

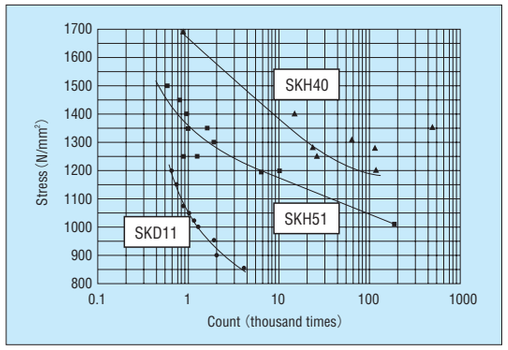
Alloy tool steel	SKD11	12%Cr class SKD11 has good wear resistance and hardenability which minimize defomation. It is most often used.
	SKD11（improved）	HRC60 to 63 hardness is achieved with high-temperature tempering. This increases toughness.
High speed tool steel	SKH51	Of high-speed steels, SKH51 is most often used. It has good wear resistance and toughness.
Powder high-speed tool steel	SKH40	Organizational particles are evenly refined with powder metallurgy. It contains a large amount of high alloying elements（W, V, Co., etc.）as usual, and has good toughness, wear resistance and fatigue strength.
Carbide	V30	Compared with steel, hardness is good, and wear resistance, compression resistance, rigidity, and heat resistance are also good, but toughness is not. If it is selected in a wrong way, its capability cannot be full used.

■Effects of alloying elements

Element	Effect
C	Carbide is formed with Cr, W, Mo, and V to achieve wear resistance. Hardness becomes greater as C content is increased.
Cr	Wear resistance, corrosion resistance and hardenability are improved.
Mo,W	Hard double carbide is formed as Mo and W combine with C together with Fe and Cr. Wear resistance, hardenability, and hardness at high temperatures are improved.
V	Wear resistance and toughness are improved.
Co	Hardness at high temperatures and tempering hardness are improved.
Mn	Hardenability and toughness are improved.



■Properties of punching tools



■Fatigue strength of punching tools（rotating bending）

The value of fatigue strength largely depends on the state of surface treatment and heat treatment, and so on.
Use this diagram as a reference.

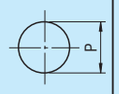
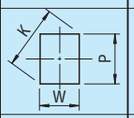
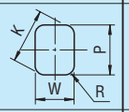
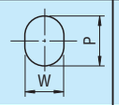
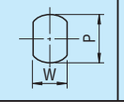
■Material properties of punching tools

Item	Material	Alloy tool steel SKD11	Alloy tool steel SKD11(improved)	High-speed steel SKH51	Powdered high-speed steel SKH40	Carbide V30
Chemical composition(%)	C	1.5	8%Cr class die steel	0.85	1.3	Co：12% Other：WC
	Cr	12		4.15	4	
	Mo	—		6.5	6	
	W	1		5.3	5	
	V	0.35		2.05	3	
	Co	—		—	8	
	Mn	0.45		0.35	—	
Quenching temperature〔℃〕		1000～1050	1020～1040	1180～1220	1120～1190	—
Tempering temperature〔℃〕		150～200	520～550	550～570	560～580	—
Hardness	HRC	60～63	60～63	61～64	64～67	1200～1350HV
Traverse rupture force	N／mm²	3500	4500	4800	4500	2500
Young's modulus	N／mm²	210000	217000	219000	228600	540000
Density	g／cm³	7.72	7.87	8.11	8.07	14.4
Thermal expansion coefficient	×10⁻⁶／℃	12.0	12.2	10.1	10.1	5.4
Thermal conductivity	w／m・k	29.3	23.7	20.6	23.8	72

（Note）・This data presents typical values but not guaranteed values.
・Powdered high-speed steel SKH40 is specified based on JIS/G/4403：2000.
（Hitachi Metal：HAP40, Kobe Seikosho：KHA30, Daido Special Steel：DEX40, Fujikoshi：FAX38 are applied among others.）

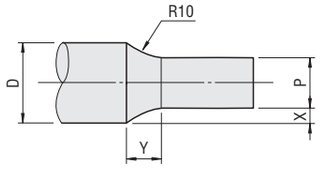
SHAPES AND DIMENSIONS OF PUCHES AND DIES

■Shapes of punches and dies

View		Profile length of blade tip ℓ	Diagonal line(circumscribed circle)K	Sectional area S
Round		πP	P	πP²／4
Square		2(P+W)	$\sqrt{(P^2+W^2)}$	PW
Round R		2πR+P+W−4R	$2R+\sqrt{(P-2R)^2+(W-2R)^2}$	$PW-(4R^2-\pi R^2)$
Oblong		πW+2(P−W)	P	$\frac{\pi}{4}W^2+W(P-W)$
Segment		$2\sqrt{P^2-W^2}+(\pi P \sin^{-1} W/P)/90$	P	$\pi P^2/4-(\pi P^2-\cos^{-1} W/P)/360+W/2\sqrt{P^2-W^2}$

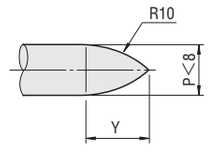
■How to find the length of R part（Y）

①Length of punch R(Y)
Find Y from X=(D−P)／2
$Y=\sqrt{X(20-X)}$ ……For R10
$Y=\sqrt{X(2R-X)}$ ……For a value other than R10

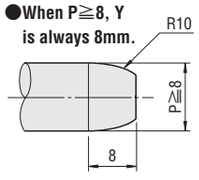


②Length of R part of pilot punch(Y)
$Y=\sqrt{P(10-P/4)}$ ……For R10
$Y=\sqrt{P(R-P/4)}$ ……For a value other than R10

●When P＜8



●When P≧8, Y is always 8mm.



Example 1）Finding Y when SPAS10—60—P6.80
X=(D−P)／2=(10−6.8)／2
=1.6
$Y=\sqrt{1.6(20-1.6)} \fallingdotseq 5.426$

Example 2）Finding Y when SPT5—20—P4.5
$Y=\sqrt{P(10-P/4)}$
$=\sqrt{4.5(10-4.5/4)} \fallingdotseq 6.32$

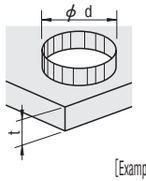
CALCULATION OF PUNCH STRENGTH①

There are cases where trouble, such as punch tip breakage and flange fractures, occurs during the punching operation. Many of these problems are caused by a lack of technical data on standard components or improper material or the shape of the selected punching tools. To reduce the number of these problems, standards for proper use of punches are described below, taking into account the fatigue strength of tool steel, stress concentration on flanges, and so on.

■1. Calculation of punching force

● **Maximum punching force Pmax.〔kgf〕**

$$P = \ell t \tau \quad \cdots\cdots (1)$$



ℓ : Punching profile length〔mm〕
(For a round punch $\ell = \pi d$)
t : Material thickness〔mm〕
τ : Shearing resistance of material〔kgf/mm²〕
($\tau \fallingdotseq 0.8 \times$ Tensile strength σ_B)

[Example 1] To calculate the maximum punching force P when a round hole with a diameter of 2.8mm is to be punched in a high tensile strength steel plate (tensile strength : 80kgf/mm²) with a thickness of 1.2mm:

In Pmax.$= \ell t \tau$

Shearing resistance $\tau = 0.8 \times 80$
$= 64$ [kgf/mm²]

$P = 3.14 \times 2.8 \times 1.2 \times 64 = 675$kgf

■2. Fracture of punch tip

● **Stress σ exerted on punch tip [kgf/mm²]**

$\sigma = P / A$

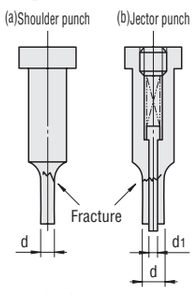
P : Punching force, A : Cross-sectional area of punch tip

(a) For shoulder punch

$$\sigma_s = 4t\tau / d \quad \cdots\cdots\cdots\cdots\cdots (2)$$

(b) For jector punch

$$\sigma_J = 4dt\tau / (d^2 - d_1^2) \quad \cdots\cdots\cdots (3)$$



〔Fig.1〕 Fracture of punch tip

[Example 2] Probability of punch tip fracture is calculated using shoulder punch SPAS6-50-P2.8 and jector punch SJAS6-50-P2.8 (the d_1 dimension is 0.7 from P.186).
(Punching conditions are the same as in Example 1.)

(a) For the houlder punch, from equation (2)

$\sigma_s = 4 \times 1.2 \times 64 / 2.8 = 110$kgf/mm²

(b) For the jector punch, from equation (3)

$\sigma_J = 4 \times 2.8 \times 1.2 \times 64 / (2.8^2 - 0.7^2)$
$= 117$kgf/mm²

From Fig. 2, when σ_s is 110kgf/mm², the punch tip of SKD11 punch will break after 9,000 punching shots. Use of the SKH51 material instead will increase this value to 40,000 shots or so.

The probability on the jector punch can be found in the same way. Its punch tip will break after about 5,000 punching shots because it has a smaller sectional area.

Where the stress σ exerted on punches is controlled to a value equal to or below the allowable stress of the specific punch materials, they will not fracture.

(This is only for reference; the maximum allowable stress depends on conditions, including die accuracy, die structure, variations in workpieces, the surface roughness of punches, heat treatment, and so on.)

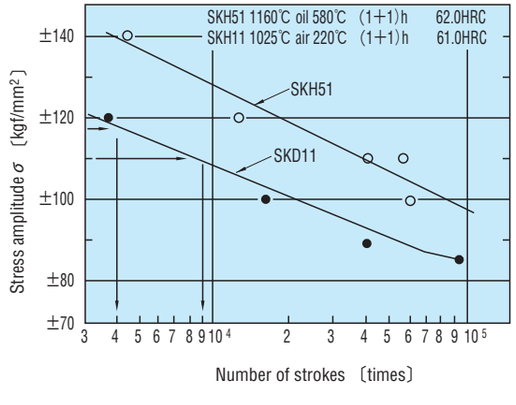
Table 1. Shearing resistance and tensile strength of various materials

Material	Shearing resistance τ (kgf/mm²)		Tensile strength σ_B (kgf/mm²)	
	Soft	Hard	Soft	Hard
Lead	2～3	—	2.5～4	—
Tin	3～4	—	4～5	—
Aluminum	7～11	13～16	8～12	17～22
Duralumin	22	38	26	48
Zinc	12	20	15	25
Lead	18～22	25～30	22～28	30～40
Brass	22～30	35～40	28～35	40～60
Bronze	32～40	40～60	40～50	50～75
Nickel silver	28～36	45～56	35～45	55～70
Silver	19	—	26	—
Hot rolled steel plate (SPH1～8)	26 or more		28 or more	
Cold rolled steel plate (SPC1～3)	26 or more		28 or more	
Steel plate for deep drawing	30～35		28～32	
Steel plate for structural use (SS330)	27～36		33～44	
Steel plate for structural use (SS400)	33～42		41～52	
Steel 0.1%C	25	32	32	40
〃 0.2%C	32	40	40	50
〃 0.3%C	36	48	45	60
〃 0.4%C	45	56	56	72
〃 0.6%C	56	72	72	90
Steel 0.8%C	72	90	90	110
〃 1.0%C	80	105	100	130
Silicon steel plate	45	56	55	65
Stainless steel plate	52	56	66～70	—
Nickel	25	—	44～50	57～63
Leather	0.6～0.8		—	
Mica 0.5mm in thick	8		—	
〃 2mm in thick	5		—	
Fiber	9～18		—	
Birch material	2		—	

＊{N} =kgf×9.80665 (Schuler, Bliss)

〔Fig.2〕 Fatigue characteristics of tool steel

Reference : Ago. Plasticity and Working 19—204 (1978)



■3. Minimum punching diameter

● **Minimum punching diameter : dmin.**

$$dmin = 4t\tau / \sigma$$

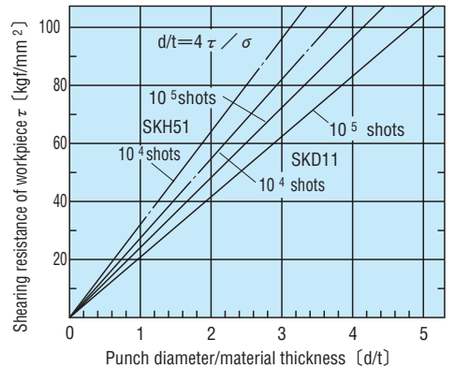
σ : Fatigue strength of tool steel [kgf/mm²]

[Example 3] To obtain the minimum punching diameter that makes it possible to punch SPCC plates with a thickness of 2mm 100,000 shots or more using a SKH51 punch :

$$dmin = 4t\ \tau / \sigma \quad \cdots\cdots\cdots\cdots (3)$$
$= 4 \times 2 \times 26 / 97$
$\fallingdotseq 2.1$mm

The fatigue strength σ of SKH51, subjected to 100,000 shots of punching;
σ is 97kgf/mm² from Fig 2.
τ is 26kgf/mm² from Table 1.

〔Fig.3〕 Punching limit



■4. Fracture due to buckling

● **Buckling load P[kgf]**

$$P = n\pi^2 EI / \ell^2 \quad \cdots\cdots\cdots\cdots (4)$$

$$\ell = \sqrt{n\pi^2 EI / P} \quad \cdots\cdots\cdots\cdots (5)$$

n : Coefficient n=1 : Without stripper guide
n=2 : With stripper guide

I : Secondary moment of inertia [mm⁴]
For a round punch $I = \pi d^4 / 64$

ℓ : Punch tip length [mm]

E : Young's modulus [kgf/mm²]
SKD11 : 21000
SKH51 : 22000
HAP40 : 23000
V30 : 56000

As expected from Euler's formula, to improve buckling strength P, it is recommended that a stripper guide and a material with a higher Young's modulus (SKD, SKH, and HAP in increasing order of Young's modulus) be used, and that the punch tip length be reduced.

The buckling load P represents the value of the load when a buckled punch fractures. When selecting a punch, therefore, safety factor 3 to 5 should be taken into account.

When selecting a punch for small holes, special attention should be paid to buckling load and stress exerted on the punch.

[Example 4] Calculating the full length of punch when a ϕ 8 hole is punched in stainless steel SUS304 (thickness 1mm, tensile strength $\sigma b = 60$kgf/mm²) using a straight punch (SKD11) without buckling:

From equation (5) $\ell = \sqrt{n\pi^2 EI/P}$
$= \sqrt{2 \times \pi^2 \times 21000 \times 201/1206}$
$= 262$mm

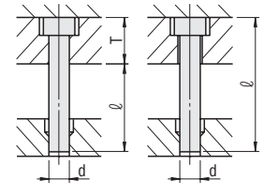
If the safety factor is 3
$\ell = 262/3 = 87$mm

Punching force $P = \pi dt\tau$
$= \pi \times 8 \times 1 \times 0.8 \times 60$
$= 1206$kgf

Secondary moment of inertia $I = \frac{\pi d^4}{64} = \frac{\pi 8^4}{64}$
$= 201$mm⁴

With stripper guide : n=2

If punch plate thickness T=20mm, buckling can be prevented by using a punch having a full length of 107mm or less. The full length is 87mm or less for the punches relative to stripper (the punch plate guides the tip in the clearance).



For relative to punch plate For relative to stripper

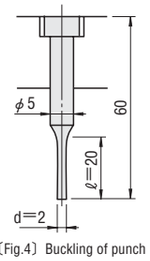
[Example 5] To obtain the buckling load P for SHAL5—60—P2.00—BC20, the punch is used without a stripper guide:

$P = n\pi^2 EI / \ell^2$
$= 1 \times \pi^2 \times 22000 \times 0.785 / 20^2$
$= 426$kgf

If the safety factor is 3
$P = 426/3 = 142$kgf

∴ Buckling will not occur if the punching force is 142kgf or less.

Punch material : SKH51
E=22000kgf/mm²
$I = \frac{\pi d^4}{64} = \frac{\pi 2^4}{64}$
$= 0.785$mm⁴
Without stripper guide : n=1



〔Fig.4〕 Buckling of punch

CALCULATION OF PUNCH STRENGTH②

■5. Flange fractures

As shown in Products Information of punches for heavy load on page 1223, it is said that the cause of flange fractures is tensile force due to elastic waves that are produced during the punching operation（the tensile force corresponding to the punching load applies to the punch at the time of breaking through）and the concentration of stress.

There are various methods for the prevention of flange fractures including：

1. Increase the radius under the flange to ease the concentration of stress.（use a punch for thick plates）
2. Increase the strength of the flange of a punch to a value higher than that of its tip.

Let us use method 2 above to find the optimum shank diameter that will not cause flanges to fracture.

● Calculations for the optimum shank diameter

The punching load P exerted on a punch tip is as follows：

$P = \pi dt \tau$

The allowable stress σ_w on the flange is

（a）For shoulder punch

$\sigma_w = P\alpha / A_t$

$= 4P\alpha / \pi D^2$

（b）For jector punch

$\sigma_{wJ} = 4P\alpha / \pi (D^2 - M^2)$

Find the strength of the flange when the punching conditions are the same as in Example 1.

A_t：Cross-sectional area flange［mm^2］

（a）For shoulder punch

$A_t = \pi D^2 / 4$

（b）For jector punch

$A_t = \pi (D^2 - M^2) / 4$

D：Shank diameter

α：Coefficient of stress concentration

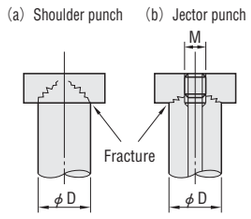
（a）For shoulder punch, $\alpha \fallingdotseq 3$

Punch for punching plate thickness $\alpha \fallingdotseq 2$

For taper head punch, $\alpha \fallingdotseq 1.6$

（b）For jector punch, $\alpha \fallingdotseq 5$

〔Fig.5〕Flange fractures



［Example 6］（a）For shoulder punch SPAS6—50—P2.8

$\sigma_w = 4 \times 675 \times 3 / \pi \cdot 6^2 = 71.6 kgf/mm^2$ ・・・・・・・・Fractures starting from the flange will not occur because the stress applied to the punch tip in Example 2 is smaller than $110 kgf/mm^2$

（b）For jector punch SJAS6—50—P2.8

$\sigma_{wJ} = 4 \times 675 \times 5 / \pi (6^2 - 3^2) = 159 kgf/mm^2$ ・・・・Fractures starting from the flange will occur because the stress applied to the punch tip in Example 2 is greater than $117 kgf/mm^2$.

When the shank diameter is 8mm, $\sigma_{wJ} = 90 kgf/mm^2$, which does not cause flange fractures.（Considering from the figure showing the fatigue strength of tool steel, the flange will break after about 50,000 shots.

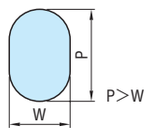
● Selection table for the optimum shank diameter

Punching conditions：Punch tip to convert P=12.8, W=10.6 into punch diameter ϕd, use the following equation：

$\phi d = [2(P - W) + W\pi] / \pi$

$= [2(12.8 - 10.6) + 10.6\pi] / \pi$

$= 12mm$



When material thickness is t=4mm, shearing resistance is $\tau = 50 kgf/mm^2$, and total number of shot times is 10^4 shots, to find the shank diameter, follow the steps described below：

Durability of punch tip（Fracture）〔Fig. 6〕

a）Obtain point a where material thickness t and shearing resistance τ intersect.

b）Obtain point b by extending a line from point a to the left or right until it intersects the diameter of the punch tip.

・Since the point b is below the line for the total number of shot times of 10^5, it is interpreted that both SKH and SKD have the durability for 10^5 shots or more.

Selection of shank diameter〔Fig. 7〕

c）Extend a line from point a to the right and obtain point c where it intersects the tip diameter.

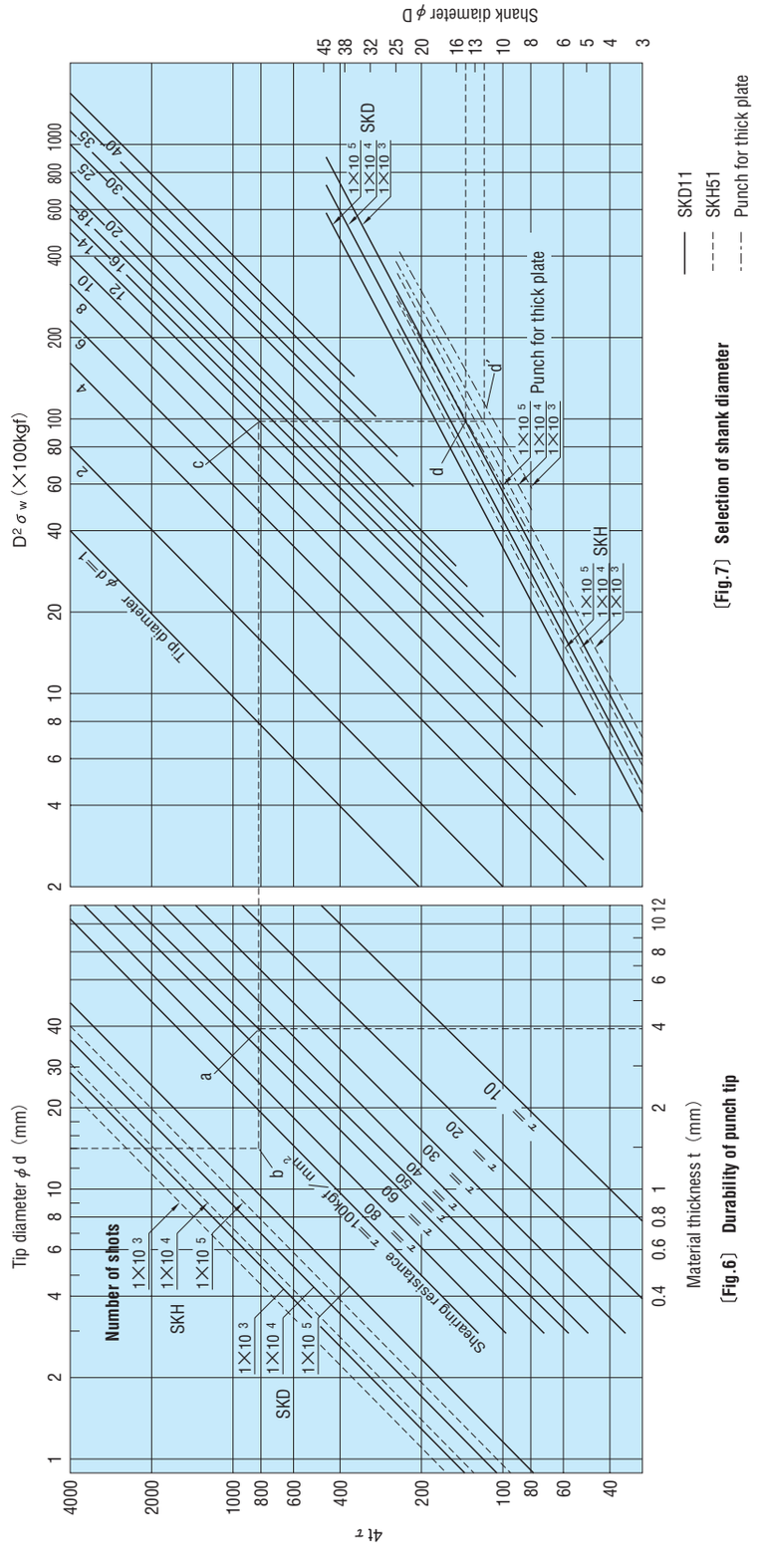
d）Extend a line from point c downward and obtain points d and d' where they intersect the line for total shot times of 10^4（for standard and thick material）.

e）Obtain the shank diameter by extending a line from points d and d' to the right.

・Since 14.0 is indicated for standard punches（SKH）, select ϕ16 for the shank.

・Since 11.8 is indicated for punches for thick material（SKH）, select ϕ13 for the shank.

Note：This selection table was prepared based on the results of tensile／compressive fatigue tests. The data may differ slightly from actual punching conditions.



〔Fig.7〕Selection of shank diameter

〔Fig.6〕Durability of punch tip

〔PRODUCTS DATA〕

DURABILITY OF PUNCHES FOR PUNCHING

Characteristics required of punching tools are wear resistance, compression resistance and toughness. The utilization of high-speed steel and a variety of surface treatments have significantly lengthened the lives of tools, and it is necessary to choose proper tools taking punching conditions into account. As data for the purpose, described below are the results of punching life, buckling and transverse tests on punches using various combinations of materials（SKD11, SKH51 and Powdered high-speed steel）and the TD process.

Note） TD＝DICOAT punch（see P.1215）.

■1. Punching life span

● Punching conditions

Material of workpiece	：S55C	Material thickness	：1.0mm
Punch diameter	：8.0mm	Clearance	：10%
Die material	：SKD11	Lubrication	：None
Bridge widt	：1.5mm	Press used	：25Ton
Punching speed	：200SPM		

● Test result

——Side wear ——

〔Figure 1〕illustrates the transition of the area of side wear with an increase in the number of shots.

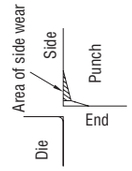
（1） The number of side wear in the punches decreases in the order of SKD11, SKH51, HAP40, SKD—TD, and HAP—TD.

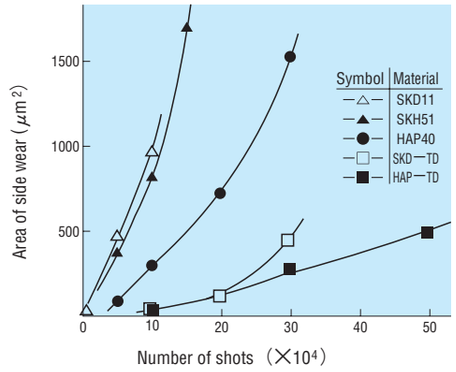
（2） Since the TD processed punches are high in surface hardness（3000 HV or more）, they develop a very small amount of side wear.

〔Table 1〕 Types of tools used

Material and surface treatment	（HRC）	Main chemical components（%）				
		C	Mo	W	V	Co
SKD11	61	1.5	1	—	0.3	—
SKD—TD	60					
SKH51	61	0.9	5.0	6.0	2.0	—
HAP40	65	1.3	5.0	6.5	3.0	8.0
HAP—TD	62					

〔Fig.1〕 Transition of area of side wear





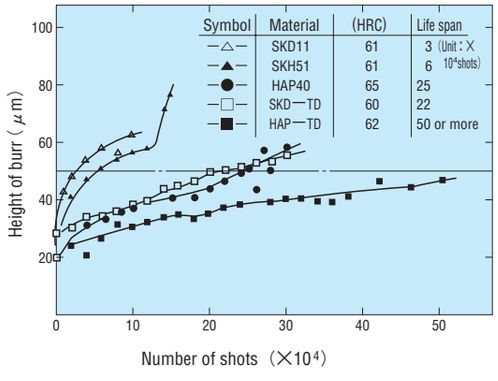
——Height of burr ——

〔Figure 2〕illustrates the transition of the height of burr with an increase in the number of shots.

（1） The life span of punches increases in the order of SKD11, SKH51, SKD—TD, HAP40, and HAP—TD.When the height of burr reached 50 μm, it was judged that the punch was at the end of its life. The life of HAP—TD lasted for 500,000 punching shots and had not yet reached the end of its life.

The TD process is to coat a workpiece with VC（vanadium carbide）to enhance its wear and seizure resistance.Because there was a very small amount of side wear in the HAP—TD punch and its base material was HAP 40（65 HRC）, its end wear was also slight, leading to its long life span.

〔Fig.2〕 Transition of height of burr with increase in number of shots



■2. Buckling and traverse tests

● Test conditions

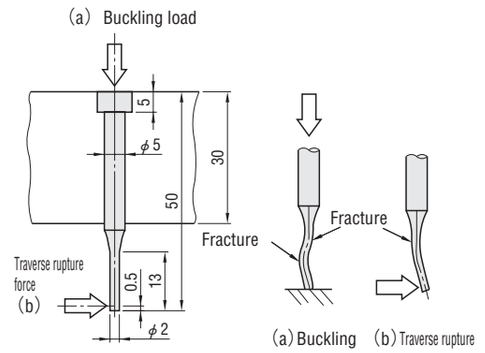
As shown in〔Fig.3〕, buckling loads and traverse rupture loads were applied to test pieces at a velocity of 1mm/min.（the traverse rupture loads were applied to the point 0.5mm from the end of a punch tip, using a knife-edge-shaped presser）, and the respective maximum load under which the punch ruptured was found.

● Test result

Both buckling strength and traverse rupture strength increase in the order of SKD11, SKD51 and HAP40.Especially, HAP40 maintains high hardness, and thus it is excellent in compression resistance.〔Table 2〕The metal structure of HAP40 is very fine, and it contains high alloy components（W, V, Co, etc.）, which makes the HAP40 punch excellent in toughness.Therefore, the HAP40 punch is most suitable for punching that may cause fracture or chipping.

Since the TD processed punches are degraded in base material hardness, they are also slightly low in buckling strength and traverse rupture strength.

〔Fig.3〕Buckling and traverse tests



〔Table 2〕 Results of buckling and traverse tests

Material and surface treatment	Buckling				Traverse rupture			
	[HRC]	Buckling load [kgf]	Buckling strength [kgf/mm²]	Ratio [%]	[HRC]	Traverse rupture strength [kgf]	Breaking deflection [mm]	Ratio [%]
SKD11	61.1	805	265	100	60.5	21.4	2.28	100
SKD—TD	59.6	829	264	103	59.5	19.4	1.65	91
SKH51	61.5	946	301	118	61.8	26.8	2.37	125
HAP40	66.0	1168	372	145	64.8	29.8	2.37	139
HAP—TD	62.2	952	303	118	62.0	24.5	1.75	113

＊{N}＝kgf×9.80665

■3. Summary

Shown below are the toughness, traverse rupture strength and wear resistance of the above-mentioned materials relative to those of SKD11.

（1） SKH51 is approx. 1.2 times greater in both buckling strength and in traverse rupture strength, and 2 times greater in wear resistance.

（2） SKD—TD is 1 times greater in both buckling strength, 0.9 times greater in traverse rupture strength, and 7 times greater in wear resistance.

（3） HAP40 is 1.5 times greater in both buckling strength, 1.4 times greater in traverse rupture strength, and 8 times greater in wear resistance.

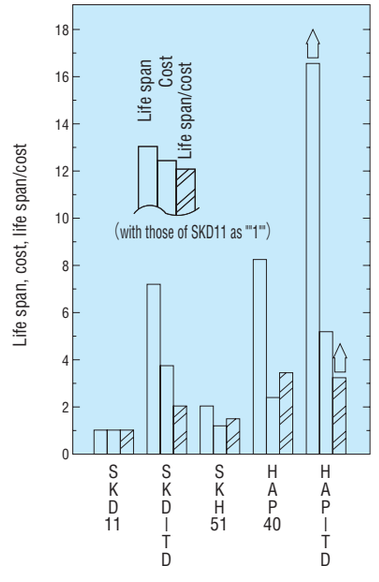
（4） HAP—TD is 1.2 times greater in both buckling strength, 1.1 times greater in traverse rupture strength, and 16 or more times greater in wear resistance.

● Economy of punch

〔Figure 4〕illustrates the punching life span, cost and life span/cost of punches as used to punch S55C materials.With the economy of the SKD11 punches as "1", a 1.5-fold economy is expected from SKH51, 2-fold from SKD—TD, 3.5-fold from HAP40, and 3.2 or more from HAP—TD.

This data is taken from life span tests with the S55C material. It differs slightly form that taken from tests with other materials.

〔Fig.4〕 Comparison of economy of punches



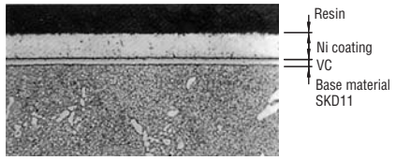
DICOAT® PUNCH

DICOAT® punches are epoch-making standard punches that have superior properties made possible by a vanadium carbide layer produced by the TD process.Having a surface hardness of 3200HV to 3800HV they can be effectively used as anti-abrasion and counter-seizure punches. As a result, overall expenses will be minimized when these punches are used.

MISUMI undertakes the overall production of these punches and applies the TD process under license, ""TD Process Application to Metallic Mold Standard Items and Sales"", granted by Toyota Central Research Institute Co., Ltd. This has enabled MISUMI to establish a production line for DICOAT® punches having the same dimensional precision as other punches.

The TD process, known as ""surface hardening by diffusion"", was developed by Toyota's general research institute, Toyota Central Research Institute Co., Ltd. With this method, a certain element (carbide) is diffused to penetrate through the surface of the metal to form an anti-abrasion and an anti-seizure film. Since its first practical use in 1970, the TD process has been widely applied to press dies, cold forging steel dies and casting dies, cutters, jigs and machine parts to improve their performance.

〔Fig.—1〕 Photograph of DICOAT® punch section



Features of DICOAT® PUNCH

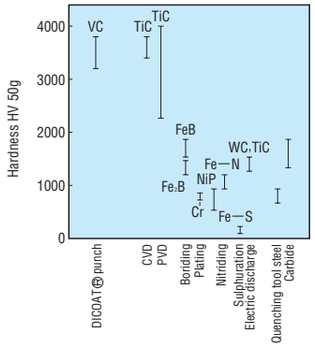
1. anti-abrasion : Surface hardness

- The tip of DICOAT® punch is coated with a 4～7 μm vanadium carbide (VC) film.
- The surface hardness of DICOAT® punch is 3200～3800HV resulting in a minimal degree of abrasion when punching all types of materials.

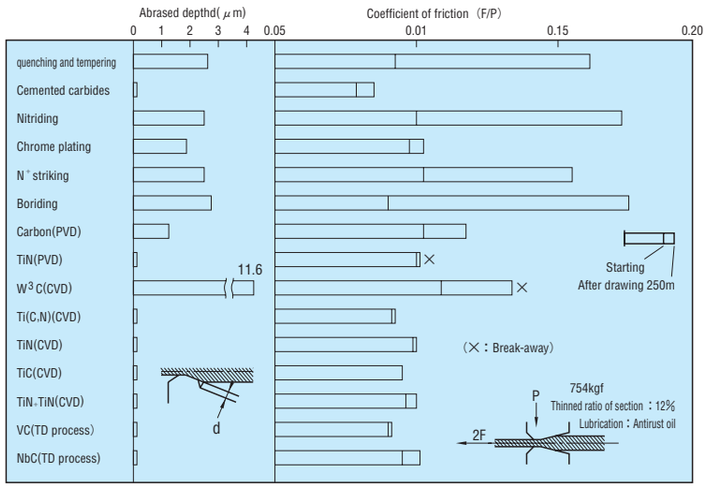
2. anti-seizure & anti-abrasion

- DICOAT® punches have high anti-seizure and anti-abrasion characteristics when used with all types of materials.
  The punches are virtually flawless and have polished surfaces.

〔Fig.—2〕 Comparison of surface hardness

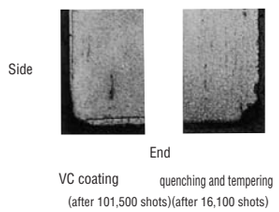


〔Fig.—3〕 Comparison of anti-abrasion and anti-seizure in press-thinning process



〔Fig.—4〕 Section structure of piercing punch tip after punching

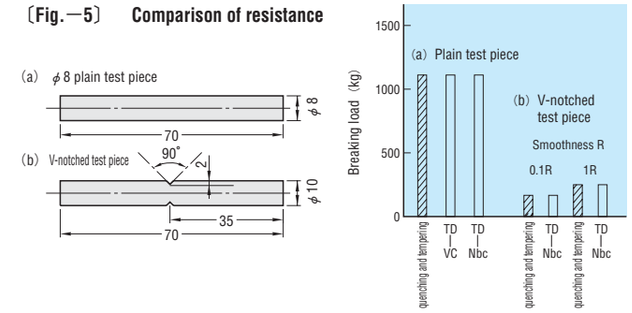
(Stock : SPCC t=3.2mm)



3. Toughness

- VC coating does not result in revised toughness of base metal. Also, DICOAT® as high tempered, which results in minimal breakage as compared with other punches.

〔Fig.—5〕 Comparison of resistance



Effect of DICOAT® PUNCH

1. DICOAT® punches exhibit excellent abrasion and seizure resistance under a wide range of conditions.

Especially under the following circumstances, the benefits extend throughout the life of the punch :

(1) Because DICOAT® punches have a smaller regrinding allowance and shorter regrinding times, even when the regrinding allowance and abrasion is severe, and the potential span is increased.

(2) Because the speed at which the burr height increases is low, quality control based on the burr height can be accomplished with minimal steps.

(3) When the product surface is important :
As scuffing hardly occurs, stable production of smooth-surfaced products is possible.

(4) When using ineffective or expensive lubricants :
The DICOAT® punches are designed to minimize scuffing and degree of abrasion which allows of use of any type of lubricant at reduced amounts.

2. DICOAT® PUNCH adoptable stocks

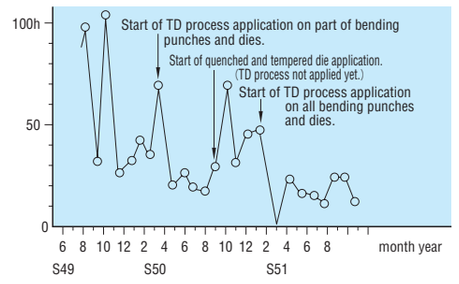
Steels	SS, SPC, SPH, SC, SCM, SK, SUS, High tensile strength steels, Silicon steels
Surface treated steel sheets	Sn plated steels, Zn plated steels, Aluminized steels, Plastic coating steels
Nonferrous metals	Al, Al alloy, Cu, Cu alloy, Zn alloy, Ni alloy
non-metal	Rubber, Cloth-inserted rubber, Asbestos, Cloth-inserted bakelite

3. Reduction of number of die repair-steps

Figure 6 shows the relationship between the time needed to repair progressive dies used at company B and the effect of applying the TD process. The time needed for repair includes the regrinding of bending and trimming punches, and other problems resulting from mis-operation.

Bending punches and dies are the only TD processed parts used in progressive dies. Nevertheless, a close relationship is clearly evident between the start of TD process application and repair times. For example, the repair time was about 50 hours per production run of 100,000 and was reduced to 15 hours after the introduction of the TD process. Due to company B's production quantity, the increase in profit from repair time reductions was significant.

