# PUNCHES & DIES FOR FORMING

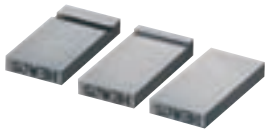
**PUNCHES & DIES FOR FORMING**

| Product name / Type | BURRING PUNCHES SPM T—SPM SJM | BURRING PUNCHES SPMB□ L—SPMB□ | BURRING PUNCHES —HALF-MADE TIP R TYPE— | BURRING PUNCHES —HALF-MADE TAPERED TIP TYPE— | BURRING DIE UNITS BDU |
|---|---|---|---|---|---|
| Page | 541 | 542 | 543 | 545 | 547 |

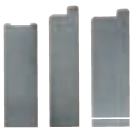
| BURRING PUNCHES —SCRAPLESS TYPE— | EMBOSSING PUNCHES —SR·STEPPED SR·STEPPED TAPER TYPES— | KNOCKOUT PINS FOR EMBOSSING PUNCHES BMPS BMP | CHAMFERING PUNCHES SHOULDER·KEY FLAT·TAPPED TYPES | DRAWING PUNCHES —NORMAL·LAPPING— |
|---|---|---|---|---|
| 549 | 551 | 552 | 553·555 | 559 |

| DRAWING PUNCHES —DICOAT® TREATMENT·TICN COATING·HW COATING— | JECTOR DRAWING PUNCHES —NORMAL·LAPPING— | JECTOR DRAWING PUNCHES —DICOAT® TREATMENT·TICN COATING— | DRAWING DIES —STEEL— | KNOCKOUT PINS KOP |
|---|---|---|---|---|
| 561 | 563 | 565 | 567 | 588 |

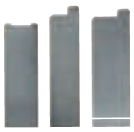
| DRAWING DIES —CARBIDE— | DRAWING DIES | ENGRAVING PUNCHES —R·L TYPE— —CONFIGURABLE TYPE— | ENGRAVING PUNCHES FOR SLANTED SURFACES TCPTS□M TCPTL□M | SHIMS TCIM TCIMT DCIM·DCIMT |
|---|---|---|---|---|
| 569 | 571 | 573 | 574 | 574 576 |



| 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 |
|---|---|---|---|
| 575 | 576 | 577 | 578 |



| ENGRAVING BLOCK PUNCHES OCP□M | ENGRAVING BLOCK PUNCHES BCP□M | PRECISION ENGRAVING BLOCK PUNCHES VCF VCM | ENGRAVING RETAINERS HCFPH HCFS | BENDING AND CHAMFERING PUNCHES & DIES —FIXED SIZE TYPE— |
|---|---|---|---|---|
| 579 | 579 | 580 | 581 | 583 |



| SHORT BENDING PUNCHES & DIES —FIXED SIZE TYPE— | CHAMFERING PUNCHES & DIES —CONFIGURABLE SIZE TYPE— | BENDING DIES —FIXING-BOLT TYPE— | RIB PUNCHES RA□P RB□P | HEIGHT ADJUSTMENT UNITS FOR CAMBER CORRECTION CAUA CAUN |
|---|---|---|---|---|
| 585 | 587 | 589 | 590 | 591 |

| GENERAL PURPOSE SCRAP CUTTERS SCL・SCT |
|---|
| 592 |

# BURRING PUNCHES

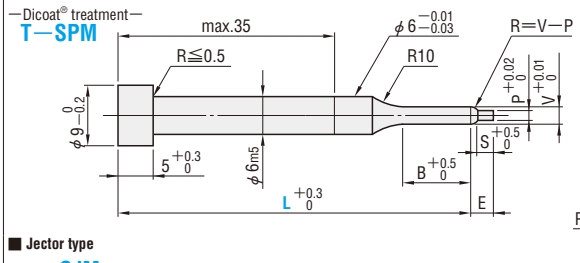
PRODUCTS DATA P.1089

RoHS

| Catalog No. | S | M | H |
|---|---|---|---|
| SPM | — | Equivalent to SKD11 | 60～63HRC |
| T—SPM | Dicoat® | Equivalent to SKD11 | 60～63HRC Surface 3000HV |
| SJM (jector) | — | SKH51 | 61～64HRC |

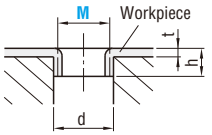
SPM

—Dicoat® treatment—
T—SPM




■ Jector type

SJM




(Example of burring)

Calculating the projection length of the jector pin (reference value) P.185
- For details of jector holes, refer to Jector Punch Blanks. P.180 (Blanks are based on SJB.)
- For details of jector pins, refer to Jector Pin Sets. P.183

| Catalog No. Type | M | L | Type | V | P | B | S | E | M × P | d: Die inner diameter, h: Burring height, Workpiece: SPCC (measured data) Type | t | 0.6 | 0.8 | 1.0 | 1.2 | 1.6 | 2.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SPM —Dicoat® treatment— T—SPM | 2.6 | 41 51 61 71 | A | 2.22 | 1.5 | 6 | 2 | 2.7 | M2.6 × 0.45 | A | d | 3.12 | 3.34 | 3.72 | | | |
| | | | | | | | | | | | h | 1.30 | 1.47 | 1.77 | | | |
| | | | B | 2.25 | | | | | | B | d | 3.15 | 3.37 | 3.75 | | | |
| | | | | | | | | | | | h | 1.30 | 1.50 | 1.80 | | | |
| | | | C | 2.32 | | | | | | C | d | 3.22 | 3.44 | 3.82 | | | |
| | | | | | | | | | | | h | 1.35 | 1.60 | 1.82 | | | |
| | | | D | 2.35 | | | | | | D | d | 3.25 | 3.47 | 3.85 | | | |
| | | | | | | | | | | | h | 1.35 | 1.60 | 1.82 | | | |
| SPM —Dicoat® treatment— T—SPM SJM | 3 | | A | 2.59 | 1.9 | 8 | 3 | 3.6 | M3 × 0.5 | A | d | 3.49 | 3.79 | 3.99 | 4.39 | | |
| | | | | | | | | | | | h | 1.30 | 1.55 | 1.75 | 2.05 | | |
| | | | B | 2.63 | | | | | | B | d | 3.53 | 3.83 | 4.03 | 4.43 | | |
| | | | | | | | | | | | h | 1.35 | 1.60 | 1.75 | 2.07 | | |
| | | | C | 2.72 | | | | 3.7 | | C | d | 3.62 | 3.92 | 4.12 | 4.52 | | |
| | | | | | | | | | | | h | 1.37 | 1.60 | 1.77 | 2.10 | | |
| | | | D | 2.76 | | | | | | D | d | 3.66 | 3.96 | 4.16 | 4.56 | | |
| | | | | | | | | | | | h | 1.40 | 1.65 | 1.80 | 2.15 | | |
| | 4 | | A | 3.39 | 2.4 | | | 3.9 | M4 × 0.7 | A | d | 4.29 | 4.59 | 4.79 | 5.07 | 5.79 | |
| | | | | | | | | | | | h | 1.50 | 1.77 | 2.00 | 2.17 | 2.60 | |
| | | | B | 3.44 | | | | | | B | d | 4.34 | 4.64 | 4.84 | 5.12 | 5.84 | |
| | | | | | | | | | | | h | 1.50 | 1.77 | 2.00 | 2.20 | 2.65 | |
| | | | C | 3.64 | | | | 4.1 | | C | d | 4.54 | 4.84 | 5.04 | 5.32 | 6.04 | |
| | | | | | | | | | | | h | 1.60 | 1.85 | 2.07 | 2.27 | 2.70 | |
| | | | D | 3.69 | | | | | | D | d | 4.59 | 4.89 | 5.09 | 5.37 | 6.09 | |
| | | | | | | | | | | | h | 1.63 | 1.90 | 2.10 | 2.30 | 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 | 3.50 |
| | | | B | 4.38 | | | | | | B | d | | | 5.88 | 6.06 | 6.62 | 7.38 |
| | | | | | | | | | | | h | | | 2.30 | 2.52 | 2.90 | 3.52 |
| | | | C | 4.62 | | | | 5.6 | | C | d | | | 6.12 | 6.30 | 6.86 | 7.62 |
| | | | | | | | | | | | h | | | 2.42 | 2.65 | 3.00 | 3.62 |
| | | | D | 4.67 | | | | | | D | d | | | 6.17 | 6.35 | 6.91 | 7.67 |
| | | | | | | | | | | | h | | | 2.45 | 2.70 | 3.05 | 3.65 |

Order

| Catalog No. | — | L | Type |
|---|---|---|---|
| SPM 3 | — | 51 | B |

Days to Ship: Quotation

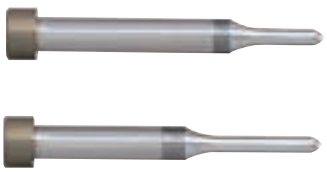
Price: Quotation

If size changes to length L, dimension S, or other dimensions are required, use drawing punch shape 8C. P.558

Specifications of half-made types P.543・P.544

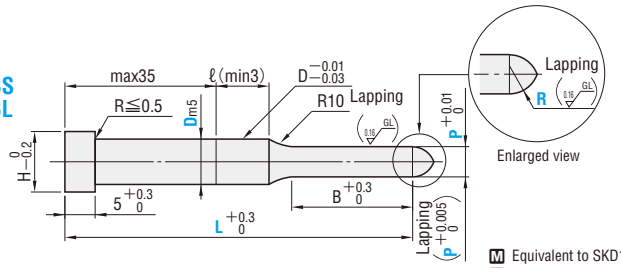
# BURRING PUNCHES
## —NORMAL・LAPPING—

RoHS



**SPMBS**
**SPMBL**

—Lapping—
**L—SPMBS**
**L—SPMBL**




M Equivalent to SKD11
H 60～63HRC

| B | H | Catalog No. Type | Tip length B | D | 0.1mm increments L | 0.01mm increments P | R | Base unit price 1～9 pieces SPMB | L—SPMB |
|---|---|---|---|---|---|---|---|---|---|
| 10 | 5 | SPMB —Lapping— L—SPMB | S | 3 | 40.0～80.0 | 1.50～ 2.99 | 2 3 | | |
| | 7 | | | 4 | | 2.00～ 2.99 | 2 3 | | |
| | | | | | | 3.00～ 3.99 | 3 4 | | |
| | 8 | | | 5 | | 2.00～ 2.99 | 2 3 | | |
| | | | | | | 3.00～ 4.99 | 3 4 | | |
| | 9 | | | 6 | | 2.50～ 2.99 | 2 3 | | |
| | | | | | | 3.00～ 4.99 | 3 4 | | |
| | | | | | | 5.00～ 5.99 | 4 | | |
| 15 | 11 | | | 8 | 45.0～80.0 | 3.00～ 4.99 | 3 4 | | |
| | | | | | | 5.00～ 6.99 | 4 | | |
| | 13 | | | 10 | 45.0～90.0 | 3.00～ 7.99 | 4 5 | | |
| | 16 | | | 13 | | 8.00～ 9.99 | 5 6 | | |
| | | | | | | 6.00～ 9.99 | 5 6 | | |
| | | | | | | 10.00～ 11.99 | 6 | | |
| 15 | 5 | | L | 3 | 45.0～80.0 | 1.50～ 2.99 | 2 3 | Quotation | |
| | 7 | | | 4 | | 2.00～ 2.99 | 2 3 | | |
| | | | | | | 3.00～ 3.99 | 3 4 | | |
| | 8 | | | 5 | | 2.00～ 2.99 | 2 3 | | |
| | | | | | | 3.00～ 4.99 | 3 4 | | |
| | 9 | | | 6 | | 2.50～ 2.99 | 2 3 | | |
| | | | | | | 3.00～ 4.99 | 3 4 | | |
| | | | | | | 5.00～ 5.99 | 4 | | |
| 21 | 11 | | | 8 | 50.0～80.0 | 3.00～ 4.99 | 3 4 | | |
| | | | | | | 5.00～ 6.99 | 4 | | |
| | 13 | | | 10 | 50.0～90.0 | 3.00～ 7.99 | 4 5 | | |
| | 16 | | | 13 | | 8.00～ 9.99 | 5 6 | | |
| | | | | | | 6.00～ 9.99 | 5 6 | | |
| | | | | | | 10.00～ 11.99 | 6 | | |

P If P>D−0.03…ℓ=0 If P>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not included. P With lapping, P dimension can be selected in 0.001mm increments.

**Order**

| Catalog No. | L | P | R |
|---|---|---|---|
| SPMBS 4 | 42.0 | P3.64 | R3 |

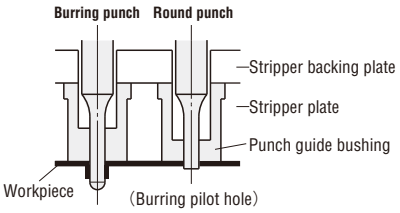
**Days to Ship** Quotation

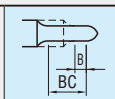
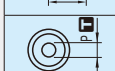
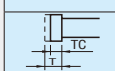
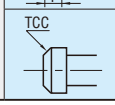
**Price** Quotation

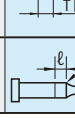
**Alterations**

| Catalog No. | L | P | R | (BC・HC・TC, etc.) |
|---|---|---|---|---|
| SPMBS 6 | 51.0 | P2.50 | R2 | KC |

**Example**

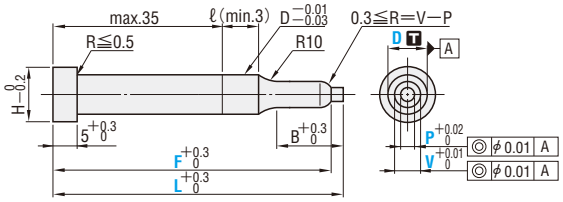



| Alteration | | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to tip |  | BC | Tip length change R+2≦BC≦BCmax. 0.1mm increments P Full length must be 30 mm longer than tip length. P: 1.50～1.99 BCmax. 20; 2.00～2.99 30; 3.00～3.99 35; 4.00～4.99 45; 5.00～ 60 | |
| |  | PKC | P dimension tolerance change P +0.01 0 ⇨ +0.005 0 ⊗ Cannot be used with lapping. | Quotation |
| Alterations to head |  | HC | Head diameter change D≦HC<H 0.1mm increments | |
| |  | TC | Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) P The full length remains as specified. | |
| |  | TCC | Chamfering of head This improves the strength of the punch head. P.1097 0.1 mm increments 0.5≦TCC≦(H−D)/2 P If H≦5, then TCC is 0.5. | |

| Alteration | | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to head |  | KC | Addition of single key flat to head | Quotation |
| |  | WKC | Addition of double key flats in parallel | |
| |  | TKC | Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 | |
| | | TKM | Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 | |
| Others |  | NDC | No press-in lead ℓ≧3 ⇨ ℓ=0 | |

# BURRING PUNCHES
## —HALF-MADE TIP R TYPE—

RoHS



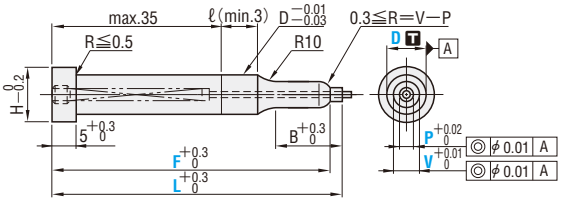

V−P≧0.3

| Catalog No. | | | | M | S | H |
|---|---|---|---|---|---|---|
| $D_{m5}$ | | $D^{+0.005}_{0}$ | | | | |
| Short tip | Long tip | Short tip | Long tip | | | |
| SPMS | SPMSL | A−SPMS | A−SPMSL | Equivalent to SKD11 | — | 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 |
| HW−SHMS | HW−SHMSL | AHW−SHMS | AHW−SHMSL | | HW 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 |
| HW−PHMS | HW−PHMSL | AHW−PHMS | AHW−PHMSL | | HW coating | 64～67HRC Surface 3000HV |

For shank diameter tolerance D T, select either (m5) or ($^{+0.005}_{0}$).

■Jector type

RoHS




V−P≧0.3

Calculating the projection length of the jector pin (reference value) P.185

- For details of jector holes, refer to Jector Punch Blanks. P.180
  (Blanks are based on SJB.)
- For details of jector pins, refer to Jector Pin Sets. P.183

| Catalog No. | | | | M | S | H |
|---|---|---|---|---|---|---|
| $D_{m5}$ | | $D^{+0.005}_{0}$ | | | | |
| Short tip | Long tip | Short tip | Long tip | | | |
| SJMS | — | A−SJMS | — | D4～6 SKH51 D8・10 Equivalent to SKD11 | — | D4～6 61～64HRC D8・10 60～63HRC |
| PJMS | — | A−PJMS | — | Powdered high-speed steel | — | 64～67HRC |
| H−PJMS | — | AH−PJMS | — | | TiCN coating | 64～67HRC Surface 3000HV |
| HW−PJMS | — | AHW−PJMS | — | | HW coating | 64～67HRC Surface 3000HV |

For shank diameter tolerance D T, select either (m5) or ($^{+0.005}_{0}$).

| B | H | Catalog No. Type | D | L | 0.01mm increments min. V max. | 0.01mm increments P min. | 0.1mm increments F |
|---|---|---|---|---|---|---|---|
| 8 | 7 | —Short tip— ($D_{m5}$) ($D^{+0.005}_{0}$) SPMS A−SPMS | 4 | 40.0～80.0 (0.1mm increments) | 1.60～3.99 | 1.00 | F≦L−2 |
| | 8 | SHMS A−SHMS | 5 | | 1.80～4.99 | 1.20 | |
| | 9 | H−SHMS AH−SHMS | 6 | | 1.80～5.99 | 1.20 | |
| | 11 | HW−SHMS AHW−SHMS | 8 | | 2.10～7.99 | 1.50 | |
| | 13 | PHMS A−PHMS H−PHMS AH−PHMS HW−PHMS AHW−PHMS | 10 | | 3.00～9.99 | 2.50 | |
| 15 | 7 | —Long tip— ($D_{m5}$) ($D^{+0.005}_{0}$) SPMSL A−SPMSL | 4 | 50.0～80.0 (0.1mm increments) | 1.60～3.99 | 1.00 | |
| | 8 | SHMSL A−SHMSL | 5 | | 1.80～4.99 | 1.20 | |
| | 9 | H−SHMSL AH−SHMSL | 6 | | 1.80～5.99 | 1.20 | |
| | 11 | HW−SHMSL AHW−SHMSL | 8 | | 2.10～7.99 | 1.50 | |
| | 13 | PHMSL A−PHMSL H−PHMSL AH−PHMSL HW−PHMSL AHW−PHMSL | 10 | | 3.00～9.99 | 2.50 | |
| 8 | 7 | —Short tip jector— ($D_{m5}$) ($D^{+0.005}_{0}$) SJMS A−SJMS | 4 | 40 50 60 70 80 | 2.00～3.99 | 1.00 | |
| | 8 | PJMS A−PJMS | 5 | | 2.00～4.99 | 2.00 | |
| | 9 | H−PJMS AH−PJMS | 6 | | 2.00～5.99 | 2.00 | |
| | 11 | HW−PJMS AHW−PJMS | 8 | | 3.00～7.99 | 3.00 | |
| | 13 | | 10 | | 3.00～9.99 | 3.00 | |

V−P≧0.3 B≧(L−F)+$\sqrt{(V-P)\{(V-P)-(V-P)/4\}}$ +2

Order

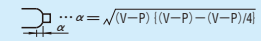
| Catalog No. | L | V | P | F |
|---|---|---|---|---|
| SHMS 4 | 41.0 | V2.60 | P1.00 | F39.0 |

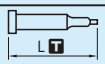
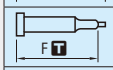
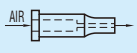
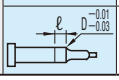
Days to Ship: Quotation

Alterations

Catalog No. — L — V — P — F — (BC・HC・TC, etc.)

SHMS 4 — 41.0 — V1.60 — P1.00 — F38.5 — BC10

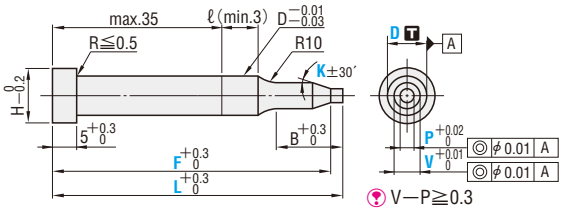
| Alteration | | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to tip |  | BC | B dimension change<br>0.1mm increments<br>Full length must be 30 mm longer than tip length.<br>(L−F)＋α＋2≦BC≦BCmax.<br>α varies depending on the shape.<br>  <br>V: 1.60~1.99 / 2.00~2.99 / 3.00~3.99 / 4.00~4.99 / 5.00~<br>BCmax.: 20 / 30 / 35 / 45 / 60<br>Cannot be used for jector punches.<br>For coating punches,<br>(L−F)＋α＋2≦BC≦BCmax.≦L/2 | Quotation |
| |  | VKC | V dimension tolerance change $V^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$<br>Cannot be used for coating punches. | |
| Alterations to head |  | HC | Head diameter change<br>D≦HC＜H<br>0.1mm increments | |
| |  | TC | Head thickness change 0.1mm increments<br>・Other than jector<br>2≦TC＜5 The full length L remains as specified.<br>・Jector<br>3.5≦TC＜5 Full length L is shortened by (5−TC).<br>(If combined with TKC・TKM, 0.01mm increments can be selected.) | |
| |  | TCC | Chamfering of head<br>This improves the strength of the punch head. P.1097<br>0.1 mm increments<br>0.5≦TCC≦(H−D)/2<br>If H≦5, then TCC is 0.5.<br>Cannot be combined with SRC. | |

| Alteration | | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to head |  | TKC | Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ | Quotation |
| | | TKM | Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ | |
| |  | KC | Addition of single key flat to head | |
| |  | WKC | Addition of double key flats in parallel | |
| |  | RC |  <br>Head thickness is machined to a tolerance of −0.04 ~ 0 relative to the retainer surface.<br>Can be used for D10 only.<br>Cannot be used for $D^{+0.005}_{0}$ types. | |
| |  | SRC | Modification of head for use with select retainers (SLS)<br>For details, refer to P.629. Can be used for D10 only.<br>Cannot be used for $D^{+0.005}_{0}$ types. | |
| Others |  | LKC | Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ | |
| |  | FKC | Full length tolerance change $F^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ | |
| |  | AC |  <br>The jector pin is removed to create an air path and the side vent hole is plugged from the inside.<br>Can be used for jector types only. | |
| |  | NC |  <br>The jector pin is removed.<br>Cannot be combined with AC.<br>Can be used for jector types only. | |
| |  | NDC | No press-in lead ℓ≧3 ⇨ ℓ=0 | |

Price Quotation

# BURRING PUNCHES
## —HALF-MADE TAPERED TIP TYPE—

RoHS



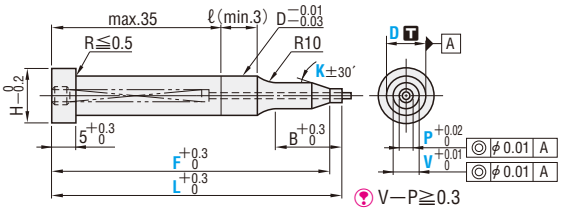

V−P≧0.3

| Catalog No. | | | | M | S | H |
|---|---|---|---|---|---|---|
| $D_{m5}$ | | $D^{+0.005}_{0}$ | | | | |
| Short tip | Long tip | Short tip | Long tip | | | |
| SPMT | SPMTL | A−SPMT | A−SPMTL | Equivalent to SKD11 | — | 60～63HRC |
| SHMT | SHMTL | A−SHMT | A−SHMTL | SKH51 | — | 61～64HRC |
| H−SHMT | H−SHMTL | AH−SHMT | AH−SHMTL | | TiCN coating | 61～64HRC Surface 3000HV |
| HW−SHMT | HW−SHMTL | AHW−SHMT | AHW−SHMTL | | HW 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 | | TiCN coating | 64～67HRC Surface 3000HV |
| HW−PHMT | HW−PHMTL | AHW−PHMT | AHW−PHMTL | | HW coating | 64～67HRC Surface 3000HV |

For shank diameter tolerance D T, select either (m5) or ($^{+0.005}_{0}$).

