# KAYAN

# KAYAN PRECISION

## Standard Components for Press Dies

***STANDARD COMPONENTS FOR PRESS DIES CATALOG***





Automotive



Appliances



Medical



High-Speed Rail



Electronics



Shipbuilding

**Guangzhou Kayan Precision Technology Co., Ltd.**
**KAYAN PRECISION TECHNOLOGY CO., LTD.**

KAYAN®

# Guangzhou Kayan Precision Technology Co., Ltd.

KAYAN PRECISION TECHNOLOGY CO., LTD.

## Company Profile




**A manufacturer that delivers solutions, with its own independent R&D capability.**

Kayan Precision is an international die-component manufacturer experienced in partnering with many well-known companies, building products to QB, JIS and other international standards. Located in Conghua District, Guangzhou, on a 30,000 m² site, with in-house heat-treatment and coating lines, Sodick wire EDM, Mazak CNC lathes, Mazak machining centers, double-sided vertical mills, CNC OD, centerless, ID and surface grinders - 400+ machines in all. We produce press-die components, automotive-die components, heavy-gauge frame punching parts, fin-die components, clinching/riveting-die components and build-to-print parts, with 28 sales offices nationwide providing fast, responsive service.

Kayan - your trusted partner!

## Manufacturing Equipment



Vacuum Heat-Treat Furnace
Optimal heat treatment selected for each product



CNC Surface Grinder
Accuracy 0.003 mm



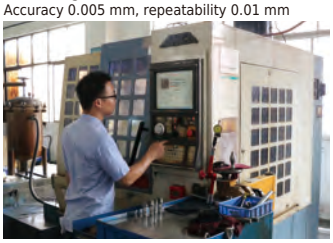
Machining Center
Accuracy 0.005 mm, repeatability 0.01 mm



Sinker EDM
EDM of shaped die details, accuracy 0.005 mm

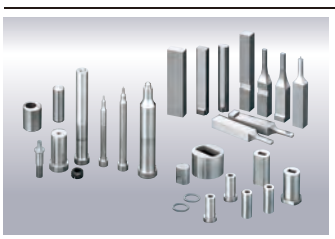


Wire EDM
Accuracy to 0.005 mm, corner radius to R0.05 mm



CNC Profile Grinder
Contour grinding, accuracy 0.01 mm

## Main Products



Press Die Components
Parts of stamping tools



Automotive Die Components
Standard parts of automobile punching



Heavy-Gauge Punching Components
Parts of thick metal punching tools



Fin Die Components
Parts of fin tools



Clinching & Riveting Die Components
Parts of riveting tools



Custom / Build-to-Print
Customize

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To our valued partners:

Thank you for choosing our products from among the many options available. Your choice is a sign of trust, and a responsibility we take seriously.

In an era of paperless, online business, a letter may seem old-fashioned, but we write with sincere gratitude. Your choice gives us great encouragement and confidence, and we will live up to it by meeting your requirements for quality, lead time, service and cost, helping you stay strong and competitive.

To meet your changing needs, we select the best process from the start and run dedicated production lines. Every part is made with care so it delivers its full value in your application, and performs reliably in service.

Markets change quickly, and meeting our customers' changing needs is our mission. Our skilled engineers form joint project teams with you - just describe your requirement and we will work through the challenge together. Professional customers deserve professional service.

Results are the true test, and time will show how we grow together. We aim to be a partner you can rely on, and we will do everything we can to support your growth.

One brand, one commitment; one responsibility, full confidence.

*Never get up on our dreams, Never say never, I'm here for you!*

We wish you continued success and prosperity.

Sincerely,

Guangzhou Kayan Precision Technology Co., Ltd.


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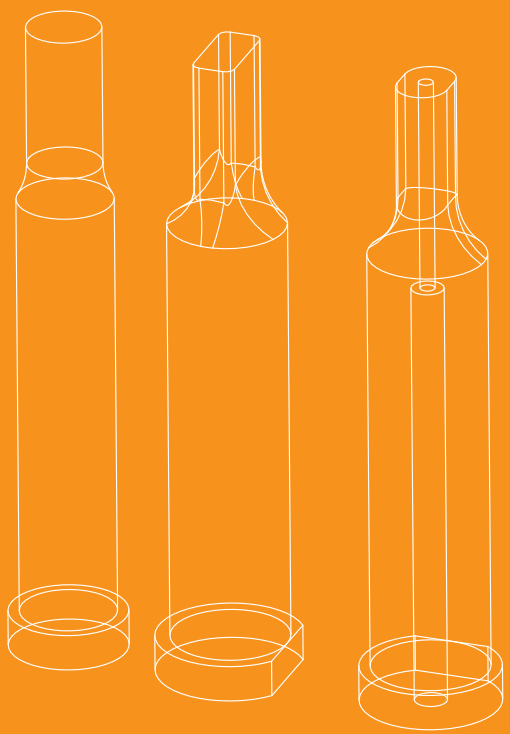

# Punches
# PUNCHES


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17 Shoulder-Clamped Punches — Standard / TiCN Coated-

# Punch Alterations Overview

—DETAIL GUIDE of ADDITION—

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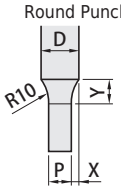
| D | Tol. Dm5 |
|---|---|
| 1 | +0.006 +0.002 |
| 1.6 | |
| 2 | |
| 2.5 | |
| 3 | |
| 4 | +0.009 +0.004 |
| 5 | |
| 6 | |
| 8 | +0.012 +0.006 |
| 10 | |
| 13 | +0.015 +0.007 |
| 16 | |
| 20 | +0.017 +0.008 |
| 25 | |
| 32 | +0.020 +0.009 |
| 38 | |
| 45 | |

**Calculating length of the shank-to-point blend radius**

Round Punches



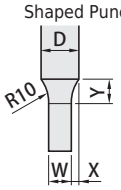

Calc. radius difference between shank and point X

$$X = \frac{(D-P)}{2}$$

Substitute X into the formula to get Y

$$Y = \sqrt{X(20-X)}$$

Shaped Punches




Calc. radius difference between shank and point X

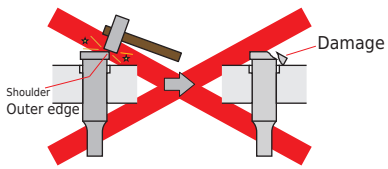
$$X = \frac{(D-W)}{2}$$

Substitute X into the formula to get Y

$$Y = \sqrt{X(20-X)}$$

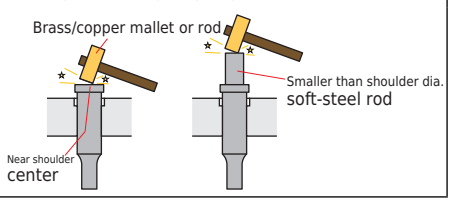
**For customers press-fitting punches, die buttons, etc. into plates**

⚠ To avoid damaging the shoulder, do not strike the shoulder's outer edge




Recommended:

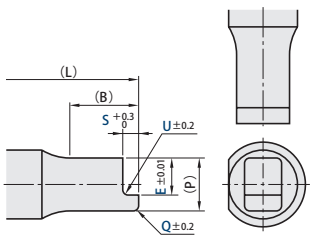
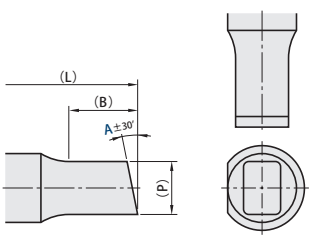
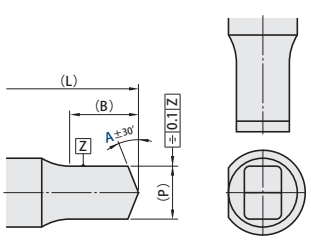
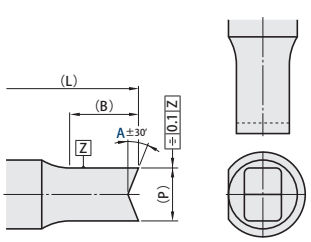
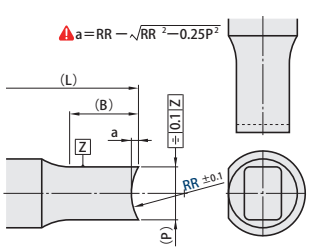
1. When pressing in, use a brass/copper mallet or rod - tools with low impact on punches and dies。
2. Die buttons and punch guide bushings are hollow, so the shoulder is weaker - take extra care。
3. Apply force near the shoulder center (see figure) using a soft-steel rod smaller than the shoulder dia。
   Do not force in a large amount at once - press in gradually with controlled force。



# Punch Alterations Overview

—DETAIL GUIDE of ADDITION—

▶ Point Face Grinding

| Code | Illustration | Alteration Details | |
|---|---|---|---|
| | | Round | Shaped |
| 1F<br>  <br>104 |  | — | Range 1≤S≤Smax.≤B ☞ Table 11<br>1≤E≤P×3/4<br>1≤P−E<br>0.2≤U≤S−1≤E<br>Q=0 or 1≤Q≤P-E<br>Increment E·Q in 0.01 S·U in 0.1<br>NO N/A for ejector punches<br>Table 11<br>P−E / Smax.<br>1.00～1.99 / 4.0<br>2.00～2.49 / 7.0<br>2.50～3.99 / 10.0<br>4.00～ / 13.0 |
| 2F<br>  <br>35 |  | Range 0°<A≤15°<br>PtanA+2<B<br>Increment in 1<br>⚠ L dim.: point face has a flat of 0.05 or less<br>⚠ With key-flat alterations, chamfer angle tol. is±1°<br>NO Cannot be combined with GC, HCC, HRC<br>NO N/A for ejector punches | Range 0°<A≤15°<br>PtanA+2<B<br>Increment in 1<br>⚠ L dim.: point face has a flat of 0.05 or less<br>NO N/A for ejector punches |
| 3F<br>  <br>69 |  | Range 0°<A≤15°<br>P/2tanA+2<B<br>Increment in 1<br>⚠ L dim.: point face has a flat of 0.05 or less<br>⚠ With key-flat alterations, chamfer angle tol. is±1°<br>NO Cannot be combined with GC, HCC, HRC | Range 0°<A≤15°<br>P/2tanA+2<B<br>Increment in 1<br>⚠ L dim.: point face has a flat of 0.05 or less |
| 4F<br>  <br>69 |  | Range 0°<A≤15°<br>P/2tanA+2<B<br>Increment in 1<br>⚠ L dim.: point face has a flat of 0.05 or less<br>⚠ With key-flat alterations, chamfer angle tol. is±1°<br>NO Cannot be combined with GC, HCC, HRC<br>NO N/A for ejector punches | Range 0°<A≤15°<br>P/2tanA+2<B<br>Increment in 1<br>⚠ L dim.: point face has a flat of 0.05 or less<br>NO N/A for ejector punches |
| 5F<br>  <br>69 |  | Range P+1≤RR≤P+10<br>0.1≤a<br>Increment in 0.1<br>⚠ L dim.: point face has a flat of 0.05 or less<br>NO N/A for ejector punches | Range P+1≤RR≤P+10<br>0.1≤a<br>Increment in 0.1<br>⚠ L dim.: point face has a flat of 0.05 or less<br>NO N/A for ejector punches |

# Punch Alterations Overview

—DETAIL GUIDE of ADDITION—

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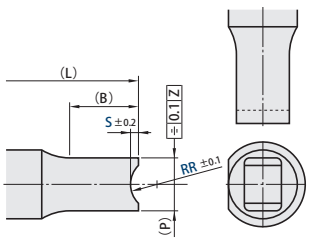
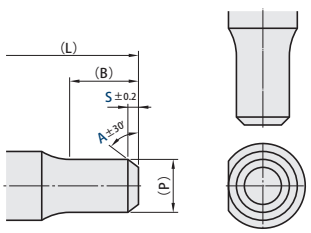
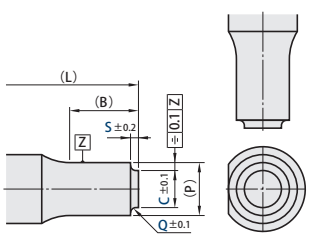
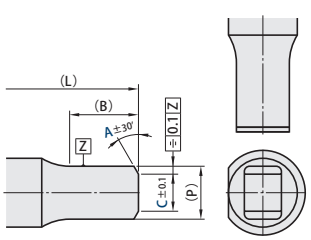
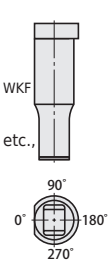
## ▶ Point Face Grinding

| Code | Illustration | Alteration Details | |
|---|---|---|---|
| | | Round | Shaped |
| **6F**<br>  <br>69 |  | Range S ≤ RR<br>$2\sqrt{RR^2-(RR-S)^2} < P$<br>Increment in 0.1<br>⚠ With key-flat alterations, chamfer angle tol. is ±1°<br>NO Cannot be combined with GC, HCC, HRC<br>NO N/A for ejector punches | Range S ≤ RR<br>$2\sqrt{RR^2-(RR-S)^2} < P$<br>Increment in 0.1<br>NO N/A for ejector punches |
| **7F**<br>  <br>23 |  | Range 0° < A ≤ 70°<br>2S / tanA < P − 0.2<br>2S / tanA < P − $d_1$ − 0.2<br>(Ejector Punches)<br>S < B<br>Increment A: in 1 S: in 0.1<br>⚠ $d_1$ = ejector hole dia.<br>(see table at right)<br>NO Not with GC, HCC, HRC<br>D / $d_1$ (Ejector / Heavy-Gauge):<br>4: 0.4 / —<br>5 · 6: 0.7 / —<br>8: 1.1 / 1.5<br>10: 1.5 / 1.8<br>13: 1.8 / 2.8<br>16 · 20: 2.8 / 2.8<br>25: 2.8 / 3.1<br>32: 2.8 / —<br>38 · 45: 4.2 / — | — |
| **1P**<br>  <br>69 |  | Range 0.3 ≤ C < P − 2Q − 0.2<br>$d_1$ + 0.2 ≤ C < P − 2Q − 0.2<br>(Ejector Punches)<br>0.1 ≤ Q ≤ S<br>0.3 ≤ S ≤ 5<br>S ≤ C<br>S < B<br>Increment in 0.1<br>⚠ $d_1$ = ejector hole dia.<br>(see table at right)<br>NO Not with GC, HCC, HRC<br>D / $d_1$ (Ejector / Heavy-Gauge):<br>4: 0.4 / —<br>5 · 6: 0.7 / —<br>8: 1.1 / 1.5<br>10: 1.5 / 1.8<br>13: 1.8 / 2.8<br>16 · 20: 2.8 / 2.8<br>25: 2.8 / 3.1<br>32: 2.8 / —<br>38 · 45: 4.2 / — | — |
| **2P**<br>  <br>46 |  | — | Range 0° < A ≤ 70°<br>1 ≤ C ≤ P − 1<br>$d_1$ + 0.2 ≤ C ≤ P − 1 (Ejector Punches)<br>0.5 × (P − C) tanA ≤ B − 0.5<br>Increment A: in 1 C: in 0.1<br>⚠ $d_1$ = ejector hole dia.<br>(see table at right)<br>D / $d_1$ (Ejector / Heavy-Gauge):<br>4: 0.4 / —<br>5 · 6: 0.7 / —<br>8: 1.1 / 1.5<br>10: 1.5 / 1.8<br>13: 1.8 / 2.8<br>16 · 20: 2.8 / 2.8<br>25: 2.8 / 3.1<br>32: 2.8 / —<br>38 · 45: 4.2 / — |

## ▶ Point Face Grinding

For high-force blanking, e.g. high-tensile steel; helps prevent breakage by reducing punching force and load. Also available coated, with short lead times。

⚠ Applicable range of point face grinding: P·W≥1.00
⚠ Ejector pin projection made to specified length
⚠ Round points have no key flat unless combined with KC, WKC, CKC or WKF
⚠ Shaped points include a key flat
Std. key-flat position is 0° at right; when relocating with KC etc., specify angle as shown at right

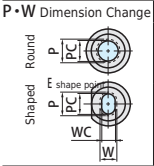
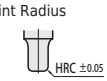
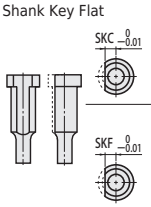



ORDER

| Code No. | L | P | W | R | (BC · HC…etc.) | (1F · 2F · 3F…, S · E · U · Q · A · RR · C) |
|---|---|---|---|---|---|---|
| KSPEL10 | — 50 | — P8.50 | — W3.50 | | — BC14 — KC | — 1F—S1.5 —E4.5 —U0.2—Q1.0 |

# Punch Alterations Overview

—DETAIL GUIDE of ADDITION—

| Add. | Code | Alteration Description |
|---|---|---|
| P・W Dimension Change  | PC (4)<br>WC (4) | Round: Reduce point dim. "P"<br>PC ≥ PCmin. ☞ Table 1<br>in 0.01→with PKC M) ( Z combined: allows in 0.001<br>⚠ Point length type X, PC ≤ 1.99:, B=20<br>Shaped: Reduce point dims. "P・W"<br>PC ≥ PCmin. WC ≥ WCmin. ☞ Table 2<br>in 0.01<br>NO D4 N/A NO Point length type X: N/A |
| B Dimension Change  | BC (4) | Change point length "B"<br>2 ≤ BC < B<br>in 0.1<br>⚠ Point length type X, PC 1.80-1.99:, Bmax.=20 |
| L Dimension Change  | LC (4) | Reduce overall length "L"<br>LC < L<br>in 0.1→w/ LKC, LKP (Z): allows in 0.01<br>⚠ B reduced (L-LC), but B≥2 ⚠ Ejector pin projection: 2 |
| H Dimension Change  | HC (4) | Reduce head dia. "H"<br>D ≤ HC < H<br>in 0.1 |
| T Dimension Change  | TC (4) | Reduce head thickness "T"<br>3.5 ≤ TC < 5<br>in 0.1→w/ TKC (M): allows in 0.01<br>⚠ L reduced accordingly (5-TC); with LC, LC unchanged |
| Head Chamfer  | CTC (6) | Chamfer the head<br>H ≤ 5: CTC = 0.5 H > 5: 0.5 ≤ CTC ≤ 1.5<br>in 0.1<br>NO Cannot be combined with KRC |
| Point Edge Chamfer  | HCC (6) | Chamfer the point edge<br>0.1 ≤ HCC ≤ 1 P−2×HCC ≥ 0.2+d1<br>in 0.1 (d1= ejector hole dia., see ☞ Table 3)<br>NO Not with HRC NO N/A for shaped punches |
| Point Cone  | GC (12) | Cone the point end<br>20 ≤ GC < 90 0.5×Ptan(90−GC) < B−0.5<br>in 1 NO Not with LKC, LKP, LKPZ, HCC, HRC<br>NO N/A for shaped punches |
| Point Radius  | HRC (12) | Radius the point end R<br>0.1 ≤ HRC ≤ 1 P−2×HRC ≥ 0.2+d1<br>in 0.1 (d1= ejector hole dia., see ☞ Table 3)<br>NO Not with HCC NO N/A for shaped punches |
| Point Face Grinding  | ☐F<br>☐P | ⚠ Only available: 3F, 7F, 1P, 2P |
| Shank Key Flat  | SKC (19) | Add 1 key flat on shank |
| | SKF (25) | Add 1 key flat of specified size on shank |

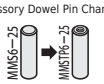
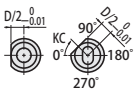
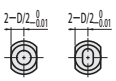
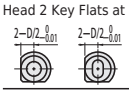
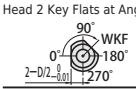
| D | SKC | P・Wmax.(Round) | P・Wmax.(Shaped) |
|---|---|---|---|
| 4～ 6 | D/2−0.5 | P ≤ D−1.2 | W ≤ D−1.2 |
| 8～25 | D/2−1.0 | P ≤ D−2.2 | W ≤ D−2.2 |

NO Cannot be combined with KC, WKC, CKC, WKF, SKF, NKC

| D | SKF (min.) | SKF (max.) | P・Wmax.(round) | P・Wmax.(shaped) |
|---|---|---|---|---|
| 4～ 6 | D/2−0.5 | D/2−0.1 | P ≤ 2(SKF −0.1) | W ≤ 2(SKF −0.1) |
| 8～25 | D/2−1.0 | D/2−0.1 | | |

in 0.1

NO Cannot be combined with KC, WKC, CKC, WKF, SKC, NKC

| Add. | Code | Alteration Description |
|---|---|---|
| Accessory Dowel Pin Change  | KNC (3) | Change straight dowel pin to precision tapped dowel pin<br>⚠ Change MMS6-25 to MMSTP6 -25 |
| Cross Hole Removed  | AC (−4) | Center hole used as air vent; no ejector pin assy.; cross hole plugged<br>NO Cannot be combined with NC |
| No ejector pin assembly  | NC (−7) | No ejector pin assembly<br>NO Cannot be combined with AC |
| Head Key Flat  | KC (6) | Round: Add 1 key flat<br>NO Cannot be combined with WKC, CKC, WKF, SKC, SKF<br>Shaped: Change std. key-flat position<br>0 < KC < 360<br>in 1 ⚠ OK with WKC, CKC<br>NO Cannot be combined with WKF, SKC, SKF |
| Head 2 Parallel Key Flats  | WKC<br>Round(12)<br>Shaped(6) | Round: Add 2 parallel key flats<br>NO Cannot be combined with KC, CKC, WKF, SKC, SKF<br>Shaped: Add 2 parallel key flats<br>⚠ Can be combined with KC<br>NO Not with CKC, WKF, SKC, SKF  |
| Head 2 Key Flats at 90°  | CKC<br>Round(12)<br>Shaped(6) | Add 2 key flats on head at 0° and 270°<br>⚠ Shaped: can be combined with KC<br>NO Not with WKC, WKF, SKC, SKF  |
| Head 2 Key Flats at Angle  | WKF<br>Round(19)<br>Shaped(12) | Add 2 key flats on head at 0° and specified angle<br>0 < WKF < 360<br>in 1<br>NO Cannot be combined with KC, WKC, CKC, SKC, SKF |
| P・W Dim. Tol. Change  | PKC (12) | P +0.01 0 → +0.005 0 P・W ±0.01 → +0.01 0<br>⚠ Round: P dim. can in 0.001 NO Shaped, pt. length type X: N/A |
| | PKCM (12) | P +0.01 0 → 0 −0.005 P・W ±0.01 → 0 −0.01<br>⚠ Round: P dim. can in 0.001 NO Shaped, pt. length type X: N/A |
| | PKCZ (12) | P +0.01 0 → ±0.002 P・W ±0.01 → ±0.005<br>⚠ Round: P dim. can in 0.001 NO Shaped, pt. length type X: N/A |
| | PNCM (0) | P +0.01 0 → 0 −0.01 NO N/A for shaped punches |
| | PNCZ (0) | P +0.01 0 → ±0.005 NO N/A for shaped punches |
| T Dim. Tolerance Change  | TKC (6) | T +0.3 0 → +0.02 0 |
| | TKCM (6) | T +0.3 0 → 0 −0.02 |

| Add. | Code |
|---|---|
| Shaped Punch Head Key Flat Removed  | NKC (0) |
| ⚠ Remove head key flat | |
| Press-in lead (D −0.01 −0.03) removed  | NDC (0) |
| ⚠ Remove press-in lead (D −0.01 −0.03) | |

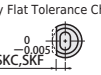
| Add. | Code |
|---|---|
| Shank Key Flat Tolerance Change  | SKKC (12) |
| ⚠ Must be combined with SKC, SKF | |
| Head thickness machined to retainer face  | RC (6) |
| ⚠ Head thk. tol. changed to retainer face | |
| NO D +0.005 0 N/A | |

Table 1

| D | PCmin. |
|---|---|
| 4 | 0.90 |
| 5 | 1.80 |
| 6 | 1.80 |
| 8 | 2.50 |
| 10 | 2.80 |
| 13 | 5.00 |
| 16 | 8.00 |
| 20 | 9.00 |
| 25 | 9.00 |

Table 2

| D | PC・WCmin. |
|---|---|
| 5 | 1.80 |
| 6 | 1.80 |
| 8 | 2.50 |
| 10 | 2.80 |
| 13 | 5.00 |
| 16 | 5.00 |
| 20 | 5.00 |
| 25 | 5.00 |

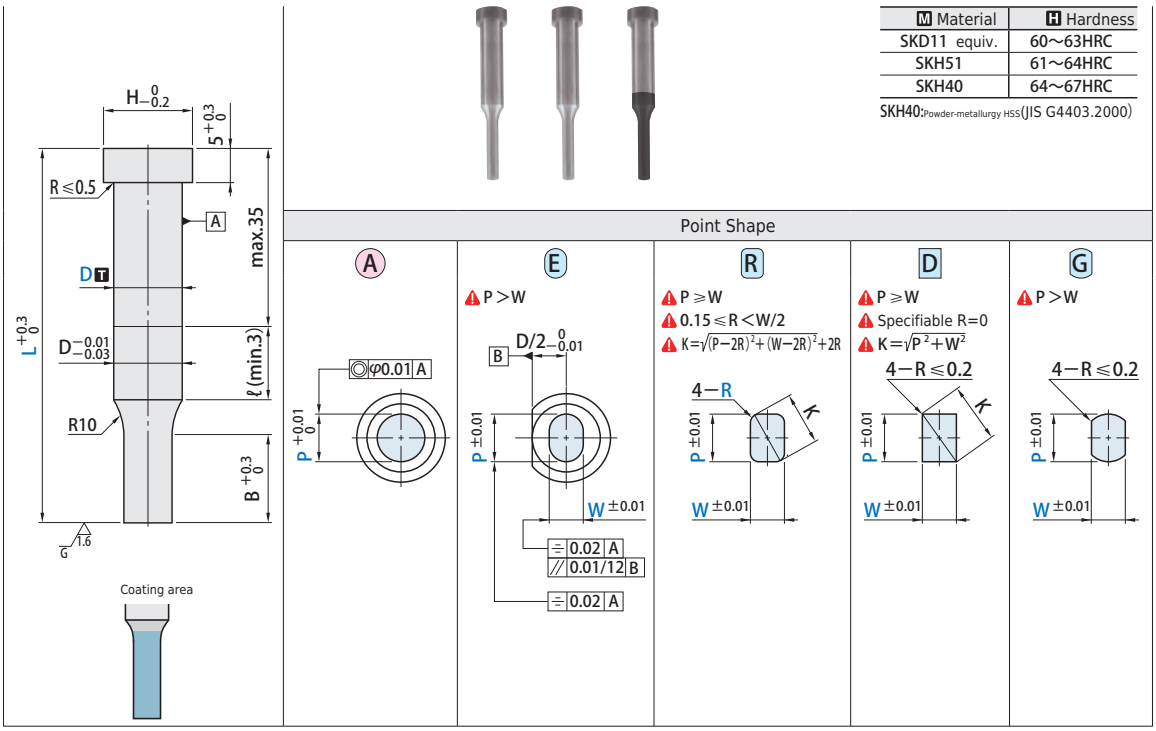
Table 3

| D | d1 |
|---|---|
| 4 | 0.4 |
| 5 | 0.7 |
| 6 | |
| 8 | 1.1 |
| 10 | 1.5 |
| 13 | 1.8 |
| 16 | 2.8 |
| 20 | |
| 25 | |

# Shoulder Punches — Standard / TiCN Coated-

KAYAN

## SHOULDER PUNCHES—STANDARD TYPE / TiCN COATING—




| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40:Powder-metallurgy HSS(JIS G4403.2000)

### Point Shape




| Tol. · Material (Shank dia. to T) | Code No. Type | Shape (Point Shape) | B (Point Length) | | D | L | | | | | | | P (A) | P·Kmax. (E R D G) | P·Wmin. (E R D G) | R (R) | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | in 0.01 | | | | |
| Dm5 SKD11 SKH51 SKH40 | KSP KSH KPH | A E R D G | S | 8 | 3 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 1.00～ 2.99 | — | — | 0.15≤R<W/2( only | 5 |
| | | | | | 4 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 1.00～ 3.99 | 3.97 | 1.00 | | 7 |
| | | | | | 5 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 2.00～ 4.99 | 4.97 | 1.20 | | 8 |
| | | | | | 6 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 2.00～ 5.99 | 5.97 | 1.50 | | 9 |
| | | | | 13 | 8 | (40) | 50 | 60 | 70 | 80 | 90 | 100 | 3.00～ 7.99 | 7.97 | 2.00 | | 11 |
| | | | | | 10 | (40) | 50 | 60 | 70 | 80 | 90 | 100 | 3.00～ 9.99 | 9.97 | 2.50 | | 13 |
| | | | | | 13 | (40) | 50 | 60 | 70 | 80 | 90 | 100 | 6.00～12.99 | 12.97 | 3.00 | | 16 |
| | | | | 19 | 16 | (40) | 50 | 60 | 70 | 80 | 90 | 100 | 10.00～15.99 | 15.97 | 4.00 | | 19 |
| | | | | | 20 | (40) | 50 | 60 | 70 | 80 | 90 | 100 | 13.00～19.99 | 19.97 | 5.00 | | 23 |
| | | | | | 25 | (40) | 50 | 60 | 70 | 80 | 90 | 100 | 18.00～24.99 | 24.97 | 6.00 | | 28 |
| D+0.005 0 SKD11 SKH51 SKH40 | KA—SP KA—SH KA—PH | | L | 13 | 3 | | 50 | 60 | 70 | 80 | 90 | 100 | 1.00～ 2.99 | — | — | | 5 |
| | | | | | 4 | | 50 | 60 | 70 | 80 | 90 | 100 | 1.00～ 3.99 | 3.97 | 2.00 | | 7 |
| | | | | | 5 | | 50 | 60 | 70 | 80 | 90 | 100 | 2.00～ 4.99 | 4.97 | 2.00 | | 8 |
| | | | | | 6 | | 50 | 60 | 70 | 80 | 90 | 100 | 2.00～ 5.99 | 5.97 | 2.00 | | 9 |
| | | | | 19 | 8 | | 50 | 60 | 70 | 80 | 90 | 100 | 3.00～ 7.99 | 7.97 | 2.50 | | 11 |
| | | | | | 10 | | 50 | 60 | 70 | 80 | 90 | 100 | 3.00～ 9.99 | 9.97 | 2.50 | | 13 |
| | | | | | 13 | | 50 | 60 | 70 | 80 | 90 | 100 | 6.00～12.99 | 12.97 | 3.00 | | 16 |
| | | | | 25 | 16 | | | 60 | 70 | 80 | 90 | 100 | 10.00～15.99 | 15.97 | 4.00 | | 19 |
| | | | | | 20 | | | 60 | 70 | 80 | 90 | 100 | 13.00～19.99 | 19.97 | 5.00 | | 23 |
| | | | | | 25 | | | 60 | 70 | 80 | 90 | 100 | 18.00～24.99 | 24.97 | 6.00 | | 28 |
| TiCN coated SKH51 | KH—SH | | X | 19 | 3 | | 50 | 60 | 70 | 80 | 90 | 100 | 1.20～ 2.99 | — | — | | 5 |
| | | | | | 4 | | 50 | 60 | 70 | 80 | 90 | 100 | 1.20～ 3.99 | 3.97 | 2.00 | | 7 |
| TiCN coated SKH40 | KH—PH | | | 25 | 5 | | | 60 | 70 | 80 | 90 | 100 | 2.00～ 4.99 | 4.97 | 3.50 | | 8 |
| | | | | | 6 | | | 60 | 70 | 80 | 90 | 100 | 2.00～ 5.99 | 5.97 | 3.50 | | 9 |
| | | | | 30 | 8 | | | 60 | 70 | 80 | 90 | 100 | 3.00～ 7.99 | 7.97 | 5.00 | | 11 |
| | | | | | 10 | | | 60 | 70 | 80 | 90 | 100 | 3.00～ 9.99 | 9.97 | 5.00 | | 13 |
| | | | | | 13 | | | 60 | 70 | 80 | 90 | 100 | 6.00～12.99 | 12.97 | 5.00 | | 16 |
| | | | | 40 | 16 | | | | 70 | 80 | 90 | 100 | 10.00～15.99 | — | — | | 19 |
| | | | | | 20 | | | | 70 | 80 | 90 | 100 | 13.00～19.99 | — | — | | 23 |
| | | | | | 25 | | | | 70 | 80 | 90 | 100 | 18.00～24.99 | — | — | | 28 |

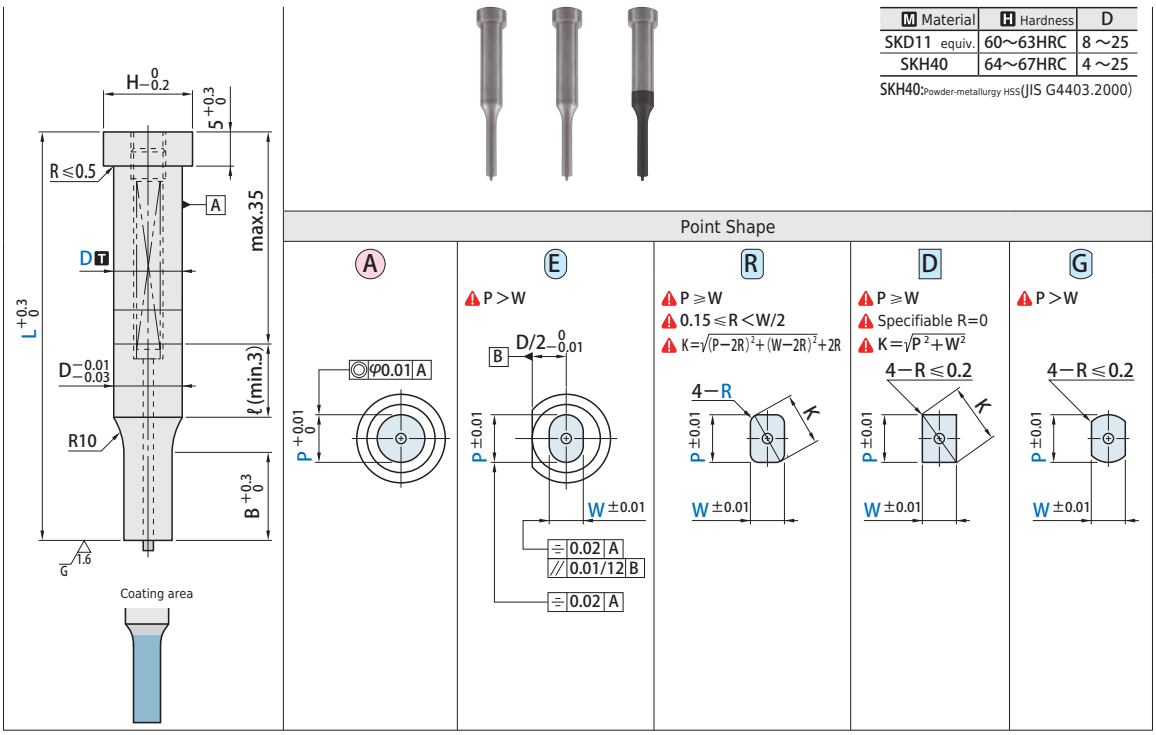
⚠ For OAL L (40), pt. length B=8 ⚠ Round point P > D-0.03: no press-in lead(D-0.01 -0.03) ⚠ Shaped point P·K > D-0.05: no press-in lead(D-0.01 -0.03)