〔Fig.—6〕 Changes in die repair index by TD process



Trimming and bending progressive dies
SCM—3 2.0t
Trimming : 8 points
Bending : 3 points
Perforating : 2 points
Chamfering : 1 point
Stamping : 1 point

Quality improvement IMPROVED COATING PUNCHES①

■Introduction

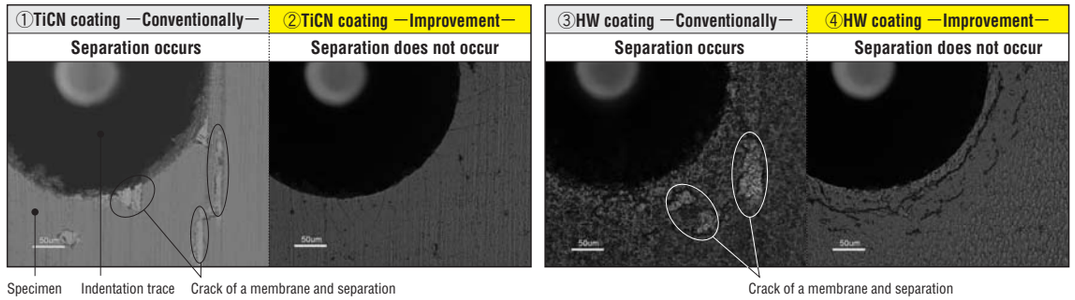
In recent years, worldwide demands for weight reduction and higher safety in the automobile industry have been increasing, and high tensile steel sheet is coming into increasingly wide use.
The punching conditions for high tensile steel sheet are becoming increasingly severe each year, and early wear and chipping have become issues.
Consequently, interest is being shown in increasing the life of the punch.
In order to solve these issues, coating punches, which have improved film adherence and wear resistance, have been commercialized.
These improved coating punches have much longer life than conventional products.

■Features of improved coating punches

■Improved adhesion of the coating film

Unless the adhesion of the film to the base material is strong, the film will quickly separate due to external stress, even if it has excellent characteristics.
Accordingly, in order to evaluate the adhesion force of the film, an impression test using a Rockwell hardness tester (C scale) was performed, and the separation condition of the film was observed.

It can be seen that in the case of the conventional product, film separation and cracking occurred, whereas in the case of the improved product the adhesion of the film has been improved, preventing the film from separating. (Fig.1)

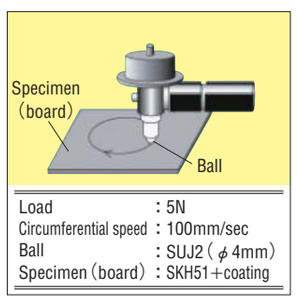


〔Fig.1〕Results of observation after the impression test (Test piece base material: SKH51)

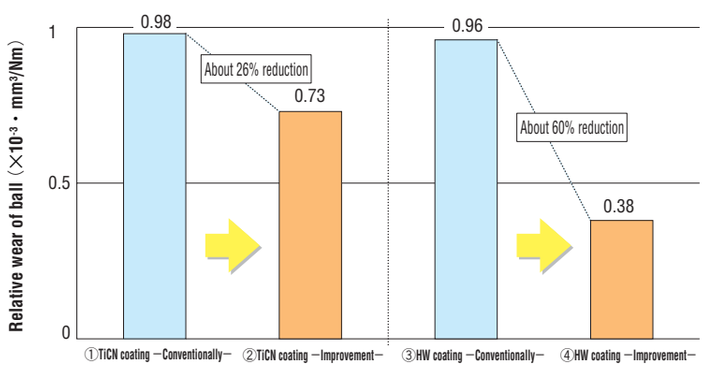
■Improved wear resistance

One cause of wear of the punch is adhesive wear in which the work piece and the punch both wear due to adhesion to each other.
Accordingly, in order to evaluate the wear resistance, a friction wear test was carried out, and the relative wear of the ball was measured.
Here, the superiority or inferiority of the wear resistance was checked by assuming that the test piece (substrate) was the punch and ball was the work piece material (Fig.2), and measuring the relative wear of the ball.

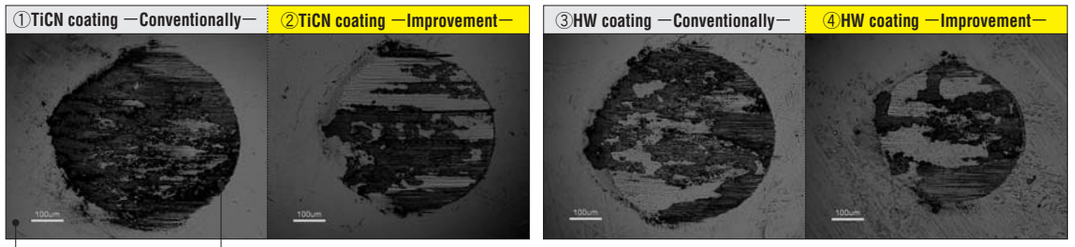
Compared to the conventional product, the relative wear resistance of the ball fell by about 26% in the case of a TiCN coating, and fell by about 60% in the case of an HW coating. (Fig.3)
Also, compared to the conventional product, it can be seen that the ball of the improved product has a smaller friction face (Fig.4), and the wear resistance has been improved.



〔Fig.2〕Outline of friction wear test



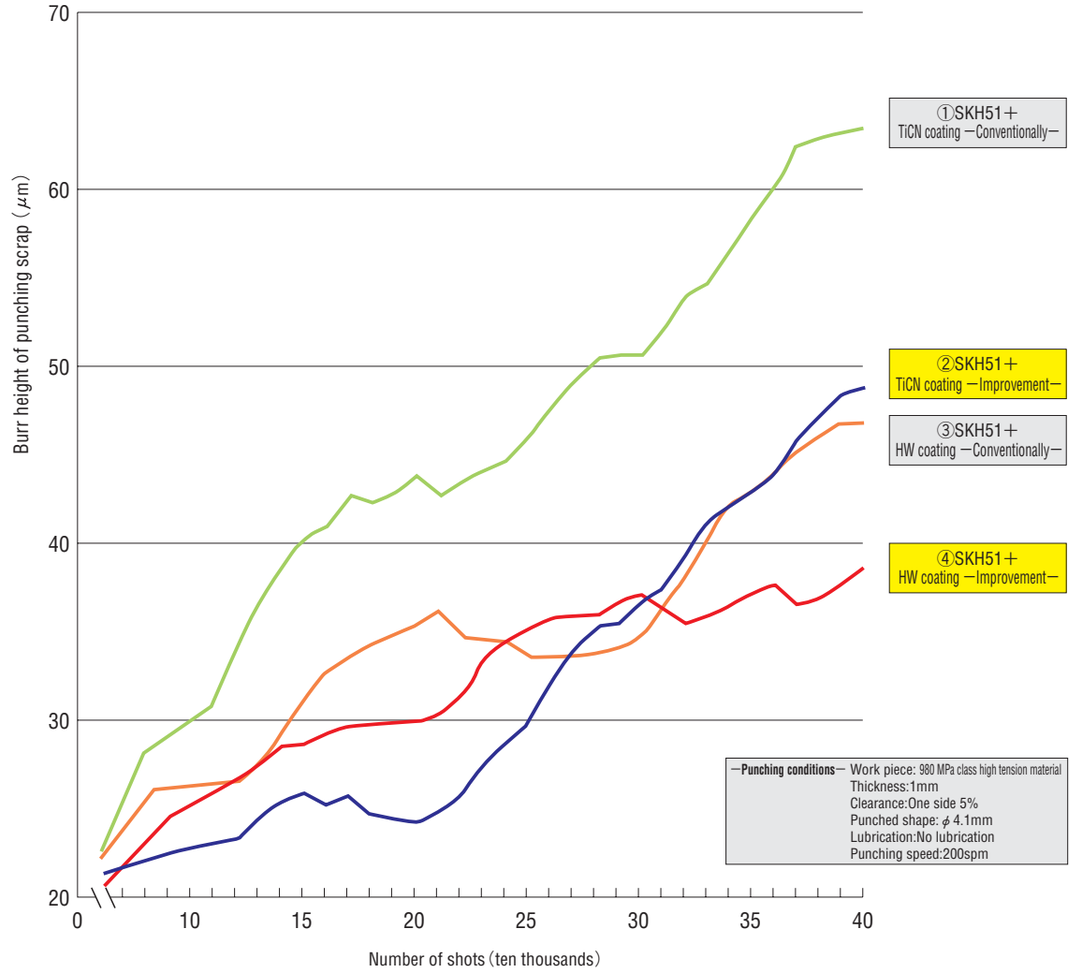
〔Fig.3〕Relative wear of ball after friction wear test



〔Fig.4〕Friction face of ball after friction wear test

■980 MPa class high tensile material punching life test

A punching life test of 980 MPa class high tensile material was carried out, and the burr height of the punching scrap was measured (Fig.5). (Test conditions: Table 1)
Assuming that the allowable value of the burr height is 50μm, the TiCN coating improved product can be used for at least 1.5 times the number of shots as that of the conventional product.
A comparison of the burr height after 400,000 shots shows that the HW coating improved product produces scrap with the smallest burr height, and also that it has the best durability of all of the coating punches that were used in this punching test.

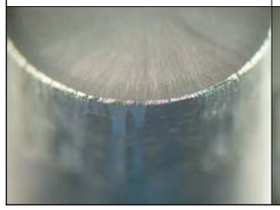
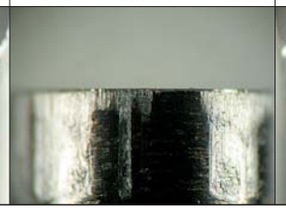
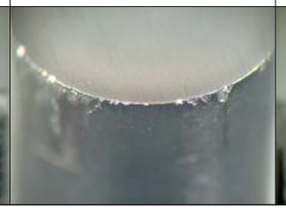
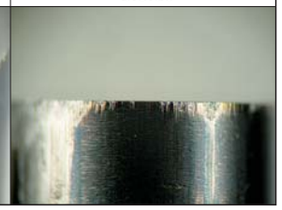


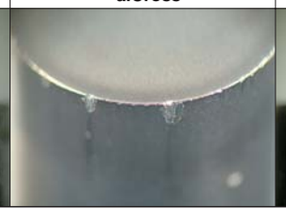
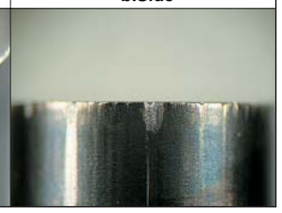
〔Fig.5〕Change of burr height accompanying the number of punching operations

■Comparison of appearance of tip and side face after 980 MPa class high tensile material punching life test

When the appearance of the tip is compared after the 980 MPa class high tensile material punching test (after 400,000 shots) (Fig.6), it is possible to confirm that separation and sticking of the coating film occur with the conventional product. Also, chipping and wear of the edge part have occurred over a wide range.
Separation of the film due to edge chipping was found on the TiCN coating improved product, however no sticking occurred on the tip or the side face, and the test was finished in a more or less satisfactory condition.
Also, no chipping or sticking was observed on the HW coating improved product, and it was confirmed that a satisfactory film condition was maintained.
It is thought that this is partly due to the fact that the WPC treatment improved the fatigue strength of the punch tip. (*Regarding WPC treatment, refer to P1221.)

From the above results, it was confirmed that the improved product was highly effective even on 980 MPa class high tension material and other material that is difficult to machine.

①TiCN Coating・Old model		②TiCN Coating・New	
a.Cross	b.Side	a.Cross	b.Side
			

③HW Coating・Old model		④HW Coating・New	
a.Cross	b.Side	a.Cross	b.Side
			

〔Fig.6〕Appearance of the tip after the 980 MPa class high tensile material punching life test (after 400,000 shots)

〔Reference〕Improved coating —Applicable Punches—

Applicable Punches	M	TiCN Coating・New		HW Coating・New		Applicable Punches	M	TiCN Coating・New		HW Coating・New	
Shoulder	SKH51	●	P.57	●	P.59	For heavy load	SKH51	●	P.113	●	P.115
	Powdered high-speed steel	●		●			Powdered high-speed steel	●		●	
Jector	Powdered high-speed steel	●	P.67	●	P.69	For heavy load jector	Powdered high-speed steel	●	P.123	●	P.125
Jector (Spring reinforced)	Powdered high-speed steel	●	P.67	●	P.69	For heavy load jector (B dimension fixed)	Powdered high-speed steel	●	P.131	●	P.133
Shoulder quill	SKH51	●	P.77			For heavy load with tapered head	SKH51	●	P.135	●	P.135
	Powdered high-speed steel	●					Powdered high-speed steel	●		●	
Shoulder short	SKH51	●	P.79			For heavy load with tapered head jector	SKH51	●	P.137	●	P.137
	Powdered high-speed steel	●					Powdered high-speed steel	●		●	
Key flat	SKH51	●	P.85	●	P.87	For heavy load with dowel	SKH51	●	P.141	●	P.143
	Powdered high-speed steel	●		●			Powdered high-speed steel	●		●	
Key flat jector	Powdered high-speed steel	●	P.89	●	P.91	For heavy load with dowel jector	SKH51	●	P.147	●	P.149
Key flat jector (Spring reinforced)	Powdered high-speed steel	●	P.89	●	P.91	Tapped	SKH51	●	P.155	●	P.157
With dowel	SKD11 or equivalent	●	P.97	●	P.99		Powdered high-speed steel	●	P.163	●	P.159
With dowel jector	SKD11 or equivalent	●	P.105	●	P.107	With key groove	SKH51	●	P.167	●	P.169
With dowel jector (Spring reinforced)	SKD11 or equivalent	●	P.105	●	P.107		Powdered high-speed steel	●		●	
						Straight	SKH51	●	P.176		
							Powdered high-speed steel	●			

※In the above punching test, an ISIS 20-ton precision press and precision forward dies were used. Various factors, such as the accuracy of the press, the accuracy of the clearance, and random variations, were involved with the actual dies, and it is assumed that compared to this punching test, early wear can be seen. Use this as reference data.

■COATING PUNCH—TiCN—

MISUMI's coating punch is the TiCN coating by ion plating, one of the PVD methods. TiCN coating has many strong points such as high hardness and low friction coefficient. It will improve the abrasion resistance of punches and contribute to raise the productivity and quality of products. Also, it is treated at 500℃ or lower in high vacuum condition so that it enables the base materials, which have the tempering temperature of 500℃ or higher, to be coated without hardness degradation or thermal deformation.

Because MISUMI's coating punch is guaranteed its dimension and accuracy after coating, there is no need to control sizes with consideration of the thickness of coated layer.

Technical data of TiCN coating

Hardness (HV)	3000
Coat thickness (μm)	3～5
Friction coefficient (to steel, dry)	0.3
Heat resistance (℃)	～400
Color	Blue gray

■Features of COATING PUNCHES —TiCN—

1. High hardness

The TiCN coating has a hardness of 3000HV, which is harder than cemented carbide.
This hardness protects the cutting edges from abrasion well enough to bring a longer life, max. 10 times, till regrinding.

2. Low friction coefficient

TiCN coating has the low friction coefficient to steel and is chemically inert, enabling to avoid surface fatigue which causes crack. This coating treatment enables to keep the punch surface away from the worked material surface, therefore the lubrication still works even if the cutting fluid lost its activity. Also TiCN has superior slide characteristic, it enables to press with high speed stroking. More effective in the worked materials which have much tackiness like light metal, nonferrous metal, stainless steel, etc.

3. Products quality improvement

TiCN coating enables to manufacture products with less fin and longer life, and work cutting surface with less streak and much smoothness.

■Notes for users

Please pay attention to the notice below at using coating punches TiCN.

- Effective coating punch length is the dimension B (point length) but there is a continuous faint coating layer about 10mm of 0.5 μm or thinner.
- There is a slight dispersion of the thickness of coating layer on the corner part of the edge.
- Do not grind too much at regrinding to prevent coating layer from exfoliation.

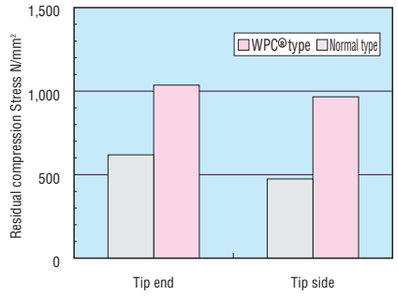
WPC® · HW COATING PUNCHES

■Features of WPC® PUNCHES

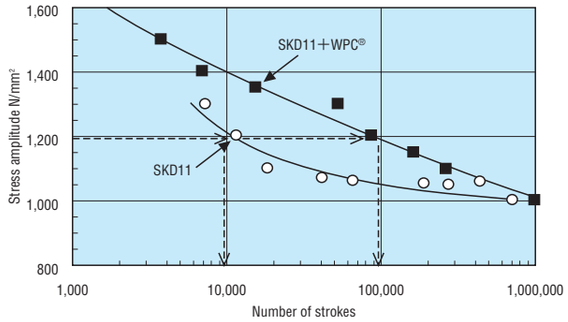
1. Fatigue strength improvement

WPC® treatment consists of causing fine particles of between 0.04 and 0.2 mm to collide with the metal surface at a high speed of at least 100 m/s, so a high residual compression stress is generated in the vicinity of the surface of the punch [**Fig.1**]. As a result, the fatigue strength of the punch is improved, **providing a high resistance to point breakage and chipping [Fig.2].**

For example, in Fig.2 if a load of 1,200 N/mm² is applied repeatedly to the point, the SKD11 may fail after about 10,000 operations, however in the case of the SKD11 + WPC® treatment, durability will increase to about 100,000 operations.（The results shown in Fig.2 are different from the actual sampling test results, so use them only a rough guide.）



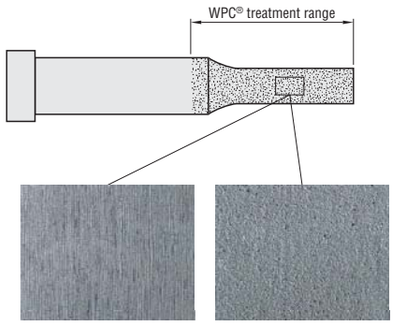
[Fig.1] Surface residual compression stress due to WPC® treatment
Punch material：SKD11



[Fig.2] Improved fatigue strength due to WPC® treatment
Lood conditions：Pulsating load.Test pieceϕ4,61HRC

2. Anti-seizure improvement

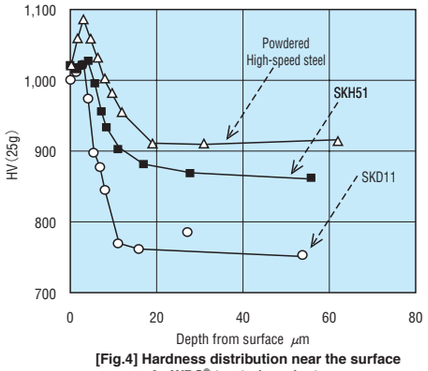
In the case of a normal polished finish, streaks running in the polishing direction remain. In contrast, a surface treated with WPC® has fine surface irregularities [**Fig.3**].
The fine depressions trap oil, so the WPC® -treated surface retains an oil film more readily than a normal polished surface. As a result, **seizure is less likely to occur.**



[Fig.3] Camparison of normal polished product and WPC®-treated product

3. Anti-abrasion improvement

When WPC® treatment is carried out, work hardening occurs, increasing the hardness of the surface. As a result, **the abrasion resistance of the punch is increased.**
In the case of a WPC® -treated punch, the surface gradually hardens from the inside [**Fig.4**], so there is no loss of toughness of the base material of the punch.

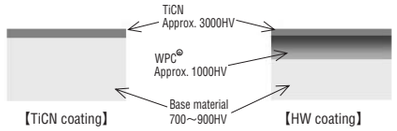


[Fig.4] Hardness distribution near the surface of a WPC®-treated product
Hardness measured using a micro-Vickers hardness tester

■Features of HW Coating

With conventional TiCN treatment, coating separation sometimes occurred under conditions in which a high stress was applied to the punch. It is thought that this trouble occurred because whereas punch base material that is of relatively low hardness deforms, the very hard coated film is unable to follow this deformation.

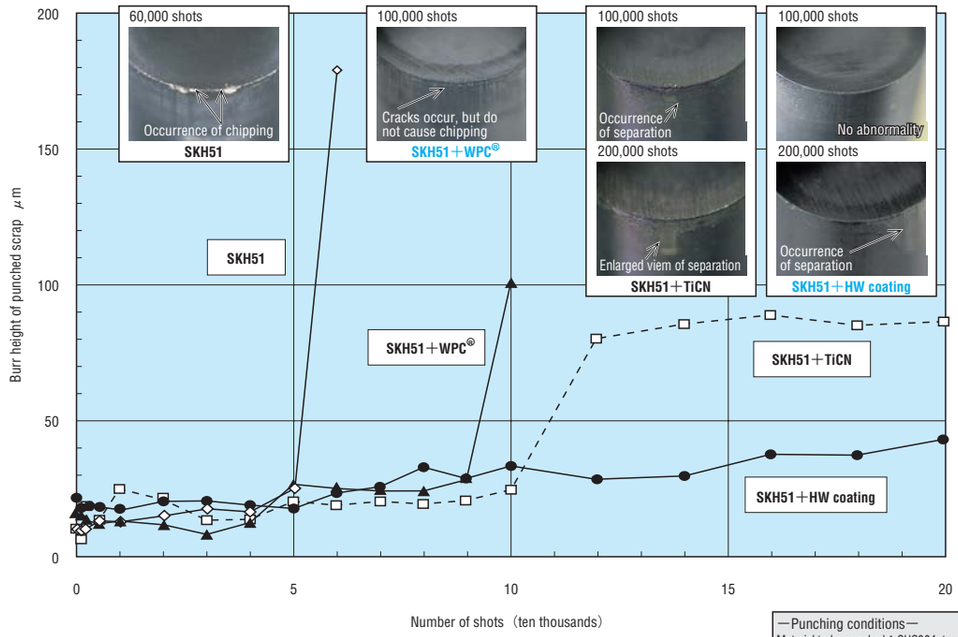
In the case of the HW coating, the base material of the punch is strengthened by the WPC® treatment, raising the adhesive performance of the TiCN film. The HW coating is a new kind of surface treatment which combines the excellent abrasion resistance of the TiCN coating with the inherent high fatigue strength of the WPC® treatment.



[Fig.5] HW coating and TiCN-coating models

〔REFERENCE DATA〕Life test with old model

■SUS304 Punching life test



[Fig.6] Change of burr height along with the unmber of punching operations, and appearance of punch point

—Punching conditions—
Material to be punched：SUS304, t=1mm, Hv180
Clearance：One side 7.5%
Punched shape：ϕ5.0mm
Punching speed：200spm

If, for example, the tolerance of the burr height was made 100 μm, the number of punching operations would be nearly doubled compared to when surface treatment was not carried out. Also, it was found that whereas a punch that had not been surface-treated started to chip at the edge of the point after about 60,000 shots, a WPC® -treated punch showed no signs of significant chipping even after 100,000 shots. As a result, it was confirmed that the fatigue strength of the punch point increased due to WPC® treatment.

The TiCN-coated punch and the HW coated punch were both able to withstand at least 200,000 punching operations. However, when the points of both were compared, it was found that after about 100,000 shots, the coating of the normal TiCN-coated punch started to separate, and also the burr height started to increase, but in contrast the coating of the HW-coated punch showed absolutely no signs of separation after about 100,000 shots, and the burr height remained at a low level up to 200,000 shots.
From these results, it was confirmed that the HW-coated punch exhibits superior performance even when used on materials, such as SUS304, that are difficult to machine.

PUNCHES FOR HEAVY LOAD, TAPERED HEAD PUNCHES

■What are punches for heavy load and tapered head punches?

When a thick sheet or high tensile steel sheet, for example, is punched, the tip of the punch often wears, breaks or chips, and also the head frequency breaks. The main causes of damage to the head of the punch are stress concentration and tensile impact force that occur at the head of the punch. Misumi's punches for heavy load and tapered punches have increased strength due the use of a different profile for the punch head.

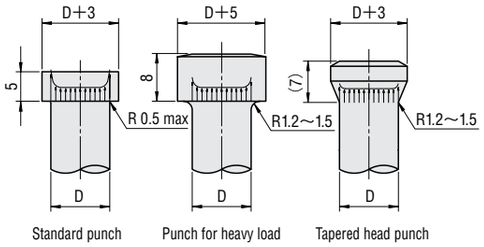
■Causes of damage to the punch head

1. Stress concentration 〔Fig.1〕

Because the punch head has a rapidly changing profile going from the shank to the head, stress concentration occurs. As a result, depending upon the tip diameter and the shank diameter, there are cases in which the head is subjected to a greater stress than the tip, causing it to become damaged

・Punch for heavy load has a larger radius of curvature beneath the neck of the punch than a standard punch in order to reduce stress concentration. However, when the radius of curvature beneath the neck is increased, the O.D. of the head also increases, which is disadvantageous from the viewpoints of cost and installation space. Consequently, it is impractical to increase the radius of curvature to an excessive degree.

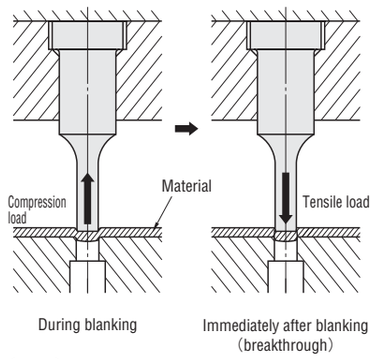
・A tapered head punch is a punch that has a tapered head and also the same radius of curvature beneath the neck as that of punch for heavy load, in order to further reduce stress concentration.



〔Fig.1〕Stress concentration condition

2. Tensile force due to elastic waves 〔Fig.2〕

When a punch is performing a blanking operation, it is subjected to a large compressive force. It is said that at the instant the punch blanks the material (breakthrough), this compressive force is abruptly released, and conversely a large tensile impact force is generated.1), 2) In certain cases, this tensile impact force is comparable in magnitude to the blanking load, and can cause damage to the punch head.



〔Fig.2〕Tensile force generation situation

[Bibliography]
1) Spring Lecture on Plastic Forming, Fiscal 1985, Nagai and Shimanuki
2) Spring Lecture on Plastic Forming, Fiscal 1981, Takaishi, Maeda, Mori et al

■Features of punches for heavy load and tapered head punches〔Figs.3 to 5〕

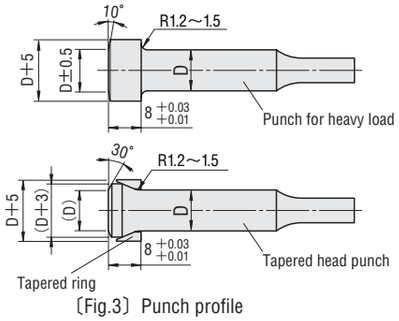
1. Thickness of the punch head

The thickness of the punch head was set on the thick side in order to prevent shear failure due to tension from the impact force.

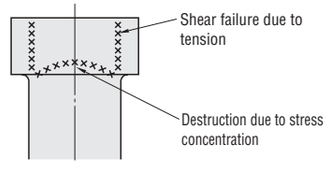
- Punch for heavy load: 8 mm
- Tapered head punch: Approx. 7 mm (Thickness of flange combined with ring: 8 mm)

2. O.D. of punch head and radius of curvature beneath the neck

Punch for heavy load has a radius of curvature beneath of the neck of between 1.2 and 1.5 R, and a head O.D. of D+5 mm (D: Punch shank diameter) in consideration of the stress concentration reduction effectiveness and economical efficiency.A tapered head punch has a radius of curvature beneath the neck of between 1.2 and 1.5 R, and a head O.D. of D+3 mm. It is designed so that when it is used in combination with a tapered ring, it's O.D.



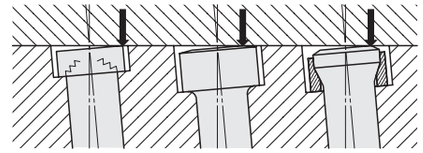
〔Fig.3〕Punch profile



〔Fig.4〕Destruction of punch head

3. Periphery of top surface of punch head

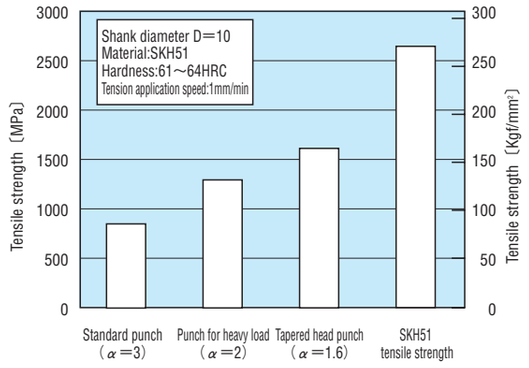
The outer periphery of the top face of the punch is inclined. This is to prevent the punch from breaking due to the application of a bending moment in the vicinity of the outer periphery in the event that the axial center of the punch is out of alignment.



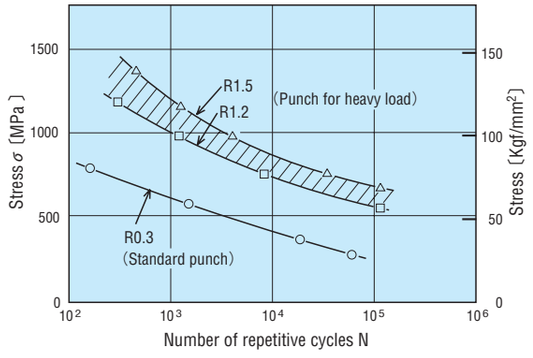
〔Fig.5〕Reduction of bending moment

■Strength of the punch head〔Refer to Fig.6 and 7.〕

If the tensile strength of the head of a standard punch is assumed to be 1, that of punch for heavy load is approx. 1.5, and that of a tapered head punch is approx 1.9. [Fig.6]
The results of a comparison of fatigue strength of punch heads carried out over several 10^4 repetitive cycles, for example, show that the head of punch for heavy load has a fatigue strength of about 1.8 times that of a standard punch. Also, the results of a comparison performed at 784 MPa [80 kgf/mm^2] show that the head of punch for heavy load can withstand nearly six times the number of repetitive cycles as that of a standard punch. [Fig.7]
The tensile strength of the head of a tapered head punch is about 20% higher than that of punch for heavy load, so it is estimated that the tapered head punch has a fatigue strength that is at least as high as that of punch for heavy load. For this reason, a tapered head punch is suitable for applications in which the head of even punch for heavy load is likely to become damaged, such as blanking of high tensile steel of at least 980 MPa [100 kgf/mm^2] class, spring steel or hardened steel.



〔Fig.6〕Tensile strength of the punch head of various types of punches (D = 10, SKH51)
α : Stress concentration coefficient of punch head



〔Fig.7〕Fatigue strength of punch for heavy load and standard punch (D = 5, SKH51)

■When using a punch

・ P.1209～ of Product Data shows the selection standards for the punch tip diameter and the shank diameter. The optimum punch (tip diameter and shank diameter) can be selected from the relationship between the shearing resistance of the workpiece, the sheet thickness, punch diameter and total number of blanking operations.

・A tapered head punch is used for on-the-spot adjustment during punching or tapering, so use punches bearing the same identification mark in combination with each other.

■Conditions under which fracture, breakage and abnormal wear are apt to occur

Factor		Conditions	Probability of punch tip being fractured	Probability of heavy wear occurring	Probability of thin punch being broken
			High/Medium/Low	High/Medium/Low	High/Medium/Low
Material of tools		Too high heat treatment hardness.	○	○	○
		Nonuniform material（e.g. internal defect）	○	○	○
		Approximation between tool material and workpiece material.	○	○	○
Material of workpiece		Presence of oxide film on surface.	○	○	○
		High hardness.	○	○	○
		High elongation and viscosity.	○	○	○
Working conditions	Tool contour	Too long relative to diameter.	○	○	○
		Too small roundness in punch shoulder.	○	○	○
		Sharp corner contained in cutting edge.	○	○	○
		Rough surface finish.	○	○	○
	Clearance	Too small.	○	○	○
		Biased.	○	○	○
	Lubrication	No lubrication provided.	○	○	○
		Improper lubricant.	○	○	○
	Bridge width	Uneven.	○	○	○
	Punch guide	No punch guide provided.	○	○	○
		Poor punch guide accuracy.	○	○	○
	Retention of workpiece	No plate retainer provided.（When fixed stripper is used）.	○	○	○
		Insufficient plate retaining force.	○	○	○
	Anomaly during punching	Double shot or two-plate shot takes place.	○	○	○
Press, die set		Poor press rigidity.	○	○	○
		Poor press accuracy.	○	○	○
		Poor die set accuracy.	○	○	○

Press Working Data Book, 1980, the Nikkan Kogyo Shimbun Ltd.

■Table of comparison of cemented carbide tools for wear resistance

Application		Classification of applicability code	Tungaloy	Sumitomo Electric Hardmetal	Mitsubishi Materials	Dijet Industrial	Hitachi Tool Engineering	Fuji Dice	Nippon Tungsten	Sanalloy Industry	Kyoritsu GOKIN	Silver Alloy
For general wear-resistant impact-resistant tools		V10	D10	D1	GTi05	D1	WH10 WH20	D10 D20	G1	DA10 DA20 DA25	H1 G1 KD05	G1 G2
		V20	D20 D25	D2	GTi10 GTi15	D2	WH30	D40 D50 C50 G55	G2	DA30 VA30	G2 KD10 A10W	G3
		V30	D30	D3 ED30	GTi20	D3 NC2 NC6 NC8	WH40	D60	G3 G20	DA50 VA40	G3 G4 KD20 MC30	G4
		V40 *	D40	G5 ED50	GTi30	G5 NC10 GD195	WH50	C60 G65	G30 G40	DA60 VA50 EA50	G5 TB6 KD40	G5 6F
		V50 *	D50	G6	GTi35 GTi30S GTi40	MH4 GD174 GD201	WH60	C70 C84 G70 G85	G50 G60	VA60 VA70 EA60 EA70	TB7	G6 F65 G65
		V60 *	D60 D70	G7 G8	GTi40S GTi50S	MH5 MH7 GD206	WB60	C95	G80 SD1	VA80 EA80 EA90	G8	G7 G8 7F 8F
Ultrafine grain cemented carbide	For cutting tools	Z01	F MD08F	F0	ZH104 SF10 MF10	FZ05 FB10	NM08	F08				
		Z10	M MD10 MD05F	XF1 F1 AFU	HTi10 MF20	FZ10 FZ15 FB15	NM15	F10 M10	FN10 FN20		EF05	
		Z20	MD15 MD20 EM10	AF0 SF2 AF1	TF15 UF30	FZ20 FB20	BRM20 EF20N	F20	FN30 SF30	FD25	EF10	
		Z30	UM	A1 CC		FZ25	NM25		FN40 SF50		EF20	
	For wear and impact resistance	V10	F	F0 SF1 ED10 AFU	UF20	FB15 FZ10 FZ15		F08 F10 F20 M10	FN10 FN20		EF05 EF10	
		V20	EM10	AF0 AF1	UF30	FB20 FZ20			FN30 SF30	FD25	EF20	SF20 SF05
		V30		A1 CC		FZ25	NM25		FN40	FD15		SF25 SF30
		V40 *					NM40		SF50			

＊：Standard of Carbide Tool Association

■Classification of applicability of cemented carbide

Unit：Wt%

Classification of applicability code	Hardness HRA	Traverse rupture force N/mm² {kgf/mm²}	Metal component Co	Hard phase component W-based hard phase
V10	Over 89	1170 or more {120 or more}	3～6	88～91
V20	Over 88	1275 or more {130 or more}	5～9	88～90
V30	Over 87	1471 or more {150 or more}	8～16	78～87
V40	Over 85	1864 or more {190 or more}	11～20	73～85
V50	Over 83	2060 or more {210 or more}	14～25	70～82
V60	Over 78	2256 or more {230 or more}	17～30	65～78

（Standard of Carbide Tool Association CIS 019C—1990）

■Ultrafine grain cemented carbide

Classification of applicability code	Hardness HRA	Traverse rupture force N/mm² {kgf/mm²}
Z01	Over 92	1177 or more {120 or more}
Z10	Over 91	1275 or more {130 or more}
Z20	Over 89.5	1471 or more {150 or more}
Z30	Over 88.5	1668 or more {170 or more}

（JIS B4053—1989）

Notes 1. The classification of applicability codes from V10 to V30 and the values for them are in accordance with JIS B 4053.
2. The classification of applicability codes should not be used as material type codes.
3. Some cemented carbide manufactures have a plurality of material type codes of their own corresponding to one and the same code of classification of applicability.

■Criteria for cemented carbide selection

Name			Classification of applicability code High←Wear resistance→Low Low←Impact resistance→High					
Rough classification	Name and classification of item		V10	V20	V30	V40	V50	V60
Trimming die	Die	Light load involved						
		Heavy load involved						
	Punch	Light load involved						
		Heavy load involved						
Drawing die	Drawing die	Light load involved						
		Heavy load involved						
	Drawing punch	Light load involved						
		Heavy load involved						
Powder metal compacting die	Die	Round						
		Deformed						
	Punch							
Other wear-resistant, impact-resistant tools and components	Small impact involved	Gauge, valve, nozzle, seal ring, precision ball, etc.						
	Medium impact involved	Bending die, crasher, spike, etc.						
	Large impact involved	Engraver, coining die, coining punch, impact die, swaging die, nail making tool, hot extrusion die, polishing disk, etc.						

（Standard of Carbide Tool Association CIS 019C—1990）

SELECTION OF BUTTON DIES

The following is a summary of the procedures for selecting proper clearances of punches, dies and outside diameters of button dies for ordinary punching processes.

Follow steps from 1 to 7.

STEP 1 See Table 1 for the material code.
Example：SPCC 1.6t·····code42

STEP 2 See Table 2 for hole tolerances.
Example：ϕ6±0.15·····code S

STEP 3 Determine clearances based on the material code and the hole tolerances, Table 3.
Example：10%×1.6=0.16

STEP 4 Determine the hole diameter of die using the following formula.
Punch diameter+(2×Clearance)=Die hole diameter
Example：6.0+(2×0.16)=6.32

STEP 5 Determine the outside diameter of die according to the tolerance code and the die hole diameter, Table 4.
Example：Material code 42, hole tolerance code S
Die hole diameter ϕ6.32·····outside diameter ϕ13

STEP 6 Determine button die length L based on design and then select head or straight type.
Example：Length of 16 long button die with head

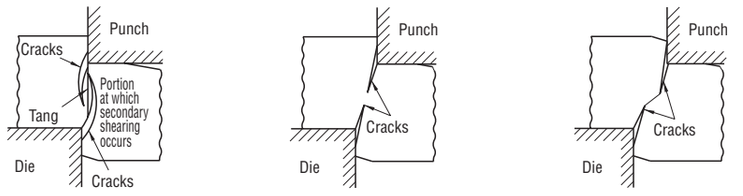
STEP 7 Place order by catalog number.
Example：MHD 13−16−P6.32·····10pcs.

(Table 1) Material code

Tensile strength kgf/mm²	Material thickness		
	1 or less	1～2	2～4
20 or less	21	22	24
40 or less	41	42	44
80 or less	81	82	84

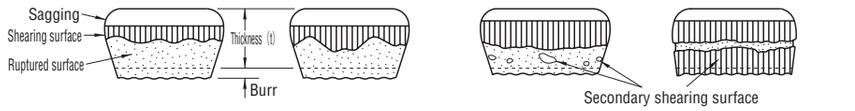
(Table 2) Code for hole tolerance

	Precision class	Standard class
Code	P	S
Hole tolerance	±0.1 or less	Over ±0.1
Hole cut surface	Shearing surface 50%	Shearing surface 30% or less
Usage	Shaft holding hole Rivet hole	Drill hole Vent Unfinished tap hole Weight-reduction hole



(a) Clearance is too small. (b) Clearance is appropriate. (c) Clearance is too large.