■Jector type

RoHS




V−P≧0.3

Calculating the projection length of the jector pin (reference value) P.185

- For details of jector holes, refer to Jector Punch Blanks. P.180
  (Blanks are based on SJB.)
- For details of jector pins, refer to Jector Pin Sets. P.183

| Catalog No. | | | | M | S | H |
|---|---|---|---|---|---|---|
| $D_{m5}$ | | $D^{+0.005}_{0}$ | | | | |
| Short tip | Long tip | Short tip | Long tip | | | |
| SJMT | — | A−SJMT | — | D4～6 SKH51 D8・10 Equivalent to SKD11 | — | D4～6 61～64HRC D8・10 60～63HRC |
| PJMT | — | A−PJMT | — | Powdered high-speed steel | — | 64～67HRC |
| H−PJMT | — | AH−PJMT | — | | TiCN coating | 64～67HRC Surface 3000HV |
| HW−PJMT | — | AHW−PJMT | — | | HW coating | 64～67HRC Surface 3000HV |

For shank diameter tolerance D T, select either (m5) or ($^{+0.005}_{0}$).

| 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 | —Short tip— ($D_{m5}$) ($D^{+0.005}_{0}$) SPMT A−SPMT | 4 | 40.0～80.0 (0.1mm increments) | 1.60～3.99 | 1.00 | F≦L−2 | 0°＜K＜90° |
| | 8 | SHMT A−SHMT | 5 | | 1.80～4.99 | 1.20 | | |
| | 9 | H−SHMT AH−SHMT HW−SHMT AHW−SHMT | 6 | | 1.80～5.99 | 1.20 | | |
| | 11 | PHMT A−PHMT | 8 | | 2.10～7.99 | 1.50 | | |
| | 13 | H−PHMT AH−PHMT HW−PHMT AHW−PHMT | 10 | | 3.00～9.99 | 2.50 | | |
| 15 | 7 | —Long tip— ($D_{m5}$) ($D^{+0.005}_{0}$) SPMTL A−SPMTL | 4 | 50.0～80.0 (0.1mm increments) | 1.60～3.99 | 1.00 | | |
| | 8 | SHMTL A−SHMTL | 5 | | 1.80～4.99 | 1.20 | | |
| | 9 | H−SHMTL AH−SHMTL HW−SHMTL AHW−SHMTL | 6 | | 1.80～5.99 | 1.20 | | |
| | 11 | PHMTL A−PHMTL | 8 | | 2.10～7.99 | 1.50 | | |
| | 13 | H−PHMTL AH−PHMTL HW−PHMTL AHW−PHMTL | 10 | | 3.00～9.99 | 2.50 | | |
| 8 | 7 | —Short tip jector— ($D_{m5}$) ($D^{+0.005}_{0}$) SJMT A−SJMT | 4 | 40 50 60 70 80 | 2.00～3.99 | 1.00 | | |
| | 8 | | 5 | | 2.00～4.99 | 2.00 | | |
| | 9 | PJMT A−PJMT | 6 | | 2.00～5.99 | 2.00 | | |
| | 11 | H−PJMT AH−PJMT | 8 | | 3.00～7.99 | 3.00 | | |
| | 13 | HW−PJMT AHW−PJMT | 10 | | 3.00～9.99 | 3.00 | | |

V−P≧0.3 B≧(L−F)＋{(V−P)/2tanK}＋2

Order

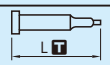
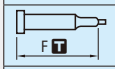
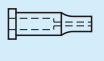
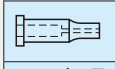
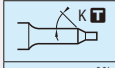
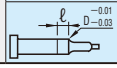
| Catalog No. | L | V | P | F | K |
|---|---|---|---|---|---|
| SPMT 4 | 41.0 | V2.60 | P1.00 | F39.0 | K30 |

Days to Ship: Quotation

Alterations

| 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 |
|---|---|---|---|---|
| Alterations to tip |  | BC | B dimension change<br>0.1mm increments<br>Full length must be 30 mm longer than tip length.<br>(L−F)＋α＋2≦BC≦BCmax.<br>α = (V−P)cotK°/2<br>V: 1.60~1.99 / 2.00~2.99 / 3.00~3.99 / 4.00~4.99 / 5.00~<br>BCmax.: 20 / 30 / 35 / 45 / 60<br>Cannot be used for jector punches.<br>For coating punches,<br>(L−F)＋α＋2≦BC≦BCmax.≦L/2 | |
| |  | VKC | V dimension tolerance change V +0.01 0 ⇨ +0.005 0<br>Cannot be used for coating punches. | Quotation |
| Alterations to head |  | HC | Head diameter change<br>D≦HC＜H<br>0.1mm increments | |
| |  | TC | Head thickness change 0.1mm increments<br>●Other than jector<br>2≦TC＜5 The full length L remains as specified.<br>●Jector<br>3.5≦TC＜5 Full length L is shortened by (5−TC).<br>(If combined with TKC・TKM, 0.01mm increments can be selected.) | |
| |  | TCC | Chamfering of head<br>This improves the strength of the punch head. P.1097<br>0.1 mm increments<br>0.5≦TCC≦(H-D)/2<br>If H≦5, then TCC is 0.5.<br>Cannot be combined with SRC. | |
| |  | TKC | Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 | |
| | | TKM | Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 | |

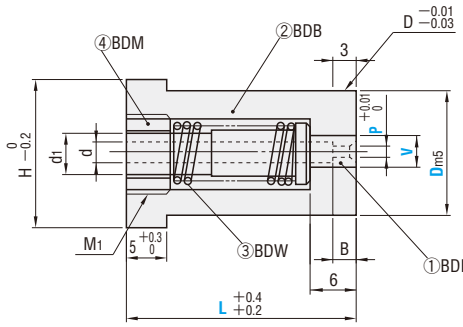
| Alteration | | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to head |  | KC | Addition of single key flat to head | |
| |  | WKC | Addition of double key flats in parallel | |
| |  | RC | Head thickness is machined to a tolerance of −0.04~0 relative to the retainer surface.<br>Can be used for D10 only.<br>Cannot be used for D +0.005 0 types. | |
| |  | SRC | Modification of head for use with select retainers (SLS)<br>For details, refer to P.629. Can be used for D10 only.<br>Cannot be used for D +0.005 0 types. | |
| Others |  | LKC | Full length tolerance change L +0.3 0 ⇨ +0.05 0 | Quotation |
| |  | FKC | Full length tolerance change F +0.3 0 ⇨ +0.05 0 | |
| |  | AC | The jector pin is removed to create an air path and the side vent hole is plugged from the inside.<br>Can be used for jector types only. | |
| |  | NC | The jector pin is removed.<br>Cannot be combined with AC.<br>Can be used for jector types only. | |
| |  | KKC | K angle tolerance change K±30′ ⇨±10′ | |
| |  | NDC | No press-in lead ℓ≧3⇨ℓ=0 | |

Price Quotation

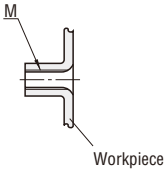
# BURRING DIE UNITS

RoHS

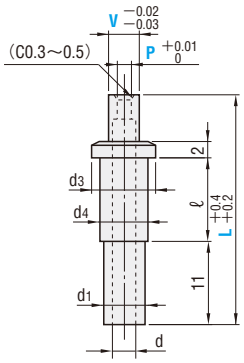
**BDU** (Unit)




(Example of burring)



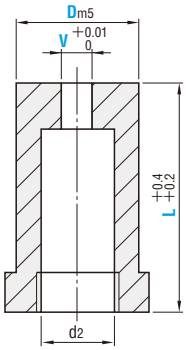

①**BDIB** (Inner bushing)




| L | ℓ |
|---|---|
| 25 | 6 |
| 30 | 11 |

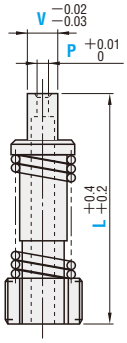
M Equivalent to SKD11
H 60~63HRC

②**BDB** (Outer bushing)

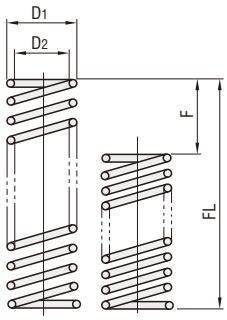



M Equivalent to SKD11
H 60~63HRC

**BDIS** (①③④)

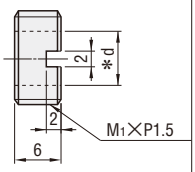



③**BDW** (Coil spring)




M SWP—B

④**BDM** (Screw plug)




M S45C
H 34~43HRC

kgf=kgf/mm×Fmm
N=kgf×9.80665

| 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 | | 11.0 | |
| 16 | 25 | 10.6 | 16 | 8.6 | | 5.5 | 7.2 |
| | 30 | | 21 | 8.4 | | 11.0 | |

| D | M | B | d | $d_1$ | $M_1$ | H | $d_2$ | $d_3$ | $d_4$ | 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 | | 30 | 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 | 16 | | 3.05~3.90 | 1.55~1.75 | 2.6 |
| | 3 | 3 | 2.5 | | | | | | | (①③④) | BDIS | | | 3.45~4.70 | 1.95~2.20 | 3 |
| | 4 | | 3.1 | | | | | | | ③ | BDW | | | 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 | | | | | | |

Days to Ship **Quotation**

Alterations

Catalog No. — L — V — P — (LKC・TKC, etc.)

BDU 13 — 25 — V3.75 — P1.70 — LKC

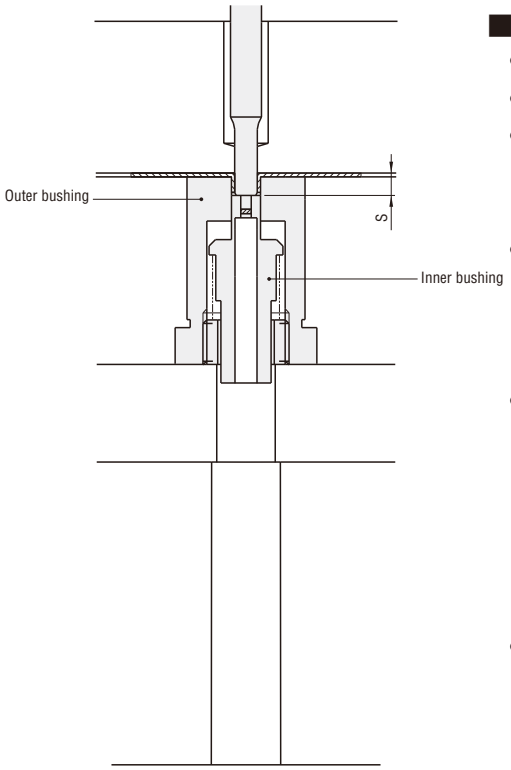
| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to full length | BDU L T | LKC | L dimension tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$ | Quotation |
| | BDB L T | LKC | L dimension tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$ | |

| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Others | BDU BDB T T | TKC | Head thickness tolerance change $5^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ | Quotation |
| | BDU BDB V T | VKC | V dimension tolerance change $V^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ | |
| | BDU BDIB BDIS P T | PKC | P dimension tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ | |

Price Quotation

## ■Features

1. Punched scraps are pushed into the inner bushing and held there, for an effective scrap retention.
2. It also knocks out the burring part at the same time. (Refer to the spring constant for the knockout force.)
3. The unit construction makes mounting and machining easier.
4. Because each component can be purchased separately, the die can be used even when there is no space to install the outer bushing.




## ■Notes for use

●Stroke Smax.=5mm

●Normal S=2～3mm

●However, use a stroke of S≧3mm in the following cases.

①Soft workpiece

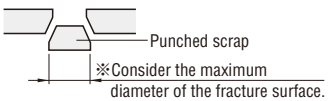
②Thick workpiece

●Function of inner bushing chamfering

The chamfering prevents dents from being left on the formed surface during burring, and allows punched scraps to be easily pushed into the inner bushing. Slightly larger chamfering is performed for new units before delivery in order to provide a margin for assembly adjustment.

●Setting of P dimension for the inner bushing

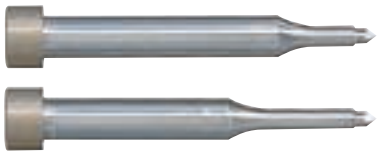
The scrap which is generated varies depending on the machining conditions. Set dimension P so that the performance of this function is optimized.




●Spring for lifting the inner bushing

The spring is intended to lift the inner bushing. It is not be intended to absorb shearing force. (Refer to the spring constant.)

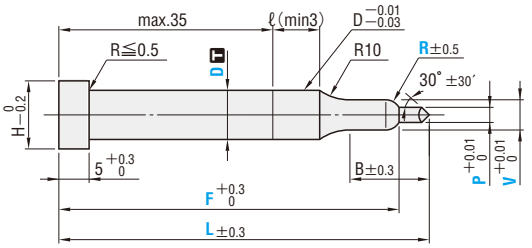
# SCRAPLESS BURRING PUNCHES

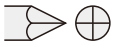


RoHS

| Type | | | | M | S | H |
|---|---|---|---|---|---|---|
| Dm5 | | D $^{+0.005}_{0}$ | | | | |
| Short tip | Long tip | Short tip | Long tip | | | |
| SP | SPL | A—SP | A—SPL | Equivalent to SKD11 | — | 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 | 64～67HRC Surface 3000HV |

For shank diameter tolerance D T, select either (m5) or ($^{+0.005}_{0}$).




| Tip shape | | |
|---|---|---|
| 2E | 3E | 4E |
|  |  |  |

| B | H | Catalog No. Type | Tip 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 |
|---|---|---|---|---|---|---|---|---|---|
| | | —Short tip— (Dm5) (D $^{+0.005}_{0}$) | | | | | | | |
| 8 | 8 | SP A—SP | 2E | 5 | 40.0～ 80.0 | 1.80～4.99 | 1.20 | 0.5≦R≦V—P | F≦L—(P×0.866)—1 |
| | 9 | SH A—SH | 3E | 6 | | 1.80～5.99 | | | |
| 13 | 11 | H—SH AH—SH | | 8 | 43.0～ 100.0 | 2.10～7.99 | 1.50 | | |
| | 13 | PH A—PH H—PH AH—PH | 4E | 10 | | 3.00～9.99 | 2.50 | | |
| | | —Long tip— (Dm5) (D $^{+0.005}_{0}$) | | | | | | | |
| 15 | 8 | SPL A—SPL | 2E | 5 | 50.0～ 80.0 | 1.80～4.99 | 1.20 | 0.5≦R≦V—P | F≦L—(P×0.866)—1 |
| | 9 | SHL A—SHL | 3E | 6 | | 1.80～5.99 | | | |
| 21 | 11 | H—SHL AH—SHL | | 8 | 50.0～ 100.0 | 2.10～7.99 | 1.50 | | |
| | 13 | PHL A—PHL H—PHL AH—PHL | 4E | 10 | | 3.00～9.99 | 2.50 | | |

V—P≧0.3
B≧L—F+R+2

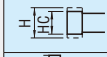
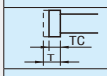
Order

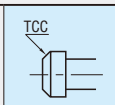
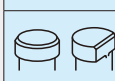
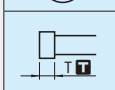
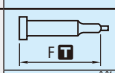
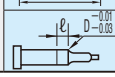
| Catalog No. | — | L | — | V·P·R·F |
|---|---|---|---|---|
| SH2E 6 | — | 51.0 | — | V4.70 — P2.50 — R0.5 — F47 |
| SHL2E 6 | — | 51.0 | — | V4.70 — P2.50 — R0.5 — F47 |

Days to Ship Quotation

Alterations

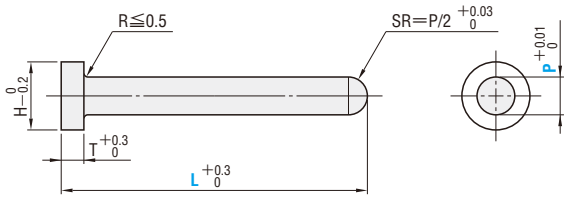
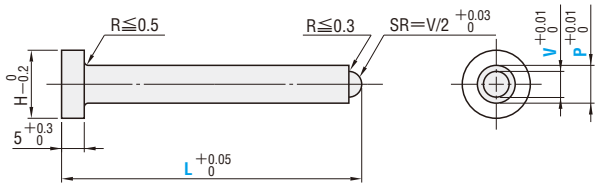
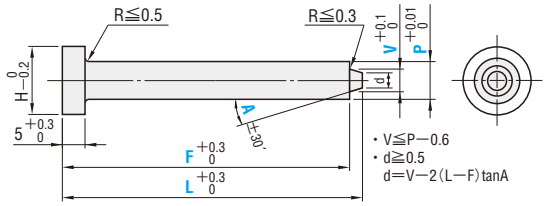
| Catalog No. | L | V | P | R | F | (BC・HC・TC, etc.) |
|---|---|---|---|---|---|---|
| SH2E 6 | 51.0 | V4.70 | P2.50 | R0.5 | F35 | KC |

| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to tip |  | BC | Tip length change (L−F)+R+2≦BC≦BCmax. 0.1mm increments<br>Full length must be 30 mm longer than tip length.<br>For coating punches, (L−F)+R+2≦BC≦BCmax.≦L/2<br>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 | |
| |  | VKC | V dimension tolerance change $V^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$<br>Cannot be used for coating punches. | Quotation |
| Alterations to head |  | RKC | R tolerance change R±0.5 ⇨ ±0.05 | |
| |  | HC | Head diameter change D≦HC<H 0.1mm increments | |
| |  | TC | Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.)<br>The full length remains as specified. | |
| |  | RC | Head thickness is machined to a tolerance of −0.04~0 relative to the retainer surface.<br>Can be used for D10 only.<br>Cannot be used for $D^{+0.005}_{0}$ types. | |

| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to head |  | TCC | Chamfering of head<br>This improves the strength of the punch head. P.1097<br>0.1 mm increments<br>0.5≦TCC≦(H-D)/2<br>If H≦5, then TCC is 0.5.<br>Cannot be combined with SRC. | |
| |  | SRC | Modification of head for use with select retainers (SLS)<br>For details, refer to P.629. Can be used for D10 only.<br>Cannot be used for $D^{+0.005}_{0}$ types. | |
| |  | KC | Addition of single key flat to head | Quotation |
| |  | WKC | Addition of double key flats in parallel | |
| |  | TKC | Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ | |
| | | TKM | Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ | |
| Others |  | FKC | F dimension tolerance change $F^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ | |
| |  | NDC | No press-in lead ℓ≧3 ⇨ ℓ=0 | |

Price Quotation

# EMBOSSING PUNCHES / KNOCKOUT PIN SETS FOR EMBOSSING PUNCHES

| Type | M H | Catalog No. | Shape |
|---|---|---|---|
| —SR type— RoHS  | SKH51 61～64HRC | SHSR |  |
| | Powdered high-speed steel 64～67HRC | PHSR | |
| —Stepped SR type— RoHS  | Equivalent to SKD11 60～63HRC | SPSR |  |
| | Powdered high-speed steel 64～67HRC | PHSRR | |
| —Stepped and tapered type— RoHS  | Equivalent to SKD11 60～63HRC | SPSTT |  |
| | SKH51 61～64HRC | SHSTT | |
| | Powdered high-speed steel 64～67HRC | PHSTT | |

■SR type

| H | T | Catalog No. Type | Catalog No. No. | 0.1mm increments L | 0.01mm increments min. P max. | Base unit price 1～9 pieces SHSR | PHSR |
|---|---|---|---|---|---|---|---|
| 2 | 3 | SHSR PHSR | 1.0 | 20.0 ～ 30.0 | 0.50 ～ 1.00 | | |
| 2.6 | | | 1.6 | | 1.00 ～ 1.60 | | |
| 3 | | | 2.0 | 20.0 ～ 50.0 | 1.60 ～ 2.00 | | |
| 3.5 | | | 2.5 | | 2.00 ～ 2.50 | | |
| 5 | 5 | | 3 | 20.0 ～ 80.0 | 2.50 ～ 3.00 | Quotation | |
| 7 | | | 4 | | 3.00 ～ 4.00 | | |
| 8 | | | 5 | | 4.00 ～ 5.00 | | |
| 9 | | | 6 | | 5.00 ～ 6.00 | | |
| 11 | | | 8 | | 6.00 ～ 8.00 | | |
| 13 | | | 10 | | 8.00 ～ 10.00 | | |

■Stepped SR type

| H | Catalog No. Type | Catalog No. No. | 0.1mm increments L | 0.01mm increments min. P max. | 0.01mm increments V | Base unit price 1～9 pieces SPSR | PHSRR |
|---|---|---|---|---|---|---|---|
| 5 | SPSR PHSRR | 3 | 20.0 ～ 80.0 | 2.00 ～ 3.00 | P/2≦V＜P | | |
| 7 | | 4 | | 3.00 ～ 4.00 | | | |
| 8 | | 5 | | 4.00 ～ 5.00 | | Quotation | |
| 9 | | 6 | | 5.00 ～ 6.00 | | | |
| 11 | | 8 | | 6.00 ～ 8.00 | | | |
| 13 | | 10 | | 8.00 ～ 10.00 | | | |

■Stepped and tapered type

| H | Catalog No. Type | Catalog No. No. | 0.1mm increments L | 0.01mm increments min. P max. | 0.01mm increments V | 1° increments A | 0.1mm increments F | Base unit price 1～9 pieces 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 | | | |
| 7 | | 4 | | 3.00～ 4.00 | | | | | | |
| 8 | | 5 | | 4.00～ 5.00 | | | | Quotation | | |
| 9 | | 6 | | 5.00～ 6.00 | | | | | | |
| 11 | | 8 | | 6.00～ 8.00 | | | | | | |
| 13 | | 10 | | 8.00～ 10.00 | | | | | | |

**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 |

**Days to Ship** Quotation

**Price** Quotation

**Alterations**

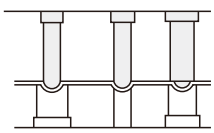
| Catalog No. | L | P | V | A | F | (RSC・LKC, etc.) |
|---|---|---|---|---|---|---|
| SHSR 3 | 40.0 | P2.80 | | | | LKC |

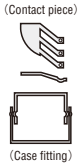
| Alteration | | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to head | | HC | Head diameter change<br>P≦HC＜H<br>0.1mm increments | |
| | | TC | Head thickness change 2≦TC＜T<br>0.1mm increments<br>(If combined with TKC・TKM, 0.01mm increments can be selected.)<br>The full length remains as specified. | |
| | | TCC | Chamfering of head<br>This improves the strength of the punch head. P.1097<br>0.1mm increments<br>0.5≦TCC≦(H−P)/2<br>If H≦5, then TCC is 0.5.<br>Cannot be used for H＜2.6. | Quotation |
| | | KC | Addition of single key flat to head<br>Can be used for No. 3 and above. | |
| | | WKC | Addition of double key flats in parallel<br>Can be used for No. 3 and above. | |
| | | TKC | Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ | |
| | | TKM | Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ | |

| Alteration | | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to tip | | RSC | R change<br>R of 0.5 or less is added to tip.<br>Can be used for SPSTT・SHSTT・PHSTT.<br>Can be used for d≧1.5. | Quotation |
| | | AKC | Angle A tolerance change<br>A±30′ ⇨ ±10′<br>Can be used for SPSTT・SHSTT・PHSTT. | |
| Others | | LKC | Full length tolerance change<br>L dimension can be selected in 0.01mm increments.<br>$L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$<br>Cannot be used for SPSR・PHSRR. | |
| | | FKC | F dimension tolerance change<br>$F^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$<br>Can be used for SPSTT・SHSTT・PHSTT. | |

**Example**

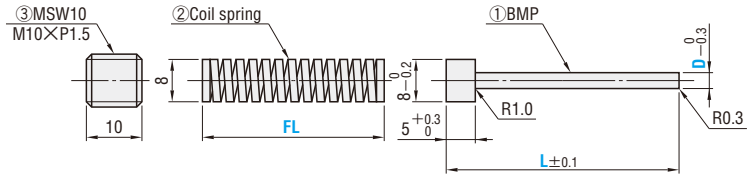
■Example of use for SHSR・SPSR






■Knockout pin sets for embossing punches RoHS

BMPS(①②③) BMP(①)




①BMP M SK4 (Raw material)

| Catalog No. Type | D | L | ②Coil spring Type | FL | Base unit price 1~9 sets BMPS (①②③) | Base unit price 1~9 pieces BMP (①) |
|---|---|---|---|---|---|---|
| BMPS(①②③)<br>BMP(①) | 1.5 | 20 | SWL | 20 | Quotation | |
| | 2.0 | | | 25 | | |
| | 2.5 | 25 | SWM | 30 | | |
| | 3.0 | 30 | SWH | 35 | | |
| | 3.5 | 35 | SWB | 40 | | |
| | 4.0 | | | 45 | | |
| | | | | 50 | | |
| | | | | 60 | | |

**Order**

| Catalog No. | L | ②Coil spring |
|---|---|---|
| BMPS 2.0 | 30 | SWL 30 |
| BMP 2.0 | 30 | |

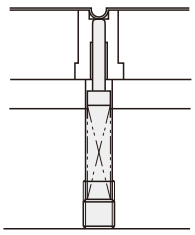
②Detailed specifications of coil springs P.977 ~ 984

**Days to Ship** Quotation

**Price** Quotation

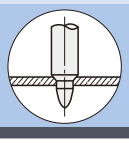
**Example**

■Example of BMPS use



・Select an alteration to the tip so that it matches the shape of the workpiece.

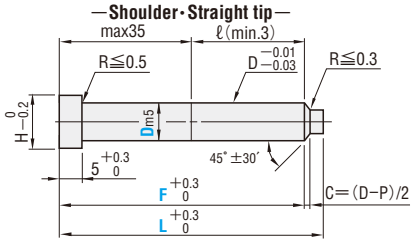
# CHAMFERING PUNCHES
## —TYPE A—



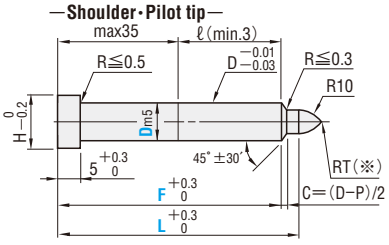
RoHS

| Tip shape | M | S | H | Catalog No. Shank type: Shoulder | Key flat shank | Tapped |
|---|---|---|---|---|---|---|
| Straight | Equivalent to SKD11 | — | 60～63HRC | SPMUA | G—SPMUA | MPMUA |
| | SKH51 | — | 61～64HRC | SHMUA | G—SHMUA | — |
| | | TiCN coating | 61～64HRC Surface treatment 3000HV | H—SHMUA | GH—SHMUA | — |
| | Powdered high-speed steel | — | 64～67HRC | PHMUA | G—PHMUA | MPHMUA |
| | | TiCN coating | 64～67HRC Surface treatment 3000HV | H—PHMUA | GH—PHMUA | H—MPHMUA |
| Pilot | Equivalent to SKD11 | — | 60～63HRC | SRMUA | G—SRMUA | MRMUA |
| | SKH51 | — | 61～64HRC | HSRMUA | G—HSRMUA | — |
| | | TiCN coating | 61～64HRC Surface treatment 3000HV | H—HSRMUA | GH—HSRMUA | — |
| | Powdered high-speed steel | — | 64～67HRC | PSRMUA | G—PSRMUA | MRHMUA |
| | | TiCN coating | 64～67HRC Surface treatment 3000HV | H—PSRMUA | GH—PSRMUA | H—MRHMUA |

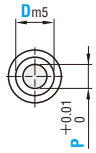
—Shoulder・Straight tip—



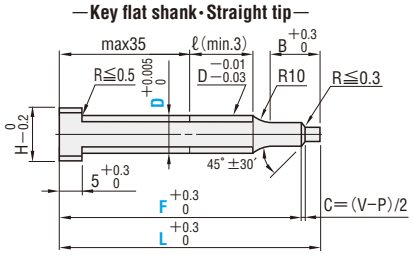

—Shoulder・Pilot tip—



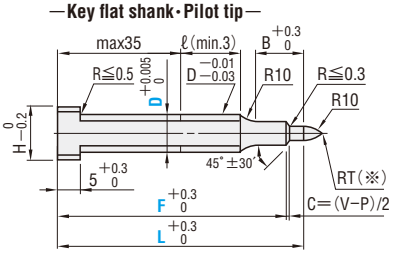

Tip shape A



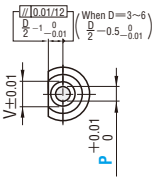

—Key flat shank・Straight tip—



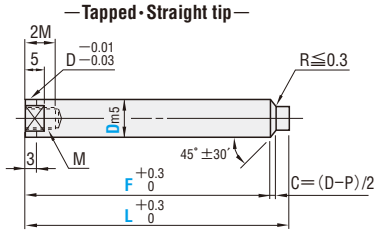

—Key flat shank・Pilot tip—



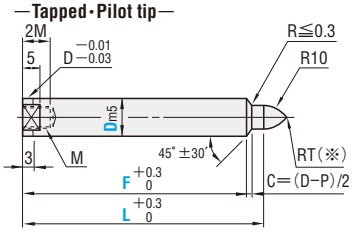

Tip shape A



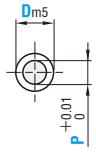

—Tapped・Straight tip—




—Tapped・Pilot tip—




Tip shape A




The tip end of a TiCN coating punch is ground before the coating is applied.