ORDER

| Code No. | L | P | W | R (R0) |
|---|---|---|---|---|
| KSPDL6 — | 50 — | P4.00 — | W2.00 | |

# Ejector Punches — Standard / TiCN Coated-

## EJECTOR PUNCHES—STANDARD TYPE / TiCN COATING—




| Material | Hardness | D |
|---|---|---|
| SKD11 equiv. | 60～63HRC | 8～25 |
| SKH40 | 64～67HRC | 4～25 |

SKH40: Powder-metallurgy HSS (JIS G4403.2000)

| Tol. · Material (Shank dia. tol. T) | Code No. Type | Shape (Point Shape) | B Point Length | | D | L | P Ⓐ 0.01 | P·Kmax. Ⓔ Ⓡ Ⓓ Ⓖ | P·Wmin. | R Ⓡ | H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dm5 SKD11 SKH40 | (D8~25) KSJ | A | S | 13 | 8 | (40) 50 60 70 80 90 100 | 3.00～ 7.99 | 7.97 | 3.00 | 0.15≤R＜W/2( only | 11 |
| | (D4~25) KPJ | E | | | 10 | (40) 50 60 70 80 90 100 | 3.00～ 9.99 | 9.97 | 3.00 | | 13 |
| | | | | | 13 | (40) 50 60 70 80 90 100 | 6.00～12.99 | 12.97 | 6.00 | | 16 |
| | | | | 19 | 16 | (40) (50) 60 70 80 90 100 | 10.00～15.99 | 15.97 | 6.00 | | 19 |
| | | | | | 20 | (40) (50) 60 70 80 90 100 | 13.00～19.99 | 19.97 | 6.00 | | 23 |
| | | | | | 25 | (40) (50) 60 70 80 90 100 | 18.00～24.99 | 24.97 | 6.00 | | 28 |
| D+0.005 0 SKD11 SKH51 TiCN coated SKH51 TiCN coated SKH40 | (D8~25) KA—SJ | R | L | 19 | 8 | 50 60 70 80 90 100 | 3.00～ 7.99 | 7.97 | 3.00 | | 11 |
| | (D4~25) KA—PJ KH—KPJ KH—KSJ | D | | | 10 | 50 60 70 80 90 100 | 3.00～ 9.99 | 9.97 | 3.00 | | 13 |
| | | G | | | 13 | 50 60 70 80 90 100 | 6.00～12.99 | 12.97 | 6.00 | | 16 |
| | | | | 25 | 16 | 60 70 80 90 100 | 10.00～15.99 | 15.97 | 6.00 | | 19 |
| | | | | | 20 | 60 70 80 90 100 | 13.00～19.99 | 19.97 | 6.00 | | 23 |
| | | | | | 25 | 60 70 80 90 100 | 18.00～24.99 | 24.97 | 6.00 | | 28 |
| | | | X | 30 | 8 | 70 80 90 100 | 3.00～ 7.99 | 7.97 | 5.00 | | 11 |
| | | | | | 10 | 70 80 90 100 | 3.00～ 9.99 | 9.97 | 6.00 | | 13 |
| | | | | | 13 | 70 80 90 100 | 6.00～12.99 | 12.97 | 6.00 | | 16 |
| | | | | 40 | 16 | 80 90 100 | 10.00～15.99 | — | — | | 19 |
| | | | | | 20 | 80 90 100 | 13.00～19.99 | — | — | | 23 |
| | | | | | 25 | 80 90 100 | 18.00～24.99 | — | — | | 28 |

⚠ For OAL L (40), pt. length B=6 ⚠ For OAL L (50), pt. length B=13 ⚠ Round point P > D-0.03: no press-in lead (D-0.01 −0.03)

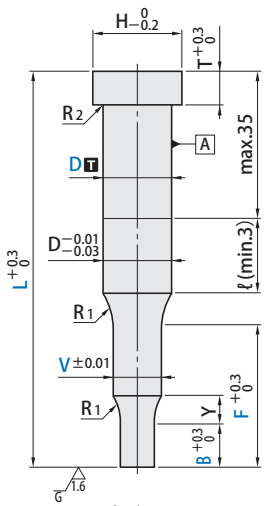
⚠ Shaped point P·K > D-0.05: no press-in lead (D-0.01 −0.03) ⚠ Ejector hole data: see ejector punch blanks

| Code No. | L | P | W | R (R0) |
|---|---|---|---|---|
| KSJAS10 — | 80 | — P8.00 | | |
| KSJDL10 — | 80 | — P8.00 | — W5.00 | |

# Two-Step Punches — Standard / TiCN Coated-

KAYAN

## TWO STEPS TYPE PUNCHES—STANDARD TYPE / TiCN COATING—





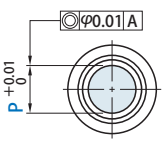

| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40: Powder-metallurgy HSS (JIS G4403.2000)

| D | $R_1$ | $R_2$ |
|---|---|---|
| 1.6～2.5 | R2～3 | R≤0.2 |
| 3 ～ | R10 | R≤0.5 |

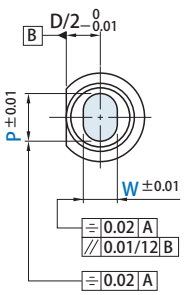
### Point Shape

**Ⓐ**



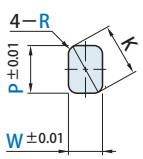

**Ⓔ**

P＞W



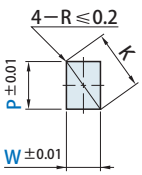

**Ⓡ**

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



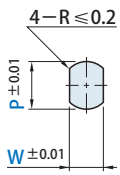

**Ⓓ**

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




**Ⓖ**

P＞W




| Tol. · Material (Shank dia. to T) | Code No. Type | Shape (Point Shape) | D | L | Pmin. Ⓐ (in 0.01) | Pmax. Ⓐ (in 0.01) | P·Kmax. ⒺⓇⒹⒼ (in 0.01) | P·Wmin. ⒺⓇⒹⒼ (in 0.01) | B (in 0.1) | V (in 0.01) | F (in 0.1) | R Ⓡ (in 0.01) | H | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dm5 SKH51 SKH40 | KSHTW KPHTW | Ⓐ | 1.6 | 20 25 30 35 40 50 60 | 0.30 | 1.56 | — | — | Bmin.=1.0 Bmax.= ☞Table 1 | D＞V≧P +0.01 | B+Y+1＜F≦Fmax. and F≦L−12 Y=R length Y=√X (6−X) X=(V−P)/2 ☞Table 2 | — | 2.6 | |
| TiCN coated SKH51 | KH − SHTW KH − PHTW | Ⓐ | 2.0 | 20 25 30 35 40 50 60 | 0.50 | 1.96 | — | — | Bmin.=1.0 Bmax.= ☞Table 1 | D＞V≧P +0.01 | B+Y+1＜F≦Fmax. and F≦L−12 Y=R length Y=√X (6−X) X=(V−P)/2 ☞Table 2 | — | 3 | 3 |
| D +0.005 0 SKH51 SKH40 | KA − SHTW KA − PHTW | Ⓐ | 2.5 | 20 25 30 35 40 50 60 | 0.80 | 2.46 | — | — | Bmin.=1.0 Bmax.= ☞Table 1 | D＞V≧P +0.01 | B+Y+1＜F≦Fmax. and F≦L−12 Y=R length Y=√X (6−X) X=(V−P)/2 ☞Table 2 | — | 3.5 | |
| Dm5 SKH51 SKH40 | KSHTW5T KPHTW5T | Ⓐ | 1.6 | 20 25 30 35 40 50 60 | 0.30 | 1.56 | — | — | Bmin.=1.0 Bmax.= ☞Table 1 | D＞V≧P +0.01 | B+Y+1＜F≦Fmax. and F≦L−12 Y=R length Y=√X (6−X) X=(V−P)/2 ☞Table 2 | — | 2.6 | |
| TiCN coated SKH51 SKH40 | KH−SHTW5T KH−PHTW5T | Ⓐ | 2.0 | 20 25 30 35 40 50 60 | 0.50 | 1.96 | — | — | Bmin.=1.0 Bmax.= ☞Table 1 | D＞V≧P +0.01 | B+Y+1＜F≦Fmax. and F≦L−12 Y=R length Y=√X (6−X) X=(V−P)/2 ☞Table 2 | — | 3 | 5 |
| D +0.005 0 SKH51 SKH40 | KA−SHTW5T KA−PHTW5T | Ⓐ | 2.5 | 20 25 30 35 40 50 60 | 0.80 | 2.46 | — | — | Bmin.=1.0 Bmax.= ☞Table 1 | D＞V≧P +0.01 | B+Y+1＜F≦Fmax. and F≦L−12 Y=R length Y=√X (6−X) X=(V−P)/2 ☞Table 2 | — | 3.5 | |
| Dm5 SKD11 SKH51 SKH40 | KSPTW KSHTW KPHTW | Ⓐ | 3 | 40 50 60 70 80 | 0.50 | 2.98 | 2.96 | 0.70 | Bmin.=2.0 Bmax.= ☞Table 3, Table 4 | D＞V≧P +0.01 ↑ D＞V≧K(P) +0.03 ⒺⓇⒹⒼ | B+Y+2＜F≦Fmax. and Ⓐ: F≦L−25 ⒺⓇⒹⒼ: F≦L−30 Y=R length Y=√X (20−X) Ⓐ: X=(V−P)/2 ⒺⓇⒹⒼ: X=(V−W)/2 ☞Table 5 | 0.15≦R＜W/2 only | 5 | 5 |
| | | Ⓐ | 4 | 40 50 60 70 80 | 0.50 | 3.98 | 3.96 | 0.80 | | | | | 7 | |
| | | Ⓔ | 5 | 40 50 60 70 80 | 1.00 | 4.98 | 4.96 | 0.80 | | | | | 8 | |
| | | Ⓔ | 6 | 40 50 60 70 80 | 1.00 | 5.98 | 5.96 | 0.80 | | | | | 9 | |
| TiCN coated SKH51 SKH40 | KH−SHTW KH−PHTW | Ⓡ | 8 | 40 50 60 70 80 90 100 | 1.00 | 7.98 | 7.96 | 1.00 | | | | | 11 | |
| | | Ⓡ | 10 | 40 50 60 70 80 90 100 | 1.50 | 9.98 | 9.96 | 1.25 | | | | | 13 | |
| | | Ⓓ | 13 | 40 50 60 70 80 90 100 | 3.00 | 12.98 | 12.96 | 1.50 | | | | | 16 | |
| D +0.005 0 SKD11 SKH51 SKH40 | KA − SPTW KA − SHTW KA − PHTW | Ⓓ | 16 | 40 50 60 70 80 90 100 | 5.00 | 15.98 | 15.96 | 2.00 | | | | | 19 | |
| | | Ⓖ | 20 | 40 50 60 70 80 90 100 | 6.50 | 19.98 | 19.96 | 2.50 | | | | | 23 | |
| | | Ⓖ | 25 | 40 50 60 70 80 90 100 | 9.00 | 24.98 | 24.96 | 3.00 | | | | | 28 | |

⚠ V＞D−0.03: no press-in lead ($D^{-0.01}_{-0.03}$)

ORDER

| Code No. | L | P | W | B | V | F | R (R0) |
|---|---|---|---|---|---|---|---|
| KHHTWR8 | — 90 | — P7.90 | — W6.10 | — B20.0 | — V7.95 | — F40.0 | — R2.90 |

Table 1 Ⓐ

| P | Bmax. |
|---|---|
| 0.30～0.49 | 3.0 |
| 0.50～0.79 | 5.0 |
| 0.80～0.99 | 8.0 |
| 1.00～2.46 | 10.0 |

Table 2

| V | Fmax. |
|---|---|
| 0.31～0.49 | 6.0 |
| 0.50～0.79 | 8.0 |
| 0.80～0.99 | 10.0 |
| 1.00～1.99 | 20.0 |
| 2.00～ | 35.0 |

Table 3 Ⓐ

| P | Bmax. |
|---|---|
| 0.50～ 0.99 | 10.0 |
| 1.00～ 1.99 | 20.0 |
| 2.00～ 3.99 | 35.0 |
| 4.00～ 5.99 | 45.0 |
| 6.00～24.98 | 60.0 |

Table 4 ⒺⓇⒹⒼ

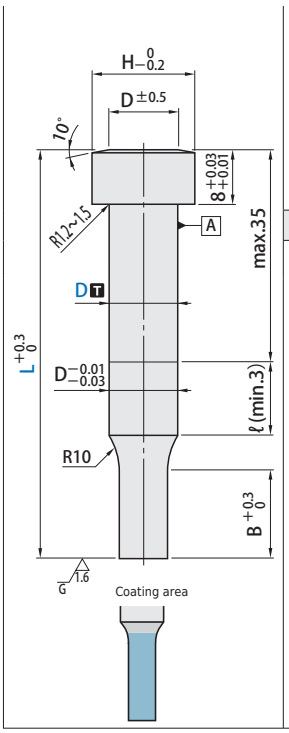
| P·W | Bmax. |
|---|---|
| 0.70～ 1.49 | 8.0 |
| 1.50～ 1.99 | 13.0 |
| 2.00～ 3.49 | 19.0 |
| 3.50～ 4.99 | 25.0 |
| 5.00～24.96 | 30.0 |

Table 5

| V | Fmax. |
|---|---|
| 0.51～0.99 | 10.0 |
| 1.00～1.99 | 20.0 |
| 2.00～3.99 | 35.0 |
| 4.00～5.99 | 45.0 |
| 6.00～ | 60.0 |

# Heavy-Gauge Punches — Standard / TiCN Coated-

## PUNCHES for HEAVY LOAD—STANDARD TYPE / TiCN COATING—

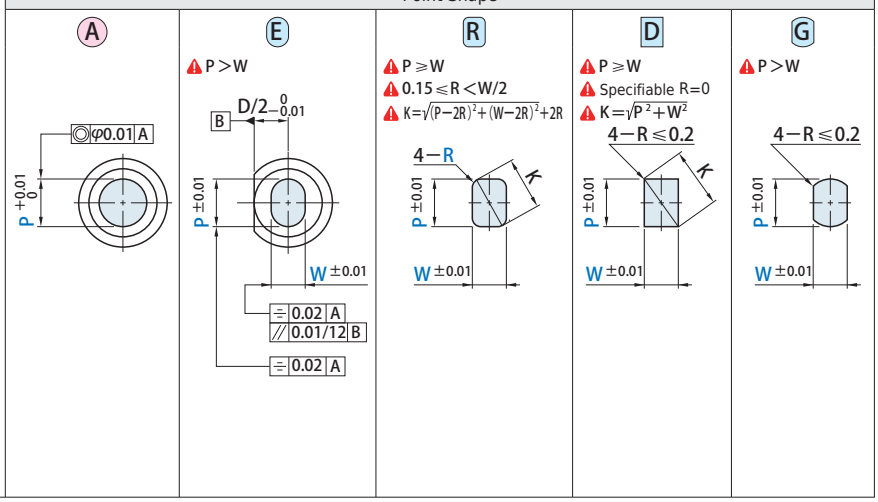





| Material | Hardness |
|---|---|
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40: Powder-metallurgy HSS (JIS G4403.2000)

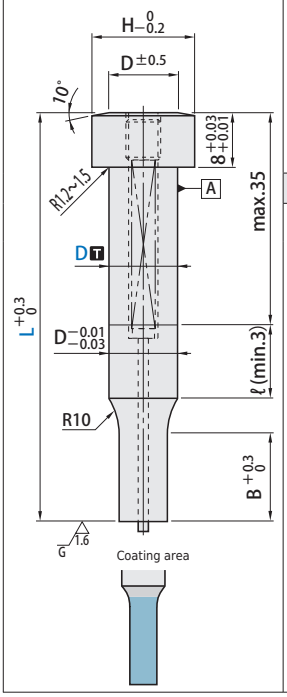
### Point Shape




| Tol. · Material (Shank dia. tol.T) | Type | Shape (Point Shape) | B (Point Length) | | D | L | P Ⓐ (in 0.01) | P·Kmax. Ⓔ Ⓡ Ⓓ Ⓖ (in 0.01) | P·Wmin. Ⓡ (in 0.01) | R | H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dm5 SKH51 SKH40 | KAP KAPH | Ⓐ Ⓔ Ⓡ Ⓓ Ⓖ | S | 8 | 5 | 50 60 70 80 90 100 | 2.00～4.99 | 4.97 | 1.20 | 0.15≦R＜W/2( only | 10 |
| | | | | | 6 | 50 60 70 80 90 100 | 2.00～5.99 | 5.97 | 1.50 | | 11 |
| | | | | 13 | 8 | (50) 60 70 80 90 100 110 120 130 | 3.00～7.99 | 7.97 | 2.00 | | 13 |
| | | | | | 10 | (50) 60 70 80 90 100 110 120 130 | 3.00～9.99 | 9.97 | 2.50 | | 15 |
| | | | | | 13 | (50) 60 70 80 90 100 110 120 130 | 6.00～12.99 | 12.97 | 3.00 | | 18 |
| | | | | 19 | 16 | (50) 60 70 80 90 100 110 120 130 | 10.00～15.99 | 15.97 | 4.00 | | 21 |
| | | | | | 20 | (50) 60 70 80 90 100 110 120 130 | 13.00～19.99 | 19.97 | 5.00 | | 25 |
| TiCN coated SKH51 | KH — AP KH — PH | | | | 25 | (50) 60 70 80 90 100 110 120 130 | 18.00～24.99 | 24.97 | 6.00 | | 30 |
| | | | L | 13 | 5 | 60 70 80 90 100 | 2.00～4.99 | 4.97 | 1.20 | | 10 |
| | | | | | 6 | 60 70 80 90 100 | 2.00～5.99 | 5.97 | 1.50 | | 11 |
| D +0.005 0 SKH51 SKH40 | KA — AP KA — APH | | | 19 | 8 | 60 70 80 90 100 110 120 130 | 3.00～7.99 | 7.97 | 2.00 | | 13 |
| | | | | | 10 | 60 70 80 90 100 110 120 130 | 3.00～9.99 | 9.97 | 2.50 | | 15 |
| | | | | | 13 | 60 70 80 90 100 110 120 130 | 6.00～12.99 | 12.97 | 3.00 | | 18 |
| | | | | 25 | 16 | 70 80 90 100 110 120 130 | 10.00～15.99 | 15.97 | 4.00 | | 21 |
| | | | | | 20 | 70 80 90 100 110 120 130 | 13.00～19.99 | 19.97 | 5.00 | | 25 |
| | | | | | 25 | 70 80 90 100 110 120 130 | 18.00～24.99 | 24.97 | 6.00 | | 30 |

⚠ For OAL L (50), pt. length B=8 ⚠ Round point P > D-0.03: no press-in lead ($D^{-0.01}_{-0.03}$) ⚠ Shaped point P·K > D-0.05: no press-in lead ($D^{-0.01}_{-0.03}$)

| Code No. | L | P | W | R (R0) |
|---|---|---|---|---|
| KAPAS10 — | 60 — | P5.00 | | |
| KAPEL13 — | 60 — | P10.0 — | W7.00 | |

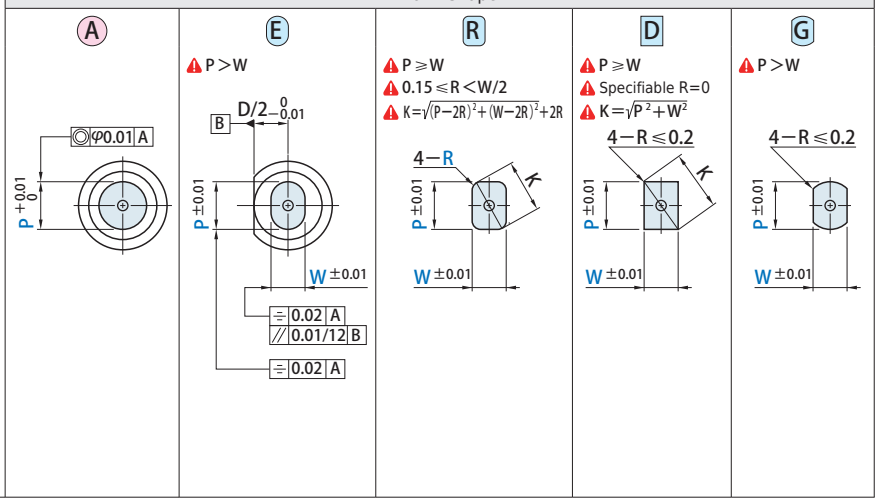





| M Material | H Hardness |
|---|---|
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40: Powder-metallurgy HSS (JIS G4403.2000)

Point Shape




| Tol. · Material (Shank dia. to T) | Code No. Type | Shape (Point Shape) | B (Point Length) | | D | L | P (A) | P·Kmax. (E R D G) | P·Wmin. (E R D G) | R (R) | H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | in 0.01 | | | | |
| Dm5 SKH51 SKH40 | KAPJ | A E R D G | S | 13 | 8 | (50) 60 70 80 90 100 110 120 130 | 4.00～ 7.99 | 7.97 | 4.00 | 0.15≦R＜W/2 only | 13 |
| | | | | | 10 | (50) 60 70 80 90 100 110 120 130 | 5.00～ 9.99 | 9.97 | 5.00 | | 15 |
| | | | | | 13 | (50) 60 70 80 90 100 110 120 130 | 6.00～12.99 | 12.97 | 6.00 | | 18 |
| | | | | 19 | 16 | (50) 60 70 80 90 100 110 120 130 | 10.00～15.99 | 15.97 | 6.00 | | 21 |
| | | | | | 20 | (50) 60 70 80 90 100 110 120 130 | 13.00～19.99 | 19.97 | 6.00 | | 25 |
| D+0.005 0 SKH51 SKH40 | KA—APJ | | | | 25 | (50) 60 70 80 90 100 110 120 130 | 18.00～24.99 | 24.97 | 6.00 | | 30 |
| | | | L | 19 | 8 | 60 70 80 90 100 110 120 130 | 4.00～ 7.99 | 7.97 | 4.00 | | 13 |
| | | | | | 10 | 60 70 80 90 100 110 120 130 | 5.00～ 9.99 | 9.97 | 5.00 | | 15 |
| | | | | | 13 | 60 70 80 90 100 110 120 130 | 6.00～12.99 | 12.97 | 6.00 | | 18 |
| TiCN coated SKH51 SKH40 | KH—APJ | | | 25 | 16 | 70 80 90 100 110 120 130 | 10.00～15.99 | 15.97 | 6.00 | | 21 |
| | | | | | 20 | 70 80 90 100 110 120 130 | 13.00～19.99 | 19.97 | 6.00 | | 25 |
| | | | | | 25 | 70 80 90 100 110 120 130 | 18.00～24.99 | 24.97 | 6.00 | | 30 |

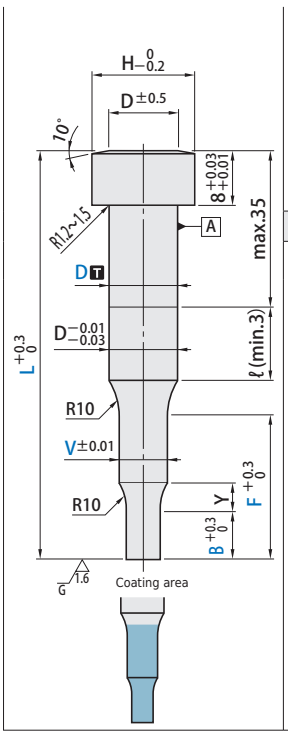
⚠ For OAL L (50), pt. length B=8 ⚠ Round point P > D-0.03: no press-in lead (D−0.01 −0.03) ⚠ Shaped point P·K > D-0.05: no press-in lead (D−0.01 −0.03)
⚠ Ejector hole data: see ejector punch blanks

ORDER

| Code No. | L | P | W | R (R0) |
|---|---|---|---|---|
| KAPJAS10 — | 60 — | P6.00 | | |
| KAPJEL20 — | 70 — | P19.00 | —W10.00 | |

# Heavy-Gauge Two-Step Punches — Standard / TiCN Coated-

## TWO STEPS TYPE PUNCHES for HEAVY LOAD—STANDARD TYPE / TiCN COATING—



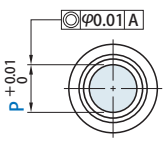



| Material | Hardness |
|---|---|
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40: Powder-metallurgy HSS (JIS G4403.2000)

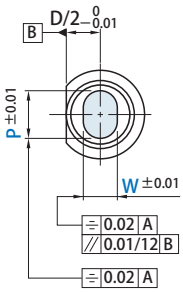
### Point Shape

**A**



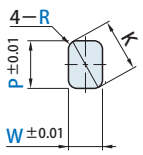

**E**

P＞W



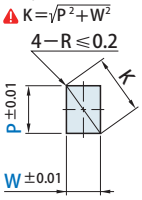

**R**

P ⩾W
0.15⩽R＜W/2
K=√((P−2R)²+(W−2R)²)+2R



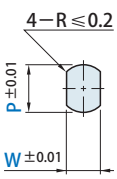

**D**

P ⩾W
Specifiable R=0
K=√(P²+W²)




**G**

P＞W




| Tol. · Material (Shank dia. to T) | Code No. Type | Shape (Point Shape) | D | L | Pmin. (A) (in 0.01) | Pmax. (A) (in 0.01) | P·Kmax. (E R D G) (in 0.01) | P·Wmin. (E R D G) (in 0.01) | B (in 0.1) | V (in 0.01) | F (in 0.1) | R (R) (in 0.01) | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dm5 SKH51 SKH40 | KAPTW KAPHTW | A E R D G | 5 | 50 60 70 80 | 1.50 | 4.98 | 4.96 | 1.00 | Bmin.=2.0 Bmax.= Table 1, Table 2 | D＞V⩾P+0.01 → P⩾V⩾K(P)+0.03 → D＞V⩾K(P)+0.03 | B+Y+2＜F⩽Fmax. and F⩽L−40 Y=R length Y=√(X(20−X)) (A) X=(V−P)/2 (E R D G) X=(V−W)/2 Table 3 | 0.15⩽R＜W/2( only | 10 |
| | | | 6 | 50 60 70 80 | 1.50 | 5.98 | 5.96 | 1.00 | | | | | 11 |
| | | | 8 | 50 60 70 80 90 100 | 1.50 | 7.98 | 7.96 | 1.00 | | | | | 13 |
| TiCN coated SKH51 | KH — APTW KH — APHTW | | 10 | 50 60 70 80 90 100 | 1.50 | 9.98 | 9.96 | 1.25 | | | | | 15 |
| | | | 13 | 50 60 70 80 90 100 | 3.00 | 12.98 | 12.96 | 1.50 | | | | | 18 |
| D +0.005 0 SKH51 SKH40 | KA — APTW KA — APHTW | | 16 | 50 60 70 80 90 100 | 5.00 | 15.98 | 15.96 | 2.00 | | | | | 21 |
| | | | 20 | 50 60 70 80 90 100 | 6.50 | 19.98 | 19.96 | 2.50 | | | | | 25 |
| | | | 25 | 50 60 70 80 90 100 | 9.00 | 24.98 | 24.96 | 3.00 | | | | | 30 |

V＞D−0.03: no press-in lead (D −0.01 −0.03)

ORDER

| Code No. | L | P | W | B | V | F | R (R0) |
|---|---|---|---|---|---|---|---|
| KAPHTWD25— | 80 | —P18.00 | —W10.00 | —B25.0 | —V23.00 | —F37.0 | |

Table 1 (A)

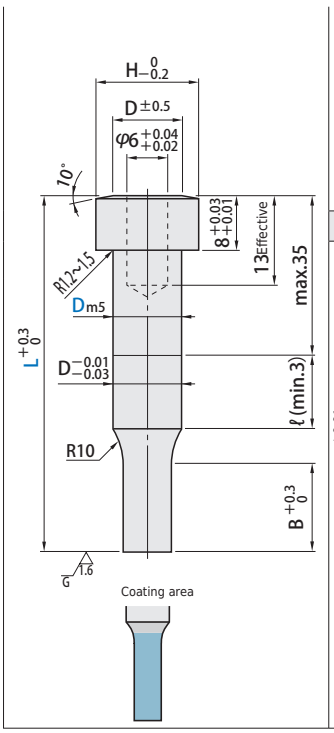
| P | Bmax. |
|---|---|
| 1.50～ 1.99 | 20.0 |
| 2.00～ 3.99 | 35.0 |
| 4.00～ 5.99 | 45.0 |
| 6.00～24.98 | 60.0 |

Table 2 (E R D G)

| P·W | Bmax. |
|---|---|
| 1.00～ 1.49 | 8.0 |
| 1.50～ 1.99 | 13.0 |
| 2.00～ 3.49 | 19.0 |
| 3.50～ 4.99 | 25.0 |
| 5.00～24.96 | 30.0 |

Table 3

| V | Fmax. |
|---|---|
| 1.03～1.99 | 20.0 |
| 2.00～3.99 | 35.0 |
| 4.00～5.99 | 45.0 |
| 6.00～ | 60.0 |

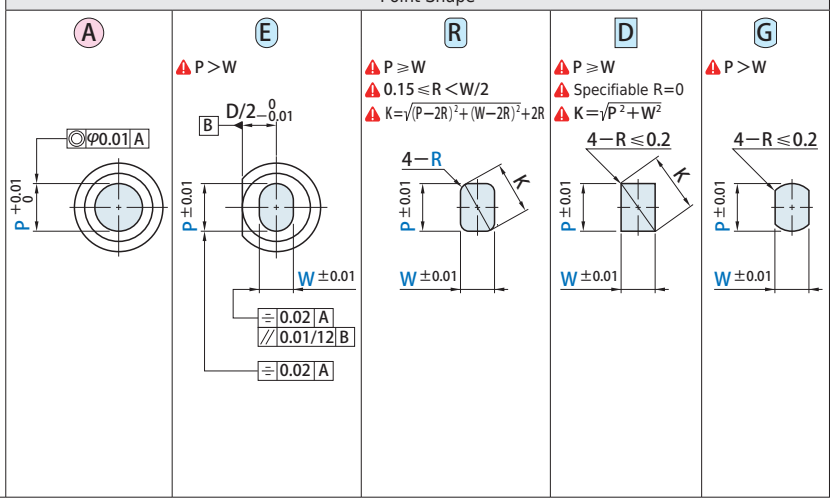





| Material | Hardness |
|---|---|
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40: Powder-metallurgy HSS (JIS G4403.2000)
Accessory: KMS6—25

Point Shape




| Tol. · Material (Shank dia. tol. T) | Code No. Type | Shape (Point Shape) | B (Point Length) | | D | L | P (A) | P·Kmax. (E R D G) | P·Wmin. (E R D G) | R (R) | H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | in 0.01 | | | | |
| Dm5 SKH51 SKH40 | KAP KAPH | A E R D G | S—C | 13 | 10 | (50) 60 70 80 90 100 110 120 130 140 150 | 3.00～ 9.99 | 9.97 | 2.50 | 0.15≦R<W/2 (only) | 15 |
| | | | | | 13 | (50) 60 70 80 90 100 110 120 130 140 150 | 6.00～12.99 | 12.97 | 3.00 | | 18 |
| | | | | 19 | 16 | (50) 60 70 80 90 100 110 120 130 140 150 | 10.00～15.99 | 15.97 | 4.00 | | 21 |
| | | | | | 20 | (50) 60 70 80 90 100 110 120 130 140 150 | 13.00～19.99 | 19.97 | 5.00 | | 25 |
| | | | | | 25 | (50) 60 70 80 90 100 110 120 130 140 150 | 18.00～24.99 | 24.97 | 6.00 | | 30 |
| TiCN coated SKH51 SKH40 | KH — AP KH — APH | | L—C | 19 | 10 | 60 70 80 90 100 110 120 130 140 150 | 3.00～ 9.99 | 9.97 | 2.50 | | 15 |
| | | | | | 13 | 60 70 80 90 100 110 120 130 140 150 | 6.00～12.99 | 12.97 | 3.00 | | 18 |
| | | | | 25 | 16 | 70 80 90 100 110 120 130 140 150 | 10.00～15.99 | 15.97 | 4.00 | | 21 |
| | | | | | 20 | 70 80 90 100 110 120 130 140 150 | 13.00～19.99 | 19.97 | 5.00 | | 25 |
| | | | | | 25 | 70 80 90 100 110 120 130 140 150 | 18.00～24.99 | 24.97 | 6.00 | | 30 |

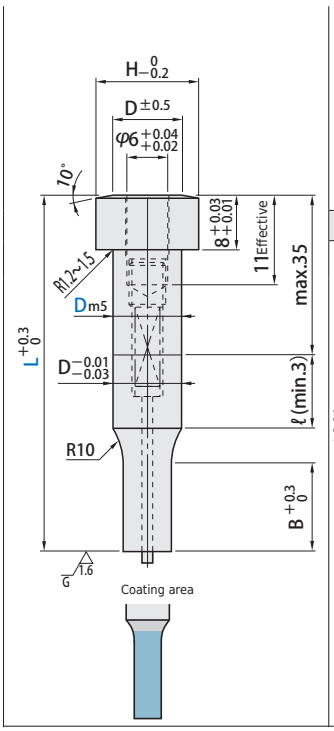
For OAL L (50), pt. length B=8 Round point P > D-0.03: no press-in lead ($D^{-0.01}_{-0.03}$) Shaped point P·K > D-0.05: no press-in lead ($D^{-0.01}_{-0.03}$)

ORDER

| Code No. | L | P | W | R (R0) |
|---|---|---|---|---|
| KAPAS —C20 | — 60 | — P15.00 | | |
| KAPDS —C20 | — 60 | — P13.00 | — W12.00 | |

# Heavy-Gauge Dowel-Pin Located Ejector Punches — Standard / TiCN Coated-

## EJECTOR PUNCHES with CENTER HOLE for HEAVY LOAD—STANDARD TYPE / TiCN COATING—



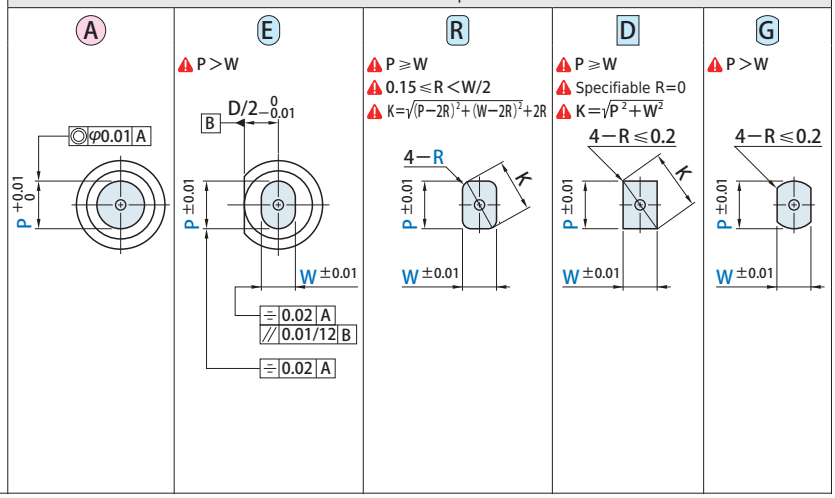



| Material | Hardness |
|---|---|
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40: Powder-metallurgy HSS (JIS G4403.2000)