Difference in growth of cracks according to the amount of clearance



(a) Clearance is large. (b) Clearance is medium. (c) Clearance is small. (d) Clearance is very small.

Effects of clearance on sectional surface of sheared products

(Table 3) Standard for clearance selection

Material		Tensile strength kgf/mm²	Recommended (on one side) %	
			Precision class P	Standard class S
Aluminum Aluminum alloy	Soft	Less than 10	3	6
	Medium	10～18	4	8
	Hard	Over 20	8	10
Tough pitch copper	Soft	20 or less	6	8
	Hard	28 〃	8	10
Brass	Soft	28 〃	4	8
	Hard	35 〃	8	10
Phosphate bronze	Soft	30 〃	6	10
	Hard	50 〃	10	15
Steel	Extra soft	28 〃	6	10
	Soft	34 〃	10	12
	Hard	70 〃	12	15
Stainless	Soft	60 〃	6	12
	Hard	100 〃	8	15
Sillicon steel		35～39	8	12
Vinyl chloride fiber		4～ 8	3	5
Phenol laminate		5～10	4	4

(Table 4) Recommended outside diameter of button die

Material Code	21		22		24		41		42		44		81		82		84	
Hole diameter \ Hole tolerance	P	S	P	S	P	S	P	S	P	S	P	S	P	S	P	S	P	S
1.0～ 1.99	6	6	6	6	—	—	6	6	6	6	—	—	8	8	8	8	—	—
2.0～ 2.99			8	8	8	8	8	8	8	8	10	10			10	10	10	10
3.0～ 3.99	8	8			10	10			10	10			10	10			13	13
4.0～ 4.99	10	10	10	10			10	10			13	13			13	13		
5.0～ 5.99					13	13			13	13			13	13			16	16
6.0～ 6.99	13	13	13	13			13	13			16	16			16	16	20	20
7.0～ 7.99																		
8.0～ 8.99	16	16	16	16	16	16	16	16	16	16			16	16				
9.0～ 9.99																	25	25
10.0～10.99							20											
11.0～11.99																		
12.0～14.99							25											
15.0～19.99							32											
20.0～25.00							38											

SCRAP RETENTION BUTTON DIES
—GUIDE—

Scrap retention during press operations is caused by product defects or damage to the dies, etc. and can become a serious problem.It is said that scrap retention occurs particularly easily when punching small holes in thin panels or during side cuts when the grinding force with the dies is low.

■Causes of scrap retention

The causes of scrap retention are said to be adsorption by a vacuum, adhesion to the punch cutting blades, adsorption by oil, punch magnetic force, and its being pushed up by compressed air in the die, etc.
Also, with general clearances, since the dimension of punching debris is smaller than the diameter of hole so scrap retention occurs easily.

■General countermeasures for scrap retention

To prevent scrap retention, if
adsorption force to the punch＜friction force with the die＋weight of punch debris, then the effect is good. Therefore,

1） **Countermeasures with the punch**·····Machining of the blade front end（shear angle, projections）, air flow, use of jector punch, etc.
2） **Countermeasures with the die**·····Suck the debris out with a vacuum, make the surface of the blade edge rougher or carry out minute chamfering of the cutting blades, etc.
3） **Other countermeasures**·····Change the contour shapes, make the clearances smaller, make the penetration depth of the punch and die greater, etc.

All kinds of methods have been used.
Generally, the suction system using a vacuum is used widely, but this requires consideration of the construction from the point when the die is designed and installation operations and adjustments of suction force, etc. are a lot of trouble. In addition, in the case of a jector punch, the jector pins need to be treated during repolishing of the punch and changes in the roughness of the inner surfaces of blade edges require retreatment after repolishing. MISUMI dies with countermeasures for scrap retention are subjected to special groove machining and solve these problems.

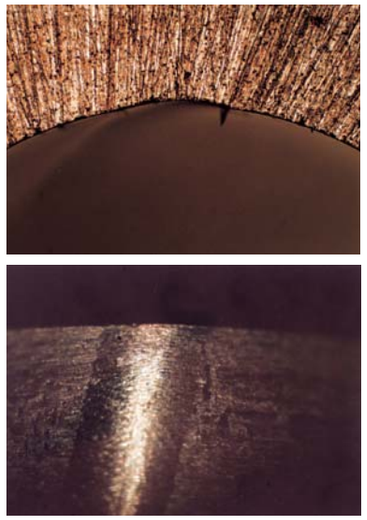


Fig. 1 Groove shape of dies with countermeasures for scrap retention

■Theory and features of button dies with countermeasures for scrap retention

1） **Theory of dies with countermeasures for scrap retention**
Two or more slanted grooves are machined in the inside surface of the die in opposite directions when viewed from the center. The scrap punched out initially in the punching process have little projections formed in them corresponding to the slanted grooves in the die. When these are pushed still farther down to the bottom surface by the downward stroke of the punch, these projections are compressed from the die's side surface（ironing effect）and the friction force becomes great, preventing scrap retention. Also, since the slanted grooves are not machined in a spiral pattern but in opposite directions, so there is no rotation of the scrap together with the punch in its upward stroke.

2） **Blade shapes and types of die**
For round and deformed tools which make it easier to produce scrap retention, it is possible and effective to use button dies with countermeasures for scrap retention on cut—out shapes（side cuts）where there is little binding force with the die.

3） **Handling is easy and the total cost is reduced.**
Since results are realized simply by incorporating dies which have undergone countermeasures for scrap retention, it is possible to use them on existing dies and it is unnecessary to undergo all the trouble at repolishing time or reprocessing after repolishing.The cost is slightly higher than previous button dies, but the cost difference from ordinary punches and jector punches make the cost about the same. And if the effects and maintenance costs are considered, we can say that the added value is extremely high.

■Influence on the shape of a sectional surface

Dies with countermeasures for scrap retention deliver their effect by providing slanted grooves in the die inside surface（0.005～0.1mm）. As a result, since the local clearance of those parts corresponding to the parts of the dies where special grooves have been machined is greater, there are slight changes in the sectional surfaces. That is, in comparison to those parts where machining of grooves is not done, the penetration（R）, cross section length（H）, cross section dimensional difference（C）and burr height（B）become greater while the shear section（S）becomes smaller. Accordingly, a lot of shear planes are necessary in shaping work, etc., so please exercise caution in cases where there are problems between the shear plane dimensions.

Run	R1＜R2
Section length	S1＞S2
Break surface length	H1＜H2
Variation of tolerance of break surface	C1＜C2
Burr height	B1＜B2

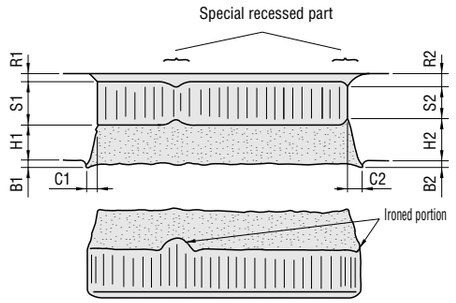


Fig. 2 Shear plane shape due to die with countermeasures for scrap retention

■Available range

1. **Hole diameter ： φ0.8mm～φ48mm**
It is said that the smaller the hole diameter, the easier it is for scrap retention to occur, but if the smallest hole diameter is φ0.8mm or larger, it is possible to handle the rising debris.（Only the precision class is compatible with diameters smaller than φ1.0mm.）
2. **Machined material：Materials with a high tensile strength up to 1177N/mm²（120kgf/mm²）**
It is said that harder the material and the less it can extend, the easier it is for scrap retention to occur. It is possible to use button dies which have undergone countermeasures for scrap retention on practically the whole diverse range of machining materials, and they can be used on materials with a tensile strength of up to 1177N/mm²（120kgf/mm²）.
In the case of machining materials with a tensile strength that exceeds 1177N/mm²（120kgf/mm²）, the effect may not be realized.
3. **Thickness of machining materials：Handles materials with thickness of 0.1mm of greater.**
Through adsorption by oil or a vacuum, etc., the thinner the panel thickness gets, the easier it is for scrap retention to occur, and this causes trouble. Button dies with countermeasures for scrap retention are capable of working with materials with thickness of 0.1mm or greater.（For materials with thickness of less than 0.15mm, only precision class dies can be used.）
4. **Die Material：Selection can be made from SKD11, SKH51, powdered high-speed steel, carbide V40 and super corpuscle.**

■Cautions

1. Machining of special grooves is done so as to achieve the best effect and to minimize the effect on the product, but scrap retention gives rise to variations in the effects due to a number of conditions.
2. Punch and die penetration：About 1mm
To realize the function of button dies with countermeasures for scrap retention sufficiently（to increase the friction force with the die by the ironing effect）, penetration of about 1mm is necessary, so caution is necessary during die design and during repolishing.
3. Amount of repolishing（regrinding）：About 1mm（When BC is used, up to BC—1mm）
In order to obtain the effect of the button die with countermeasures for scrap retention sufficiently, it is desirable that regrinding up to about 1mm be carried out.（In order to realize the effect, grinding of a minimum of 1mm on the blade straight portion is necessary.）

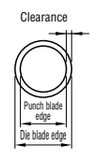
■Order Method

In order to machine slanted grooves which will achieve the best effect as a countermeasure for scrap retention and minimize the effect on products, in addition to the ordinary button die dimensions, the plate thickness of the machining material and the clearance（one side）values are necessary.

- Worked material thickness [MT]：0.15mm or more（0.01mm increments）
  Clearance precision [MT]：0.10mm or more（0.01mm increments）
- Clearance [C]：0.01mm or more（0.005mm increments）
  Clearance precision [C]：0.005mm or more（0.001mm increments）

Order

Catalog No.	L	P	W	R(Ⓡonly)	MT	C
SR—MHD13	30	P7.00			MT1.50	C0.105



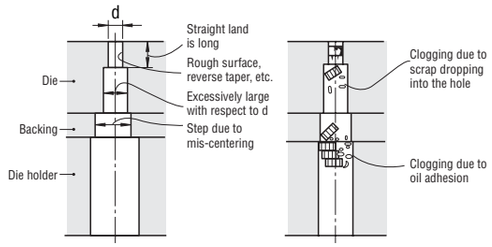
BUTTON DIES WITH AIR HOLE AND SCRAP VACUUM UNIT

■Causes of scrap clogging

Generally, the following are conceivable causes of scrap clogging.

- The straight part of the die tip is too long.
- The rear relief profile is unsuitable（is a reverse taper）.
- The inside surface of the die is rough.
- Steps are formed due to mis-centering of the holes in the die, backing plate and die holder.
- When pieces of blanking scrap fall on top of each other and drop together like a cylinder, they clog up the relief hole.
- Scraps become magnetized.

Particularly, during blanking of thin sheets or blanking of small holes, the blanked scrap is light, so it is considered that the scrap will readily clog up due to even a small impediment.



[Fig.1] Causes of scrap clogging

1）“Presswork Troubleshooting” by Hiromi Yoshida, Fumio Yamaguchi

■Non-clogging button dies（SV series）

1）Principle and features of non-clogging button dies

One conceivable way of thinking concerning the prevention of scrap clogging is as follows:

Scrap discharge resistance（cause of scrap clogging）< Scrap discharge force + Weight of scrap

Misumi's non-clogging button dies have an air inlet hole near the tip, so if a non-clogging button die is used in combination with a vacuum device, a downward airflow is generated inside the die. As a result of this airflow the scrap discharge force increases, thus helping to reduce the amount of scrap generated.

For the vacuum device, please use a vacuum pump, vacuum cleaner（pail cleaner）or a scrap vacuum unit. [Fig.2].

2）Scope

Material		Shape of relief hole		Shank diameter	Tip diameter	Page
		Regular	Angular	D	P	
Steel	SKD11 or equivalent	○	—	6～10	1.00 ～6.00	P.273
	SKH51	○	—	3～ 5	0.50 ～2.50	
	Powdered high-speed steel	○	—	6～10	1.00 ～6.00	
Cemented carbide	V40	○	○	3～10	0.50 ～6.00	P.517、P.523
Precision carbide	V40	—	○	3～10	0.500～6.000	P.446
	Superfine particles	—	○	3～10	0.500～6.000	

3）When used for scrap retention

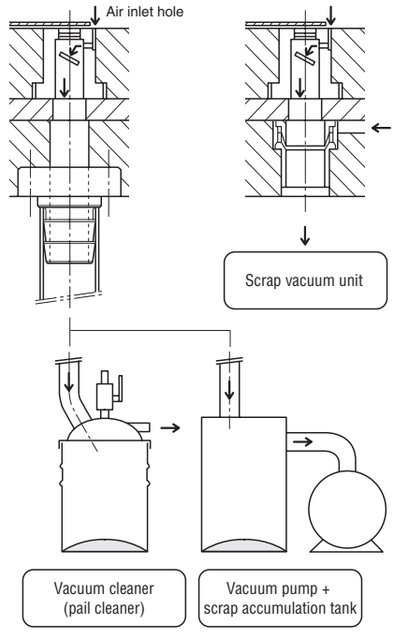
When the BC alterations are used to shorten the tip length（length of the straight part）and increase the bite of the punch in order to separate scrap from one sheet at a time using airflow it is possible to prevent scrap from rising. [Fig.3]

The conventional scrap retention button die was unable to prevent scrap from rising when it was necessary to perform shaving during a subsequent process or when the sheet thickness of the work piece was less than 0.1 mm and the clearance was small. In contrast, these dies can be used to prevent scrap from rising in these applications.

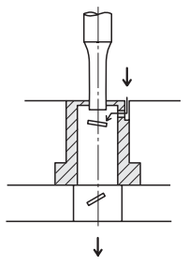
（Only the angular type can be used for BC alterations.）

4）Precautions

- A non-clogging button die is intended to be used in combination with a vacuum device such as a vacuum pump. It is not possible to prevent scrap from clogging by using a button die on its own.
- If the air inlet hole at the top of the button die becomes clogged with lubricating oil, cutting chips, dirt, and so on, the effectiveness of the die will be impaired, so maintain the die periodically. After the die has been stored for a long period, remove solidified lubricating oil, dirt, and so on, clogging the air inlet hole before using the die.
- If the airtightness of a die is poor, it may not be possible to obtain adequate suction effect.
- This product is intended mainly for punching thin sheet material. It may not always be possible to obtain adequate suction performance in the case of thick sheets.



[Fig.2] Examples of combinations with different vacuum devices



[Fig.3] When used for scrap retention

■Scrap vacuum unit（SVBN）

1）Principle and features of scrap vacuum unit

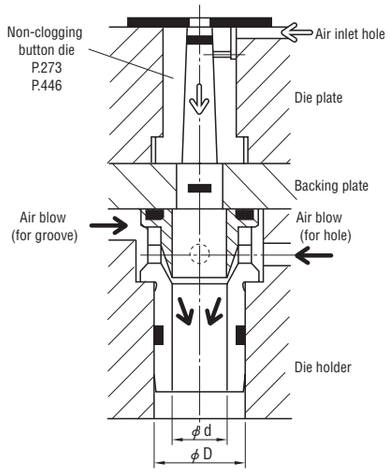
- The scrap vacuum unit uses an air blow（compressed air）to create a negative pressure inside the die. This causes the scrap（product）to be pushed downward, preventing the scrap from clogging or rising.
- Greater effectiveness can be obtained by using a non-clogging button die that has an air inlet hole.
- The air supply path to the die holder can be selected from groove feed and hole feed.
- The unit is intended to be recessed in the die holder, enabling it to be installed later as a countermeasure against scrap rising and scrap clogging without making major changes in design.
- There is no need to form an inclined hole to the die plate, die holder, and so on.

2） Scope

- Hole diameter d: ϕ 3 mm to 16 mm
- O.D. D: ϕ 6 mm to 20 mm

3）Precautions

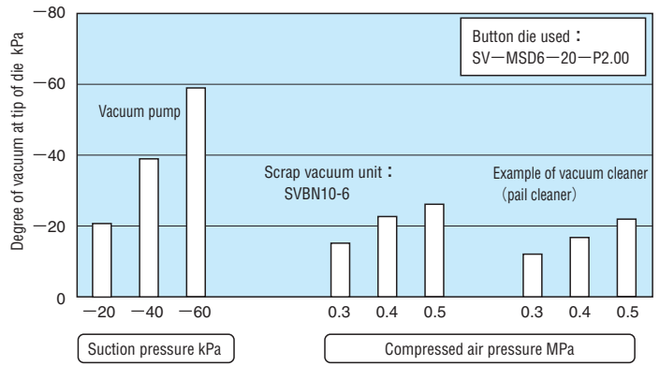
- The magnitude of the suction force of the scrap vacuum unit differs depending upon the pressure of the air supplied, the hose diameter, the cross-sectional area and length of the air supply path of the plate, and the size of the unit.
- A scrap vacuum unit that is not adequately airtight is likely to have insufficient suction effect.
- When using two or more scrap vacuum units, take steps to ensure that the flow of air through each airflow path is the same. Note that in this case the flow velocity will fall, causing the vacuum to fall as well. The vacuum is proportional to the pressure of the compressed air and the cross-sectional area of the flow path, and inversely proportional to the diameter of the vacuum unit and the length of the flow path.
- Use a hose that has an O.D. of ϕ 6 and an I.D. of at least ϕ 4.
- This unit can be used to prevent scrap from rising or clogging, however it cannot solve these problems under all conditions.
- Dimensions not included in this catalog may be changed for the purpose of improvement.



[Fig.4] Example of use of a scrap vacuum unit

■Test data （reference value）

- The scrap suction performance（degree of vacuum at the die tip）becomes maximum when suction is performed using a vacuum pump.
- The suction performance of a scrap vacuum unit or a vacuum cleaner（pail cleaner）is inferior to that of a vacuum pump, however it is possible to drive a scrap vacuum unit using an existing compressor, for example, so there is almost no need to purchase new equipment.
- The suction performance differs depending upon the size of the button die, the hose diameter, the length, and so on, so it is given here only as a rough guide.



[Fig.5] Comparison of different suction units

Note: The suction performance of a vacuum cleaner differs according to the particular model.

NOTES ON ASSEMBLING STRIPPER GUIDES

■Effects of machining errors and adhesive gaps on stripper guides

Centering may deviate when the punch is inserted during die production due to machining errors in punch plates, stripper plates and die plates, and gaps between the guide bushing and adhesive. If inserted in these conditions, the punch will deform due to deviation from the center, resulting in breakage or abnormal wear.
The following countermeasures can be used to eliminate the causes of the above trouble：

Countermeasures

（Ⅰ）Enlarge the hole of the punch guide bushing.

When the hole of the punch guide is enlarged, the stripper plate can only be used for stripping machining materials. This makes the features as a punch guide to be lost, and unsuitable for punching thin plates having small clearances or precision dies.

（Ⅱ）Make the punch guide as an insert type for adjustments.

Adjustments are easy, but the cost will increase.

（Ⅲ）Adjust the die.

Use liners, shims and the like on the block die to prevent center deviation.

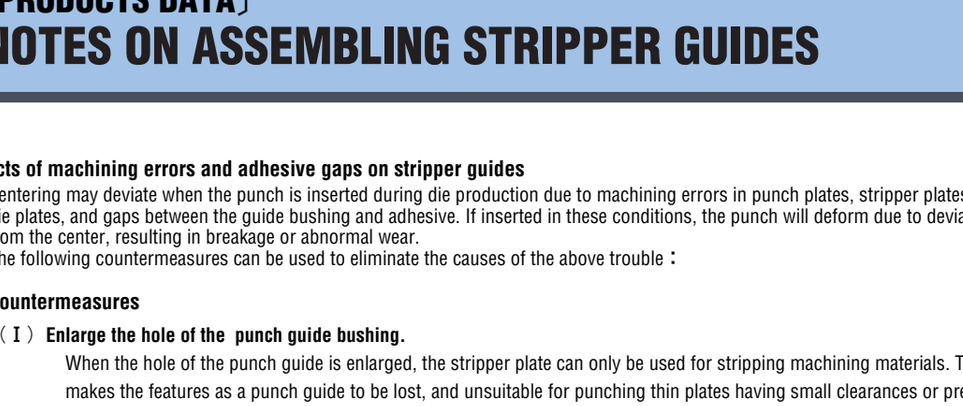
（Ⅳ）Use a reference pin for adjustments.

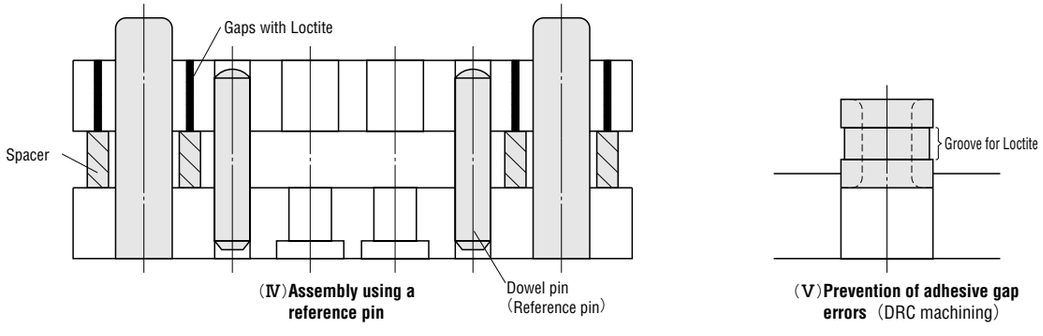
The reference pin can be used for leveling uneven gaps between the guide bushing and Loctite adhesive.

（Ⅴ）Make the precision of mounting hole of stripper guide bushing to the level of a micro clearance.

For precision dies that should have no machining errors, one way to prevent center deviation due to gaps produced by adhesive is to minimize the clearance between the mounting hole and bushing. In this case, the concentricity and circularity of the bushing are critical. Use a precision class bushing（VG/TG series）. Using alteration DRC is the best way to increase the adhesive strength.

Press fit of the bushing is another way to prevent center deviation, but is not recommended for precision dies because press fit will cause deformation due to the shrinkage of internal diameter, or weaken the mounting strength.





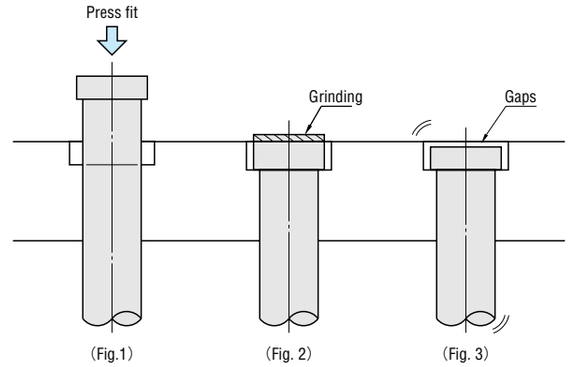
■Assembling stripper guide pin

Headed type

（1） The headed type guide pins are press fit with the sliding part as a lead. This minimizes the press-fit errors, and facilitates to produce perpendicularity.（Fig. 1）

（2） It is ideal to level off the guide pin and plate surface after press fit by grinding the head of the pin protruding from the plate surface.（Fig.2）
（Adjustments with counterbore depth is possible for the TG/VG series having the tolerance of 5 $^{0}_{-0.05}$ in head thickness.） For SGPH/SGOH, alteration TKC will improve the tolerance of head thickness. Gaps at the head part will cause a slight movement of the

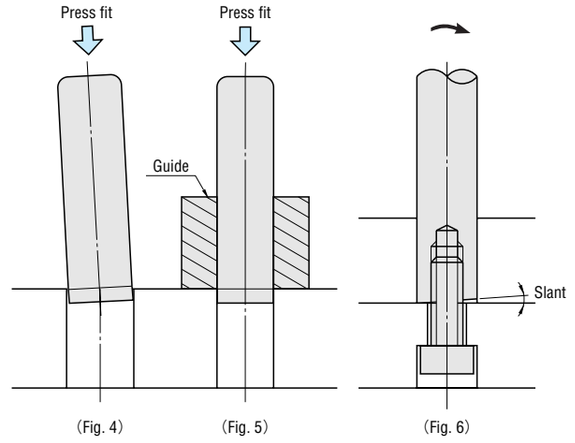
（3） guide pin which will exert bad effects on perpendicularity during machining.（Fig. 3）



Straight Type

（1） When the straight type guide pin is press fit as slanted during assembly, a seizure may be caused during sliding due to insufficient perpendicularity.（Fig. 4）

（2） Perfect perpendicularity can be obtained by press fit of the guide pin using a guide（Fig.5）
For bolt type guide pins, perpendicularity defect will be caused by tightening the bolt if perpendicularity is not maintained at the end face of the guide pin.（Fig. 6）
（The orthogonality of SGPN and SGON can be improved by alteration TGC. The TG/VG series are delivered with their end faces polished.）



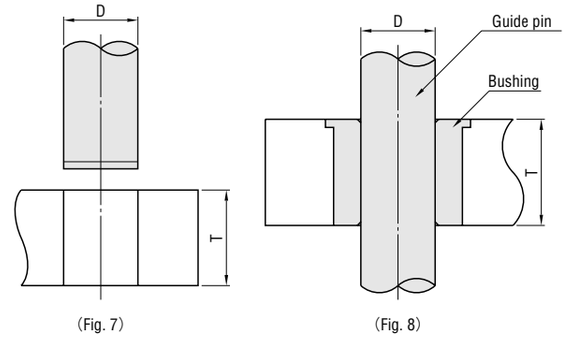
■Guide length of stripper guide pins

Press fit length of guide pin of punch plate

Thickness of the plate 1.5 to 2 times the diameter of the guide pin is most suitable for producing perpendicularity.（Fig. 7）
T≧D, T＝(1.5～2)D

Guide length of stripper plates

Thickness of the plate 1.5 to 2 times the diameter of the guide pin is most suitable considering the stability and seizure of the guide（Fig. 8）.
T≧D, T＝(1.5～2)D



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〔TECHNICAL DATA〕

SI(International System of Units)

Excerpts from JIS Z 8203(1985)

1. International System of Units and Usage

1—1. Scope of application This standard specifies how to use the International System of Units (SI) and other international unitary systems, as well as units used in correlation with units from international systems, and other units which made be used.

1—2. Terms and definitions Terminology used in this specification and definitions thereof are as follows

(1) **International System of Units (SI)** Coherent system of units adopted and recommended by the International committee on Weights and Measures. It contains base units and supplementary units, units derived from them, and their integral exponents to the 10th power. SI is the abbreviation of Systeme International d'Unites (International System of Units).

(2) **SI unit** Generic term used to describe base units, supplementary units or derived units of the International System of Units (SI).

(3) **Base unit** Those units given in Table 1.

(4) **Supplementary unit** Those units given in Table 2.

Table 1. Base Unit

Base Quantity	Unit	Symbol	Definition
Length	Meter	m	A meter is the length of the path traveled by light in a vacuum during a time interval of $\frac{1}{299,792,458}$ of a second.
Mass	Kilogram	kg	A kilogram is a unit of mass (not weight nor force); it is equal to the mass of the international prototype of the kilogram.
Time	Second	s	A second is the duration of 9 192 631 770 periods of radiation corresponding to the transition between the two hyperfine levels of the ground state of the cesium 133 atom.
Current	Ampere	A	An ampere is that constant current which, if maintained in two straight parallel conductors of infinite length, of negligible circular cross-section, and placed 1 meter apart in a vacuum, would produce between these conductors a force equal to 2×10^{-7} Newton per meter of length.
Thermodynamic Temperature	Kelvin	K	Kelvin, a unit of thermodynamic temperature, is the fraction $\frac{1}{273.16}$ of the thermodynamic temperature of the triple point of water.
Amount of Substance	Mole	mol	A mole is the amount of substance of a system that contains as many elementary particles (1) or aggregation of elementary particles as there are atoms in 0.012 kilogram of carbon 12 and when the mole is used, the elementary particles must be specified.
Luminous Intensity	Candela	cd	A candela is the luminous intensity, in a given direction, of a source that emits monochromatic radiation of frequency 540×10^{12}hertz and that has a radiant intensity in that direction of $\frac{1}{683}$ watt per steradian.

Note(1) The elementary particles here must be atoms, molecules, ions, electrons or other particles.

Table 2. Supplementary Unit

Base Quantity	Unit	Symbol	Definition
Plane angle	Radian	rad	A radian is the plane angle between two radii of a circle that cuts off an arch on the circumference equal in length to the radius.
Solid angle	Steradian	sr	A steradian is the solid angle which, having its vertex in the center of a sphere, cuts off an area of the surface of the sphere equal to that of a square with sides equal in length to the radius of the sphere.

(5) **Derived units** The units algebraically expressed using mathematical symbols such as plus, minus, etc. The SI derived units with special names and symbols are given in Table 3.

Examples of SI Derived Units Expressed in Terms of Base Units

Base Quantity	Derived units	
	Unit	Symbol
Area	Square	m^2
Volume	Cubic	m^3
Velocity	Meter/Second	m/s
Acceleration	Meter/Second^2	m/s^2
Wave Numbers	Every Meter	m^{-1}
Density	Kilogram Every Cubic Meter	kg/m^3
Current Density	Ampere Every Square Meter	A/m^2
Magnetic Field Strength	Ampere Every Meter	A/m
Concentration of Substance	Mole Every Cubic Meter	mol/m^3
Specific Volume	Cubic Meter Every Kilogram	m^3/kg
Luminance	Candela Every Square Meter	cd/m^2

Table 3. SI Derived Units with Special Names and Symbols

Base Quantity	SI Derived units		Expression in Terms of Base Units or Supplementary Units, Supplementary Units or other SI Units
	Unit	Symbol	
Frequency	Herz	Hz	1 Hz=$1s^{-1}$
Force	Newton	N	1 N=1kg·m/s^2
Pressure, Stress	Pascal	Pa	1 Pa=$1N/m^2$
Energy, Work, Heat Quantity	Joule	J	1 J=1N·m
Work Rate, Process Rate, Power, Electric Power	Watt	W	1 W=1J/s
Electric Charge, Quantity of Electricity	Coulomb	C	1 C=1A·s
Electric Potential, Potential Difference, Voltage, Electromotive Force	Bolt	V	1 V=1J/C
Electrostatic Capacity, Capacitance	Farad	F	1 F=1C/V
Electric Resistance	Ohm	Ω	1 Ω=1V/A
Conductance	Siemens	S	1 S=$1\Omega^{-1}$
Magnetic Flux	Weber	Wb	1 Wb=1V·s
Magnetic Flux Density,	Tesla	T	1 T=$1Wb/m^2$
Inductance	Henry	H	1 H=1Wb/A
Celsius Temperature	Celsius degree or Degree	℃	1 t=(t+273.15)K
Luminous Flux	Lumen	lm	1 lm=1cd·sr
Illumination	Lux	lx	1 lx=$1lm/m^2$
Radioactivity	Becquerel	Bq	1 Bq=$1s^{-1}$
Absorbed Dose	Gray	Gy	1 Gy=1J/kg
Dose Equivalent	Sievert	Sv	1 Sv=1J/kg

1—3. Multiple of 10 of SI Units

(1) **Prefixes** The multiples and the names and symbols of prefixes to express integer multiples of 10 SI Units are shown in Table 4.

Table 4. Prefixes

Multiples of Unit	Prefixes		Multiples of Unit	Prefixes		Multiples of Unit	Prefixes	
	Name	Symbol		Name	Symbol		Name	Symbol
10^{18}	Exsa	E	10^{2}	Hect	h	10^{-9}	Nano	n
10^{15}	Peta	P	10	Deca	da	10^{-12}	Pico	p
10^{12}	Tera	T	10^{-1}	Deci	d	10^{-15}	Femt	f
10^{9}	Giga	G	10^{-2}	Centi	c	10^{-18}	Ato	a
10^{6}	Mega	M	10^{-3}	Milli	m			
10^{3}	Kilo	k	10^{-6}	Micro	μ			

2. Conversion Tables for SI and Conventional Units

(The units enclosed by thick lines are the SI units.)

	N	dyn	kgf
Force	1	1×10^{5}	$1.019\ 72\times10^{-1}$
	1×10^{-5}	1	$1.019\ 72\times10^{-6}$
	9.806 65	$9.806\ 65\times10^{5}$	1

	Pa·s	cP	P
Viscosity	1	1×10^{3}	1×10
	1×10^{-3}	1	1×10^{-2}
	1×10^{-1}	1×10^{2}	1

Note) 1 P =1 dyn·s/cm^2 =1 g/cm·s
1 Pa·s =1 N·S/m^2,1 cP=1mPa·s

	Pa or N/m^2	MPa or N/mm^2	kgf/mm^2	kgf/cm^2
Stress	1	1×10^{-6}	$1.019\ 72\times10^{-7}$	$1.019\ 72\times10^{-5}$
	1×10^{6}	1	$1.019\ 72\times10^{-1}$	$1.019\ 72\times10$
	$9.806\ 65\times10^{6}$	9.806 65	1	1×10^{2}
	$9.806\ 65\times10^{4}$	$9.806\ 65\times10^{-2}$	1×10^{-2}	1

	m^2/s	cSt	St
Kinematic viscosity	1	1×10^{6}	1×10^{4}
	1×10^{-6}	1	1×10^{-2}
	1×10^{-4}	1×10^{2}	1

Note) 1 St=1cm^2/s, 1 cSt=1mm /S^2

Note) 1 Pa=1 N/m^2, 1Mpa N/mm^2

	Pa	kPa	MPa	bar	kgf/cm^2	atm	mmH_2O	mmHg or Torr
Pressure	1	1×10^{-3}	1×10^{-6}	1×10^{-5}	$1.019\ 72\times10^{-5}$	$9.869\ 23\times10^{-6}$	$1.019\ 72\times10^{-1}$	$7.500\ 62\times10^{-3}$
	1×10^{3}	1	1×10^{-3}	1×10^{-2}	$1.019\ 72\times10^{-2}$	$9.869\ 23\times10^{-3}$	$1.019\ 72\times10^{2}$	$7.500\ 62$
	1×10^{6}	1×10^{3}	1	1×10	$1.019\ 72\times10$	$9.869\ 23$	$1.019\ 72\times10^{5}$	$7.500\ 62\times10^{3}$
	1×10^{5}	1×10^{2}	1×10^{-1}	1	$1.019\ 72$	$9.869\ 23\times10^{-1}$	$1.019\ 72\times10^{4}$	$7.500\ 62\times10^{2}$
	$9.806\ 65\times10^{4}$	$9.806\ 65\times10$	$9.806\ 65\times10^{-2}$	$9.806\ 65\times10^{-1}$	1	$9.678\ 41\times10^{-1}$	1×10^{4}	$7.355\ 59\times10^{2}$
	$1.013\ 25\times10^{5}$	$1.013\ 25\times10^{2}$	$1.013\ 25\times10^{-1}$	$1.013\ 25$	$1.033\ 23$	1	$1.033\ 23\times10^{4}$	$7.600\ 00\times10^{2}$
	$9.806\ 65$	$9.806\ 65\times10^{-3}$	$9.806\ 65\times10^{-6}$	$9.806\ 65\times10^{-5}$	1×10^{-4}	$9.678\ 41\times10^{-5}$	1	$7.355\ 59\times10^{-2}$
	$1.333\ 22\times10^{2}$	$1.333\ 22\times10^{-1}$	$1.333\ 22\times10^{-4}$	$1.333\ 22\times10^{-3}$	$1.359\ 51\times10^{-3}$	$1.315\ 79\times10^{-3}$	$1.359\ 51\times10$	1

Note) 1 Pa=1 N/m^2

	J	kW·h	kgf·m	kcal
Work, Energy, Heat Quantity	1	$2.777\ 78\times10^{-7}$	$1.019\ 72\times10^{-1}$	$2.388\ 89\times10^{-4}$
	$3.600\ \times10^{6}$	1	$3.670\ 98\times10^{5}$	$8.600\ 0\times10^{2}$
	$9.806\ 65$	$2.724\ 07\times10^{-6}$	1	$2.342\ 70\times10^{-3}$
	$4.186\ 05\times10^{3}$	$1.162\ 79\times10^{-3}$	$4.268\ 58\times10^{2}$	1

Note) 1 J=1 W·s, 1 J=1N·m

	W	kgf·m/s	PS	kcal/h
Power, Heat Flow	1	$1.019\ 72\times10^{-1}$	$1.359\ 62\times10^{-3}$	$8.600\ 0\ \times10^{-1}$
	$9.806\ 61$	1	$1.333\ 33\times10^{-2}$	$8.433\ 71$
	$7.355\ \times10^{2}$	$7.5\ \ \times10$	1	$6.325\ 29\times10^{2}$
	$1.162\ 79$	$1.185\ 72\times10^{-1}$	$1.580\ 95\times10^{-3}$	1

Note) 1 W=1 J/s, PS : French horsepower

	W/(m·K)	kcal/(h·m·℃)
Thermal Conductivity	1	$8.600\ 0\times10^{-1}$
	$1.162\ 79$	1

	W/(m^2·K)	kcal/(h·m^2·℃)
Coefficient of Heat Transfer	1	$8.600\ 0\times10^{-1}$
	$1.162\ 79$	1

	J/(kg·K)	kcal/(kg·℃) cal/(g·℃)
Specific Heat	1	$2.388\ 89\times10^{-4}$
	$4.186\ 05\times10^{-3}$	1

HARDENINGS AND HARDNESS TEST METHODS

Heat Treatment for Steel Materials

Name	Vickers hardness (HV)	Quenching depth (mm)	Strain	Applicable material	Typical materials	Remark
Through hardening	Max. 750	Full depth	Varies according to material.	High-C steel C＞0.45%	SKS3 SKS21 SUJ2 SKH51 SKS93 SK4 S45C	・Not applicable for long or precision parts such as spindles, etc.
Carburizing	Max. 750	Standard：0.5 Max. 2	Moderate	Low-C steel C＜0.3%	SCM415 SNCM220	・Hardening parts. ・Hardening depth specified on drawings. ・Applicable for precision parts.
Induction Hardening	Max. 500	1～2	High	Medium-C steel C0.3～0.5%	S45C	・Hardening parts. ・Expensive in small volume. ・Good strain resistance.
Nitriding	900～1000	0.1～0.2	Low	Nitriding steel	SACM645	・Obtains highest hardness of all Hardening techniques. ・Applicable for precision parts. ・Applicable for spindles for radial bearing.
Tufftride	Carbon steel：500 SUS：1000	0.01～0.02	Low	Steel materials	S45C SCM415 SK3 Stainless	・Good fatigue resistance and wear resistance. ・Same corrosion resistance as zinc plating. ・Not applicable for precision parts because of incapability of polishing after the heat treatment. ・Applicable for dry bearings.
Bluing				Wire rod	SWP—B	・Low-temperature annealing. ・Removes internal stress in forming to enhance elasticity.