RT(※)…If P＜8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0.

For the length of tip R, refer to the products data "Punch R length". P.1082

| B | H | V | M | Catalog No. Type: —Shoulder— Straight tip | Pilot tip | D | 0.1mm increments L | 0.01mm increments min. P max. | 0.1mm increments F |
|---|---|---|---|---|---|---|---|---|---|
| — | 5 | — | — | SPMUA | SRMUA | 3 | 30.0～ 90.0 | 1.00～ 2.00 | 28≦F≦L—C—2.0 |
| | 7 | | | SHMUA | HSRMUA | 4 | | 1.00～ 3.00 | |
| | 8 | | | H—SHMUA | H—HSRMUA | 5 | | 2.00～ 4.00 | |
| | 9 | | | PHMUA | PSRMUA | 6 | | 2.00～ 5.00 | |
| | 11 | | | H—PHMUA | H—PSRMUA | 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: —Key flat shank— Straight tip | Pilot tip | D | 0.1mm increments L | 0.01mm increments min. P max. | 0.1mm increments F |
|---|---|---|---|---|---|---|---|---|---|
| 8 | 7 | 2.8 | — | G—SPMUA | G—SRMUA | 4 | 40.0～ 90.0 | 1.00～ 1.80 | 29≦F≦L—C—2.0 and B≧L—F+2.0 |
| | 8 | 3.8 | | G—SHMUA | G—HSRMUA | 5 | | 2.00～ 2.80 | |
| | 9 | 4.8 | | GH—SHMUA | GH—HSRMUA | 6 | | 2.00～ 3.80 | |
| 13 | 11 | 5.8 | | G—PHMUA | G—PSRMUA | 8 | | 3.00～ 4.80 | |
| | 13 | 7.8 | | GH—PHMUA | GH—PSRMUA | 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 | |

| B | H | V | M | Catalog No. Type: —Tapped— Straight tip | Pilot tip | D | 0.1mm increments L | 0.01mm increments min. P max. | 0.1mm increments F |
|---|---|---|---|---|---|---|---|---|---|
| — | — | — | 3 | MPMUA | MRMUA | 5 | 30.0～ 70.0 | 2.00～ 4.00 | 28≦F≦L—C—2.0 |
| | | | 4 | MPHMUA | MRHMUA | 6 | | 2.00～ 5.00 | |
| | | | 5 | H—MPHMUA | H—MRHMUA | 8 | | 3.00～ 7.00 | |
| | | | 6 | | | 10 | 30.0～ 90.0 | 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 |

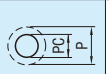
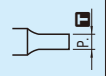
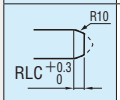
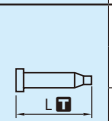
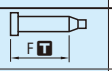
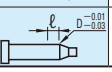
**Order**

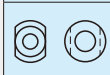
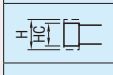
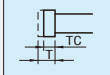
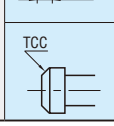
| Catalog No. | — | L | — | P | — | F |
|---|---|---|---|---|---|---|
| SPMUA 5 | — | 60.0 | — | P4.0 | — | F37.0 |
| G—SHMUA 10 | — | 70.0 | — | P6.6 | — | F65.0 |

**Days to Ship** Quotation

**Alterations**

| No. | — | L | — | P | — | F | — (PKC, etc.) |
|---|---|---|---|---|---|---|---|
| SRMUA 5 | — | 55.0 | — | P2.40 | — | F51.0 | — PKC |

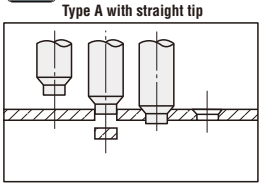
| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to tip |  | PC | Tip dimension change<br>PC≧$\frac{Pmin.}{2}$≧1.00<br>0.01mm increments<br>(If combined with PKC, 0.001mm increments can be selected.) | |
| |  | PKC | Tip tolerance change<br>P$^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$<br>(P dimension can be selected in 0.001mm increments.)<br>TiCN coating cannot be used for D>13. | |
| |  | RLC | Tip R is cut flat.<br>2≦RLC<$\sqrt{P(10-P/4)}$<br>0.1mm increments<br>Can be used for P<8.<br>Can be used for pilot tip types only. | Quotation |
| Alterations to full length |  | LKC | Full length tolerance change L$^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$<br>Cannot be used for pilot tip types.<br>(L dimension can be selected in 0.01mm increments.) | |
| | | LKZ | Full length tolerance change L$^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$<br>Cannot be used for pilot tip types.<br>Cannot be used with TiCN coating.<br>(L dimension can be selected in 0.01mm increments.) | |
| Shank |  | FKC | F dimension tolerance change F$^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ | |
| |  | NDC | No press-in lead ℓ≧3 ⇨ℓ=0<br>Cannot be used for tapped types. | |

| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to head |  | KC | Addition of single key flat<br>Cannot be used for D5 tapped types.<br>Cannot be used for key flat shank types. | |
| |  | WKC | Addition of double key flats in parallel<br>Cannot be used for D5 tapped types.<br>Cannot be used for key flat shank types. | |
| |  | HC | Head diameter change<br>D≦HC<H<br>0.1mm increments Cannot be used for tapped types. | Quotation |
| |  | TC | Head thickness change 2≦TC<5<br>0.1mm increments (If combined with TKC•TKM, 0.01mm increments can be selected.)<br>The full length remains as specified.<br>Cannot be used for tapped types. | |
| |  | TKC | Head thickness tolerance change T$^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ Cannot be used for tapped types. | |
| | | TKM | Head thickness tolerance change T$^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ Cannot be used for tapped types. | |
| |  | TCC | Chamfering of head<br>This improves the strength of the punch head. P.1097<br>0.1mm increments<br>0.5≦TCC≦(H−D)/2 Cannot be used for tapped types.<br>If H≦5, then TCC is 0.5. | |

**Price** Quotation

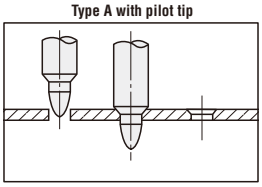
**Example**

Type A with straight tip



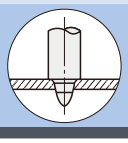
① Punching and chamfering are done simultaneously. Chamfering can be done in one operation.

Type A with pilot tip



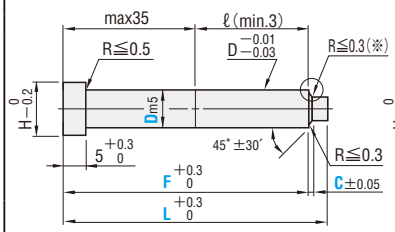
② Chamfering is done after punching. Chamfering can be done in two operations.

# CHAMFERING PUNCHES
## —TYPE B—

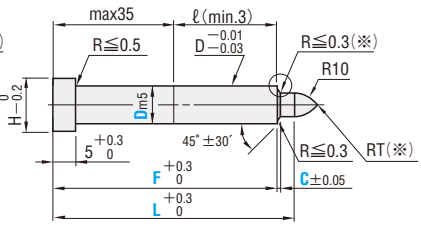


| Tip shape | M | S | H | Catalog No. Shank type: Shoulder | Shank type: Key flat shank | Shank type: Tapped | Tip shape |
|---|---|---|---|---|---|---|---|
| Straight | Equivalent to SKD11 | — | 60 ～ 63HRC | SPMUB | G—SPMUB | MPMUB | Ⓐ (Unnecessary to specify.) |
| | SKH51 | — | 61 ～ 64HRC | SHMUB | G—SHMUB | — | Ⓔ |
| | | TiCN coating | 61 ～ 64HRC Surface treatment 3000HV | H—SHMUB | GH—SHMUB | — | Ⓖ |
| | Powdered high-speed steel | — | 64 ～ 67HRC | PHMUB | G—PHMUB | MPHMUB | |
| | | TiCN coating | 64 ～ 67HRC Surface treatment 3000HV | H—PHMUB | GH—PHMUB | H—MPHMUB | |
| Pilot | Equivalent to SKD11 | — | 60 ～ 63HRC | SRMUB | G—SRMUB | MRMUB | |
| | SKH51 | — | 61 ～ 64HRC | HSRMUB | G—HSRMUB | — | Ⓐ (Unnecessary to specify.) |
| | | TiCN coating | 61 ～ 64HRC Surface treatment 3000HV | H—HSRMUB | GH—HSRMUB | — | |
| | Powdered high-speed steel | — | 64 ～ 67HRC | PSRMUB | G—PSRMUB | MRHMUB | |
| | | TiCN coating | 64 ～ 67HRC Surface treatment 3000HV | H—PSRMUB | GH—PSRMUB | H—MRHMUB | |

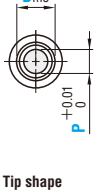
—Shoulder・Straight tip—



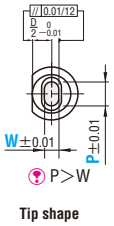

—Shoulder・Pilot tip—



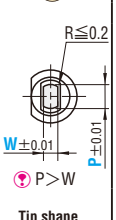

Tip shape Ⓐ



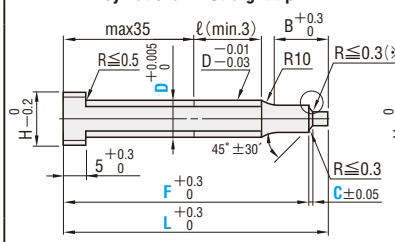

Tip shape Ⓔ



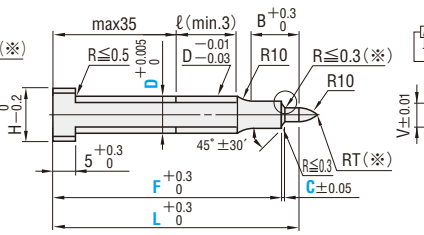

Tip shape Ⓖ



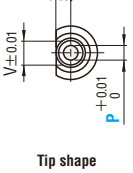

—Key flat shank・Straight tip—



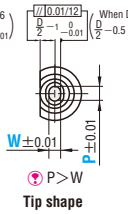

—Key flat shank・Pilot tip—



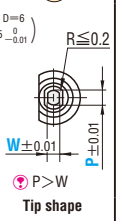

Tip shape Ⓐ



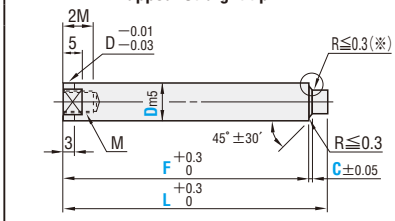

Tip shape Ⓔ



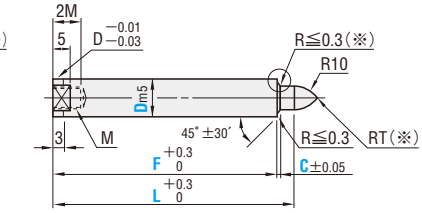

Tip shape Ⓖ



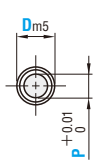

—Tapped・Straight tip—



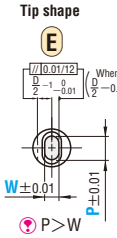

—Tapped・Pilot tip—



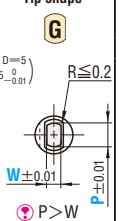

Tip shape Ⓐ

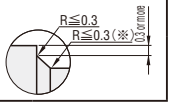



Tip shape Ⓔ




Tip shape Ⓖ




Ⓡ R≦0.3(※)⋯With tip shapes E・G, R≦0.5
Ⓡ The tip end of a TiCN coating punch is ground before the coating is applied.

Ⓡ RT(※)⋯If P＜8, tip is rounded for safety.
To keep the sharp tip (no rounding), specify RT=0.
Ⓡ For the length of tip R, refer to the products data "Punch R length". P.1082

| B | H | V | M | Catalog No. Type | Shape | D | 0.1mm increments L | 0.01mm increments Ⓐ min. P max. | 0.01mm increments Ⓔ Ⓖ P・max. | 0.01mm increments Ⓔ Ⓖ P・Wmin. | 0.1mm increments F | 0.1mm increments C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| — | 7 | — | — | —Shoulder— Straight tip / Pilot tip: SPMUB / SRMUB; SHMUB / HSRMUB; H—SHMUB / H—HSRMUB; PHMUB / PSRMUB; H—PHMUB / H—PSRMUB | Ⓐ (Round) Unnecessary to specify shape in this case. Ⓔ Ⓖ | 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 L−F 20 or less; 2.00～3.99 35 or less; 4.00～5.99 45 or less; 6.00～ 50 or less. Shapes E・G: W 1.00～1.29 L−F 8 or less; 1.30～1.49 15 or less; 1.50～ 20 or less | 0.5≦C≦(D−P)/2−0.6 and With shapes E・G, C≦2.0 |
| | 8 | | | | | 5 | | 2.00 ～ 2.80 | 2.80 | 1.20 | | |
| | 9 | | | | | 6 | | 2.00 ～ 3.80 | 3.80 | 1.50 | | |
| | 11 | | | | | 8 | | 3.00 ～ 5.80 | 5.80 | 2.00 | | |
| | 13 | | | | | 10 | 30.0～ 100.0 | 3.00 ～ 7.80 | 7.80 | 2.50 | | |
| | 16 | | | | | 13 | | 6.00 ～ 10.80 | 10.80 | 5.00 | | |
| | 19 | | | | | 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 shank— Straight tip / Pilot tip: G—SPMUB / G—SRMUB; G—SHMUB / G—HSRMUB; GH—SHMUB / GH—HSRMUB; G—PHMUB / G—PSRMUB; GH—PHMUB / GH—PSRMUB | | 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 With shapes E・G, C≦3.5 |
| 13 | 11 | 5.8 | | | | 8 | | 3.00 ～ 3.60 | 3.60 | 2.00 | | |
| | 13 | 7.8 | | | | 10 | 50.0～ 100.0 | 3.00 ～ 5.60 | 5.60 | 2.50 | | |
| | 16 | 10.8 | | | | 13 | | 6.00 ～ 8.60 | 8.60 | 3.00 | | |
| | 19 | 13.8 | | | | 16 | | 10.00 ～ 11.60 | 11.60 | 4.00 | | |
| 19 | 23 | 17.8 | | | | 20 | | 13.00 ～ 15.60 | 15.60 | 5.00 | | |
| | 28 | 22.8 | | | | 25 | | 18.00 ～ 20.60 | 20.60 | 6.00 | | |
| — | — | — | 3 | —Tapped— Straight tip / Pilot tip: MPMUB / MRMUB; MPHMUB / MRHMUB; H—MPHMUB / H—MRHMUB | | 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 L−F 20 or less; 2.00～3.99 35 or less; 4.00～5.99 45 or less; 6.00～ 50 or less. Shapes E・G: W 1.00～1.29 L−F 8 or less; 1.30～1.49 15 or less; 1.50～ 20 or less | 0.5≦C≦(D−P)/2−0.6 and With shapes E・G, C≦2.0 |
| | | | 4 | | | 6 | | 2.00 ～ 3.80 | 3.80 | 1.50 | | |
| | | | 5 | | | 8 | 30.0～ 90.0 | 3.00 ～ 5.80 | 5.80 | 2.00 | | |
| | | | 6 | | | 10 | | 3.00 ～ 7.80 | 7.80 | 2.50 | | |
| | | | | | | 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 | | |

Ⓡ Ⓔ Ⓖ Can be used for shapes SPMUB□, G—SPMUB□, and MPMUB□ only.

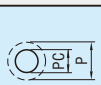
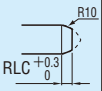
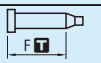
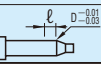
**Order**

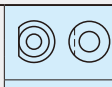
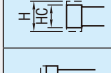
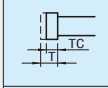
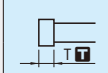
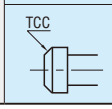
| Catalog No. | L | P | W | F | C |
|---|---|---|---|---|---|
| SPMUB 6 | 51.0 | P3.40 | | F45.0 | C0.6 |
| G—SPMUBG 10 | 65.0 | P5.6 | W4.0 | F60.0 | C0.5 |

**Days to Ship** Quotation

**Alterations**

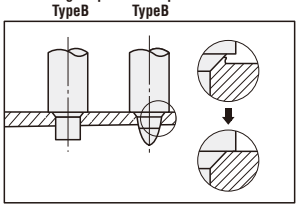
| Catalog No. | L | P | W | F | C | (PKC, etc.) |
|---|---|---|---|---|---|---|
| SRMUB 5 | 55.0 | P2.40 | | F52.0 | C0.5 | PKC |

| Alteration | | Code | Ⓐ | Ⓔ Ⓖ | 1Code |
|---|---|---|---|---|---|
| Alterations to tip |  | PC | Tip dimension change<br>PC≧Pmin./2≧1.00<br>0.01mm increments<br>(If combined with PKC, 0.001mm increments can be selected.) | —— | |
| |  | PKC | Tip tolerance change<br>P +0.01 0 ⇨ +0.005 0<br>(P dimension can be selected in 0.001mm increments.)<br>⊗ TiCN coating cannot be used for D>13. | Tip tolerance change<br>P·W±0.01 ⇨ +0.01 0 | |
| |  | RLC | Tip R is cut flat.<br>2≦RLC<√P(10−P/4)<br>0.1mm increments<br>Can be used for P<8.<br>Can be used for pilot tip types only. | —— | Quotation |
| Alterations to full length |  | LKC | Full length tolerance change L +0.3 0 ⇨ +0.05 0<br>⊗ Cannot be used for pilot tip types.<br>(L dimension can be selected in 0.01mm increments.) | | |
| | | LKZ | Full length tolerance change L +0.3 0 ⇨ +0.01 0<br>⊗ Cannot be used for pilot tip types.<br>⊗ Cannot be used with TiCN coating.<br>(L dimension can be selected in 0.01mm increments.) | | |
| Shank |  | FKC | F dimension tolerance change F +0.3 0 ⇨ +0.05 0 | | |
| |  | NDC | No press-in lead ℓ≧3⇨ℓ=0<br>⊗ Cannot be used for tapped types. | | |

| Alteration | | Code | Ⓐ | Ⓔ Ⓖ | 1Code |
|---|---|---|---|---|---|
| Alterations to head |  | KC | Addition of single key flat<br>⊗ Cannot be used for D5 tapped types.<br>⊗ Cannot be used for key flat shank types. | Key flat 90° 0° 180° 270° position change 1° increments<br>⊗ Cannot be used for key flat shank types. | Quotation |
| |  | WKC | Addition of double key flats in parallel<br>⊗ Cannot be used for D5 tapped types.<br>⊗ Cannot be used for key flat shank types. | Double key flats in parallel Can be combined with KC.<br>⊗ Cannot be used for key flat shank types. | |
| |  | HC | Head diameter change<br>D≦HC<H<br>0.1mm increments ⊗ Cannot be used for tapped types. | | |
| |  | TC | Head thickness change 2≦TC<5<br>0.1mm increments (If combined with TKC·TKM, 0.01mm increments can be selected.)<br>The full length L remains as specified.<br>⊗ Cannot be used for tapped types. | | |
| |  | TKC | Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 | ⊗ Cannot be used for tapped types. | |
| | | TKM | Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 | ⊗ Cannot be used for tapped types. | |
| |  | TCC | Chamfering of head<br>This improves the strength of the punch head. P.1097<br>0.1mm increments<br>0.5≦TCC≦(H−D)/2<br>If H≦5, then TCC is 0.5. | ⊗ Cannot be used for tapped types. | |

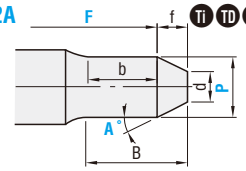
**Price** Quotation

**Example**



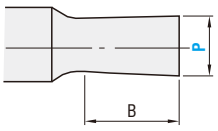

Parts which are raised during chamfering are also chamfered down.

# DRAWING PUNCHES
## —TIP SHAPES—

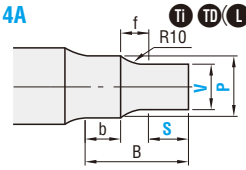
### 2A



- 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》

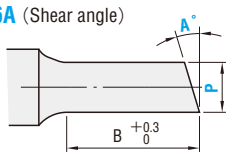
### 3A (1/200 reverse taper)



- Cannot be used for PKC.

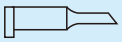
### 4A


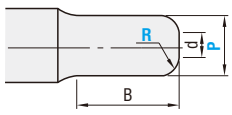

- S≧2
- B≧S+f+2 (b≧2)

《f=√10(P−V)−(P−V)²/4》

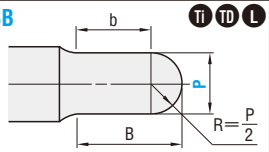
### 6A (Shear angle)



- 0<A≦15°
- B≧PtanA+2
- Cannot be used for LKC.
- Position of alteration KC (key flat)

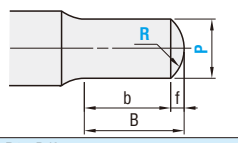


### 2B



- 0.5≦R≦(P−0.5)/2
- For jector punch, 0.5≦R≦(P−dmin.)/2

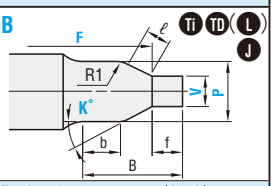
### 3B



- B≧(P/2)+2 (b≧2)

### 4B


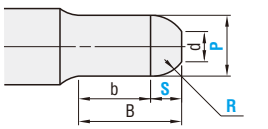

- R>P/2
- B≧f+2 (b≧2)

《f=R−√R²−(P/2)²》

### 5B


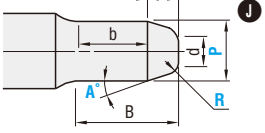

- F≦L−2 (f≧2)
- B≧L−F+ℓ+2 (b≧2)
- V≦P−0.6

《0.2≦ℓ=|(P−V)/2sinK|−tan|90−(180−K)/2|R》

### 6B


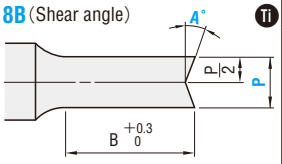

- S≧2
- R>S
- B≧S+2 (b≧2)
- d≧0.5
- For jector punch, d≧dmin.

《d=P−2(R−√R²−S²)》

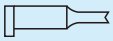
### 7B


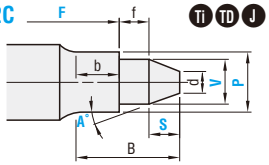

- F≦L−R−1 (f≧R+1)
- B≧L−F+2 (b≧2)
- d≧0.5
- For jector punch, d≧dmin.
- R=0⋯2A

《d=P−2{Rtan|(90−A)/2|+(L−F)tanA}》

### 8B (Shear angle)


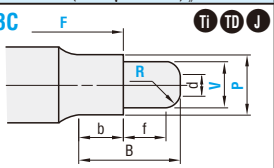

- 0<A≦15°
- B>(P/2)tanA
- Cannot be used for LKC.
- Position of alteration KC (key flat)



### 2C


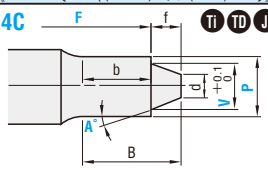

- F≦L−S−2 (f≧2)
- S≧1
- B≧L−F+2 (b≧2)
- V≦P−0.6
- d≧0.5
- For jector punch. d≧dmin.

《d=V−2StanA》

### 3C


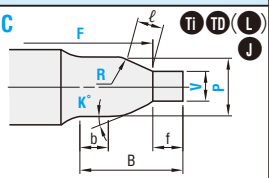

- F≦L−R−2 (f≧2)
- B≧L−F+2 (b≧2)
- V≦P−0.6
- d≧0.5
- For jector punch, d≧dmin.

《d=V−2R》

### 4C


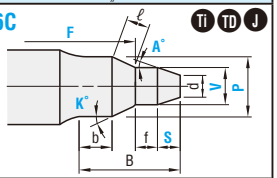

- F≦L−2 (f≧2)
- B≧L−F+2 (b≧2)
- V≦P−0.6
- d≧0.5
- For jector punch, d≧dmin.