Accessory: KMS6—25

### Point Shape




| Tol. · Material (Shank dia. tol. T) | Code No. Type | Shape (Point Shape) | B (Point Length) | | D | L | P (A) | P·Kmax. (E R D G) | P·Wmin. (G) | R (R) | H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | in 0.01 | | | | |
| Dm5 SKH51 | KAHJ | A E R D G | S—C | 13 | 10 | (60) 70 80 90 100 110 120 130 | 5.00～ 9.99 | 9.97 | 5.00 | 0.15≤R<W/2( only | 15 |
| | | | | | 13 | (60) 70 80 90 100 110 120 130 | 6.00～12.99 | 12.97 | 6.00 | | 18 |
| | | | | 19 | 16 | (60) 70 80 90 100 110 120 130 | 10.00～15.99 | 15.97 | 6.00 | | 21 |
| | | | | | 20 | (60) 70 80 90 100 110 120 130 | 13.00～19.99 | 19.97 | 6.00 | | 25 |
| | | | | | 25 | (60) 70 80 90 100 110 120 130 | 18.00～24.99 | 24.97 | 6.00 | | 30 |
| TiCN coated | KH — AHJ | | L—C | 19 | 10 | (60) 70 80 90 100 110 120 130 | 5.00～ 9.99 | 9.97 | 5.00 | | 15 |
| | | | | | 13 | (60) 70 80 90 100 110 120 130 | 6.00～12.99 | 12.97 | 6.00 | | 18 |
| | | | | 25 | 16 | 70 80 90 100 110 120 130 | 10.00～15.99 | 15.97 | 6.00 | | 21 |
| | | | | | 20 | 70 80 90 100 110 120 130 | 13.00～19.99 | 19.97 | 6.00 | | 25 |
| | | | | | 25 | 70 80 90 100 110 120 130 | 18.00～24.99 | 24.97 | 6.00 | | 30 |

For OAL L (60), pt. length B=8 Round point P > D-0.03: no press-in lead ($D^{-0.01}_{-0.03}$) Shaped point P·K > D-0.05: no press-in lead ($D^{-0.01}_{-0.03}$)

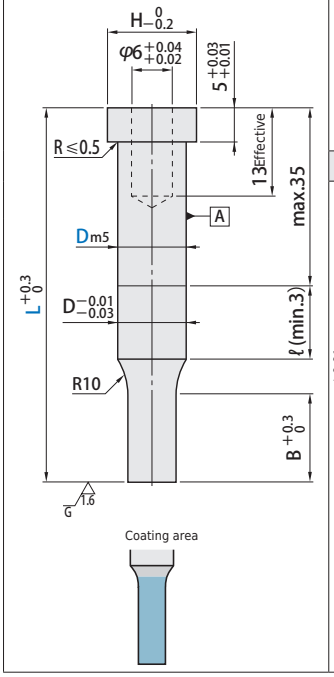
Ejector hole data: see ejector punch blanks

ORDER

| Code No. | L | P | W | R (R0) |
|---|---|---|---|---|
| KAHJAS —C13 — | 80 | — P11.00 | | |
| KAHJEL —C13 — | 80 | — P8.37 | — W6.25 | |

# Dowel-Pin Located Punches — Standard / TiCN Coated

PUNCHES with CENTER HOLE—STANDARD TYPE / TiCN COATING—

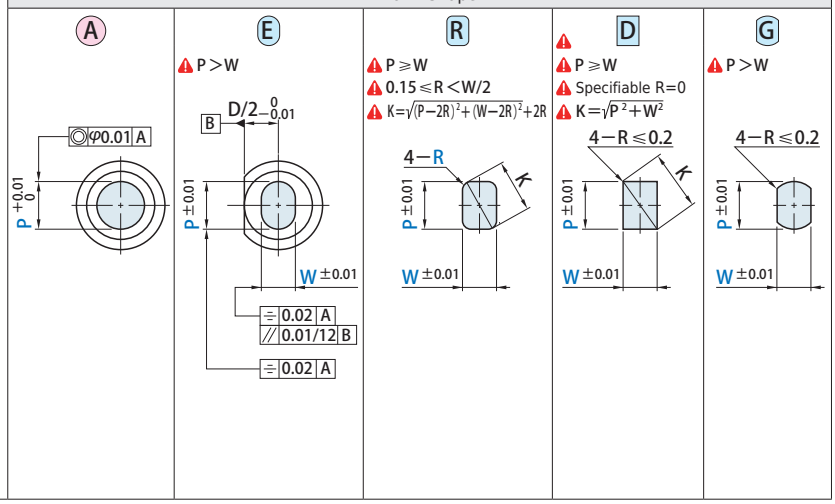





| Material | Hardness |
|---|---|
| SKH51 equiv. | 61～64HRC |

Accessory: KMS6–25

Point Shape




| Tol. · Material (Shank dia. to T) | Code No. Type | Shape (Point Shape) | B (Point Length) | | D | L | P (A) | P·Kmax. (E R D G) | P·Wmin. (E R D G) | R (R) | H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | in 0.01 | | | | |
| Dm5 SKD11 / TiCN coated SKH51 | KSP / KH — SP | A E R D G | S—C | 13 | 10 | (40) 50 60 70 80 90 100 110 120 130 140 150 | 3.00～ 9.99 | 9.97 | 2.50 | 0.15≦R＜W/2( only | 13 |
| | | | | | 13 | (40) 50 60 70 80 90 100 110 120 130 140 150 | 6.00～12.99 | 12.97 | 3.00 | | 16 |
| | | | | 19 | 16 | (40) 50 60 70 80 90 100 110 120 130 140 150 | 10.00～15.99 | 15.97 | 4.00 | | 19 |
| | | | | | 20 | (40) 50 60 70 80 90 100 110 120 130 140 150 | 13.00～19.99 | 19.97 | 5.00 | | 23 |
| | | | | | 25 | (40) 50 60 70 80 90 100 110 120 130 140 150 | 18.00～24.99 | 24.97 | 6.00 | | 28 |
| | | | | | 32 | (40) (50) 60 70 80 90 100 110 120 130 140 150 | 20.00～31.99 | 31.97 | 7.00 | | 35 |
| | | | | | 38 | (40) (50) 60 70 80 90 100 110 120 130 140 150 | 28.00～37.99 | 37.97 | 8.00 | | 41 |
| | | | | | 45 | (40) (50) 60 70 80 90 100 110 120 130 140 150 | 35.00～44.99 | 44.97 | 9.00 | | 48 |
| | | | L—C | 19 | 10 | 50 60 70 80 90 100 110 120 130 140 150 | 3.00～ 9.99 | 9.97 | 2.50 | | 13 |
| | | | | | 13 | 50 60 70 80 90 100 110 120 130 140 150 | 6.00～12.99 | 12.97 | 3.00 | | 16 |
| | | | | 25 | 16 | 60 70 80 90 100 110 120 130 140 150 | 10.00～15.99 | 15.97 | 4.00 | | 19 |
| | | | | | 20 | 60 70 80 90 100 110 120 130 140 150 | 13.00～19.99 | 19.97 | 5.00 | | 23 |
| | | | | | 25 | 60 70 80 90 100 110 120 130 140 150 | 18.00～24.99 | 24.97 | 6.00 | | 28 |
| | | | | | 32 | 60 70 80 90 100 110 120 130 140 150 | 20.00～31.99 | 31.97 | 7.00 | | 35 |
| | | | | | 38 | 60 70 80 90 100 110 120 130 140 150 | 28.00～37.99 | 37.97 | 8.00 | | 41 |
| | | | | | 45 | 60 70 80 90 100 110 120 130 140 150 | 35.00～44.99 | 44.97 | 9.00 | | 48 |
| | | | X—C | 30 | 10 | 70 80 90 100 110 120 130 140 150 | 3.00～ 9.99 | 9.97 | 5.00 | | 13 |
| | | | | | 13 | 70 80 90 100 110 120 130 140 150 | 6.00～12.99 | 12.97 | 5.00 | | 16 |
| | | | | 40 | 16 | 80 90 100 110 120 130 140 150 | 10.00～15.99 | — | — | | 19 |
| | | | | | 20 | 80 90 100 110 120 130 140 150 | 13.00～19.99 | — | — | | 23 |
| | | | | | 25 | 80 90 100 110 120 130 140 150 | 18.00～24.99 | — | — | | 28 |
| | | | | | 32 | 80 90 100 110 120 130 140 150 | 20.00～31.99 | — | — | | 35 |
| | | | | | 38 | 80 90 100 110 120 130 140 150 | 28.00～37.99 | — | — | | 41 |
| | | | | | 45 | 80 90 100 110 120 130 140 150 | 35.00～44.99 | — | — | | 48 |

For L (40), D10-25, point length B=8　For L (40), D32-45, point length B=6　For overall length L (50), point length B=13

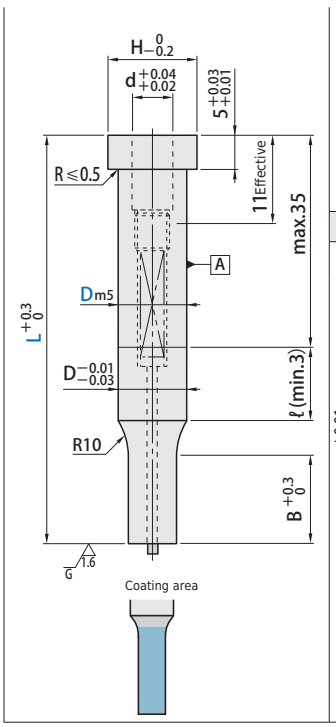
Round point P > D-0.03: no press-in lead(D $^{-0.01}_{-0.03}$)　Shaped point P·K > D-0.05: no press-in lead(D $^{-0.01}_{-0.03}$)

ORDER

| Code No. | L | P | W | R (R0) |
|---|---|---|---|---|
| KSPAS —C10 — | 50 | — P8.00 | | |
| KSPEL —C20 — | 70 | — P17.00 | — W13.50 | |

# Dowel-Pin Located Ejector Punches — Standard / TiCN Coated-

## EJECTOR PUNCHES with CENTER HOLE—STANDARD TYPE / TiCN COATING—

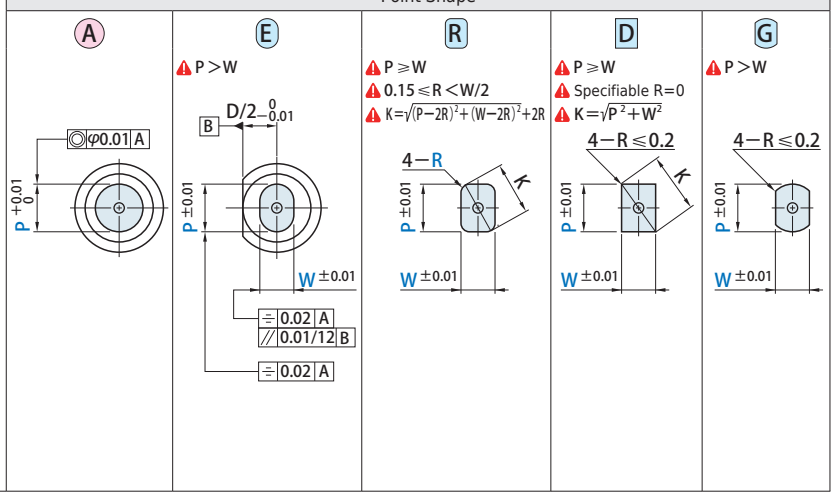





| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 equiv. | 61～64HRC |

| D | d | A Accessory |
|---|---|---|
| 10～32 | 6 | KMS6 −25 |
| 38・45 | 10 | KSJB −CMS |

Point Shape




| Tol. · Material (Shank dia. tol. T) | Code No. Type | Shape (Point Shape) | B Point Length | | D | L | P (A) | P·Kmax. (E R D G) | P·Wmin. (R) | R | H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | m 0.01 | | | | |
| Dm5 SKD11 / TiCN coated SKH51 | KSJ / KH — SJ | A E R D G | S—C | 13 | 10 | 60 70 80 90 100 | 3.00～ 9.99 | 9.97 | 3.00 | 0.15≦R＜W/2( only | 13 |
| | | | | | 13 | 60 70 80 90 100 | 6.00～12.99 | 12.97 | 6.00 | | 16 |
| | | | | 19 | 16 | (60) 70 80 90 100 | 10.00～15.99 | 15.97 | 6.00 | | 19 |
| | | | | | 20 | (60) 70 80 90 100 | 13.00～19.99 | 19.97 | 6.00 | | 23 |
| | | | | | 25 | (60) 70 80 90 100 | 18.00～24.99 | 24.97 | 6.00 | | 28 |
| | | | | | 32 | (60) 70 80 90 100 110 120 | 20.00～31.99 | 31.97 | 7.00 | | 35 |
| | | | | | 38 | (60) 70 80 90 100 110 120 | 28.00～37.99 | 37.97 | 8.00 | | 41 |
| | | | | | 45 | (60) 70 80 90 100 110 120 | 35.00～44.99 | 44.97 | 9.00 | | 48 |
| | | | L—C | 19 | 10 | 70 80 90 100 | 3.00～ 9.99 | 9.97 | 3.00 | | 13 |
| | | | | | 13 | 70 80 90 100 | 6.00～12.99 | 12.97 | 6.00 | | 16 |
| | | | | 25 | 16 | 70 80 90 100 | 10.00～15.99 | 15.97 | 6.00 | | 19 |
| | | | | | 20 | 70 80 90 100 | 13.00～19.99 | 19.97 | 6.00 | | 23 |
| | | | | | 25 | 70 80 90 100 | 18.00～24.99 | 24.97 | 6.00 | | 28 |
| | | | | | 32 | 70 80 90 100 110 120 | 20.00～31.99 | 31.97 | 7.00 | | 35 |
| | | | | | 38 | 70 80 90 100 110 120 | 28.00～37.99 | 37.97 | 8.00 | | 41 |
| | | | | | 45 | 70 80 90 100 110 120 | 35.00～44.99 | 44.97 | 9.00 | | 48 |
| | | | X—C | 30 | 10 | 100 | 6.00～ 9.99 | 9.97 | 6.00 | | 13 |
| | | | | | 13 | 100 | 6.00～12.99 | 12.97 | 6.00 | | 16 |
| | | | | 40 | 16 | 100 | 10.00～15.99 | — | — | | 19 |
| | | | | | 20 | 100 | 13.00～19.99 | — | — | | 23 |
| | | | | | 25 | 100 | 18.00～24.99 | — | — | | 28 |
| | | | | | 32 | 100 110 120 | 20.00～31.99 | — | — | | 35 |

⚠ For OAL L (60), pt. length B=13 ⚠ Round point P > D-0.03: no press-in lead($D^{-0.01}_{-0.03}$) ⚠ Shaped point P·K > D-0.05: no press-in lead($D^{-0.01}_{-0.03}$)
⚠ Ejector hole data: see ejector punch blanks

ORDER

| Code No. | L | P | W | R (R0) |
|---|---|---|---|---|
| KSJAS —C10 — | 60 | — P6.00 | | |
| KSJEL —C20 — | 70 | — P15.00 | — W11.30 | |

# Shoulder-Clamped Punches

## SHOULDER HELD PUNCHES

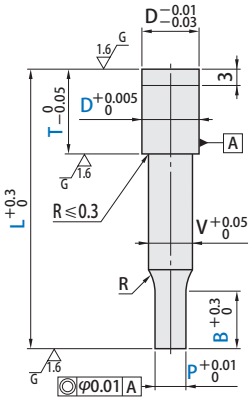
KAYAN

| M Material | H Hardness |
|---|---|
| SKH40 | 64～67HRC |

SKH40: Powder-metallurgy HSS (JIS G4403.2000)

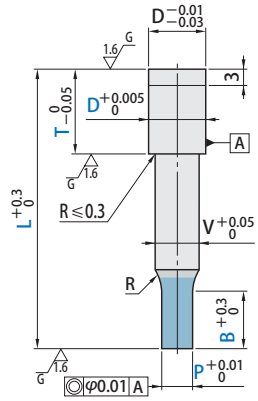
Standard






TiCN Coated






= TiCN coating area (surface 2700HV)

▶ Standard

| Material | Code No. Code | D | L | | | | P in 0.01 | T | B in 1 | V | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SKH40 | KPHTAL | 4 | 40 | 50 | | | 0.50～ 2.00 | 13 16 20 (22) (25) | 2～ 6 | 2 | 2～3 |
| | | 5 | 40 | 50 | 60 | | 1.00～ 3.00 | | 2～ 8 | 3 | 10 |
| | | 6 | 40 | 50 | 60 | 70 | 1.50～ 4.00 | | 2～(13) | 4 | |
| | | 8 | 40 | 50 | 60 | 70 | 2.00～ 6.00 | | | 6 | |
| | | 10 | 40 | 50 | 60 | 70 | 3.00～ 8.00 | | | 8 | |
| | | 13 | 40 | 50 | 60 | 70 | 3.00～10.00 | | | 11 | |
| | | 16 | 40 | 50 | 60 | 70 | 6.00～13.00 | | | 14 | |
| | | 20 | 40 | 50 | 60 | 70 | 10.00～16.00 | | | 18 | |
| | | 25 | 40 | 50 | 60 | 70 | 13.00～23.00 | | | 23 | |

⚠ Head thk. T (22)·(25) for OAL L50 and up ⚠ Point length B11-13 for overall length L50 and up

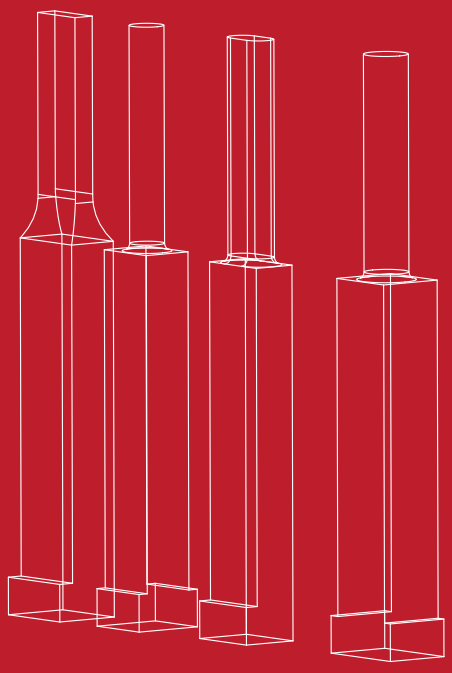
▶ TiCN Coated

| Material | Code No. Code | D | L | | | | P in 0.01 | T | B in 1 | V | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SKH40 | KH—PHTAL | 4 | 40 | 50 | | | 1.00～ 2.00 | 13 16 20 (22) (25) | 2～ 6 | 2 | 2～3 |
| | | 5 | 40 | 50 | 60 | | 1.00～ 3.00 | | 2～ 8 | 3 | 10 |
| | | 6 | 40 | 50 | 60 | 70 | 1.50～ 4.00 | | 2～(13) | 4 | |
| | | 8 | 40 | 50 | 60 | 70 | 2.00～ 6.00 | | | 6 | |
| | | 10 | 40 | 50 | 60 | 70 | 3.00～ 8.00 | | | 8 | |
| | | 13 | 40 | 50 | 60 | 70 | 3.00～10.00 | | | 11 | |
| | | 16 | 40 | 50 | 60 | 70 | 6.00～13.00 | | | 14 | |
| | | 20 | 40 | 50 | 60 | 70 | 10.00～16.00 | | | 18 | |
| | | 25 | 40 | 50 | 60 | 70 | 13.00～23.00 | | | 23 | |

⚠ Head thk. T (22)·(25) for OAL L50 and up ⚠ Point length B11-13 for overall length L50 and up

ORDER

| Code No. | L | P | T | B |
|---|---|---|---|---|
| KPHTAL13 — | 70 — | P10.50 — | T20 — | B5 |
| KH—PHTAL13 — | 60 — | P10.00 — | T16 — | B8 |



# Square Punches
# BLOCK PUNCHES


19 Square Punch Alterations Overview
23 Square Punches — Standard / TiCN Coated-
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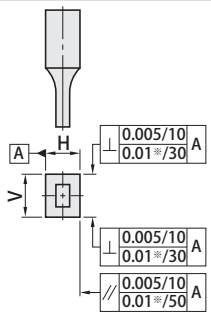
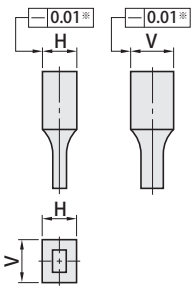
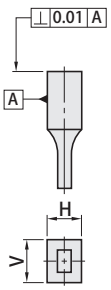
29 Ball Lock Punches & Retainers Overview
31 Ball Lock Punches
33 Ball Lock Ejector Punches
35 Ball Lock Retainers

# Square Punch Alterations Overview



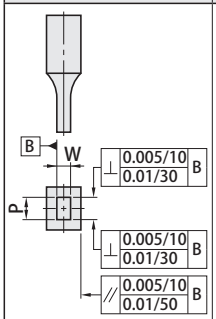
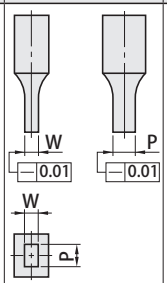
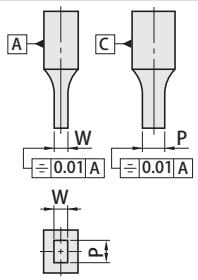
KAYAN

▶ Shank accuracy datum

| Profile accuracy | Straightness | Mounting-face squareness |
|---|---|---|
|  |  |  |

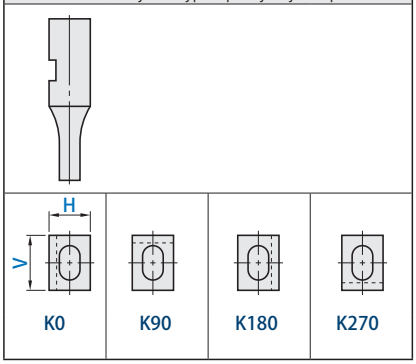
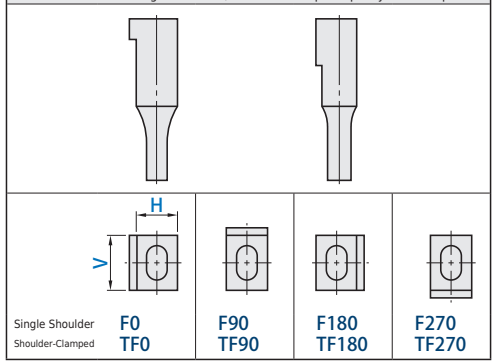
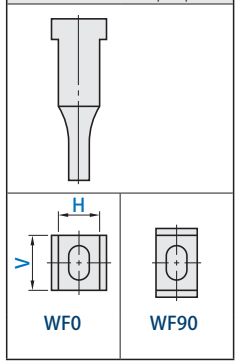
※ With alteration VKC: 0.005 ※ With alteration VKC: 0.005

▶ Point accuracy datum

| Profile accuracy | Straightness | Symmetry to shank |
|---|---|---|
|  |  |  |

▶ How to Order Square Punches

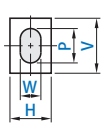
⚠ Specify machining position (angle) for key-slot / shoulder / shoulder-clamped types)

| Key-slot type: specify key-slot position | | | | Single-shoulder / shoulder-clamped: specify shoulder position | | | | Double shoulder: spec. position | |
|---|---|---|---|---|---|---|---|---|---|
|  | | | |  | | | |  | |
| K0 | K90 | K180 | K270 | Single Shoulder / Shoulder-Clamped: F0 / TF0 | F90 / TF90 | F180 / TF180 | F270 / TF270 | WF0 | WF90 |

| Code No. | V | H | L | P | W | R (R0) | T | K・F・WF・TF |
|---|---|---|---|---|---|---|---|---|
| KHKEL | 08 | 06 | — 60 | — P4.50 | — W3.00 | | — T10.0 | — K90 |

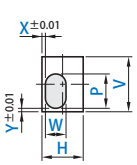
⚠ Point may be placed freely within shank V·H

▶ Point concentric with shank



| Code No. | V | H | L | P | W | R (R0) |
|---|---|---|---|---|---|---|
| KHKEL | 08 | 06 | — 50 | — P4.50 | — W3.00 | |

▶ Point offset from shank



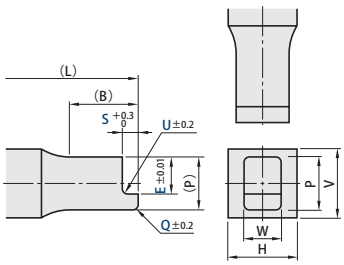
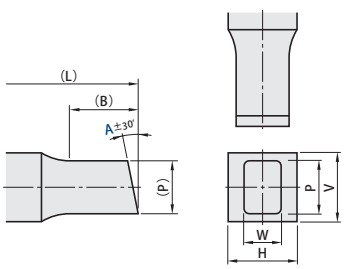
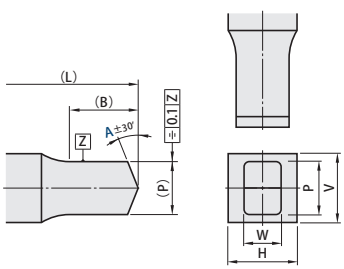
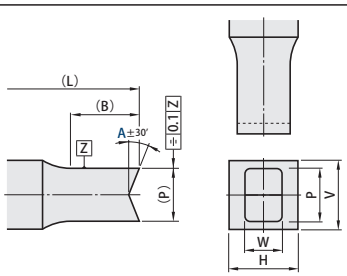
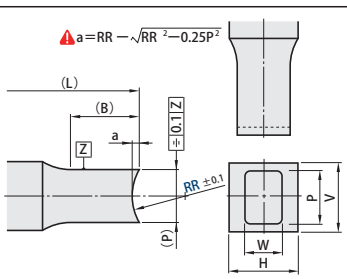
| Code No. | V | H | L | P | W | R (R0) | X | Y |
|---|---|---|---|---|---|---|---|---|
| KHKEL | 08 | 06 | — 50 | — P4.50 | — W3.00 | | — X0.50 | — Y0.50 |

⚠ When specifying X, Y: X, Y ≥ 0.02 or X, Y=0 in 0.01

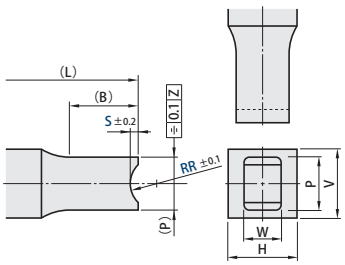
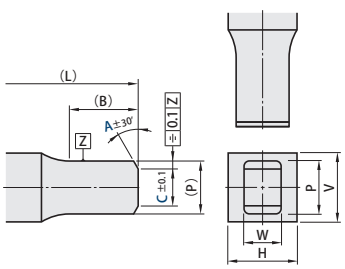
# Square Punch Alterations Overview

## BLOCK PUNCHES—DETAIL GUIDE of ADDITION—

▶ Point Face Grinding

| Code | Illustration | Alteration Details |
|---|---|---|
| **1F**<br>  <br>104 |  | Range 1≤S≤Smax.≤B ☞ Table 1<br>1≤E≤P×3/4<br>1≤P−E<br>0.2≤U≤S−1≤E<br>Q=0 or 1≤Q≤P-E<br>Increment E·Q in 0.01 S·U in 0.1<br>NO N/A for ejector punches<br>Table 1<br>P−E / Smax.<br>1.00～1.99 / 4.0<br>2.00～2.49 / 7.0<br>2.50～3.99 / 10.0<br>4.00～ / 13.0 |
| **2F**<br>  <br>35 |  | Range 0°<A≤15°<br>PtanA+2<B<br>Increment in 1<br>⚠ L dim.: point face has a flat of 0.05 or less<br>NO N/A for ejector punches |
| **3F**<br>  <br>69 |  | Range 0°<A≤15°<br>P/2tanA+2<B<br>Increment in 1<br>⚠ L dim.: point face has a flat of 0.05 or less |
| **4F**<br>  <br>69 |  | Range 0°<A≤15°<br>P/2tanA+2<B<br>Increment in 1<br>⚠ L dim.: point face has a flat of 0.05 or less<br>NO N/A for ejector punches |
| **5F**<br>  <br>69 |  | Range P+1≤RR≤P+10<br>0.1≤a<br>Increment in 0.1<br>⚠ L dim.: point face has a flat of 0.05 or less<br>NO N/A for ejector punches |

## ▶ Point Face Grinding

| Code | Illustration | Alteration Details |
|---|---|---|
| 6F<br>  <br>69 |  | Range S≤RR<br>$2\sqrt{RR^2-(RR-S)^2}<P$<br>Increment 0.1<br>NO N/A for ejector punches |
| 2P<br>  <br>46 |  | Range 0°<A≤70°<br>1≤C≤P−1<br>$d_1+0.2\leq C\leq P-1$ (Ejector Punches)<br>$0.5\times(P-C)\tan A\leq B-0.5$<br>Increment A: 1 C: 0.1<br>⚠ $d_1$= ejector hole dia. (see table at right) |

| H | $d_1$ |
|---|---|
| 6 | 0.7 |
| 8 | 1.1 |
| 10 | 1.5 |
| 13 | 1.8 |
| 16~25 | 2.8 |

## ▶ Point Face Grinding

For high-force blanking, e.g. high-tensile steel; helps prevent breakage by reducing punching force and load. Also available coated, with short lead times。

⚠ Applicable range of point face grinding: P·W≥1.00

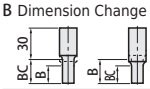
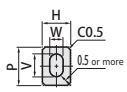
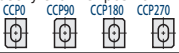
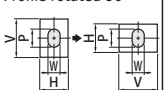
⚠ Ejector pin projection made to specified length

| Code No. | V | H | L (C) | P (C) | W (C) | R | (BC・HC…etc) | (1F・2F・3F…, S・E・U・Q・A・RR・C) |
|---|---|---|---|---|---|---|---|---|
| KH—HMDS | 20 | 16 | —LC75.5 | —P16.50 | —W7.00 | | —BC16 | —PKC —1F—S1.5—E4.5—U0.2—Q1.0 |

# Square Punch Alterations Overview

## BLOCK PUNCHES—DETAIL GUIDE of ADDITION—

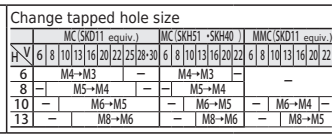
ADDITIONS

| Add. | Code | Alteration Description |
|---|---|---|
| **P・W** Dimension Change  | PC (4)<br>WC (4) | Reduce point dims. "P·W"<br>PC ⩾V×0.3⩾1.00 ☞ Table 1<br>WC ⩾H×0.15⩾0.50<br>⚠ Coated: WC≥H×0.15≥1.00<br>in 0.01<br>⚠ PC・WC Dim. change may reduce pt. length B |
| **B** Dimension Change  | BC (7) | Change point length "B"<br>2⩽BC⩽Bmax. ☞ Table 1<br>in 0.1<br>⚠ BC⩽L−30 |
| **L** Dimension Change  | LC (4) | Reduce overall length "L"<br>30+B (C)⩽LC<L<br>in 0.1→w/ LKC, LKP (Z): allows in 0.01<br>⚠ LC<30+B (C when, B=LC -30 |
| Shank Corner Chamfer (4 places)  | CC (6) | C0.5 chamfer on 4 shank corners<br>⚠ Shank corner to point distance must be 0.5+ before machining |
| Shank Corner Chamfer (1 place)  | CCP (6) | C1.0 chamfer on 1 shank corner<br>⚠ Shank-to-point position at chamfer:<br>m+n⩾1.3 (see figure at right)<br>⚠ Specify chamfer position<br>CCP0 CCP90 CCP180 CCP270   |
| Profile rotated 90°  | HVC (6) | Point (P·W) unchanged, shank (V·H) rotated 90°<br>⚠ Pmin.・Wmin Unchanged<br>⚠ Only when point is concentric with shank<br>⚠ Applies to V≤30 |
| Bottom Face Chamfer  | CTC (6) | Chamfer punch bottom face<br>0.3⩽CTC⩽1.5<br>CTC⩽H/5<br>in 0.1  |
| Point Land Polishing  | SC (58) | Polish the effective point land<br>⚠ Shaped point: D not specifiable R=0 |

| Add. | Code | Add. | Code |
|---|---|---|---|
| Point Face Grinding  | ☐F<br>☐P<br>☞ P.100 | Press-in Lead Added  <br>⚠ Add press-in lead (V·H $^{-0.01}_{-0.03}$) | DC (6) |

ORDER

| Code No. | V | H | L (C) | P (C) | W (C) | R (R0) | X | Y | (BC・CC・PKC ···etc) |
|---|---|---|---|---|---|---|---|---|---|
| KPHPES | 16 | 13 | −LC75.5 | −P15.50 | −W8.00 | | | − | BC15.5 |

| | Code | Change tapped hole size |
|---|---|---|
| Tapped Hole Size Change  | MC<br>MMC<br>(0) |  |

| H \ V | MC (SKD11 equiv.) 6 | 8 | 10 | 13 | 16 | 20 | 22 | 25 | 28・30 | MC (SKH51・SKH40) 6 | 8 | 10 | 13 | 16 | 20 | 22 | MMC (SKD11 equiv.) 6 | 8 | 10 | 13 | 16 | 20 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | M4→M3 | | | | | | | − | | M4→M3 | | | | | | − | − | | | | | | |
| 8 | − | M5→M4 | | | | | | − | | − | M5→M4 | | | | | | | | | | | | |
| 10 | − | | M6→M5 | | | | | | | − | | M6→M5 | | | | − | M6→M4 | | | | | | − |
| 13 | − | | | M8→M6 | | | | | | − | | | M8→M6 | | | − | | | | M8→M5 | | | |

| | Code | |
|---|---|---|
| Shoulder Relief  | FK (6) | 15° relief from where shank line meets shoulder, toward shoulder OD<br>⚠ Relief on shoulder prevents breakage from stress concentration<br>⚠ Relief: 1 place<br>⚠ With HC, relief still starts from the shank line |

# Square Punches — Standard / TiCN Coated

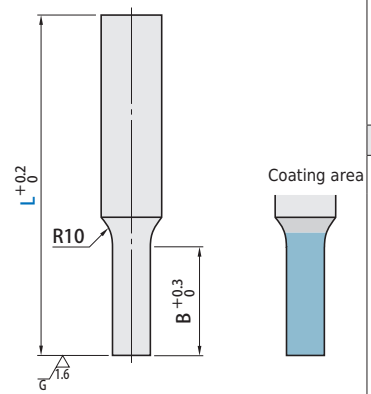
## BLOCK PUNCHES—STANDARD TYPE / TiCN COATING—

KAYAN



| Material | Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

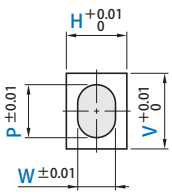
SKH40 Powder-metallurgy HSS(JIS G4403.2000)