Hardness Test Methods and Applicable Parts

Test method	Principle	Applicable heat-treated parts	Features	Remark
1.Brinell Hardness	・A（Steel or superhard alloy）ball indenter is used to indent the test surface. Hardness is given as a quotient minus the surface area of the indent, computed from the diameter.	・Annealed parts ・Normalized parts ・Anchored materials	①Applicable to uneven materials and forged products because indent is large. ②Not applicable for small or thin specimens.	JISZ2243
2.Rockwell Hardness	・The standard or test load is applied via a diamond or boll indenter. Hardness is read on a tester.	・Quenched-Tempered parts ・Carburized surfaces ・Nitrided surfaces ・Thin sheets like copper, brass, bronze, etc.	①Hardness value obtained quickly. ②Applicable as intermediate test to actual products. ③Caution is required as there are 30 types.	JISZ2245
3.Shore Hardness	・The specimen is set on a table. A hammer is dropped from a uniform height. Hardness is based on how high the hammer bounces.	・Quenched-Tempered parts ・Nitrided parts ・Large carburized parts, etc.	①Extremely easy to operate. Data can be obtained quickly. ②Applicable for large parts. ③Indent is kept shallow, therefore is applicable to actual products. ④Compact and light-weight. Portable.	JISZ2246
4.Vickers Hardness	・Uses a diamond 136° square pyramid indenter. Hardness value is obtained as the surface area of the indent, computed from the length of the diagonal lines of the indent.	・Thin parts hardened by Induction Hardening, carburizing, nitriding, electrolytic plating, ceramic coating, etc. ・Hardened layer depth in carburized and nitrided parts	①Applicable for small and thin specimens. ②Applicable for all materials because of diamond indenter.	JISZ2244

HARDNESS CONVERSION TABLE

Excerpts from SAE J 417 (1983)

Approximate Conversion of Rockwell C Hardness Values for Steel (1)

(HRC) Rockwell Hardness C scale	(HV) Vickers Hardness	Brinell hardness(HB) Ball：10mm in diameter Load：3,000kgf		Rockwell Hardness (3)			Rockwell Superficial Hardness Diamond Conical Penetrator			(Hs) Shore Hardness	Tensile Strength (Approximate Value) MPa (kgf/mm²) (2)	Rockwell Hardness C scale (3)
		Standard Ball	Tungsten Carbide Ball	(HRA) A scale Load：60kgf Diamond Conical penetrator	(HRB) B scale Load：100kgf Ball of 1.6mm (1/16in) dia.	(HRD) D scale Load：100kgf Diamond Conical Penetrator	15—N Scale Load：15kgf	30—N Scale Load：30kgf	45—N Scale Load：45kgf			
68	940	—	—	85.6	—	76.9	93.2	84.4	75.4	97	—	68
67	900	—	—	85.0	—	76.1	92.9	83.6	74.2	95	—	67
66	865	—	—	84.5	—	75.4	92.5	82.8	73.3	92	—	66
65	832	—	(739)	83.9	—	74.5	92.2	81.9	72.0	91	—	65
64	800	—	(722)	83.4	—	73.8	91.8	81.1	71.0	88	—	64
63	772	—	(705)	82.8	—	73.0	91.4	80.1	69.9	87	—	63
62	746	—	(688)	82.3	—	72.2	91.1	79.3	68.8	85	—	62
61	720	—	(670)	81.8	—	71.5	90.7	78.4	67.7	83	—	61
60	697	—	(654)	81.2	—	70.7	90.2	77.5	66.6	81	—	60
59	674	—	(634)	80.7	—	69.9	89.8	76.6	65.5	80	—	59
58	653	—	615	80.1	—	69.2	89.3	75.7	64.3	78	—	58
57	633	—	595	79.6	—	68.5	88.9	74.8	63.2	76	—	57
56	613	—	577	79.0	—	67.7	88.3	73.9	62.0	75	—	56
55	595	—	560	78.5	—	66.9	87.9	73.0	60.9	74	2075 (212)	55
54	577	—	543	78.0	—	66.1	87.4	72.0	59.8	72	2015 (205)	54
53	560	—	525	77.4	—	65.4	86.9	71.2	58.6	71	1950 (199)	53
52	544	(500)	512	76.8	—	64.6	86.4	70.2	57.4	69	1880 (192)	52
51	528	(487)	496	76.3	—	63.8	85.9	69.4	56.1	68	1820 (186)	51
50	513	(475)	481	75.9	—	63.1	85.5	68.5	55.0	67	1760 (179)	50
49	498	(464)	469	75.2	—	62.1	85.0	67.6	53.8	66	1695 (173)	49
48	484	451	455	74.7	—	61.4	84.5	66.7	52.5	64	1635 (167)	48
47	471	442	443	74.1	—	60.8	83.9	65.8	51.4	63	1580 (161)	47
46	458	432	432	73.6	—	60.0	83.5	64.8	50.3	62	1530 (156)	46
45	446	421	421	73.1	—	59.2	83.0	64.0	49.0	60	1480 (151)	45
44	434	409	409	72.5	—	58.5	82.5	63.1	47.8	58	1435 (146)	44
43	423	400	400	72.0	—	57.7	82.0	62.2	46.7	57	1385 (141)	43
42	412	390	390	71.5	—	56.9	81.5	61.3	45.5	56	1340 (136)	42
41	402	381	381	70.9	—	56.2	80.9	60.4	44.3	55	1295 (132)	41
40	392	371	371	70.4	—	55.4	80.4	59.5	43.1	54	1250 (127)	40
39	382	362	362	69.9	—	54.6	79.9	58.6	41.9	52	1215 (124)	39
38	372	353	353	69.4	—	53.8	79.4	57.7	40.8	51	1180 (120)	38
37	363	344	344	68.9	—	53.1	78.8	56.8	39.6	50	1160 (118)	37
36	354	336	336	68.4	(109.0)	52.3	78.3	55.9	38.4	49	1115 (114)	36
35	345	327	327	67.9	(108.5)	51.5	77.7	55.0	37.2	48	1080 (110)	35
34	336	319	319	67.4	(108.0)	50.8	77.2	54.2	36.1	47	1055 (108)	34
33	327	311	311	66.8	(107.5)	50.0	76.6	53.3	34.9	46	1025 (105)	33
32	318	301	301	66.3	(107.0)	49.2	76.1	52.1	33.7	44	1000 (102)	32
31	310	294	294	65.8	(106.0)	48.4	75.6	51.3	32.5	43	980 (100)	31
30	302	286	286	65.3	(105.5)	47.7	75.0	50.4	31.3	42	950 (97)	30
29	294	279	279	64.7	(104.5)	47.0	74.5	49.5	30.1	41	930 (95)	29
28	286	271	271	64.3	(104.0)	46.1	73.9	48.6	28.9	41	910 (93)	28
27	279	264	264	63.8	(103.0)	45.2	73.3	47.7	27.8	40	880 (90)	27
26	272	258	258	63.3	(102.5)	44.6	72.8	46.8	26.7	38	860 (88)	26
25	266	253	253	62.8	(101.5)	43.8	72.2	45.9	25.5	38	840 (86)	25
24	260	247	247	62.4	(101.0)	43.1	71.6	45.0	24.3	37	825 (84)	24
23	254	243	243	62.0	100.0	42.1	71.0	44.0	23.1	36	805 (82)	23
22	248	237	237	61.5	99.0	41.6	70.5	43.2	22.0	35	785 (80)	22
21	243	231	231	61.0	98.5	40.9	69.9	42.3	20.7	35	770 (79)	21
20	238	226	226	60.5	97.8	40.1	69.4	41.5	19.6	34	760 (77)	20
(18)	230	219	219	—	96.7	—	—	—	—	33	730 (75)	(18)
(16)	222	212	212	—	95.5	—	—	—	—	32	705 (72)	(16)
(14)	213	203	203	—	93.9	—	—	—	—	31	675 (69)	(14)
(12)	204	194	194	—	92.3	—	—	—	—	29	650 (66)	(12)
(10)	196	187	187	—	90.7	—	—	—	—	28	620 (63)	(10)
(8)	188	179	179	—	89.5	—	—	—	—	27	600 (61)	(8)
(6)	180	171	171	—	87.1	—	—	—	—	26	580 (59)	(6)
(4)	173	165	165	—	85.5	—	—	—	—	25	550 (56)	(4)
(2)	166	158	158	—	83.5	—	—	—	—	24	530 (54)	(2)
(0)	160	152	152	—	81.7	—	—	—	—	24	515 (53)	(0)

Notes (1) Blue Figures: Based on ASTM E 140, Table 1（Jointly coordinated by SAE, ASM and ASTM.）
(2) The units and figures shown in brackets are the results of conversion from psi figures by reference to JIS Z 8413 and Z8438 conversion tables. 1MPa=1N/mm².
(3) The figures in brackets are in ranges not frequently used. They are given as reference data.

SURFACE ROUGHNESS

Excerpts from JIS B 0601(1994)and JIS B 0031(1994)

Varieties of Surface Roughness Indicators

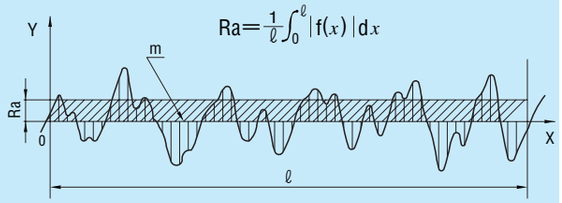
Definitions and presentations of arithmetic average roughness (Ra), maximum height (Ry), 10-spot average roughness (Rz), average concave-to-convex distance (Sm), average distance between local peaks (S) and load length rate (tp) are given as parameters indicating the surface roughness of an industrial product. Surface roughness is the arithmetic average of values at randomly extracted spots on the surface of an object. 〔Center-line average roughness (Ra_{75}) is defined in the supplements to JIS B 0031 and JIS B 0601.〕

Typical Calculations of Surface Roughness

Arithmetical Average Roughness, (Ra)

A portion stretching over a reference length in the direction in which the average line extends is cut out from the roughness curve. This portion is presented in a new graph with the X axis extending in the same direction as the average line and the Y axis representing the magnitude. Ra is represented by the equation shown at right, in microns (μm).

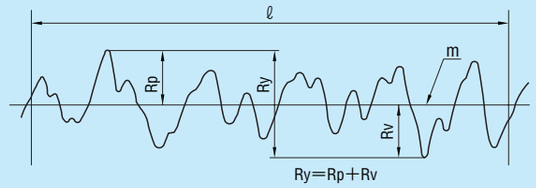
$$Ra=\frac{1}{\ell}\int_0^{\ell}|f(x)|\,dx$$



Maximum Height, (Ry)

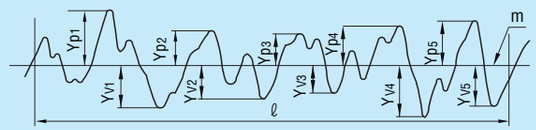
A portion stretching over a reverence length in the direction in which the average line extends is cut out from the roughness curve. The gap between the peak line and the trough line is measured in the direction in which the magnitude axis extends, in microns (μm).

Remarks : A portion without an abnormally high peak or abnormally low trough, which may be regarded as a flaw, is cut out over the reference length.



Ten-Spot Average Roughness, (Rz)

A portion stretching over a reference length in the direction in which the average line extends is cut out from the roughness curve. The average of the levels (Yp) of the highest peak of the fifth highest peak as measured from the average line and the average of the levels (Yv) of the lower trough to the fifth lowest trough similarly measured in the said portion are added together. Rz is this sum, in microns (μm).



$$Rz=\frac{|Yp_1+Yp_2+Yp_3+Yp_4+Yp_5|+|Yv_1+Yv_2+Yv_3+Yv_4+Yv_5|}{5}$$

$Yp_1, Yp_2, Yp_3, Yp_4, Yp_5$: Levels of the highest peak to the fifth highest peak in the said portion with the length ℓ.

$Yv_1, Yv_2, Yv_3, Yv_4, Yv_5$: Levels of the lowest trough to the fifth highest trough in the said portion with the length ℓ.

Reference : Relation between Arithmetic Average Roughness (Ra) and Conventional Parameters

Arithmetic Average Roughness Ra			Max. height Ry	Ten-Spot Average Roughness Rz	Reference Ry / Rz Length	Conventional Finish Symbol
Standard Series	Cut-off value λc(mm)	Graphic Representation of Surface Texture	Standard Series		ℓ (mm)	
0.012 a	0.08	0.012 ~ 0.2	0.05 s	0.05 z	0.08	
0.025 a	0.25		0.1 s	0.1 z		
0.05 a			0.2 s	0.2 z	0.25	
0.1 a			0.4 s	0.4 z		
0.2 a			0.8 s	0.8 z		
0.4 a	0.8	0.4 ~ 1.6	1.6 s	1.6 z	0.8	
0.8 a			3.2 s	3.2 z		
1.6 a			6.3 s	6.3 z		
3.2 a	0.25	3.2 ~ 6.3	12.5 s	12.5 z	0.25	
6.3 a			25 s	25 z		
12.5 a	8	12.5 ~ 25	50 s	50 z	8	
25 a			100 s	100 z		
50 a	—	50 ~ 100	200 s	200 z	—	~
100 a			400 s	400 z		

※Interrelations among the three varieties shown here are not precise, and are presented for convenience only.
※Ra : The evaluated values of Ry and Rz are the cut-off values and the reference length each multiplied by five, respectively.

DRAWING INDICATION OF SURFACE TEXTURE

Excerpts from JIS Z B 0031(1994)

Position of Auxiliary Symbols for Surface Symbol

A surface roughness value, cut-off value or reference length, processing method, grain direction, surface undulation, etc. are indicated around the surface symbol as shown in Fig.7 below.

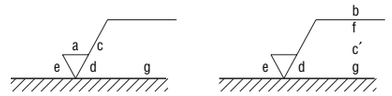


Fig. 7 Positions of Auxiliary Symbols

a : Ra Value
b : Machining Method
c : Cutoff Value. Evaluation Length
c′ : Reference Length. Evaluation Length
d : Grain Direction
f : Parameter other than Ra (tp : Parameter / Cutoff Level)
g : Surface Undulation (according to JIS B 0610)

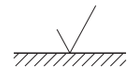
Remark : These symbols except a and f are provided when they are needed.

Remark : Under ISO 1302, a finish allowance should be indicated as e in Fig.7.

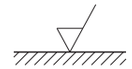
Symbol	Meaning	Illustration
=	The trace left by a cutting instrument is parallel to the projection plane in the drawing. (ex) Shaped Surface	Trace Left by a Cutting Instrument
⊥	The trace left by a cutting instrument is perpendicular to the projection plane in the drawing. (ex) Shaped Surface (SideView), Circular Cut, Cylindrical Cut.	Trace Left by a Cutting Instrument
X	The pattern left by a cutting instrument diagonally crosses the projection plane in the drawing (ex) Honed Surface	Trace Left by a Cutting Instrument
M	The patter left by a cutting instrument crosses in various directions or has no grain direction. (ex) Lapped Surface, Superfinished Surface and Surface Finished with a Front Mill or End Mill.	
C	The pattern left by a cutting instrument is virtually concentric around the center of the plane in the drawing. (ex) Faced Surface	
R	The pattern left by a cutting instrument is virtually radial around the center of the plane in the drawing.	

■Examples

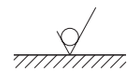
Surface Symbol



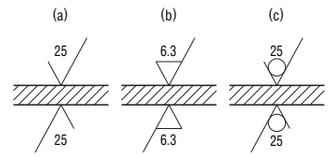
Removal process by Machining is Required



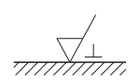
Removal process is Prohibited



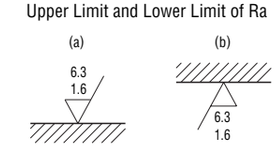
Upper Limits of Ra



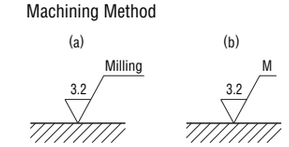
Grain Direction



Upper Limit and Lower Limit of Ra



Machining Method



〔TECHNICAL DATA〕

SURFACE ROUGHNESS BY DIFFERENT METHODS

Arithmetical average roughness Ra		0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50	100
Former designations of surface roughness	Max. height Rmax.	0.1 —S	0.2 —S	0.4 —S	0.8 —S	1.6 —S	3.2 —S	6.3 —S	12.5 —S	25 —S	50 —S	100 —S	200 —S	400 —S
	Standard values of standard length (mm)	0.25				0.8			2.5		8		25	
	Triangular indication	▽▽▽▽				▽▽▽			▽▽		▽		—	
Methods	Forging								Precision					
	Casting								Precision					
	Die casting													
	Hot rolling													
	Cold rolling													
	Drawing													
	Extruding													
	Tumbling													
	Sandblasting													
	Rolling													
	Face cutter grinding						Precision							
	Planing													
	Carving(Slotting)													
	Cutter grinding						Precision							
	Precision boring													
	Filing						Precision							
	Round grinding			Precision			Fine		Medium			Rough		
	Boring						Precision							
	Drilling													
	Reaming					Precision								
	Broach grinding					Precision								
	Shaving													
	Grinding			Precision	Fine		Medium			Rough				
	Hone finishing			Precision										
	Super finishing	Precision												
	Buffing			Precision										
	Paper finishing			Precision										
	Lapping	Precision												
	Liquid honing			Precision										
	Burnishing													
	Surface rolling													
	Electric discharge carving													
	Wire cut electric sparking													
	Chemical polishing						Precision							
	Electrolytic abrasion		Precision											

〔TECHNICAL DATA〕

INDICATIONS OF GEOMETRICAL TOLERANCE ON DRAWINGS

Excerpts from JIS B 0021(1984)

■Kinds and symbols of geometrical tolerances

Kind of tolerance		Symbol	Definition of tolerance zone	Examples of diagrammatical indication and its interpretation
Form tolerance	Straightness tolerance	—	Where symbol ϕ is attached before the numerical value indicating a tolerance zone, this tolerance zone is a zone in a cylinder of diameter t.	ϕ0.08 — Where a tolerance frame is connected to the dimension showing the diameter of a cylinder, the axis of the cylinder shall be contained a cylinder of 0.08mm diameter.
	Flatness tolerance	▱	The tolerance zone is a zone held between two parallel planes a distance t apart.	0.08 — This surface shall be contained between two parallel planes 0.08mm apart.
	Circularity tolerance	○	The tolerance zone in the considered plane is a zone between two concentric circles a distance t apart.	0.1 — The circumference in any section normal to the axis shall be contained between two concentric circles 0.1mm apart on the same plane.
	Cylindricity tolerance	⌭	The tolerance zone is a zone contained between two coaxial cylinder surfaces a distance t apart.	0.1 — The considered surface shall be contained between two coaxial cylinder surfaces 0.1mm apart.
	Profile tolerance of line	⌒	The tolerance zone is a zone held between two lines enveloping circles of diameter t, the centers of which are situated on a theoretically exact profile line.	0.04 — In any cross-section parallel to the projection plane the considered profile shall be contained between two lines enveloping circles of 0.04mm in diameter, the centers of which are situated on a surface having the theoretically exact profile.
	Profile tolerance of surface	⌓	The tolerance zone is a zone held between the two surfaces enveloping the spheres of diameter t, the centers of which are situated on a theoretically exact profile surface.	Sϕt — 0.02 — The considered surface shall be contained between two surfaces enveloping the spheres of diameter 0.02mm, the centers of which are situated on a surface having the theoretically exact profile.
Orientation tolerance	Parallelism tolerance	//	The tolerance zone is a zone held between two parallel planes parallel to the datum plane and a distance t apart from each other.	0.01 A — The surface shown by the arrow of the leader line shall be contained between two planes parallel to the datum plane A and 0.01mm apart from each other in the direction of the arrow of the leader line.
	Perpendicularity tolerance	⊥	Where symbol ϕ is attached before the numerical value indicating the tolerance, the tolerance zone is a zone within a cylinder of diameter t perpendicular to the datum plane.	ϕ0.01 A — The axis of the cylinder shown by the arrow of the leader line shall be contained within a cylinder of diameter 0.01mm perpendicular to the datum plane A.
	Angularity tolerance	∠	The tolerance zone is a zone held between two parallel planes inclined at the specified angle to the datum plane and a distance t apart from each other.	0.08 A, 40° — The surface shown by the arrow of the leader line shall be contained between two parallel planes which are inclined at 40° with theoretical exactness to the datum plane A and which are 0.08mm apart from each other in the direction of the arrow of the leader line.
Location tolerance	Positional tolerance	⌖	The tolerance zone is a zone within a circle or sphere of diameter t having its center at the theoretically exact location, hereinafter referred to as the ""true location"".	True location — B, ϕ0.03 AB, 60, 100 — The point shown by the arrow of the leader line shall be contained within a circle of 0.03mm diameter having its center at the true location 60mm and 100mm apart, respectively, from the datum straight line A and from the datum straight line B.
	Coaxiality tolerance or concentricity tolerance	◎	Where symbol ϕ is attached before the numerical value indicating the tolerance, the tolerance zone is a zone within a cylinder of diameter t whose axis agrees with the datum axial straight line.	ϕ0.01 A — The axis shown by the arrow of the leader line shall be contained within a cylinder of 0.01mm diameter whose axis agrees with the datum axial straight line A.
	Symmetry tolerance	⌯	The tolerance zone is a zone held between two parallel planes a distance t apart from each other and arranged symmetrically about the datum median plane.	0.08 A — The median surface shown by the arrow of the leader line shall be contained between two parallel planes 0.08mm apart form each other and arranged symmetrically about the datum median plane A.
Run-out tolerance	Circular run-out tolerance	↗	The tolerance is a zone between two concentric circles whose centers agree with the datum axial straight line on any measuring plane normal to the datum axial straight line and which are a distance t apart from each other in the radial direction.	Measuring plane, Tolerance surface — 0.1 A–B — The run-out in the radial direction of the cylinder surface shown by the arrow of the leader line shall not exceed 0.1mm on any measuring plane normal to the datum axial straight line when the cylinder is rotated by one rotation about the datum axial straight line A—B.
	Total run-out tolerance	⌰	The tolerance zone is a zone between two coaxial cylinders having axes agreeing with the datum axial straight line and a distance t apart from each other in the radial direction.	0.1 A–B — The total radial run-out of the cylinder surface shown by the arrow of the leader line shall not exceed 0.1mm at any point on the cylinder surface when the cylinder part is rotated about the datum axial straight line A—B with a relative movement in the axial direction.

Lines used in the drawings in the column of ""definition of tolerance zone"" indicate the following meanings：

Thick solid line or broken line：Feature
Thick alternate long and short dash line：Datum
Thin solid line or broken line：Tolerance zone
Thin alternate long and short dash line：Center line
Thin alternate long and two short dashes line：Supplementary projection plane or sectional plane.
Thick alternate long and two short dashes line：Projection of a feature to supplementary Projection plane or sectional plane

			H6	H7	H8	H9	Applicable part	Functional classification		Application example
Can be moved relatively	Clearance fit	Loose Fit				c9	Part which accommodates a wide gap or moving part which needs a gap. Part which accommodates a wide gap to facilitate assembling. Part which needs an appropriate gap even at high temperature.	Part whose structure needs a gap. { Inflates. Large position error / Long } Cost needs to be reduced. { Manufacturing cost / Maintenance cost }		Piston ring and piston ring groove Fitting by means of a loose set pin
		Light Roll Fit			d9	d9	Part which accommodates or needs a gap.			Crank Web and Pin Bearing (Side) Exhaust Valve Box and the Sliding Part of a Spring Bearing Piston Ring and the Ring Groove
				e7	e8	e9	Part which accommodates a wide gap or needs a gap. Fairly wide gap, well greased bearing. Bearing subjected to a high temperature, high speed and heavy load (high-degree forced lubrication).	Regular Rotary or Sliding Part (Must be well greased)		Fitting of the Exhaust Valve Box Main Bearing for the Crankshaft Regular Sliding Part Stripper bolt MSB (e9)
		Roll Fit	f6	f7	f7 f8		Fitting so as to provide an appropriate gap to permit movement (high-quality fitting). Regular normal-temperature bearing lubricated with grease or oil.	Regular Fitting (Often comes apart)		Part in which a cooled Exhaust Valve Box is inserted. Regular Shaft and Bush Guide lifter pin (g6) Link Device Lever and Bush
		Fine Roll Fit	g5	g6			Continuously rotating part of a precision machine under a light load. Fitting with a narrow gap so as to permit movement (spigot and positioning). Precision sliding part.	Part required making a precision motion with virtually no play.		Link Device Pin and Lever Key and its Groove Precision Control Valve Rod
Cannot be moved relatively	Transition fit	Sliding Fit	h5	h6	h7 h8	h9	Fitting so as to permit movement by hand, with a lubricant applied. (high-quality positioning). Special High-Precision Sliding Part. Unimportant Stationary Part.	Can be disassembled / re-assembled without damaging component parts.	Force cannot be transmitted by the fitting force alone.	Fitting a rim and boss together Dowel pin MSTH (h7) Fitting the gear of a precision gear device
		Push Fit	h5 h6	js6			Fitting which accommodates a light gap. Precision fitting which locks both parts while the unit is used. Fitting which allow assembling and disassembling with a wooden or lead hammer.			Fitting Coupling Flanges Together Governor Path and Pin Fitting a Gear Rim and a Boss Together
		Driving Fit	js5	k6			Fitting. Which requires an iron hammer or hand press for assembling / disassembling (a key or the like is necessary to prevent inter-part shaft rotation). Precision positioning.			Fixing the Shaft of a Gear Pump and a Casing together Reamer Bolt
			k5	m6			Requires an iron hammer or hand press for assembling / disassembling. Precision positioning which allows no gap.			Reamer Bolt Dowel pin MSTM (m6) Fixing the piston of hydraulic equipment and a shaft together Fitting a Coupling Flange and a Shaft Together
		Light Press Fit	m5	n6			Fitting which requires considerable force for assembling / disassembling. Precision stationary fitting (a key or the like is necessary for high-torque transmission purposes).		Slight force can be transmitted by the fitting force alone.	Flexible-Axis Coupling and Gear (Passive Side) Precision Fitting Punch SPAS, etc. (m5) Insertion of a Suction Valve and Valve Guide Die MHD, etc. (m5)
	Interference Fit	Press Fit	n5 n6	p6			Fitting which requires much force for assembling / disassembling (a key or the like is necessary for high-torque transmission). Light press fitting or the like is necessary for non-ferrous component parts. Standard press fitting is required for iron component part and a bronze part and a copper part.	Hard to disassemble without damaging component parts.		Insertion of a Suction Valve and Valve Guide Straight die MSD, etc. (n6) Fixing a Gear and a Shaft Together (Low Torque) Shaft of a Flexible Coupling and a Gear (Drive Side).
			p5	r6			Fitting which require much force for assembling / disassembling. Shrinkage press fitting, cold press fitting or forced press fitting is required for large component parts.			Coupling and Shaft
		Strong Press Fit・Shrinkage Fit・Freeze Fit	r5	s6 t6 u6 x6			Firmly coupled together and require shrinkage press fitting, cold press fitting or forced press fitting. Permanent assembly, which can not come apart. Press fitting or the like is required for light alloy members.		Considerable force can be transmitted by the fitting force alone.	Attaching and Fixing a Bearing Bush Insertion of a Suction Valve and Valve Guide Dowel pin MST (p6) Fixing a Coupling Flange and Shaft Together (High-Torque) Fixing the Rim of a Drive Gear and a Boss Together Attaching and Fixing a Bearing Bush

The items printed in red in the Application example are press die parts presented in this catalog.

1.1 Fitting, with Regularly Used Hole Adopted as Reference

Reference hole	Class of Tolerance Range for Shafts																
	Clearance fit							Transition fit			Interference Fit						
H6						g5	h5	js5	k5	m5							
					f6	g6	h6	js6	k6	m6	n6 *	p6 *					
H7					f6	g6	h6	js6	k6	m6	n6	p6 *	r6 *	s6	t6	u6	x6
				e7	f7		h7	js7									
H8					f7		h7										
				e8	f8		h8										
H9			d9	e9													
			d8	e8			h8										
		c9	d9	e9			h9										
H10	b9	c9	d9														

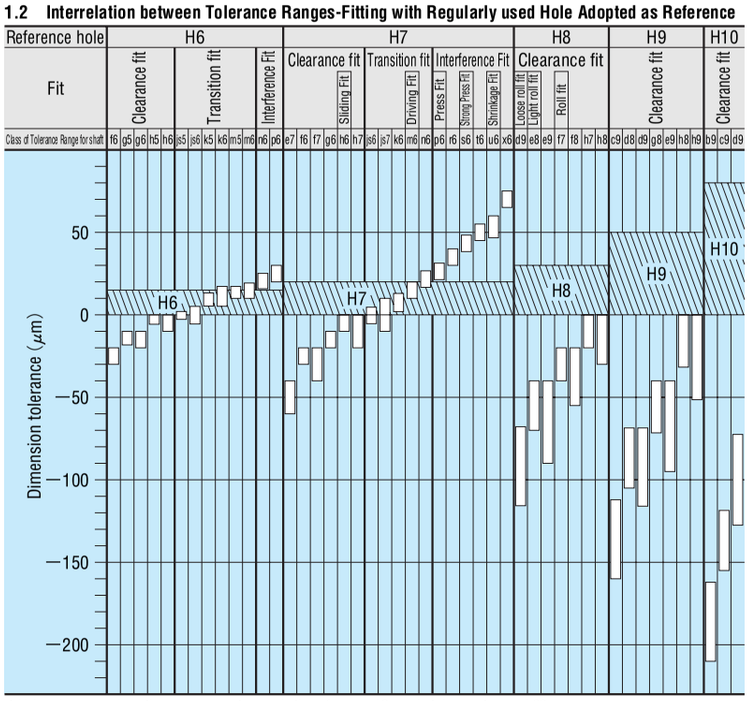
Note : An exception may arise according to the dimensional sectioning scheme.

2.1 Fitting, with Regularly Used Shaft Adopted as Reference

Reference shaft	Class of Tolerance Range for Shafts																
	Clearance fit							Transition fit			Interference Fit						
h5							H6	JS6	K6	M6	N6 *	P6					
h6					F6	G6	H6	JS6	K6	M6	N6	P6 *					
					F7	G7	H7	JS7	K7	M7	N7	P7 *	R7	S7	T7	U7	X7
h7				E7	F7		H7										
					F8		H8										
h8			D8	E8	F8		H8										
			D9	E9			H9										
h9			D8	E8			H8										
		C9	D9	E9			H9										
	B10	C10	D10														

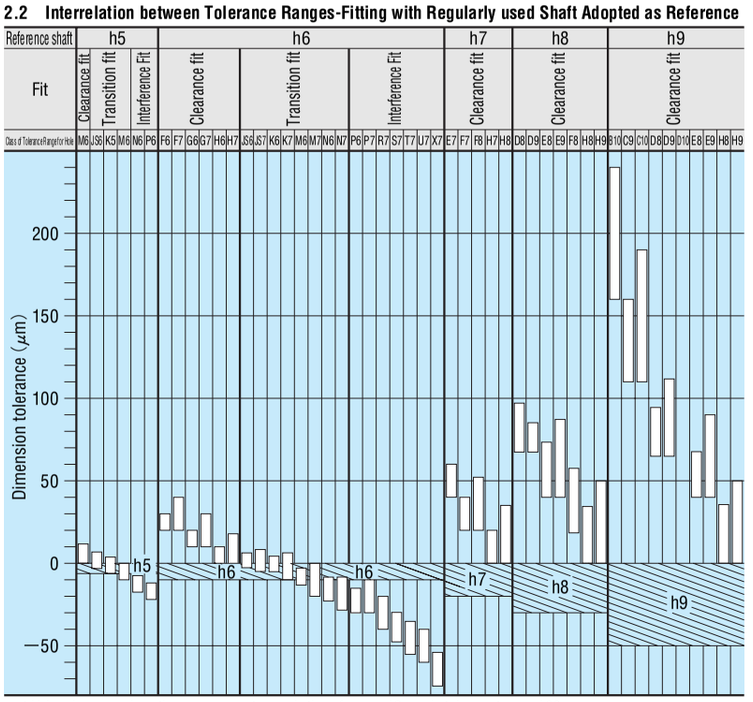
Note : An exception may arise according to the dimensional sectioning scheme.

1.2 Interrelation between Tolerance Ranges-Fitting with Regularly used Hole Adopted as Reference



* Values in cases where the measurement exceeds the reference, 18mm, but does not exceed 30mm.

2.2 Interrelation between Tolerance Ranges-Fitting with Regularly used Shaft Adopted as Reference



* Values in cases where the measurement exceeds the reference, 18mm, but does not exceed 30mm.

Dimensional Tolerances of Hole, Regularly Used Fitting

Unit : μm

Basic size (mm) Over	or less	Class of Tolerance Range of hole																																
		B10	C9	C10	D8	D9	D10	E7	E8	E9	F6	F7	F8	G6	G7	H6	H7	H8	H9	H10	JS6	JS7	K6	K7	M6	M7	N6	N7	P6	P7	R7	S7	T7	U7	X7
–	3	+180 +140	+85 +60	+100 +60	+34 +20	+45 +20	+60 +20	+24 +14	+28 +14	+39 +14	+12 +6	+16 +6	+20 +6	+8 +2	+12 +2	+6 0	+10 0	+14 0	+25 0	+40 0	±3	±5	0 −6	0 −10	−2 −8	−2 −12	−4 −10	−4 −14	−6 −12	−6 −16	−10 −20	−14 −24	–	−18 −28	−20 −30
3	6	+188 +140	+100 +70	+118 +70	+48 +30	+60 +30	+78 +30	+32 +20	+38 +20	+50 +20	+18 +10	+22 +10	+28 +10	+12 +4	+16 +4	+8 0	+12 0	+18 0	+30 0	+48 0	±4	±6	+2 −6	+3 −9	−1 −9	0 −12	−5 −13	−4 −16	−9 −17	−8 −20	−11 −23	−15 −27	–	−19 −31	−24 −36
6	10	+208 +150	+116 +80	+138 +80	+62 +40	+76 +40	+98 +40	+40 +25	+47 +25	+61 +25	+22 +13	+28 +13	+35 +13	+14 +5	+20 +5	+9 0	+15 0	+22 0	+36 0	+58 0	±4.5	±7	+2 −7	+5 −10	−3 −12	0 −15	−7 −16	−4 −19	−12 −21	−9 −24	−13 −28	−17 −32	–	−22 −37	−28 −43
10	14	+220 +150	+138 +95	+165 +95	+77 +50	+93 +50	+120 +50	+50 +32	+59 +32	+75 +32	+27 +16	+34 +16	+43 +16	+17 +6	+24 +6	+11 0	+18 0	+27 0	+43 0	+70 0	±5.5	±9	+2 −9	+6 −12	−4 −15	0 −18	−9 −20	−5 −23	−15 −26	−11 −29	−16 −34	−21 −39	–	−26 −44	−33 −51 −38 −56
18	24	+244 +160	+162 +110	+194 +110	+98 +65	+117 +65	+149 +65	+61 +40	+73 +40	+92 +40	+33 +20	+41 +20	+53 +20	+20 +7	+28 +7	+13 0	+21 0	+33 0	+52 0	+84 0	±6.5	±10	+2 −11	+6 −15	−4 −17	0 −21	−11 −24	−7 −28	−18 −31	−14 −35	−20 −41	−27 −48	– −33 −54	−33 −54 −40 −61	−46 −67 −56 −77
30	40	+270 +170	+182 +120	+220 +120	+119	+142	+180	+75	+89	+112	+41	+50	+64	+25	+34	+16	+25	+39	+62	+100	±8	±12	+3 −13	+7 −18	−4 −20	0 −25	−12 −28	−8 −33	−21 −37	−17 −42	−25 −50	−34 −59	−39 −64 −45 −70	−51 −76 −61 −86	–
50	65	+310 +190	+214 +140	+260 +140	+146	+174	+220	+90	+106	+134	+49	+60	+76	+29	+40	+19	+30	+46	+74	+120	±9.5	±15	+4 −15	+9 −21	−5 −24	0 −30	−14 −33	−9 −39	−26 −45	−21 −51	−30 −60 −32	−42 −72 −48	−55 −85 −64	−76 −106 −91	–
65	80	+320 +200	+224 +150	+270 +150	+100	+100	+100	+60	+60	+60	+30	+30	+30	+10	+10	0	0	0	0	0													−62	−78	−94	−121	
80	100	+360 +220	+257 +170	+310 +170	+174	+207	+260	+107	+126	+159	+58	+71	+90	+34	+47	+22	+35	+54	+87	+140	±11	±17	+4 −18	+10 −25	−6 −28	0 −35	−16 −38	−10 −45	−30 −52	−24 −59	−38 −73 −41	−58 −93 −66	−78 −113 −91	−111 −146 −131	–
100	120	+380 +240	+267 +180	+320 +180	+120	+120	+120	+72	+72	+72	+36	+36	+36	+12	+12	0	0	0	0	0													−76	−101	−126	−166	
120	140	+420 +260	+300 +200	+360 +200																											−48 −88	−77 −117	−107 −147		
140	160	+440 +280	+310 +210	+370 +210	+208 +145	+245 +145	+305 +145	+125 +85	+148 +85	+185 +85	+68 +43	+83 +43	+106 +43	+39 +14	+54 +14	+25 0	+40 0	+63 0	+100 0	+160 0	±12.5	±20	+4 −21	+12 −28	−8 −33	0 −40	−20 −45	−12 −52	−36 −61	−28 −68	−50 −90	−85 −125	−119 −159	–	–
160	180	+470 +310	+330 +230	+390 +230																											−53 −93	−93 −133	−131 −171		
180	200	+525 +340	+355 +240	+425 +240																											−60 −106	−105 −151			
200	225	+565 +380	+375 +260	+445 +260	+242 +170	+285 +170	+355 +170	+146 +100	+172 +100	+215 +100	+79 +50	+96 +50	+122 +50	+44 +15	+61 +15	+29 0	+46 0	+72 0	+115 0	+185 0	±14.5	±23	+5 −24	+13 −33	−8 −37	0 −46	−22 −51	−14 −60	−41 −70	−33 −79	−63 −109	−113 −159	–	–	–
225	250	+605 +420	+395 +280	+465 +280																											−67 −113	−123 −169			
250	280	+690 +480	+430 +300	+510 +300	+271	+320	+400	+162	+191	+240	+88	+108	+137	+49	+69	+32	+52	+81	+130	+210	±16	±26	+5 −27	+16 −36	−9 −41	0 −52	−25 −57	−14 −66	−47 −79	−36 −88	−74 −126	–	–	–	–
280	315	+750 +540	+460 +330	+540 +330	+190	+190	+190	+110	+110	+110	+56	+56	+56	+17	+17	0	0	0	0	0											−78 −130				
315	355	+830 +600	+500 +360	+590 +360	+299	+350	+440	+182	+214	+265	+98	+119	+151	+54	+75	+36	+57	+89	+140	+230	±18	±28	+7 −29	+17 −40	−10 −46	0 −57	−26 −62	−16 −73	−51 −87	−41 −98	−87 −144	–	–	–	–
355	400	+910 +680	+540 +400	+630 +400	+210	+210	+210	+125	+125	+125	+62	+62	+62	+18	+18	0	0	0	0	0											−93 −150				
400	450	+1010 +760	+595 +440	+690 +440	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63	+97	+155	+250	±20	±31	+8 −32	+18 −45	−10 −50	0 −63	−27 −67	−17 −80	−55 −95	−45 −108	−103 −166	–	–	–	–
450	500	+1090 +840	+635 +480	+730 +480	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0	0	0	0											−109 −172				

Note : In each column, the upper value is the upper dimensional tolerance, and the lower figure is the lower dimensional tolerances.