《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》

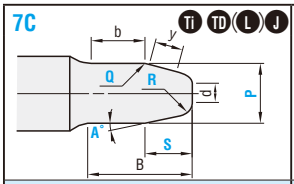
### 6C



- 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|》

- TiCN coating is available for tip shapes marked with Ti. (P.561・565)
- Dicoat® treatment is available for tip shapes marked with TD. (P.561・565)
- Lapping is available for tip shapes marked with L.
  However for shapes (L), lapping of the punch end surface is not performed. (P.559・563)
- Tip shapes marked with J can be used for jector punches. (P.563・565)
- Shape 5A is created by alteration GC. For details, refer to the page of the relevant punch (P.47 ～ ).

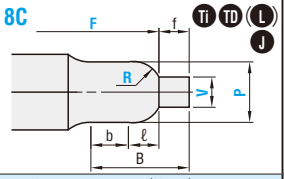
## 7C




- 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 machining.

《d=P−2{Rtan{(90−A)/2}+StanA}》
《y=S/cosA−Qtan(A/2)−Rtan{(90−A)/2}》

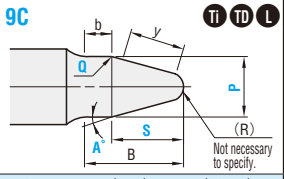
## 8C




- F≦L−2 (f≧2)
- B≧L−F+ℓ+2 (b≧2)
- R≧(P−V)/2

《ℓ=√(P−V){R−(P−V)/4}》

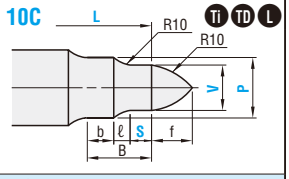
## 9C




- B≧S+Qtan(A/2)+2 (b≧2)
- y≧1
- S is the dimension of Q before machining.

《y=S/cosA−Qtan(A/2)−Rtan{(90−A)/2}》
《R=(P/2−StanA)/tan{(90−A)/2}》

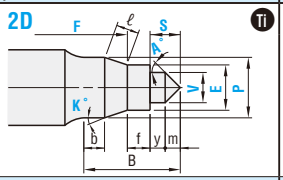
## 10C




- 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》

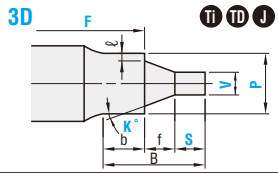
## 2D




- F≦L−S−2 (f≧2)
- S≧m+2 (y≧2)
- A≧20°
- B≧L−F+ℓ+2 (b≧2)
- V≦P−0.6
- Cannot be used for LKC.

《m=(V/2)tan(90−A)》
《0.2≦ℓ={(P−E)/2sinK}》

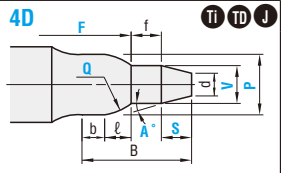
## 3D




- 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》

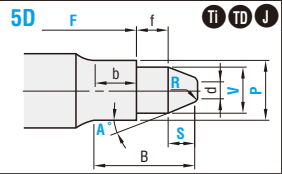
## 4D




- 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}》

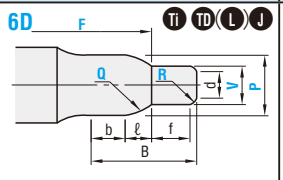
## 5D




- 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}》

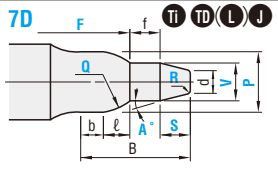
## 6D




- 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}》

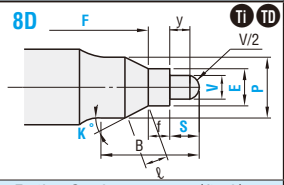
## 7D




- 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}》

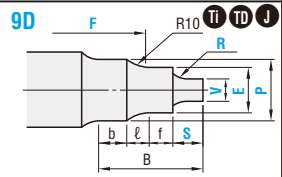
## 8D




- 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}》

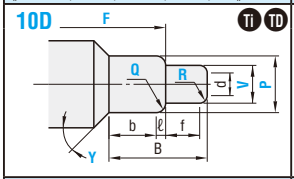
## 9D




- 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 cannot be selected.
- Cannot be used fro FKC.

《ℓ=√10(P−E)−(P−E)²/4》

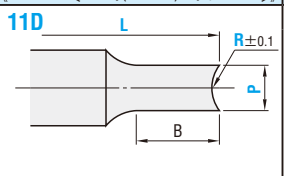
## 10D




- 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 ±30′

《ℓ=√(P−V){Q−(P−V)/4}》

## 11D




- P+5≧R≧P+1 The tip is not spherical.
- L T L±0.3
- Cannot be used for LKC.
- Cannot be used for PKC.
- Cannot be used for RKC.
- Position of alteration KC (key flat)

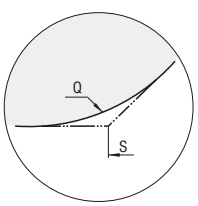
### ■Increment

| T | Increment |
|---|---|
| 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<br>R=0 or 0.5≦R≦15 |
| Q ±0.5 | 0.1mm increments<br>Q=0 or 0.5≦Q≦15 |

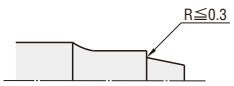
Even for a lapped punch (L−), the dimension tolerance and increment for each part do not change.

**7C·9C**

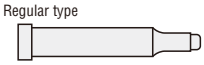
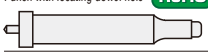
For 7C and 9C, S is the dimension of Q before machining.

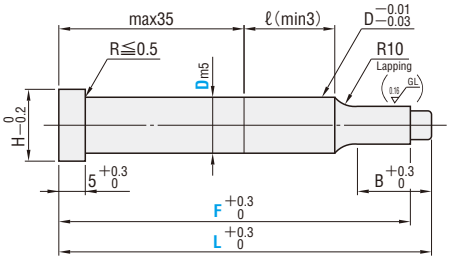



All interior angles are rounded to R 0.3 or less.



# DRAWING PUNCHES
## —NORMAL・LAPPING—

| Type | M | H | Shank diameter D | Catalog No. |
|---|---|---|---|---|
| RoHS Regular type  | Equivalent to SKD11 | 60～63HRC | 3～25 | SP Lapping L—SP |
| | SKH51 | 61～64HRC | | SH Lapping L—SH |
| | Powdered high-speed steel | 64～67HRC | | PH Lapping L—PH |
| RoHS Punch with locating dowel hole  | Equivalent to SKD11 | 60～63HRC | 10～25 | SP—C Lapping L—SP—C |
| RoHS Tapped punch  | Equivalent to SKD11 | 60～63HRC | 5～25 | MP Lapping L—MP |
| | Powdered high-speed steel | 64～67HRC | | MPH Lapping L—MPH |




- SP—C…T=5 +0.03 +0.01
- Lapping is applied to the area from the punch tip up to B dimension. (However end face is not lapped.)

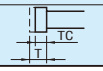
Shape P.557

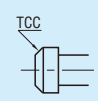
| B | H | (M) | Catalog No. Type | Catalog No. Shape | D | 0.1mm increments L | 0.01mm increments min. P max.* | 0.01mm increments Vmin. |
|---|---|---|---|---|---|---|---|---|
| 8 | 5 | — | Regular type (D3～25) SP —Lapping— L—SP | 2A～4A・6A | 3 | 40.0～80.0 | 2.00～ 2.99 | 1.00 |
| | 7 | | | | 4 | | 2.00～ 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 | | | 8 | (40.0～49.9) | 3.00～ 7.99 | 1.50 |
| | 13 | 5 | With locating dowel hole (D10～25) SP—C L—SP—C | 2C～10C | 10 | | 3.00～ 9.99 | 1.50 |
| | 16 | 6 | | | 13 | | 6.00～ 12.99 | 2.00 |
| 19 | 19 | | Tapped (D5～25) MP L—MP | 2D～11D | 16 | 50.0～100.0 | 10.00～ 15.99 | 3.00 |
| | 23 | | MPH L—MPH | | 20 | | 13.00～ 19.99 | 3.00 |
| | 28 | | | | 25 | | 18.00～ 24.99 | 4.00 |

- Lapping cannot be used for shapes 2A・6A・8B・2C・3C・4C・6C・2D・3D・4D・5D・8D・9D・10D・11D.
- L(40.0～49.9)…B=8 If full length L is (40.0～49.9), tip length B is 8mm in all cases.
- P>D—0.03…ℓ=0 If P>D—0.03, D −0.01 −0.03 (press-in lead) is not included.
- P can be the same value as D. P=D…P T m5・ℓ=0 ＊If P=D, tolerance of P is m5 and D −0.01 −0.03 (press-in lead) is not included.
- (M)…Tapped punch Can be used for MP・L—MP・MPH・L—MPH only.

Alterations

| 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 |
|---|---|---|---|---|
| Alterations to tip |  | PC | P dimension change PC≧ Pmin. 2 ≧Vmin. 0.01mm increments | |
| |  | BC | Tip length change 2≦BC≦BCmax. 0.1mm increments ? Full length L must be at least 30mm longer than tip length BC. 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 | |
| | P T | PKC | P dimension tolerance change P +0.01 0 ⇨ +0.005 0 ⊗ Cannot be used with lapping. | Quotation |
| | A T | AKC | Angle A tolerance change A±30′⇨±10′ ⊗ Cannot be used with lapping. | |
| | K T | KKC | Angle K tolerance change K±30′⇨±10′ ⊗ Cannot be used with lapping. | |
| | R T | RKC | R dimension tolerance R±0.5⇨±0.05 Can be used for 0.1≦R≦10. ⊗ Cannot be used with lapping. | |
| | Q T | QKC | Q dimension tolerance Q±0.5⇨±0.05 Can be used for 0.1≦Q≦10. ⊗ Cannot be used with lapping. | |
| Alterations to head |  | HC | Head diameter change D≦HC<H 0.1mm increments | |
| |  | TC | Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) ? The full length remains as specified. | |

| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to head |  | TCC | Chamfering of head This improves the strength of the punch head. P.1097 0.1 mm increments 0.5≦TCC≦(H-D)/2 ? If H≦5, then TCC is 0.5. ⊗ Cannot be combined with SRC. | |
| |  | KC | Addition of single key flat ⊗ Cannot be used for D5 MP・MPH・L—MP・L—MPH types. | |
| |  | WKC | Addition of double key flats in parallel ⊗ Cannot be used for D5 MP・MPH・L—MP・L—MPH types. | |
| |  | RC |  Head thickness is machined to a tolerance of —0.04～0 relative to the retainer surface. | Quotation |
| |  | SRC | Modification of head for use with select retainers (SLS) ? For details, refer to P.675. ? Can be used for D10～25. | |
| | T T | TKC | Head thickness tolerance change 5 +0.3 0 ⇨ +0.02 0 ⊗ Cannot be used for punches with locating dowel holes. | |
| | | TKM | Head thickness tolerance change 5 +0.3 0 ⇨ 0 −0.02 ⊗ Cannot be used for punches with locating dowel holes. | |
| Others | L T | LKC | L dimension tolerance change L +0.3 0 ⇨ +0.05 0 | |
| | F T | FKC | F dimension tolerance change F +0.3 0 ⇨ +0.05 0 | |
| |  | NDC | No press-in lead ℓ≧3⇨ℓ=0 ⊗ Cannot be used for tapped punches. | |

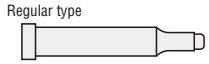
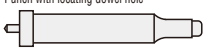
Order

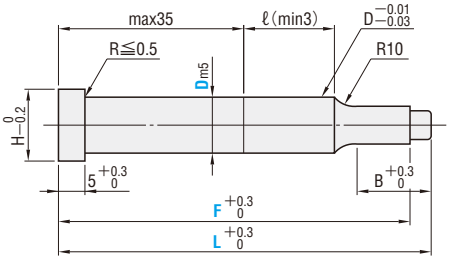
| Catalog No. | — | L | — | P·E·V·R·Q·A·K·F·S |
|---|---|---|---|---|
| SP2C 16 | — | 70.0 | — | P12.00—V9.00—A30—F65.0—S3 |

Days to Ship **Quotation**

Price **Quotation**

# DRAWING PUNCHES
## —DICOAT® TREATMENT・TiCN COATING・HW COATING—

| Type | M | H | S | Shank diameter D | Catalog No. |
|---|---|---|---|---|---|
| RoHS Regular type  | Equivalent to SKD11 | 60～63HRC Surface 3000HV | Dicoat® treatment | 3～25 | T—SP |
| | Powdered high-speed steel | 62～64HRC Surface 3000HV | | | T—PH |
| | SKH51 | 61～64HRC Surface 3000HV | TiCN coating | 3～25 | H—SH |
| | | | HW coating | | HW—SH |
| | Powdered high-speed steel | 64～67HRC Surface 3000HV | TiCN coating | | H—PH |
| | | | HW coating | | HW—PH |
| RoHS Punch with locating dowel hole  | Equivalent to SKD11 | 60～63HRC Surface 3000HV | Dicoat® treatment | 10～25 | T—SP—C |
| RoHS Tapped punch  | Powdered high-speed steel | 64～67HRC Surface 3000HV | TiCN coating | 5～25 | H—MPH |
| | | | HW coating | | HW—MPH |




SP—C ⋯▸ T=5 +0.03 +0.01

Shape P.557

| 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 | — | Regular type (D3～25) Dicoat® treatment T—SP T—PH; TiCN coating H—SH H—PH; HW coating HW—SH HW—PH | 2A～4A・6A | 3 | 40.0～80.0 | 2.00～ 2.99 | 1.00 |
| | 7 | | | | 4 | | 2.00～ 3.99 | 1.00 |
| | 8 | 3 | | | 5 | | 2.00～ 4.99 | 1.20 |
| | 9 | | | | 6 | | 2.00～ 5.99 | 1.20 |
| 13 | 11 | 4 | With locating dowel hole (D10～25) T—SP—C | 2B ～ 8B | 8 | (40.0～49.9) | 3.00～ 7.99 | 1.50 |
| | 13 | 5 | | | 10 | | 3.00～ 9.99 | 1.50 |
| | 16 | 6 | | 2C～10C | 13 | | 6.00～ 12.99 | 2.00 |
| 19 | 19 | | Tapped (D5～25) H—MPH HW—MPH | 2D～10D | 16 | 50.0～100.0 | 10.00～ 15.99 | 3.00 |
| | 23 | | | | 20 | | 13.00～ 19.99 | 3.00 |
| | 28 | | | | 25 | | 18.00～ 24.99 | 4.00 |

Dicoat® treatment punches cannot be used for shapes 6A・8B・2D.
L(40.0～49.9)⋯▸B=8 If full length L is (40.0～49.9), tip length B is 8mm in all cases.
P>D−0.03 ⋯▸ℓ=0 If P>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

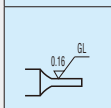
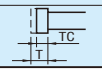
| Catalog No. | — | L | — | P・E・V・R・Q・A・K・F・S |
|---|---|---|---|---|
| T—SP2C 16 | — | 70.0 | — | P12.00—V9.00—A30—F65.0—S3 |

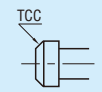
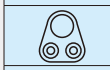
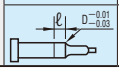
Days to Ship Quotation

Alterations

Catalog No. — L — P(PC)·E·V·R·Q·A·K·F·S — (BC·HC, etc.)

T—SP2C 16 — 75.0 — P12.00—V9.00—A30—F65.0—S3 — LKC

| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to tip |  | PC | P dimension change<br>PC≧Pmin./2≧Vmin. 0.01mm increments | |
| |  | BC | Tip length change<br>2≦BC≦BCmax. 0.1mm increments<br>(?) Full length L must be at least 30mm longer than tip length BC.<br>·TiCN coating ·Dicoat® treatment<br>HW coating<br>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<br>P(PC) / BCmax.: 1.00～1.99 15; 2.00～2.99 25; 3.00～3.99 30; 4.00～5.99 40; 6.00～ 45<br>For coating punches, 2≦BC≦BCmax.≦L/2 | |
| |  | SC | Lapping of tip<br>(?) P dimension tolerance and increment remain the same. The base material is finished before the coating is applied.<br>⊗ Cannot be used with Dicoat® treatment·HW coating.<br>⊗ Cannot be used for shapes 2A·6A·8B·2C·3C·4C·6C·2D·3D·4D·5D·8D·9D·10D.<br>⊗ Cannot be combined with AKC·KKC·RKC·QKC. | Quotation |
| | A T | AKC | Angle A tolerance change A±30′⇨±10′ ⊗ Cannot be used with Dicoat® treatment punches. | |
| | K T | KKC | Angle K tolerance change K±30′⇨±10′ ⊗ Cannot be used with Dicoat® treatment punches. | |
| | R T | RKC | R dimension tolerance R±0.5⇨±0.05 ⊗ Cannot be used with Dicoat® treatment punches.<br>Can be used for 0.1≦R≦10. | |
| | Q T | QKC | Q dimension tolerance change Q±0.5⇨±0.05 ⊗ Cannot be used with Dicoat® treatment punches.<br>Can be used for 0.1≦Q≦10. | |
| Head |  | HC | Head diameter change<br>D≦HC<H<br>0.1mm increments | |
| |  | TC | Head thickness change 2≦TC<5<br>0.1mm increments (If combined with TKC·TKM, 0.01mm increments can be selected.)<br>(?) The full length remains as specified. | |

| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to head |  | TCC | Chamfering of head<br>This improves the strength of the punch head. P.1097<br>0.1mm increments<br>0.5≦TCC≦(H—D)/2<br>(?) If H≦5, then TCC is 0.5.<br>⊗ Cannot be combined with SRC. | |
| |  | KC | Addition of single key flat<br>⊗ Cannot be used for D5 H—MPH type. | |
| |  | WKC | Addition of double key flats in parallel<br>⊗ Cannot be used for D5 H—MPH type. | |
| |  | RC |  <br>Head thickness is machined to a tolerance of —0.04～0 relative to the retainer surface. | Quotation |
| |  | SRC | Modification of head for use with select retainers (SLS)<br>(?) For details, refer to P.629. (?) Can be used for D10～25.<br>⊗ Express A cannot be used with TiCN coating. | |
| | T | TKC | Head thickness tolerance change 5 +0.3 0 ⇨ +0.02 0<br>⊗ Cannot be used for punches with locating dowel holes. | |
| | T | TKM | Head thickness tolerance change 5 +0.3 0 ⇨ 0 —0.02<br>⊗ Cannot be used for punches with locating dowel holes. | |
| Others | L T | LKC | L dimension tolerance change L +0.3 0 ⇨ +0.05 0 | |
| | F T | FKC | F dimension tolerance change F +0.3 0 ⇨ +0.05 0<br>⊗ Cannot be used with Dicoat® treatment punches. | |
| |  | NDC | No press-in lead ℓ≧3 ⇨ ℓ=0<br>⊗ Cannot be used for tapped punches. | |

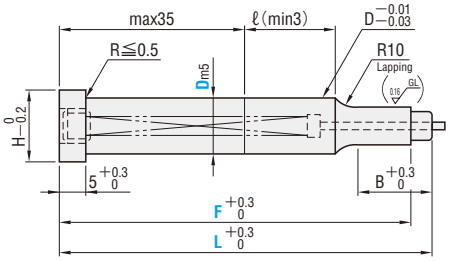
Price Quotation

# JECTOR DRAWING PUNCHES
## —NORMAL・LAPPING—

Calculating the projection length of the jector pin (reference value) P.185

- For details of jector holes, refer to Jector Punch Blanks. P.180
- For details of jector pins, refer to Jector Pin Sets. P.183

| Type | M | H | Shank diameter D | Catalog No. |
|---|---|---|---|---|
| RoHS<br>Regular type  | SKH51 | 61～64HRC | 4～6 | SJ<br>Lapping<br>L—SJ |
| | Equivalent to SKD11 | 60～63HRC | 8～25 | |
| | Powdered high-speed steel | 64～67HRC | 4～25 | PJ<br>Lapping<br>L—PJ |
| Punch with locating dowel hole RoHS  | Equivalent to SKD11 | 60～63HRC | 10～25 | SJ—C<br>Lapping<br>L—SJ—C |




SJ—C⋯›T=5 +0.03 +0.01

Lapping is applied to the area from the punch tip up to B dimension. (However end face is not lapped.)

Shape P.577

| B | H | Catalog No. Type | Catalog No. Shape | Catalog No. D | L | 0.01mm increments min. P max.* | 0.01mm increments Vmin. | dmin. |
|---|---|---|---|---|---|---|---|---|
| 8 | 7 | Regular type SJ Lapping L—SJ / PJ L—PJ | 2A～4A<br>2B<br>5B～7B<br>2C～8C<br>3D～7D<br>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 locating dowel hole SJ—C L—SJ—C (D10～25, L60～100) | | 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 |

- Lapping cannot be used for shapes 2A・2C・3C・4C・6C・3D・4D・5D・9D.
- L (40)⋯›B=6 If full length L is (40), tip length B is 6mm in all cases.
- L (50)⋯›B=13 If full length L is (50), tip length B is 13mm in all cases.
- SJ—C⋯›D≧10, L≧60 For SJ—C, D is 10～25 and full length L is 60 or more.
- SJ—C L=60⋯›B=13 If full length L is (60) for SJ—C, tip length B is 13mm in all cases.
- P>D—0.03⋯›ℓ=0 If P>D—0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
- P can be the same value as D. P=D⋯›P T m5・ℓ=0 ＊If 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, pay special attention to dmin.

Order

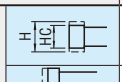
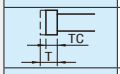
| Catalog No. | — | L | — | P・E・V・R・Q・A・K・F・S |
|---|---|---|---|---|
| SJ2C 16 | — | 70 | — | P12.00—V10.00—A30—F65.0—S3 |

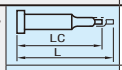
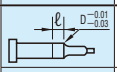
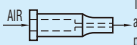
Days to Ship: Quotation

Alterations

Catalog No. — L(LC) — P·E·V·R·Q·A·K·F·S — (HC·TC, etc.)

SJ2C 16 — LC75.0 — P12.00—V10.00—A30—F65.0—S3 — LKC—FKC

| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to head |  | HC | Head diameter change<br>D≦HC＜H<br>0.1mm increments | |
| |  | TC | Head thickness change 3.5≦TC＜5<br>0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.)<br>Full length is shortened by (5—TC). | |
| |  | TCC | Chamfering of head<br>This improves the strength of the punch head. P.1097<br>0.1 mm increments<br>0.5≦TCC≦(H-D)/2<br>If H≦5, then TCC is 0.5.<br>Cannot be combined with SRC. | |
| |  | KC | Addition of single key flat to head | Quotation |
| |  | WKC | Addition of double key flats in parallel | |
| |  | RC |  <br>Head thickness is machined to a tolerance of —0.04~0 relative to the retainer surface. | |
| |  | SRC | Modification of head for use with select retainers (SLS)<br>For details, refer to P.629. Can be used for D10~25. | |
| | T | TKC | Head thickness tolerance change<br>$5^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$<br>Cannot be used for punches with locating dowel holes. | |
| | | TKM | Head thickness tolerance change<br>$5^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$<br>Cannot be used for punches with locating dowel holes. | |

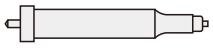
| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to full length |  | LC | Full length change LC＜L 0.1mm increments<br>Tip length B is reduced by (L—LC).<br>Projection length of jector pin is 2mm. | |
| | L T | LKC | L dimension tolerance change<br>$L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$ | |
| Alterations to tip | P T | PKC | P dimension tolerance change<br>$P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ Cannot be used with lapping. | |
| | A T | AKC | Angle A tolerance change<br>A±30′⇨±10′ Cannot be used with lapping. | |
| | K T | KKC | Angle K tolerance change<br>K±30′⇨±10′ Cannot be used with lapping. | Quotation |
| | R T | RKC | R dimension tolerance<br>R±0.5⇨±0.05 Cannot be used with lapping.<br>Can be used for 0.1≦R≦10. | |
| | Q T | QKC | Q dimension tolerance change<br>Q±0.5⇨±0.05 Cannot be used with lapping.<br>Can be used for 0.1≦Q≦10. | |
| Others |  | NDC | No press-in lead ℓ≧3⇨ℓ=0 | |
| |  | AC |  <br>The jector pin is removed to create an air path and the side vent hole is plugged from the inside. | |
| |  | NC |  <br>The jector pin is removed. Cannot be combined with AC. | |
| | F T | FKC | F dimension tolerance change<br>$F^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$ | |

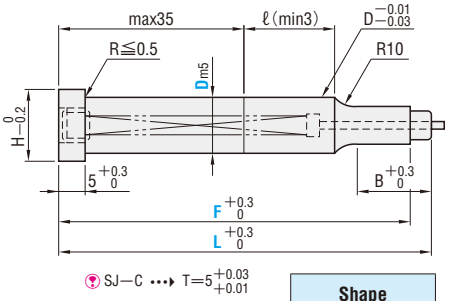
Price Quotation

# JECTOR DRAWING PUNCHES
## —DICOAT® TREATMENT・TiCN COATING—

Calculating the projection length of the jector pin (reference value) P.185

- For details of jector holes, refer to Jector Punch Blanks. P.180
- For details of jector pins, refer to Jector Pin Sets. P.183

| Type | M | H | Shank diameter D | Catalog No. |
|---|---|---|---|---|
| RoHS Regular type  | Equivalent to SKD11 | 60～63HRC Surface 3000HV | 4～25 | Dicoat® treatment T—SJ |
| | Powdered high-speed steel | 64～67HRC Surface 3000HV | 4～25 | TiCN coating H—PJ |
| Punch with locating dowel hole RoHS  | Equivalent to SKD11 | 60～63HRC Surface 3000HV | 10～25 | Dicoat® treatment T—SJ—C |




SJ—C ••• T=5 +0.03 +0.01

Shape P.557

| B | H | Catalog No. Type | Shape | D | L | 0.01mm increments min. P max. | 0.01mm increments Vmin. | dmin. |
|---|---|---|---|---|---|---|---|---|
| 8 | 7 | Regular type Dicoat® treatment T—SJ / TiCN coating H—PJ; with locating dowel hole 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 If full length L is (40), tip length B is 6mm in all cases.
- L (50) ···B=13 If full length L is (50), tip length B is 13mm in all cases.
- T—SJ—C···D≧10, L≧60 For T—SJ—C, D is 10～25 and full length L is 60 or more.
- T—SJ—C L=60···B=13 If full length L is 60 for T—SJ—C, tip length B is 13mm in all cases.
- P>D—0.03···ℓ=0 If P>D—0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.
- For the shapes with dimension d, pay special attention to dmin.