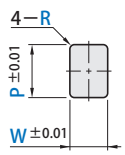

■ = TiCN coating area (surface 2700HV)
⚠ Coated type applies to V3-30

### Point Shape

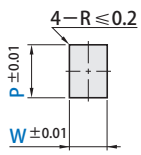
**E**
⚠ W≦P≦W×20




**R**
⚠ W≦P≦W×20
⚠ 0.15≦R＜W/2
in R: 0.01



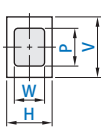

**D**
⚠ W≦P≦W×20
⚠ Specifiable R=0




| Type · Material · Shank Range | Code No. Type | Shape (Point Shape) | B Point Length S | B Point Length L | H | V | Point Dim.s P・W in 0.01 3 | 4 | 5 | 6 | 8 | 10 | 13 | 16 | 20 | 22 | 25 | 28 | 30 | (40) | (50) | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Hmin | Pmin | 1.50 | 2.00 | 2.50 | 3.00 | 3.00 | 4.00 | 5.00 | 7.00 | 8.00 | 9.00 | 10.00 | 12.00 | 12.00 | 16.00 | 20.00 | |
| Standard | | | 6 | 8 | (3) | 1.00 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | |
| | | | | | (4) | 1.00 | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | |
| SKD11 SKH51 | H6～30 H3～ 5 | KHP | 8 | 13 | 5 | 1.20 | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | (40) |
| | | | | | 6 | 1.50 | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | (50) |
| SKH51 SKH40 | H6～30 H3～30 | KHSP KPHP | | | 8 | 2.00 | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | 60 |
| | | | 13 | 19 | 10 | 2.50 | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | | | | | 13 | 3.00 | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 70 |
| Coated | | | | | 16 | 4.00 | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| SKD11 SKH51 | H6～30 H3～ 5 | KH — HP | 19 | 25 | 20 | 5.00 | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 80 |
| | | | | | 22 | 6.00 | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | 90 |
| SKH51 SKH40 | H6～30 H3～30 | KH — HSP KH — PHP | | | 25 | 6.50 | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | 100 |
| | | | | | 28 | 7.00 | | | | | | | | | | | | ○ | ○ | ○ | ○ | |
| | | | | | 30 | 7.50 | | | | | | | | | | | | | ○ | ○ | ○ | |

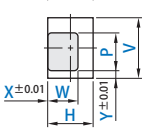
⚠ For L (40), H10-30, point length B=13 ⚠ For L (50), H16-30, point length B=19
⚠ H (3)・(4 when, HHP·HH-HP: L40-80, PPHP·HH-PHP: L40-70 ⚠ V (40)・(50 Applies only to HHP




▶ Point concentric with shank

| Code No. | V | H | L | P | W | R (R0) |
|---|---|---|---|---|---|---|
| KHPDS | 08 | 06 | — 60 | — P6.50 | — W4.00 | — R0 |



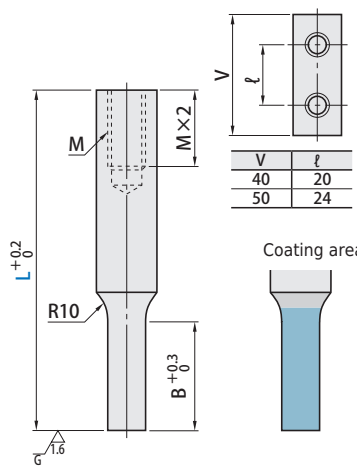

▶ Point offset from shank

| Code No. | V | H | L | P | W | R (R0) | X | Y |
|---|---|---|---|---|---|---|---|---|
| KHPDS | 08 | 06 | — 60 | — P6.50 | — W4.00 | | — X0.00 | — Y0.50 |

⚠ When specifying X, Y: X, Y ≥ 0.02 or X, Y=0 in 0.01

# Screw-Retained Square Punches — Standard / TiCN Coated-

## BLOCK PUNCHES with TAP HOLE—STANDARD TYPE / TiCN COATING—




| V | ℓ |
|---|---|
| 40 | 20 |
| 50 | 24 |

= TiCN coating area (surface 2700HV)
Coated type applies to V5-30

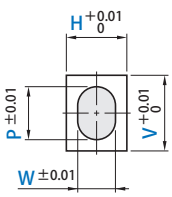


| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60〜63HRC |
| SKH51 | 61〜64HRC |
| SKH40 | 64〜67HRC |

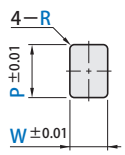
SKH40 Powder-metallurgy HSS(JIS G4403.2000)

### Point Shape

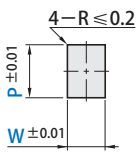
**E**
- W≦P≦W×20




**R**
- W≦P≦W×20
- 0.15≦R＜W/2
- R: 0.01



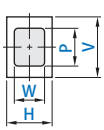

**D**
- W≦P≦W×20
- Specifiable R=0




| Type · Material · Shank Range | Code No. Type | Shape (Point Shape) | B Point Length S | B Point Length L | H \ V | V 5 | 6 | 8 | 10 | 13 | 16 | 20 | 22 | 25 | 28 | 30 | (40) | (50) | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Wmin \ Pmin | 2.50 | 3.00 | 3.00 | 4.00 | 5.00 | 7.00 | 8.00 | 9.00 | 10.00 | 12.00 | 12.00 | 16.00 | 20.00 | | |
| Standard SKD11 SKH51 | H6〜30 H5 | KHM | E S | 8 | 13 | 5 1.20 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | 3 |
| | | | | | | 6 1.50 | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | 4 |
| | | | | | | 8 2.00 | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | (40) | 5 |
| SKH51 SKH40 | H6〜30 H5〜30 | KHSM KPHM | | 13 | 19 | 10 2.50 | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | (50) | 6 |
| | | | | | | 13 3.00 | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 60 | |
| Coated SKD11 SKH51 | H6〜30 H5 | KH — HM | R D L | 19 | 25 | 16 4.00 | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 70 | |
| | | | | | | 20 5.00 | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | 80 | |
| | | | | | | 22 6.00 | | | | | | | | ○ | ○ | ○ | ○ | ○ | 90 | 8 |
| SKH51 SKH40 | H6〜30 H5〜30 | KH — HSM KH — PHM | | | | 25 6.50 | | | | | | | | | ○ | ○ | ○ | ○ | 100 | |
| | | | | | | 28 7.00 | | | | | | | | | | ○ | ○ | ○ | | |
| | | | | | | 30 7.50 | | | | | | | | | | | ○ | ○ | | |

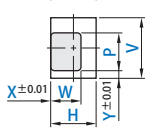
- For L (40), H10-30, point length B=10
- For L (50), H16-30, point length B=19
- V (40 : tapped hole pitch ℓ=20
- V (50 : tapped hole pitch ℓ=24
- V (40)・(50 Applies only to HHM

ORDER




▶ Point concentric with shank

| Code No. | V | H | L | P | W | R (R0) |
|---|---|---|---|---|---|---|
| KHMDS | 08 | 07 | — 50 | — P6.00 | — W5.00 | — R0 |




▶ Point offset from shank

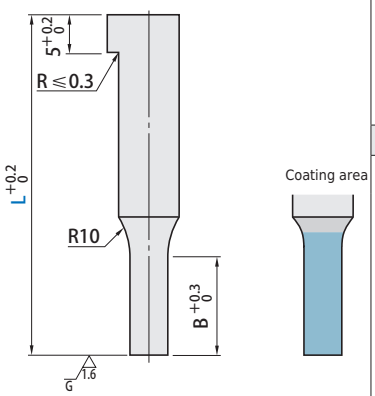
| Code No. | V | H | L | P | W | R (R0) | X | Y |
|---|---|---|---|---|---|---|---|---|
| KHMDS | 08 | 07 | — 50 | — P6.00 | — W5.00 | | — X0.00 | — Y0.50 |

- When specifying X, Y: X, Y ≥ 0.02 or X, Y=0 in 0.01

# Single-Shoulder Square Punches — Standard / TiCN Coated-

BLOCK PUNCHES with SINGLE FLANGE—STANDARD TYPE / TiCN COATING—

KAYAN




■ = TiCN coating area (surface 2700HV)
⚠ Coated type applies to V3-30, H3-30



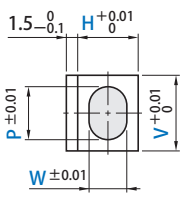
| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40 Powder-metallurgy HSS(JIS G4403.2000)

## Point Shape

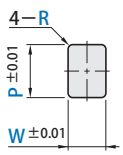
**E**

⚠ W≤P≤W×20



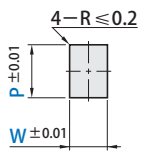

**R**

⚠ W≤P≤W×20
⚠ 0.15≤R<W/2
in R: 0.01




**D**

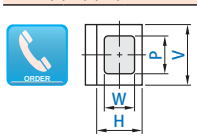
⚠ W≤P≤W×20
⚠ Specifiable R=0




| Type · Material | Shank Range | Code No. Type | Shape (Point Shape) | B Point Length S | B Point Length L | H | V (Wmin. / Pmin.) | 2 / 1.00 | 3 / 1.50 | 4 / 2.00 | 5 / 2.50 | 6 / 3.00 | 8 / 3.00 | 10 / 4.00 | 13 / 5.00 | 16 / 7.00 | 20 / 8.00 | 22 / 9.00 | 25 / 10.00 | 28 / 12.00 | 30 / 12.00 | (40) / 16.00 | (50) / 20.00 | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Standard | | | | | | (2) | 1.00 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | |
| SKD11 | H6～30 | KHF | E | S | 6 | (3) | 1.00 | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | |
| SKH51 | H2～ 5 | | | | | (4) | 1.00 | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | (40) |
| SKH51 | H6～30 | KHSF | | | 8 | 5 | 1.20 | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | (50) |
| SKH40 | H2～30 | KPHF | | | | 6 | 1.50 | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | |
| | | | | | | 8 | 2.00 | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | 60 |
| Coated | | | R | L | 13 | 10 | 2.50 | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 70 |
| SKD11 | H6～30 | KH — HF | D | | | 13 | 3.00 | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| SKH51 | H2～ 5 | | | | 19 | 16 | 4.00 | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 80 |
| SKH51 | H6～30 | KH — HSF | | | | 20 | 5.00 | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 90 |
| SKH40 | H2～30 | KH — PHF | | | | 22 | 6.00 | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | |
| | | | | | | 25 | 6.50 | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | 100 |
| | | | | | | 28 | 7.00 | | | | | | | | | | | | | ○ | ○ | ○ | ○ | |
| | | | | | | 30 | 7.50 | | | | | | | | | | | | | | ○ | ○ | ○ | |

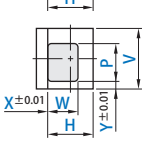
Point Dim.s P・W in 0.01】

⚠ For L (40), H10-30, point length B=13 ⚠ For L (50), H16-30, point length B=19
⚠ H (2)・(3)・(4 : OAL L is 40-70 ⚠ V (40)・(50 Applies only to HHF




▶ Point concentric with shank

| Code No. | V | H | L | P | W | R (R0) | F |
|---|---|---|---|---|---|---|---|
| KHFDS | 08 | 08 | — 60 | — P6.00 | — W4.00 | — R0 | — F0 |

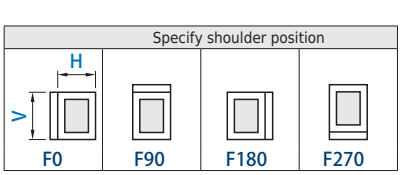



▶ Point offset from shank

| Code No. | V | H | L | P | W | R (R0) | F | X | Y |
|---|---|---|---|---|---|---|---|---|---|
| KHFDS | 10 | 10 | — 60 | — P7.50 | — W6.50 | | — F0 | — X2.00 | — Y1.00 |

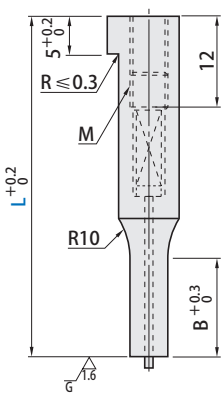
⚠ When specifying X, Y: X, Y ≥ 0.02 or X, Y=0 in 0.01

Specify shoulder position

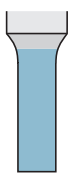


# Single-Shoulder Square Ejector Punches — Standard / TiCN Coated-

## EJECTOR BLOCK PUNCHES with SINGLE FLANGE—STANDARD TYPE / TiCN COATING—




Coating area



■ = TiCN coating area (surface 2700HV)



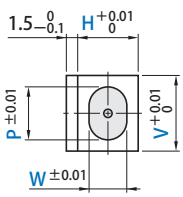
| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40 Powder-metallurgy HSS(JIS G4403.2000)

### Point Shape

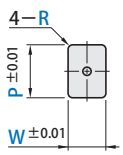
**E**

⚠ W≤P



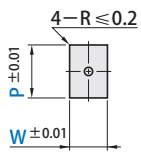

**R**

⚠ W≤P
⚠ 0.15≤R<W/2
in R: 0.01




**D**

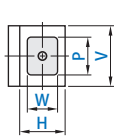
⚠ W≤P
⚠ Specifiable R=0




| Type · Material | Code No. Type | Shape Point Shape | B Point Length S | B Point Length L | H | Wmin. | V / Pmin. | 6 / 3.00 | 8 / 3.00 | 10 / 4.00 | 13 / 5.00 | 16 / 7.00 | 20 / 8.00 | 22 / 9.00 | 25 / 10.00 | 28 / 12.00 | 30 / 12.00 | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Standard SKD11 SKH51 SKH40 | KHJF KHSJF KPHJF | E R D | S | 8 | 6 | 2.00 | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | (40) (50) 60 70 80 | 4 |
| | | | | | 8 | 2.50 | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | 5 |
| | | | | 13 | 10 | 3.00 | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | 6 |
| | | | | | 13 | 4.00 | | | | | ○ | ○ | ○ | ○ | ○ | ○ | | | 8 |
| Coated SKD11 SKH51 SKH40 | KH — HJF KH — HSJF KH — PHJF | | L | 19 | 16 | 5.00 | | | | | | ○ | ○ | ○ | ○ | ○ | | | |
| | | | | | 20 | 6.00 | | | | | | | ○ | ○ | ○ | ○ | | | |
| | | | | | 22 | 6.00 | | | | | | | | ○ | ○ | ○ | | | |
| | | | | | 25 | 6.00 | | | | | | | | | ○ | ○ | | | |

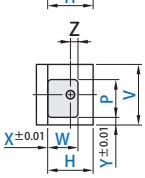
Point Dim.s P・W in 0.01】

⚠ For OAL L (40), pt. length B=6 ⚠ For L (50), H10-25, point length B=13
⚠ Ejector hole data: see square ejector punch blanks




▶ Point concentric with shank

| Code No. | V | H | L | P | W | R (R0) | F |
|---|---|---|---|---|---|---|---|
| KHJFDL | 08 | 06 | — 50 | — P6.80 | — W2.80 | — R0 | — F0 |



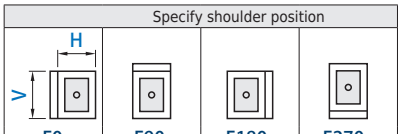

▶ Point offset from shank

| Code No. | V | H | L | P | W | R (R0) | F | X | Y |
|---|---|---|---|---|---|---|---|---|---|
| KHJFDL | 08 | 06 | — 40 | — P6.80 | — W2.80 | | — F0 | — X0.00 | — Y0.30 |

⚠ When specifying X, Y: X, Y ≥ 0.02 or X, Y=0 in 0.01 ⚠ If point is relocated, Z ≥ Zmin.; ejector hole position fixed

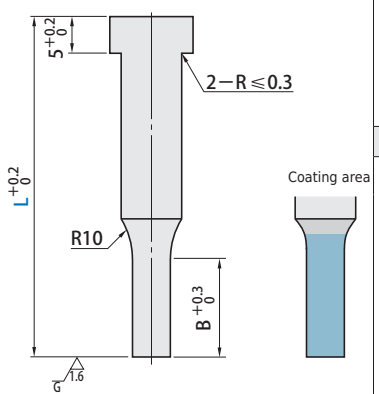
| H | Zmin. |
|---|---|
| 6・8 | 1.0 |
| 10・13 | 1.5 |
| 16～25 | 2.0 |

Specify shoulder position



# Double-Shoulder Square Punches — Standard / TiCN Coated-

## BLOCK PUNCHES with DOUBLE FLANGE—STANDARD TYPE / TiCN COATING—




■ = TiCN coating area (surface 2700HV)
⚠ Coated type applies to V3-30, H3-30

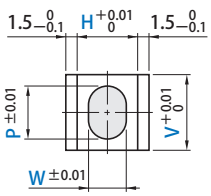


| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

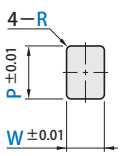
SKH40 Powder-metallurgy HSS(JIS G4403.2000)

### Point Shape

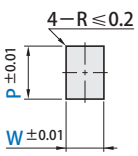
**E**
⚠ W≤P≤W×20




**R**
⚠ W≤P≤W×20
⚠ 0.15≤R<W/2
in R: 0.01



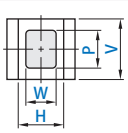

**D**
⚠ W≤P≤W×20
⚠ Specifiable R=0




| Type · Material · Shank Range | | Code No. Type | Shape (Point Shape) | B Point Length S | B Point Length L | H | V | Point Dim.s P•W in 0.01】 2 | 3 | 4 | 5 | 6 | 8 | 10 | 13 | 16 | 20 | 22 | 25 | 28 | 30 | (40) | (50) | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 1.00 | 1.50 | 2.00 | 2.50 | 3.00 | 3.00 | 4.00 | 5.00 | 7.00 | 8.00 | 9.00 | 10.00 | 12.00 | 12.00 | 16.00 | 20.00 | |
| Standard | | | | | | (2) | 1.00 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | |
| SKD11 | H6～30 | | | | | (3) | 1.00 | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | |
| SKH51 | H2～ 5 | KHW | E | S | 6 | (4) | 1.00 | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | (40) |
| | | | | | 8 | 5 | 1.20 | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | (50) |
| SKH51 | H6～30 | KHSW | | | | 6 | 1.50 | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | |
| SKH40 | H2～30 | KPHW | | | | 8 | 2.00 | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | 60 |
| | | | R | | 13 | 10 | 2.50 | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| Coated | | | | | | 13 | 3.00 | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 70 |
| SKD11 | H6～30 | | | L | | 16 | 4.00 | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 80 |
| SKH51 | H2～ 5 | KH — HW | D | | 19 | 20 | 5.00 | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 90 |
| | | | | | | 22 | 6.00 | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | |
| SKH51 | H6～30 | KH — HSW | | | | 25 | 6.50 | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | 100 |
| SKH40 | H2～30 | KH — PHW | | | | 28 | 7.00 | | | | | | | | | | | | | ○ | ○ | ○ | ○ | |
| | | | | | | 30 | 7.50 | | | | | | | | | | | | | | ○ | ○ | ○ | |

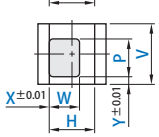
⚠ For L (40), H10-30, point length B=13 ⚠ For L (50), H16-30, point length B=19
⚠ H (2)・(3)・(4 : OAL L is 40-70 ⚠ V (40)・(50 Applies only to HHW




▶ Point concentric with shank

| Code No. | V | H | L | P | W | R (R0) | WF |
|---|---|---|---|---|---|---|---|
| KHWEL | 06 | 04 | — 60 | — P4.60 | — W2.30 | | — WF0 |

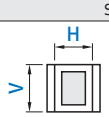



▶ Point offset from shank

| Code No. | V | H | L | P | W | R (R0) | WF | X | Y |
|---|---|---|---|---|---|---|---|---|---|
| KHWEL | 06 | 04 | — 60 | — P4.60 | — W2.30 | | — WF0 | — X0.00 | — Y0.20 |

⚠ When specifying X, Y: X, Y ≥ 0.02 or X, Y=0 in 0.01

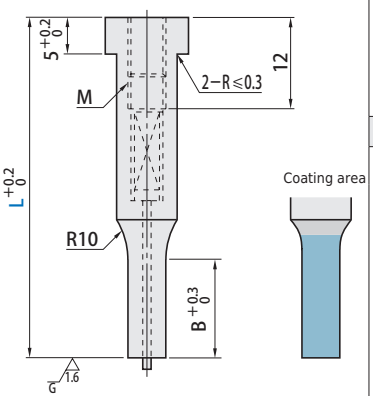
Specify shoulder position




WF0 WF90

# Double-Shoulder Square Ejector Punches — Standard / TiCN Coated-

## EJECTOR BLOCK PUNCHES with DOUBLE FLANGE—STANDARD TYPE / TiCN COATING—




■ = TiCN coating area (surface 2700HV)



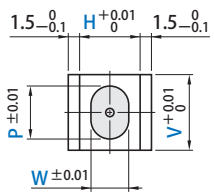
| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40 Powder-metallurgy HSS(JIS G4403.2000)

### Point Shape

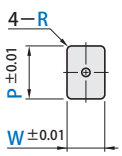
**E**

⚠ W≤P



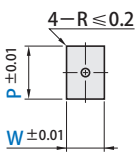

**R**

⚠ W≤P
⚠ 0.15≤R<W/2
in R: 0.01



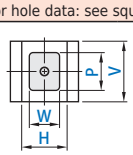

**D**

⚠ ≤P
⚠ Specifiable R=0



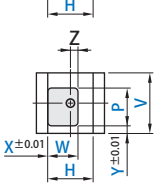

| Type · Material | Code No. Type | Shape Point Shape | B Point Length S | B Point Length L | H | Point Dim.s P・W in 0.01】 Pmin. \ V | 6 | 8 | 10 | 13 | 16 | 20 | 22 | 25 | 28 | 30 | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Wmin. | 3.00 | 3.00 | 4.00 | 5.00 | 7.00 | 8.00 | 9.00 | 10.00 | 12.00 | 12.00 | | |
| Standard SKD11 SKH51 SKH40 | KHJW KHSJW KPHJW | E R D | S | 8 | 6 | 2.00 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | (40) (50) 60 70 80 | 4 |
| | | | | | 8 | 2.50 | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | 5 |
| | | | | 13 | 10 | 3.00 | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | 6 |
| | | | | | 13 | 4.00 | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | 8 |
| Coated SKD11 SKH51 SKH40 | KH — HJW KH — HSJW KH — PHJW | | L | 19 | 16 | 5.00 | | | | | ○ | ○ | ○ | ○ | ○ | ○ | | |
| | | | | | 20 | 6.00 | | | | | | ○ | ○ | ○ | ○ | ○ | | |
| | | | | | 22 | 6.00 | | | | | | | ○ | ○ | ○ | ○ | | |
| | | | | | 25 | 6.00 | | | | | | | | ○ | ○ | ○ | | |

⚠ For OAL L (40), pt. length B=6 ⚠ For L (50), H10-25, point length B=13
⚠ Ejector hole data: see square ejector punch blanks




▶ Point concentric with shank

| Code No. | V | H | L | P | W | R (R0) | WF |
|---|---|---|---|---|---|---|---|
| KHJWES | 08 | 08 | — 70 | — P6.00 | — W2.50 | | — WF0 |



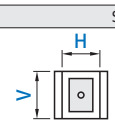

▶ Point offset from shank

| Code No. | V | H | L | P | W | R (R0) | WF | X | Y |
|---|---|---|---|---|---|---|---|---|---|
| KHJWES | 08 | 08 | — 70 | — P6.00 | — W2.50 | | — WF0 | — X0.00 | — Y0.50 |

⚠ When specifying X, Y: X, Y ≥ 0.02 or X, Y=0 in 0.01 ⚠ If point is relocated, Z ≥ Zmin.; ejector hole position fixed

| H | Zmin. |
|---|---|
| 6・8 | 1.0 |
| 10・13 | 1.5 |
| 16～25 | 2.0 |

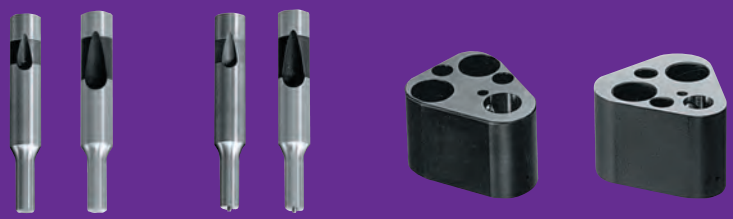
Specify shoulder position




WF0



WF90



# Ball Lock Punches

## & Die Buttons / Retainers

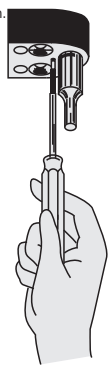
## BALL-LOCK PUNCHES & DIES / RETAINERS

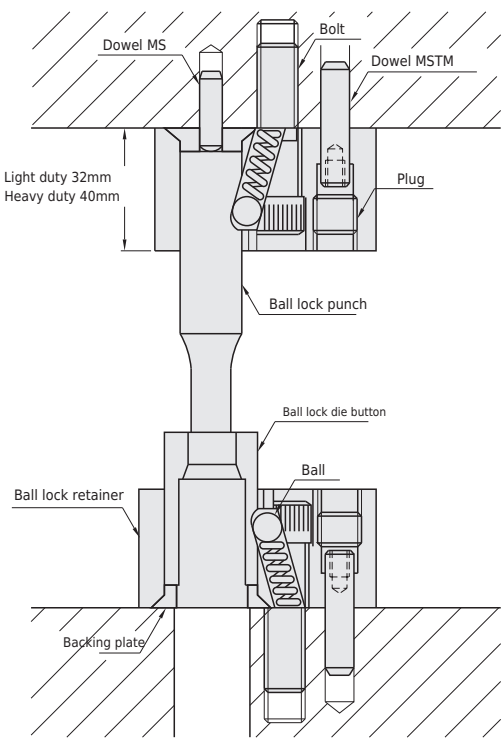

30 Ball Lock Punches / Retainers - Overview-
31 Ball Lock Punches — Light Duty, Standard / Light Duty, TiCN Coated-
32 Ball Lock Punches — Heavy Duty, Standard / Heavy Duty, TiCN Coated-
33 Ball Lock Ejector Punches — Light Duty, Standard / Light Duty, TiCN Coated-
34 Ball Lock Ejector Punches — Heavy Duty, Standard / Heavy Duty, TiCN Coated-
35 Ball Lock Retainers — Light Duty, Compact-
36 Ball Lock Retainers — Heavy Duty, Compact-
37 Ball Lock Retainers — Light Duty, Triangular-
38 Ball Lock Retainers — Heavy Duty, Triangular-
39 Ball Lock Retainers — Components-

## ■ Ball Lock Punch & Die Button Construction

Spring-loaded steel balls in the retainer engage the seats in the punch / die button to lock it in place. To remove, just press the ball - the punch or die button comes out without removing the retainer.

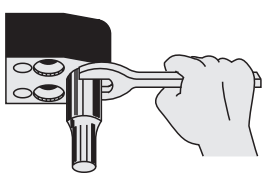
● Thread a tool into the front tapped hole to push the ball up, then pull out the punch.





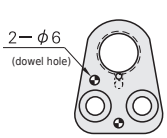
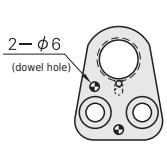

## ■ Punches

- Choose heavy duty or light duty to suit the application.
- Use heavy duty when the work material is 3 mm or thicker.
- Each type is also offered as an ejector type to prevent slug pulling.
- On wrench-slot types, the slot is used to check the punch is locked.
- Fit the wrench into the shank slot and turn it left and right to confirm the ball has locked the punch in position.



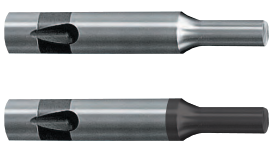
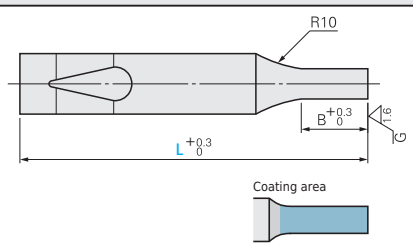
## ■ Retainers

- Light duty and heavy duty types to match the punch / die button.
- Use light duty retainers with light duty punches, heavy duty retainers with heavy duty punches.

| | Outline | Locating Method |
|---|---|---|
| Light duty |   | ● **When locating punches by NC machining• •** locate with the backing plate's center dowel hole and the retainer's dowel hole (1). |
| Heavy duty |   | ● **When locating by matching punch and die-button·points** through-machine to the retainer's dowel holes (2). |

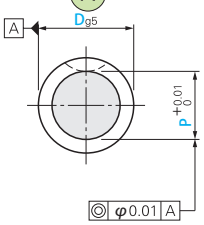
## ■ Precautions

When removing ball lock punches / die buttons, keep the retainer mounted in the die; otherwise the spring may come out and cause malfunction.

| Shank Shape | M Material H Hardness | Catalog No. Type | Shape Point Shape | B Point Length | Select point shape Point Shape Ⓐ〜Ⓖ below |
|---|---|---|---|---|---|
|  | SKD11 equiv. 60〜63HRC | KELP | Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ | S L |  |

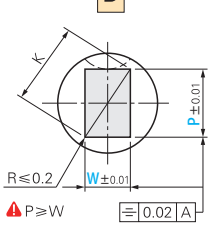


Point Shape Ⓐ





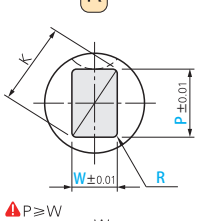
Point Shape Ⓓ





⚠ P≥W
⚠ Specifiable: R=0
⚠ $K=\sqrt{P^2+W^2}$

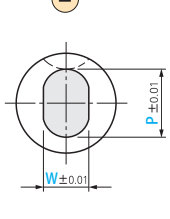
Point Shape Ⓡ





⚠ P≥W
⚠ $0.15 \leq R < \frac{W}{2}$
⚠ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

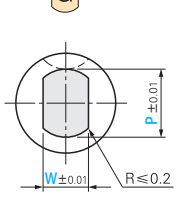
Point Shape Ⓔ





⚠ P>W

Point Shape Ⓖ





⚠ P>W

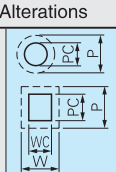
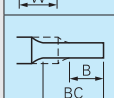
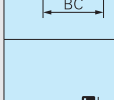
| Catalog No. Type | D | L | Specified unit 0.01 mm Ⓐ min. P max. | ⒹⓇⒺⒼ P・Kmax. | ⒹⓇⒺⒼ P・Wmin. | Ⓡ R | B |
|---|---|---|---|---|---|---|---|
| S ⒶKELPAS | 10 | 63 71 74 80 90 | 3.00〜 9.97 | 9.90 | 2.50 | 0.15 ≦ W/2 | 13 |
| ⒹKELPDS | 13 | | 6.00〜12.97 | 12.90 | 3.00 | | |
| ⓇKELPRS | 16 | | 10.00〜15.97 | 15.90 | 4.00 | | 19 |
| ⒺKELPES | 20 | | 13.00〜19.97 | 19.90 | 5.00 | | |
| ⒼKELPGS | 25 | | 18.00〜24.97 | 24.90 | 6.00 | | |
| | 32 | | 22.00〜31.97 | 31.90 | 7.00 | | |
| L ⒶKELPAL | 10 | 71 74 80 90 | 3.00〜 9.97 | 9.90 | 2.50 | max. | 19 |
| ⒹKELPDL | 13 | | 6.00〜12.97 | 12.90 | 3.00 | | |
| ⓇKELPRL | 16 | | 10.00〜15.97 | 15.90 | 4.00 | only Ⓡ | 25 |
| ⒺKELPEL | 20 | | 13.00〜19.97 | 19.90 | 5.00 | | |
| ⒼKELPGL | 25 | | 18.00〜24.97 | 24.90 | 6.00 | | |
| | 32 | | 22.00〜31.97 | 31.90 | 7.00 | | |

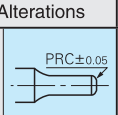
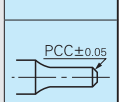
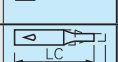
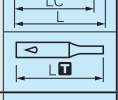
ORDER

| Catalog No. | L | P | W | R (only Ⓡ) |
|---|---|---|---|---|
| KELPRS 16 | 74 | P12.00 | W10.00 | R3.00 |

ADDITIONS ORDER

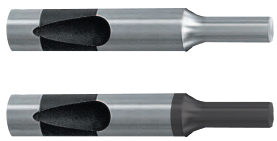
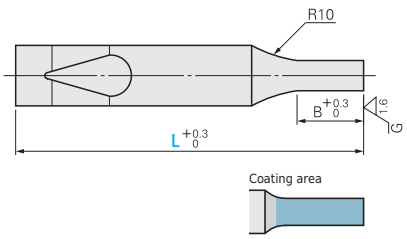
| Catalog No. | L (LC) | P (PC) | W (WC) | R | (BC・KC…etc.) |
|---|---|---|---|---|---|
| KELPRS 16 | LC70.5 | P12.00 | W10.00 | R3.00 | BC15.5 |

| Alterations | Code | Ⓐ | ⒹⓇⒺⒼ |
|---|---|---|---|
| Point Alterations  | PC WC | Change point dim. PC≧Pmin./2 WC≧Wmin./2 Unit: 0.01 mm<br>P(PC) / Bmax.: 1.50〜1.99 / 20; 2.00〜3.99 / 35; 4.00〜 / 45 | Change point dim. PC≧P・Wmin./2 WC≧P・Wmin./2 Unit: 0.01 mm<br>P(PC)・W(WC) / Bmax.: 1.25〜1.49 / 8; 1.50〜1.99 / 13; 2.00〜3.49 / 19; 3.50〜4.99 / 25; 5.00〜 / 30 |
|  | BC | Change point length 2≦BC≦Bmax. Unit: 0.1 mm<br>E OAL (L) must be ≥ point length (BC)+45 mm min. | |
|  | PKC | Change point dim. tol. P +0.01 0 ⇨ +0.005 0 | Change point dim. tol. P・W±0.01 ⇨ +0.01 0 |

| Alterations | Code | Ⓐ | ⒹⓇⒺⒼ |
|---|---|---|---|
| Point Alts.  | PRC | Radius on point edge 0.3≦PRC≦1 Unit: 0.1 mm<br>E PRC≦(P−0.2)/2<br>X Not with PCC | —— |
|  | PCC | Chamfer on point edge 0.3≦PCC≦1 Unit: 0.1 mm<br>E PCC≦(P−0.2)/2<br>X Not with PRC | —— |
| OAL Alts.  | LC | Change OAL45 +B(BC)≦LC<L Unit 0.1 mm (0.01 mm when combined with LKC)<br>E If LC - B ≦ 45 mm, point length = OAL - 45 mm. | |
|  | LKC | Change OAL tol. L +0.3 0 ⇨ +0.05 0 | |
| Other  | KC | —— | 0° 90° 180° 270° Change ball position Unit: 1° |

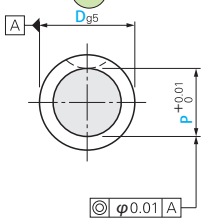
# Ball Lock Punches — Heavy Duty, Standard / Heavy Duty, TiCN Coated-

## BALL-LOCK PUNCHES—HEAVY LOAD TYPE • STANDARD TYPE / HEAVY LOAD TYPE • TiCN COATING—

| Shank Shape | M Material H Hardness | Catalog No. Type | Shape Point Shape | B Point Length | Select point shape Point Shape A~G below |
|---|---|---|---|---|---|
|  | SKH51 equiv. 61~64HRC | KEBP | A D R E G | S L |  |