Dimensional Tolerances of Shaft, Regularly Used Fitting

Unit : μm

Basic size (mm) Over	or less	Class of Tolerance Range of shaft																																
		b9	c9	d8	d9	e7	e8	e9	f6	f7	f8	g5	g6	h4 *	h5	h6	h7	h8	h9	js5	js6	js7	k5	k6	m5	m6	n5 *	n6	p6	r6	s6	t6	u6	x6
–	3	−140 −165	−60 −85	−20 −34	−20 −45	−14 −24	−14 −28	−14 −39	−6 −12	−6 −16	−6 −20	−2 −6	−2 −8	0 −3	0 −4	0 −6	0 −10	0 −14	0 −25	±2	±3	±5	+4 0	+6 0	+6 +2	+8 +2	+8 +4	+10 +4	+12 +6	+16 +10	+20 +14	–	+24 +18	+26 +20
3	6	−140 −170	−70 −100	−30 −48	−30 −60	−20 −32	−20 −38	−20 −50	−10 −18	−10 −22	−10 −28	−4 −9	−4 −12	0 −4	0 −5	0 −8	0 −12	0 −18	0 −30	±2.5	±4	±6	+6 +1	+9 +1	+9 +4	+12 +4	+13 +8	+16 +8	+20 +12	+23 +15	+27 +19	–	+31 +23	+36 +28
6	10	−150 −186	−80 −116	−40 −62	−40 −76	−25 −40	−25 −47	−25 −61	−13 −22	−13 −28	−13 −35	−5 −11	−5 −14	0 −4	0 −6	0 −9	0 −15	0 −22	0 −36	±3	±4.5	±7	+7 +1	+10 +1	+12 +6	+15 +6	+16 +10	+19 +10	+24 +15	+28 +19	+32 +23	–	+37 +28	+43 +34
10	14	−150 −193	−95 −138	−50 −77	−50 −93	−32 −50	−32 −59	−32 −75	−16 −27	−16 −34	−16 −43	−6 −14	−6 −17	0 −5	0 −8	0 −11	0 −18	0 −27	0 −43	±4	±5.5	±9	+9 +1	+12 +1	+15 +7	+18 +7	+20 +12	+23 +12	+29 +18	+34 +23	+39 +28	–	+44 +33	+51 +40 +56 +45
18	24	−160 −212	−110 −162	−65 −98	−65 −117	−40 −61	−40 −73	−40 −92	−20 −33	−20 −41	−20 −53	−7 −16	−7 −20	0 −6	0 −9	0 −13	0 −21	0 −33	0 −52	±4.5	±6.5	±10	+11 +2	+15 +2	+17 +8	+21 +8	+24 +15	+28 +15	+35 +22	+41 +28	+48 +35	– +54 +41	+54 +41 +61 +48	+67 +54 +77 +64
30	40	−170 −232	−120 −182	−80	−80	−50	−50	−50	−25	−25	−25	−9	−9	0	0	0	0	0	0	±5.5	±8	±12	+13 +2	+18 +2	+20 +9	+25 +9	+28 +17	+33 +17	+42 +26	+50 +34	+59 +43	+64 +48 +70 +54	+76 +60 +86 +70	–
40	50	−180 −242	−130 −192	−119	−142	−75	−89	−112	−41	−50	−64	−20	−25	−7	−11	−16	−25	−39	−62															
50	65	−190 −264	−140 −214	−100	−100	−60	−60	−60	−30	−30	−30	−10	−10	0 −8	0 −13	0 −19	0 −30	0 −46	0 −74	±6.5	±9.5	±15	+15 +2	+21 +2	+24 +11	+30 +11	+33 +20	+39 +20	+51 +32	+60 +41 +62 +43	+72 +53 +78 +59	+85 +66 +94 +75	+106 +87 +121 +102	–
65	80	−200 −274	−150 −224	−146	−174	−90	−106	−134	−49	−60	−76	−23	−29																					
80	100	−220 −307	−170 −257	−120	−120	−72	−72	−72	−36	−36	−36	−12	−12	0 −10	0 −15	0 −22	0 −35	0 −54	0 −87	±7.5	±11	±17	+18 +3	+25 +3	+28 +13	+35 +13	+38 +23	+45 +23	+59 +37	+73 +51 +76 +54	+93 +71 +101 +79	+113 +91 +126 +104	+146 +124 +166 +144	–
100	120	−240 −327	−180 −267	−174	−207	−107	−126	−159	−58	−71	−90	−27	−34																					
120	140	−260 −360	−200 −300																											+88 +63	+117 +92	+147 +122		
140	160	−280 −380	−210 −310	−145 −208	−145 −245	−85 −125	−85 −148	−85 −185	−43 −68	−43 −83	−43 −106	−14 −32	−14 −39	0 −12	0 −18	0 −25	0 −40	0 −63	0 −100	±9	±12.5	±20	+21 +3	+28 +3	+33 +15	+40 +15	–	+52 +27	+68 +43	+90 +65	+125 +100	+159 +134	–	–
160	180	−310 −410	−230 −330																											+93 +68	+133 +108	+171 +146		
180	200	−340 −455	−240 −355																											+106 +77	+151 +122			
200	225	−380 −495	−260 −375	−170 −242	−170 −285	−100 −146	−100 −172	−100 −215	−50 −79	−50 −96	−50 −122	−15 −35	−15 −44	0 −14	0 −20	0 −29	0 −46	0 −72	0 −115	±10	±14.5	±23	+24 +4	+33 +4	+37 +17	+46 +17	–	+60 +31	+79 +50	+109 +80	+159 +130	–	–	–
225	250	−420 −535	−280 −395																											+113 +84	+169 +140			
250	280	−480 −610	−300 −430	−190	−190	−110	−110	−110	−56	−56	−56	−17	−17	0 −16	0 −23	0 −32	0 −52	0 −81	0 −130	±11.5	±16	±26	+27 +4	+36 +4	+43 +20	+52 +20	–	+66 +34	+88 +56	+126 +94	–	–	–	–
280	315	−540 −670	−330 −460	−271	−320	−162	−191	−240	−88	−108	−137	−40	−49																	+130 +98				
315	355	−600 −740	−360 −500	−210	−210	−125	−125	−125	−62	−62	−62	−18	−18	0 −18	0 −25	0 −36	0 −57	0 −89	0 −140	±12.5	±18	±28	+29 +4	+40 +4	+46 +21	+57 +21	–	+73 +37	+98 +62	+144 +108	–	–	–	–
355	400	−680 −820	−400 −540	−299	−350	−182	−214	−265	−98	−119	−151	−43	−54																	+150 +114				
400	450	−760 −915	−440 −595	−230	−230	−135	−135	−135	−68	−68	−68	−20	−20	0 −20	0 −27	0 −40	0 −63	0 −97	0 −155	±13.5	±20	±31	+32 +5	+45 +5	+50 +23	+63 +23	–	+80 +40	+108 +68	+166 +126	–	–	–	–
450	500	−840 −995	−480 −635	−327	−385	−198	−232	−290	−108	−131	−165	−47	−60																	+172 +132				

Note : In each column, the upper value is the upper dimensional tolerance, and the lower figure is the lower dimensional tolerances. [Notes] * : h4 and n5 are the previous version of JIS. Presented here because many Misumi products conform to this version.

〔TECHNICAL DATA〕
GENERAL DIMENSIONAL TOLERANCES FOR PARTS FORMED BY PRESS WORKING FROM SHEET METAL AND SHEAR FROM METAL PLATES

Excerpts from JIS B 0408/0410(1991)

1. General dimensional tolerances for parts formed by press working from sheet metal JIS B 0408 —1991

Table 1. General dimensional tolerance of blanking Unit：mm

Basic size step	Grades		
	Grade A	Grade B	Grade C
6 or less	±0.05	±0.1	±0.3
Over 6 to 30 incl.	±0.1	±0.2	±0.5
Over 30 to 120 incl.	±0.15	±0.3	±0.8
Over 120 to 400 incl.	±0.2	±0.5	±1.2
Over 400 to 1000 incl.	±0.3	±0.8	±2
Over 1000 to 2000 incl.	±0.5	±1.2	±3

Note：Grade A, B and C are equal to tolerance grade f, m and c of JIS B 0405 respectively.

Table 2. Dimensional tolerance of bending and drawing Unit：mm

Basic size step	Grades		
	Grade A	Grade B	Grade C
6 or less	±0.1	±0.3	±0.5
Over 6 to 30 incl.	±0.2	±0.5	±1
Over 30 to 120 incl.	±0.3	±0.8	±1.5
Over 120 to 400 incl.	±0.5	±1.2	±2.5
Over 400 to 1000 incl.	±0.8	±2	±4
Over 1000 to 2000 incl.	±1.2	±3	±6

Note：Grade A, B and C are equal to tolerance grade m, c and v of JIS B 0405 respectively.

2. General tolerances for parts formed by shear from metal plates JIS B 0410 —1991

Table 1. General dimensional tolerance of cut width Unit：mm

Basic size step	Metal plate thickness (t)							
	$t \leqq 1.6$		$1.6 < t \leqq 3$		$3 < t \leqq 6$		$6 < t \leqq 12$	
	Grades							
	Grade A	Grade B	Grade A	Grade B	Grade A	Grade B	Grade A	Grade B
30 or less	±0.1	±0.3	—	—	—	—	—	—
Over 30 to 120 incl.	±0.2	±0.5	±0.3	±0.5	±0.8	±1.2	—	±1.5
Over 120 to 400 incl.	±0.3	±0.8	±0.4	±0.8	±1	±1.5	—	±2
Over 400 to 1000 incl.	±0.5	±1	±0.5	±1.2	±1.5	±2	—	±2.5
Over 1000 to 2000 incl.	±0.8	±1.5	±0.8	±2	±2	±3	—	±3
Over 2000 to 4000 incl.	±1.2	±2	±1.2	±2.5	±3	±4	—	±4

Table 2. General tolerance of straightness Unit：mm

Nominal length on cut dimension	Metal plate thickness (t)							
	$t \leqq 1.6$		$1.6 < t \leqq 3$		$3 < t \leqq 6$		$6 < t \leqq 12$	
	Grades							
	Grade A	Grade B	Grade A	Grade B	Grade A	Grade B	Grade A	Grade B
30 or less	0.1	0.2	—	—	—	—	—	—
Over 30 to 120 incl.	0.2	0.3	0.2	0.3	0.5	0.8	—	1.5
Over 120 to 400 incl.	0.3	0.5	0.3	0.5	0.8	1.5	—	2
Over 400 to 1000 incl.	0.5	0.8	0.5	1	1.5	2	—	3
Over 1000 to 2000 incl.	0.8	1.2	0.8	1.5	2	3	—	4
Over 2000 to 4000 incl.	1.2	2	1.2	2.5	3	5	—	6

Table 3. General tolerance of perpendicularity Unit：mm

Nominal length on shorter side	Metal plate thickness (t)					
	$t \leqq 3$		$3 < t \leqq 6$		$6 < t \leqq 12$	
	Grades					
	Grade A	Grade B	Grade A	Grade B	Grade A	Grade B
30 or less	—	—	—	—	—	—
Over 30 to 120 incl.	0.3	0.5	0.5	0.8	—	1.5
Over 120 to 400 incl.	0.8	1.2	1	1.5	—	2
Over 400 to 1000 incl.	1.5	3	2	3	—	3
Over 1000 to 2000 incl.	3	6	4	6	—	6
Over 2000 to 4000 incl.	6	10	6	10	—	10

〔TECHNICAL DATA〕
STANDARD MACHINING TOLERANCES

Excerpts from JIS B 0405/0419(1991)

1. Regular Cut Dimension Tolerance JIS B 0405—1991

Tolerances in Respect of Length Excluding Chamfered Portion Unit：mm

Degree		Standard Dimension							
Symbol	Description	0.5 (1) to 3 incl.	Over 3 to 6 incl.	Over 6 to 30 incl.	Over 30 to 120 incl.	Over 120 to 400 incl.	Over 400 to 1000 incl.	Over 1000 to 2000 incl.	Over 2000 to 4000 incl.
		Tolerance							
f	Fine	±0.05	±0.05	±0.1	±0.15	±0.2	±0.3	±0.5	—
m	Medium	±0.1	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2
c	Coarse	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3	±4
v	Very coarse	—	±0.5	±1	±1.5	±2.5	±4	±6	±8

Note (1)：Tolerance for standard dimensions of less than 0.5mm shall be specified individually.

2. Tolerances in Respect of the Length of the Chamfered Portion (Radius of Rounding for Edges and Edge Chamfering Dimension)

Unit：mm

Degree		Standard Dimension		
Symbol	Description	0.5 (2) to 3 incl.	Over 3 to 6 incl.	Over 6
		Tolerance		
f	Fine	±0.2	±0.5	±1
m	Medium			
c	Coarse	±0.4	±1	±2
v	Very coarse			

Note (2)：Tolerance for standard dimensions of less than 0.5mm shall be specified individually.

3. Angle Tolerance

Unit：mm

Degree		Length of Shorter Side				
Symbol	Explanation	10 or less	Over 10 to 50 incl.	Over 50 to 120 incl.	Over 120 to 400 incl.	Over 400
		Tolerance				
f	Fine	±1°	±30′	±20′	±10′	± 5′
m	Medium					
c	Coarse	±1° 30′	± 1°	±30′	±15′	±10′
v	Very coarse	±3°	± 2°	± 1°	±30′	±20′

4. Regular Perpendicularity Tolerance

JIS B 0419 —1991 Unit：mm

Tolerance Class	Nominal Length on Shorter Side			
	100 or less	Over 100 to 300 incl.	Over 300 to 1000 incl.	Over 1000 to 3000 incl.
	Perpendicularity Tolerance			
H	0.2	0.3	0.4	0.5
K	0.4	0.6	0.8	1
L	0.6	1	1.5	2

5. Regular Straightness and Flatness Tolerance

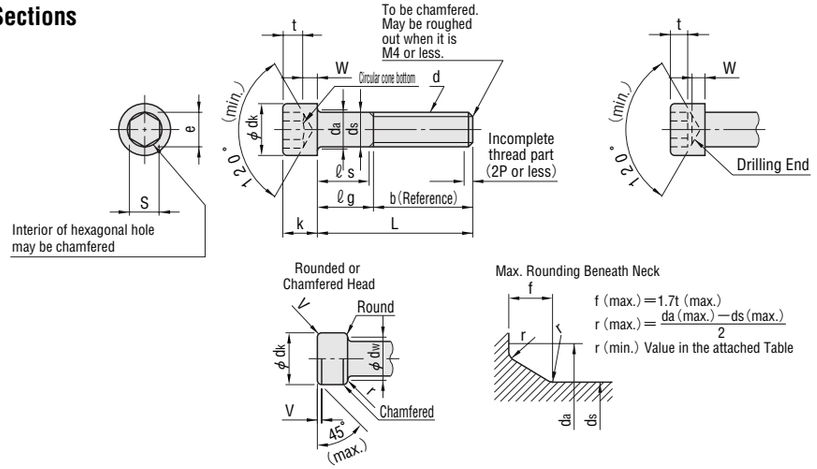
JIS B 0419 —1991 Unit：mm

Tolerance Class	Nominal Length					
	10 or less	Over 10 to 30 incl.	Over 30 to 100 incl.	Over 100 to 300 incl.	Over 300 to 1000 incl.	Over 1000 to 3000 incl.
	Straightness and Flatness Tolerance					
H	0.02	0.05	0.1	0.2	0.3	0.4
K	0.05	0.1	0.2	0.4	0.6	0.8
L	0.1	0.2	0.4	0.8	1.2	1.6

HEXAGON SOCKET HEAD CAP SCREWS

Excerpts from JIS B 1176 (1999・2000)

1. Dimension of Sections



Unit：mm

Nominal thread (d) (15)		M3	M4	M5	M6	M8	M10	M12	(M14)	M16	(M18)	M20	(M22)	M24	(M27)	M30
Pitch of thread (P)		0.5	0.7	0.8	1	1.25	1.5	1.75	2	2	2.5	2.5	2.5	3	3	3.5
b	Reference	18	20	22	24	28	32	36	40	44	48	52	56	60	66	72
d_k	Max. (Standard size)*	5.5	7	8.5	10	13	16	18	21	24	27	30	33	36	40	45
	Max.**	5.68	7.22	8.72	10.22	13.27	16.27	18.27	21.33	24.33	27.33	30.33	33.39	36.39	40.39	45.39
	Min.	5.32	6.78	8.28	9.78	12.73	15.73	17.73	20.67	23.67	26.67	29.67	32.61	35.61	39.61	44.61
d_a	Max.	3.6	4.7	5.7	6.8	9.2	11.2	13.7	15.7	17.7	20.2	22.4	24.4	26.4	30.4	33.4
d_s	Max. (Standard size)	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
	Min.	2.86	3.82	4.82	5.82	7.78	9.78	11.73	13.73	15.73	17.73	19.67	21.67	23.67	26.67	29.67
e	Min.	2.87	3.44	4.58	5.72	6.86	9.15	11.43	13.72	16.00	16.00	19.44	19.44	21.73	21.73	25.15
f	Max.	0.51	0.60	0.60	0.68	1.02	1.02	1.45	1.45	1.45	1.87	2.04	2.04	2.04	2.89	2.89
k	Max. (Standard size)	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
	Min.	2.86	3.82	4.82	5.70	7.64	9.64	11.57	13.57	15.57	17.57	19.48	21.48	23.48	26.48	29.48
r	Min.	0.1	0.2	0.2	0.25	0.4	0.4	0.6	0.6	0.6	0.6	0.8	0.8	0.8	1	1
s	Nominal designation (Standard size)	2.5	3	4	5	6	8	10	12	14	14	17	17	19	19	22
	Min.	2.52	3.02	4.02	5.02	6.02	8.025	10.025	12.032	14.032	14.032	17.050	17.050	19.065	19.065	22.065
	Max.(14) Column 1	2.580	3.080	4.095	5.140	6.140	8.175	10.175	12.212	14.212	14.212	17.230	17.230	19.275	19.275	22.275
	Max.(14) Column 2	2.560	3.080	4.095	5.095	6.095	8.115	10.115	12.142	14.142	14.142					
t	Min.	1.3	2	2.5	3	4	5	6	7	8	9	10	11	12	13.5	15.5
v	Max.	0.3	0.4	0.5	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.7	3
d_w	Min.	5.07	6.53	8.03	9.38	12.33	15.33	17.23	20.17	23.17	25.87	28.87	31.81	34.81	38.61	43.61
w	Min.	1.15	1.4	1.9	2.3	3.3	4	4.8	5.8	6.8	7.7	8.6	9.5	10.4	12.1	13.1

Notes(14) Column 1 for s (max.) applied to items in strength brackets 8.8 and 10.9 and properties brackets A 2-50 and A2-70. Column 2 applies to strength bracket 12.9. Column 1 may be applied to strength bracket 12.9 in accordance with an agreement made between the delivering and receiving sides. When the thread size is M20 or larger, s (max.) applies to all strength brackets and properties brackets.

Notes(15) Thread of a size in brackets should not be used unless it is absolutely necessary.

Remarks 1. A side of the head should be knurled into a straight-line or twill pattern〔refer to JIS B 0951 (knurling pattern)〕. d_k (max.) should be the value marked with two asterisks.
When an unknurled item is needed, it should be specified by the ordering side. d_k (max.), however, should be the value marked with an asterisk.

2. The recommended length (L) of the thread is shown with a bold frame around it. If L is shorter than the dotted line, the thread should be fully threaded. The length of the incompletely threaded portion beneath the neck should be approximately 3P.

3. ℓ_g (max.) and ℓ_s (min.) for a screw whose length, (L), exceeds the dotted line is represented by the equations below.
ℓ_g (max.) = Nominal length (ℓ) − b
ℓ_s (min.) = ℓ_g (max.) − 5P

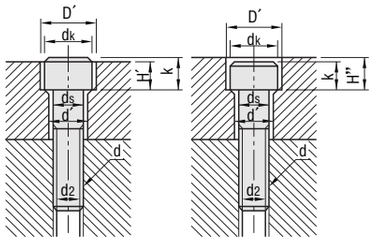
2. L, ℓ_s and ℓ_g of Hexagon Socket Head Cap Screw

Unit：mm

Nominal thread (d)		M3		M4		M5		M6		M8		M10		M12		(M14)		M16		(M18)		M20		(M22)		M24		(M27)		M30	
L		ℓ_s min and ℓ_g max																													
Nominal length	min	max	ℓ_s min	ℓ_g max	ℓ_s min	ℓ_g max	ℓ_s min	ℓ_g max	ℓ_s min	ℓ_g max	ℓ_s min	ℓ_g max	ℓ_s min	ℓ_g max	ℓ_s min	ℓ_g max	ℓ_s min	ℓ_g max	ℓ_s min	ℓ_g max	ℓ_s min	ℓ_g max	ℓ_s min	ℓ_g max	ℓ_s min	ℓ_g max	ℓ_s min	ℓ_g max	ℓ_s min	ℓ_g max	ℓ_s min	ℓ_g max
5	4.76	5.24																													
6	5.76	6.24																													
8	7.71	8.29																													
10	9.71	10.29																													
12	11.65	12.35																													
16	15.65	16.35																													
20	19.58	20.42																													
25	24.58	25.42	4.5	7																											
30	29.58	30.42	9.5	12	6.5	10	4	8																							
35	34.5	35.5			11.5	15	9	13	6	11																					
40	39.5	40.5			16.5	20	14	18	11	16	5.75	12																			
45	44.5	45.5					19	23	16	21	10.75	17	5.5	13																	
50	49.5	50.5					24	28	21	26	15.75	22	10.5	18																	
55	54.4	55.6							26	31	20.75	27	15.5	23	10.25	19															
60	59.4	60.6							31	36	25.75	32	20.5	28	15.25	24	10	20													
65	64.4	65.6									30.75	37	25.5	33	20.25	29	15	25	11	21	4.5	17									
70	69.4	70.6									35.75	42	30.5	38	25.25	34	20	30	16	26	9.5	22									
80	79.4	80.6									45.75	52	40.5	48	35.25	44	30	40	26	36	19.5	32	15.5	28	11.5	24					
90	89.3	90.7											50.5	58	45.25	54	40	50	36	46	29.5	42	25.5	38	21.5	34	15	30	9	24		
100	99.3	100.7											60.5	68	55.25	64	50	60	46	56	39.5	52	35.5	48	31.5	44	25	40	19	34		
110	109.3	110.7													65.25	74	60	70	56	66	49.5	62	45.5	58	41.5	54	35	50	29	44	20.5	38
120	119.3	120.7													75.25	84	70	80	66	76	59.5	72	55.5	68	51.5	64	45	60	39	54	30.5	48
130	129.2	130.8															80	90	76	86	69.5	82	65.5	78	61.5	74	55	70	49	64	40.5	58
140	139.2	140.8															90	100	86	96	79.5	92	75.5	88	71.5	84	65	80	59	74	50.5	68
150	149.2	150.8																	96	106	89.5	102	85.5	98	81.5	94	75	90	69	84	60.5	78
160	159.2	160.8																	106	116	99.5	112	95.5	108	91.5	104	85	100	79	94	70.5	88
180	179.2	180.8																			119.5	132	115.5	128	111.5	124	105	120	99	114	90.5	108
200	199.05	200.95																					135.5	148	131.5	144	125	140	119	134	110.5	128
220	219.05	220.95																											139	154	130.5	148
240	239.05	240.95																											159	174	150.5	168
260	258.95	261.05																											179	194	170.5	188
280	278.95	281.05																											199	214	190.5	208
300	298.95	301.05																											219	234	210.5	228

Reference：Dimensions of Counterboring and Bolt Hole for the Hexagon Socket Head Cap Screws.

Unit：mm



Nominal thread (d)	M3	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
d_s	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
d′	3.4	4.5	5.5	6.6	9	11	14	16	18	20	22	24	26	30	33
d_k	5.5	7	8.5	10	13	16	18	21	24	27	30	33	36	40	45
D′	6.5	8	9.5	11	14	17.5	20	23	26	29	32	35	39	43	48
K	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
H′	2.7	3.6	4.6	5.5	7.4	9.2	11	12.8	14.5	16.5	18.5	20.5	22.5	25	28
H″	3.3	4.4	5.4	6.5	8.6	10.8	13	15.2	17.5	19.5	21.5	23.5	25.5	29	32
d_2	2.6	3.4	4.3	5.1	6.9	8.6	10.4	12.2	14.2	15.7	17.7	19.7	21.2	24.2	26.7

TABLE OF HOLE SIZE BEFORE THREADING

1. Metric coarse thread

Nominal of thread	Last dimension Grade 2・Grade 3	Max. dimension Grade 2	Max. dimension Grade 3
M 1×0.25	0.73	0.78	—
M 1.1×0.25	0.83	0.89	—
M 1.2×0.25	0.93	0.98	—
M 1.4×0.3	1.08	1.14	—
M 1.6×0.35	1.22	1.32	—
M 1.7×0.35	1.33	1.42	—
M 1.8×0.35	1.42	1.52	—
M 2×0.4	1.57	1.67	—
M 2.2×0.45	1.71	1.84	—
M 2.3×0.4	1.87	1.97	—
M 2.5×0.45	2.01	2.14	—
M 2.6×0.45	2.12	2.23	—
M 3×0.5	2.46	2.60	2.64
M 3.5×0.6	2.85	3.01	3.05
M 4×0.7	3.24	3.42	3.47
M 4.5×0.75	3.69	3.88	3.92
M 5×0.8	4.13	4.33	4.38
M 6×1	4.92	5.15	5.22
M 7×1	5.92	6.15	6.22
M 8×1.25	6.65	6.91	6.98
M 9×1.25	7.65	7.91	7.98
M 10×1.5	8.38	8.68	8.75
M 11×1.5	9.38	9.68	9.75
M 12×1.75	10.11	10.44	10.53
M 14×2	11.84	12.21	12.31
M 16×2	13.84	14.21	14.31
M 18×2.5	15.29	15.74	15.85
M 20×2.5	17.29	17.74	17.85
M 22×2.5	19.29	19.74	19.85
M 24×3	20.75	21.25	21.38
M 27×3	23.75	24.25	24.38
M 30×3.5	26.21	26.77	26.92
M 33×3.5	29.21	29.77	29.92
M 36×4	31.67	32.27	32.42
M 39×4	34.67	35.27	35.42
M 42×4.5	37.13	37.80	37.98
M 45×4.5	40.13	40.80	40.98
M 48×5	42.59	43.30	43.49

Nominal of thread	Last dimension Grade 2・Grade 3	Max. dimension Grade 2	Max. dimension Grade 3
M 16×1.5	14.38	14.68	14.75
M 16×1	14.92	15.15	15.22
M 17×1.5	15.38	15.68	15.75
M 17×1	15.92	16.15	16.22
M 18×2	15.84	16.21	16.31
M 18×1.5	16.38	16.68	16.75
M 18×1	16.92	17.15	17.22
M 20×2	17.84	18.21	18.31
M 20×1.5	18.38	18.68	18.75
M 20×1	18.92	19.15	19.22
M 22×2	19.84	20.21	20.31
M 22×1.5	20.38	20.68	20.75
M 22×1	20.92	21.15	21.22
M 24×2	21.84	22.21	22.31
M 24×1.5	22.38	22.68	22.75
M 24×1	22.92	23.15	23.22
M 25×2	22.84	23.21	23.31
M 25×1.5	23.38	23.68	23.75
M 25×1	23.92	24.15	24.22
M 26×1.5	24.38	24.68	24.75
M 27×2	24.84	25.21	25.31
M 27×1.5	25.38	25.68	25.75
M 27×1	25.92	26.15	26.22
M 28×2	25.84	26.21	26.31
M 28×1.5	26.38	26.68	26.75
M 28×1	26.92	27.15	27.22
M 30×3	26.75	27.25	27.38
M 30×2	27.84	28.21	28.31
M 30×1.5	28.38	28.68	28.75
M 30×1	28.92	29.15	29.22
M 32×2	29.84	30.21	30.31
M 32×1.5	30.38	30.68	30.75
M 33×3	29.75	30.25	30.38
M 33×2	30.84	31.21	31.31
M 33×1.5	31.38	31.68	31.75
M 35×1.5	33.38	33.68	33.75
M 36×3	32.75	33.25	33.38
M 36×2	33.84	34.21	34.31
M 36×1.5	34.38	34.68	34.75
M 38×1.5	36.38	36.68	36.75
M 39×3	35.75	36.25	36.38
M 39×2	36.84	37.21	37.31
M 39×1.5	37.38	37.68	37.75
M 40×3	36.75	37.25	37.38
M 40×2	37.84	38.21	38.31
M 40×1.5	38.38	38.68	38.75
M 42×4	37.67	38.27	38.42
M 42×3	38.75	39.25	39.38
M 42×2	39.84	40.21	40.31
M 42×1.5	40.38	40.68	40.75
M 45×4	40.67	41.27	41.42
M 45×3	41.75	42.25	42.38
M 45×2	42.84	43.21	43.31
M 45×1.5	43.38	43.68	43.75
M 48×4	43.67	44.27	44.42
M 48×3	44.75	45.25	45.38
M 48×2	45.84	46.21	46.31
M 48×1.5	46.38	46.68	46.75
M 50×3	46.75	47.25	47.38
M 50×2	47.84	48.21	48.31
M 50×1.5	48.38	48.68	48.75

2. Metric fine pitch thread

Nominal of thread	Last dimension Grade 2・Grade 3	Max. dimension Grade 2	Max. dimension Grade 3
M 2.5×0.35	2.12	2.22	—
M 3×0.35	2.62	2.72	—
M 3.5×0.35	3.12	3.22	—
M 4×0.5	3.46	3.60	3.64
M 4.5×0.5	3.96	4.10	4.14
M 5×0.5	4.46	4.60	4.64
M 5.5×0.5	4.96	5.10	5.14
M 6×0.75	5.19	5.38	5.42
M 7×0.75	6.19	6.38	6.42
M 8×1	6.92	7.15	7.22
M 8×0.75	7.19	7.38	7.42
M 9×1	7.92	8.15	8.22
M 9×0.75	8.19	8.38	8.42
M 10×1.25	8.65	8.91	8.98
M 10×1	8.92	9.15	9.22
M 10×0.75	9.19	9.38	—
M 11×1	9.92	10.15	10.22
M 11×0.75	10.19	10.38	10.42
M 12×1.5	10.38	10.68	10.75
M 12×1.25	10.65	10.91	10.98
M 12×1	10.92	11.15	11.22
M 14×1.5	12.38	12.68	12.75
M 14×1	12.92	13.15	13.22
M 15×1.5	13.38	13.68	13.75
M 15×1	13.92	14.15	14.22

PROPER BOLT AXIAL TIGHTENING FORCE / TORQUE

A bolt is tightened by torque, torque inclination, rotational angle, stretch measurement and other methods. The torque method is widely used due to its simplicity and convenience.

■Axial Tightening Force for Bolt and Fatigue Limit

- The proper axial tightening force for a bolt should be calculated within an elasticity range up to 70% of the rated yield strength when the torque method is used.
- The fatigue strength of a bolt under repeated load should not exceed the specified tolerance.
- Do not let the seat of a bolt or nut dent the contact area.
- Do not break the tightened piece by over tightening.

■Calculation of Axial Tightening Force and Tightening Torque

The relation between the axial tightening force and Ff is represented by equation (1) below.

$Ff = 0.7 \times \sigma_y \times As \cdots\cdots (1)$

Tightening Torque, TfA, can be calculated using the equation (2) below.

$T_{fA} = 0.35k(1+1/Q)\,\sigma_y \cdot As \cdot d \cdots\cdots (2)$

k : Torque coefficient
d : Nominal diameter of bolt [cm]
Q : Tightening coefficient
σ_y : Proof stress (112kgf/mm^2 when the strength class is 12.9)
As : Effective sectional area of the bolt [mm^2]

■Example

Proper torque and axial force for soft steel pieces tightened together by means of a bolt with a hexagonal hole, M6 (strength bracket 12.9), with the pieces lubricated with oil can be calculated.

・Proper torque, by using equation (2) :

$T_{fA} = 0.35k(1+1/Q)\,\sigma_y \cdot As \cdot d$
$= 0.35 \cdot 0.17(1+1/1.4)112 \cdot 20.1 \cdot 0.6$
$= 138$[kgf・cm]

・Axial force, by using equation (1) :

$Ff = 0.7 \times \sigma_y \times As$
$= 0.7 \times 112 \times 20.1$
$= 1576$[kgf]

■Surface Treatment for Bolt and Torque Coefficient Dependent on the Combination of material for Area to be Fastened and material of Female Thread

Surface treatment & lubrication	Torque coefficient k	Combination Tightened piece material—Internal thread material (a) (b)
Steel bolt Black oxide film Oil lubrication	0.145	SCM—FC FC—FC SUS—FC
	0.155	S10C—FC SCM—S10C SCM—SCM FC—S10C FC—SCM
	0.165	SCM—SUS FC—SUS AL—FC SUS—S10C SUS—SCM SUS—SUS
	0.175	S10C—S10C S10C—SCM S10C—SUS AL—S10C AL—SCM
	0.185	SCM—AL FC—AL AL—SUS
	0.195	S10C—AL SUS—AL
	0.215	AL—AL
Steel bolt Black oxide film not lubricated	0.25	S10C—FC SCM—FC FC—FC
	0.35	S10C—SCM SCM—SCM FC—S10C FC—SCM AL—FC
	0.45	S10C—S10C SCM—S10C AL—S10C AL—SCM
	0.55	SCM—AL FC—AL AL—AL

S10C : Unrefined soft steel SCM : Refined steel (35HRC) FC : Cast iron (FC200) AL : Aluminum SUS : Stainless (SUS304)

■Standard value of tightening coefficient Q

Tightening coefficient Q	Tightening method	Surface condition Bolt	Surface condition nut	Lubrication
1.25	Torque wrench	Manganese phosphate	Not treated or treated with phosphate	Lubricated with oil or MoS_2 paste
1.4	Torque wrench	Not treated or treated with phosphate		
	Torque controlled wrench			
1.6	Impact wrench			
1.8	Torque wrench	Not treated or treated with phosphate	Not treated	not lubricated
	Torque controlled wrench			

Strength code

ex. 12.9
- Proof Stress (yield stress) : 90% of the mianimum value of tensile strength
- The minimum tensile strength is 1220N/mm^2 {124kgf/mm^2}

ex. 10.9
- Proof Stress (yield stress) : 90% of the minimum value of tensile strength
- The minimum tensile strength is 1040N/mm^2 {106kgf/mm^2}

■Initial clamping force and tightening torque

Nominal diameter of thread	Effective sectional area As mm^2	Strength rank 12.9 Yield load kgf	12.9 Initial Tightening force kgf	12.9 Tightening torque kgf・cm	10.9 Yield load kgf	10.9 Initial Tightening force kgf	10.9 Tightening torque kgf・cm	8.8 Yield load kgf	8.8 Initial Tightening force kgf	8.8 Tightening torque kgf・cm	4.8 Yield load kgf	4.8 Initial Tightening force kgf	4.8 Tightening torque kgf・cm
M 3×0.5	5.03	563	394	17	482	338	15	328	230	10	175	122	5
M 4×0.7	8.78	983	688	40	842	589	34	573	401	23	305	213	12
M 5×0.8	14.2	1590	1113	81	1362	953	69	927	649	47	493	345	25
M 6×1	20.1	2251	1576	138	1928	1349	118	1313	919	80	697	488	43
M 8×1.25	36.6	4099	2869	334	3510	2457	286	2390	1673	195	1270	889	104
M10×1.5	58	6496	4547	663	5562	3894	567	3787	2651	386	2013	1409	205
M12×1.75	84.3	9442	6609	1160	8084	5659	990	5505	3853	674	2925	2048	358
M14×2	115	12880	9016	1840	11029	7720	1580	7510	5257	1070	3991	2793	570
M16×2	157	17584	12039	2870	15056	10539	2460	10252	7176	1670	5448	3814	889
M18×2.5	192	21504	15053	3950	18413	12889	3380	12922	9045	2370	6662	4664	1220
M20×2.5	245	27440	19208	5600	23496	16447	4790	16489	11542	3360	8502	5951	1730
M22×2.5	303	33936	23755	7620	29058	20340	6520	20392	14274	4580	10514	7360	2360
M24×3	353	39536	27675	9680	33853	23697	8290	23757	16630	5820	12249	8574	3000

(Note) ・Tightening conditions : Use of a torque wrench (lubricated with oil ; Torque coefficient k=0.17 ; Tightening coefficient Q=1.4)
・The torque coefficient varies with the usage conditions. Values in this table should be used as rough referential values.
・The table is an excerpt from a catalog published by Kyokuto Seisakusho Co., Ltd.

〔TECHNICAL DATA〕

STRENGTH OF BOLTS, SCREW AND DOWEL PINS

■Strength of bolts

1) Tensile Load Bolt

Pt＝σt×As……（1）

＝πd²σt／4……（2）

Pt：Tensile load in the axial direction［kgf］
σb：Yield stress of bolt［kgf/mm²］
σt：Allowable stress of bolt［kgf/mm²］
（σt＝σb/safety factor α）
As：Effective sectional area of bolt［mm₂］
As＝πd²/4
d：Effective Dia of bolt（core diameter）［mm］

■Safety factor of Unwin based on tensile strength α

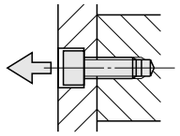
Material	Static load	Repeated load		Impact load
		Pulsating	Reversed	
Steel	3	5	8	12
Cast iron	4	6	10	15
Copper, soft metal	5	5	9	15

Stress＝Reference strength／Safety factor α　Reference strength：Yield stress for ductile materials, Fracture stress for brittle materials

〔Example〕The proper size of a bolt with a hexagonal hole, which is to bear a repeated tensile load（pulsating）at P＝200 kgf, should be determined.（Bolt with a hexagonal hole, made of SCM435, 38 to 43 HRC, strength class 12.9）

Using equation（1）

As＝Pt／σt
＝200／22.4
＝8.9［mm²］



∴ A larger effective sectional area should be found in the table at the right, and M5, 14.2〔mm²〕, should be selected. M6, tolerable load of 213 kgf, should be selected from the column for strength class 12.9, with the fatigue strength taken into account.