Order

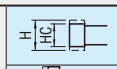
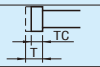
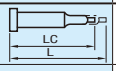
| Catalog No. | — | L | — | P・E・V・R・Q・A・K・F・S |
|---|---|---|---|---|
| T—SJ2C 16 | — | 70 | — | P12.00—V9.50—A30—F65.0—S3 |

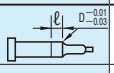
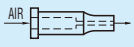
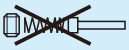
Days to Ship: Quotation

Alterations

Catalog No. — L(LC) — P・E・V・R・Q・A・K・F・S — (HC・TC, etc.)

T—SJ2C 16 — LC75.0 — P12.00—V9.50—A30—F65.0—S3 — LKC

| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to head |  | HC | Head diameter change<br>D≦HC＜H<br>0.1mm increments | |
| |  | TC | Head thickness change 3.5≦TC＜5<br>0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.)<br>Ⓟ Full length is shortened by (5—TC). | |
| |  | TCC | Chamfering of head<br>This improves the strength of the punch head. P.1097<br>0.1 mm increments<br>0.5≦TCC≦(H-D)/2<br>Ⓟ If H≦5, then TCC is 0.5.<br>⊗ Cannot be combined with SRC. | |
| |  | KC | Addition of single key flat to head | |
| |  | WKC | Addition of double key flats in parallel | Quotation |
| |  | RC |  <br>Head thickness is machined to a tolerance of —0.04～0 relative to the retainer surface. | |
| |  | SRC | Modification of head for use with select retainers (SLS)<br>Ⓟ For details, refer to P.629. Ⓟ Can be used for D10～25.<br>⊗ Express A cannot be used with TiCN coating. | |
| | T | TKC | Head thickness tolerance change<br>$5^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$<br>⊗ Cannot be used for punches with locating dowel holes. | |
| | | TKM | Head thickness tolerance change<br>$5^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$<br>⊗ Cannot be used for punches with locating dowel holes. | |
| Alterations to full length |  | LC | Full length change LC＜L 0.1mm increments<br>Ⓟ Tip length B is reduced by (L—LC).<br>Ⓟ Projection length of jector pin is 2mm. | |
| | L | LKC | L dimension tolerance change<br>$L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ | |

| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to tip |  | SC | Lapping of tip<br>Ⓟ P dimension tolerance and increment remain the same.The base material is finished before the coating is applied.<br>⊗ Cannot be used for Dicoat® treatment punches.<br>⊗ Cannot be used for shapes 2A・2C・3C・4C・6C・3D・4D・5D・9D.<br>⊗ Cannot be combined with AKC・KKC・RKC・QKC. | |
| | A | AKC | Angle A tolerance change<br>A±30′⇨±10′ ⊗ Cannot be used for Dicoat® treatment punches. | |
| | K | KKC | Angle K tolerance change<br>K±30′⇨±10′ ⊗ Cannot be used for Dicoat® treatment punches. | |
| | R | RKC | R dimension tolerance<br>R±0.5 ⇨±0.05 ⊗ Cannot be used for Dicoat® treatment punches.<br>Can be used for 0.1≦R≦10. | Quotation |
| | Q | QKC | Q dimension tolerance change<br>Q±0.5 ⇨±0.05 ⊗ Cannot be used for Dicoat® treatment punches.<br>Can be used for 0.1≦Q≦10. | |
| Others |  | NDC | No press-in lead ℓ≧3⇨ℓ=0 | |
| |  | AC |  <br>The jector pin is removed to create an air path and the side vent hole is plugged from the inside. | |
| |  | NC |  <br>The jector pin is removed.<br>⊗ Cannot be combined with AC. | |
| | F | FKC | F dimension tolerance change<br>$F^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be used for Dicoat® treatment punches. | |

Price Quotation

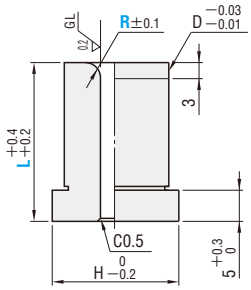
Headed type

Straight type

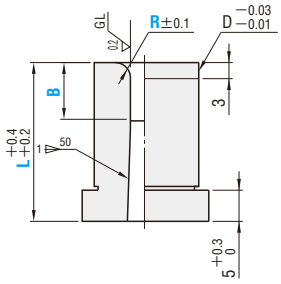
RoHS

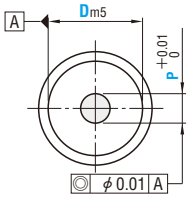
| Headed type | Straight type | M | H |
|---|---|---|---|
| HDC2S | HSC2S | Equivalent to SKD11 | 60～63HRC |
| HDC2B | HSC2B | | |
| PHC2S | PSC2S | Powdered high-speed steel | 64～67HRC |
| PHC2B | PSC2B | | |

**HDC2S** M Equivalent to SKD11
**PHC2S** M Powdered high-speed steel

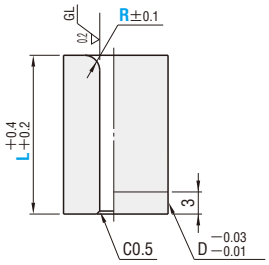



**HDC2B** M Equivalent to SKD11
**PHC2B** M Powdered high-speed steel

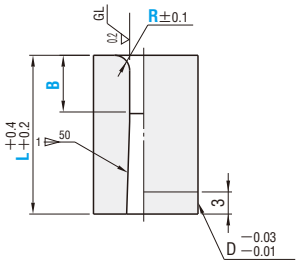


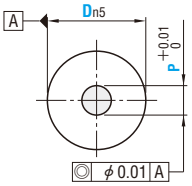




**HSC2S** M Equivalent to SKD11
**PSC2S** M Powdered high-speed steel




**HSC2B** M Equivalent to SKD11
**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 Equivalent to SKD11 HDC2S HSC2S / M Powdered high-speed steel PHC2S PSC2S | 6 | 16.0 ～ 25.0 | 2.20 ～ 3.00 | — | 0.2～ $\frac{D-P-2}{2}$ (R=0 can be selected.) | 9 |
| | 8 | | 2.50 ～ 4.00 | | | 11 |
| | 10 | | 3.00 ～ 5.00 | | | 13 |
| | 13 | | 4.00 ～ 6.50 | | | 16 |
| | 16 | | 5.00 ～ 8.00 | | | 19 |
| | 20 | | 8.00 ～ 10.00 | | | 23 |
| | 25 | | 10.00 ～ 12.50 | | | 28 |
| M Equivalent to SKD11 HDC2B HSC2B / M Powdered high-speed steel PHC2B PSC2B | 6 | 16.0 ～ 35.0 | 2.20 ～ 3.00 | B≦P×3 and B≦$\frac{L}{2}$+2 | 0.2～ $\frac{D-P-2}{2}$ (R=0 can be selected.) | 9 |
| | 8 | | 2.50 ～ 4.00 | | | 11 |
| | 10 | | 3.00 ～ 5.00 | | | 13 |
| | 13 | | 4.00 ～ 6.50 | | | 16 |
| | 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 |

Days to Ship Quotation

Alterations

Catalog No. – L(LC) – P – B – R – (HC・TC, etc.)

HSC2B 13 – LC21.0 – P5.50 – B8 – R1.4 – HC15

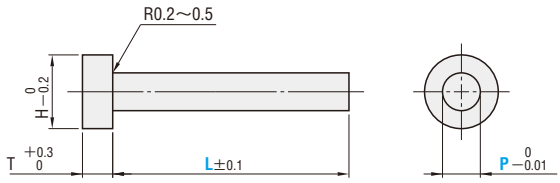
| Alteration | | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to full length |  | LC | Full length change 13≦LC＜16 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Press-in lead is shortened by (L−LC). | Quotation |
| |  | LKC | Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$ | |

| Alteration | | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to head |  | HC | Head diameter change D≦HC＜H 0.1mm increments | |
| |  | TC | Head thickness change 2≦TC＜5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) The full length remains as specified. | Quotation |
| |  | TKC | Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ Cannot be used for L＜16. | |
| | | TKM | Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ Cannot be used for L＜16. | |
| Others |  | PKC | P dimension tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ | |
| |  | RKC | R dimension tolerance change R±0.1⇨±0.05 | |

Price Quotation

■Knockout pin RoHS

KOP




M Equivalent to SK4
H 53～58HRC

| T | H | Catalog No. | | 0.1mm increments L | 0.01mm increments min. P max. | Base unit price 1～19 pieces |
|---|---|---|---|---|---|---|
| 3 | 6 | KOP | 4 | 7.0～60.0 | 1.00～ 4.00 | Quotation |
| | 8 | | 6 | | 1.00～ 6.00 | |
| 5 | 10 | | 8 | | 2.00～ 8.00 | |
| | 12 | | 10 | | 3.00～ 10.00 | |
| | 14 | | 12 | | 4.00～ 12.00 | |
| | 16 | | 13 | | 6.00～ 13.00 | |

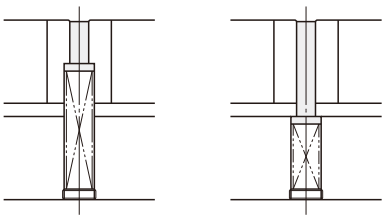
Order: Catalog No. – L – P

KOP 6 — 15.5 — P3.50

Days to Ship: Quotation

Price: Quotation

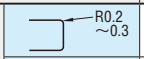
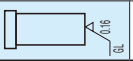
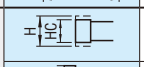
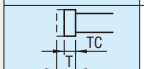
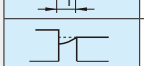
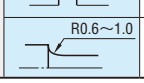
Example



Alterations

Catalog No. – L – P – (HC・TC, etc.)

KOP 6 — 45.5 — P5.50 — VSC

| Alteration | | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to tip |  | RC | Rounding of pin end to R0.2～0.3. | |
| |  | VSC | Lapping of pin end | |
| Full length |  | LKC | L dimension tolerance change L±0.1⋯±0.02 | Quotation |
| Alterations to head |  | HC | Head diameter change P≦HC＜H 0.1mm increments | |
| |  | TC | Head thickness change 3.5≦TC＜5 0.1mm increments Can be used for KOP8～13. | |
| |  | TRN | Addition of undercut (Plate chamfering is not necessary.) | |
| |  | TRC | Change of R under head R0.2～0.5 is changed to 0.6～1.0. Can be used for H−P≧3.5. | |

■Features

- Use these products as knockout pins for drawing dies (P.571).
- The head diameter is such that the head can be inserted into the relief hole in the drawing die.
- The R shape under the head can be changed by alteration. Change it according to the required strength and mounting conditions.

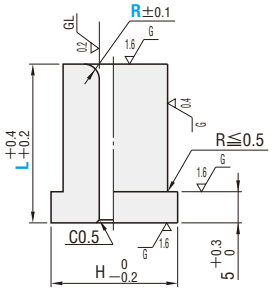
Headed type

Straight type

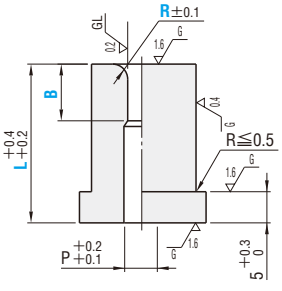
RoHS

| Headed type | Straight type | M | H |
|---|---|---|---|
| WHA2S | WSA2S | Super fine grain (HIP) | 90～92HRA |
| WHA2A | WSA2A | | |
| WHA2B | WSA2B | | |
| WHB2S | WSB2S | V40 (HIP) | 87～88HRA |
| WHB2A | WSB2A | | |
| WHB2B | WSB2B | | |

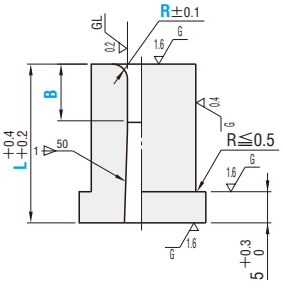
**WHA2S** M Super fine grain
**WHB2S** M V40

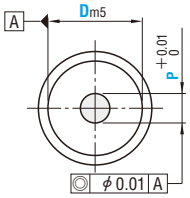



**WHA2A** M Super fine grain
**WHB2A** M V40

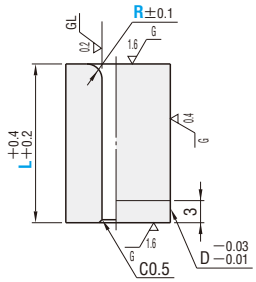



**WHA2B** M Super fine grain
**WHB2B** M V40

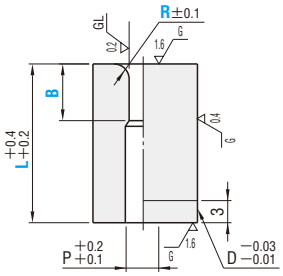


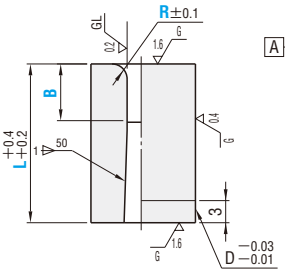

**WSA2S** M Super fine grain
**WSB2S** M V40

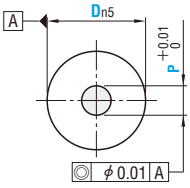



**WSA2A** M Super fine grain
**WSB2A** M V40




**WSA2B** M Super fine grain
**WSB2B** M V40




| Catalog No. Type | D | L | 0.01mm increments min. P max. | 1mm increments B | 0.1mm increments R | H |
|---|---|---|---|---|---|---|
| M Super fine grain WHA2S WSA2S / M V40 WHB2S WSB2S | 6 | 16 | 2.20～ 3.00 | — | 0.2～(D−P−2)/2 (R=0 can be selected.) | 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 fine grain WHA2A WSA2A WHA2B WSA2B / M V40 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 be selected.) | 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**

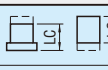
| Catalog No. | L | P | B | R |
|---|---|---|---|---|
| WHB2S 13 | 22 | P5.50 | | R1.4 |
| WHB2A 13 | 22 | P5.50 | B8 | R1.4 |

**Days to Ship** Quotation

**Alterations**

| Catalog No. | L(LC) | P | B | R | (HC・TC, etc.) |
|---|---|---|---|---|---|
| WHB2A 13 | LC21 | P5.50 | B8 | R1.4 | HC15 |

| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to head |  | HC | Head diameter change<br>D≦HC＜H<br>0.1mm increments | Quotation |
| |  | TC | Head thickness change 2≦TC＜5 0.1mm increments<br>(If combined with TKC・TKM, 0.01mm increments can be selected.)<br>Full length is shortened by (5—TC).<br>If combined with LC, full length L is equal to LC. | |
| |  | TKC | Head thickness tolerance change<br>$T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ Cannot be used for L＜16. | |
| | | TKM | Head thickness tolerance change<br>$T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ Cannot be used for L＜16. | |

| | Alteration | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to full length |  | LC | Full length change 13≦LC＜L<br>0.1mm increments<br>(If combined with LKC, 0.01mm increments can be selected.) | |
| |  | LKC | Full length tolerance change<br>$L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ | Quotation |
| Others |  | PKC | P dimension tolerance change<br>$P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ | |
| |  | DKC | D dimension tolerance change<br>$D_{m5}$ ⇨ $^{+0.005}_{0}$ | |
| |  | RKC | R dimension tolerance change<br>R±0.1 ⇨±0.05 | |

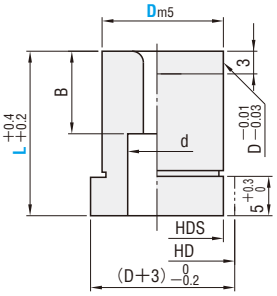
**Price** Quotation

# DRAWING DIES

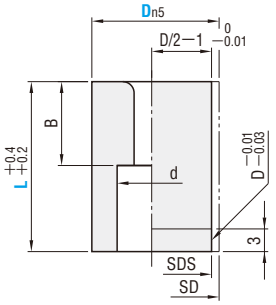
RoHS

**Button die type** (**Select the hole shape from 2A～4A・2B～5B・2C・3C in the figure below.**)

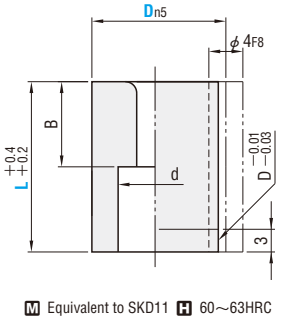
(Headed)
**HD** (L=16～35)
**HDS** (L=40) ＊




(Straight type)
**SD** (L=16～35)
**SDS** (L=16～40) ＊



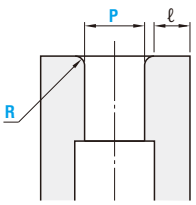

(Dowel slot type)
**KD** (L=16～35)
**KKDS** (L=16～40)




M Equivalent to SKD11 H 60～63HRC

## Hole shape

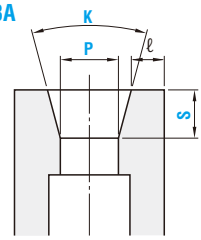
**2A**




- ℓmin.＜ℓ=$\frac{D}{2}-\frac{P}{2}-R$
- R≦B−2

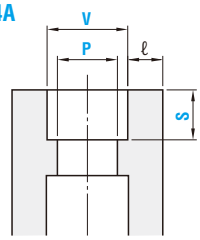
R=0 can be selected.

**3A**



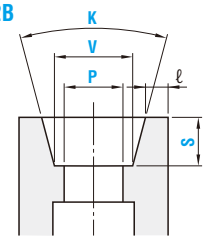

- ℓmin.≦ℓ=$\frac{D}{2}-\frac{P}{2}-\mathrm{Stan}\frac{K}{2}$
- S≦B−2

**4A**



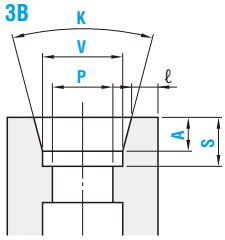

- P＜V
- ℓmin.≦ℓ=$\frac{D}{2}-\frac{V}{2}$
- S≦B−2

**2B**



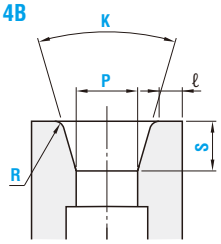

- P＜V
- S≦B−2
- V±0.05
- ℓmin.≦ℓ=$\frac{D}{2}-\frac{V}{2}-\mathrm{Stan}\frac{K}{2}$

**3B**



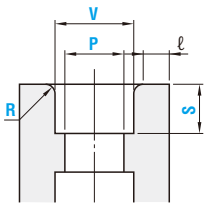

- P＜V
- S≦B−2
- S−A≧2
- ℓmin.≦ℓ=$\frac{D}{2}-\frac{V}{2}-\mathrm{Atan}\frac{K}{2}$

**4B**



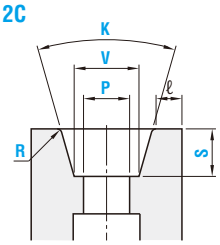

- ℓmin.≦ℓ=$\frac{D}{2}-\frac{P}{2}-\mathrm{Stan}\frac{K}{2}-\mathrm{Rtan}\frac{180^\circ-K}{4}$
- S≦B−2

**5B**



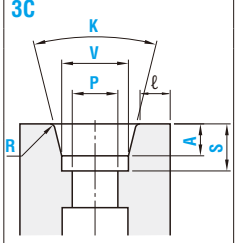

- P＜V
- ℓmin.≦ℓ=$\frac{D}{2}-\frac{V}{2}-R$
- S≦B−2

**2C**




- P＜V
- S≦B−2
- V±0.05
- ℓmin.≦ℓ=$\frac{D}{2}-\frac{V}{2}-\mathrm{Stan}\frac{K}{2}-\mathrm{Rtan}\frac{180^\circ-K}{4}$

**3C**

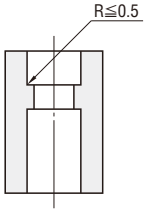



- P＜V
- S≦B−2
- S−A≧2
- ℓmin.≦ℓ=$\frac{D}{2}-\frac{V}{2}-\mathrm{Atan}\frac{K}{2}-\mathrm{Rtan}\frac{180^\circ-K}{4}$

＊


**HDS・SDS** include key flats.

(Interior angle)




**Machining limits and increments**

- 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

If alteration KC is selected for SD, ℓmin.=1.5.

| Catalog No. Type | | D | L | 0.01mm increments min. P max. | HD·SD KD B | HDS·SDS KDS B | d |
|---|---|---|---|---|---|---|---|
| Headed type<br>**HD** (L=16～35)<br>**HDS** (L=40)<br>Straight type<br>**SD** (L=16～35)<br>**SDS** (L=16～40)<br>Dowel slot type<br>**KD** (L=16～35)<br>**KDS** (L=16～40) | 2A～4A<br>2B～5B<br>2C·3C | 10 | (16) 20 22 25 (28) 30 (32) 35 (40) | 2.00 ～ 6.00 | 6 | | 6.4 |
| | | 13 | | 3.00 ～ 8.00 | 8 | 10 | 8.4 |
| | | 16 | | 5.00 ～ 10.00 | | | 10.6 |
| | | 20 | | 7.00 ～ 12.00 | | 12 | 12.6 |
| | | 25 | | 10.00 ～ 16.00 | | | 16.6 |
| | | 32 | | 15.00 ～ 20.00 | | 15 | 20.6 |
| | | 38 | | 19.00 ～ 26.00 | | | 26.6 |
| | | 45 | | 25.00 ～ 35.00 | | 20 | 36.0 |
| | | 50 | | 33.00 ～ 40.00 | | | 41.0 |
| | | 56 | | 38.00 ～ 45.00 | | | 46.0 |

(P) L(16) ···›Can be used for D10～38. (P) L(40) ···›Can be used for HDS·SDS·KDS only. (P) L(28)·(32) ···›Can be used for HD·SD·KD with D10～D32 only.