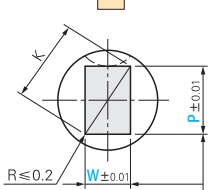


Point Shape A





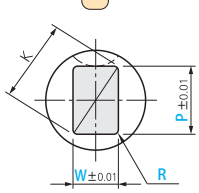
Point Shape D





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

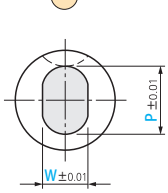
Point Shape R





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

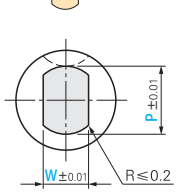
Point Shape E





- P>W

Point Shape G





- P>W

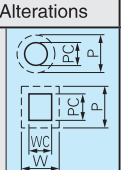
| Catalog No. Type | D | L | Specified unit 0.01 mm Ⓐ min. P max. | ⒹⓇⒺⒼ P·Kmax. | ⒹⓇⒺⒼ P·Wmin. | Ⓡ R | B |
|---|---|---|---|---|---|---|---|
| S | 10 | 71 80 90 100 | 3.00～ 9.97 | 9.90 | 2.50 | 0.15 ≀ W/2 | 13 |
| ⒶKEBPAS | 13 | | 6.00～12.97 | 12.90 | 3.00 | | |
| ⒹKEBPDS | 16 | | 10.00～15.97 | 15.90 | 4.00 | | 19 |
| ⓇKEBPRS | 20 | | 13.00～19.97 | 19.90 | 5.00 | | |
| ⒺKEBPES | 25 | | 18.00～24.97 | 24.90 | 6.00 | | |
| ⒼKEBPGS | 32 | | 22.00～31.97 | 31.90 | 7.00 | | |
| L | 10 | 80 90 100 | 3.00～ 9.97 | 9.90 | 2.50 | max. | 19 |
| ⒶKEBPAL | 13 | | 6.00～12.97 | 12.90 | 3.00 | | |
| ⒹKEBPDL | 16 | | 10.00～15.97 | 15.90 | 4.00 | only Ⓡ | 25 |
| ⓇKEBPRL | 20 | | 13.00～19.97 | 19.90 | 5.00 | | |
| ⒺKEBPEL | 25 | | 18.00～24.97 | 24.90 | 6.00 | | |
| ⒼKEBPGL | 32 | | 22.00～31.97 | 31.90 | 7.00 | | |

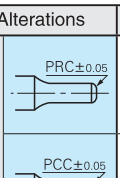
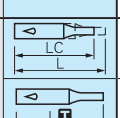
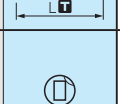
ORDER

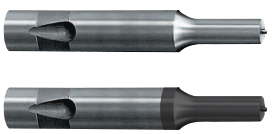
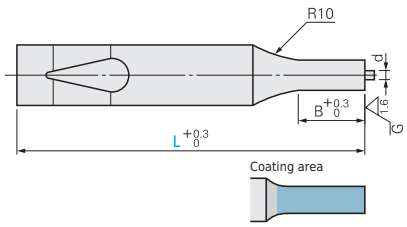
| Catalog No. | L | P | W | R (only Ⓡ) |
|---|---|---|---|---|
| KEBPRL 32 | 100 | P26.20 | W14.00 | R3.00 |

ADDITIONS ORDER

| Catalog No. | L (LC) | P (PC) | W (WC) | R | (BC·KC···etc.) |
|---|---|---|---|---|---|
| KEBPDS 32 | 100 | P26.20 | W14.00 | | KC90 |

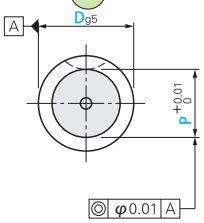
| Alterations | Code | Ⓐ | ⒹⓇⒺⒼ |
|---|---|---|---|
| Point Alterations  | PC WC | Change point dim. $PC \geqq \frac{Pmin.}{2}$ Unit: 0.01 mm<br>P(PC) / Bmax.: 1.50～1.99 / 20; 2.00～3.99 / 35; 4.00～5.99 / 45; 6.00～ / 50 | Change point dim. $PC\ WC \geqq \frac{P \cdot Wmin.}{2}$ Unit: 0.01 mm<br>P(PC)·W(WC) / Bmax.: 1.25～1.49 / 8; 1.50～1.99 / 13; 2.00～3.49 / 19; 3.50～4.99 / 25; 5.00～ / 30 |
| | BC | Change point length 2≤BC≤Bmax. Unit: 0.1 mm<br>E OAL (L) must be ≥ point length (BC)+50 mm min. | |
| | PKC | Change point dim. tol. $P^{+0.01}_{0} \Rightarrow P^{+0.005}_{0}$ | Change point dim. tol. $P \cdot W \pm 0.01 \Rightarrow P^{+0.01}_{0}$ |

| Alterations | Code | Ⓐ | ⒹⓇⒺⒼ |
|---|---|---|---|
| Point Alts.  | PRC | Radius on point edge 0.3≤PRC≤1 Unit: 0.1 mm<br>E PRC≤(P−0.2)/2<br>X Not with PCC | —— |
| | PCC | Chamfer on point edge 0.3≤PCC≤1 Unit: 0.1 mm<br>E PCC≤(P−0.2)/2<br>X Not with PRC | —— |
| OAL Alts.  | LC | Change OAL50 +B(BC)≤LC<L Unit 0.1 mm (0.01 mm when combined with LKC)<br>E If LC - B ≤ 50 mm, point length = OAL - 50 mm. | |
| | LKC | Change OAL tol. $L^{+0.3}_{0} \Rightarrow L^{+0.05}_{0}$ | |
| Other  | KC | —— | 0° 90° 180° 270° Change ball position Unit: 1° |

| Shank Shape | M Material H Hardness | Catalog No. Type | Shape Point Shape | B Point Length | Select point shape Point Shape A~G below |
|---|---|---|---|---|---|
|  | SKD11 equiv. 60~63HRC | KELJ | A D R E G | S L |  |

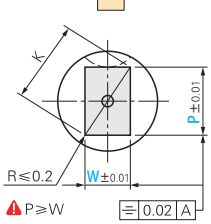


Point Shape A



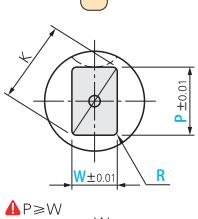


Point Shape D



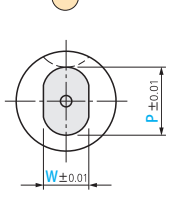


Point Shape R



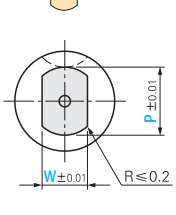


Point Shape E





Point Shape G





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

| Catalog No. Type | D | L | Specified unit 0.01 mm Ⓐ min. P max. | DREG P・Kmax. | DREG P・Wmin. | Ⓡ R | B | d (hole dia.) |
|---|---|---|---|---|---|---|---|---|
| S | 10 | 63 71 74 80 90 | 3.00～ 9.97 | 9.90 | 3.00 | 0.15 ≦ W/2 max. only Ⓡ | 13 | 1.5 |
| AKELJAS | 13 | | 6.00～12.97 | 12.90 | 6.00 | | | 1.8 |
| DKELJDS | 16 | | 10.00～15.97 | 15.90 | 6.00 | | 19 | 2.8 |
| RKELJRS | 20 | | 13.00～19.97 | 19.90 | 6.00 | | | |
| EKELJES | 25 | | 18.00～24.97 | 24.90 | 6.00 | | | |
| GKELJGS | 32 | | 22.00～31.97 | 31.90 | 6.00 | | | |
| L | 10 | 71 74 80 90 | 3.00～ 9.97 | 9.90 | 3.00 | | 19 | 1.5 |
| AKELJAL | 13 | | 6.00～12.97 | 12.90 | 6.00 | | | 1.8 |
| DKELJDL | 16 | | 10.00～15.97 | 15.90 | 6.00 | | 25 | 2.8 |
| RKELJRL | 20 | | 13.00～19.97 | 19.90 | 6.00 | | | |
| EKELJEL | 25 | | 18.00～24.97 | 24.90 | 6.00 | | | |
| GKELJGL | 32 | | 22.00～31.97 | 31.90 | 6.00 | | | |

ORDER

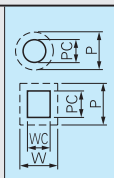
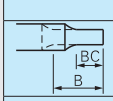
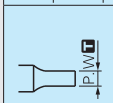
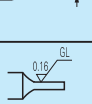
Catalog No. — L — P — W — R(only Ⓡ)

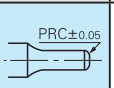
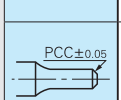
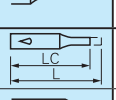
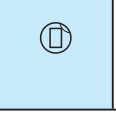
KELJEL 25 — 80 — P21.00 — W12.40

ADDITIONS ORDER

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC…etc.)

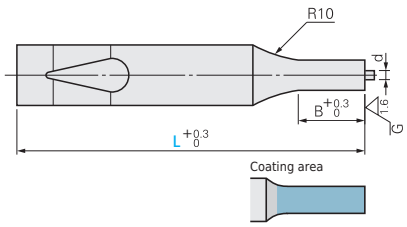
KELJEL 25 — 80 — P21.00 — W12.40 — — PKC

| Alterations | | Code | Ⓐ | DREG |
|---|---|---|---|---|
| Point Alterations |  | PC WC | Change point dim. PC≧PCmin. Unit: 0.01 mm | Change point dim. PC・WC≧PC・WCmin. Unit: 0.01 mm |
| | | | D / PCmin.: 10 2.80; 13 5.00; 16 8.00; 20 9.00; 25 9.00; 32 15.00 | D / PC・WCmin.: 10 2.80; 13 5.00; 16 5.00; 20 5.00; 25 5.00; 32 5.00 |
| |  | BC | Change point length 2≦BC<B Unit: 0.1 mm | |
| |  | PKC | Change point dim. tol. $P^{+0.01}_{0} \Rightarrow P^{+0.005}_{0}$ | Change point dim. tol. $P・W \pm 0.01 \Rightarrow ^{+0.01}_{0}$ |
| |  | SC | Point land polishing E P dim. tolerance and unit unchanged. X Pt. Dshape: corner R=0 not specifiable | |

| Alterations | | Code | Ⓐ | DREG |
|---|---|---|---|---|
| Point Alts. |  | PRC | Radius on point edge 0.3≦PRC≦1 Unit: 0.1 mm E PRC≦(P−d−0.5)/2 X Not with PCC | —— |
| |  | PCC | Chamfer on point edge 0.3≦PCC≦1 Unit: 0.1 mm E PCC≦(P−d−0.5)/2 X Not with PRC | —— |
| OAL Alts. |  | LC | Change OAL L −(B−2)≦LC<L Unit 0.1 mm (0.01 mm when combined with LKC) E Point length B reduced by (L-LC). | |
| |  | LKC | Change OAL tol. $L^{+0.3}_{0} \Rightarrow ^{+0.05}_{0}$ | |
| Other |  | KC | —— | 0° 90° 180° 270° Change ball position Unit: 1 ° |

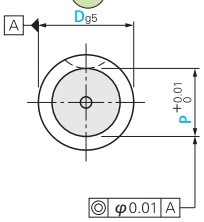
# Ball Lock Ejector Punches — Heavy Duty, Standard / Heavy Duty, TiCN Coated-

## BALL-LOCK JECTOR PUNCHES—HEAVY LOAD TYPE • STANDARD TYPE / HEAVY LOAD TYPE • TiCN COATING—

| Shank Shape | M Material H Hardness | Catalog No. Type | Shape Point Shape | B Point Length | Select point shape Point Shape A~G below |
|---|---|---|---|---|---|
|  | SKH51 equiv. 61~64HRC | KEBJ | A D R E G | S L |  |

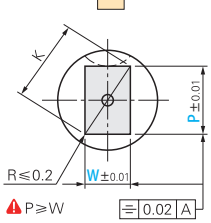


Point Shape A





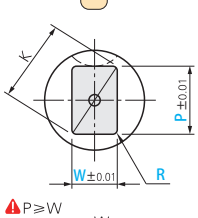
Point Shape D





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

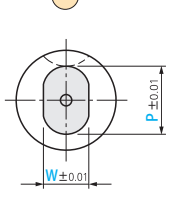
Point Shape R





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

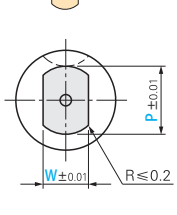
Point Shape E





- P>W

Point Shape G





- P>W

| Catalog No. Type | D | L | Specified unit 0.01 mm Ⓐ min. P max. | DREG P・Kmax. | DREG P・Wmin. | Ⓡ R | B | d (hole dia.) |
|---|---|---|---|---|---|---|---|---|
| S | 10 | 71 80 90 100 | 3.00~ 9.97 | 9.90 | 3.00 | 0.15 ≦ W/2 max. | 13 | 1.5 |
| ⒶKEBJAS | 13 | | 6.00~12.97 | 12.90 | 6.00 | | | 1.8 |
| ⒹKEBJDS | 16 | | 10.00~15.97 | 15.90 | 6.00 | | 19 | 2.8 |
| ⓇKEBJRS | 20 | | 13.00~19.97 | 19.90 | 6.00 | | | |
| ⒺKEBJES | 25 | | 18.00~24.97 | 24.90 | 6.00 | | | |
| ⒼKEBJGS | 32 | | 22.00~31.97 | 31.90 | 6.00 | | | |
| L | 10 | 80 90 100 | 3.00~ 9.97 | 9.90 | 3.00 | only Ⓡ | 19 | 1.5 |
| ⒶKEBJAL | 13 | | 6.00~12.97 | 12.90 | 6.00 | | | 1.8 |
| ⒹKEBJDL | 16 | | 10.00~15.97 | 15.90 | 6.00 | | 25 | 2.8 |
| ⓇKEBJRL | 20 | | 13.00~19.97 | 19.90 | 6.00 | | | |
| ⒺKEBJEL | 25 | | 18.00~24.97 | 24.90 | 6.00 | | | |
| ⒼKEBJGL | 32 | | 22.00~31.97 | 31.90 | 6.00 | | | |

ORDER

Catalog No. — L — P — W — R (only Ⓡ)

KEBJAS 13 — 71 — P12.56

ADDITIONS ORDER

Catalog No. — L (LC) — P (PC) — W (WC) — R — (BC・KC…etc.)

KEBJAS 13 — LC78.5 — P12.56

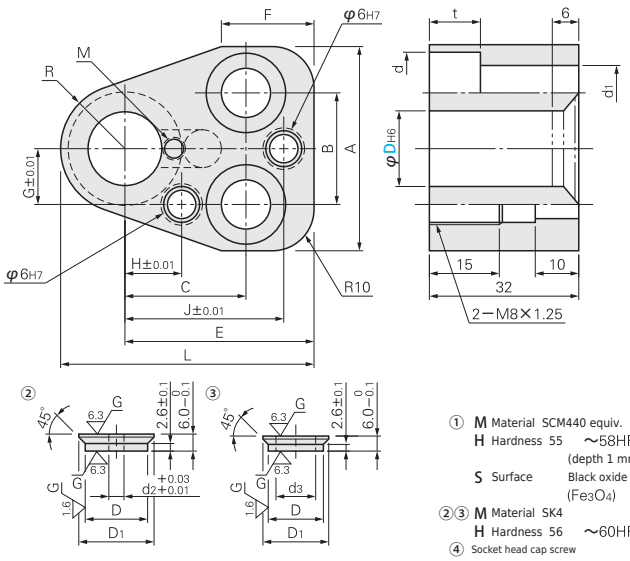
| Alterations | Code | Ⓐ | DREG |
|---|---|---|---|
| Point Alterations — PC / WC | PC WC | Change point dim. PC≧PCmin. Unit: 0.01 mm<br>D / PCmin.: 10 2.80; 13 5.00; 16 8.00; 20 9.00; 25 9.00; 32 15.00 | Change point dim. PC・WC≧PC・WCmin. Unit: 0.01 mm<br>D / PC・WCmin.: 10 2.80; 13 5.00; 16 5.00; 20 5.00; 25 5.00; 32 5.00 |
| Point Alterations — BC | BC | Change point length 2≦BC<B Unit: 0.1 mm | |
| Point Alterations — PKC | PKC | Change point dim. tol. $P^{+0.01}_{0} \Rightarrow P^{+0.005}_{0}$ | Change point dim. tol. $P・W\pm0.01 \Rightarrow P^{+0.01}_{0}$ |
| Point Alterations — SC | SC | Point land polishing<br>E P dim. tolerance and unit unchanged.<br>X Pt. Dshape: corner R=0 not specifiable | |

| Alterations | Code | Ⓐ | DREG |
|---|---|---|---|
| Point Alts. — PRC±0.05 | PRC | Radius on point edge 0.3≦PRC≦1 Unit: 0.1 mm<br>E PRC≦(P−d−0.5)/2<br>X Not with PCC | —— |
| Point Alts. — PCC±0.05 | PCC | Chamfer on point edge 0.3≦PCC≦1 Unit: 0.1 mm<br>E PCC≦(P−d−0.5)/2<br>X Not with PRC | —— |
| OAL Alts. — LC | LC | Change OAL L −(B−2)≦LC<L Unit 0.1 mm (0.01 mm when combined with LKC)<br>E Point length B reduced by (L-LC). | |
| OAL Alts. — LKT | LKC | Change OAL tol. $L^{+0.3}_{0} \Rightarrow L^{+0.05}_{0}$ | |
| Other | KC | —— | 0° 90° 180° 270° Change ball position Unit: 1° |

| Use | Catalog No. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | D |
|---|---|---|---|---|---|---|---|---|---|
| Punch | KCLN—P | ○ | ○ | | ○ | ○ | ○ | ○ | 10～32 |
| Die btn | KCLN—D | ○ | | ○ | ○ | ○ | ○ | ○ | 13～38 |
| Punch body +Plug | KCLN—PP | ○ | ○ | | | | | | 10～32 |
| Die body +Plug | KCLN—DN | ○ | | ○ | | | | | 13～38 |




Use light duty punches only - heavy duty punches cannot be used.




① M Material SCM440 equiv.
H Hardness 55 ～58HRC (depth 1 mm)
S Surface Black oxide finish ($Fe_3O_4$)

②③ M Material SK4
H Hardness 56 ～60HRC

④ Socket head cap screw

| Catalog No. Type | D | DH6 | A | B | C | E | F | G | H | J | L | R | D1 | d | d1 | t | d2 | M | d3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (punch) | (10) | +0.009 0 | 37 | 20 | 21 | 35 | 20 | 10 | 9 | 29 | 44.5 | 9.5 | 16 | 14 | 9 | 10 | 6 | 4 | — |
| ①②④⑤⑥⑦ KCLN—P ①② KCLN—PP | 13 | +0.011 0 | 43 | 26 | 23 | 38 | | 13 | 11 | 32 | 50 | 12 | 19 | | | | | | 6.2 |
| | 16 | | 44 | 24 | 26 | 40 | | | 12 | 34 | 54 | 14 | 22 | 17 | 11 | 12 | | | 9 |
| (die button) | 20 | +0.013 0 | 48 | 28 | 27 | 42 | | 16 | 14 | 36 | 59 | 17 | 26 | | | | | | 12 |
| | 25 | | 50 | 30 | 30 | 46 | | 18 | 17 | 39 | 65.5 | 19.5 | 31 | | | | | | 17 |
| ①③④⑤⑥⑦ KCLN—D ①③ KCLN—DN | 32 | +0.016 0 | 54 | | 33 | 48 | | 21 | 20 | 42 | 71 | 23 | 38 | 19 | 13 | 14 | | | 21 |
| | (38) | | 58 | | 35 | 52 | | 23 | 23 | 46 | 78 | 26 | 44 | | | | — | | 27 |

D10: punches only; D38: die buttons only.

| Catalog No. Type | D | A Accessories |
|---|---|---|
| KCLN—P KCLN—PP KCLN—D KCLN—DN | (10) | ④M8—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20 |
| | 13 | |
| | 16 | ④M10—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20 |
| | 20 | |
| | 25 | |
| | 32 | ④M12—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20 |
| | (38) | |

ORDER

Catalog No.
KCLN—P 16

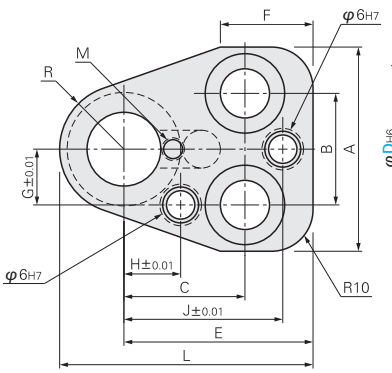
# Ball Lock Retainers — Heavy Duty, Compact-

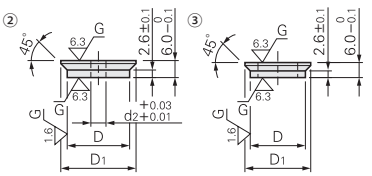
## BALL-LOCK RETAINERS—HEAVY LOAD TYPE • COMPACT—

| Use | Catalog No. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | D |
|---|---|---|---|---|---|---|---|---|---|
| Punch | KCBN—P | ○ | ○ | | ○ | ○ | ○ | ○ | 10～32 |
| | KCBN—PN | ○ | | ○ | ○ | ○ | ○ | ○ | |
| Body＋Plug | KCBN—PP | ○ | ○ | | | | | | |
| | KCBN—PNP | ○ | | ○ | | | | | |




Use heavy duty punches only - light duty punches cannot be used.




① **M** Material SCM440 equiv.
**H** Hardness 55 ～58HRC (depth 1 mm)
**S** Surface Black oxide finish ($Fe_3O_4$)
②③ **M** Material SK4
**H** Hardness 56 ～60HRC
④ Socket head cap screw

| Catalog No. Type | D | DH6 | A | B | C | E | F | G | H | J | L | R | D1 | d | d1 | t | d2 | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (punch) | 10 | +0.009 0 | 37 | 20 | 21 | 35 | 20 | 10 | 9 | 29 | 44.5 | 9.5 | 16 | 14 | 9 | 10 | 6 | 4 |
| | 13 | +0.011 0 | 43 | 26 | 23 | 38 | | 13 | 11 | 32 | 50 | 12 | 19 | | | | | |
| ①②④⑤⑥⑦ KCBN—P ①② KCBN—PP | 16 | | 44 | 24 | 26 | 40 | | | 12 | 34 | 54 | 14 | 22 | 17 | 11 | 12 | | |
| | 20 | +0.013 0 | 48 | 28 | 27 | 42 | | 16 | 14 | 36 | 59 | 17 | 26 | | | | | |
| ①③④⑤⑥⑦ KCBN—PN ①③ KCBN—PNP | 25 | | 50 | 30 | 30 | 46 | | 18 | 17 | 39 | 65.5 | 19.5 | 31 | | | | | |
| | 32 | +0.016 0 | 54 | | 33 | 48 | | 21 | 20 | 42 | 71 | 23 | 38 | 19 | 13 | 14 | | |

| Catalog No. Type | D | A Accessories |
|---|---|---|
| KCBN—P KCBN—PP | 10 | ④M8—45 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20 |
| | 13 | |
| | 16 | ④M10—50 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20 |
| KCBN—PN KCBN—PNP | 20 | |
| | 25 | |
| | 32 | ④M12—50 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20 |

ORDER

Catalog No.
KCBN—P 10

# Ball Lock Retainers — Light Duty, Triangular-

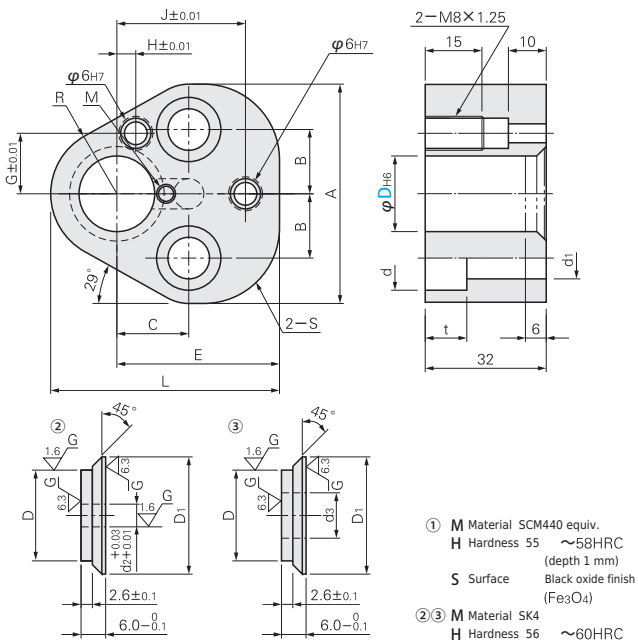


KAYAN

| Use | Catalog No. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | D |
|---|---|---|---|---|---|---|---|---|---|
| Punch | KCRN—P | ○ | ○ | | ○ | ○ | ○ | ○ | 10～32 |
| Die btn | KCRN—D | ○ | | ○ | ○ | ○ | ○ | ○ | 13～38 |
| Punch body +Plug | KCRN—PP | ○ | ○ | | | | | | 10～32 |
| Die body +Plug | KCRN—DN | ○ | | ○ | | | | | 13～38 |




Use light duty punches only - heavy duty punches cannot be used.




① M Material SCM440 equiv.
H Hardness 55 ～58HRC (depth 1 mm)
S Surface Black oxide finish ($Fe_3O_4$)
②③ M Material SK4
H Hardness 56 ～60HRC
④ Socket head cap screw

| Catalog No. Type | D | DH6 | A | B | C | E | G | H | J | L | R | S | D1 | d | d1 | t | d2 | d3 | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (punch) | (10) | +0.009 0 | 43.7 | 11.12 | 19.05 | 35.0 | 9.0 | 7.5 | 26.925 | 44.5 | 9.5 | 12.0 | 16 | 14 | 9 | 9 | 6 | — | 4 |
| ①②④⑤⑥⑦ KCRN—P ①② KCRN—PP | 13 | +0.011 0 | 50.0 | 14.27 | | 38.1 | 12.0 | 6.5 | 29.970 | 50.8 | 12.7 | 15.2 | 19 | | | | | 6.2 | |
| | 16 | | 53.2 | 15.87 | | 39.7 | 13.5 | 6.0 | 31.750 | 54.0 | 14.3 | 16.8 | 22 | | | | | 9 | |
| (die button) | 20 | +0.013 0 | 59.5 | 17.47 | | 42.8 | 16.5 | 5.0 | 33.530 | 60.3 | 17.5 | 20.0 | 26 | 17 | 11 | 11 | | 12 | |
| ①③④⑤⑥⑦ KCRN—D ①③ KCRN—DN | 25 | | 69.1 | 19.84 | 23.82 | 47.7 | 22.0 | 7.0 | 40.640 | 69.9 | 22.2 | 24.7 | 31 | 19 | 13 | 14 | | 17 | |
| | 32 | +0.016 0 | | | | | | | | | | | 38 | | | | | 21 | |
| | (38) | | 76.6 | 24.00 | 27.00 | 51.4 | 26.0 | 10.0 | 43.993 | 77.4 | 26.0 | 28.5 | 44 | | | | — | 27 | |

D10: punches only; D38: die buttons only.

| Catalog No. Type | D | A Accessories |
|---|---|---|
| KCRN—P KCRN—PP KCRN—D KCRN—DN | (10) | ④M8—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20 |
| | 13 | |
| | 16 | |
| | 20 | ④M10—40 ⑥MSW8 ⑤MSTM6—30 ⑦MS6—20 |
| | 25 | ④M12—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20 |
| | 32 | |
| | (38) | |

ORDER

Catalog No.
KCRN—P 16

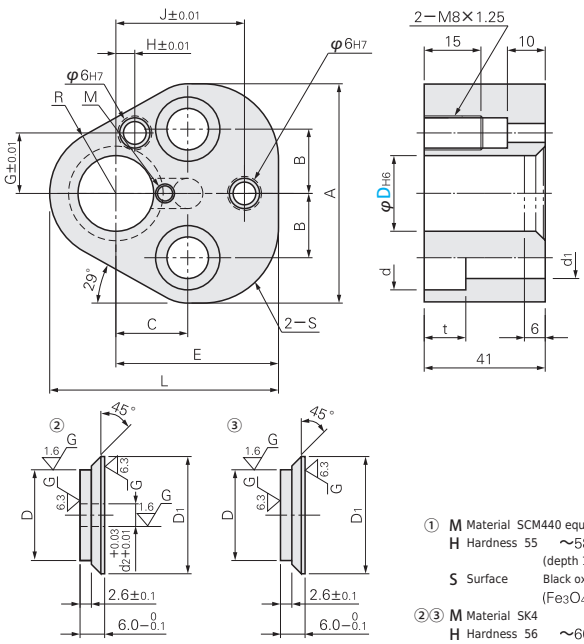
# Ball Lock Retainers — Heavy Duty, Triangular-

## BALL-LOCK RETAINERS—HEAVY LOAD TYPE • TRIANGLE—

| Use | Catalog No. | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | D |
|---|---|---|---|---|---|---|---|---|---|
| Punch | BRN −P | ○ | ○ | | ○ | ○ | ○ | ○ | 10〜32 |
| | BRN −PN | ○ | | ○ | ○ | ○ | ○ | ○ | |
| Body+Plug | BRN −PP | ○ | ○ | | | | | | |
| | BRN −PNP | ○ | | ○ | | | | | |




Use heavy duty punches only - light duty punches cannot be used.




① M Material SCM440 equiv.
H Hardness 55 〜58HRC (depth 1 mm)
S Surface Black oxide finish ($Fe_3O_4$)
②③ M Material SK4
H Hardness 56 〜60HRC
④ Socket head cap screw

| Catalog No. Type | D | DH6 | A | B | C | E | G | H | J | L | R | S | d | d1 | t | D1 | d2 | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (punch) | 10 | +0.009 0 | 43.7 | 11.12 | 19.05 | 35.0 | 9.0 | 7.5 | 26.925 | 44.5 | 9.5 | 12.0 | 14 | 9 | 9 | 16 | 6 | 4 |
| ①②④⑤⑥⑦ KBRN−P | 13 | +0.011 0 | 50.0 | 14.27 | | 38.1 | 12.0 | 6.5 | 29.970 | 50.8 | 12.7 | 15.2 | | | | 19 | | |
| ①② KBRN−PP | 16 | | 53.2 | 15.87 | | 39.7 | 13.5 | 6.0 | 31.750 | 54.0 | 14.3 | 16.8 | | | | 22 | | |
| ①③④⑤⑥⑦ KBRN−P | 20 | +0.013 0 | 59.5 | 17.47 | | 42.8 | 16.5 | 5.0 | 33.530 | 60.3 | 17.5 | 20.0 | 17 | 11 | 11 | 26 | | |
| ①③ KBRN−PNP | 25 | | 69.1 | 19.84 | 23.82 | 47.7 | 22.0 | 7.0 | 40.640 | 69.9 | 22.2 | 24.7 | 19 | 13 | 14 | 31 | | |
| | 32 | +0.016 0 | | | | | | | | | | | | | | 38 | | |

| Catalog No. Type | D | A Accessories |
|---|---|---|
| KBRN−P KBRN−PP | 10 | ④M8−45 ⑤MSTM6−30 ⑥MSW8 ⑦MS6−20 |
| | 13 | |
| | 16 | |
| KBRN−P KBRN−PNP | 20 | ④M10−50 ⑥MSW8 ⑤MSTM6−30 ⑦MS6−20 |
| | 25 | ④M12−50 ⑤MSTM6−30 ⑥MSW8 ⑦MS6−20 |
| | 32 | |

ORDER

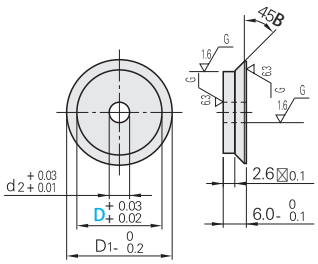
Catalog No.
KBRN−P 20
BRN−P・BRN−PP (D≤10)

## ■ Ball Lock Plugs

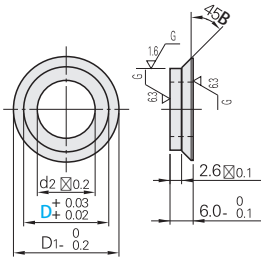


## ■ Ball Lock Backing Plates

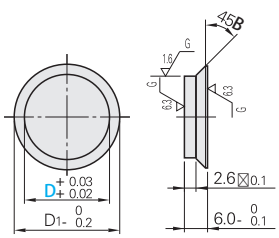
**KBPN—LR** (punch)




**KBDN—LR** (die button)




**KBNN—BR** (no dowel hole)




M Material SK4 H Hardness 56~60HRC

| Applicable retainer | D1 | d2 | Catalog No. Type | Catalog No. D |
|---|---|---|---|---|
| KCRN—P KCLN—PS KBRN—P KCLN—FS KCLN—P KLRGD—L/R KCBN—P KBRGD—L/R | 16 | 6 | KBPN—LR | 10 |
| | 19 | | | 13 |
| | 22 | | | 16 |
| | 26 | | | 20 |
| | 31 | | | 25 |
| | 38 | | | 32 |
| KCRN—D KCLN—D | 19 | 6.2 | KBDN—LR | 13 |
| | 22 | 9 | | 16 |
| | 26 | 12 | | 20 |
| | 31 | 17 | | 25 |
| | 38 | 21 | | 32 |
| | 44 | 27 | | 38 |
| KBRN—P KCBN—PN | 16 | — | KBNN—BR | 10 |
| | 19 | | | 13 |
| | 22 | | | 16 |
| | 26 | | | 20 |
| | 31 | | | 25 |
| | 38 | | | 32 |

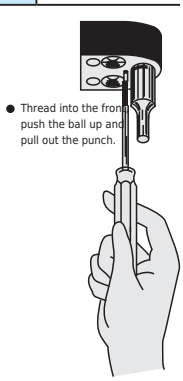
ORDER Catalog No. KBPN—LR25

## ■ Balls for Ball Lock Retainers

| Applicable retainer | | D | Catalog No. |
|---|---|---|---|
| Light duty | KCLN—P KCRN—P CCRN KCLN—PS KCLN—FS KCLN—D KCRN—D | 10～38 | BB 8 |
| Heavy duty | KCBN—P KCRN—P KCBN—PN KBRN—PN | 10 | BB 10 |
| | | 13～32 | BB 13 |

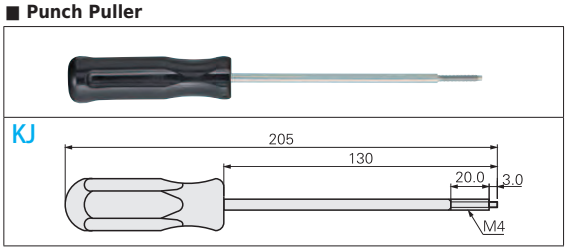
## ■ Springs for Ball Lock Retainers

| Applicable retainer | | D | Catalog No. |
|---|---|---|---|
| Light duty | KCLN—P KCRN—P CCRN KCLN—PS KCLN—FS KCLN—D KCRN—D | 10～38 | BF 8 |
| Heavy duty | KCBN—P KCRN—P KCBN—PN KBRN—PN | 10 | BF 10 |
| | | 13～32 | BF 13 |

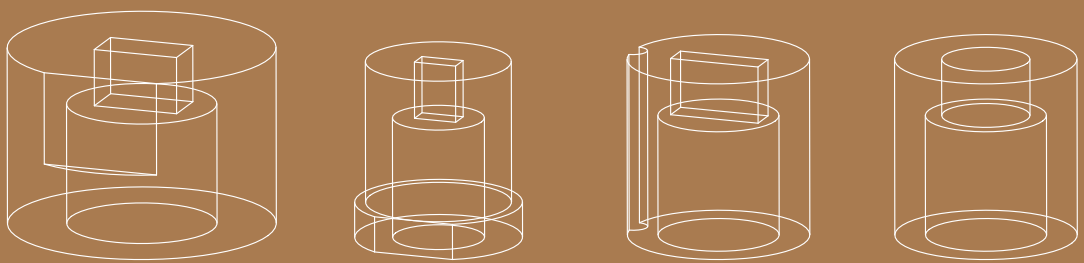


● Thread into the front, push the ball up and pull out the punch.