Yield stress in strength class 12.9 is σb=112〔kgf/mm²〕.
Allowable stress σt＝σb/safety factor (safety factor is 5 from the above table)
＝112／5
＝22.4［kgf／mm²］

■Fatigue strength of bolts (In case of screws：Fatigue strength is 2 million times)

Nominal diameter of thread	Effective sectional area As mm²	Strength rank 12.9 Fatigue strength* kgf／mm²	12.9 Allowable load kgf	10.9 Fatigue strength* kgf／mm²	10.9 Allowable load kgf
M 4	8.78	13.1	114	9.1	79
M 5	14.2	11.3	160	7.8	111
M 6	20.1	10.6	213	7.4	149
M 8	36.6	8.9	326	8.7	318
M10	58	7.4	429	7.3	423
M12	84.3	6.7	565	6.5	548
M14	115	6.1	702	6	690
M16	157	5.8	911	5.7	895
M20	245	5.2	1274	5.1	1250
M24	353	4.7	1659	4.7	1659

Fatigue strength* is corrected excerpt from "Estimated values of fatigue limit of metric screw threads for machine screws, bolts and nuts" (Yamamoto).

2) If the bolt, like a stripper bolt, is to bear a tensile impact load, the right size should be selected from the fatigue strength column.（Under a load of 200kgf, Stripper bolt made of SCM435, 33 to 38HRC, strength class 10.9）

If the tolerable load is 200kgf or more, strength class 10.9, M8, 318〔kgf〕, should be selected from the table at the right. Hence, MSB10 with the M8 threaded portion and an axial diameter of 10mm should be selected. If it is to bear a shearing load, a dowel pin should also be used.

■Strength of screw plugs

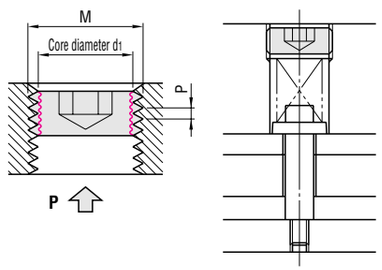
Allowable load P when screw plug MSW30 is to bear an impact load should be determined.（MSW30 made of S45C, Tensile strength σb for 34～43HRC is 65kgf／mm².）

If MSW is shorn at a spot within the minor diameter section and is broken, allowable load P can be calculated as shown below.

Allowable load P＝τt×A.
＝3.9×107.4
＝4190［kgf］

Find the allowable shearing force based on the core diameter of internal thread if tapping is made of soft material.

Area A＝Core diameter d₁×π×L
（Core diameter d₁≒M－P）
A＝（M－P）π L＝（30－1.5）π×12
＝1074［mm²］
Yield stress≒0.9×Tensile strength σb＝0.9×65＝58.2
Shearing stress≒0.8×Yield stress
＝46.6
Allowable shearing stress τt＝Shearing stress/safety factor 12
＝46.6／12＝3.9［kgf／mm²］

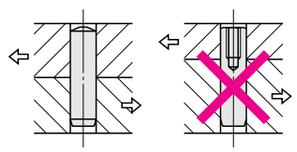


■Strength of dowel pins

The proper size of a dowel pin under repeated shearing load of 800 kgf（one-way swing）should be determined.（Dowel pin made of SUJ2, 58HRC or greater）.

P＝A×τ
＝πD²τ／4
D＝√(4P)／(πτ)
＝√(4×800)／(3.14×19.2)
≒7.3

σb for yield stress of SUJ2＝120［kgf／mm²］
Allowable shearing strength τ＝σb×0.8／safety factor α
＝120×0.8／5
＝19.2［kgf／mm²］



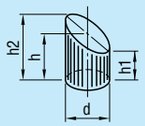
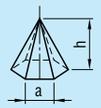
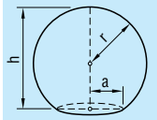
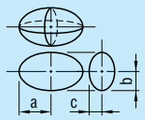
The dowel pin must not be loaded

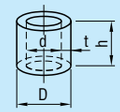
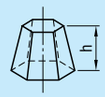
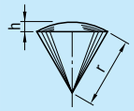
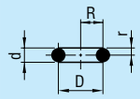
∴ D8 or larger size should be selected for MS. If the dowel pins are of a large uniform size, some of the tools and part of the stock or the like will be necessary.

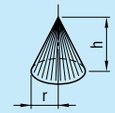
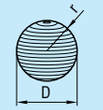
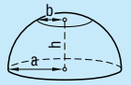
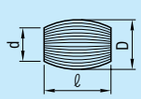
Typical strength calculations are presented here. In a real-life situation, it will be necessary to take into account hole-to-hole pitch precision, hole perpendicularity, surface roughness, circularity, plate material, parallelism, quenching or non-quenching, precision of the press, product output, wear of tools, etc. Hence the value in theses examples are referential（but not guaranteed）values.

〔TECHNICAL DATA〕

CALCULATION OF CUBIC VOLUME

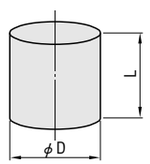
Solid	Volume V
Truncated cylinder 	V＝π/4 d²h ＝π/4 d²((h1＋h2)/2)
Pyramid 	V＝h/3 A＝h/6 arn A＝Area of base r＝Radius of inscribed circle a＝Length of a side of a regular polygon n＝Number of the sides of a regular polygon
Spherical crown 	V＝πh²/3 (3r－h) ＝πh/6 (3a²＋h²) a is the radius.
Ellipsoid 	V＝4/3 π abc In case of a spheroid (b＝c) V＝4/3 π ab²

Solid	Volume V
Hollow cylinder 	V＝π/4 h(D²－d²) ＝πth(D－t) ＝πth(d＋t)
Truncated pyramid 	V＝h/3 (A＋a＋√Aa) A,a＝Area of both ends
Spherical segment 	V＝2/3 πr²h ＝2.0944r² h
Torus 	V＝2π²Rr² ＝19.739Rr² ＝π²/4 Dd² ＝2.4674Dd²

Solid	Volume V
Circular cone 	V＝π/3 r²h ＝1.0472r²h
Sphere 	V＝4/3 πr³＝4.1888r³ ＝π/6 d³＝0.5236d³
Spherical belt 	V＝πh/6 (3a²＋3b²＋h²)
Barrel 	When circumference makes a curve equal to the circular arc, V＝πℓ/12 (2D²＋d²) When its periphery makes a curve equal to a parabolic line, V＝0.209 ℓ (2D²Dd＋1/4d²)

■How to calculate the weight

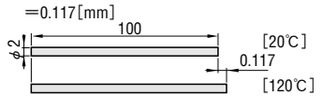
Weight［g］＝Volume［cm³］×Density



〔Example〕Material：Mild steel
φD＝16 L＝50mm, the weight is：
W＝π/4 D²×L×Density
＝π/4×1.6²×5×7.85
≒79［g］

■Method for finding changes dimensions due to thermal expansion

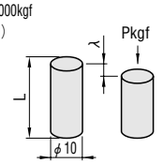
〔Example〕Material：SKD11
φD＝2 The volume of dimension change δ when a pin of L＝100mm is heated to 100℃ is
δ＝Coefficient of thermal expansion×Total length×Change in temperature
＝11.7×10－⁶×100mm×100℃
＝0.117［mm］



■Finding strain with Young's modulus E

〔Example〕Find amount of strain λ when load P＝1000kgf to φ10×L60 pin.（Material：SKD11）

E＝PL／Aλ
λ＝PL／AE＝1000×60／78.5×21000
≒0.036mm
Sectional area A＝π/4 D²＝78.5



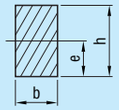
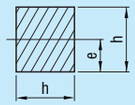
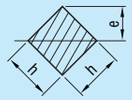
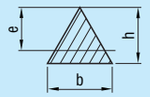
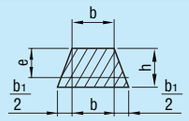
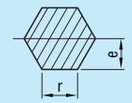
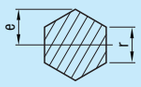
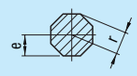
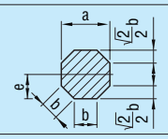
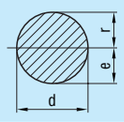
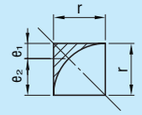
■Characteristics of Metals

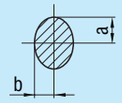
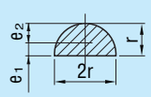
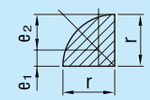
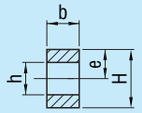
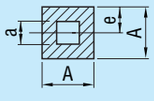
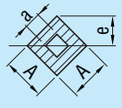
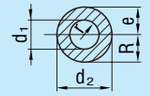
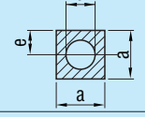
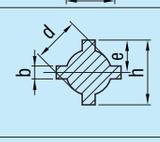
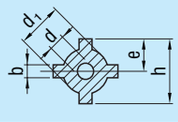
Material	Density [g/cm³]	Young's modulusE [Kgf/mm²]	Thermal expansion coefficient [×10⁻⁶/℃]
Mild steel	7.85	21000	11.7
SKD11	7.85	21000	11.7
Powdered high-speed steel（HAP40）	8.07	23300	10.1
Cemented carbide V30	14.1	56000	6.0
Cast iron	7.3	7500～10500	9.2～11.8
SUS304	8.0	19700	17.3
Oxygen free copper C1020	8.9	11700	17.6
6/4 Brass C2801	8.4	10300	20.8
Aluminum A1100	2.7	6900	23.6
Duralumin A7075	2.8	7200	23.6
Titanium	4.5	10600	8.4

1Kgf/mm²＝9.80665×10⁶Pa

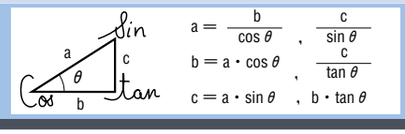
〔TECHNICAL DATA〕

CALCULATIONS OF AREA, CENTER OF GRAVITY GEOMETRICAL MOMENT OF INERTIA

Cross Section	Sectional area A	Distance of gravitational center e	Geometrical moment of Inertia	Section modulus Z=I/e
	bh	$\frac{h}{2}$	$\frac{bh^3}{12}$	$\frac{bh^2}{6}$
	h^2	$\frac{h}{2}$	$\frac{h^4}{12}$	$\frac{h^3}{6}$
	h^2	$\frac{h}{2}\sqrt{2}$	$\frac{h^4}{12}$	$0.1179\ h^3=\frac{\sqrt{2}}{12}h^3$
	$\frac{bh}{2}$	$\frac{2}{3}h$	$\frac{bh^3}{36}$	$\frac{bh^2}{24}$
	$(2b+b_1)\frac{h}{2}$	$\frac{1}{3}\times\frac{3b+2b_1}{2b+b_1}h$	$\frac{6b^2+6bb_1+b_1^2}{36(2b+b_1)}h^3$	$\frac{6b^2+6bb_1+b_1^2}{12(3b+2b_1)}h^2$
	$\frac{3\sqrt{3}}{2}r^2$ $=2.598\ r^2$	$\sqrt{\frac{3}{4}}r=0.866\ r$	$\frac{5\sqrt{3}}{16}r^4=0.5413\ r^4$	$\frac{5}{8}r^3$
		r		$\frac{5\sqrt{3}}{16}r^3=0.5413\,r^3$
	$2.828\ r^2$	$0.924\ r^2$	$\frac{1+2\sqrt{2}}{6}r^4$ $=0.6381\ r^4$	$0.6906\,r^3$
	$0.8284\ a^2$	$b=\frac{a}{1+\sqrt{2}}$ $=0.4142\ a$	$0.0547\ a^4$	$0.1095\,a^3$
	$\pi r^2=\frac{\pi d^2}{4}$	$\frac{d}{2}$	$\frac{\pi d^4}{64}=\frac{\pi r^4}{4}$ $=0.0491\ d^4$ $\fallingdotseq 0.05\ d^4$ $=0.7854\ r^4$	$\frac{\pi d^3}{32}=\frac{\pi r^3}{4}$ $=0.0982 d^3$ $\fallingdotseq 0.1\ d^3$ $=0.7854\ r^3$
	$r^2\left(1-\frac{\pi}{4}\right)$ $=0.2146\,r^2$	e_1 $=0.2234\ r$ e_2 $=0.7766\ r$	$0.0075\,r^4$	$\frac{0.0075\ r^4}{e_2}$ $=0.00966r^3$ $\fallingdotseq 0.01r^3$

Cross Section	Sectional area A	Distance of gravitational center e	Geometrical moment of Inertia	Section modulus Z=I/e
	πab	a	$\frac{\pi}{4}ba^3=0.7854\ ba^3$	$\frac{4}{\pi}ba^2=0.7854\ ba^2$
	$\frac{\pi}{2}r^2$	e_1 $=0.4244\ r$ e_2 $=0.5756\ r$	$\left(\frac{\pi}{8}-\frac{8}{9\pi}\right)r^4$ $=0.1098\ r^4$	$Z_1=0.2587\ r^3$ $Z_2=0.1908\ r^3$
	$\frac{\pi}{4}r^2$	e_1 $=0.4244\ r$ e_2 $=0.5756\ r$	$0.055\ r^4$	$Z_1=0.1296\ r^3$ $Z_2=0.0956\ r^3$
	$b(H-h)$	$\frac{H}{2}$	$\frac{b}{12}(H^3-h^3)$	$\frac{b}{6H}(H^3-h^3)$
	A^2-a^2	$\frac{A}{2}$	$\frac{A^4-a^4}{12}$	$\frac{1}{6}\frac{A^4-a^4}{A}$
	A^2-a^2	$\frac{A}{2}\sqrt{2}$	$\frac{A^4-a^4}{12}$	$\frac{A^4-a^4}{12\,A}\sqrt{2}$ $=\frac{0.1179(A^4-a^4)}{A}$
	$\frac{\pi}{4}(d_2^2-d_1^2)$	$\frac{d_2}{2}$	$\frac{\pi}{64}(d_2^4-d_1^4)$ $=\frac{\pi}{4}(R^4-r^4)$	$\frac{\pi}{32}\left(\frac{d_2^4-d_1^4}{d_2}\right)$ $=\frac{\pi}{4}\times\frac{R^4-r^4}{R}$
	$a^2-\frac{\pi d^2}{4}$	$\frac{a}{2}$	$\frac{1}{12}\left(a^4-\frac{3\pi}{16}d^4\right)$	$\frac{1}{6a}\left(a^4-\frac{3\pi}{16}d^4\right)$
	$2b(h-d)$ $+\frac{\pi}{4}d^2$	$\frac{h}{2}$	$\frac{1}{12}\left\{\frac{3\pi}{16}d^4+b(h^3-d^3)+b^3(h-d)\right\}$	$\frac{1}{6h}\left\{\frac{3\pi}{16}d^4+b(h^3-d^3)+b^3(h-d)\right\}$
	$2b(h-d)+$ $\frac{\pi}{4}(d_1^2-d^2)$	$\frac{h}{2}$	$\frac{1}{12}\left\{\frac{3\pi}{16}(d_1^4-d^4)+b(h^3-d_1^3)+b^3(h-d_1)\right\}$	$\frac{1}{6h}\left\{\frac{3\pi}{16}(d_1^4-d^4)+b(h^3-d_1^3)+b^3(h-d_1)\right\}$

COMPARISON CHART OF TRIGONOMETRICAL FUNCTION



θ	When deg=0° 00' ~11° 50'				
deg	sin θ	cos θ	tan θ	cot θ	
0° 00'	.0000	1.0000	.0000	∞	90° 00'
10	.0029	1.0000	.0029	343.77	50
20	.0058	1.0000	.0058	171.89	40
30	.0087	1.0000	.0087	114.59	30
40	.0116	0.9999	.0116	85.940	20
50	.0145	.9999	.0145	68.750	10
1° 00'	.0175	.9998	.0175	57.290	89° 00'
10	.0204	.9998	.0204	49.104	50
20	.0233	.9997	.0233	42.964	40
30	.0262	.9997	.0262	38.188	30
40	.0291	.9996	.0291	34.368	20
50	.0320	.9995	.0320	31.242	10
2° 00'	.0349	.9994	.0349	28.636	88° 00'
10	.0378	.9993	.0378	26.432	50
20	.0407	.9992	.0407	24.542	40
30	.0436	.9990	.0437	22.904	30
40	.0465	.9989	.0466	21.470	20
50	.0494	.9988	.0495	20.206	10
3° 00'	.0523	.9986	.0524	19.081	87° 00'
10	.0552	.9985	.0553	18.075	50
20	.0581	.9983	.0582	17.169	40
30	.0610	.9981	.0612	16.350	30
40	.0640	.9980	.0641	15.605	20
50	.0669	.9978	.0670	14.924	10
4° 00'	.0698	.9976	.0699	14.301	86° 00'
10	.0727	.9974	.0729	13.727	50
20	.0756	.9971	.0758	13.197	40
30	.0785	.9969	.0787	12.706	30
40	.0814	.9967	.0816	12.251	20
50	.0843	.9964	.0846	11.826	10
5° 00'	.0872	.9962	.0875	11.430	85° 00'
10	.0901	.9959	.0904	11.059	50
20	.0929	.9957	.0934	10.712	40
30	.0958	.9954	.0963	10.385	30
40	.0987	.9951	.0992	10.078	20
50	.1016	.9948	.1022	9.7882	10
6° 00'	.1045	.9945	.1051	9.5144	84° 00'
10	.1074	.9942	.1080	9.2553	50
20	.1103	.9939	.1110	9.0098	40
30	.1132	.9936	.1139	8.7769	30
40	.1161	.9932	.1169	8.5555	20
50	.1190	.9929	.1198	8.3450	10
7° 00'	.1219	.9925	.1228	8.1443	83° 00'
10	.1248	.9922	.1257	7.9530	50
20	.1276	.9918	.1287	7.7704	40
30	.1305	.9914	.1317	7.5958	30
40	.1334	.9911	.1346	7.4287	20
50	.1363	.9907	.1376	7.2687	10
8° 00'	.1392	.9903	.1405	7.1154	82° 00'
10	.1421	.9899	.1435	6.9682	50
20	.1449	.9894	.1465	6.8269	40
30	.1478	.9890	.1495	6.6912	30
40	.1507	.9886	.1524	6.5606	20
50	.1536	.9881	.1554	6.4348	10
9° 00'	.1564	.9877	.1584	6.3138	81° 00'
10	.1593	.9872	.1614	6.1970	50
20	.1622	.9868	.1644	6.0844	40
30	.1650	.9863	.1673	5.9758	30
40	.1679	.9858	.1703	5.8708	20
50	.1708	.9853	.1733	5.7694	10
10° 00'	.1736	.9848	.1763	5.6713	80° 00'
10	.1765	.9843	.1793	5.5764	50
20	.1794	.9838	.1823	5.4845	40
30	.1822	.9833	.1853	5.3955	30
40	.1851	.9827	.1883	5.3093	20
50	.1880	.9822	.1914	5.2257	10
11° 00'	.1908	.9816	.1944	5.1446	79° 00'
10	.1937	.9811	.1974	5.0658	50
20	.1965	.9805	.2004	4.9894	40
30	.1994	.9799	.2035	4.9152	30
40	.2022	.9793	.2065	4.8430	20
50	.2051	.9787	.2095	4.7729	78° 10
	cos θ	sin θ	cot θ	tan θ	deg
	When deg=78° 10' ~90° 00'				θ

θ	When deg=12° 00' ~23° 50'				
deg	sin θ	cos θ	tan θ	cot θ	
12° 00'	.2079	.9781	.2126	4.7046	78° 00'
10	.2108	.9775	.2156	4.6382	50
20	.2136	.9769	.2186	4.5736	40
30	.2164	.9763	.2217	4.5107	30
40	.2193	.9757	.2247	4.4494	20
50	.2221	.9750	.2278	4.3897	10
13° 00'	.2250	.9744	.2309	4.3315	77° 00'
10	.2278	.9737	.2339	4.2747	50
20	.2306	.9730	.2370	4.2193	40
30	.2334	.9724	.2401	4.1653	30
40	.2363	.9717	.2432	4.1126	20
50	.2391	.9710	.2462	4.0611	10
14° 00'	.2419	.9703	.2493	4.0108	76° 00'
10	.2447	.9696	.2524	3.9617	50
20	.2476	.9689	.2555	3.9136	40
30	.2504	.9681	.2586	3.8667	30
40	.2532	.9674	.2617	3.8208	20
50	.2560	.9667	.2648	3.7760	10
15° 00'	.2588	.9659	.2679	3.7321	75° 00'
10	.2616	.9652	.2711	3.6891	50
20	.2644	.9644	.2742	3.6470	40
30	.2672	.9636	.2773	3.6059	30
40	.2700	.9628	.2805	3.5656	20
50	.2728	.9621	.2836	3.5261	10
16° 00'	.2756	.9613	.2867	3.4874	74° 00'
10	.2784	.9605	.2899	3.4495	50
20	.2812	.9596	.2931	3.4124	40
30	.2840	.9588	.2962	3.3759	30
40	.2868	.9580	.2994	3.3402	20
50	.2896	.9572	.3026	3.3052	10
17° 00'	.2924	.9563	.3057	3.2709	73° 00'
10	.2952	.9555	.3089	3.2371	50
20	.2979	.9546	.3121	3.2041	40
30	.3007	.9537	.3153	3.1716	30
40	.3035	.9528	.3185	3.1397	20
50	.3062	.9520	.3217	3.1084	10
18° 00'	.3090	.9511	.3249	3.0777	72° 00'
10	.3118	.9502	.3281	3.0475	50
20	.3145	.9492	.3314	3.0178	40
30	.3173	.9483	.3346	2.9887	30
40	.3201	.9474	.3378	2.9600	20
50	.3228	.9465	.3411	2.9319	10
19° 00'	.3256	.9455	.3443	2.9042	71° 00'
10	.3283	.9446	.3476	2.8770	50
20	.3311	.9436	.3508	2.8502	40
30	.3338	.9426	.3541	2.8239	30
40	.3365	.9417	.3574	2.7980	20
50	.3393	.9407	.3607	2.7725	10
20° 00'	.3420	.9397	.3640	2.7475	70° 00'
10	.3448	.9387	.3673	2.7228	50
20	.3475	.9377	.3706	2.6985	40
30	.3502	.9367	.3739	2.6746	30
40	.3529	.9356	.3772	2.6511	20
50	.3557	.9346	.3805	2.6279	10
21° 00'	.3584	.9336	.3839	2.6051	69° 00'
10	.3611	.9325	.3872	2.5826	50
20	.3638	.9315	.3906	2.5605	40
30	.3665	.9304	.3939	2.5386	30
40	.3692	.9293	.3973	2.5172	20
50	.3719	.9283	.4006	2.4960	10
22° 00'	.3746	.9272	.4040	2.4751	68° 00'
10	.3773	.9261	.4074	2.4545	50
20	.3800	.9250	.4108	2.4342	40
30	.3827	.9239	.4142	2.4142	30
40	.3854	.9228	.4176	2.3945	20
50	.3881	.9216	.4210	2.3750	10
23° 00'	.3907	.9205	.4245	2.3559	67° 00'
10	.3934	.9194	.4279	2.3369	50
20	.3961	.9182	.4314	2.3183	40
30	.3987	.9171	.4348	2.2998	30
40	.4014	.9159	.4383	2.2817	20
50	.4041	.9147	.4417	2.2637	66° 10
	cos θ	sin θ	cot θ	tan θ	deg
	When deg=66° 10' ~78° 00'				θ

θ	When deg=24° 00' ~35° 50'				
deg	sin θ	cos θ	tan θ	cot θ	
24° 00'	.4067	.9135	.4452	2.2460	66° 00'
10	.4094	.9124	.4487	2.2286	50
20	.4120	.9112	.4522	2.2113	40
30	.4147	.9100	.4557	2.1943	30
40	.4173	.9088	.4592	2.1775	20
50	.4200	.9075	.4628	2.1609	10
25° 00'	.4226	.9063	.4663	2.1445	65° 00'
10	.4253	.9051	.4699	2.1283	50
20	.4279	.9038	.4734	2.1123	40
30	.4305	.9026	.4770	2.0965	30
40	.4331	.9013	.4806	2.0809	20
50	.4358	.9001	.4841	2.0655	10
26° 00'	.4384	.8988	.4877	2.0503	64° 00'
10	.4410	.8975	.4913	2.0353	50
20	.4436	.8962	.4950	2.0204	40
30	.4462	.8949	.4986	2.0057	30
40	.4488	.8936	.5022	1.9912	20
50	.4514	.8923	.5059	1.9768	10
27° 00'	.4540	.8910	.5095	1.9626	63° 00'
10	.4566	.8897	.5132	1.9486	50
20	.4592	.8884	.5169	1.9347	40
30	.4617	.8870	.5206	1.9210	30
40	.4643	.8857	.5243	1.9074	20
50	.4669	.8843	.5280	1.8940	10
28° 00'	.4695	.8829	.5317	1.8807	62° 00'
10	.4720	.8816	.5354	1.8676	50
20	.4746	.8802	.5392	1.8546	40
30	.4772	.8788	.5430	1.8418	30
40	.4797	.8774	.5467	1.8291	20
50	.4823	.8760	.5505	1.8165	10
29° 00'	.4848	.8746	.5543	1.8040	61° 00'
10	.4874	.8732	.5581	1.7917	50
20	.4899	.8718	.5619	1.7796	40
30	.4924	.8704	.5658	1.7675	30
40	.4950	.8689	.5696	1.7556	20
50	.4975	.8675	.5735	1.7437	10
30° 00'	.5000	.8660	.5774	1.7321	60° 00'
10	.5025	.8646	.5812	1.7205	50
20	.5050	.8631	.5851	1.7090	40
30	.5075	.8616	.5890	1.6977	30
40	.5100	.8601	.5930	1.6864	20
50	.5125	.8587	.5969	1.6753	10
31° 00'	.5150	.8572	.6009	1.6643	59° 00'
10	.5175	.8557	.6048	1.6534	50
20	.5200	.8542	.6088	1.6426	40
30	.5225	.8526	.6128	1.6319	30
40	.5250	.8511	.6168	1.6212	20
50	.5275	.8496	.6208	1.6107	10
32° 00'	.5299	.8480	.6249	1.6003	58° 00'
10	.5324	.8465	.6289	1.5900	50
20	.5348	.8450	.6330	1.5798	40
30	.5373	.8434	.6371	1.5697	30
40	.5398	.8418	.6412	1.5597	20
50	.5422	.8403	.6453	1.5497	10
33° 00'	.5446	.8387	.6494	1.5399	57° 00'
10	.5471	.8371	.6536	1.5301	50
20	.5495	.8355	.6577	1.5204	40
30	.5519	.8339	.6619	1.5108	30
40	.5544	.8323	.6661	1.5013	20
50	.5568	.8307	.6703	1.4919	10
34° 00'	.5592	.8290	.6745	1.4826	56° 00'
10	.5616	.8274	.6787	1.4733	50
20	.5640	.8258	.6830	1.4641	40
30	.5664	.8241	.6873	1.4550	30
40	.5688	.8225	.6916	1.4460	20
50	.5712	.8208	.6959	1.4370	10
35° 00'	.5736	.8192	.7002	1.4281	55° 00'
10	.5760	.8175	.7046	1.4193	50
20	.5783	.8158	.7089	1.4106	40
30	.5807	.8141	.7133	1.4019	30
40	.5831	.8124	.7177	1.3934	20
50	.5854	.8107	.7221	1.3848	54° 10
	cos θ	sin θ	cot θ	tan θ	deg
	When deg=54° 10' ~66° 00'				θ

θ	When deg=36° 00' ~45° 00'				
deg	sin θ	cos θ	tan θ	cot θ	
36° 00'	.5878	.8090	.7265	1.3764	54° 00'
10	.5901	.8073	.7310	1.3680	50
20	.5925	.8056	.7355	1.3597	40
30	.5948	.8039	.7400	1.3514	30
40	.5972	.8021	.7445	1.3432	20
50	.5995	.8004	.7490	1.3351	10
37° 00'	.6018	.7986	.7536	1.3270	53° 00'
10	.6041	.7969	.7581	1.3190	50
20	.6065	.7951	.7627	1.3111	40
30	.6088	.7934	.7673	1.3032	30
40	.6111	.7916	.7720	1.2954	20
50	.6134	.7898	.7766	1.2876	10
38° 00'	.6157	.7880	.7813	1.2799	52° 00'
10	.6180	.7862	.7860	1.2723	50
20	.6202	.7844	.7907	1.2647	40
30	.6225	.7826	.7954	1.2572	30
40	.6248	.7808	.8002	1.2497	20
50	.6271	.7790	.8050	1.2423	10
39° 00'	.6293	.7771	.8098	1.2349	51° 00'
10	.6316	.7753	.8146	1.2276	50
20	.6338	.7735	.8195	1.2203	40
30	.6361	.7716	.8243	1.2131	30
40	.6383	.7698	.8292	1.2059	20
50	.6406	.7679	.8342	1.1988	10
40° 00'	.6428	.7660	.8391	1.1918	50° 00'
10	.6450	.7642	.8441	1.1847	50
20	.6472	.7623	.8491	1.1778	40
30	.6494	.7604	.8541	1.1708	30
40	.6517	.7585	.8591	1.1640	20
50	.6539	.7566	.8642	1.1571	10
41° 00'	.6561	.7547	.8693	1.1504	49° 00'
10	.6583	.7528	.8744	1.1436	50
20	.6604	.7509	.8796	1.1369	40
30	.6626	.7490	.8847	1.1303	30
40	.6648	.7470	.8899	1.1237	20
50	.6670	.7451	.8952	1.1171	10
42° 00'	.6691	.7431	.9004	1.1106	48° 00'
10	.6713	.7412	.9057	1.1041	50
20	.6734	.7392	.9110	1.0977	40
30	.6756	.7373	.9163	1.0913	30
40	.6777	.7353	.9217	1.0850	20
50	.6799	.7333	.9271	1.0786	10
43° 00'	.6820	.7314	.9325	1.0724	47° 00'
10	.6841	.7294	.9380	1.0661	50
20	.6862	.7274	.9435	1.0599	40
30	.6884	.7254	.9490	1.0538	30
40	.6905	.7234	.9545	1.0477	20
50	.6926	.7214	.9601	1.0416	10
44° 00'	.6947	.7193	.9657	1.0355	46° 00'
10	.6967	.7173	.9713	1.0295	50
20	.6988	.7153	.9770	1.0235	40
30	.7009	.7133	.9827	1.0176	30
40	.7030	.7112	.9884	1.0117	20
50	.7050	.7092	.9942	1.0058	10
45° 00'	.7071	.7071	1.0000	1.0000	45° 00'
	cos θ	sin θ	cot θ	tan θ	deg
	When deg=45° 00' ~54° 00'				θ

How to Obtain Trigonometrical Functions from the Chart

When deg. (degree) is between 0° 00' and 45° 00'

①Locate the target deg. value in the **left-handed side θ column**.
②Check the required type of trigonometrical function in the chart's **top row**, and obtain the real number corresponding to the deg. value from the appropriate column.

ex.) sin 5° = 0.0872
cos5° = 0.9962
tan5° = 0.0875
cot 5° =11.430

When deg. (degree) is between 45° 00' and 90° 00'

①Locate the target deg. value in the **right most column**.
②Check the required type of trigonometrical function in the chart's **bottom row**, and obtain the real number corresponding to the deg. value from the appropriate column.

ex.) sin 85° = 0.9962
cos85° = 0.0872
tan 85° =11.430
cot 85° = 0.0875

If the deg value contains any fractions, convert it into a degree and minute value.
ex.) 5.5° stands for 5° 30' (5 degrees 30 minutes). (1 degree=60 minutes)

■Carbon steels for machine structual use and Alloy steel

Japan Industrial Standards		Steel types related to foreign standards					
Standard number Name	Code	ISO 683/1,10,11[5]	AISI SAE	BS 970 Part1,3 BS EN 10083−1,2	DIN EN 10084 DIN EN 10083−1,2	NF A35−551 NF EN 10083−1,2	ГОСТ 4543
JIS G 4051 Carbon steel for machine structual use	S10C	C10	1010	040A10 045A10 045M10	C10E C10R	XC10	—
	S12C	—	1012	040A12	—	XC12	—
	S15C	C15E4 C15M2	1015	055M15	C15E C15R	—	—
	S17C	—	1017	—	—	XC18	—
	S20C	—	1020	070M20 C22 C22E C22R	C22 C22E C22R	C22 C22E C22R	—
	S22C	—	1023	—	—	—	—
	S25C	C25 C25E4 C25M2	1025	C25 C25E C25R	C25 C25E C25R	C25 C25E C25R	—
	S28C	—	1029	—	—	—	25Г
	S30C	C30 C30E4 C30M2	1030	080A30 080M30 C30 C30E C30R	C30 C30E C30R	C30 C30E C30R	30Г
	S33C	—	—	—	—	—	30Г
	S35C	C35 C35E4 C35M2	1035	C35 C35E C35R	C35 C35E C35R	C35 C35E C35R	35Г
	S38C	—	1038	—	—	—	35Г
	S40C	C40 C40E4 C40M2	1039 1040	080M40 C40 C40E C40R	C40 C40E C40R	C40 C40E C40R	40Г
	S43C	—	1042 1043	080A42	—	—	40Г
	S45C	C45 C45E4 C45M2	1045 1046	C45 C45E C45R	C45 C45E C45R	C45 C45E C45R	45Г
	S48C	—	—	080A47	—	—	45Г
	S50C	C50 C50E4 C50M2	1049	080M50 C50 C50E C50R	C50 C50E C50R	C50 C50E C50R	50Г
	S53C	—	1050 1053	—	—	—	50Г
	S55C	C55 C55E4 C55M2	1055	070M55 C55 C55E C55R	C55 C55E C55R	C55 C55E C55R	—
	S58C	C60 C60E4 C60M2	1059 1060	C60 C60E C60R	C60 C60E C60R	C60 C60E C60R	60Г
	S09CK	—	—	045A10 045M10	C10E	XC10	—
	S15CK	—	—	—	C15E	XC12	—
	S20CK	—	—	—	—	XC18	—
JIS G 4102 Nickel-chrome steel	SNC236	—	—	—	—	—	40XH
	SNC415	—	—	—	—	—	—
	SNC631	—	—	—	—	—	30XH3A
	SNC815	15NiCr13	—	655M13	15NiCr13		—
	SNC836	—	—	—	—	—	—
JIS G 4103 Nickel-chrome molybdenum steel	SNCM220	20NiCrMo2 20NiCrMoS2	8615 8617 8620 8622	805A20 805M20 805A22 805M22	20NiCrMo2 20NiCrMo2	20NCD2	—
	SNCM240	41CrNiMo2 41CrNiMoS2	8637 8640	—	—	—	—
	SNCM415	—	—	—	—	—	—
	SNCM420	—	4320	—	—	—	20XH2M(20XHM)
	SNCM431	—	—	—	—	—	—
	SNCM439	—	4340	—	—	—	—
	SNCM447	—	—	—	—	—	—
	SNCM616	—	—	—	—	—	—
	SNCM625	—	—	—	—	—	—
	SNCM630	—	—	—	—	—	—
	SNCM815	—	—	—	—	—	—
JIS G 4104 Chrome steel	SCr415	—	—	—	17Cr3 17CrS3	—	15X 15XA
	SCr420	20Cr4 20CrS4	5120	—	—	—	20X
	SCr430	34Cr4 34CrS4	5130 5132	34Cr4 34CrS4	34Cr4 34CrS4	34Cr4 34CrS4	30X
	SCr435	34Cr4 34CrS4 34Cr4 34CrS4	5132	37Cr4 37CrS4	37Cr4 37CrS4	37Cr4 37CrS4	35X
	SCr440	37Cr4 37CrS4 41Cr4 41CrS4	5140	530M40 41Cr4 41CrS4	41Cr4 41CrS4	41Cr4 41CrS4	40X
	SCr445	—	—	—	—	—	45X
JIS G 4105 Chrome molybdenum steel	SCM415	—	—	—	—	—	—
	SCM418	18CrMo4 18CrMoS4	—	—	18CrMo4 18CrMoS4	—	20XM
	SCM420	—	—	708M20	—	—	20XM
	SCM421	—	—	—	—	—	—
	SCM430	—	4131	—	—	—	20XM 30XMA
	SCM432	—	—	—	—	—	—
	SCM435	34CrMo4 34CrMoS4	4137	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	35XM
	SCM440	42CrMo4 42CrMoS4	4140 4142	708M40 709M40 42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	—
	SCM445	—	4145 4147	—	—	—	—
	SCM822	—	—	—	—	—	—

※ISO (International Standard), AISI (USA), BS (UK), DIN (Germany), NF (France), ГОСТ (Russia)

Japan Industrial Standards		Steel types related to foreign standards					
Standard number Name	Code	ISO 683/1,10,11[5]	AISI SAE	BS 970 Part1,3 BS EN 10083−1,2	DIN EN 10084 DIN EN 10083−1,2	NF A35−551 NF EN 10083−1,2	ГОСТ 4543
JIS G 4106 Structual manganese steel for machine Structual use and manganese chrome steel	SMn420	22Mn6	1522	150M19	—	—	—
	SMn433	—	1534	150M36	—	—	30Г2 35Г2
	SMn438	36Mn6	1541	150M36	—	—	35Г2 40Г2
	SMn443	42Mn6	1541	—	—	—	40Г2 45Г2
	SMnC420	—	—	—	—	—	—
	SMnC443	—	—	—	—	—	—
JIS G 4202 Aluminum chrome molybdenum steel	SACM645	41CrAlMo74	—	—	—	—	—
JIS G 4052 Structual steel with guaranteed hardenability (H steel)	SMn420H	22Mn6	1522H	—	—	—	—
	SMn433H	—	—	—	—	—	—
	SMn438H	36Mn6	1541H	—	—	—	—
	SMn443H	42Mn6	1541H	—	—	—	—
	SMnC420H	—	—	—	—	—	—
	SMnC443H	—	—	—	—	—	—
	SCr415H	—	—	—	17Cr3 17CrS3	—	15X
	SCr420H	20Cr4 20CrS4	5120H	—	—	—	20X
	SCr430H	34Cr4 34CrS4	5130H 5132H	34Cr4 34CrS4	34Cr4 34CrS4	34Cr4 34CrS4	30X
	SCr435H	34Cr4 34CrS4 37Cr4 37CrS4	5135H	37Cr4 37CrS4	37Cr4 37CrS4	37Cr4 37CrS4	35X
	SCr440H	37Cr4 37CrS4 41Cr4 41CrS4	5140H	41Cr4 41CrS4	41Cr4 41CrS4	41Cr4 41CrS4	40X
	SCM415H	—	—	—	—	—	—
	SCM418H	18CrMo4 18CrMoS4	—	—	18CrMo4 18CrMoS4	—	—
	SCM420H	—	—	708H20	—	—	—
	SCM435H	34CrMo4 34CrMoS4	4135H 4137H	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	—
	SCM440H	42CrMo4 42CrMoS4	4140H 4142H	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	—
	SCM445H	—	4145H 4147H	—	—	—	—
	SCM822H	—	—	—	—	—	—
	SNC415H	—	—	—	—	—	—
	SNC631H	—	—	—	—	—	—
	SNC815H	15NiCr13	—	655H13	15NriCr13	—	—
	SNCM220H	20NiCrMo2 20NiCrMoS2	8617H 8620H 8622H	805H17 805H20 805H22	—	20NCD2	—
	SNCM420H	—	4320H	—	—	—	—
JIS G 4107 High-temperature alloy steel for bolts	SNB5	—	501	BS1506−625	—	—	—
	SNB7	42CrMo4 42CrMoS4	4140 4142 4145	708M40 709M40 42CrMo4[1]	42CrMo4[2]	42CrMo4[4]	—
	SNB16	—	—	40CrMoV4−6[1]	40CrMoV47[3]	40CrMoV4−6[4]	—
JIS G 4108 Steel bar for special-purpose alloy steel bolt	SNB21−1~5	—	—	40CrMoV4−6[1]	40CrMoV47[3]	40CrMoV4−6[4]	—
	SNB22−1~5	42CrMo4 42CrMoS4	4142H	—	42CrMo4[2]	—	—
	SNB23−1~5	—	E4340H	—	—	—	—
	SNB24−1~5	—	4340	—	—	—	—

※1) BS EN 10259
2) DIN 1654 Part 4
3) DIN 17240
4) NF EN 10259
5) The translation JIS of ISO683−1, 10, and 11 are issued as JIS G 7501, G7502, and G7503.