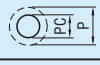
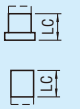
**Order**

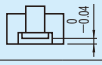
| Catalog No. | L | P·V·R·K·S·A |
|---|---|---|
| HD3B 16 | 30 | P5.00—V6.00—K60—S5.0—A3.0 |

**Days to Ship** Quotation

**Alterations**

| 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 |
|---|---|---|---|---|
| Shaped hole |  | PC | Shaped hole diameter change<br>P>PC≧Pmin./2≧1.90<br>0.01mm increments | |
| Alterations to full length |  | LC | Full length change<br>● HD·HDS<br>L−(B−S(R))+2≦LC<L 0.1mm increments<br>(P) Press-in lead is shortened by (L−LC).<br>(P) B dimension is shortened by (L−LC).<br>● SD·SDS·KD·KDS<br>10≦LC<L 0.1mm increments<br>(P) Press-in lead is shortened by (L−LC).<br>(If combined with LKC, 0.01mm increments can be selected.) | Quotation |
| |  | LKC | Full length tolerance change<br>L +0.4 +0.2 ⇨ +0.05 0 | |

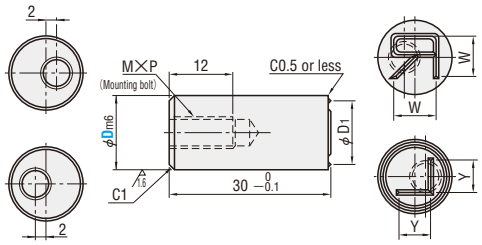
| Alteration | | Code | Spec. | 1Code |
|---|---|---|---|---|
| Alterations to head |  | HC | Head diameter change<br>D≦HC<H<br>0.1mm increments | |
| |  | TC | Head thickness change 2≦TC<5<br>0.1mm increments (If combined with TKC·TKM, 0.01mm increments can be selected.)<br>(P) Full length is shortened by (S−TC).<br>If combined with LC, full length is equal to LC. | Quotation |
| |  | KC | ⊗ Cannot be used for HDS/SDS/KD/KDS. | |
| |  | RC |  <br>Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface.<br>⊗ Cannot be used for L<30. | |
| |  | TKC | Head thickness tolerance change<br>T +0.3 0 ⇨ +0.02 0 ⊗ Cannot be used for L<16. | |
| | | TKM | Head thickness tolerance change<br>T +0.3 0 ⇨ 0 −0.02 ⊗ Cannot be used for L<16. | |

**Price** Quotation

# ENGRAVING PUNCHES

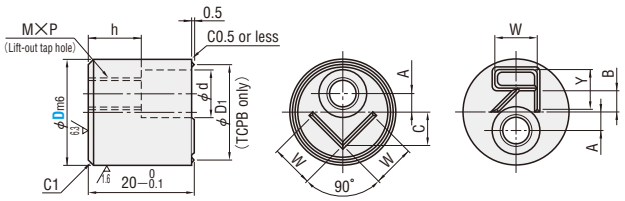
## ■R・L type RoHS

### TCPA
(1 character)




| Catalog No. | Character |
|---|---|
| TCPA<br>TCPB | Ⓛ R<br>R is not surrounded by a border. |
| TCPBT | L R<br>L and R are not surrounded by borders. |

### TCPB (Mounting bolt M5)
### TCPBT (Mounting bolt M8)
(1 character)

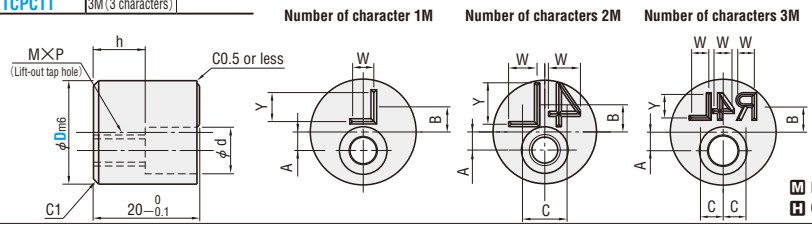



M Equivalent to SKD11
H 60～63HRC

| A | B | C | M×P | φd | h | φD1 | W | Y | φDm6 | | Mounting bolt | Catalog No. Type | Catalog No. D | CHR Character | Base unit price 1～4 pieces |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| — | — | — | M4×P0.7 | — | — | 8 | 5 | 3 | 10 | +0.015 +0.006 | M4 | TCPA | 10 | R<br>L | Quotation |
| — | — | — | M6×P1.0 | — | — | 12 | 8 | 6 | 14 | +0.018 +0.007 | M6 | | 14 | | |
| 1.5 | 4.5 | 5.7 | M6×P1.0 | 9 | 10 | 14 | 4 | 3.2 | 16 | +0.018 +0.007 | M5 | TCPB | 16 | | |
| 3.5 | 4 | 6.5 | | | | 18 | 8 | 8 | 20 | +0.021 +0.008 | | | 20 | | |
| 2.5 | 6.5 | 8.5 | M10×P1.5 | 13.5 | 7 | — | 5.5 | 5 | 20 | +0.021 +0.008 | M8 | TCPBT | 20 | | |

## ■Configurable types RoHS

| Type | Number of characters | Mounting bolt |
|---|---|---|
| TCPBS | 1M (1character) | M5 |
| TCPBW | 2M (2 characters) | |
| TCPCT | 3M (3 characters) | |
| TCPBWT | 2M (2 characters) | M8 |
| TCPCTT | 3M (3 characters) | |




M Equivalent to SKD11
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 Character | Base unit price 1～4 pieces |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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<br>A B C D E F G H I J K L M<br>N O P Q R S T U V W X Y Z | Quotation |
| 3.5 | 5.2 | — | | | | 4 | 6 | 20 | +0.021 +0.008 | | | | 20 | | |
| 5.5 | 4 | — | | | | 6 | 8 | 24 | | | | | 24 | | |
| 3.5 | 4.75 | 5.6 | | | | 4 | 5.5 | 20 | | | 2M | TCPBW | 20 | | |
| 5.5 | 4 | 8 | | | | 6 | 8 | 24 | | | | | 24 | | |
| 5.5 | 4 | 5 | | | | 4 | 6 | | | | 3M | TCPCT | 24 | | |
| 4.5 | 5.8 | 8 | M10×P1.5 | 13.5 | 7 | 5.5 | 5.5 | 24 | +0.021 +0.008 | M8 | 2M | TCPBWT | 24 | | |
| 4.5 | 6 | 5 | | | | 3.3 | 5 | | | | 3M | TCPCTT | 24 | | |

**Order**

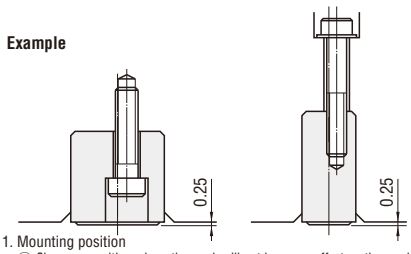
| Catalog No. | — | CHR |
|---|---|---|
| TCPB 20 | — | L |
| TCPCTT 24 | — | R4L |

**Actual engraving**

**Days to Ship** Quotation

**Price** Quotation

**Example**

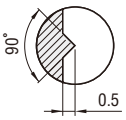


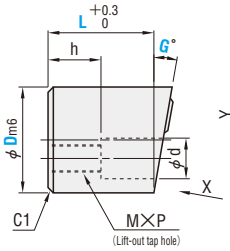

1. Mounting position
   ① Choose a position where the mark will not have any effect on the product.
   ② Select a location that is as flat as possible for the punch to contact, and install the punch perpendicular to that surface.
2. Fasten the punch using a bolt.
   The punch tip should protrude 0.25mm from the mounting surface.
   (Depth of character engraved in product: 0.25mm)

# ENGRAVING PUNCHES FOR SLANTED SURFACE / SHIMS

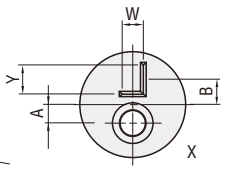
RoHS

| Catalog No. Type | Number of characters | Mounting bolt |
|---|---|---|
| TCPTS | 1M (1character) | M5 |
| | 2M (2 characters) | |
| | 3M (3 characters) | |
| TCPTL | 2M (2 characters) | M8 |
| | 3M (3 characters) | |

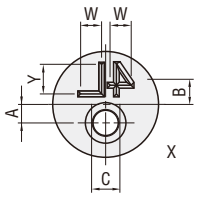


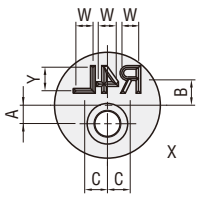

Number of character 1M




Number of characters 2M




Number of characters 3M




M Equivalent to SKD11
H 60～63HRC

| A | B | C | M×P | φ d | h | W | Y | Number of characters | φ Dm6 | | Mounting bolt | Catalog No. Type | Catalog No. Number of characters | Catalog No. D | L | 1° increments G | CHR Character | Base unit price 1～4 pieces |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 5.2 | — | M6×P1.0 | 9 | 10 | 4 | 6 | 1M | 20 | +0.021 +0.008 | M5 | TCPTS | 1M | 20 | 20 25 | 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 | Quotation |
| 5.5 | 4 | — | | | | 6 | 8 | | 24 | | | | | 24 | | | | |
| 3.5 | 4.75 | 5.6 | | | | 4 | 5.5 | 2M | 20 | | | | 2M | 20 | | | | |
| 5.5 | 4 | 8 | | | | 6 | 8 | | 24 | | | | | 24 | | | | |
| 5.5 | 4 | 5 | | | | 4 | 6 | 3M | 24 | | | | 3M | 24 | | | | |
| 4.5 | 5.8 | 8 | M10×P1.5 | 13.5 | 7 | 5.5 | 5.5 | 2M | 24 | | M8 | TCPTL | 2M | 24 | | | | |
| 4.5 | 6 | 5 | | | | 3.3 | 5 | 3M | 24 | | | | 3M | 24 | | | | |

Order

| Catalog No. | L | G | CHR |
|---|---|---|---|
| TCPTS1M20 | 25 | G3 | L |
| TCPTL3M24 | 20 | G10 | R4L |

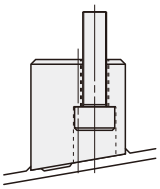
Actual engraving

Days to Ship: Quotation

Price: Quotation

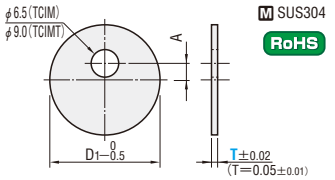
Example

Can be used to engrave character(s) on a slanted surface such as a casting die.



■Shims

| Used for | Type | No. | D1 | A |
|---|---|---|---|---|
| TCPB TCPBW | TCIM | 16 | 14 | 1.5 |
| | | 20 | 18 | 3.5 |
| | | 24 | 22 | 5.5 |
| TCPBT TCPBWT | TCIMT | 20 | 18 | 2.5 |
| | | 24 | 22 | 4.5 |




M SUS304

RoHS

| Catalog No. Type | No. | T | Base unit price 1～4 pieces |
|---|---|---|---|
| TCIM TCIMT | (16) | 0.05 | Quotation |
| | | 0.1 | |
| | 20 | 0.2 | |
| | | 0.3 | |
| | | 0.5 | |
| | | 1.0 | |
| | 24 | 0.05 | |
| | | 0.1 | |
| | | 0.2 | |
| | | 0.3 | |
| | | 0.5 | |
| | | 1.0 | |

(16) is available for TCIM only.
The numbers in the "No." column in the table represent the nominal outside diameters for TCPB・TCPBT・TCPBW・TCPBWT.

Order

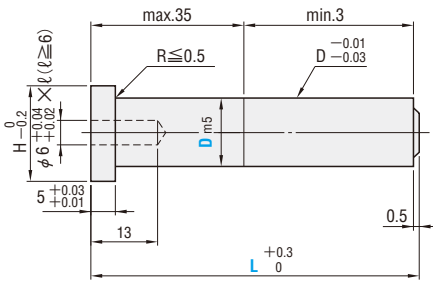
| Catalog No. | T |
|---|---|
| TCIM 16 | 0.05 |

Days to Ship: Quotation

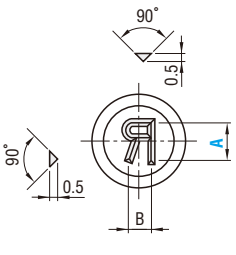
Price: Quotation

# ENGRAVING PUNCHES

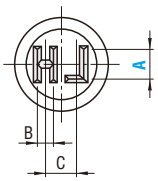
RoHS




**KMCP**




**KMCPW**
**KMCPWF**




M Equivalent to SKD11
H 60～63HRC
(A Dowel pin MS 6—25)

| H | B | C | Catalog No. Type | D | 0.1mm increments L | A | Characters CHR | Base unit price 1～9 pieces |
|---|---|---|---|---|---|---|---|---|
| 13 | 3.3 | — | KMCP (1 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 | |
| | 4 | | | 10 | | 6 | | |
| 16 | 5.3 | | | 13 | | 8 | | |
| 19 | 6.5 | | | 16 | | 10 | | |
| 23 | 8.5 | | | 20 | | 13 | | |
| 13 | 2.5 | 3.5 | KMCPW (2 characters) | 10 | 30.0～120.0 | 4 | RH LH FR FL RR RL | Quotation |
| 16 | 3.3 | 5 | | 13 | | 5 | | |
| 19 | 4 | 6 | | 16 | | 6 | | |
| 23 | 5.3 | 8 | | 20 | | 8 | | |
| 28 | 6.5 | 10 | | 25 | | 10 | | |
| 13 | 2.5 | 3.5 | KMCPWF (Any 2 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 | |
| 16 | 3.3 | 5 | | 13 | | 5 | | |
| 19 | 4 | 6 | | 16 | | 6 | | |
| 23 | 5.3 | 8 | | 20 | | 8 | | |
| 28 | 6.5 | 10 | | 25 | | 10 | | |

・**KMCPW**
**RH**···RIGHT HAND　**FR**···FRONT RIGHT　**RR**···REAR RIGHT
**LH**···LEFT HAND　**FL**···FRONT LEFT　**RL**···REAR LEFT

**Order**

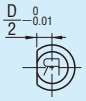
| Catalog No. | — | L | — | A | — | CHR |
|---|---|---|---|---|---|---|
| KMCP 13 | — | 110.0 | — | A8 | — | G |
| KMCPWF 16 | — | 110.0 | — | A6 | — | AB |

**Days to Ship** Quotation

**Price** Quotation

**Alterations**

| Catalog No. | — | L | — | A | — | CHR | — | (KC・SRC) |
|---|---|---|---|---|---|---|---|---|
| KMCP 10 | — | 80.0 | — | A5 | — | R | — | KC90 |

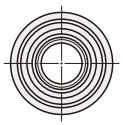
| Alteration | Code | Spec. | 1Code |
|---|---|---|---|
|  | KC | Addition of key flat to head 90° increments  KC0 KC90 KC180 KC270 | Quotation |
|  | SRC | Modification of head for use with select retainers (SLS) For details, refer to **P.629**. | |

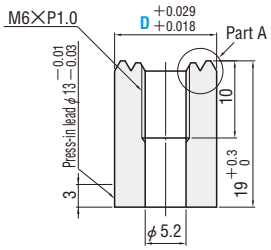
# DIE CHECK BUTTONS / SHIMS

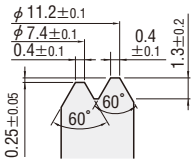
## ■Die check buttons

RoHS

| Catalog No. | M | H |
|---|---|---|
| DCBAW13 | SKS3 | 56～58HRC |



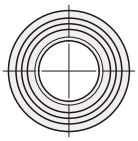


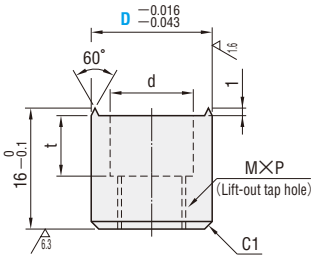




Details of part A

Use a plastic hammer to press-fit DCBAW13.

| Catalog No. | M | H |
|---|---|---|
| DCBA16<br>DCBA18 | Equivalent to SKD11 | 60～63HRC |





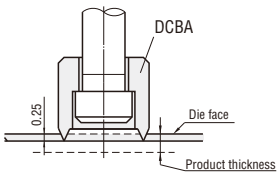

| φd | M×P | t | Catalog No. Type | D | Base unit price 1 ～ 4 pieces |
|---|---|---|---|---|---|
| — | M 6×P1.0 | — | DCBAW | 13 | |
| 11 | M 8×P1.25 | 8 | DCBA | 16 | Quotation |
| 13.5 | M10×P1.5 | 10 | | 18 | |

Order — Catalog No.: DCBA 16

Days to Ship: Quotation

Price: Quotation

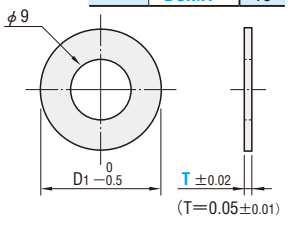
Example




1. Mounting position
   ① Choose a position where the mark will not have any effect on the product.
   ② Select a location that is as flat as possible for the punch to contact, and install the punch perpendicular to that surface.
2. Fasten the punch using a bolt. The punch tip should protrude 0.25mm from the mounting surface.
   (Depth of character engraved in product: 0.25mm)

## ■Shims

| Catalog No. | | $D_1$ |
|---|---|---|
| For DCBA | DCIM | 14 |
| | DCIMT | 16 |




M SUS304

| Catalog No. | T | Base unit price 1～4 pieces DCIM | DCIMT |
|---|---|---|---|
| DCIM DCIMT | 0.05 | | |
| | 0.1 | | |
| | 0.2 | Quotation | |
| | 0.3 | | |
| | 0.5 | | |
| | 1.0 | | |

Order — Catalog No. — T: DCIM — 0.05

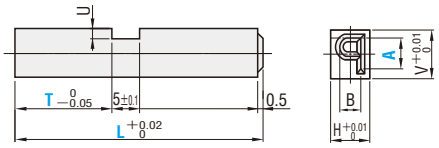
Days to Ship: Quotation

Price: Quotation

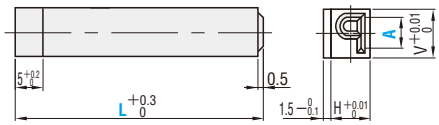
# ENGRAVING BLOCK PUNCHES
## —SINGLE CHARACTER TYPE—

RoHS

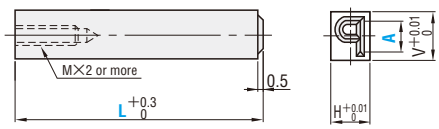
**HCP** (With key groove)




**HCF** (Single flange)

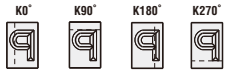



**HCM** (Tapped)



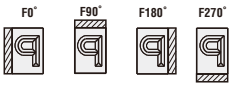

※HCP in the photograph is K90, and HCF is F0.

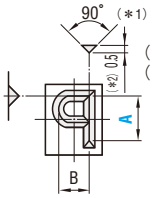
**■Key groove position K**




⊗ For HCP1.5, K0° and K180° cannot be selected.

**■Flange position F**




(＊1) HCP1.5•••▸72°
(＊2) HCP1.5•••▸0.4

M SKH51
H 59～62HRC

| U | M | V | H | B | Catalog No. Type | A | 0.1mm increments L | 0.1mm increments T | Characters CHR | Base unit price 1～9 pieces |
|---|---|---|---|---|---|---|---|---|---|---|
| 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<br>A B C D E F G H I<br>J K L M N O P Q R<br>S T U V W X Y Z | Quotation |
| | | 4 | 3 | 1.3 | | 2 | 16.0～50.0 | | | |
| 1.0 | | 5 | 4 | 2 | | 3 | 16.0～60.0 | | | |
| | | 6 | 5 | 2.7 | | 4 | 16.0～70.0 | | | |
| — | — | 4 | 3 | 1.3 | HCF | 2 | 16.0～50.0 | — | | |
| | | 5 | 4 | 2 | | 3 | 16.0～60.0 | | | |
| | | 6 | 5 | 2.7 | | 4 | 16.0～70.0 | | | |
| | | 8 | 6 | 3.4 | | 5 | 16.0～70.0 | | | |
| — | 3 | 5 | 5 | 1.3 | HCM | 2 | 16.0～50.0 | — | | |
| | | 6 | 5 | 2 | | 3 | 16.0～60.0 | | | |
| | | | | 2.7 | | 4 | 16.0～70.0 | | | |
| | 4 | 8 | 6 | 3.4 | | 5 | 16.0～70.0 | | | |

Katakana and symbols can be ordered by alteration.See the alteration descriptions below.
HCP1.5 should be regularly cleaned with a wire brush so that the closed portions of the characters are not clogged with scraps.

**Order**

| Catalog No. | L | T | CHR・No | K・F |
|---|---|---|---|---|
| HCP 3 | 50.0 | T15.0 | P | K0 |
| HCF 3 | 20.0 | — | L | F90 |
| HCM 3 | 50.0 | — | I | |

HCP→If no key groove is required, select T dimension that is the same as the full length L. T=L

| Catalog No. | L | T | CHR | K・F |
|---|---|---|---|---|
| HCP 3 | 50.0 | T50.0 | P | K0 |

**Days to Ship** Quotation

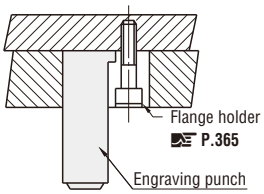
**Price** Quotation

**Alterations**

| Catalog No. | L | T | CHR | K・F | (VKC・HKC) |
|---|---|---|---|---|---|
| HCP 3 | 50.0 | T15.0 | 20 (→) | K0 | |

Quotation

**Example**

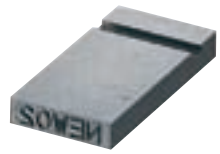
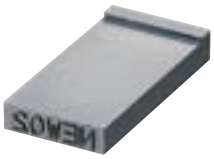
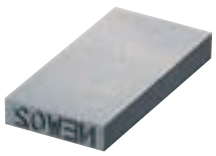



| Alteration | Character・Symbol | | | | | | | | | | | 1Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| The symbols and katakana characters in the table at right can be ordered by alteration.For a symbol, specify the corresponding No.<br>Can be used only for HCP with A2 ～ 4. | Symbol | No. | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | | Quotation |
| | | No. | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
| | | | → | ↑ | ・ | . | , | ※ | ( | ) | 「 | 」 | ニ | |
| | Katakana | アイウエオカキクケコサシスセソタチツテト<br>ナニヌネノハヒフヘホマミムメモヤユヨラリ<br>ルレロワン | | | | | | | | | | | | |

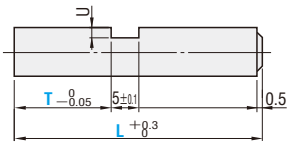
| Alteration | Code | Spec. | 1Code |
|---|---|---|---|
| V | VKC | V dimension tolerance change $V^{+0.01}_{0}$ ⇨ $^{0}_{-0.01}$ | Quotation |
| H T | HKC | H dimension tolerance change $H^{+0.01}_{0}$ ⇨ $^{0}_{-0.01}$ | Quotation |

# ENGRAVING BLOCK PUNCHES
## —MULTIPLE SELECTABLE CHARACTERS TYPE—

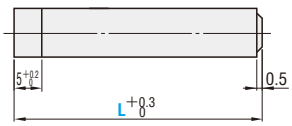
RoHS

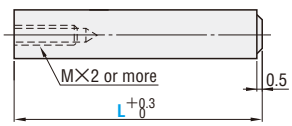
**HCP□M** (With key groove)




**HCF□M** (Single flange)

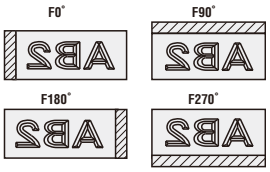



**HCM□M** (Tapped)




■Key groove position K


■Flange position F





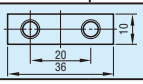
(*1) A=2 ···▸80°
(*2) A=2 ···▸0.4

M Equivalent to SKD11
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) | Characters CHR | Base unit price 1～9 pieces |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.0 | 3 | 5 | 8 | 2.5 | 1.3 | HCP<br>HCF<br>HCM | 2M<br>3M<br>4M<br>5M<br>6M | 2 | 20.0～70.0 | 2≦T＜L | 0 1 2 3 4 5 6 7 8 9<br>A B C D E F G H I J<br>K L M N O P Q R S T<br>U V W X Y Z<br>(Note 1) [ ] (Space)<br>(Note 2) — (Hyphen) | Quotation |
| | | | 10 | | | | | | | | | |
| | | | 16 | | | | | | | | | |
| | | | 8 | 3.5 | 2.0 | | 2M<br>3M<br>4M<br>5M<br>6M | 3 | | | | |
| | | | 16 | | | | | | | | | |
| | | | 22 | | | | | | | | | |
| 1.5 | 5 | 8 | 12 | 4.9 | 3.4 | | 2M<br>3M<br>4M<br>5M<br>6M | 5 | | | | |
| | | | 20 | | | | | | | | | |
| | | | 30 | | | | | | | | | |
| | 6 | 10 | 16 | 6.0 | 4.0 | | 2M<br>3M<br>4M<br>5M<br>6M | 6 | | | | |
| | | | 25 | | | | | | | | | |
| | | | 36 | | | | | | | | | |

(Note 1) [ ] Use % to indicate a space. (Note 2) Use # to indicate a— (hyphen).

H=36···2—M




**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% | K270 |
| HCF5M | 6 | 25.0 | | ABCDE | F0 |
| HCM5M | 6 | 25.0 | | A%B%C | |

Example of engraving layout

Catalog No. — A — L — T — CHR — K·F — (VKC·HKC)

HCP3M — 3 — 50.0 — T15.0 — ABC — K90 — HKC

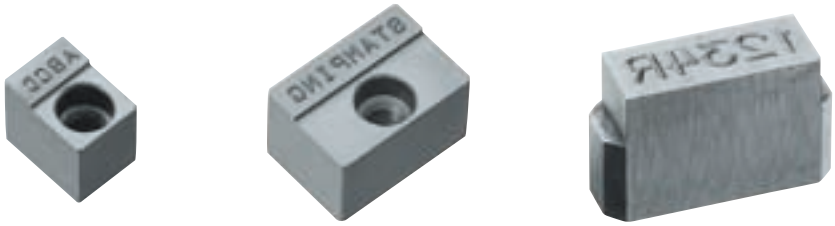
| Alteration | Code | Spec. | 1Code |
|---|---|---|---|
| V | VKC | V dimension tolerance change $V^{+0.01}_{0}$ ⇨ $^{0}_{-0.01}$ | Quotation |
| H | HKC | H dimension tolerance change $H^{+0.01}_{0}$ ⇨ $^{0}_{-0.01}$ | |

**Days to Ship** Quotation

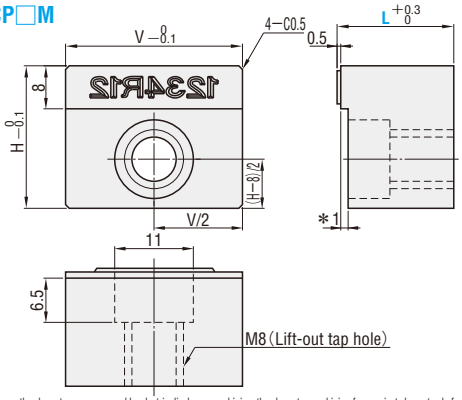
**Price** Quotation

# ENGRAVING BLOCK PUNCHES

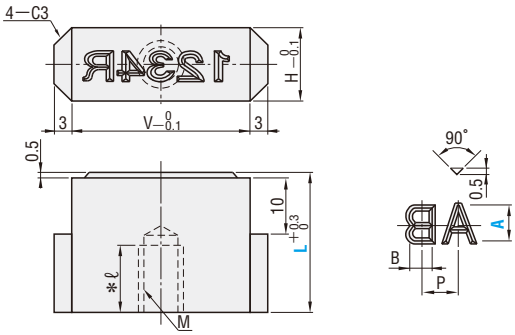
RoHS



**OCP□M**




**BCP□M**







∗Because the characters are engraved by electric discharge machining, the character machining face projects by a step before machining is performed.

∗ℓ is M×1.5 or more in case of L20 or M×2 or more in case of L25.

M Equivalent to SKD11
H 60～63HRC

| Mounting bolt M | V | H | P | B | Catalog No. Type | Catalog No. Number of characters | A | L | Characters CHR | Base unit price 1～9 pieces |
|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 16 | 22 | 3.5 | 2 | OCP | 3M | 3 | 20 25 | 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) | Quotation |
| | 25 | | | | | 4M | | | | |
| | 32 | | | | | 5M | | | | |
| | | | | | | 6M | | | | |
| | | | | | | 7M | | | | |
| | | | | | | 8M | | | | |
| 6 | 16 | 10 | 3.5 | 2 | BCP | 3M | 3 | 20 25 | | |
| | 25 | | | | | 4M | | | | |
| | 32 | | | | | 5M | | | | |
| | | | | | | 6M | | | | |
| | | | | | | 7M | | | | |
| | | | | | | 8M | | | | |
| 8 | 25 | 13 | 6.0 | 4 | | 3M | 6 | | | |
| | 32 | | | | | 4M | | | | |
| | | | | | | 5M | | | | |

(Note 1) [ ] Use % to indicate a space. (Note 2) Use # to indicate a — (hyphen).