## ■ Punch Puller




ORDER Catalog No. KJ



# Die Buttons
## BUTTON DIES

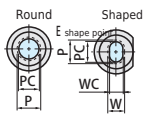
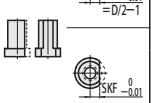

41 Die Button Alterations Overview
42 Taper-Relief Die Buttons - Headed-
43 Taper-Relief Die Buttons - Headless-
44 Die Buttons - Headed, Standard-
45 Die Buttons - Headless, Standard-
46 Pin-Keyed Die Buttons — Standard / Economy-
47 Pin-Keyed Die Buttons — Extended Point-

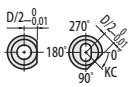
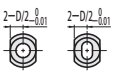
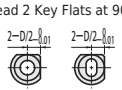
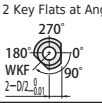
# Die Button Alterations Overview

BUTTON DIES—DETAIL GUIDE of ADDITION—

KAYAN

| Code No. | L (C) | P (C) | W (C) | R (only R) | (BC·KC ···etc) |
|---|---|---|---|---|---|
| KAHDE6 | —LC29.0 — | P3.58 — | W1.66 — | | BC4.0 |

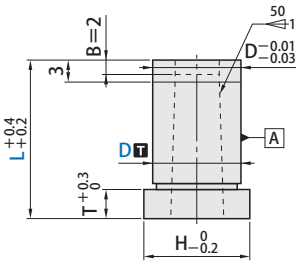
| Add. | Code | Alteration Description |
|---|---|---|
| P·W Dimension Change<br>Round Shaped<br>  | PC (4)<br>WC (4) | Round: Reduce point dim. "P"<br>min: P>PC≥Pmin./2≥1.00 max: P<PC≤P·Kmax.+0.2<br>in 0.01<br>⚠ Round point, 1.00 ≤ PC ≤ 1.99:, b=4 |
| | | Shaped: Change point dims. "P·W"<br>min: P>PC≥Pmin./2≥1.00 max: P<PC≤P·Kmax.+0.2<br>W>WC≥Wmin./2≥1.00 W<WC≤P·Kmax.+0.2<br>in 0.01 |
| B Dimension Change<br>  | BC (4) | Change point length "B"<br>1≤BC≤4<br>in 0.1<br>NO P<1.00 N/A |
| L Dimension Change<br>  | LC (4) | Reduce overall length "L"<br>10≤LC<L<br>in 0.1→w/ LKC·LKP: allows in 0.01<br>⚠ Press-in lead reduced accordingly(L-LC ) |
| H Dimension Change<br>  | HC (4) | Reduce shoulder dia. "H"<br>D≤HC<H<br>in 0.1 |
| T Dimension Change<br>  | TC (4) | Reduce shoulder thickness "T"<br>2≤TC<T<br>in 0.1→w/ TKC (M): allows in 0.01<br>⚠ L reduced accordingly (T-TC); with LC, LC unchanged |
| Point Edge Chamfer<br>  | HCC (6) | Chamfer die button top outer edge<br>0.3≤HCC≤1.0<br>D−2×HCC≥P+0.2<br>in 0.1 |
| Point Radius<br>  | HRC (12) | Machine die button top outer edge R<br>0.3≤HRC≤1.0<br>D−2×HRC≥P+0.2<br>in 0.1 |
| Shank Key Flat<br>  | SKC (19) | Add 1 key flat on shank<br>⚠ Applies to D≥8, L≥20<br>NO Cannot be combined with KC, WKC, CKC, WKF, SKF |
|  | SKF (25) | Add 1 key flat of specified size on shank<br>P·Kmax./2+1.2≤SKF<D/2<br>in 0.1<br>⚠ Applies to D≥8, L≥20<br>NO Cannot be combined with KC, WKC, SKC, CKC, WKF |

| Add. | Code | Alteration Description |
|---|---|---|
| Relief Hole Size Specified<br>  | ANC (6) | Change relief hole size of taper-relief die button as specified<br>AN<ANC≤P+4≤Pmax. [AN=P+(L−B)/50] (Fig. 1)<br>⚠ K (Relief angle)≤5 {K=tan⁻¹[(ANC−P)/2(L−B)]} Fig. 1)<br>⚠ B≤(P−0.6)/tanK(round) (Fig. 2) ⚠ B≤(W−0.6)/tanK(shaped) (Fig. 2)<br>in 0.1<br>⚠ B(C Keep ≥0.6 mm clearance between point and EDM wire (Fig. 2)<br>⚠ Shaped point: full perimeter cut at relief angle K from P and ANC (Fig. 3)<br>Fig. 1 P 50 1 B L K(Relief angle) AN(Std. relief hole size) ANC(Specified relief hole size)<br>Fig. 2 P·W 0.6 or more Point EDM wire<br>Fig. 3 W P B |
| Head Key Flat<br>  | KC (6) | Round: Add 1 key flat<br>NO Cannot be combined with WKC, CKC, WKF, SKC, SKF |
| | | Shaped: Change std. key-flat position<br>0<KC<360<br>in 1 ⚠ OK with WKC, CKC<br>NO Not with WKF, SKC, SKF |
| Head 2 Parallel Key Flats<br>  | WKC<br>Round(12)<br>Shaped(6) | Round: Add 2 parallel key flats<br>NO Cannot be combined with KC, CKC, WKF, SKC, SKF |
| | | Shaped: Add 2 parallel key flats<br>⚠ Can be combined with KC<br>NO Not with CKC, WKF, SKC, SKF<br>Combined with KC 270° 180° 0° 90° KC |
| Head 2 Key Flats at 90°<br>  | CKC<br>Round(12)<br>Shaped(6) | Add 2 key flats on head at 0° and 270°<br>⚠ Shaped: can be combined with KC<br>NO Not with WKC, WKF, SKC, SKF<br>Combined with KC 270° 180° 0° KC 90° |
| Head 2 Key Flats at Angle<br>  | WKF<br>Round(19)<br>Shaped(12) | Add 2 key flats on head at 0° and specified angle<br>0<WKF<360<br>in 1<br>NO Cannot be combined with KC, WKC, CKC, SKC, SKF |
| Shank Key Flat Tol. Change<br>  | SKKC (12) | Must be combined with SKC, SKF |
| L Dim. Tolerance Change<br>  | LKC (12) | L +0.4 +0.2 → +0.05 0 |
| | LKP (19) | L +0.4 +0.2 → +0.01 0 |
| T Dim. Tolerance Change<br>  | TKC (6) | T +0.3 0 → +0.02 0 |
| | TKCM (6) | T +0.3 0 → 0 −0.02 |

# Taper-Relief Die Buttons - Headed-

## ANGULAR BUTTON DIES—HEAD TYPE—





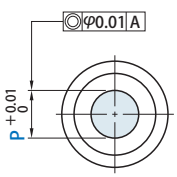

| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40:Powder-metallurgy HSS(JIS G4403.2000)

⚠ Point shapes A·E·R·D·G viewed from point side

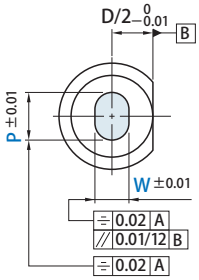
### Point Shape

**A**



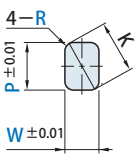

**E**

⚠ P＞W



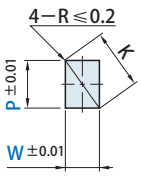

**R**

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



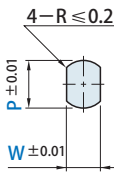

**D**

⚠ P≧W
⚠ $K=\sqrt{P^2+W^2}$




**G**

⚠ P＞W

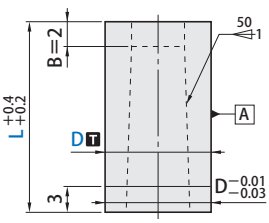



| Tol. · Material (Shank dia. tol. T) | Code No. Code | Shape (Point Shape) | D | L | P (Ⓐ) (in 0.01) | P·Kmax. (Ⓔ Ⓡ Ⓓ Ⓖ) | P·Wmin. (Ⓔ Ⓡ Ⓓ Ⓖ) | R (Ⓡ) | H |
|---|---|---|---|---|---|---|---|---|---|
| Dm5 SKH51 SKH40 / D +0.005 0 SKH51 SKH40 | T=3 KAHD KPAHD / KA—AHD KA—PAHD | A | 3 | 8 13 | 0.30～ 0.70 | — | — | — | 4 |
| | T=5 KAHD5T KPAHD5T / KA—AHD5T KA—PAHD5T | A | 4 | 8 13 16 20 22 25 28 30 | 0.50～ 1.50 | — | — | — | 5 |
| | | A | 5 | 8 13 16 20 22 25 28 30 | 0.50～ 2.50 | — | — | — | 6 |
| Dm5 SKH51 SKH40 / D +0.005 0 SKH51 SKH40 | T=5 KAHD KPAHD / KA—AHD KA—PAHD | A Shape A Not required | 6 | 16 20 22 25 28 30 32 35 | 1.00～ 3.00 | 3.00 | 1.00 | 0.15≦R＜W/2( only | 9 |
| | KAHD□ KPAHD□ / KA—AHD□ KA—PAHD□ | A | 8 | 16 20 22 25 28 30 32 35 | 1.00～ 4.00 | 4.00 | 1.00 | | 11 |
| | | E | 10 | 16 20 22 25 28 30 32 35 40 | 2.00～ 6.00 | 6.00 | 1.20 | | 13 |
| | | E | 13 | 16 20 22 25 28 30 32 35 40 | 3.00～ 8.00 | 8.00 | 1.50 | | 16 |
| | | R | 16 | 16 20 22 25 28 30 32 35 40 | 5.00～10.00 | 10.00 | 2.00 | | 19 |
| | | D | 20 | 16 20 22 25 28 30 32 35 40 | 7.00～12.00 | 12.00 | 3.00 | | 23 |
| | | D | 22 | 16 20 22 25 28 30 32 35 40 | 8.00～14.00 | 14.00 | 3.00 | | 25 |
| | | G | 25 | 16 20 22 25 28 30 32 35 40 | 10.00～16.00 | 16.00 | 3.00 | | 28 |

ORDER

| Code No. | L | P | W | R (only R) |
|---|---|---|---|---|
| KAHDR13 — | 25 | — P7.52 | — W2.86 | — R0.58 |





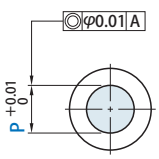

| Material | Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40: Powder-metallurgy HSS (JIS G4403.2000)

⚠ Point shapes A·E·R·D·G viewed from point side

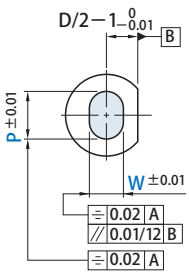
## Point Shape

### A



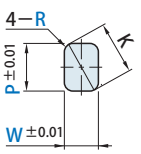

### E

⚠ P＞W



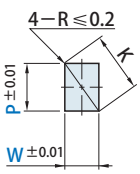

### R

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



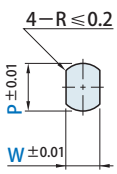

### D

⚠ P≧W
⚠ $K=\sqrt{P^2+W^2}$




### G

⚠ P＞W




| Tol. · Material (Shank dia. tol. T) | Code No. Code | Shape (Point Shape) | D | L | P Ⓐ (in 0.01) | P·Kmax. Ⓔ Ⓡ Ⓓ Ⓖ | P·Wmin. Ⓔ Ⓡ Ⓓ Ⓖ | R Ⓡ |
|---|---|---|---|---|---|---|---|---|
| Dn5 SKH51 / SKH40 | KASD / KPASD | Ⓐ | 3 | 8 13 | 0.30～ 0.70 | — | — | — |
| | | | 4 | 8 13 16 20 22 25 28 30 | 0.50～ 1.50 | — | — | |
| D +0.005 0 SKH51 / SKH40 | KA — ASD / KA — PASD | | 5 | 8 13 16 20 22 25 28 30 | 0.50～ 2.50 | — | — | |
| Dn5 SKD11 / SKH40 | KASD / KPASD | Ⓐ Shape A Not required | 6 | 16 20 22 25 28 30 32 35 | 1.00～ 3.00 | — | — | 0.15≦R＜W/2 (only) |
| | KASD□ / KPASD□ | Ⓔ | 8 | 16 20 22 25 28 30 32 35 | 1.00～ 4.00 | 4.00 | 1.00 | |
| | | | 10 | 16 20 22 25 28 30 32 35 | 2.00～ 6.00 | 6.00 | 1.20 | |
| | | | 13 | 16 20 22 25 28 30 32 35 | 3.00～ 8.00 | 8.00 | 1.50 | |
| D +0.005 0 SKD11 / SKH40 | KA — ASD / KA — PASD | Ⓡ | 16 | 16 20 22 25 28 30 32 35 | 5.00～10.00 | 10.00 | 2.00 | |
| | KA — ASD□ / KA — PASD□ | Ⓓ | 20 | 16 20 22 25 28 30 32 35 | 7.00～12.00 | 12.00 | 3.00 | |
| | | | 22 | 16 20 22 25 28 30 32 35 | 8.00～14.00 | 14.00 | 3.00 | |
| | | Ⓖ | 25 | 16 20 22 25 28 30 32 35 | 10.00～16.00 | 16.00 | 3.00 | |

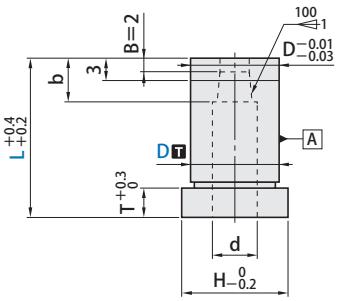
ORDER

| Code No. | L | P | W | R (only R) |
|---|---|---|---|---|
| KASDD10 — | 20 — | P5.00 — | W2.00 | |

# Die Buttons - Headed, Standard-

## BUTTON DIES—NORMAL • HEAD TYPE—





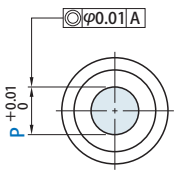

| Material | Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40: Powder-metallurgy HSS (JIS G4403.2000)

⚠ Point shapes A·E·R·D·G viewed from point side

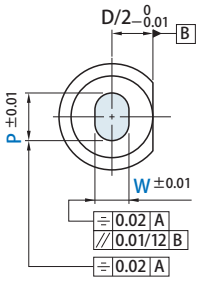
### Point Shape

**A**



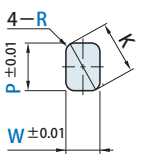

**E**

⚠ P＞W



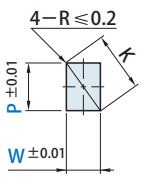

**R**

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



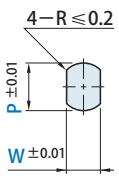

**D**

⚠ P≧W
⚠ $K=\sqrt{P^2+W^2}$




**G**

⚠ P＞W



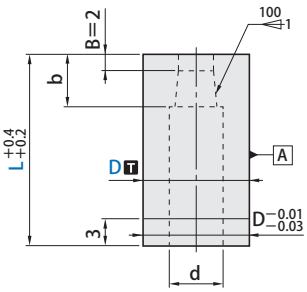

| Tol. · Material (Shank dia. to T) | Code No. Code | Shape (Point Shape) | D | L | P (A) | P·Kmax. (E R D G) | P·Wmin. (E R D G) | R (R) | b | d | H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | in 0.01 | | | | | | |
| Dm5 SKH51 D +0.005 0 | T=3 KMHD / KA—MHD | A | 3 | 16 20 | 0.30～1.00 | — | — | — | 2 | 2.0 | 4 |
| | T=5 KMHD5T / KA—MHD5T | A | 4 | 16 20 22 25 28 30 | 0.50～2.00 | — | — | — | 2 | 2.4 | 5 |
| | | A | 5 | 16 20 22 25 28 30 | 0.50～2.50 | — | — | — | 2 | 2.9 | 6 |
| SKD11 Dm5 SKH40 D +0.005 0 | T=5 (D6～56) KMHD / KA — MHD; (D6～25) KPMHD / KA — PMHD | A Shape A Not required; E R D G | 6 | 16 20 22 25 28 30 32 35 40 | 1.00～3.00 | 3.00 | 1.00 | 0.15≦R＜W/2 only | 3 | 3.4 | 9 |
| | | | 8 | 16 20 22 25 28 30 32 35 40 | 1.00～4.00 | 4.00 | 1.00 | | 4 | 4.4 | 11 |
| | | | 10 | 16 20 22 25 28 30 32 35 40 45 | 2.00～6.00 | 6.00 | 1.20 | | 6 | 6.4 | 13 |
| | KHD□ / KA — HD□; (D6～25) KPHD□ / KA — PHD□ | | 13 | 16 20 22 25 28 30 32 35 40 45 | 3.00～8.00 | 8.00 | 1.50 | | 8 | 8.4 | 16 |
| | | | 16 | 16 20 22 25 28 30 32 35 40 45 | 5.00～10.00 | 10.00 | 2.00 | | | 10.6 | 19 |
| | | | 20 | 16 20 22 25 28 30 32 35 40 45 | 7.00～12.00 | 12.00 | 3.00 | | | 12.6 | 23 |
| | | | 22 | 16 20 22 25 28 30 32 35 40 45 | 8.00～14.00 | 14.00 | 3.00 | | | 14.6 | 25 |
| | | | 25 | 16 20 22 25 28 30 32 35 40 45 | 10.00～16.00 | 16.00 | 3.00 | | | 16.6 | 28 |
| | | | 32 | 16 20 22 25 28 30 32 35 40 | 15.00～20.00 | 20.00 | 4.00 | | | 20.6 | 35 |
| | | | 38 | 16 20 22 25 28 30 32 35 40 | 19.00～26.00 | 26.00 | 5.00 | | | 26.6 | 41 |
| | | | 45 | 20 22 25 30 35 | 25.00～35.00 | 35.00 | 6.00 | | | 36.0 | 48 |
| | | | 50 | 20 22 25 30 35 | 33.00～40.00 | 40.00 | 7.00 | | | 41.0 | 53 |
| | | | 56 | 20 22 25 30 35 | 38.00～45.00 | 45.00 | 8.00 | | | 46.0 | 59 |

⚠ D3 Thin wall under head - avoid damage when installing

ORDER

| Code No. | L | P | W | R (only R) |
|---|---|---|---|---|
| KHDD25 | — 35 | — P10.55 | — W3.05 | |





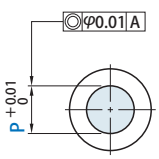

| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40: Powder-metallurgy HSS (JIS G4403.2000)

⚠ Point shapes A·E·R·D·G viewed from point side

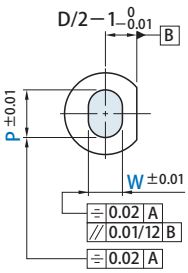
## Point Shape

**A**



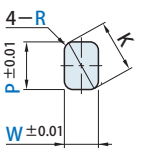

**E**

⚠ P＞W



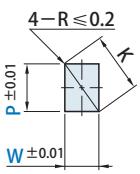

**R**

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



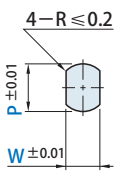

**D**

⚠ P≧W
⚠ $K=\sqrt{P^2+W^2}$




**G**

⚠ P＞W




| Tol. · Material (Shank dia. tol. T) | Code No. Code | Shape (Point Shape) | D | L | P (A) | P·Kmax. (E R D G) | P·Wmin. (E R D G) | R (R) | b | d |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | in 0.01 | | | | | |
| Dn5 SKH51 $D^{+0.005}_{0}$ | KMSD<br>KA—MSD | A | 3 | 16 20 | 0.30～ 1.00 | — | — | — | 2 | 2.0 |
| | | | 4 | 16 20 22 25 28 30 | 0.50～ 2.00 | — | — | | | 2.4 |
| | | | 5 | 16 20 22 25 28 30 | 0.50～ 2.50 | — | — | | | 2.9 |
| Dn5 SKD11 $D^{+0.005}_{0}$ | (D6～56) KMSD KSD □<br>(D6～25) KPMSD KPSD □<br>(D6～56) KA—MSD KA—SD□<br>(D6～25) KA—PMSD KA—PSD□ | A Shape A Not required<br>E<br>R<br>D<br>G | 6 | 16 20 22 25 28 30 32 35 | 1.00～ 3.00 | — | — | — | 3 | 3.4 |
| | | | 8 | 16 20 22 25 28 30 32 35 | 1.00～ 4.00 | 4.00 | 1.00 | 0.15≦R＜W/2( only | 4 | 4.4 |
| | | | 10 | 16 20 22 25 28 30 32 35 40 | 2.00～ 6.00 | 6.00 | 1.20 | | 6 | 6.4 |
| | | | 13 | 16 20 22 25 28 30 32 35 40 | 3.00～ 8.00 | 8.00 | 1.50 | | 8 | 8.4 |
| | | | 16 | 16 20 22 25 28 30 32 35 40 | 5.00～10.00 | 10.00 | 2.00 | | | 10.6 |
| | | | 20 | 16 20 22 25 28 30 32 35 40 | 7.00～12.00 | 12.00 | 3.00 | | | 12.6 |
| | | | 22 | 16 20 22 25 28 30 32 35 40 | 8.00～14.00 | 14.00 | 3.00 | | | 14.6 |
| | | | 25 | 16 20 22 25 28 30 32 35 40 | 10.00～16.00 | 16.00 | 3.00 | | | 16.6 |
| | | | 32 | 16 20 22 25 28 30 32 35 | 15.00～20.00 | 20.00 | 4.00 | | | 20.6 |
| | | | 38 | 16 20 22 25 28 30 32 35 | 19.00～26.00 | 26.00 | 5.00 | | | 26.6 |
| | | | 45 | 20 22 25 30 35 | 25.00～35.00 | 35.00 | 6.00 | | | 36.0 |
| | | | 50 | 20 22 25 30 35 | 33.00～40.00 | 40.00 | 7.00 | | | 41.0 |
| | | | 56 | 20 22 25 30 35 | 38.00～45.00 | 45.00 | 8.00 | | | 46.0 |

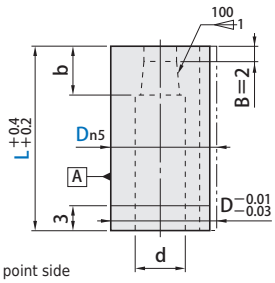
ORDER

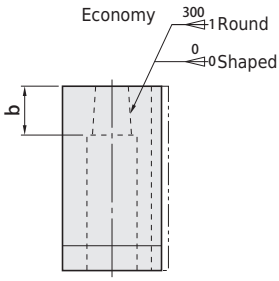
| Code No. | L | P | W | R (only R) |
|---|---|---|---|---|
| KSDR25 | — 20 | — P14.56 | — W7.22 | — R2.00 |

# Pin-Keyed Die Buttons — Standard / Economy-

## DOWEL SLOTTED BUTTON DIES—NORMAL / ECONOMICAL TYPE—





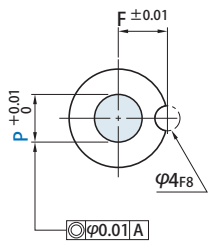

| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |

A Accessory: MMS4-15

⚠ Point shapes A·E·R·D·G viewed from point side

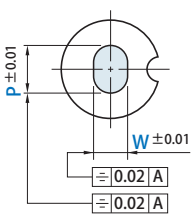
### Point Shape

**A**



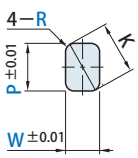

**E**

⚠ P＞W



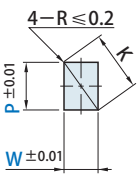

**R**

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



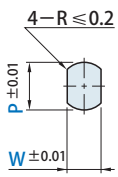

**D**

⚠ P≧W
⚠ $K=\sqrt{P^2+W^2}$




**G**

⚠ P＞W




| Tol. · Material (Shank dia. tol. T) | Code No. Code | Shape (Point Shape) | D | L | P (A) | P·Kmax. (E R D G) | P·Wmin. (E R D G) | R (R) | b | d | F |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | in 0.01 | | | | | | |
| Dn5 SKD11 | Standard KKSD KKD□ Economy KEKSD KEKD□ | A Shape A Not required / E / R / D / G | 10 | 16 20 22 25 28 30 32 35 | 2.00～ 6.00 | 6.00 | 1.20 | 0.15≦R＜W/2 ( only | 6 | 6.4 | 6 |
| | | | 13 | 16 20 22 25 28 30 32 35 | 3.00～ 8.00 | 8.00 | 1.50 | | 8 | 8.4 | 7.5 |
| | | | 16 | 16 20 22 25 28 30 32 35 | 5.00～10.00 | 10.00 | 2.00 | | | 10.6 | 8 |
| | | | 20 | 16 20 22 25 28 30 32 35 | 7.00～12.00 | 12.00 | 3.00 | | | 12.6 | 10 |
| | | | 22 | 16 20 22 25 28 30 32 35 | 8.00～14.00 | 14.00 | 3.00 | | | 14.6 | 11 |
| | | | 25 | 16 20 22 25 28 30 32 35 | 10.00～16.00 | 16.00 | 3.00 | | | 16.6 | 12.5 |
| | | | 32 | 16 20 22 25 28 30 32 35 | 15.00～20.00 | 20.00 | 4.00 | | | 20.6 | 16 |
| | | | 38 | 16 20 22 25 28 30 32 35 | 19.00～26.00 | 26.00 | 5.00 | | | 26.6 | 19 |
| | | | 45 | 20 22 25 30 35 | 25.00～35.00 | 35.00 | 6.00 | | | 36.0 | 22.5 |
| | | | 50 | 20 22 25 30 35 | 33.00～40.00 | 40.00 | 7.00 | | | 41.0 | 25 |
| | | | 56 | 20 22 25 30 35 | 38.00～45.00 | 45.00 | 8.00 | | | 46.0 | 28 |

ORDER

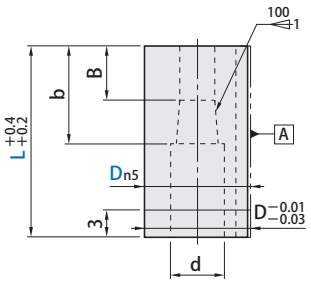
| Code No. | L | P | W | R (only R) |
|---|---|---|---|---|
| KKDD13 — | 16 — | P8.50 — | W5.00 | |

# Pin-Keyed Die Buttons — Extended Point-

## DOWEL SLOTTED BUTTON DIES—LONG CUTTING EDGE TYPE—

KAYAN





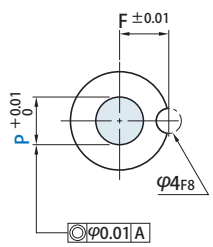

| Material | Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |

Accessory: MMS4-15

Point shapes A·E·R·D·G viewed from point side

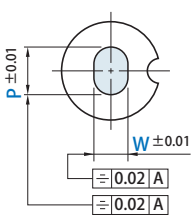
### Point Shape

**A**



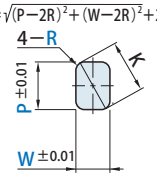

**E**

P > W



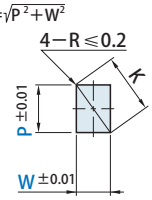

**R**

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



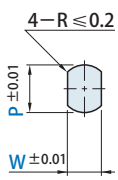

**D**

P ≥ W
$K=\sqrt{P^2+W^2}$




**G**

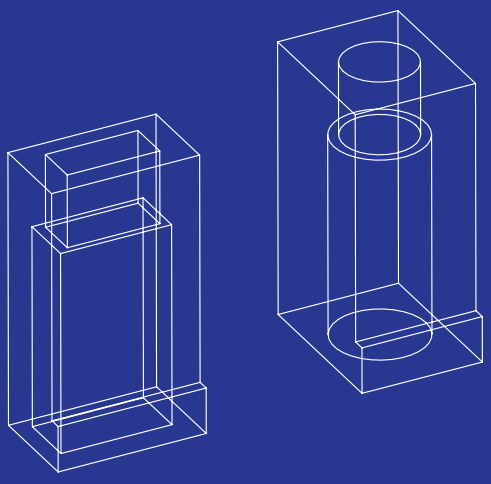
P > W




| Tol. · Material (Shank dia. tol. T) | Code No. Code | Shape (Point Shape) | D | L | P (A) (in 0.01) | P·Kmax. (E R D G) | P·Wmin. (E R D G) | R (R) | B | b | d | F | @/P (1～9P) KKSDS | @/P (1～9P) KKD □S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dn5 SKD11 | KKSDS<br>KKD □ S | A Shape A Not required<br>E<br>R<br>D<br>G | 10 | 16 20 22 25 28 30 32 35 40 | 2.00～ 6.00 | 6.00 | 1.20 | 0.15 ≤ R < W/2 ( only | 6 | 10 | 6.4 | 6 | 58.5 | 192 |
| | | | 13 | 16 20 22 25 28 30 32 35 40 | 3.00～ 8.00 | 8.00 | 1.50 | | | | 8.4 | 7.5 | 55.0 | 199 |
| | | | 16 | 16 20 22 25 28 30 32 35 40 | 5.00～10.00 | 10.00 | 2.00 | | | | 10.6 | 8 | 55.0 | 213 |
| | | | 20 | 16 20 22 25 28 30 32 35 40 | 7.00～12.00 | 12.00 | 3.00 | | 8 | 12 | 12.6 | 10 | 58.5 | 224 |
| | | | 22 | 16 20 22 25 28 30 32 35 40 | 8.00～14.00 | 14.00 | 3.00 | | | | 14.6 | 11 | 64.1 | 231 |
| | | | 25 | 16 20 22 25 28 30 32 35 40 | 10.00～16.00 | 16.00 | 3.00 | | | | 16.6 | 12.5 | 70.3 | 238 |
| | | | 32 | 16 20 22 25 28 30 32 35 40 | 15.00～20.00 | 20.00 | 4.00 | | 10 | 15 | 20.6 | 16 | 83.6 | 252 |
| | | | 38 | 16 20 22 25 28 30 32 35 40 | 19.00～26.00 | 26.00 | 5.00 | | | | 26.6 | 19 | 110 | 269 |
| | | | 45 | 20 22 25 30 35 40 | 25.00～35.00 | 35.00 | 6.00 | | 14 | 20 | 36.0 | 22.5 | 255 | 613 |
| | | | 50 | 20 22 25 30 35 40 | 33.00～40.00 | 40.00 | 7.00 | | | | 41.0 | 25 | 303 | 671 |
| | | | 56 | 20 22 25 30 35 40 | 38.00～45.00 | 45.00 | 8.00 | | | | 46.0 | 28 | 364 | 759 |

ORDER

| Code No. | L | P | W | R (only R) |
|---|---|---|---|---|
| KKDDS16 — | 25 | — P10.00 — | W4.50 | |



**Square Die Buttons**

# BLOCK DIES

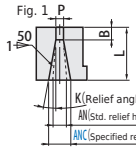
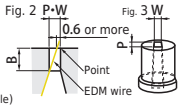

49 Square Die Button Alterations Overview
50 Square Die Buttons - Headless-
51 Square Die Buttons - Single Shoulder-

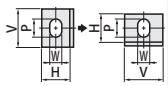
# Square Die Button Alterations Overview



KAYAN

| Code No. | V | H | L (C) | P | W | R (only R)(BC·PKC ···etc) |
|---|---|---|---|---|---|---|
| KBLDF | 08 | 06 | — LC18.0 — P3.00 | | | — BC3.5 |

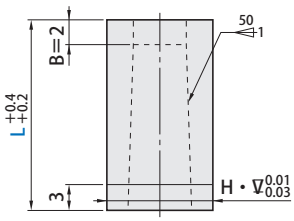
| Add. | Code | Alteration Description |
|---|---|---|
| B Dimension Change  | BC (4) | Change point length "B"<br>0≤BC≤4<br>in 0.1 |
| L Dimension Change  | LC (4) | Reduce overall length "L"<br>10≤LC<L<br>in 0.1→w/ LKC, LKP: allows in 0.01<br>▲ LC≤12: single-shoulder has no press-in lead |
| Shoulder Width Change  | HC (4) | Reduce shoulder dia. "H"<br>0≤HC<1.5<br>in 0.1 |
| T Dimension Change  | TC (4) | Reduce shoulder thickness "T"<br>2≤TC<5<br>in 0.1→w/ TKC (M): allows in 0.01<br>▲ L reduced accordingly (5-TC); with LC, LC unchanged |
| Relief Hole Size Specified  | ANC (6) | Change relief hole size of taper-relief die button as specified<br>AN<ANC≤P+4≤Pmax. {AN=P+(L−B)/50} (Fig. 1)<br>▲ K (Relief angle)≤5 {K=tan⁻¹{(ANC−P)/2(L−B)}} (Fig. 1)<br>▲ B≤(P−0.6)/tanK (Round) (Fig. 2)<br>▲ B≤(W−0.6)/tanK (Shaped) (Fig. 2)<br>in 0.1<br>▲ B (C Keep ≥0.6 mm clearance between point and EDM wire (Fig. 2)<br>▲ Shaped point: full perimeter cut at relief angle K from P and ANC (Fig. 3)<br>Fig. 1 P<br>  <br><br>Fig. 2 P•W<br>  <br><br>Fig. 3 W<br><br> |

| Add. | Code | Alteration Description |
|---|---|---|
| Profile rotated 90°  | HVC (0) | "W·P" swapped relative to "H·V"(H,W·V,P→H,P·V,W)<br>▲ P dim. range per W in std. spec table<br>▲ Shaped only |
| L Dim. Tolerance Change  | LKC (12) | L $^{+0.4}_{+0.2}$ → $^{+0.05}_{0}$ |
| | LKP (19) | L $^{+0.4}_{+0.2}$ → $^{+0.01}_{0}$ |
| T Dim. Tolerance Change  | TKC (6) | T $^{+0.3}_{0}$ → $^{+0.02}_{0}$ |
| | TKCM (6) | T $^{+0.3}_{0}$ → $^{0}_{-0.02}$ |

# Square Die Buttons - Headless-

## BLOCK DIES—STRAIGHT TYPE—





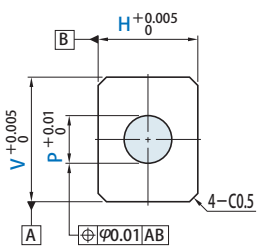

| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH40 | 64～67HRC |

SKH40 Powder-metallurgy HSS(JIS G4403.2000)