Name of tool steel

Rolled steel for general structure	SS400…… Steel・Structure・400N/mm²
Carbon steel for machine structure	S45C…… Steel・0.45%C
Chrome molybdenum steel	SCM435…… Steel・Cr・Mo 435
Nickel chrome molybdenum steel	SNCM220… Steel・Ni・Cr・Mo 220
Carbon tool steel	SK105…… Steel・Tool・105 types (Previous SK3)
Alloy tool steel	SKS3…… Steel・Tool・Special・3 types
〃	SKD11…… Steel・Tool・Dies・11 types
High-speed tool steel	SKH51…… Steel・Tool・High Speed・51 types
High-carbon chrome bearing steel	SUJ2…… Steel・Use・Bearing・2 types
Stainless steel	SUS304…… Steel・Use・Stainless・304 types
Gray Cast iron	FC250…… Ferrum (Steel)・Cast・250N/mm²

■Stainless steels・Heat resisting steels and related materials

Japan Industrial Standards		International Standards	Foreign standards							European Standards	
JIS Number・Name (Stainless steel is omitted)	JIS	ISO TR 15510 L・No.	USA UNS	USA AISI	UK BS	Germany DIN	France NF	Russia (Old Soviet Union) ГOCT	EN Category	EN Number
JIS G 4303～	**SUS 201**	12	S20100	201			Z12CMN17-07Az		X12CrMnNiN17-7-5	1.4372
4305	**SUS 202**		S20200	202	284S16			12Х17Г9АН4	X12CrMnNiN18-9-5	1.4373
Bar	**SUS 301**	5	S30100	301	301S21	X12CrNi17 7	Z11CN17-08	07X16H6	X5CrNi17-7	1.4319
Hot-rolled plate and band	**SUS 301L**	4				X2CrNiN18-7			X2CrNiN18-7	1.4318
Cold-rolled plate and band	**SUS 301J1**					X12CrNi17 7				
JIS G 4308～	**SUS 302**		S30200	302	302S25		Z12CN18-09	12Х18Н9		
4309	**SUS 302B**		S30215	302B						
Wire rod	**SUS 303**	13	S30300	303	303S21	X10CrNiS18 9	Z8CNF18-09		X8CrNiS18-9	1.4305
Wire	**SUS 303Se**		S30323	303Se	303S41			12Х18Н10Е		
	SUS 303Cu									
JIS G 4313～	**SUS 304**	6	S30400	304	304S31	X5CrNi18 10	Z7CN18-09	08Х18Н10	X4CrNi18-10	1.4301
4315	**SUS 304L**	1	S30403	304L	304S11	X2CrNi19 11	Z3CN19-11	03Х18Н11	X2CrNi19-11	1.4307
		2								1.4307
Band for spring	**SUS 304N1**	10	S30451	304N			Z6CN19-09Az		X2CrNi18-9	1.4306
Wire for spring	**SUS 304N2**		S30452							
Wires for cold forging	**SUS 304LN**	3	S30453	304LN		X2CrNiN18 10	Z3CN18-10Az		X2CrNiN18-10	1.4311
JIS G 4317～	**SUS 304J1**									
4320	**SUS 304J2**									
Hot-rolled equilateral angle iron	**SUS 304J3**		S30431	S30431						
Cold finishing bar	**SUS 305**	8	S30500	305	305S19	X5CrNi18 12	Z8CN18-12	06Х18Н11	X4CrNi18-12	1.4303
Billet for tempered steel product	**SUS 305J1**									
Cold forming equilateral angle iron	**SUS 309S**	X6CrNi23-14	S30908	309S			Z10CN24-13			
	SUS 310S	X6CrNi25-21	S31008	310S	310S31		Z8CN25-20	10Х23Н18	X6CrNi25-20	
	SUS 315J1									
	SUS 315J2									
	SUS 316	26	S31600	316	316S31	X5CrNiMo17 12 2	Z7CND17-12-02		X4CrNiMo17-12-2	1.4401
	SUS 316F	27				X5CrNiMo17 13 3	Z6CND18-12-03		X4CrNiMo17-13-3	1.4436
	SUS 316L	19	S31603	316L	316S11	X2CrNiMo17 13 2	Z3CND17-12-02		X2CrNiMo17-12-2	1.4404
		20				X2CrNiMo17 14 3	Z3CND17-13-03	03Х17Н14М3	X2CrNiMo17-13-3	1.4432
									X2CrNiMo18-14-3	1.4435
	SUS 316N		S31651	316N						
	SUS 316LN	22	S31653	316LN		X2CrNiMoN17 12 2	Z3CND17-11Az		X2CrNiMoN17-11-2	1.4406
		23				X2CrNiMoN17 13 3	Z3CND17-12Az		X2CrNiMoN17-13-3	1.4429
	SUS 316Ti	28	S31635			X6CrNiMoTi17 12 2	Z6CNDT17-12	08Х17Н13М2Т	X6CrNiMoTi17-12-2	1.4571
	SUS 316J1									
	SUS 316J1L									
	SUS 317		S31700	317	317S16					
	SUS 317L	21	S31703	317L	317S12	X2CrNiMo18 16 4	Z3CND19-15-04		X2CrNiMo18-15-4	1.4438
	SUS 317LN	24	S31753				Z3CND19-14Az		X2CrNiMoN18-12-4	1.4434
	SUS 317J1								X2CrNiMoN17-13-5	1.4439
	SUS 317J2									
	SUS 317J3L									
	SUS 836L		N08367							
	SUS 890L	31	N08904	N08904	904S14		Z2NCDU25-20		X1CrNiMoCuN25-25-5	1.4539
	SUS 321	15	S32100	321	321S31	X6CrNiTi18 10	Z6CNT18-10	08Х18Н10Т	X6CrNiTi18 10	1.4541
	SUS 347	17	S34700	347	347S31	X6CrNiNb18 10	Z6CNNb18-10	08Х18Н12Б	X6CrNiNb18 10	1.4550
	SUS 384	9	S38400	384			Z6CN18-16			
	SUS XM7	D26(1)	S30430	304Cu	394S17		Z2CNU18-10		X3CrNiCu18-9-4	1.4587
	SUS XM15J1		S38100				Z15CNS20-12		X1CrNiSi18-15-4	1.4381
	SUS 329J1		S32900	329						
	SUS 329J3L	33	S39240	S31803			Z3CNDU22-05Az	08Х21Н6М2Т	X2CrNiMoN22-5-3	1.4462
	SUS 329J4L	34	S39275	S31260			Z3CNDU25-07Az		X2CrNiMoCuN25-6-3	1.4507
	SUS 405	40	S40500	405	405S17	X6CrAl13	Z8CA12		X6CrAl13	1.4002
	SUS 410L						Z3C14			
	SUS 429		S42900	429						
	SUS 430	41	S43000	430	430S17	X6Cr17	Z8C17	12Х17	X6Cr17	1.4016
	SUS 430F	42	S43020	430F		X7CrMoS18	Z8CF17		X6CrMoS17	1.4105
	SUS 430LX	44	S43035			X6CrTi17	Z4CT17		X3CrTi17	1.4510
						X6CrNb17			X2CrTi17	1.4520
	SUS 430J1L						Z4CNb17		X3CrNb17	1.4511
	SUS 434	43	S43400	434	434S17	X6CrMo17 1	Z8CD17-01		X6CrMo17-1	1.4113
	SUS 436L		S43600	436					X1CrMoTi16-1	1.4513
	SUS 436J1L									
	SUS 444	46	S44400	444			Z3CDT18-02		X2CrMoTi18-2	1.4521
	SUS 445J1									
	SUS 445J2									
	SUS 447J1		S44700							
	SUS XM27		S44627				Z1CD26-01			
	SUS 403		S40300	403						
	SUS 410	48	S41000	410	410S21	X10Cr13	Z13C13		X12Cr13	1.4006
	SUS 410S	39	S41008	410S	403S17	X6Cr13	Z8C12	08Х13	X6Cr13	1.4000
	SUS 410F2									
	SUS 410J1		S41025							
	SUS 416	49	S41600	416	416S21		Z11CF13		X12CrS13	1.4005
	SUS 420J1	50	S42000	420	420S29	X20Cr13	Z20C13	20Х13	X20Cr13	1.4021
	SUS 420J2	51	S42000	420	420S37	X30Cr13	Z33C13	30Х13	X30Cr13	1.4028
	SUS 420F		S42020	420F			Z30CF13		X29CrS13	1.4029
	SUS 420F2									
	SUS 429J1									
	SUS 431	57	S43100	431	431S29	X20CrNi17 2	Z15CN16-02	20Х17Н2	X19CrNi17 2	1.4057
	SUS 440A		S44002	440A			Z70C15		X70CrMo15	1.4109
	SUS 440B		S44003	440B						
	SUS 440C		S44004	440C			Z100CD17	95Х18	X105CrMo17	1.4125
	SUS 440F		S44020	S44020						
	SUS 630	58	S17400	S17400			Z6CNU17-04		X5CrNiCuNb16-4	1.4542
	SUS 631	59	S17700	S17700		X7CrNiAl17 7	Z9CNA17-07	09Х17Н7Ю	X7CrNiAl17-7	1.4568
	SUS 632J1									
JIS G 4311～	**SUH 31**				331S42		Z35CNWS14-14	45Х14Н14В2М		
4315	**SUH 35**	X53CrMnNi21 4 (2)			349S52		Z52CMN21-09Az			
Heat resisting steel bar										
Heat resisting steel plate	**SUH 36**		S63008		349S54	X53CrMnNi21 9	Z55CMN21-09Az	55Х20Г9АН4		
	SUH 37		S63017		381S34					
	SUH 38									
	SUH 309		S30900	309	309S24		Z15CN24-13			
	SUH 310		S31000	310	310S24	CrNi2520	Z15CN25-20	20Х25Н20С2		
	SUH 330		N08330	N08330			Z12NCS35-16			
	SUH 660		S66286				Z6NCTV25-20			
	SUH 661		R30155							
	SUH 21					CrAl1205				
	SUH 409	37	S40900	409	409S19	X6CrTi12	Z6CT12			
	SUH 409L	36					Z3CT12		X2CrTi12	1.4512
	SUH 446	X15CrN26(3)	S44600	446			Z12C25	15Х28		
	SUH 1	X45CrSi9-3(2)	S65007		401S45	X45CrSi9 3	Z45CS9			
	SUH 3						Z40CSD10	40Х10С2М		
	SUH 4				443S65		Z80CSN20-02			
	SUH 11	X50CrSi18-2(2)						40Х 9С2		
	SUH 600							20Х12ВНМБ ф г		
	SUH 616		S42200							

Remark 1. The ISO is based on the ISO TR 15510：1997. The code is same as the EN expression. However, (1) is based on the ISO 4954, and (2) is based on the ISO 683・15.
2. For USA, UNS registration numbers and AISI steel manuals are referred.
3. European standards are based on the EN10088—1： 1995
4. For European countries, BS, DIN, NF, etc, has been referred, but the specifications of each country will be abolished by the EN enactment.
5. ГOCT is based on 5632.

■Tool steels and related materials

Japan Industrial Standards		Steel types related to foreign standards					
JIS number・name	Symbol	ISO	AISI ASTM	BS	DIN VDEh	NF	ГOCT
JIS G 4401 Carbon tool steel	SK140 (Previous select SK1)	TC140	—	—	—	C140E3U	Y13
	SK120 (Previous select SK2)	TC120	W1—11½	—	—	C120E3U	Y12
	SK105 (Previous select SK3)	TC105	W1—10	—	C105W1	C105E2U	Y11
	SK95 (Previous select SK4)	TC 90	W1— 9	—	—	C 90E2U	Y10
	SK85 (Previous select SK5)	TC 90 TC 80	W1— 8	—	C 80W1	C 90E2U C 80E2U	Y8Г Y9
	SK75 (Previous select SK6)	TC 80 TC 70	—	—	C 80W1	C 80E2U C 70E2U	Y8
	SK65 (Previous select SK7)	—	—	—	C 70W2	C 70E2U	Y7
JIS G 4403 High speed tool steel	SKH 2	HS18—0—1	T 1	BT 1	—	HS18—0—1	P18
	SKH 3	HS18—1—1—5	T 4	BT 4	S18—1—2—5	HS18—1—1—5	—
	SKH 4	HS18—0—1—10	T 5	BT 5	—	HS18—0—2—9	—
	SKH10	HS12—1—5—5	T15	BT15	S12—1—4—5	HS12—1—5—5	—
	SKH51	HS 6—5—2	M2	BM 2	S 6—5—2	HS 6—5—2	—
	SKH52	—	M3—1	—	—	—	—
	SKH53	HS 6—5—3	M3—2	—	S 6—5—3	HS 6—5—3	—
	SKH54	—	M4	BM 4	—	HS 6—5—4	—
	SKH55	HS 6—5—2—5	—	BM35	S 6—5—2—5	HS6—5—2—5HC	P6M5K5
	SKH56	—	M36	—	—	—	—
	SKH57	HS10—4—3—10	—	BT42	S10—4—3—10	HS10—4—3—10	—
	SKH58	HS 2—9—2	M7	—	—	HS 2—9—2	—
	SKH59	HS 2—9—1—8	M42	BM42	S 2—10—1—8	HS 2—9—1—8	—
JIS G 4404 Alloy tool steel	SKS11	—	F2	—	—	—	XB4
	SKS 2	105WCr1	—	—	105WCr6	105WCr5	XBГ
	SKS21	—	—	—	—	—	—
	SKS 5	—	—	—	—	—	—
	SKS51	—	L6	—	—	—	—
	SKS 7	—	—	—	—	—	—
	SKS 8	—	—	—	—	C140E3UCr4	13X
	SKS 4	—	—	—	—	—	—
	SKS41	—	—	—	—	—	—
	SKS43	TCV105	W2—9½	BW2	—	100V2	—
	SKS44	—	W2—8	—	—	—	—
	SKS 3	—	—	—	—	—	9XBГ
	SKS31	105WCr1	—	—	105WCr6	105WCr5	XBГ
	SKS93	—	—	—	—	—	—
	SKS94	—	—	—	—	—	—
	SKS95	—	—	—	—	—	—
	SKD 1	210Cr12	D3	BD3	X210Cr12	X200Cr12	X12
	SKD11	—	D2	BD2	—	X160CrMoV12	—
	SKD12	100CrMoV5	A2	BA2	—	X100CrMoV5	—
	SKD 4	30WCrV5	—	—	—	X32WCrV3	—
	SKD 5	30WCrV9	H21	BH21	—	X30WCrV9	—
	SKD 6	—	H11	BH11	X38CrMoV51	X38CrMoV5	4Х5М ф С
	SKD61	40CrMoV5	H13	BH13	X40CrMoV51	X40CrMoV5	4Х5М ф 1С
	SKD62	—	H12	BH12	—	X35CrWMoV5	3Х3М3 ф
JIS G 4404 (Continued)	**SKD 7**	30CrMoV3	H10	BH10	X32CrMoV33	32CrMoV12—18	—
	SKD 8	—	H19	BH19	—	—	—
	SKT 3	—	—	—	—	55CrNiMoV4	—
	SKT 4	55NiCrMoV2	—	BH224/5	55NiCrMoV6	55NiCrMoV7	5ХНМ

Special purpose steels

Japan Industrial Standards		Steel types related to foreign standards					
JIS number・name	Symbol	ISO	AISI SAE	BS	DIN	NF	ГOCT
JIS G 4801 Spring steel	**SUP 3**	—	1075 1078	—	—	—	75 80 85
	SUP 6	59Si7	—	—	—	60Si7	60С2
	SUP 7	59Si7	9260	—	—	60Si7	60С2Г
	SUP 9	55Cr3	5155	—	55Cr3	55Cr3	—
	SUP 9A	—	5160	—	—	60Cr3	—
	SUP10	51CrV4	6150	735A51,735H51	50CrV4	51CrV4	ХфА50ХГфА
	SUP11A	60CrB3	51B60	—	—	—	50ХГР
	SUP12	55SiCr63	9254	685A57,685H57	54SiCr6	54SiCr6	—
	SUP13	60CrMo33	4161	705A60,705H60	—	60CrMo4	—
JIS G 4804 Sulfur and sulfur combined free cutting steel	**SUM11**	—	1110	—	—	—	—
	SUM12	—	1108	—	—	—	—
	SUM21	9 S20	1212	—	—	—	—
	SUM22	11SMn28	1213	(230M07)	9 SMn28	S250	—
	SUM22L	11SMnPb28	12L13	—	9 SMnPb28	S250Pb	—
	SUM23	—	1215	—	—	—	—
	SUM23L	—	—	—	—	—	—
	SUM24L	11SMnPb28	12L14	—	9 SMnPb28	S250Pb	—
	SUM25	12SMn35	—	—	9 SMn36	S300	—
	SUM31	—	1117	—	15S10	—	—
	SUM31L	—	—	—	—	—	—
	SUM32	—	—	210M15,210A15	—	(13MF4)	—
	SUM41	—	1137	—	—	(35MF6)	—
	SUM42	—	1141	—	—	(45MF6.1)	—
	SUM43	44SMn28	1144	(226M44)	—	(45MF6.3)	—
JIS G 4805 High-carbon chrome bearing steel	**SUJ 1**	—	51100	—	—	—	—
	SUJ 2	B1or 100Cr6	52100	—	100Cr6	100Cr6	ЩХ15
	SUJ 3	B2 or 100CrMnSi4-4	ASTM A 485 Grade 1	—	—	—	—
	SUJ 4	—	—	—	—	—	—
	SUJ 5	—	—	—	—	—	—

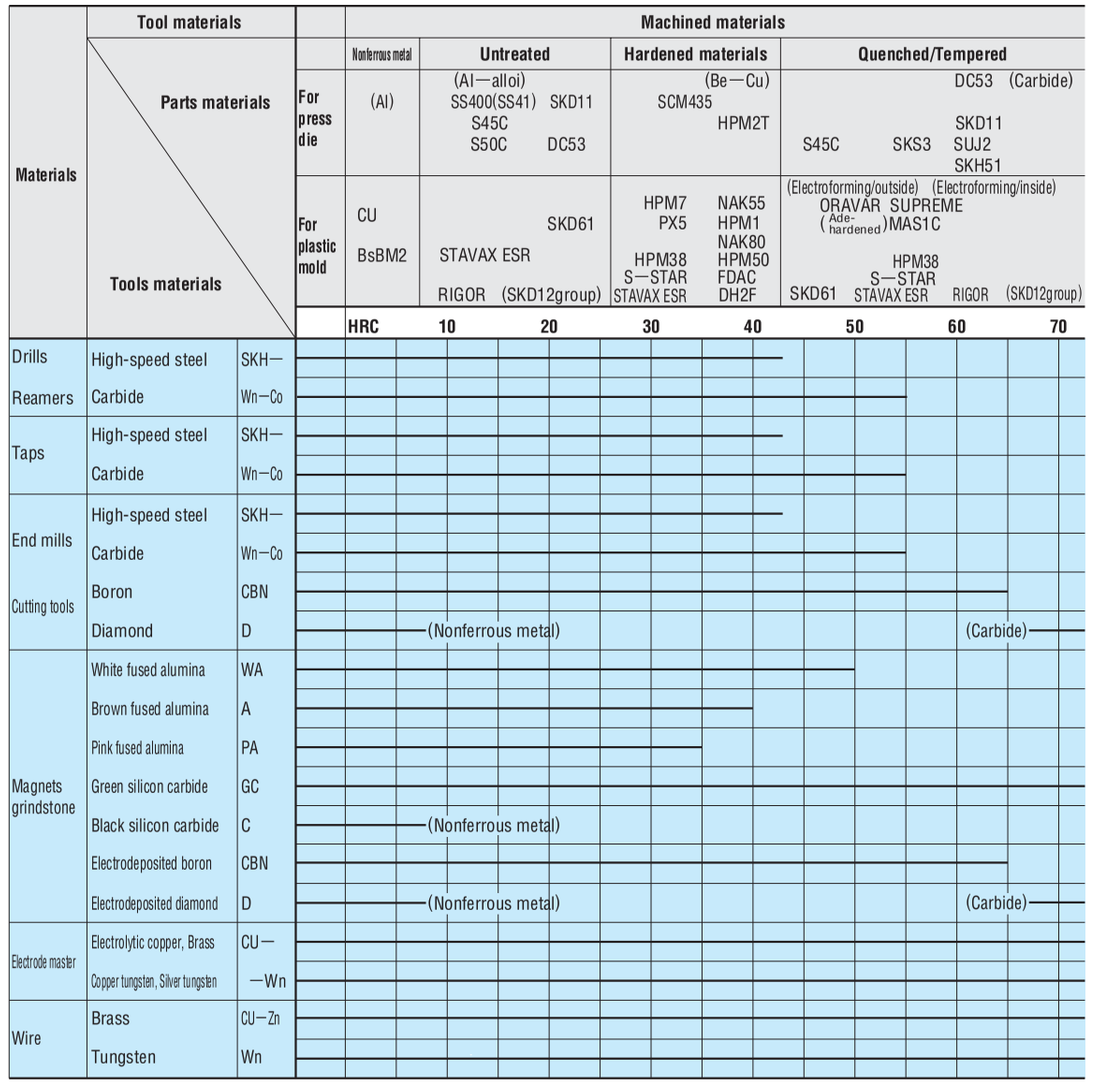
■COMPARISON OF DIE STEEL BY MANUFACTURERS

Category	International Standards related symbols				Hitachi Metals, Ltd.	Aichi Steel Works., Ltd.	Kobe Steel Co., Ltd.	Sanyo Special Steel Co., Ltd.	Daido Steel Co., Ltd.	Nippon Koshuha Steel Co., Ltd.	Nachi-Fujikoshi Corp.	Riken Seiko Co., Ltd.	Uddeholm (Sweden)	Bohler (Germany)
	JIS	AISI	DIN	ISO										
Carbon tool steel	SK105 (Previous select SK3)	W1-10		TC105	YC3	SK3		QK3	YK3	K3				K990
Alloy tool steel	SKS93				YCS3	SK301		QKSM	YK30	K3M	SK3M			
	SKS3				SGT	SKS3		QKS3	GOA	KS3	SKS3	RS3	ARNE	K460
	SKD1	D3		X210Cr12	CRD	SKD1		QC1	DC1	KD1			SVERKER3	K100 K107
	SKD11	D2	X210Cr12	X210Cr12W12	SLD	SKD11		QC11	DC11	KD11	CDS11	RD11	SVERKER21	K105 K110
	SKD11 (Modification)				SLD8 SLD10	AUD15		QCM8 QCM10	DC53	KD11S KD21	MDS9		SLEIPNER	K340
	CrSKD in matrix group				ARK1	SXACE		QCM7	DCX					
	SKD12			X100CrMoV5	SCD	SKD12			DC12	KD12			RIGOR	K305
	Preharden 40HRC	A2			HPM2T				GO40F	KAP65			IMPAX	
	Preharden 50HRC or more				PRE2				CX1	RC55				
	Flame-hardened steel				HMD5 HMD1	SX105V SX4		QF3	GO5	FH5			FERNO	
	Low temperature air-cooled steel				ACD37	AKS3			GO4	KSM				
	High-impact steel				YSM	AKS4		QF1	GS5	KTV5	SRS6		PREGA COMPAX	K630
	Others				ACD8	AUD11 SX5 SX44					ICS22 MCR1		CALMAX VIKING ELMAX VANADIS4 VANADIS6 VANADIS10	K190
High-speed tool steel	SKH51	M2	H6.5.2	HS6—5—2	YXM1			QH51	MH51	H51	SKH9	RHM1		S600
	SKH55 group		S6.2.5	HS6—5—2—5	YXM4				MH55	HM35	HM35 HS53M	RHM5		S705
	SKH57 group		S10—4—3—10	HS10—4—3—10	XVC5				MH8	MV10	HS93R HS98M FM38V	RHM7		S700
	Matrix group				YXR33 YXR3 YXR7			QHZ	MH85 MH88	KXM KMX2 KMX3	MDS1 MDS3 MDS7 MATRIX2 ATM3			
Powdered high-speed tool steel	SKH40			HS6—5—3—8	HAP40		KHA30		DEX40		FAX38		ASP30	S590
	Matrix group				HAP5R		KHA3VN		DEX—M1 DEX—M3					
	Others				HAP10									S690
							KHA32	SPM23	DEX21		FAX31		ASP23	S790
					HAP50				DEX60					S390
									DEX61		FAX55			
					HAP72		KHA60	SPM60	DEX80		FAXG1		ASP60	
							KHA77				FAX18			
											FAXG2			
							KHA30N							
							KHA33N							
							KHA3NH							
							KHA5NH							

Reference material："Special steel" November 2001

Matrix group：The tool steel type that accelerates tool wear at cutting and enhances its toughness

Processing method		Equipment	Required tools
Cutting	Boring on flanks and bottom	General purpose milling cutter NC milling cutter Machining center	Drills Reamers End mills Cutting tools
	Boring	Drilling machine Drill press Boring machine Jig borer	Drills Taps Reamers Cutting tools
	Machining cylinder	General purpose lathe NC lathe Turning center	Drills Reamers Taps Cutting tools
Grinding		Surface grinder Cylindrical grinder Jig grinder Profile grinder Forming grinder	Magnets grindstone
Electroerosion		E D M	Electrode master
		W E D M	Wire



BUSINESS INFORMATION

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Competitiveness of MISUMI

Specialists

All products in the catalog are the result of the ideas and demands of customers.

Free CAD DATA

Just pick out part numbers from the catalog.
You can dramatically cut the time needed for preparing chart data.

Top Quality

MISUMI collects individual orders and concentrates production at special factories for each product.
MISUMI guarantees reliable, high quality and on-time delivery.

Published Price

All MISUMI prices are published in our catalog.
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No need to screen suppliers.

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Shows drawings, size, materials and surface treatment.
All necessary information in one catalog. Reduce unnecessary machining.

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There are 400 cooperating manufacturers around the world which have been carefully selected as outstanding suppliers for each product line.

One-Stop Shopping

All 275,000 standardized products are developed based on customers' demands.

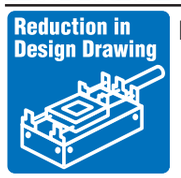
Reliable Delivery

Delivery compliance rate =99.97%
No need to monitor delivery.

No Minimum Order Quantity

We securely deliver everything.
Even just a single piece!

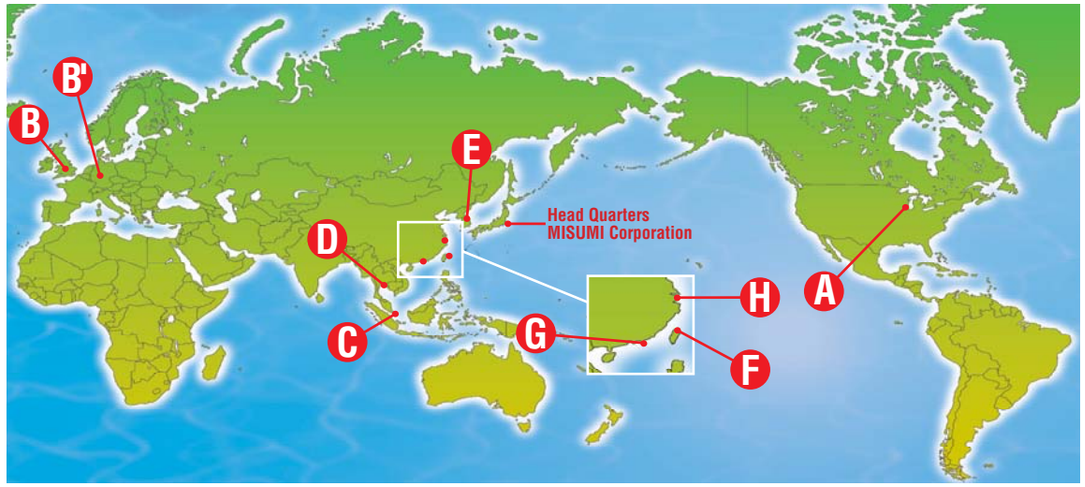
Reduction in Design Drawing



No need to make a parts list.

World Network

–Provide same products and service to anywhere in the world–



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(H) Shanghai MISUMI Precision Machinery Co., Ltd.	TEL: 86-21-6391-7301 FAX: 86-21-6391-7360	http://www.misumi.com.cn/ misumi@misumi.sh.cn	16th Floor JinLingHaiXin Building, No.666 FuzhouRoad, Shanghai 200001 P.R. China	China
HEAD QUARTERS MISUMI CORPORATION Press Die Components Division	TEL: 81-3-3647-7114 FAX: 81-3-3647-7030	http://www.misumi.co.jp	4-43, 2-chome Toyo, Koto-ku, Tokyo, 135-8458 JAPAN	Japan

1 How to Order

To open an account with MISUMI, please call our subsidiaries representing your country or region for an application form. Our subsidiaries will send you the necessary information of trading with MISUMI. If you have an account with us, please fax our order form with a complete description of the products directly to our subsidiary.

2 Quantity

There is no minimum order quantity. You can even order one piece.

3 Price

We are aiming to distribute our products at the catalog price all over the world, but considering tax or foreign exchange, prices are adjusted to each region. Contact our subsidiary for details. We have a volume discount rate system for many products.

4 Delivery

"Delivery" in the catalog is the lead time to ship your order from MISUMI distribution center. *Delivery stipulated in catalog might delay depending on the stock availability and required quantity.

5 Express Service

We have an express service that reduces the lead time (refer to P.38). Please contact our subsidiary for this service if you need urgent delivery.

6 Changes or Cancellation of Order

You can change or cancel your order on the day of placement all over the world. Please contact our subsidiary if you need to change or cancel your order on the day after placement.

7 Return Goods

We do not generally accept return goods that are not defective. Contact our subsidiary if necessary.

8 Claims

We pay full attention to ship the highest quality products in the correct quantity specified by the customer. However, if a customer needs to reorder because of a defective part, MISUMI will express ship replacement parts at our own expense. If the part is no longer needed, MISUMI will give a full refund.

■Changing or Canceling Orders

Changing or canceling orders (the Cancellation) is treated according to the shipment date and the timing when you make the cancellation. Cancellation charges will be imposed in some cases. Please contact our subsidiary in your country for details.

- Stock Items

  No cancellation is accepted.

- Items of 3 Day-Production Time or More

  Please refer to the table of the cancellation and shipment date below. Cancellation is acceptable with or without charges (40% of product cost) by two days before the shipment date depending on the timing of the cancellation. Please contact our subsidiary for details.

- Express Services

  No cancellation is accepted.

- Table of Cancellation and Shipment date

Days from the Day of Ordering ＼ Catalogue Delivery Schedule and Service	3 Days Catalog Item	4 Days Catalog Item	5 Days Catalog Item	6 Days Catalog Item	8 Days Catalog Item	10 Days Catalog Item	12 Days Catalog Item	16 Days Catalog Item	20 Days Catalog Item	Express A	Express B	Express C
Day of Ordering	○	○	○	○	○	○	○	○	○	△	○	○
1 Day Later	△	△	○	○	○	○	○	○	○	Shipment Date	△	○
2 Day Later	×	△	△	△	○	○	○	○	○		×	△
3 Day Later	Shipment Date	×	△	△	△	○	○	○	○		Shipment Date	△
4 Day Later		Shipment Date	×	△	△	△	○	○	○			×
5 Day Later			Shipment Date	×	△	△	△	○	○			Shipment Date
6 Day Later				Shipment Date	△	△	△	△	○			
7 Day Later					×	△	△	△	△			
8 Day Later					Shipment Date	△	△	△	△			
9 Day Later						×	△	△	△			
10 Day Later						Shipment Date	△	△	△			
11 Day Later							×	△	△			
12 Day Later							Shipment Date	△	△			
13 Day Later								△	△			
14 Day Later								△	△			
15 Day Later								×	△			
16 Day Later								Shipment Date	△			
17 Day Later									△			
18 Day Later									△			
19 Day Later									×			
20 Day Later									Shipment Date			

○ : Cancellation without charge. △ : 40% of product cost is imposed on the cancellation. × : No cancellation is accepted.

■Returning and Replacing Goods

- Stock items can be returned. Customer is kindly requested to contact our subsidiary prior to making the return. Please note that the delivery cost of returning goods to the destination we determined must be paid by the customer.
- Items of 3 day-production time or more cannot be returned.
- When the received goods differ from the placed order, please contact our subsidiary for the replacement.

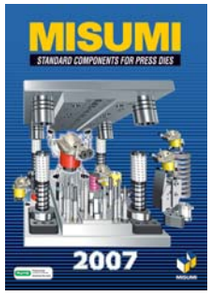
Request for MISUMI Catalogs

■Our catalogs contain a wide range of components, tools and technical data to meet your needs in designing and manufacturing Press Dies, Factory Automation and Plastic Mold.

●To request a catalog, please call us or fax the request form on the right page to our subsidiary in your country.
We will send a catalog for free.

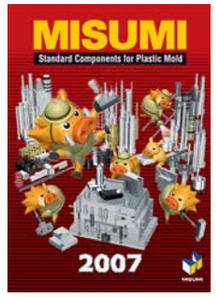
●Please always keep the latest edition of catalog, because of additional new products, price revision and improvement of lead-time.

Standard Components for Press Dies (Japanese)
June 2007～May 2008

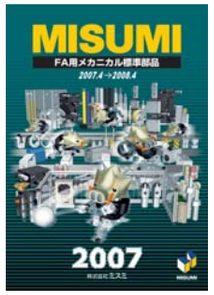


Standard Components for Press Dies (English)

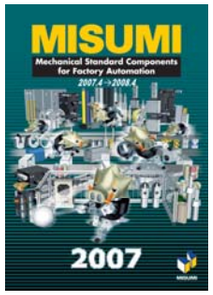
Standard Components for Plastic Mold (Japanese)
May 2007～April 2008



Standard Components for Plastic Mold (English)



Mechanical Standard Components for Factory Automation (Japanese)
April 2007～April 2008



Mechanical Standard Components for Factory Automation (English)
April 2007～April 2008

Mechanical Custom Components for Factory Automation (Japanese only)
May 2007～May 2008

Machining Tools“Tool Direct”
(Japanese only)
June 2007～May 2008

Electronics for Factory Automation
(Japanese only)
June 2007～May 2008

Catalog Request Form

●Please fax this catalog request form to our subsidiary in your country. We will send a free catalog to you.

●Please complete this form with your full name, company name, department, job title and your contact.

Company Name
URL
Address

Please circle appropriate one item in each box.

Industry	Business Category	Paid-up Capital (US $)	No. of Employees
1. Automobile	1. Finished Products	1. Less than 5Mil.	1. Less than 20
2. Automobile Components	2. Assembly	2. 5	2. 20
3. Other Transportations	3. Manufacturing of Components	3. 10	3. 50
4. Heavy Electric	4. Press Molding	4. 20 Mil. or More	4. 100
5. Consumer Electronics	5. Injection Molding	5. 50	5. 200 or More
6. Audio Visual Devices	6. Manufacturing of Automated Equipment	6. 100	6. 500
7. Semiconductor	7. Mechanical Design of Automated Equipment	7. 1	7. 1,000
8. Other Electric Appliances	8. Electrical Design of Automated Equipment	8. 5 Bill. or More	8. 5,000
9. Precision Instrument	9. Design of Press Dies	9. 10	9. 10,000
10. Computers and Peripherals	10. Design of Plastic Mold Dies		
11. Office Automation／Office Supply	11. Manufacturing of Press Dies		
12. Logistics	12. Manufacturing of Plastic Mold Dies		
13. Printing	99. Others		
14. Machine Tools			
15. Industrial Machinery			
16. Machine Works			
17. Chemicals			
18. Textiles			
19. Foods			
20. Communications			
30. Trading House			
40. Schools／Government Offices			
99. Others			

Department		Job Title	
Name		Phone No.	
		Fax No.	
E-mail		Your Field in Charge	Type of Job

Please circle the catalogs you request.

1. Standard Components for Press Dies (English)
2. Standard Components for Press Dies (Japanese)
3. Standard Components for Plastic Mold (English)
4. Standard Components for Plastic Mold (Japanese)
5. Mechanical Standard Components for Factory Automation (English)
6. Mechanical Standard Components for Factory Automation (Japanese)
7. Mechanical Custom Components for Factory Automation (Japanese only)
8. Machining Tools “Tool Direct” (Japanese only)
9. Electronics for Factory Automation (Japanese only)

99. Others (　　)

Your Field in Charge

1. Press Dies
2. Plastic Mold Dies
3. Machinery and Equipment
4. Electrical Equipment
5. Software for Factory Automation
6. Products Manufacturing
7. Components Manufacturing

99. Others

Type of Job

1. Design Engineering
2. Equipment Manufacturing
3. R＆D
4. Production Engineering
5. Production
6. Purchase／Procurement
7. Sales
8. Inspection／Quality Control

99. Others

Entry Card

Please note that this card is NOT for catalog request.

In order to make sure that MISUMI Catalog to reach to the customer who wishes to receive, we register customer's personal name as a membership. Please kindly let us know by this entry card if our mail is sent to the incorrect address/name or no longer needed.If you are new customer to MISUMI, please use Catalog request form.

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■Please write company and department name accurately.

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If your company name and address is changed, please write previous ones.