**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% | |

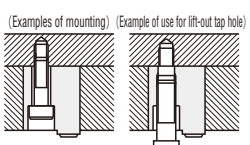
**Days to Ship** Quotation

**Price** Quotation

**Example**

**●OCP□M**

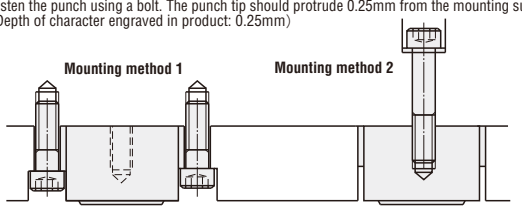
1. Maintenance is possible without disassembling the die.
2. The use of shims allows fine adjustments to be made even after the die is assembled.




Screw a bolt into the lift-out tap hole and pull the punch out of the punch plate.

**●BCP□M**

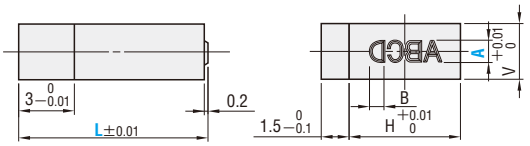
1. Mounting position
   Select a location that is as flat as possible for the punch to contact, and install the punch perpendicular to that surface.
2. Fasten the punch using a bolt. The punch tip should protrude 0.25mm from the mounting surface. (Depth of character engraved in product: 0.25mm)



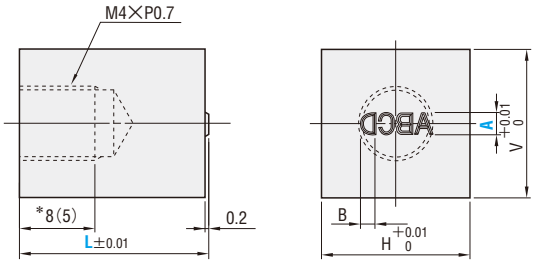
# PRECISION ENGRAVING BLOCK PUNCHES

RoHS

**VCF**

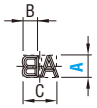



**VCM**

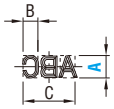



**1M**

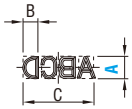

**2M**

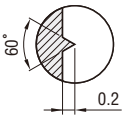



**3M**




**4M**




M SKH51
H 59～62HRC

(Note 1) ∗The tap depth is 5mm if L＜12.

| V | H | A | B | C | Catalog No. Type | Catalog No. Number of characters | A | 0.1mm increments L | Characters CHR | Base unit price 1～9 pieces |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 2 | 1.0 | 0.7 | — | VCF | 1M | 1.0 | 8.0 ～ 30.0 | 0 1 2 3 4 5 6 7 8 9<br>A B C D E F G H I J K L M<br>N O P Q R S T U V W X Y Z<br>(Note 1) [ ] (Space)<br>(Note 2) — (Hyphen) | Quotation |
| | | 1.2 | 0.8 | | | | 1.2 | | | |
| | | 1.5 | 1.0 | | | | 1.5 | | | |
| | 3 | 1.0 | 0.7 | 1.8 | | 2M | 1.0 | | | |
| | | 1.2 | 0.8 | 2.0 | | | 1.2 | | | |
| | | 1.5 | 1.0 | 2.4 | | | 1.5 | | | |
| | 6 | 1.0 | 0.7 | 3.0 | | 3M | 1.0 | | | |
| | | 1.2 | 0.8 | 3.3 | | | 1.2 | | | |
| | | 1.5 | 1.0 | 3.9 | | | 1.5 | | | |
| | | 1.0 | 0.7 | 4.1 | | 4M | 1.0 | | | |
| | | 1.2 | 0.8 | 4.5 | | | 1.2 | | | |
| | | 1.5 | 1.0 | 5.3 | | | 1.5 | | | |
| 8 | 8 | 1.0 | 0.7 | — | VCM | 1M | 1.0 | | | |
| | | 1.2 | 0.8 | | | | 1.2 | | | |
| | | 1.5 | 1.0 | | | | 1.5 | | | |
| | | 1.0 | 0.7 | 1.8 | | 2M | 1.0 | | | |
| | | 1.2 | 0.8 | 2.0 | | | 1.2 | | | |
| | | 1.5 | 1.0 | 2.4 | | | 1.5 | | | |
| | | 1.0 | 0.7 | 3.0 | | 3M | 1.0 | | | |
| | | 1.2 | 0.8 | 3.3 | | | 1.2 | | | |
| | | 1.5 | 1.0 | 3.9 | | | 1.5 | | | |
| | | 1.0 | 0.7 | 4.1 | | 4M | 1.0 | | | |
| | | 1.2 | 0.8 | 4.5 | | | 1.2 | | | |
| | | 1.5 | 1.0 | 5.3 | | | 1.5 | | | |

(Note 1) [ ] Use % to indicate a space. (Note 2) Use # to indicate a — (hyphen).

**Order**

Catalog No. — A — L — CHR

| Catalog No. | A | L | CHR | Actual engraving |
|---|---|---|---|---|
| VCF3M | — 1.5 | — 20.0 | — ABC | C B A |
| VCF3M | — 1.5 | — 25.0 | — %BA | B A |
| VCM4M | — 1.5 | — 20.0 | — ABCD | D C B A |
| VCM4M | — 1.5 | — 25.0 | — A#B% | B — A |

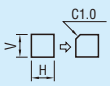
**Days to Ship** Quotation

**Price** Quotation

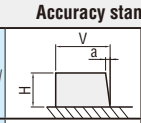
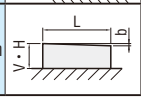
**Alterations**

Catalog No. — A — L — CHR — (VHM・VHZ, etc.)

VCM3M — 1.2 — 15.0 — ABC — CCP180

| Alteration | Code | Spec. | 1Code |
|---|---|---|---|
|  | VHM | Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01 | |
| | VHZ | Shank tolerance change V・H +0.01 0 ⇨ ±0.005 | |
|  | HC | Flange width change<br>0≦HC＜1.5<br>0.1mm increments<br>⊗ Cannot be used for VCM. | Quotation |
|  | CCP | Chamfering to one corner of shank (for error prevention)<br>One corner of shank is chamfered to C1.0.<br>■Selection of chamfering position (as viewed from engraving side)<br>CCP0 CCP90 CCP180 CCP270<br>  <br>⊗ Cannot be used for VCF. | |

■Accuracy standards for precision engraving block punches

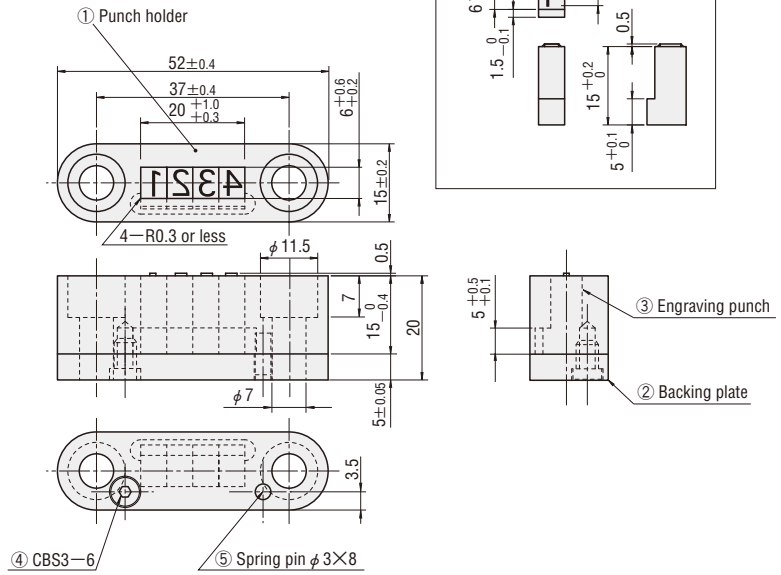
| Accuracy standards | | |
|---|---|---|
| Perpendicularity |  | a≦0.005 |
| Parallelism |  | b≦0.005 |

# ENGRAVING PUNCH HOLDERS

RoHS

| Catalog No. | COMPONENTS | | | | |
|---|---|---|---|---|---|
| | ① | ② | ③ | ④ | ⑤ |
| HCFPH4 | ○ | ○ | | ○ | ○ |
| HCFS4 | | | ○ | | |

Mounting bolts (M6) are purchased separately.




①M S45C
②M SK4
H 58～62HRC
③M SKD11
H 60～63HRC

■Engraving punch holders —For a 4—character set—

| Catalog No. | Base unit price |
|---|---|
| Type | 1～9 pieces |
| HCFPH4 | Quotation |

Order — Catalog No.: HCFPH4
Days to Ship — Quotation
Price — Quotation

■Engraving punches for punch holder (Punches are sold individually.)

| Catalog No. | CHR | Base unit price |
|---|---|---|
| Type | | 1～9 pieces |
| HCFS4 | 0 1 2 3 4 5 6 7 8 9 X Y Z | Quotation |

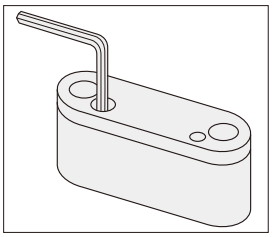
Order — Catalog No.: HCFS4 — CHR: X
Days to Ship — Quotation
Price — Quotation

| Character font |
|---|
| 0 1 2 3 4 5 6 7 8 9 X Y Z |

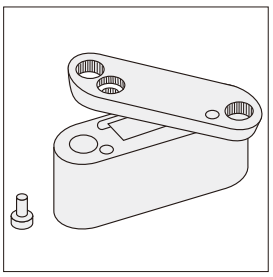
## ●Features

- These engraving punches are used for product traceability purposes.
- By incorporating it in the die, it is possible to engrave the production date onto the products.
- This compact punch is only 20mm in height and requires little space.

## ●Changing the punches



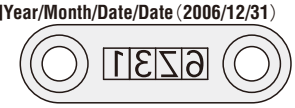
①Remove the low-head bolt which fixes the backing plate.



②By rotating the backing plate around the spring pin, it is possible to replace the last digit of the date easily.
(The backing plate can be completely removed.)

## ●Set of punches required for date engraving (Holder is not included.)

■Year/Month/Date (2006/12/31)



Required number of punches for engraving dates from 2000—2009

| CHR | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | X | Y | Z | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quantity | 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 | Days to Ship: Quotation | Price: Set (34 pcs.) price: Quotation

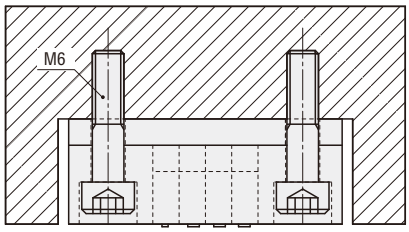
■Month/Month/Date/Date (12/31)

Required number of punches for engraving dates from 01/01 to 12/31

| CHR | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Quantity | 2 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 23 |

Order | Catalog No. 23SET — MMDD — HCFS4 | Days to Ship: Quotation | Price: Set (23 pcs.) price: Quotation

Example




■Shim tape P.608

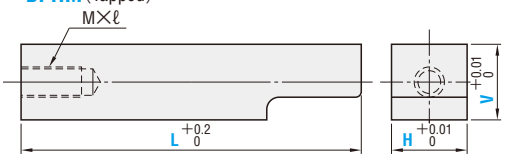
FGSM
FGSMW
FGSML

Use shims to adjust the height.

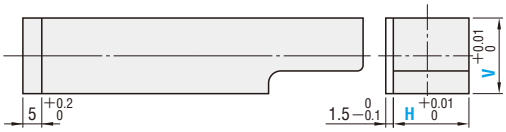
# BENDING AND CHAMFERING PUNCHES & DIES
## —FIXED SIZE TYPE—

**Type** (Select the tip shape from the figure below.)

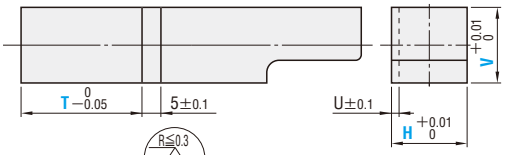
**BPHM** (Tapped)



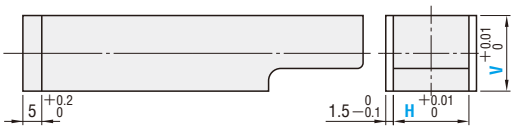

**BPHF** (Single flange) RoHS




**BPHK** (With key groove)




**BPHW** (Double flanges)



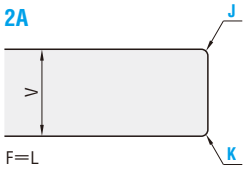

Details of key groove


Details of flange

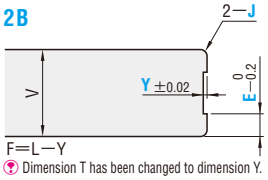

H5 M SKH51 H 61～64HRC
H6～50 M Equivalent to SKD11 H 60～63HRC

**Tip shape**

**2A**

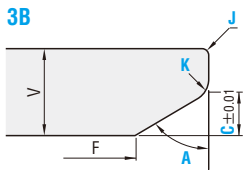



**2B**

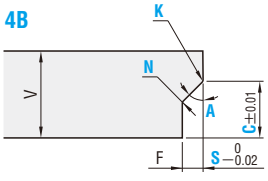



Dimension T has been changed to dimension Y.

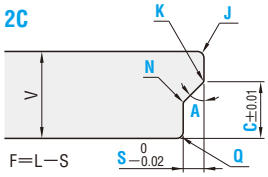
**3B**



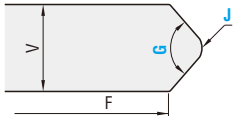

**4B**



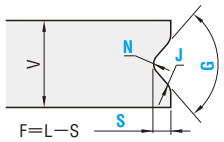

**2C**



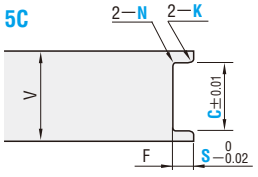

**3C**



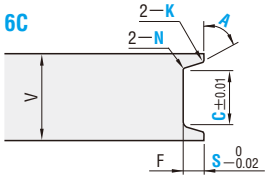

**4C**



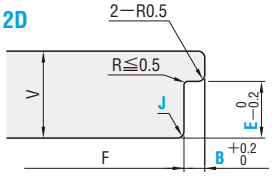

**5C**



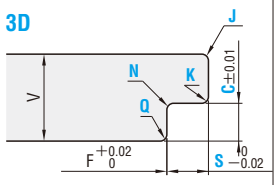

**6C**



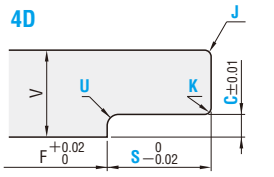

**2D**



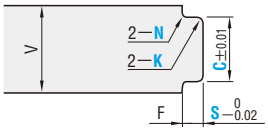

**3D**



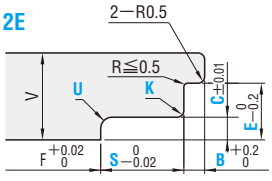

**4D**



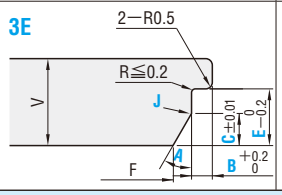

**5D**



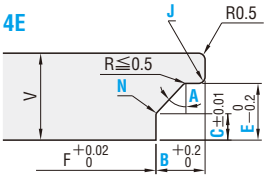

**2E**




**3E**




**4E**




**Increment**

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°

●For shape 2B only
0.5≦Y≦1
2.00≦E≦3.99→Ymax.5
E≧4.00→Ymax.10
●For shapes 5C・6C only
1.00≦C≦V−4

●For shape 5D only
2.0≦C
●For shape BPHM・BPHF・BPHW
F≧Fmin.
●For BPHK only
F−(T+5)≧2

●Shape 5C・6C

| $\frac{V-C}{2}$ | Smax. |
|---|---|
| 2.00～3.99 | 5 |
| 4.00～ | 10 |

**■Key groove position change** (Free of charge)

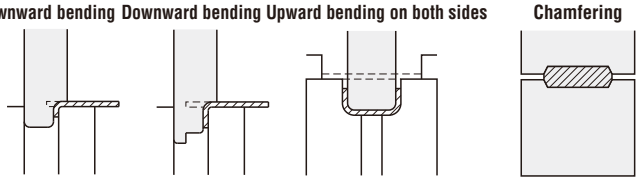
BPHK — KK0 — KK90 — KK180 — KK270

**■Flange position change** (Free of charge)

BPHF — F0 — F90 — F180 — F270

BPHW — WF0 — WF90

Example

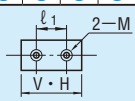


| Catalog No. Type | Shape | V / H | 5 | 6 | 8 | 10 | 13 | 16 | 20 | 22 | 25 | 28 | 30 | 40 | 50 | 0.1mm increments L | T | F min. | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tapped BPHM | 2A | 5 | ◇ | ◇ | ◇ | ◇ | ◇ | ◇ | ◇ | ◇ | ◇ | ◇ | ◇ | | | 20.0 ～ 100.0 | T≧20 (BPHK only) | 15 | 1.0 |
| | | 6 | ◇ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | |
| | | 8 | ◇ | ○ | △ | △ | △ | △ | △ | △ | △ | △ | △ | △ | | | | 20 | |
| | 2B 3B 4B | 10 | ◇ | ○ | △ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | | | | |
| With key groove BPHK | | 13 | ◇ | ○ | △ | □ | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | |
| | | 16 | ◇ | ○ | △ | □ | ● | ● | ● | ● | ● | ● | ● | ● | ● | Tapped: H5～H8 ···L20.0～; H10 ···L24.0～; H13～50 ···L28.0～ | | | |
| | 2C 3C 4C 5C 6C | 20 | ◇ | ○ | △ | □ | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | |
| Single flange BPHF | | 22 | ◇ | ○ | △ | □ | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | 1.5 |
| | 2D 3D 4D 5D | 25 | ◇ | ○ | △ | □ | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | 25 | |
| Double flanges BPHW | | 28 | ◇ | ○ | △ | □ | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | |
| | 2E 3E 4E | 30 | ◇ | ○ | △ | □ | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | |
| | | 40 | | | △ | □ | ● | ● | ● | ● | ● | ● | ● | | | | | | |
| | | 50 | | | | □ | ● | ● | ● | ● | ● | ● | ● | | | | | | |

Be aware that for tapped BPHM, Lmin. varies depending on H dimension.However if H>V, dimension V is used.
If BPHK with no key groove is required, select T dimension that is the same as the full length L.T=L

V·H=40·50···2—M

| V·H | 40 | 50 |
|---|---|---|
| ℓ1 | 20 | 24 |




Relationship between symbols in table and tap specification 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 type**

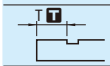
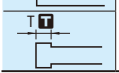
| Catalog No. | V | H | — | L | — | B·C·E·J·K·N·Q·S·Y·U·A·G | — | F·WF |
|---|---|---|---|---|---|---|---|---|
| BPHF 2B | 08 | 16 | — | 60.5 | — | E2.0—J1.50—Y0.5 | — | F0 |
| BPHW 3D | 16 | 13 | — | 72.3 | — | C6.00—J0.50—K0.5—N1.30—Q0.50—S19.27 | — | WF90 |

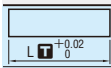
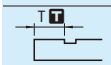
## Days to Ship

Quotation

## Alterations

| Catalog No. | V | H | — | L | — | B·C·E·J·K·N·Q·S·Y·U·A·G | — | F·WF | — (HC·TC, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| BPHF 2A | 06 | 06 | — | 60.5 | — | J3.00 — K2.00 | — | F0 | — HC1.0—TKC |

| Alteration | Code | Spec. | 1Code |
|---|---|---|---|
|  | HC | Flange width change 0≦HC<1.5 0.1mm increments | Quotation |
|  | TC | Flange thickness change 2≦TC<5 0.1mm increments | |
|  | TKC | Key groove position tolerance T 0 −0.05 ⇨ 0 −0.02 change | |
|  | | Flange thickness tolerance 5 +0.2 0 ⇨ +0.02 0 change | |

| Alteration | Code | Spec. | 1Code |
|---|---|---|---|
|  | LKC | Full length tolerance change L +0.2 0 ⇨ +0.02 0 ⊗ Cannot be used for 6C·2D·3D·4D·2E·3E·4E. | Quotation |
|  | MC | Tap diameter change (V / H: 6 / 8 / 10 / 13 / 16 / 20 / 22 / 25 / 28-30) 6: M4→M3 (16–22: —; 25, 28-30: —) 8: —; M5→M4 (16–22: —; 25, 28-30: —) 10: — —; M6→M5 13: — — —; M8→M6 | |
|  | RTC | Key groove position tolerance T 0 −0.05 ⇨ +0.05 0 change | |

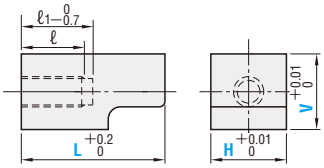
## Price

Quotation

# SHORT BENDING PUNCHES & DIES
## —FIXED SIZE TYPE—

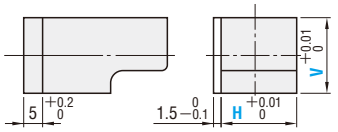
**Type** (Select the tip shape from the figure below.)

**BPHMS** (Tapped)

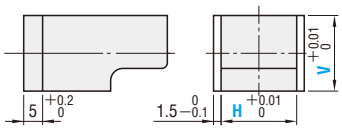



| H | ℓ | ℓ1 |
|---|---|---|
| 6 | 6 | 8.5 |
| 8 | 7.5 | 10 |
| 10 | 9 | 12.5 |
| 13<br>16<br>20 | 12 | 15.5 |

**BPHFS** (Single flange)




**BPHWS** (Double flanges)



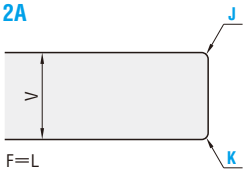

RoHS

Details of flange

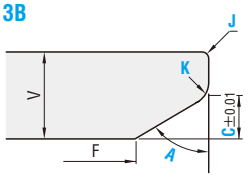

M Equivalent to SKD11
H 60～63HRC

**Tip shape**

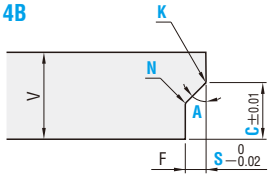
**2A**



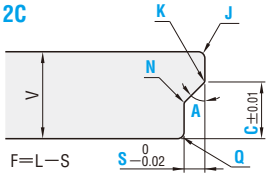

**3B**



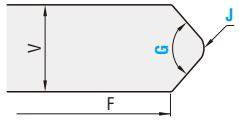

**4B**



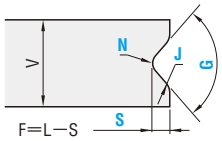

**2C**



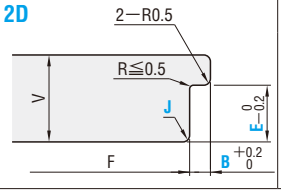

**3C**



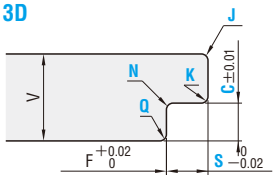

**4C**



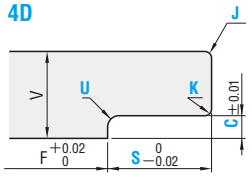

**2D**




**3D**




**4D**




**Increment**

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≧Fmin.

| Catalog No. Type | Shape | V / H | 6 | 8 | 10 | 13 | 16 | 20 | 0.1mm increments L | Fmin. Tapped | Fmin. Single flange・double flanges |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tapped BPHMS | 2A 3B 4B 2C 3C 4C 2D 3D 4D | 6 | ○ | ○ | ○ | ○ | ○ | ○ | 13.0～25.0 | 10.5 | 10.5 |
| | | 8 | ○ | △ | △ | △ | △ | △ | | 12.0 | |
| Single flange BPHFS | | 10 | ○ | △ | □ | □ | □ | □ | | 14.5 | |
| | | 13 | ○ | △ | □ | ● | ● | ● | | 17.5 | |
| Double flanges BPHWS | | 16 | ○ | △ | □ | ● | ● | ● | | | |
| | | 20 | ○ | △ | □ | ● | ● | ● | | | |

Relationship between symbols in table and tap specification 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**

■Selection of flange position (Free of charge)

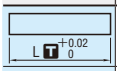

| Catalog No. | V | H | — | L | — | B・C・E・J・K・N・Q・S・U・A・G | — | F・WF |
|---|---|---|---|---|---|---|---|---|
| BPHFS 3B | 08 | 16 | — | 20.0 | — | C2.00 — J1.50 — K2.00 — A60 | — | F0 |
| BPHWS 3D | 16 | 13 | — | 25.0 | — | C6.00—J0.50—K0.50—N1.30—Q0.50—S14.50 | — | WF90 |

Days to Ship **Quotation**

Alterations

| Catalog No. | V | H | — | L | — | B·C·E·J·K·N·Q·S·U·A·G | — | F·WF | — (HC·TC, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| BPHFS 2A | 06 | 06 | — | 20.0 | — | J1.00—K2.00 | — | F0 | — HC1.3—TKC |

| Alteration | Code | Spec. | 1Code |
|---|---|---|---|
|  | HC | Flange width change<br>0≦HC<1.5<br>0.1mm increments | Quotation |
|  | TC | Flange thickness change<br>2≦TC<5<br>0.1mm increments | |
|  | TKC | Flange thickness tolerance change<br>$5^{+0.2}_{0}$ ⇨ $^{+0.02}_{0}$ | |

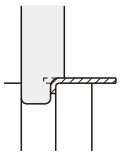
| Alteration | Code | Spec. | 1Code |
|---|---|---|---|
|  | LKC | Full length tolerance change<br>$L^{+0.2}_{0}$ ⇨ $^{+0.02}_{0}$<br>⊗ Cannot be used for 2D, 3D, and 4D. | Quotation |
|  | MC | Tap diameter change<br>H \ V: 6 / 8 / 10 / 13 / 16 / 20<br>6: M4→M3<br>8: — / M5→M4<br>10: — / — / M6→M5<br>13: — / — / — / M8→M6 | |

Price **Quotation**

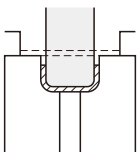
Example

■**Features** The shorter tap length and drill hole have made it possible to expand the dimensional limits for tip machining.