⚠ Point shapes A·E·R·D·G viewed from point side

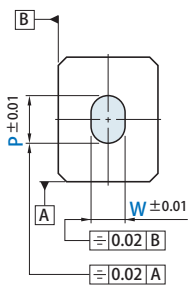
### Point Shape

**A**



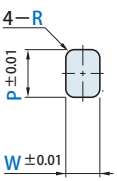

**E**

⚠ P＞W



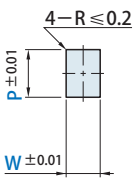

**R**

⚠ P≥W
⚠ 0.15≤R＜W/2



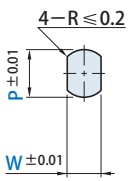

**D**

⚠ P≥W




**G**

⚠ P＞W




| Material | Code No. Type | Shape | H | V / W \ P | 6 | 8 | 10 | 13 | 16 | 20 | 25 | R | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1.00～3.00 | 1.00～4.00 | 1.00～6.00 | 1.00～8.00 | 1.00～10.00 | 1.50～12.00 | 1.50～16.00 | Ⓡ | |
| SKD11 SKH40 | KBLD KPBLD | A Shape A Not required | 6 | 1.00～ 3.00 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 0.15≤R＜W/2( only | 16 |
| | | | 8 | 1.00～ 4.00 | | ○ | ○ | ○ | ○ | ○ | ○ | | 20 |
| | | E | 10 | 1.00～ 6.00 | | | ○ | ○ | ○ | ○ | ○ | | 22 |
| | | R | 13 | 1.00～ 8.00 | | | | ○ | ○ | ○ | ○ | | 25 |
| SKD11 SKH40 | KBLD □ KPBLD □ | D | 16 | 1.00～10.00 | | | | | ○ | ○ | ○ | | 28 |
| | | | 20 | 1.50～12.00 | | | | | | ○ | ○ | | 30 |
| | | G | 25 | 1.50～16.00 | | | | | | | ○ | | 32 |
| | | | | | | | | | | | | | 35 |

【P・W・R in 0.01】

⚠ Point shape A: P limited by W range

ORDER

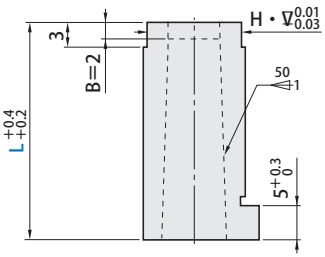
| Code No. | V | H | L | P | W | R (only R) |
|---|---|---|---|---|---|---|
| KBLDR | 08 | 08 — | 16 — | P3.00 — | W1.00 — | R0.20 |

# Square Die Buttons - Single Shoulder-

BLOCK DIES—SINGLE FLANGE TYPE—

KAYAN





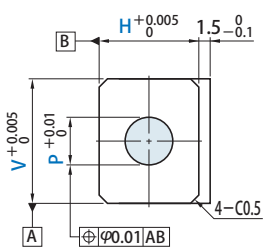

| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH40 | 64～67HRC |

SKH40 Powder-metallurgy HSS(JIS G4403.2000)

⚠ Point shapes A·E·R·D·G viewed from point side

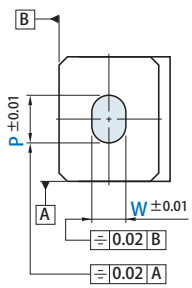
## Point Shape

**A**




**E**

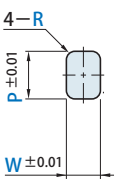
⚠ P＞W




**R**

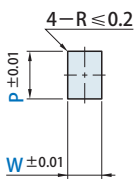
⚠ P≥W

⚠ 0.15≤R＜W/2



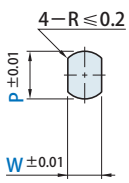

**D**

⚠ P≥W




**G**

⚠ P＞W



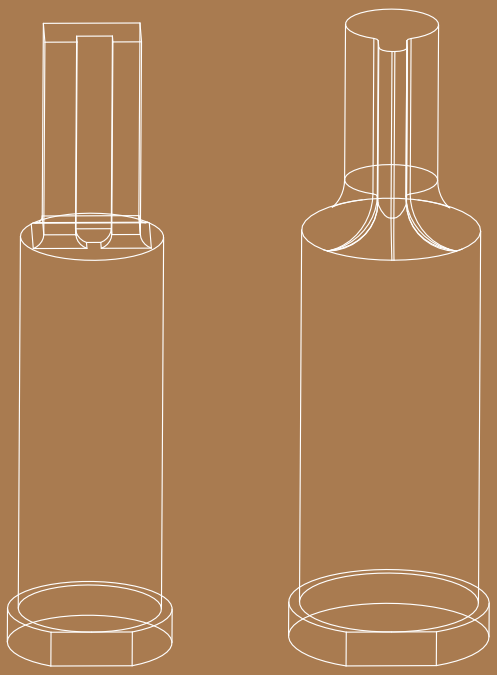

| Material | Code No. Type | Shape | H | V / W \ P | 6 | 8 | 10 | 13 | 16 | 20 | 25 | R | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1.00～3.00 | 1.00～4.00 | 1.00～6.00 | 1.00～8.00 | 1.00～10.00 | 1.50～12.00 | 1.50～16.00 | R | |
| SKD11 SKH40 | KBLDF KPBLDF | A Shape A Not required | 6 | 1.00～ 3.00 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 0.15≤R＜W/2( only | 16 |
| | | | 8 | 1.00～ 4.00 | | ○ | ○ | ○ | ○ | ○ | ○ | | 20 |
| | | E | 10 | 1.00～ 6.00 | | | ○ | ○ | ○ | ○ | ○ | | 22 |
| | | R | 13 | 1.00～ 8.00 | | | | ○ | ○ | ○ | ○ | | 25 |
| SKD11 SKH40 | KBLD □ F KPBLD □ F | | 16 | 1.00～10.00 | | | | | ○ | ○ | ○ | | 28 |
| | | D | 20 | 1.50～12.00 | | | | | | ○ | ○ | | 30 |
| | | G | 25 | 1.50～16.00 | | | | | | | ○ | | 32 |
| | | | | | | | | | | | | | 35 |

【P・W・R in 0.01】

⚠ Point shape A: P limited by W range

ORDER

| Code No. | V | H | L | P | W | R (only R) |
|---|---|---|---|---|---|---|
| KBLDRF | 08 | 08 — | 16 — | P3.00 — | W1.52 — | R0.20 |

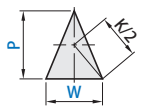


**Shaped Punches / Die Buttons**

# SPECIAL SHAPED PUNCHES & DIES


53 Shaped Punches / Punch Guide Bushings / Die Button Point Shapes
55 Shaped Punches
56 Shaped Ejector Punches
57 Shaped Square Punches
58 Shaped Straight Punches
59 Shaped Die Buttons
60 Shaped Square Die Buttons

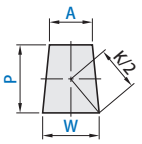
## 2H




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

Range ❹ ❺ ❻

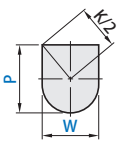
## 4H




- $W>A\geqq 0.5$
- $K=\sqrt{P^2+W^2}$

Range ❸ ❹ ❺ ❻

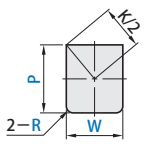
## 5H




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

Range ❹ ❺

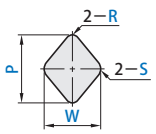
## 6H




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

Range ❹ ❺

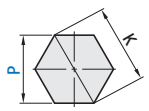
## 7H




- $K=P$

Range ❹ ❺

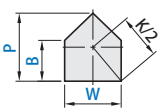
## 8H




- $K=1.1547\times P$

Range ❹ ❺

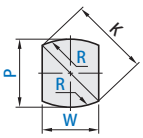
## 9H




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

Range ❹ ❺ ❻

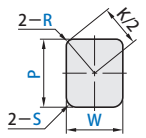
## 10H




- $24\geqq R>W/2$
- $P/2\geqq R\rightarrow K=P$
- $P/2<R\rightarrow K=\sqrt{4(Y-X)^2+W^2}$
- $X=R-P/2$
- $Y=\sqrt{R^2-(W/2)^2}$

Range ❹ ❺

## 11H

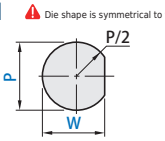



- $R<S$
- $W>2S$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Range ❹ ❺

## 12H

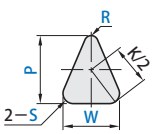
⚠ Die shape is symmetrical to this




- $P>W\geqq P/2+0.2$
- $K=P$

Range ❹ ❺

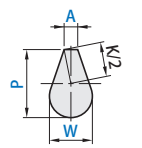
## 2J




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

Range ❹ ❺

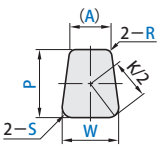
## 3J




- $P>W$
- $W>A\geqq 0.5$
- $K=\sqrt{P^2+A^2}$

Range ❸ ❹ ❺

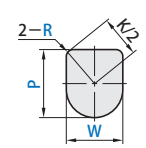
## 4J




- $P>R+S$
- $A>2R$
- $W>2S$
- $W>A\geqq 0.5$
- (A = dim. before R
- $K=\sqrt{(P-2S)^2+(W-2S)^2}+2S$

Range ❸ ❹ ❺

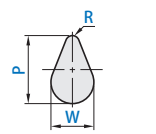
## 5J




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

Range ❹ ❺

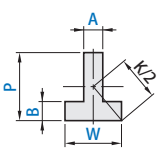
## 8J




- $P>W$
- $W>2R$
- $K=P$

Range ❹ ❺

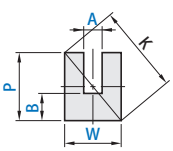
## 9J




- $P>B$
- $W>A$
- $K=\sqrt{P^2+W^2}$

Range ❶ ❸ ❹ ❺ ❼

## 10J

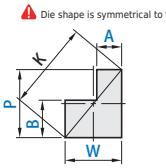



- $P>B$
- $W>A$
- $K=\sqrt{P^2+W^2}$

Range ❷ ❸ ❹ ❺ ❼

## 11J

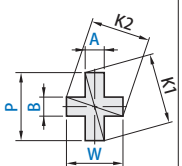
⚠ Die shape is symmetrical to this




- $P>B$
- $W>A$
- $K=\sqrt{P^2+W^2}$

Range ❶ ❸ ❹ ❺ ❼

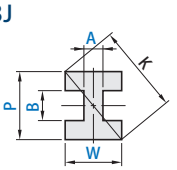
## 12J




- $P>B$
- $W>A$
- $K1=\sqrt{P^2+A^2}$
- $K2=\sqrt{W^2+B^2}$
- $K1>K2\rightarrow K=K1$
- $K1<K2\rightarrow K=K2$

Range ❶ ❸ ❹ ❺ ❼

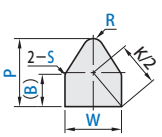
## 13J




- $P>B$
- $W>A$
- $K=\sqrt{P^2+W^2}$

Range ❷ ❸ ❹ ❺ ❼

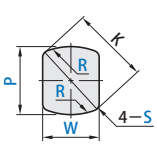
## 14J




- (B = dim. before S
- $P>B\geqq 0.5$
- $K=\sqrt{P^2+W^2}$

Range ❹ ❺

## 15J




- $24\geqq R>W/2$
- K→see formula at right

P/2<R when, $K=\sqrt{2(\chi-(W/2-S)^2}+2S$

$\chi=R-P/2$

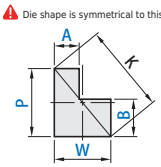
$\gamma=\sqrt{(R-S)^2+(W/2-S)^2}$

P/2≥R when, K=P

Range ❹ ❺

## 16J

⚠ Die shape is symmetrical to this

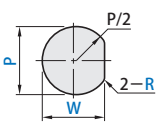



- $P>B$
- $W>A$
- $K=\sqrt{P^2+W^2}$

Range ❶ ❸ ❹ ❺ ❼

## 17J

⚠ Die shape is symmetrical to this

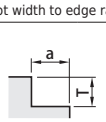



- $P>W\geqq P/2+R+0.2$
- $K=P$
- Not specifiable R=0

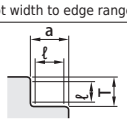
Range ❹ ❺

## ▶ Punch range

### ❶ Slot width to edge range ① Slot width to edge range



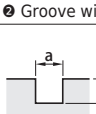

$1.0\leqq a\leqq 30$ $0.5\leqq T\leqq 10$




Straight length $\ell\geqq 0.5$

$a\leqq 30$ $T\leqq 10$

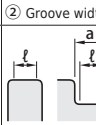
### ❷ Groove width & depth range




$T\geqq 0.5$

| a | Tmax. |
|---|---|
| 1.00~2.99 | 3.5 |
| 3.00~4.99 | 5.0 |
| 5.00~9.99 | 7.0 |
| 10.00~ | 10.0 |

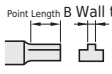
### ② Groove width & depth range

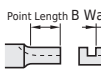



Straight length $\ell\geqq 0.5$

| a | Tmax. |
|---|---|
| 1.00~2.99 | 3.5 |
| 3.00~4.99 | 5.0 |
| 5.00~9.99 | 7.0 |
| 10.00~ | 10.0 |

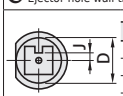
### ❸ Point width & length range



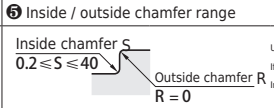

| Min. wall thickness | Bmax. |
|---|---|
| 0.50~0.99 | 7 |
| 1.00~1.99 | 8 |
| 2.00~2.99 | 13 |
| 3.00~3.99 | 19 |
| 4.00~4.99 | 25 |
| 5.00~ | 30 |

### ❹ Ejector hole wall thickness range



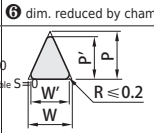

| D | J |
|---|---|
| 5・6・8 | 1.0 |
| 10・13 | 1.5 |
| 16~32 | 2.0 |
| 38・45 | 4.0 |

### ❺ Inside / outside chamfer range




Unmarked corners R0.2 max.
If no chamfer, specify MR=0
Inside chamfer S not specifiable S=0

### ❻ dim. reduced by chamfer




Due to chamfer, measured value is smaller than spec.
If no chamfer, specify MR=0

### ❼ Point dim. range

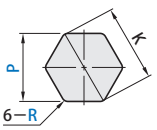
P・Wmax.=30.00

# Shaped Punches / Punch Guide Bushings / Die Button Point Shapes

## CUTTING EDGE SHAPES—SPECIAL SHAPED PUNCHES / PUNCH GUIDE BUSHINGS / BUTTON DIES—

⚠ Each shape viewed from point side of punch (guide bushing / die button) ⚠ Point shape center = shank center of punch / die button (except straight punches)

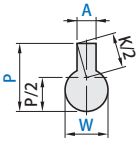
### 18J




- K=1.1547(P−2R)+2R

Range ❹ ❺

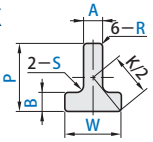
### 3K




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

Range ❶ ❸ ❹ ❺ ❼

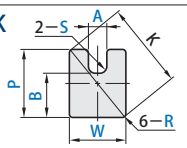
### 4K




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

Range ① ❸ ❹ ❺ ❼

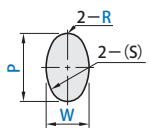
### 5K




- P>B+R+S
- W>A+4R
- A>2S
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Range ② ❸ ❹ ❺ ❼

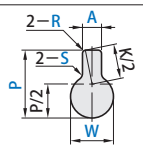
### 6K




- $S=\frac{P^2-4PR+W^2}{4(W-2R)}\leqq 24$
- K=P

Range ❹ ❺

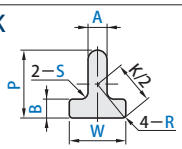
### 8K




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

Range ① ❸ ❹ ❺ ❼

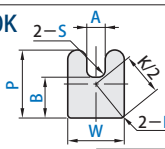
### 9K




- P>B+S+A/2
- W>A+2(R+S)
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Range ① ❸ ❹ ❺ ❼

### 10K



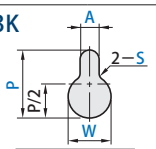

- $P>B+\frac{W-A}{4}+S$
- A>2S
- K→see formula below

Range ② ❸ ❹ ❺ ❼

$R\leqq(W-A)/4$ のとき, $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

$R>(W-A)/4$ のとき, $K=\sqrt{\{P-2[(W-A)/4]\}^2+\{W-2[(W-A)/4]\}^2}+2[(W-A)/4]$

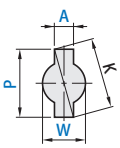
### 13K




- $P>\sqrt{(W/2+S)^2-(A/2+S)^2}+A/2+W/2$
- K=P

Range ① ❸ ❹ ❺ ❼

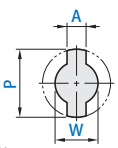
### 14K




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

Range ❶ ❸ ❹ ❺ ❼

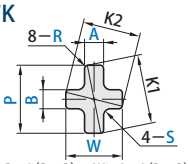
### 15K




- P>W
- W>A
- K=P

Range ❶ ❸ ❹ ❺ ❼

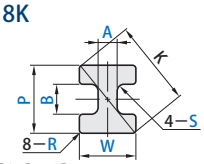
### 17K




- P>B+2(R+S)
- W>A+2(R+S)
- $K1=\sqrt{(P-2R)^2+(A-2R)^2}+2R$
- $K2=\sqrt{(W-2R)^2+(B-2R)^2}+2R$
- K1>K2→K=K1、K1<K2→K=K2

Range ① ❸ ❹ ❺ ❼

### 18K

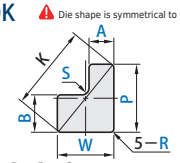



- P>B+4R
- W>A+2(R+S)
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Range ② ❸ ❹ ❺ ❼

### 20K

⚠ Die shape is symmetrical to this

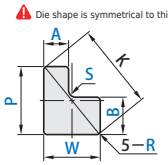



- P>B+R+S
- W>A+R+S
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Range ① ❸ ❹ ❺ ❼

### 21K

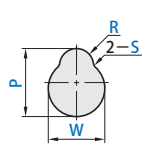
⚠ Die shape is symmetrical to this




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

Range ① ❸ ❹ ❺ ❼

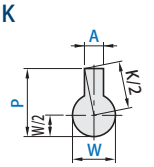
### 22K




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

Range ❷ ❸ ❹ ❺ ❼

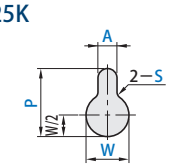
### 23K




- P>W
- $K=2\sqrt{(P-W/2)^2+(A/2)^2}$

Range ❶ ❸ ❹ ❺ ❼

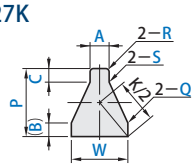
### 25K




- $P>\sqrt{(W/2+S)^2-(A/2+S)^2}+A/2+W/2$
- K=2(P−W/2)

Range ① ❸ ❹ ❺ ❼

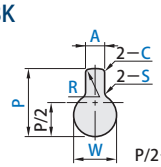
### 27K




- P>B+C
- W>A
- B>Q
- B≥0.5(B = dim. before Q)
- C>R+S
- $K=\sqrt{P^2+W^2}$

Range ❸ ❹ ❺ ❼

### 28K




- P>W+C+S
- K→※see formula at right

P/2<R のとき, $K=\frac{2}{\cos\chi}(-\chi)\sqrt{(A/2-C)^2+2C}$

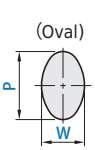
$\chi=R-P/2$

$\gamma=\sqrt{(R-C)^2+(A/2-C)^2}$

P/2≧R のとき, K=P/2

Range ❸ ❹ ❺ ❼

### 29K

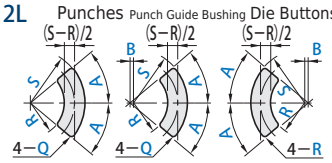



- P>W

Range ❹

### 2L

Punches Punch Guide Bushing Die Buttons




- S−R≧2
- A≦90°
- S or R≦50

Range ❸(S−R) ❹ ❺ ❼

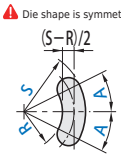
To ensure uniform clearance between guide bushing/die and punch,, specify the datum point of angle A B

$B=\frac{\text{Clearance (per side)}}{\sin A}$

- 0≦B≦2.00

### 3L

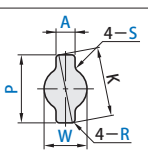
⚠ Die shape is symmetrical to this




- S−R≧2
- A≦90°
- S or R≦50

Range ❸(S−R) ❹ ❺ ❼

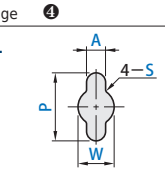
### 4L




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

Range ❸ ❹ ❺ ❼

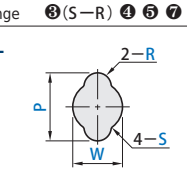
### 5L




- $P>2\sqrt{(W/2+S)^2-(A/2+S)^2}+A$
- K=P

Range ❸ ❹ ❺ ❼

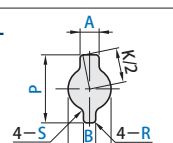
### 7L




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

Range ❸ ❹ ❺ ❼

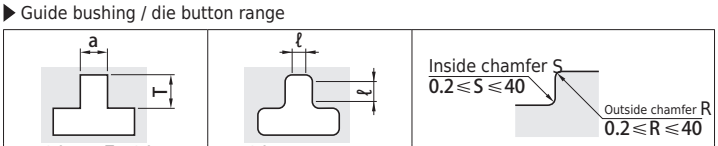
### 8L




- P>W+2(S+R)
- W>A
- B>Q
- $\frac{K}{2}=\frac{\sqrt{(P-2R)^2+(A-2R)^2}+2R}{2}$

Range ❸ ❹ ❺ ❼

### ▶ Guide bushing / die button range




- a≧1.0
- T≧1.0
- ℓ≧1.0

### ▶ Increment

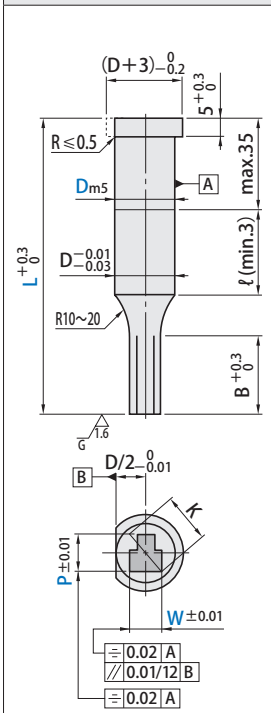
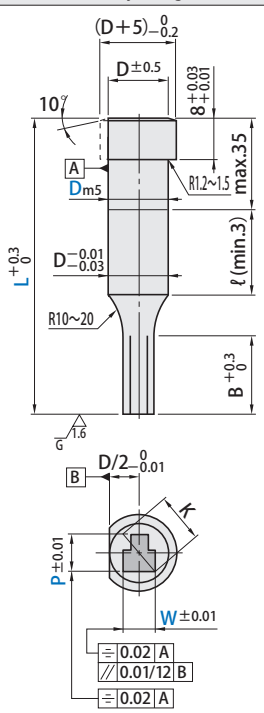
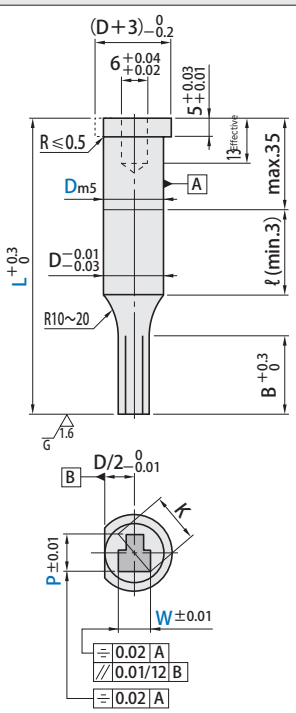
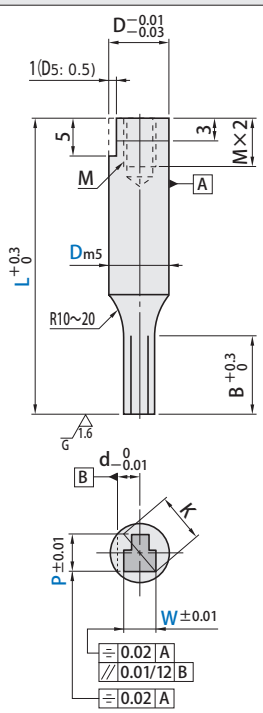
| Dim. T Tol. | in Increment |
|---|---|
| P±0.01 | 0.01 |
| W±0.01 | |
| A±0.01 | |
| B±0.01 | |
| C±0.01 | |

| Dim. T Tol. | in Increment |
|---|---|
| Q | 0.01 |
| R | |
| S | |
| C (R section) | |
| A (Angle) | 0.1 |



| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40: Powder-metallurgy HSS (JIS G4403.2000)

| Headed | Heavy-Gauge | Dowel-pin locate A Accessory: MMS6-25) | Screw-retained |
|---|---|---|---|
|  |  |  |  |
| ●Point shape example 9J | ●Point shape example 9J | ●Point shape example 9J | ●Point shape example 9J |

| Tol. · Material | Code No. Code | Shape | D | L | P·Kmax. (in 0.01) | P·Wmin. (in 0.01) | B | d | M |
|---|---|---|---|---|---|---|---|---|---|
| Dm5 | Headed(D4-25) Screw-retained(D5-25) | 2H～12H 2J～18J 3K～29K 2L～7L 8L (D10～45) | 4 | (40) 50 60 70 80 | 3.90 | 2.00 | 8 | — | — |
| SKD11 | KSP KMP | | 5 | | 4.90 | 2.00 | | 2 | 3 |
| SKH51 | KSH KMSH | | 6 | | 5.90 | 2.00 | | | |
| SKH40 | KPH KMPH | | 8 | (40) (50) 60 70 80 90 100 | 7.90 | 2.00 | 13 | 3 | 4 |
| | Heavy-Gauge(D5-25) | | 10 | | 9.90 | 2.50 | | 4 | 5 |
| SKH51 | KAP | | 13 | | 12.90 | 3.00 | | 5.5 | 6 |
| SKH40 | KAPH | | 16 | | 15.90 | 4.00 | 19 | 7 | |
| | Dowel-pin located(D10-45) | | 20 | | 19.90 | 5.00 | | 9 | |
| SKD11 | KSP — C | | 25 | | 24.90 | 6.00 | | 11.5 | |
| | | | 32 | 70 80 90 100 110 120 | 31.90 | 7.00 | | — | — |
| | | | 38 | 80 90 100 110 120 | 37.90 | 8.00 | | | |
| | | | 45 | | 44.90 | 9.00 | | | |

⚠ Heavy-gauge: OAL not specifiable L(40) ⚠ For OAL L (40), pt. length B=6 ⚠ Heavy-gauge, L (50): point length B=8 ⚠ For L (50), point length B=13

ORDER

| Code No. | L | P·W·A·B·C·Q·R·S··· (in 0.01) |
|---|---|---|
| KSP4H25 — | 50 — | P18.10—W16.10—A8.00 |

# Shaped Ejector Punches

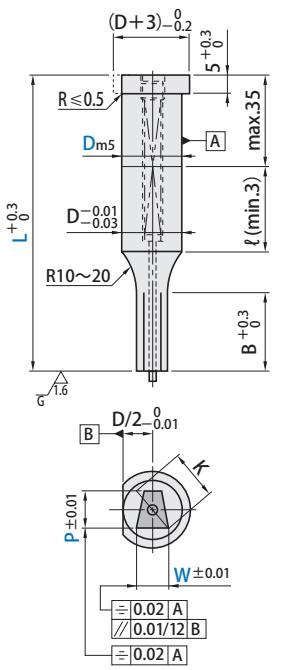
## SPECIAL SHAPED EJECTOR PUNCHES



| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

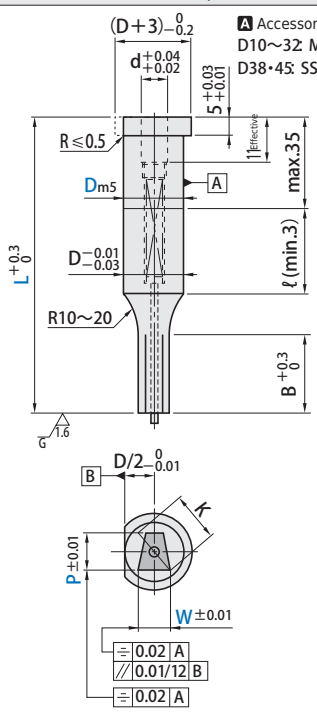
SKH40: Powder-metallurgy HSS (JIS G4403.2000)

### Headed




●Point shape example 4H

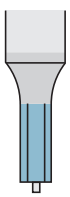
### Dowel-pin located




●Point shape example 4H

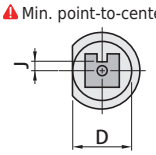
A Accessory:
D10～32: MMS6－25
D38・45: SSJB －CMS

| D | d |
|---|---|
| 10～32 | 6 |
| 38・45 | 10 |



= TiCN coating area (surface 2700HV)
Coated type applies to D5-25

Min. point-to-center distance




| Tol. · Material | Code No. Code | Shape | D | L | P・Kmax. (in 0.01) | P・Wmin. (in 0.01) | B | J |
|---|---|---|---|---|---|---|---|---|
| Dm5 | Headed Standard / Coated | 2H～12H 2J ～18J 3K～29K 2L～7L 8L (D10～45) | 5 | (40) 50 60 70 80 | 4.90 | 2.00 | 8 | 1.0 |
| | | | 6 | | 5.90 | 2.00 | | |
| | | | 8 | (40) (50) (60) 70 80 90 100 | 7.90 | 3.00 | 13 | 1.5 |
| SKD11 SKH51 | D8～25 D5・6 KSJ | KH － SJ | 10 | | 9.90 | 3.00 | | |
| | | | 13 | | 12.90 | 6.00 | | |
| SKH40 | D5～25 KPJ | KH － PJ | 16 | | 15.90 | 6.00 | 19 | 2.0 |
| | | | 20 | | 19.90 | 6.00 | | |
| | | | 25 | | 24.90 | 6.00 | | |
| | Dowel-pin located Standard / Coated | | 32 | 70 80 90 100 110 120 | 31.90 | 7.00 | | |
| SKD11 | D10～45 KSJ － C | KH － SJ － C | 38 | 80 90 100 110 120 | 37.90 | 8.00 | | 4.0 |
| | | | 45 | | 44.90 | 9.00 | | |

For OAL L (40), pt. length B=6 For OAL L (50), pt. length B=13 SSJ －C・HH－SJ －C overall length L≥60
SSJ －C・HH－SJ －C overall length L (60): point length B=13 Coated type N/A for point shape 10J·13J·5K·10K·18K

| Code No. | L | P・W・A・B・C・Q・R・S… (in 0.01) |
|---|---|---|
| KSJ3K5 － | 50 － | P3.10－W2.10－A1.00 |

# Shaped Square Punches

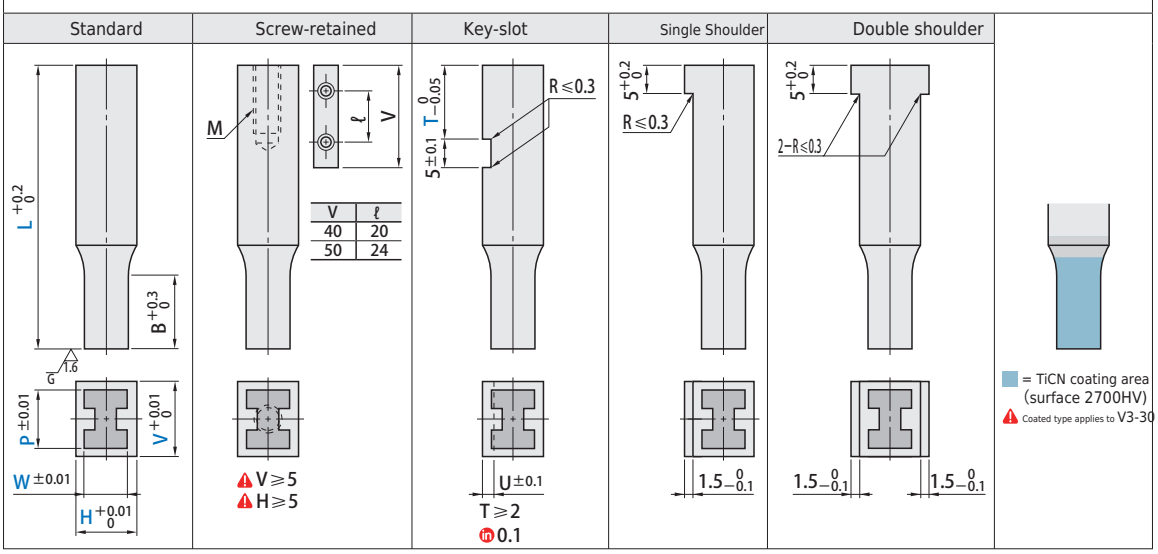
SPECIAL SHAPED BLOCK PUNCHES

KAYAN



| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40:Powder-metallurgy HSS(JIS G4403.2000)



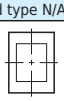

| Material | Code No. Code | Shape | H | Wmin. | Pmin. | V 3 / 1.5 | 4 / 2.0 | 5 / 2.5 | 6 / 3.0 | 8 / 3.0 | 10 / 4.0 | 13 / 5.0 | 16 / 7.0 | 20 / 8.0 | 22 / 9.0 | 25 / 10.0 | 28 / 12.0 | 30 / 12.0 | (40) / 16.0 | (50) / 20.0 | L | B | M | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SKD11 | Coated H6～30 V6～50 Standard KHP KH−HP | 2H～12H 2J～18J 3K～29K 2L～7L | (3) | 1.0 | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | (40) 50 60 70 80 | 8 | — | 1.0 |
| | Screw-retained KHM KH−HM | | (4) | 1.0 | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | |
| | Key-slot KHK KH−HK | | 5 | 1.2 | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | 3 | |
| | Single Shoulder KHF KH−HF | | 6 | 1.5 | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | 4 | 1.5 |
| | Double shoulder KHW KH−HW | | 8 | 2.0 | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | 5 | |
| SKH51 | H3～30 V3～30 Standard KHSP KH−HSP | | 10 | 2.5 | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | 13 | 6 | |
| | Screw-retained KHSM KH−HSM | | 13 | 3.0 | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | 8 | |
| | Key-slot KHSK KH−HSK | | 16 | 4.0 | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | 19 | | |
| | Single Shoulder KHSF KH−HSF | | 20 | 5.0 | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | |
| | Double shoulder KHSW KH−HSW | | 22 | 6.0 | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ○ | | | | |
| SKH40 | H3～30 V3～30 Standard KPHP KH−PHP | | 25 | 6.5 | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | | | | |
| | Screw-retained KPHM KH−PHM | | 28 | 7.0 | | | | | | | | | | | | | ○ | ○ | ○ | ○ | | | | |
| | Key-slot KPHK KH−PHK | | 30 | 7.5 | | | | | | | | | | | | | | ○ | ○ | ○ | | | | |
| | Single Shoulder KPHF KH−PHF | | | | | | | | | | | | | | | | | | | | | | | |
| | Double shoulder KPHW KH−PHW | | | | | | | | | | | | | | | | | | | | | | | |