Your Name			
Company Name		Department	
(Previous Company Name)			
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(Previous Address)			
Job Title		Contact No.	Tel Fax
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	Your Field in Charge	Type of Job	Catalogs you're been using
Please circle appropriate one.	1. Press Dies 2. Plastic Mold Dies 3. Machinery and Equipment 4. Eletrical Equipment 5. Software for Factory Automation 6. Products Manufacturing 7. Components Manufacturing 99. Others	1. Design Engineering 2. Equipment Manufacturing 3. R & D 4. Production Engineering 5. Production 6. Purchase / Procurement 7. Sales 8. Inspection / Quality Control 99. Others	1. Standard Components for Press Dies (English) 2. Standard Components for Press Dies (Japanese) 3. Standard Components for Plastic Mold (English) 4. Standard Components for Plastic Mold (Japanese) 5. Mechanical Standard Components for Factory Automation (English) 6. Mechanical Standard Components for Factory Automation (Japanese) 7. Mechanical Custom Components for Factory Automation (Japanese only) 8. Machining Tools "Tool Direct" (Japanese only) 9. Electronics for Factory Automation (Japanese only)

Communication Card

Please fax this card to our subsidiary in your country.

■Please send your suggestions and opinions about new products and spec. that the MISUMI catalog doesn't list in Catalog.
■Please send your questions and inquiries about the products and the services in this catalog.
■We keep on improving our products and services based on your valuable suggestions and opinions.

Your name			
Company Name		Department	
Address			
Job Title		Contact No.	Tel Fax
E-mail		URL	

Ideas, Suggestions & Feedbacks

MISUMI Corporation

HISTORY

1963 Established as MISUMI Shoji Co., Ltd., focused on selling electronic equipment and bearings.
1965 Began sale of press die components.
1973 Established Chubu Office (now Nagoya Marketing Center) and continued establishing regional offices (Marketing Centers) across Japan.
1977 Published first edition of *Face: Standard Components for Press Dies* catalog.
1979 All service centers (Marketing Centers) networked online.
1980 Published first edition of *Voice*, an information magazine.
1981 Established Kansai Plant as a distribution center (now West Japan Distribution Center).
1985 Published first edition of *Face: Standard Components for Plastic Molds* (now *Standard Components for Plastic Mold & Diecast*) catalog.
1987 Established branch office in Taipei, Taiwan.
1988 Established local subsidiary, MISUMI USA, INC., in the United States.
Published first edition of *Face: Standard Components for Factory Automation* (now *Mechanical Standard Components for Factory Automation*) catalog.
1989 Established local subsidiary, MISUMI TAIWAN CORP., in Taipei to succeed the Taipei Office.
Changed corporate name from MISUMI Shoji Co., Ltd. to MISUMI Corporation.
Established local subsidiary, MISUMI (U.K.) LTD., (now MISUMI UK LTD.) in the United Kingdom.
1991 New building of Kansai Plant completed (now West Japan Distribution Center) and automatic sorting line installed.
Published first edition of *Face: Electronics Components for Factory Automation* (now *Wiring Components*) catalog.
1993 Published first edition of *Face: Machine Tools* (now *Tool Box: Machine Tools*) catalog.
Began outsourcing basic information systems.
Began ordering system utilizing PC communication.
1994 Listed on the second section of the Tokyo Stock Exchange.
Established local subsidiary, MISUMI SOUTH EAST ASIA PTE LTD., in Singapore.
Published first edition of parts catalog, *Face: Custom Mechanical Parts for Factory Automation.*
Published first edition of medical supplies catalog (now *PROMICLOS*) for medical practitioners.
1995 Published first edition of *Computer Components for Factory Automation* (now *PC Components for Measurement and Control*) catalog.
Established local subsidiary, MISUMI E.A. HK LTD., in Hong Kong.
Published first edition of foodstuff and sundry supplies catalog (now *MISUMI Pro Stock*).
1996 Published first edition of desktop publishing supplies catalog (now *Multi-Bits*).
1997 Established local subsidiary, MISUMI (THAILAND) CO., LTD., in Thailand.
1998 Listed on the first section of the Tokyo Stock Exchange.
1999 Established local subsidiary, MISUMI KOREA CORP., in South Korea.
2000 Published first edition of *Assembly Parts* catalog.
2001 Established sales offices in San Jose, CA, USA; Nuremberg, Germany; and Shanghai, China.
2002 Established local subsidiary, SHANGHAI MISUMI INTERNATIONAL TRADING CO., LTD., in Shanghai, China.
South Korean distributor MULTI-BITS CO., LTD. made into a subsidiary company.
Established local subsidiary, GUANGZHOU MISUMI INTERNATIONAL TRADING CO., LTD., in Guangzhou, China.
2003 Established local subsidiary, MISUMI EUROPA GmbH, in Germany.
Opened QCT Center in Shanghai as a major distribution center.
2004 Published catalog *Inch Mechanical Standard Components for Factory Automation* for the North American market.
Opened QCT Center in North America as a major distridution center.
2005 Merged with SURUGA SEIKI CO.,LTD. through a stock swap. Company name changed to MISUMI Group Inc., and a new company, MISUMI Corporation, is incorporated to assume MISUMI's entire business.

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ⓉⒶⒷⒸsignify available express delivery services. These are reference only.
The actual delivery may differ on conditions. Refer to respective pages for details.

Printed in red are new products added in this catalog. Printed in blue are carried from previous catalog. Printed in black are discontinued/modified products.

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ⓉⒶⒷⒸsignify available express delivery services. These are reference only.
The actual delivery may differ on conditions. Refer to respective pages for details.

Printed in red are new products added in this catalog. Printed in blue are carried from previous catalog. Printed in black are discontinued/modified products.

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The actual delivery may differ on conditions. Refer to respective pages for details.

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The actual delivery may differ on conditions. Refer to respective pages for details.

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The actual delivery may differ on conditions. Refer to respective pages for details.

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ⓉⒶⒷⒸsignify available express delivery services. These are reference only.
The actual delivery may differ on conditions. Refer to respective pages for details.

Printed in red are new products added in this catalog. Printed in blue are carried from previous catalog. Printed in black are discontinued/modified products.

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ⓉⒶⒷⒸsignify available express delivery services. These are reference only.
The actual delivery may differ on conditions. Refer to respective pages for details.

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The actual delivery may differ on conditions. Refer to respective pages for details.

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The actual delivery may differ on conditions. Refer to respective pages for details.

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Rules of Use of the Catalog

The mail-order service (the "Service") for the products (the "Products") listed in the Standards Components for Press Dies Catalog (the "Catalog") of MISUMI Corporation (the "Company") is to be used by the customers who purchase the Products. Please be aware that the Service must be used in accordance with these rules (these "Rules") unless it is clear they do not apply due to the nature of the Products.

Article 1 Registration

1. To use the Service, the customer must complete the membership registration procedures of the Company. After the customer has completed the membership registration application procedures in a manner specified by the Company and has been approved as a member meeting the standards prescribed by the Company, the Company will issue a Customer Number and the customer will become a member (the "Customer").

2. The Company may deny approval of an application to register as a member of the Company for any of the following reasons.
   (1) the Customer is not registered as a corporation;
   (2) the Customer has already registered;
   (3) the Customer's principal place of business or postal address as of the time of the membership registration procedures is outside of the country where the overseas affiliated company of the Company that sent the Catalog to the Customer (the "Overseas Affiliated Company") is located . ;
   (4) it becomes evident that the Customer has had its membership registration revoked in the past;
   (5) any of the details in the membership registration application are untrue;
   (6) it is evident that customer is a distributor, or intends to resell.
   (7) any other matter that the Company deems to be appropriate to consider for approval of membership.

3. When ordering the Products, the Customer must provide the Customer Number issued to it at the time of registration as a member under this Article 1.

4. The Company will notify the Customer by facsimile or by email of sales campaigns and other matters when sending the Catalog or other materials, The Company will not send such information to the Customer if the Customer so requests.

Article 2 Details of the Service

1. The Customer may purchase the Products listed in the Catalog using the Service subject to the provisions of these Rules and the terms set out in the Catalog (including, without limitation, specifications, price, delivery date, and terms of use). Please be aware, however, that because of the nature of the Products, the Customer's business or other standards prescribed by the Company, or at the discretion of the original manufacturer or the Company, some of the Products may be removed from the Service without prior notice or warning.

2. The Service is provided within the country where the Overseas Affiliated Company is located (provided, however, this includes Customer's countries that do not have an Overseas Affiliated Company but that are separately approved by the Company) This does not apply to areas where deliveries cannot be made. Please direct any queries to the Overseas Affiliated Company.

3. Regarding Volume Discount Rate listed in the Catalog, any volume order requiring a quotation is considered a Large Order and the Price and the Production Time may differ from listed amounts.

Article 3 Ordering the Products

1. The Customer may apply to purchase the Products using the following methods as set out in the Catalog. Provided, however, that the Company may restrict the ordering method depending on special orders or the type or quantity of the Products ordered. The date and time the Company may receive an order are set out in the Catalog. Please note that it may not be possible to use the following methods depending on the country.
   (1) Internet orders: fill in the required fields in the web site of the Company. Please consult the Overseas Affiliated Company for details on how to use the web site.
   (2) Facsimile orders: fill in the required fields on the order sheet specified by the Company and send the order sheet to the fax number specified by the Company.

2. Orders made by the Customer will become effective upon receipt of the order by the Company under Article 3.1. If there is any disruption in transmission of the Customer's data due to a problem with any telecommunication service or any of the details required for the order are missing, the order will not be deemed effective. In this case, the Company will not be liable in any way for the Customer not being able to purchase the Product or any damages arising in connection therewith.

3. Orders made by the Customer will constitute a sales agreement upon receipt of the order by the Company under Article 3.1. Provided, however, that this will not apply if the Company notifies the Customer that it declines the order immediately after receiving the order. In this case, the Company will not be liable in any way for the Customer believing that the order constitutes a sales agreement or any damages arising in connection therewith. If the Company deems it particularly necessary, it will additionally execute a written sales agreement with the Customer and change the terms of sale.

4. Please be aware that the Company may claim from the Customer any expenses the Company incurs in connection with requests from the Customer.

Article 4 Obligations regarding Use of the Products

The Customer may order the Products on the following conditions with respect to the use of the Products. The Company will not be liable in any way for any damages incurred by the Customer that are caused by the Customer's error in using or selecting the Products.

(1) The products are to be used as a part of general production equipment (meaning press dies and jigs & fixtures series for inspection) ("Uses for General Production Equipment"). Please note that general production equipment does not include transportation devices with the purpose of transporting humans such as automobiles, vehicles, or ships, medical equipment with the purpose of curing and diagnosing humans, or consumer goods that are used in general households such as electronic and electric equipment.
(2) The Products may not be used in aerospace equipment, nuclear energy equipment, or military-related products such as weapons or arms.
(3) The Company provides the Service on the condition that the Customer orders and uses the Products at its sole responsibility and in compliance with matters relating to the Products that are listed in the Catalog such as the specifications, intended uses, terms of use, conditions of use, or drawings; or with any notice or other description in documentation that comes with the Products (or accessories).
(4) The Products may not be resold to a third party, incorporated in products offered to general consumers or used in any other similar manner without the written consent of the Company.

Article 5 Delivery Period

1. While the number of days required for the Products to be delivered to the Customer (the "Delivery Period," meaning the number of days required to ship the Products, as set out on the relevant page of the Catalog, plus the number of additional days needed to send the Products to the Customer's area, as set out in the Catalog) depends on the type and quantity of the Products ordered (such as when the Products cannot be shipped right away or there is a large order), when the order is placed, and the delivery area, the basic Delivery Period standards are set out in the Catalog. Provided, however, that a separate Delivery Period may be stipulated for the Products especially specified by the Company.

2. If the time the Customer sends a facsimile order and the time the Company receives such order differs due to the transmission environment of the facsimile, the Delivery Period will be calculated from the time the Company receives such facsimile.

3. Please be aware that the Company may not be able to process an order as a normal order if any of the details in the order are missing or inaccurate, and the Company may not be able to deliver the Products within the Delivery Period set out in the Catalog due to transportation factors such as weather, traffic jams, or road construction, the timing of the delivery (such as during delivery companies'year-end and New Year holidays, summer holidays, or the Christmas holidays), the inventory status of the Products, or any other matter, and in this case the Company will not be liable to the Customer in any way.

Article 6 Delivery of the Products

1. Delivery of the Products will be deemed to be complete once the Products have been sent to the address registered by the Customer or the address specified by the Customer at the time of ordering the Products. Upon receiving the Products, the Customer is requested to affix its seal or representative's signature to the delivery company's form as proof of receipt.

2. The Products may not be delivered if the Customer's company name, factory name, research institute name, nameplate or other verification of the Customer cannot be confirmed.

3. If the Products are delivered to a location other than that specified by the Customer, the person receiving the Products may be required to provide personal identification such as a license or passport. (In this case, details such as the address, name and registration number in the license or passport provided may be copied.)

Article 7 Inspection

1. Within one (1) week of receipt of the Products, the Customer is requested to confirm the name and quantity of the Products, check that the specifications of the Products match those listed in the Catalog and that there is no damage, deformation, defects or flaws (including if the specifications do not meet those listed in the Catalog or, in the case of special orders, specified in the Customer's drawings) in the Products. If the Products fail to meet the specifications, the Customer must give written notification to the Overseas Affiliated Company or QTC Centers within one (1) week of receipt of the Products. If the Products fail to meet the specifications, the Customer is requested to immediately send written notification detailing the Products that do not meet the specifications and the cause and status thereof to the Company's address provided by the Overseas Affiliated Company.

2. Please note that the Company may deem that the Products have been inspected and approved by the Customer if it does not receive notice within one (1) week of receipt of the Products.

Article 8 Measures for Defective Products

If it is discovered through the inspection set out in Article 7 that all or part of the Products fail to meet the specifications, the Company will check such Products and if it is clear to the Company that the defects are attributable to only the Company, the Company will promptly deliver a replacement (or provide the service again in the case of a service) or, if directed by the Customer, refund the amount paid by the Customer for the part of the Products that is defective.

Article 9 Extra Products

If the Company delivers to the Customer a greater quantity of the Products than that which the Customer ordered and such mistake is attributable to the Company, the Customer may return the extra Products to the Company upon contacting the Overseas Affiliated Company. In this case, the Company will pay for all postage costs incurred in returning the extra Products. The Customer is kindly requested to keep the extra Products in accordance with the nature of such Products with the due care of a good manager from the time it receives such Products until it returns them to the Company.

Article 10 Special Orders

The ordering method is different for special orders for products with specifications set out in drawings provided by the Customer, specifications other than those prescribed by the Company or other special orders not for the Products with the specifications listed in the Catalog ("Special Orders"). Other than the ordering method, these Rules apply to Special Orders to the extent that they do not contradict the nature of the Special Orders.

Article 11 Consumption Tax and the like

The Customer must additionally pay an amount equivalent to all consumption taxes and other taxes incurred in using the Service.

Article 12 Payment

1. The Customer must pay the purchase price for the Products it has purchased and the consumption tax and other taxes imposed thereon by any of the methods set out in the Catalog specified by the Customer at the time it registered for membership. Provided, however, that the method of payment to a handling financial institution may change. Further, please be aware that the Company may request advance payment from the Customers if it is a new member, due to the status of a transaction or for other reasons.

2. Invoices will be for the Products that have been shipped by each date set out for each payment method mentioned in Article 12.1, and the Customer is requested to pay the invoice amount set out in such invoice.

3. If the Customer fails to pay the amount for the Products by the due date, a default charge may be additionally imposed on the unpaid amount at the rate the Company separately decides until payment is made, regardless of the reason for such delay.

4. If payment by the Customer cannot be confirmed by the specified due date, please be aware that the Company may carry out prescribed procedures such as suspending the Customer's order and shipment of ordered products, or revoking the Customer's membership

5. The Customer may change its payment method by contacting the Overseas Affiliated Company. In this case, the new payment method will apply to orders received during and after the following month. Please note that a certain period may be required for procedures to change the payment method depending on the payment method.

Article 13 Maximum Amount

1. The Company will set a maximum amount the Customer can owe to the Company as the price of the Products (the "Maximum Amount").

2. The Company may respond at its discretion in any of the following ways if the total price for the Products ordered by the Customer exceeds the Maximum Amount or if otherwise necessary with respect to the Maximum Amount. Please be aware that it may not be possible to deliver the Products by the prescribed delivery date.
   (1) Requesting the Customer pay in advance or pay the outstanding amount.
   (2) Refusing the order.
   (3) Any other method determined by the Company.

3. The Customer may check its Maximum Amount by contacting the Overseas Affiliated Company.

Article 14 Refusal to Receive Products

If the Customer refuses to receive the Products or the Products cannot otherwise be sent to the Customer's address for reasons attributable to the Customer (such as nobody being at the address to receive the Products), the Company will consider the sales agreement for such Products to be automatically terminated. Please be aware that in this case the Customer must pay an amount equivalent to the price of the Products and any damages incurred by the Company. Provided, however, that this will not apply if the Company believes there are special circumstances in light of the nature, type, or quantity of the Products, the distribution system used or any other factor.

Article 15 Force Majeure Disclaimer

If any delivery of products is delayed or impossible due to natural disasters (including, without limitation, earthquakes, floods and fires), amendments to or abolishment of laws or ordinances, dispositions through exercise of a public authority, transportation-related problems, labor disputes or any other unavoidable circumstances, the Company will notify the Customer within a reasonable period considering such circumstances. Provided, however, that the Company will not be liable in any way for any damages or expenses incurred by the Customer due to such delay or failure in delivery.

Article 16 Changing or Canceling Orders

1. The Customer may change the details of or cancel an order ("Cancellation") by contacting the Overseas Affiliated Company by telephone on or before the date and time corresponding to the shipping date of the Products set out in the Catalog. It is possible Cancellations will not be accepted because of the nature, type, quantity or shipping date of the Products, the distribution system used or other factors.

2. Depending on the time of making the Cancellation, type and quantity of the Products and other factors, the Customer may have to pay a cancellation charge pursuant to the terms set out in the Catalog.

3. The Customer may not cancel an order unless such cancellation is in accordance with the provisions of this Article 16. If the Company cannot accept a Cancellation from the Customer, it may be possible for the Customer to return the Products in accordance with the provisions of Article 17.

Article 17 Returning and Replacing Products

1. The Customer may return or receive replacement of the Products ("Return"), if all of the following cases apply. This may be after the period specified in Article7. Shipping costs must be paid by Customer. Customer must contact Company to confim Return is applicable, and store Product in suitable environment until Return is completed.
   (1) Products that are unopened, unused
   (2) Products that are marked "Stock Items" or "1 Day" in the Catalog

(3) Products not ordered as a "Large Order".

(4) Customer contacts the Company within one month of shipment of the Product

2. Not withstanding the provisions of the previous section, if there is any damage or mistake attributable to the Company, pease contact the Company within the period mentioned in the provision of Article 17.1(4). As soon as practical after the Customer contacts the Company, The Company will determine whether the damage or mistake is attributable to the Company, and then accept a return of the Products delivered to the Customer . The Company will pay for all the postage costs incurred in returning the Products. If the Company cannot confirm the state of the Product, the Company may reject the requirement of returning the Product.

3. The Customer must pay all postage costs if the Return is made under the provisions of Article 17.1.

4. The purchase price of the Products that have been Returned to the Company will not be calculated in the aggregate amount that is used to determine any volume discounts to be offered by the Company.

Article 18 Warranty

The sole warranty mate with respect to the Products is set that in annex A hereto.

Article 19 Revocation of Membership and Termination of Sales Agreements

1. If any of the following cases apply to the Customer, the Company may revoke the Customer's membership and immediately terminate any sales agreements it has entered into with the Customer without further notice:

(1) If it becomes evident that any of the cases set out in Article 1.2 apply to the Customer.

(2) If the Customer delays in or fails to perform its obligations arising through use of the Service and fails to remedy this within seven (7) days, regardless of whether the Company gives notification to the Customer demanding remedy thereof.

(3) In addition to Article 19.1(2), if the Customer breaches any terms of these Rules and fails to remedy this within fourteen (14) days, regardless of whether the Company gives notification to the Customer demanding remedy thereof.

(4) If the Customer sustains a disposition from the relevant supervisory agency, such as a cancellation or suspension of its business operations.

(5) If the Customer is subject to a suspension of payments or becomes insolvent.

(6) If the Customer's credibility substantially deteriorates or there is a material change to its business that will affect its credibility.

(7) If the Customer is subject to a petition for attachment, provisional attachment, provisional disposition or any other compulsory execution or auction filed by a third party, or is subject to a disposition to collect tax or other public charges delinquencies.

(8) If a petition for bankruptcy, reorganization or other insolvency proceeding is filed against or by the Customer.

(9) If the Customer passes a resolution to dissolve or merges with another company.

(10) If it becomes difficult for the Customer to perform its obligations under these Rules or any individual sales agreements due to a natural disaster, labor dispute or other reasons.

(11) If the Customer defrauds the Company or commits any other act in bad faith that makes it difficult to continue the Customer's membership.

(12) If the Customer's financial condition deteriorates or there are grounds to objectively believe this may occur.

(13) If the Company cannot contact the Customer using reasonable methods of communication.

(14) If the Customer cancels its membership at its own discretion under Article 21.

(15) If the Customer has not placed an order for one (1) year or more.

(16) If there are grounds that otherwise make the Company believe the Customer is inappropriate as a member.

2. If any of the above circumstances apply to the Customer, all obligations owed by the Customer through use of the Service will become immediately due and payable, and the Customer must promptly pay all such obligations. Further, the Customer must indemnify the Company for any damages incurred by the Company due to the Customer's breach of any provisions of these Rules.

Article 20 Notification of and Changes to Registered Information

1. If there are any changes to the name, company name, address, representative, telephone number, fax number, contact person or other information registered by the Customer at the time of applying for membership, the Customer must immediately notify the Company of such change in writing using the prescribed procedures.

2. In addition to Article 20.1, if (i) the Customer transfers its business to a third party, receive an assignment of a business from a third party or undergo a merger, or (ii) any of the circumstances set out in Article 19.1 occur, the Customer must immediately notify the Company. In this case, the Company may, if it deems it is necessary, request consultation with the Customer about whether to continue transactions and the Customer's membership.

3. If the Customer fails to or delays in giving the notice provided in Article 20.1 or 20.2, and the Products and the Catalog and any administrative communications are not delivered to the Customer or such delivery is delayed, the Company will deem such items to have arrived or been received by the Customer at the time they would normally reach the Customer. Further, the Customer must pay for all postage costs in sending such items to its new address, costs incurred in replacing the Products and any additional fees incurred by the Company.

Article 21 Cancellation of Membership by the Customer

The Customer may cancel its membership by notifying the Company in a manner prescribed by the Company. Upon receipt of such notification, the Company will revoke the membership of such Customer, and the Customer will loose its status as a member at the time such revocation is registered.

Article 22 Governing Law: Jurisdiction

These Rules and the provision of the Service will be governed by Japanese law. The Tokyo District Court will have exclusive jurisdiction over any disputes regarding the Products or the Service.

Article 23 Revisions to Price and Specifications

The Company may change, revise or suspend sales of the Products listed in the Catalog ("Revisions"), and may choose the timing, media and other methods concerning notification at its discretion in giving notification of Revisions to the Customer. If the Customer orders the Products after such Revisions, the Customer will be deemed to have approved such Revisions. Please note, however, that the Company will not notify the Customer of minor changes that do not affect the specifications listed in the Catalog.

Article 24 Approval to Amend these Rules

The Company may revise, modify or amend these Rules ("Amendments") and will set forth such Amendments in the Catalog. If the Customer orders the Products after such Amendments, the Customer will be deemed to have approved such Amendments.

Article 25 Effective Term of Catalog

The Catalog is effective only until the end of the effective period set forth in the Catalog (the "Catalog Effective Term"). Please be aware that, unless the Company indicates otherwise, the Customer will be unable to make any orders from the Catalog after expiration of the Catalog Effective Term. This also applies to orders from any Catalog issued that are made before the expiry of the current Catalog Effective Term. The expiry of the Catalog Effective Term will not affect in any way the effect of this provision. The Company will not be liable in any way to the Customer for any expenses or damages incurred by the Customer as a result of making an order from a Catalog whose effective term has expired.

Article 26 Priority of these Rules

These Rules apply equally to all Customers who use the Service. The Customer must fully understand the contents of the Catalog before using the Service. Please be aware that if there is any contradiction between these Rules and any agreement or other contract separately entered into between the Customer and the Company (including any agreement terms on order forms used by the Customer), these Rules will take priority.

Article 27 Disclaimer Concerning Internet Services

1. When the Customer views information or receives the Services or the like by using the web site of the Company (the "Internet Service"), the Customer does so at its liability and must do so in accordance with these Rules as well as in accordance with the individual rules and regulations pertaining to individual services and with laws and ordinances.

2. The Company is working to improve the quality of the information and services it provides through the Internet Service, but it does not warrant the safety, reliability, usability, fitness for a particular purpose, newness, legality, ethicality, or imperviousness to computer viruses of, for example, the Products, information, and services provided through the Internet Service, unless caused by the Company's willful misconduct or gross negligence.

3. The Company addresses security matters, such as preventing information divulgence, but asks the Customer to be aware that there is a risk that information might be divulged and that absolute security thereof cannot be completely assured.

4. The Company will not be liable in any way for any damages the Customer incurs in relation to using the Internet Service (including damages caused by undelivered orders made through the web site), unless such damages are caused by the Company's willful misconduct or gross negligence.

5. The Company will not be liable in any way for any damages that the Customer incurs as a result of using the Internet Services in a way other than the ordinary way of using it.

Article 28 Temporary and Permanent Discontinuation of the Services

In the event that any of the following occur, Company reserves the right to suspend or discontinue, part of, or all aspects of the Service, without prior notice to the Customer.

(1) If an ordered product is damaged or rendered unusable because of a natural disaster (including, without limitation, earthquakes, floods, and fires), a power failure or similar event, or damage to the lines of a telecommunications carrier.

(2) If it is possible delivering the Products will be difficult because of a natural disaster (including, without limitation, earthquakes, floods, and fires), the enactment or abolishment of a law or ordinance, a labor dispute, or any other unavoidable situation.

(3) If the ordered products require repairs or maintenance.

(4) If the Company otherwise believes the discontinuation of the Service is necessary in relation to the operation of the Service.

Article 29 Prohibited Acts

The Customer may not carry out any of the following acts while using the Service:

(1) Register false details in its membership registration.

(2) Carry out an act that would or might interfere with the operation of the Service.

(3) Make an order under another name or a false Customer Number.

(4) Act in a way that would or might be detrimental to another Customer, a third party or the Company or cause another Customer, a third party or the Company trouble or to incur damages.

(5) Carry out any act that would or might infringe any copyright or other intellectual property right or any right to privacy or other right of another Customer, a third party, or the Company.

(6) Illegally access the Internet Service and falsify information.

(7) Use the Internet Service to send or post harmful computer viruses or programs.

(8) Carry out any act that would or might contravene public policy or any law or ordinance.

(9) Carry out any act that contravenes these Rules.

(10) Carry out any act that the Company otherwise deems inappropriate.

Article 30 Copyright

1. The Customer may not without the approval of the copyright holder use any of the information provided through the Service beyond the scope of applicable copyright law, such as private copying by individuals,

2. The Customer will indemnify the Company for any trouble or damages in connection with problems arising through the Customer's breach of this Article 30.

Article 31 Management of Customer Numbers

1. The Customer is responsible for managing its registered Customer Number.
2. The Customer may not transfer, lend or disclose its registered Customer Number to a third party.

Article 32 Use of Customer Information

1. Information collected by Company will be used for the following:

(1) To provide Corporate information, Business infomation and events by Misumi Group／Misumi Corporation.

(2) To provide Product information or surveys regarding Misumi's Machinery Related Business or Diversified Business.

2. The Company may not disclose or provide to a third party any information obtained in relation to use of the Service, except for the following cases. Regarding Customer's personal information, in addition to this article, the description about protecting Customer's personal information on the Company web site are also applicable.

(1) When the Company provides to a third party statistical information collected to identify trends in use of the Service that does not specify the names of any customers.

(2) When the Customer agrees to the Company disclosing its details such as its name, address, telephone number or email address.

(3) When disclosure is required by laws, regulations or ordinances.

Article 33 Liability of the Company

The Company is only liable for the specifications of the Products that are listed in the Catalog, and makes no warranty whatsoever as to the fitness for purpose, usefulness, appropriateness or compatibility with other products, or period of sale of, or any other matter concerning, the Products. Further, other than Articles 17.2 and 18.1 of the Rules and the liabilities of manufacturers under the Product Liability Law of Japan where the Company is the manufacturer of the Products, the Company will not be liable in any way for any direct, indirect, consequential, incidental or special damages or any other damages, losses, or detriment arising in connection with the Products or the Services. Provided, however, that if the Customer breaches any terms of use, the Customer may not make any claims for indemnification or compensation against the Company. The maximum damages arising from the Service the Customer can claim is the amount the Customer paid to purchase the Products that caused the damages.

Article 34 No Cooling-Off System

To the extent permissible by applicable law, no cooling-off period will apply to mail-order sales of the Products listed in the Catalog.

Article 35 Information Provision and Product Procurement Service

These Rules apply to services other than sale of the Products listed in the Catalog, provided that they do not contradict the nature of such services. The Company may separately stipulate details regarding such services and the Customer must use such services in accordance with such separate stipulations.

Article 36 Communications with the Company

The Customer is requested to place orders, give notifications and make any other communications regarding transactions with the Company to the Overseas Affiliated Company during the reception time of the Company set out in the Catalog. The Customer is also requested to contact the Overseas Affiliated Company regarding any problems with the Products or other technical consultations. Provided, however, that this does not apply if otherwise stipulated in the Catalog. Please see the Catalog for all other details.

Article 37 Business Day

The Customer is requested to place orders, give notifications and make any other communications regarding transactions with the Company to the Overseas Affiliated Company during the reception time of the Company set out in the Catalog. The Customer is also requested to contact the Overseas Affiliated Company regarding any problems with the Products or other technical consultations. Provided, however, that this does not apply if otherwise stipulated in the Catalog. Please see the Catalog for all other details.

Article 38 Consultation

Any matters not provided for in these Rules must be dealt with in accordance with the spirit of these Rules upon consultation between the Company and the Customer.

These Rules have been enacted on June 1, 2007.

1. These Rules apply to the Catalog issued in June 2007 and each subsequent Catalog.
2. These Rules do not apply to the customers in the Republic of China. Please refer to the separate Rules we provide upon the membership registration.

Misumi Calendar 2007

□Operations during the beginning and the end of the year
- 27 Dec will be the last date of shipment for 2007
- When shipment date falls on 28 Dec, products will be shipped on 5 Jan of the following year.
- Business is closed during the period from 29 Dec 2007 to 4 Jan 2008

□Operation on 3,4 May
- Business operates as normal but shipment is not available
- When shipment date falls on 3,4 May, products will be shipped on 5 May. However, shipment of products with express service will still be done.

※Please contact us for urgent need.

□Operation on 13, 14, 15 Aug
- Business operates as normal but shipment is not available.
- When shipment date falls on 13, 14, 15 Aug, goods will be shipped on 16 Aug. However, shipping of products with express service will still be done.

※Please contact us for urgent need.

2007 April 4

SUN	MON	TUE	WED	THU	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	·	·	·	·	·

May 5

SUN	MON	TUE	WED	THU	FRI	SAT
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13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	·	·

June 6

SUN	MON	TUE	WED	THU	FRI	SAT
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July 7

SUN	MON	TUE	WED	THU	FRI	SAT
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August 8

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September 9

SUN	MON	TUE	WED	THU	FRI	SAT
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23/30	24	25	26	27	28	29

October 10

SUN	MON	TUE	WED	THU	FRI	SAT
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November 11

SUN	MON	TUE	WED	THU	FRI	SAT
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December 12

SUN	MON	TUE	WED	THU	FRI	SAT
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30	31					

2008 January 1

SUN	MON	TUE	WED	THU	FRI	SAT
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February 2

SUN	MON	TUE	WED	THU	FRI	SAT
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March 3

SUN	MON	TUE	WED	THU	FRI	SAT
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16	17	18	19	20	21	22
23/30	24/31	25	26	27	28	29

Company Profile

Company Name	: **Misumi Corporation**
Address	: 4-43, 2-CHOME, TOYO, KOTO-KU, TOKYO
Chairman and C.E.O	: Tadashi Saegusa
Date of Settlement	: March 31
Principal Activities:	Marketing & Distribution of dies components
	Marketing & Distribution of mechanical components for factory automation
	Marketing & Distribution of manufacturing tools
	Marketing & Distribution of industrial computer, network component and wiring
Principal Transaction Banks	Mizuho Bank　Bank of Tokyo-Mitsubishi UFJ　Sumitomo Mitsui Banking　Mitsubishi UFJ Trust and Banking
Detailed Information	http://www.misumi.co.jp

Warranty Standard

All warranties on products (the "Products") purchased by the customer from MISUMI Corporation (the "Company" that are listed in the Standard Components for Press Dies Catalog) the "Catalog" are based on the Rules of Use of the Catalog (the "Rules") and the following warranty provisions (this "Warranty"). Please note that this Warranty does not apply to special orders.
By purchasing or using the Products, the customer agrees to this Warranty.
Some of the Products come with a manufacturer guarantee certificate or warranty. In this case, please be aware that the manufacturer guarantee certificate or warranty will supersede this Warranty and this Warranty will not be applicable.

●Scope and Period of Warranty

1. With respect to the Products purchased by the customer, the Company will replace all or part of the Products or repair the Products free of charge if it is deemed there is any damage, deformation or defects to the Products (the "Defects") that are attributable to the Company, on the condition that (i) written notification stating sufficient details of the Defects, as deemed by the Company, reaches the Company within the warranty period (defined in the following clause), and (ii) the Company deems the Defects are attributable to the Company.
   Provided, however, that the following cases are outside of the scope of the warranty.
   (1) Defects caused by use of the Products in any way other than as a part of general production equipment. In this case, general production equipment means press dies, inspection jigs, but does not include transportation devices with the purpose of transporting humans such as automobiles, vehicles, or ships, medical equipment with the purpose of curing and diagnosing humans, or consumer goods that are used in general households such as electronic and electric equipment.
   (2) Defects caused by use of the Products in aerospace equipment, nuclear energy equipment, or military-related products such as weapons or arms.
   (3) Defects caused by recklessness or error in the customer's handling of the Products.
   (4) Defects caused by natural disasters (including, without limitation, earthquakes, fires and floods).
   (5) Defects caused by failure to comply with matters relating to the Products that are listed in the Catalog such as the specifications, intended uses, terms of use, conditions of use, or drawings; or with any notice or other description in documentation that comes with the Products (or accessories).
   (6) Defects caused by the customer itself processing, repairing, modifying or disassembling the Products.
   (7) Defects caused by equipment other than the Products.
   (8) Defects caused by use of the Products outside the country where the overseas affiliated company of the Company that sent the Catalog to the customer (the "Overseas Affiliated Company") [or the customer] is located.
   (9) Defects caused by using the Products for untested or unanticipated purposes or in untested or unanticipated ways.
   (10) Defects caused by the customer using the Products in violation of the provisions of the Rules.
2. The warranty period applicable to the Products under this Warranty is one (1) year from the day the Company ships the Products.
3. Minor flaws such as scratches, marks, dents or discoloration that do not make the Products unusable do not constitute Defects. Provided, however, that if the Company deems any flaws such as scratches, marks, dents or discoloration to be particularly significant, such flaws will constitute a Defect.
4. Within one (1) week of receipt of the Products the customer is requested to confirm the name and quantity of the Products, check that the specifications of the Products match those listed in the Catalog and that there are no Defects in the Products. If there is any Defect, the customer must give written notification to the Overseas Affiliated Company that is responsible for the customer's area according to the Catalog within one week. Please note that the Company may deem that the Products have no Defects under warranty if it does not receive notice within one (1) week of receipt of the Products.
5. The customer will be charged for all replacements and repairs of the Products that take place after the warranty period, that are outside the scope of warranty, or are otherwise not subject to this Warranty.

●Disclaimer

1. [Other than as expressly provided in the Rules and this Annex A], the Company will not be liable in any way for any damages (regardless of whether such damages are direct or indirect, or general or special), losses or expenses arising in relation to the Products. Damages arising from use of the Products include damages caused by defects in products manufactured using the Products, and damages arising from inability to use the Products include damages caused by a suspension of any production line in the customer's factories or production facilities.
2. About the damages arising by the Products or the Company's responsibility, we will pay an upper price of the products that the customer bought and arisen damages.
3. If the manufacturers are not provided for Product Liability Law, the customer should ask the responsibility for the manufacturers directly and based on the Product Liability Law.
4. About the damages arising because of the following reasons or such the relation, the customer may not make any claims for indemnification or compensation against the Company.
   (1) Use the Products against regulations, the notes or prohibition written on guarantee and warranty provisions by the manufacturers
   (2) Defects in the Product caused by the willful misconduct or negligence of the customer
   (3) Defects in the Products caused by unavoidable
   (4) Infringement of any patent rights, utility model rights, design rights, trademark rights or other intellectual property rights of a third party arising in relation to the Products
   (5) Exportation of the Products or delays in or prohibition of exportation of the Products due to laws or ordinances, or regulations

●Terms of Use

1. This Warranty only applies to the purchase and use of the Products within Japan, and is not applicable outside of the country.
2. Under this Warranty, the Company may request the customer return the products that need to be repaired or replaced to the Company (the original manufacturer will carry out actual repairs of the Products). Please be aware that the Company cannot send employees to the customer to repair or replace the Products.
3. Production and sale of the Products may be suspended at the discretion of the original manufacturer. Please be aware that in this case it will not be possible to replace the Product with the exact same product.

That's all

Standard Components for Press Dies 2007 Catalog　Main Revisions to Rules of Use of the Catalog

Rules of Use of the Catalog is mainly revised as follows:

- Article 1.2(6)　Added a case when membership application may not be approved.
- Article 2.3　Added the statement that any order required a quotation is considered an Large Order and the Price and Production Time may vary depending on order.
- Article 7.1　Added QCT Centers as contact information used for reporting dissatisfied products.
- Article 12.2　Added the statement that the Customer is required to pay any transfer fee upon payment.
- Article 12.4　Added that a shipment may be stopped if payment is not received.
- Article 17.1　Added a case when Products can be returned at customer's request.
- Article 17.2　Added description on returns caused by the Company error.
- Article 24　Changed the terms so that the latest Rules of Use of the Catalog is only required to set forth in the next catalog.
- Article 28　Changed the terms so that they cover both temporary and permanent discontinuation of the Services.
- Article 29(9)　Added another prohibited act: an act that transfers the privilege to utilize the Service in the contract to the third party.
- Article 32　Regarding personal information, the purpose of use and disclosure of personal information to the third party are stipulated separately.

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