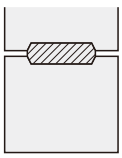
**Downward bending**



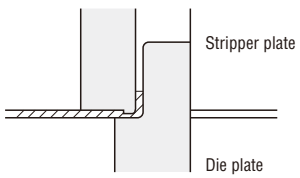
**Upward bending on both sides**



**Chamfering**



**Upward bending**



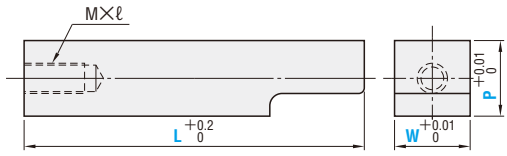

**Short block punch blanks P.363**

# BENDING AND CHAMFERING PUNCHES & DIES

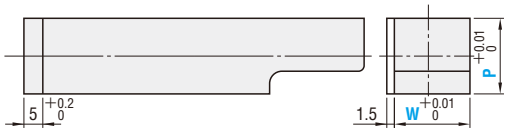
## —CONFIGURABLE SIZE TYPE—

**Type (Select the tip shape from the figure below.)**

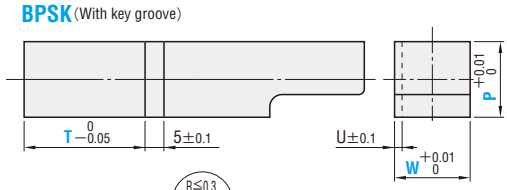
**BPSM** (Tapped)



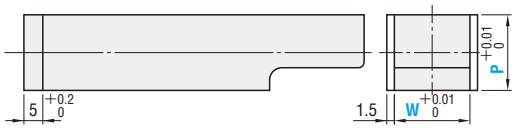

**BPSF** (Single flange) RoHS




**BPSK** (With key groove)




**BPSW** (Double flanges)



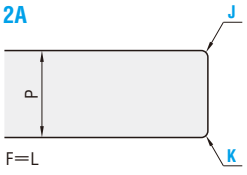

Details of key groove 


Details of flange 

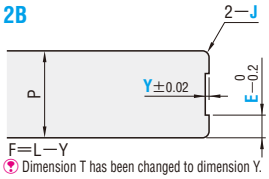

M Equivalent to SKD11
H 60～63HRC

**Tip shape**

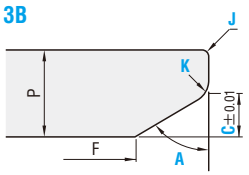
**2A**



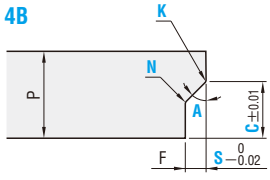

**2B**



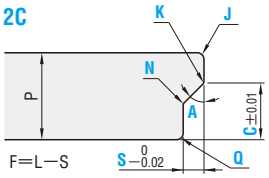

**3B**



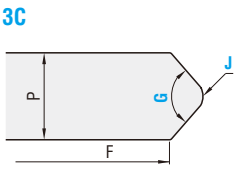

**4B**



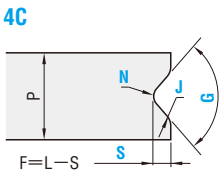

**2C**



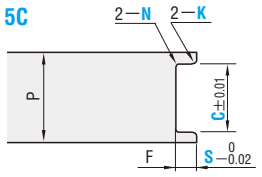

**3C**



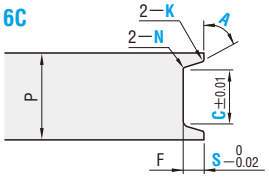

**4C**



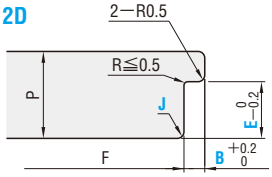

**5C**



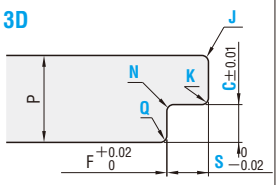

**6C**



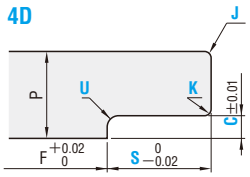

**2D**



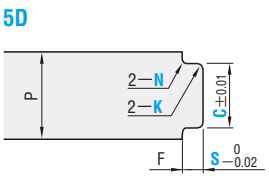

**3D**



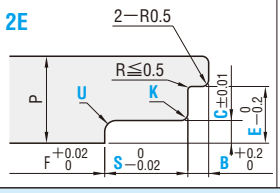

**4D**



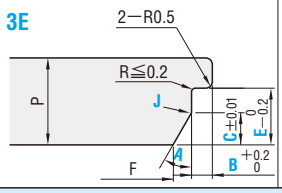

**5D**



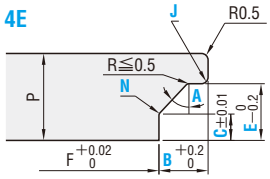

**2E**




**3E**




**4E**




**Increment**

C·J·K·N·Q·S·U·Y ——→ 0.01mm increments
B·E ——→ 0.1mm increments
A·G ——→ 0.5° increments

**Machining limit**

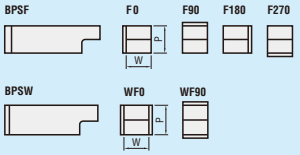
J·K·Q=0 or J·K·Q≧0.2
N·U≧0.2
1≦B≦25
Y≦1
U≦C
0.2≦C·E≦V−2
K+N<S≦25
K+U<S≦25
A≦70°
G≧40°
●For shape 2B only
0.5≦Y≦1
2.00≦E≦3.99→Ymax.5
E≧4.00→Ymax.10
●For shapes 5C·6C only
1.00≦C≦V−4
●For shape 5D only
2.0≦C
●For shape BPSM·BPSF·BPSW
F≧Fmin.
●For BPSK only
F−(T+5)≧2

●Shape 5C·6C

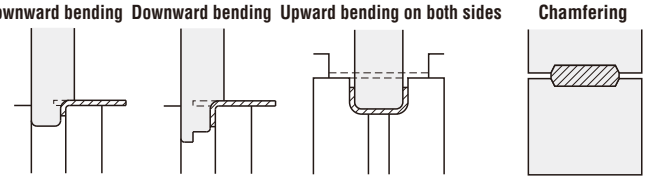
| P−C / 2 | Smax. |
|---|---|
| 2.00～3.99 | 5 |
| 4.00～ | 10 |

**■Key groove position change** (Free of charge)


**■Flange position change** (Free of charge)




**Example**



| 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<br>2B 3B 4B<br>2C 3C 4C 5C 6C<br>2D 3D 4D 5D<br>2E 3E 4E | 20.0～100.0<br>(Tapped<br>W5.01～8.00 ···L20.0～<br>W8.01～10.00 ···L24.0～<br>W10.01～30.00 ···L28.0～) | 5.01～ 6.00 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | T≧20<br>(BPSK only) | 15 | 1.0 |
| With key groove | BPSK | | | 6.01～ 8.00 | ○ | △ | △ | △ | △ | △ | △ | | 20 | 1.5 |
| Single flange | BPSF | | | 8.01～ 10.00 | ○ | △ | □ | □ | □ | □ | □ | | | |
| Double flanges | BPSW | | | 10.01～ 15.00 | ○ | △ | □ | ● | ● | ● | ● | | 25 | |
| | | | | 15.01～ 20.00 | ○ | △ | □ | ● | ● | ● | ● | | | |
| | | | | 20.01～ 25.00 | ○ | △ | □ | ● | ● | ● | ● | | | |
| | | | | 25.01～ 30.00 | ○ | △ | □ | ● | ● | ● | ● | | | |

Be aware that for tapped BPHM, Lmin. varies depending on W dimension. However if W>P, P dimension is used.
If BPHK with no key groove is required, specify dimension T that is the same value as full length L.T=L

Relationship between symbols in table and tap specifications 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 type

| 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—W5.01—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 |

**Days to Ship** Quotation

**Alterations**

| Catalog No. | — | L | — | P·W·B·C·E·J·K·N·Q·S·Y·U·A·G | — | F·WF | — | (HC·TC, etc.) |
|---|---|---|---|---|---|---|---|---|
| BPSF 2A | — | 60.5 | — | P8.01—W6.01—J3.00—K2.00 | — | F0 | — | HC1.0—TKC |

| Alteration | Code | Spec. | 1Code |
|---|---|---|---|
| | HC | Flange width change<br>0≦HC<1.5<br>0.1mm increments | Quotation |
| | TC | Flange thickness change<br>2≦TC<5<br>0.1mm increments | |
| T T | TKC | Key groove position tolerance change T $^{0}_{-0.05}$ ⇨ $^{0}_{-0.02}$ | |
| T T | | Flange thickness tolerance change 5 $^{+0.2}_{0}$ ⇨ $^{+0.02}_{0}$ | |

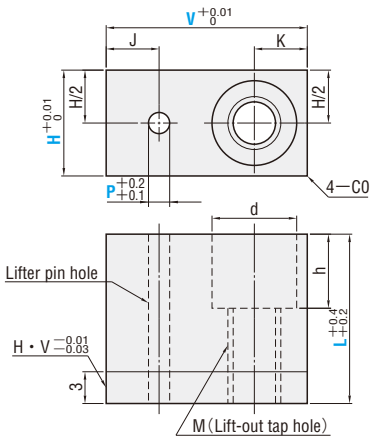
| Alteration | Code | Spec. | 1Code |
|---|---|---|---|
| L T $^{+0.02}_{0}$ | LKC | Full length tolerance change L $^{+0.2}_{0}$ ⇨ $^{+0.02}_{0}$<br>⊗ Cannot be used for 6C, 2D, 3D, 4D, 2E, 3E, and 4E. | Quotation |
| M | MC | Tap diameter change<br>W: 5.01～6.00 M4→M3; 6.01～8.00 M5→M4; 8.01～10.00 M6→M5; 10.01～13.00 M8→M6 | |
| T T | RTC | Key groove position tolerance change T $^{0}_{-0.05}$ ⇨ $^{+0.05}_{0}$ | |

**Price** Quotation

# BENDING DIES
## —FIXING-BOLT TYPE—

RoHS

**BBMD**




For the lift-out tap hole, use a bolt 1 size larger than the mounting bolt.

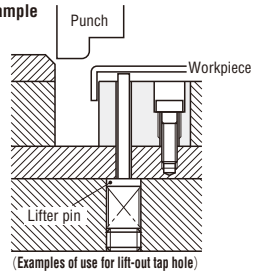
| Mounting bolt | M (lift-out tap hole) |
|---|---|
| M3 | M4 |
| M4 | M5 |
| M6 | M8 |
| M8 | M10 |

M Equivalent to SKD11
H 60～63HRC

| K | Mounting bolt d | h | Size | J | Catalog No. | V | H | L | P | Base unit price 1～9 pieces |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 6 | 7.5 | M3 | 3 | BBMD | 13 | 8 | 16 | 2 | Quotation |
| | | | | 4 | | 16 | | 20 | 4 | |
| | | | | 5 | | 18 | | 22 | 6 | |
| | | | | 6.5 | | 20 | | 25 | 8 | |
| 5 | 8 | 8.5 | M4 | 4 | | 18 | 10 | 30 | 10 | |
| | | | | 5 | | 20 | | 35 | | |
| | | | | 6.5 | | 22 | | | | |
| | | | | 8 | | 25 | | | | |
| 6.5 | 11 | 10.5 | M6 | 5 | | 22 | 13 | | | |
| | | | | 6.5 | | 25 | | | | |
| | | | | 8 | | 28 | | | | |
| | | | | 10 | | 32 | | | | |
| | | | | 6.5 | | 25 | 16 | | | |
| | | | | 8 | | 28 | | | | |
| | | | | 10 | | 32 | | | | |
| | | | | 12.5 | | 38 | | | | |
| 8 | 14 | 12.5 | M8 | 8 | | 32 | 20 | | | |
| | | | | 10 | | 35 | | | | |
| | | | | 12.5 | | 40 | | | | |
| | | | | 15 | | 45 | | | | |
| | | | | 10 | | 35 | 25 | | | |
| | | | | 12.5 | | 40 | | | | |
| | | | | 15 | | 45 | | | | |
| | | | | 17.5 | | 50 | | | | |

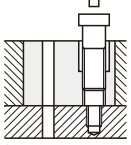
⊗ P6・8・10 cannot be used for H8, and P8・10 cannot be used for H10.

**Example**



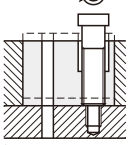

(Examples of use for lift-out tap hole)

(Example 1)



Screw a bolt into the lift-out tap hole and pull the die away from the die plate.

(Example 2)

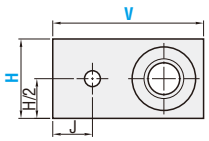


Screw a bolt into the lift-out tap hole and lift up the die.

**Order**

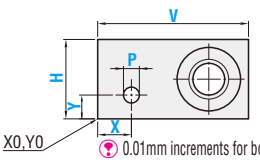
(1) If the center of lifter pin hole is at the standard position (J, H/2)

| Catalog No. | V | H | — | L | — | P |
|---|---|---|---|---|---|---|
| BBMD | 25 | 13 | — | 20 | — | P2 |



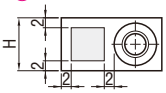

(2) If the lifter pin hole position is specified (X, Y)

| 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

Available area for lifter pin hole

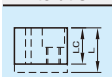
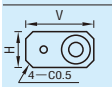


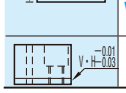

**Days to Ship** Quotation

**Price** Quotation

**Alterations**

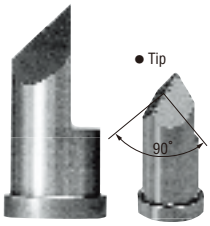
Catalog No. | V | H | — | L(LC) | — | P | — (PKC・CC, etc.)
BBMD | 25 | 13 | — | LC18.0 | — | P2 | — | PKC

| Alteration | Code | Spec. | 1Code |
|---|---|---|---|
|  | LC | Full length change 16＜LC＜35 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) | Quotation |
|  | PKC | P dimension tolerance change $P^{+0.2}_{+0.1}$ ⇨ $P^{+0.10}_{+0.05}$ | |
|  | CC | C0.5 chamfering to 4 outer (V・H) corners | |

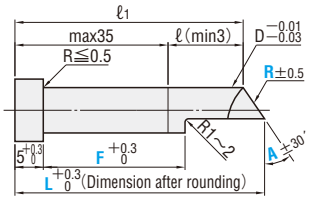
| Alteration | Code | Spec. | 1Code |
|---|---|---|---|
|  | LKC | Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ | Quotation |
|  | VKC1 | V・H tolerance change $V\cdot H^{+0.01}_{0}$ ⇨ $V\cdot H^{+0.005}_{0}$ | |
| | VKC2 | V・H tolerance change $V\cdot H^{+0.01}_{0}$ ⇨ $V\cdot H^{0}_{-0.005}$ | |
|  | NDC | No press-in lead | |

# RIB PUNCHES

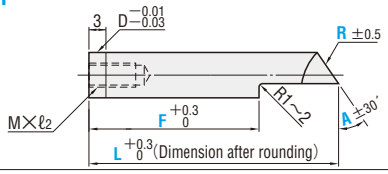
**For sinking** RoHS

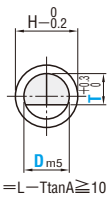



**RASP**

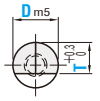



**RAMP**



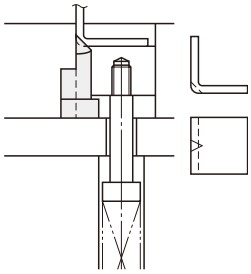




ℓ1=L−TtanA≧10




M Equivalent to SKD11
H 60~63HRC

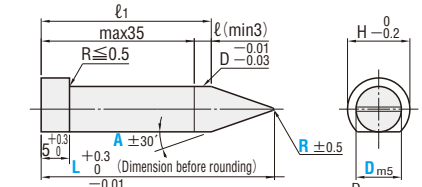
ex Example



| H | M×ℓ2 | Catalog No. Type | D | 0.1mm increments L | T | selection A | 0.5mm increments R | 0.1mm increments F | Base unit price 1 ~ 9 pieces |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 4×8 | RASP RAMP | 8 | 25.0~70.0 | D/2≦T≦D−2 | 30 45 60 | 1≦R≦5 or R0 | 0≦F≦L/2 ▼RAMP··· ℓ2+6≦F≦L/2 | Quotation |
| 13 | 5×10 | | 10 | 30.0~70.0 | | | | | |
| 16 | 6×12 | | 13 | 30.0~70.0 | | | | | |
| 19 | | | 16 | 35.0~70.0 | | | | | |
| 23 | | | 20 | 40.0~70.0 | | | | | |
| 28 | | | 25 | 45.0~70.0 | | | | | |

**For V-bending** RoHS

**RBSP**

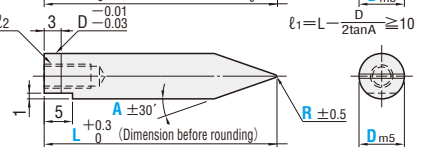






ℓ1=L−D/2tanA ≧10

**RBMP**

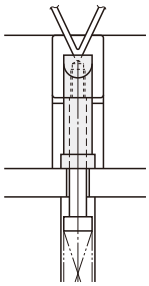






M Equivalent to SKD11
H 60~63HRC

ex Example



| H | M×ℓ2 | Catalog No. Type | D | 0.1mm increments L | 1° increments A | 0.1mm increments R | Base unit price 1 ~ 9 pieces |
|---|---|---|---|---|---|---|---|
| 11 | 4×8 | RBSP RBMP | 8 | 20.0~70.0 | A≧20 | 0.5≦R≦5 or R0 | Quotation |
| 13 | 5×10 | | 10 | | | | |
| 16 | 6×12 | | 13 | 30.0~70.0 | | | |
| 19 | | | 16 | | | | |
| 23 | | | 20 | 40.0~70.0 | | | |
| 28 | | | 25 | | | | |

**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 |

**Days to Ship** Quotation

**Price** Quotation

**Alterations**

| 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 |

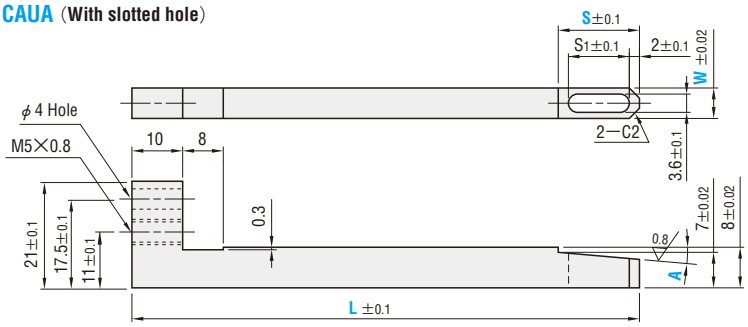
| Alteration | Code | Spec. | 1Code |
|---|---|---|---|
| | HC | Head diameter change D≦HC<H 0.1mm increments | Quotation |
| | TC | Head thickness change 2≦TC<5 0.1mm increments | |
| | KC | Addition of single key flat·Position change ●RASP·RBSP 1° increments 180° 90° 270° 0° ●RAMP·RBMP 180° 90° 270° 0° 5 | |

| Alteration | Code | Spec. | 1Code |
|---|---|---|---|
| | WKC | Addition of double key flats in parallel ●RASP·RAMP ●RBSP·RBMP | Quotation |
| | SKC | Key flat on shank | |

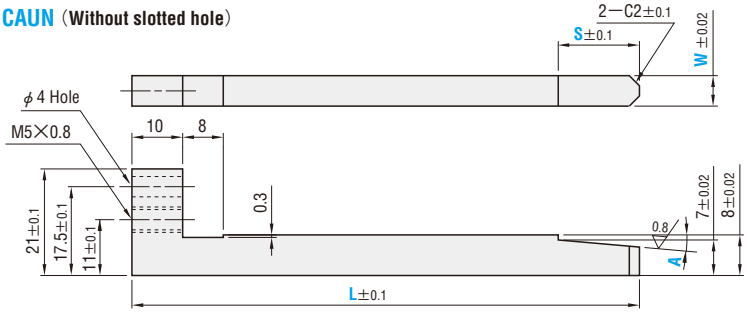
# HEIGHT ADJUSTMENT UNITS FOR CAMBER CORRECTION

RoHS

**CAUA** (With slotted hole)




**CAUN** (Without slotted hole)




M GO40F
H 40HRC

| $S_1$ | Catalog No. | | 1mm increments | | A (Selection) | Base unit price 1～9 pieces | |
|---|---|---|---|---|---|---|---|
| | Type | W | L | S | | CAUA | CAUN |
| S—4 | CAUA (With slotted hole) / CAUN (Without slotted hole) | 6 / 8 / 10 | 70～120 | 10～25 | 1 / 2.5 / 5 | Quotation | |

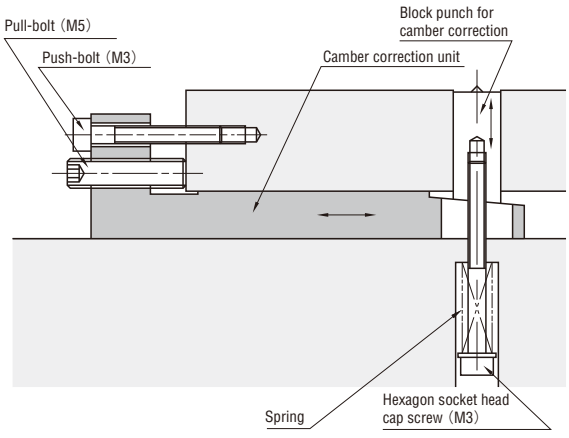
**Order**

| Catalog No. | — | L | — | S | — | A |
|---|---|---|---|---|---|---|
| CAUA 6 | — | 100 | — | 20 | — | 5 |
| CAUN 6 | — | 102 | — | 20 | — | 2.5 |

**Days to Ship** Quotation

**Price** Quotation

**Example**



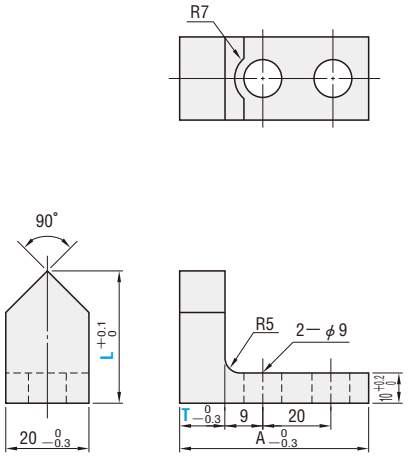

## ■Features

- These height adjustment units are used to correct the camber (material warpage) of thin workpieces such as connector lead frames.
- By using the push-pull bolts to move the adjustment unit back and forth, fine adjustments can be made to the correction punch height.

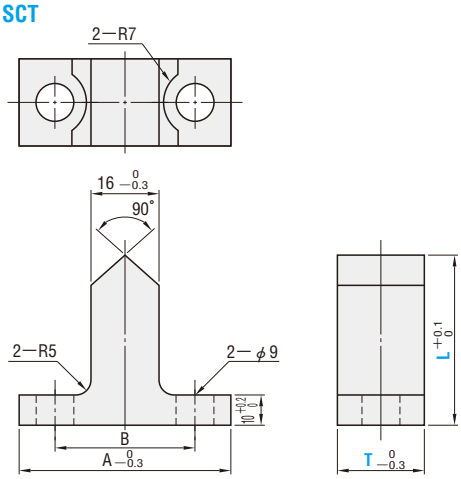
# GENERAL PURPOSE SCRAP CUTTERS

RoHS

**SCL**




**SCT**




M Equivalent to SKD11
H 60～63HRC

| A | B | Catalog No. Type | Catalog No. T | L 10mm increments | Base unit price 1～9 pieces Shortest L～L60 | Base unit price 1～9 pieces L70～L100 |
|---|---|---|---|---|---|---|
| 48 | — | SCL | 10 | 20～60 | | |
| 54 | | | 16 | | | |
| 63 | | | 25 | | Quotation | |
| 50 | 32 | SCT | 20 | 30～100 | | |
| | | | 25 | | | |
| | | | 30 | | | |

**Order**

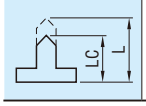
| Catalog No. | — | L |
|---|---|---|
| SCL 16 | — | 20 |
| SCT 20 | — | 50 |

**Days to Ship** Quotation

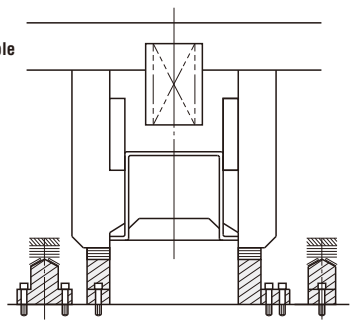
**Price** Quotation

**Alterations**

| Catalog No. | — | L(LC) |
|---|---|---|
| SCT 25 | — | LC55 |

| Alteration | Code | Spec. | 1 Code |
|---|---|---|---|
|   | LC | L dimension change 1mm increments Lmin.＜LC＜Lmax. | Quotation |

**Example**



Used to cut scrap from the ring during trimming.