Point Dim.s P・W in 0.01】

H (3)・(4 : OAL L is 40-70 H10～30 For OAL L (40), pt. length B=8 Point shapes 9-13J, 16J, 3-29K, 2-8L: Pmax.=30.00

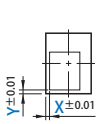
Screw-retained V (40): tapped hole pitch ℓ=20 Screw-retained V (50): tapped hole pitch ℓ=24

Coated type N/A for point shape 10J·13J·5K·10K·18K



▶ Point concentric with shank

| Code No. | V | H | | L | | P・W・A・B・C・Q・R・S… in 0.01 | (T・K・F・WF) |
|---|---|---|---|---|---|---|---|
| KHP2J | 6.0 | 10 | — | 50 | — | P8.00—W6.00—R1.00—S1.00 | |

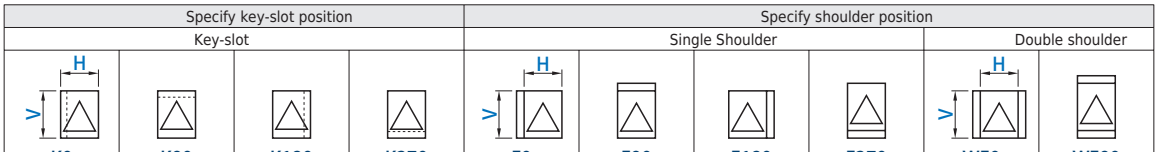



▶ Point offset from shank

| Code No. | V | H | | L | | P | (T・K・F・WF)—X—Y |
|---|---|---|---|---|---|---|---|
| KHP4L | 8.0 | 10 | — | 50 | — | P8.00—W6.00—A4.00—R0.20—S0.50 — | X0—Y1.00 |

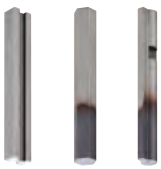
X、Y≥0.02 (Specifiable 0)

| Specify key-slot position | | | | Specify shoulder position | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Key-slot | | | | Single Shoulder | | | | Double shoulder | |
| K0 | K90 | K180 | K270 | F0 | F90 | F180 | F270 | WF0 | WF90 |



# Shaped Straight Punches

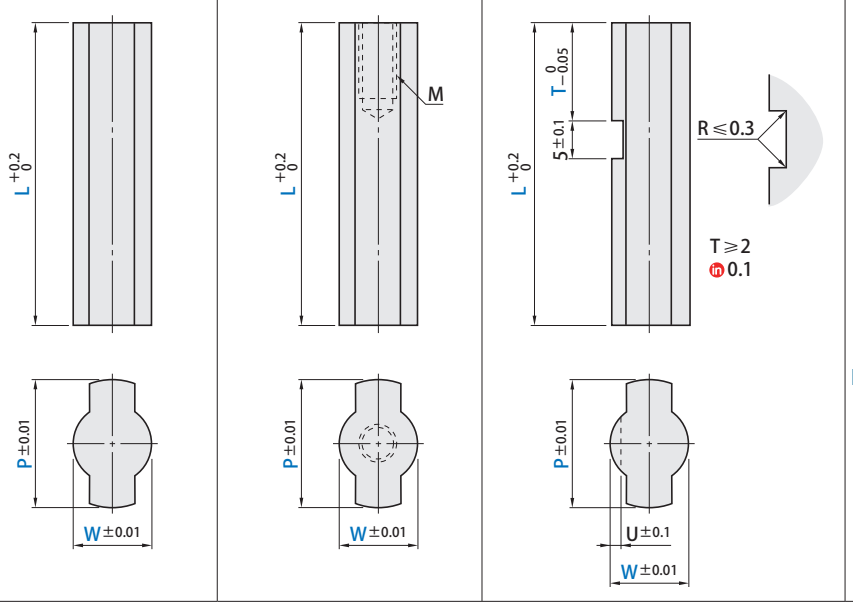
## SPECIAL SHAPED STRAIGHT PUNCHES

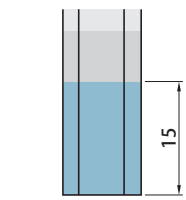


| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40: Powder-metallurgy HSS (JIS G4403.2000)

| Standard | Screw-retained | Key-slot |
|---|---|---|



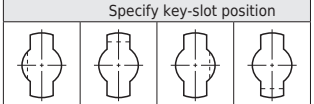

= TiCN coating area (surface 2700HV)

| Material | Code No. Code | Shape | L | Point Dim.s P・W in 0.01】 W \ P: 2.00～5.00 | 5.01～10.00 | 10.01～15.00 | 15.01～20.00 | 20.01～25.00 | 25.01～30.00 | M | U |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SKD11 SKH51 SKH40 | Standard: W5.01～30.00 KHPC / W2.00～30.00 KHSPC KPHPC; Screw-retained: KHMC KHSMC KPHMC; Key-slot: KHKC KHSKC KPHKC | 2H～12H 2J ～18J 3K～29K 2L～7L | 40 50 60 70 80 | 2.00～ 3.00 | ○ | ○ | ○ | | | | — | 1.0 |
| | | | | 3.01～ 4.00 | ○ | ○ | ○ | ○ | | | — | |
| | | | | 4.01～ 5.00 | ○ | ○ | ○ | ○ | ○ | ○ | 3 | |
| | | | | 5.01～ 6.00 | | ○ | ○ | ○ | ○ | ○ | 4 | |
| | | | | 6.01～ 8.00 | | ○ | ○ | ○ | ○ | ○ | 5 | 1.5 |
| Coated SKD11 SKH51 SKH40 | W5.01～30.00 KH－HPC KH－HMC KH－HKC; W2.00～30.00 KH－HSPC KH－HSMC KH－HSKC KH－PHPC KH－PHMC KH－PHKC | | | 8.01～10.00 | | ○ | ○ | ○ | ○ | ○ | 6 | |
| | | | | 10.01～15.00 | | | ○ | ○ | ○ | ○ | 8 | |
| | | | | 15.01～20.00 | | | | ○ | ○ | ○ | | |
| | | | | 20.01～25.00 | | | | | ○ | ○ | | |
| | | | | 25.01～30.00 | | | | | | ○ | | |

⚠ P (W) <8.00: OAL L is 40, 50　⚠ Coated type N/A for point shape 10J·13J·5K·10K·18K

| Code No. | L | P・W・A・B・C・Q・R・S… in 0.01 | (T・K) |
|---|---|---|---|
| KHKC6H | — 60 | — P13.10—W10.10—R1.80 | — T18.0—K90 |

Specify key-slot position



K0　K90　K180　K270

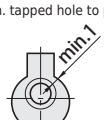
### ▶ Screw-retained machining conditions

Shapes below cannot be machined



23K　25K

Min. tapped hole to point distance




⚠ Min. distance tapped hole OD to profile: 1

P・W dim. vs. tapped hole M

| P・W Short side | M |
|---|---|
| 14.01～15.00 | 3 |
| 15.01～16.00 | 4 |
| 16.01～18.00 | 5 |
| 18.01～10.00 | 6 |
| 10.01～3'0.00 | 8 |

⚠ Point shape 8H·18J: left column above = P dim.

### ▶ Tapped hole position

⚠ Tapped hole is at center of each point shape; for shapes 2L·3L it is at the center of the max. point width on the symmetry line

# Shaped Die Buttons

SPECIAL SHAPED BUTTON DIES

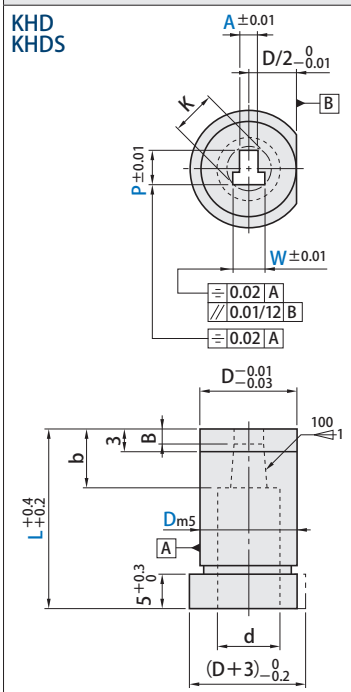
KAYAN



| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |

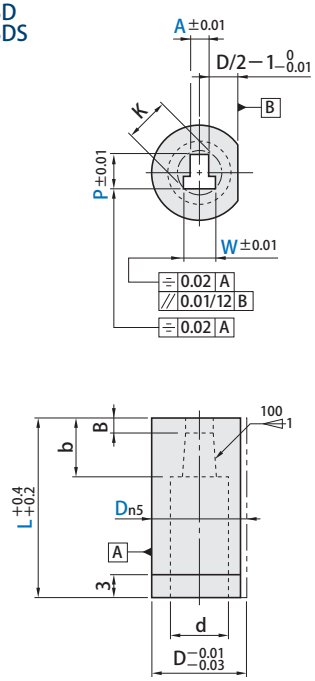
## Headed

**KHD / KHDS**



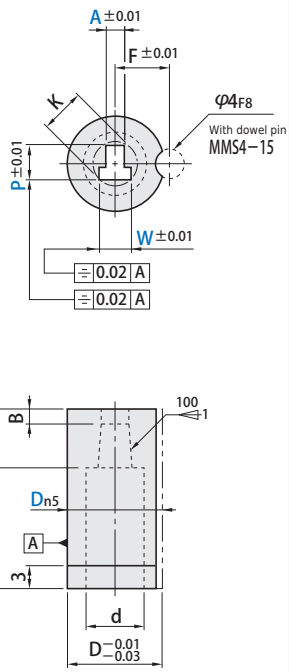

## Headless

**KSD / KSDS**




## Pin-keyed

**KKD / KKDS**

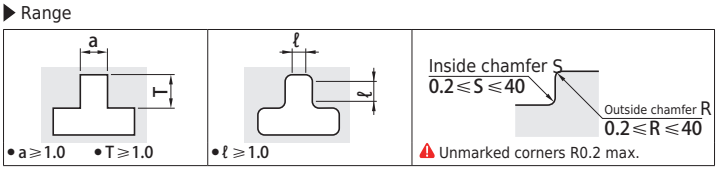



| Material | Code No. Code | Shape | D | L | P·Kmax. (in 0.01) | P·Wmin. (in 0.01) | HHD SSD KKD b | HHD SSD KKD B | HHDS SSDS KKDS b | HHDS SSDS KKDS B | d | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SKD11 | Dm5 Headed D6～56 L16～35 KHD; D10～56 Extended point L40 KHDS | 2H～12H 2J ～18J 3K～29K 2L～7L 8L (D10～16) | 6 | (16) 20 22 25 28 30 32 35 (40) | 3.00 | 2.00 | 3 | 2 | — | — | 3.4 | — |
| | | | 8 | | 4.00 | 2.00 | 4 | | | | 4.4 | |
| | | | 10 | | 6.00 | 2.00 | 6 | | 10 | 6 | 6.4 | 6 |
| | | | 13 | | 8.00 | 2.00 | 8 | | | | 8.4 | 7.5 |
| | | | 16 | | 10.00 | 2.50 | | | | | 10.6 | 8 |
| | Dn5 Headless D8～56 L16～35 KSD; D10～56 Extended point L16～40 KSDS | | 20 | | 12.00 | 3.00 | | | 12 | 8 | 12.6 | 10 |
| | | | 22 | | 14.00 | 3.00 | | | | | 14.6 | 11 |
| | | | 25 | | 16.00 | 4.00 | | | | | 16.6 | 12.5 |
| | | | 32 | | 20.00 | 5.00 | | | 15 | 10 | 20.6 | 16 |
| | | | 38 | | 26.00 | 6.00 | | | | | 26.6 | 19 |
| | | | 45 | | 35.00 | 6.00 | | | 20 | 14 | 36.0 | 22.5 |
| | | | 50 | | 40.00 | 7.00 | | | | | 41.0 | 25 |
| | Pin-keyed D10～56 L16～35 KKD; D10～56 Extended point L16～40 KKDS | | 56 | | 45.00 | 8.00 | | | | | 46.0 | 28 |

⚠ L = (16)·(40 : applicable Code and D per table 1

| Code No. | L | P·W·A·B·C·Q·R·S··· (in 0.01) |
|---|---|---|
| KHD4H13 — | 22 — | P6.50—W4.50—A3.50 |

▶ Range




▶ Increment

| Dim. T Tol. | in Increment |
|---|---|
| P ±0.01 | 0.01 |
| W ±0.01 | |
| A ±0.01 | |
| B ±0.01 | |
| C ±0.01 | |

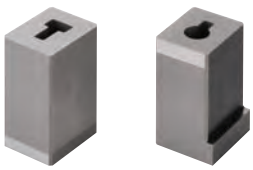
| Dim. T Tol. | in Increment |
|---|---|
| Q | 0.01 |
| R | |
| S | |
| C (R section) | |
| A (Angle) | 0.1 |

Table 1

| L | D | Code |
|---|---|---|
| (16) | 6～38 | HHD |
| | | SSD |
| | | SSDS |
| | | KKD |
| | | KKDS |
| (40) | 10～56 | HHDS |
| | | SSDS |
| | | KKDS |

# Shaped Square Die Buttons

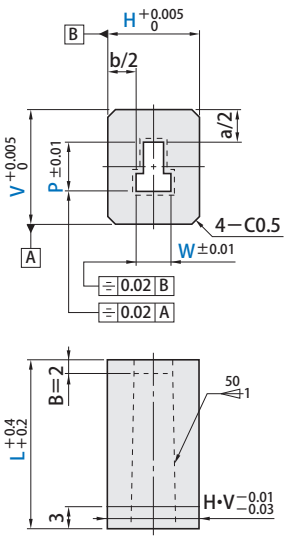
## SPECIAL SHAPED BLOCK DIES



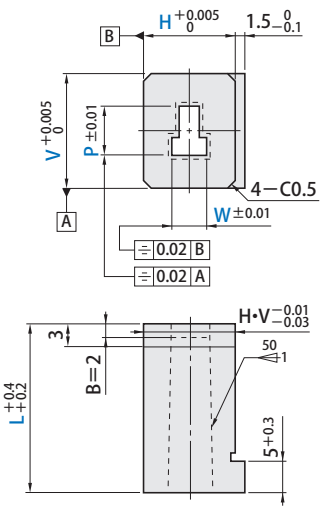
| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH40 | 64～67HRC |

SKH40: Powder-metallurgy HSS (JIS G4403.2000)

### Straight / Outline-Specified




### Single Shoulder



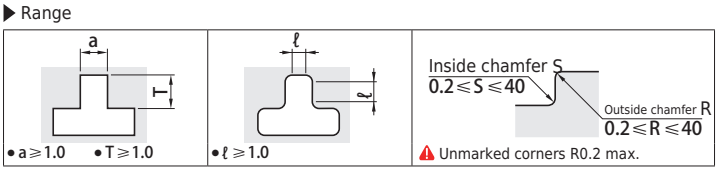

| Material | Code No. Code | Shape | H | P \ V / W | 6 | 8 | 10 | 13 | 16 | 20 | 25 | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1.00～3.00 | 1.00～4.00 | 1.00～6.00 | 1.00～8.00 | 1.00～10.00 | 1.50～12.00 | 1.50～16.00 | |
| SKD11 SKH40 | Straight KBL KPBL / Single Shoulder KBLF KPBLF | 2H～12H 2J～18J 3K～29K 2L～7L | 6 | 1.00～ 3.00 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 16 |
| | | | 8 | 1.00～ 4.00 | | ○ | ○ | ○ | ○ | ○ | ○ | 20 |
| | | | 10 | 1.00～ 6.00 | | | ○ | ○ | ○ | ○ | ○ | 22 |
| | | | 13 | 1.00～ 8.00 | | | | ○ | ○ | ○ | ○ | 25 |
| | | | 16 | 1.00～10.00 | | | | | ○ | ○ | ○ | 28 30 |
| | | | 20 | 1.50～12.00 | | | | | | ○ | ○ | 32 |
| | | | 25 | 1.50～16.00 | | | | | | | ○ | 35 |

| Material | Code No. Code | Shape | H | W | b \ a | 6.0～8.0 | 8.1～10.0 | 10.1～13.0 | 13.1～16.0 | 16.1～20.0 | 20.1～25.0 | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | P | | 1.00～4.00 | 1.00～6.00 | 1.00～8.00 | 1.00～10.00 | 1.50～12.00 | 1.50～16.00 | |
| | | | | | a | 4 | 4 | 5 | 6 | 8 | 9 | |
| SKD11 SKH40 | Outline-specified KFBL KFPBL | 2H～12H 2J～18J 3K～29K 2L～7L | 6.0～ 8.0 | 1.00～ 4.00 | 4 | ○ | ○ | ○ | ○ | ○ | ○ | 16 |
| | | | 8.1～10.0 | 1.00～ 6.00 | 4 | | ○ | ○ | ○ | ○ | ○ | 20 22 |
| | | | 10.1～13.0 | 1.00～ 8.00 | 5 | | | ○ | ○ | ○ | ○ | 25 |
| | | | 13.1～16.0 | 1.00～10.00 | 6 | | | | ○ | ○ | ○ | 28 30 |
| | | | 16.1～20.0 | 1.50～12.00 | 8 | | | | | ○ | ○ | 32 |
| | | | 20.1～25.0 | 1.50～16.00 | 9 | | | | | | | 35 |

⚠ V−P ≥ a　⚠ H−W ≥ b

| Code No. | V | H | L | P ·W·A·B·C·Q·R·S··· in 0.01 |
|---|---|---|---|---|
| KBL9J | 13 | 13 — | 22 — | P4.60—W3.20—A3.20—B1.80 |

▶ Range



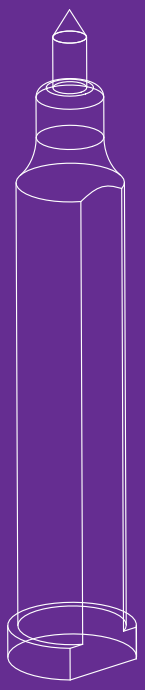

• a ≥ 1.0　• T ≥ 1.0　• ℓ ≥ 1.0

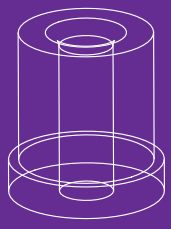
⚠ Unmarked corners R0.2 max.

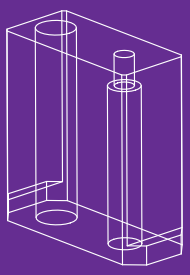
▶ Increment

| Dim. T Tol. | in Increment |
|---|---|
| P ±0.01 | 0.01 |
| W ±0.01 | |
| A ±0.01 | |
| B ±0.01 | |
| C ±0.01 | |

| Dim. T Tol. | in Increment |
|---|---|
| Q | 0.01 |
| R | |
| S | |
| C (R section) | |
| A (Angle) | 0.1 |







# Forming Punches / Dies

## PUNCHES & DIES for FORMING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76 Precision Square Marking Punches

# Forming Punch Alterations Overview

PUNCH for FORMING—DETAIL GUIDE of ADDITION—

| Code No. | L | P (C) | V・A・E・F・K・Q・R・S | (BC・HC…etc) |
|---|---|---|---|---|
| KSP2A3 | — 50.0 | — P2.00 | — A20—F38.0 | — LKC —FKC |

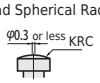
| Add. | Code | Alteration Description |
|---|---|---|
| P Dimension Change  | PC (4) | Reduce point dim. "P"<br>PC ≥ Pmin./2 ≥ Vmin<br>in 0.01→with PKC(( Z combined: allows in 0.001 |
| B Dimension Change  | BC (4) | Change point length "B"<br>2≤BC≤Bmax. Table 1<br>in 0.1<br>⚠ ≤L—30 |
| H Dimension Change  | HC (4) | Reduce head dia. "H"<br>D≤HC<H<br>in 0.1<br>NO N/A for screw-retained |
| T Dimension Change  | TC (4) | Reduce head thickness "T"<br>2≤TC<5<br>in 0.1<br>⚠ L dim. unchanged NO N/A for screw-retained |
| Head Chamfer  | CTC (6) | Chamfer the head<br>H≤5: CTC =0.5 H>5: 0.5≤CTC≤1.5<br>in 0.1<br>⚠ Headed type only NO Not with KRC |
| Head Spherical Radius  | KRC (12) | Spherical radius on head R Table 2<br>in 0.1<br>⚠ Head center has a flat ≤ φ0.3<br>⚠ Headed type only NO Not with TC, CTC |
| Accessory Dowel Pin Change  | KNC (3) | Change straight dowel pin to precision tapped dowel pin<br>⚠ Change MMS6-25 to MMSTP6 -25<br>⚠ Dowel-pin located type only |
| Head Key Flat  | KC (6) | Add 1 key flat<br>NO Cannot be combined with WKC, CKC, WKF |
| Head 2 Parallel Key Flats  | WKC (12) | Add 2 parallel key flats<br>NO Cannot be combined with KC, CKC, WKF |

Table 1

| P (C) | 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 |

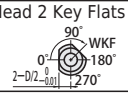
| Add. | Code | Alteration Description |
|---|---|---|
| Head 2 Key Flats at 90°  | CKC (12) | Add 2 key flats at 90° on head<br>NO N/A for screw-retained<br>NO Cannot be combined with KC, WKC, WKF |
| Head 2 Key Flats at Angle WKF (19)  | | Add 2 key flats at specified angle<br>0<WKF<360<br>in 1 NO N/A for screw-retained<br>NO Cannot be combined with KC, WKC, CKC |
| Press-in lead (D$^{-0.01}_{-0.03}$) removed  | NDC (0) | Remove press-in lead (D$^{-0.01}_{-0.03}$)<br>NO N/A for screw-retained |
| Head thickness machined to retainer face  | RC (6) | ⚠ Head thk. tolerance changed to retainer face<br>⚠ Headed type only<br>NO D$^{+0.005}_{0}$ N/A  |
| K Dim. Tolerance Change | KKC (12) | K ±30′ →±10′ ⚠ K dim. tolerance by shape |
| A Dim. Tolerance Change | AKC (12) | A ±30′ →±10′ ⚠ A dim. tolerance by shape |
| R Dim. Tolerance Change | RKC (12) | R ±0.5 →±0.05 ⚠ R dim. tolerance by shape |
| Q Dim. Tolerance Change | QKC (12) | Q ±0.5 →±0.05 ⚠ Q dim. tolerance by shape |
| L Dim. Tolerance Change | LKC (12) | L $^{+0.3}_{0}$ →$^{+0.05}_{0}$ ⚠ L dim. tolerance by shape |
| | LKP (19) | L $^{+0.3}_{0}$ →$^{+0.01}_{0}$ ⚠ L dim. tolerance by shape |
| | LKPZ (19) | L $^{+0.3}_{0}$ →±0.005 ⚠ L dim. tolerance by shape |
| T Dim. Tolerance Change | TKC (6) | T $^{+0.3}_{0}$ →$^{+0.02}_{0}$ ⚠ Headed type only |
| | TKCM (6) | T $^{+0.3}_{0}$ →$^{0}_{-0.02}$ ⚠ Headed type only |
| F Dim. Tolerance Change | FKC (25) | F $^{+0.3}_{0}$ →$^{+0.05}_{0}$ ⚠ F dim. tolerance by shape |

Table 2

| D | KRC |
|---|---|
| 3 | 3~ 6 |
| 4 | 4~12 |
| 5 | 5~16 |
| 6 | 5~20 |
| 8 | 7~30 |
| 10 | 9~ 42 |
| 13 | 13~ 64 |
| 16 | 17~ 90 |
| 20 | 24~132 |
| 25 | 25~196 |

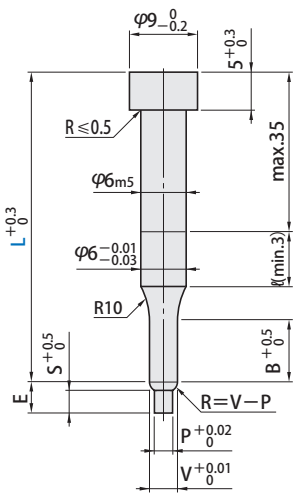
| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |



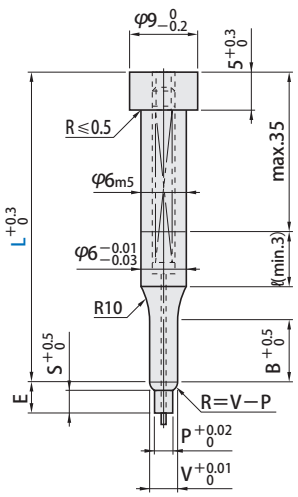
| M Material | H Hardness |
|---|---|
| SKH51 | 61～64HRC |



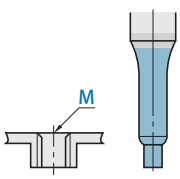
Standard




Ejector




Coating area




= TiCN coating area (surface 2700HV)

| Type · Material | Code No. Code | Code No. M | L | Type | V | P | B | S | E | M ×P |
|---|---|---|---|---|---|---|---|---|---|---|
| Standard<br>TiCN Coated SKD11<br>Polished | KSPM<br>KH — SPM<br>KL — SPM | 2.6 | 41<br>51<br>61<br>71 | A | 2.22 | 1.5 | 6 | 2 | 2.7 | M2.6×0.45 |
| | | | | B | 2.25 | | | | | |
| | | | | C | 2.32 | | | | | |
| | | | | D | 2.35 | | | | | |
| Standard SKD11 SKH51<br>TiCN Coated SKD11 SKH51 | KSPM<br>KSJM<br>KH — SPM<br>KH — SJM | 3 | | A | 2.59 | 1.9 | 8 | 3 | 3.6 | M3×0.5 |
| | | | | B | 2.63 | | | | | |
| | | | | C | 2.72 | | | | 3.7 | |
| | | | | D | 2.76 | | | | | |
| | | 4 | | A | 3.39 | 2.4 | | | 3.9 | M4×0.7 |
| | | | | B | 3.44 | | | | | |
| | | | | C | 3.64 | | | | 4.1 | |
| | | | | D | 3.69 | | | | | |
| | | 5 | | A | 4.33 | 2.8 | | 4 | 5.4 | M5×0.8 |
| | | | | B | 4.38 | | | | | |
| | | | | C | 4.62 | | | | 5.6 | |
| | | | | D | 4.67 | | | | | |

⚠ Ejector hole data: see ejector punch blanks

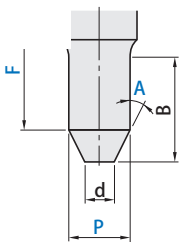
ORDER

| Code No. | | L | | Type |
|---|---|---|---|---|
| KSPM2.6 | — | 51 | — | B |

# Drawing Punch Nose Shapes

## ANTERIOR SHAPES of DRAWING PUNCH

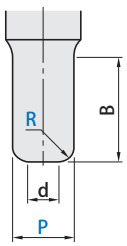
### 2A




- F≤L−1
- B≥L−F+2
- d≥dmin.(Table 1·2)

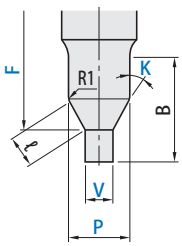
d=P−2(L−F)tanA

### 2B




- 0.5≤R≤(P−dmin.)/2

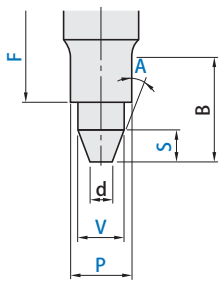
### 5B




- F≤L−2
- B≥L−F+ℓ+2
- V≤P−0.6

0.2≤ℓ=[(P−V)/2sinK]−tan[90−(180−K)/2]R

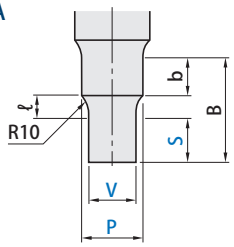
### 2C




- F≤L−S−2
- S≥1
- B≥L−F+2
- V≤P−0.6
- d≥dmin.(Table 1·2)

d=V−2StanA

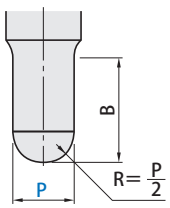
### 4A




- S≥2
- B≥S+ℓ+2

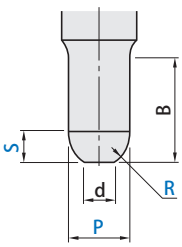
ℓ=√10(P−V)−(P−V)²/4

### 3B ✻




- B≥P/2+2

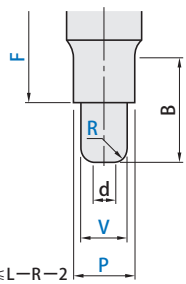
### 6B




- S≥2
- B≥S+2
- R>S
- d≥dmin.(Table 1·2)

d=P−2(R−√R²−S²)

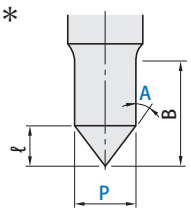
### 3C




- F≤L−R−2
- B≥L−F+2
- V≤P−0.6
- d≥d min.(Table 1·2)

d=V−2R

### 5A ✻

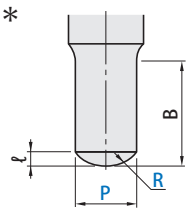



- A≥20°
- ℓ≥1
- B≥ℓ+2

NO LKC N/A

ℓ=(P/2)tan(90−A)

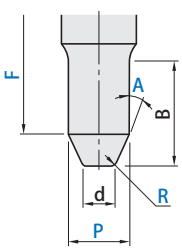
### 4B ✻




- R>P/2
- B≥ℓ+2

ℓ=R−√R²−(P/2)²

### 7B

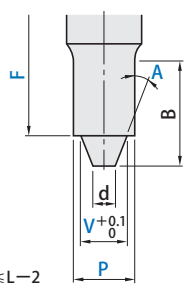



- F≤L−R−1
- B≥L−F+2
- d≥dmin.(Table 1·2)

⚠ R=0→2A

d=P−2{Rtan[(90−A)/2]+(L−F)tanA}

### 4C




- F≤L−2
- B≥L−F+2
- V≤P−0.6
- d≥dmin(Table 1·2)

NO VKC N/A

d=V−2(L−F)tanA

Table 1 Standard

| D | P | Vmin. | Point Length B | | dmin. |
|---|---|---|---|---|---|
| | in 0.01 | | S | L | |
| 3 | 2.00～2.99 | 1.00 | 8 | 13 | 0.5 |
| 4 | 2.00～3.99 | 1.00 | | | |
| 5 | 2.00～4.99 | 1.20 | | | |
| 6 | 2.00～5.99 | 1.20 | | | |
| 8 | 3.00～7.99 | 1.50 | 13 | 19 | |
| 10 | 3.00～9.99 | 1.50 | | | |
| 13 | 6.00～12.99 | 2.00 | | | |
| 16 | 10.00～15.99 | 3.00 | 19 | 25 | |
| 20 | 13.00～19.99 | 3.00 | | | |
| 25 | 18.00～24.99 | 4.00 | | | |

⚠ Pmax. = D specifiable (except coated type)

Table 2 Ejector

| D | P | Vmin. | Point Length B | | dmin. |
|---|---|---|---|---|---|
| | in 0.01 | | S | L | |
| 4 | 2.00～3.99 | 1.00 | 8 | 13 | 1.00 |
| 5 | 2.00～4.99 | 2.00 | | | 2.00 |
| 6 | 2.00～5.99 | 2.00 | | | 2.00 |
| 8 | 3.00～7.99 | 3.00 | 13 | 19 | 3.00 |
| 10 | 3.00～9.99 | 3.00 | | | 3.00 |
| 13 | 6.00～12.99 | 6.00 | | | 6.00 |
| 16 | 10.00～15.99 | 6.00 | 19 | 25 | 6.00 |
| 20 | 13.00～19.99 | 6.00 | | | 6.00 |
| 25 | 18.00～24.99 | 6.00 | | | 6.00 |

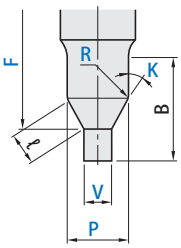
NO Shapes marked * N/A for ejector type

# Drawing Punch Nose Shapes

## ANTERIOR SHAPES of DRAWING PUNCH

KAYAN

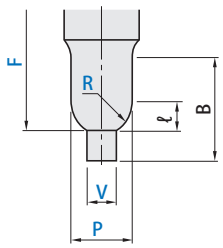
### 5C




- F≤L−2
- B≥L−F+ℓ+2
- R=1 → 5B

$0.2 \leqslant \ell = [(P-V)/2\sin K] - \tan[90-(180-K)/2]R$

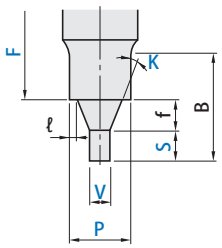
### 8C




- F≤L−2
  B≥L−F+ℓ+2
  R≥(P−V)/2

$\ell = \sqrt{(P-V)[R-(P-V)/4]}$

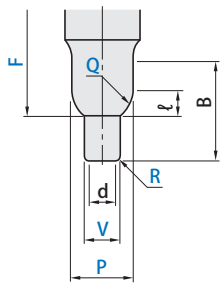
### 3D




- F≤L−4
- B≥6
- S≥2
- ℓ≥0.3
- f≥2(f=L−F−S)

$\ell = [(P-V)/2] - (L-F-S)\tan K$

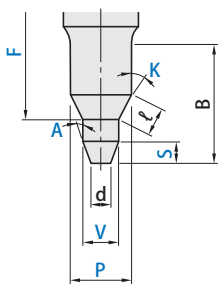
### 6D




- F≤L−R−2
- R<(V−0.5)/2
- Q≥(P−V)/2
- B≥L−F+ℓ+2
- d≥dmin.(Table 1·2)
- 0.5≤Q≤15 and R=0→8C
- 0.5≤R≤15 and Q=0→3C
- d=V−2R

$\ell = \sqrt{(P-V)[Q-(P-V)/4]}$

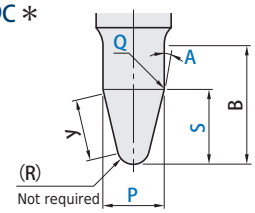
### 6C




- F≤L−S−2
- S≥1
- B≥L−F+ℓ+2
- d≥dmin.(Table 1·2)

d=V−2StanA
$0.2 \leqslant \ell = [(P-V)/2\sin K]$

### 9C ✻



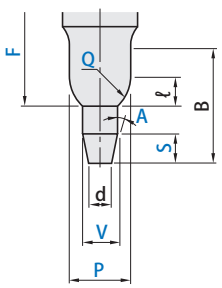

- B≥S+Qtan(A/2)+2
- y≥1

⚠ S= dim. before Q

$S < \frac{P}{2\tan A}$

y= S/cosA−Qtan(A/2)−Rtan[(90−A)/2]
R=(P/2−StanA)/tan[(90−A)/2]

### 4D

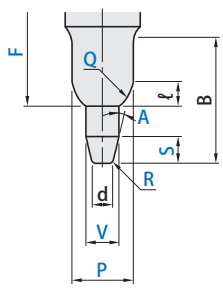



- F≤L−S−2
- Q≥(P−V)/2
- S≥1
- B≥L−F+ℓ+2
- d≥dmin.(Table 1·2)

⚠ Q=0→2C

$\ell = \sqrt{(P-V)[Q-(P-V)/4]}$

### 7D

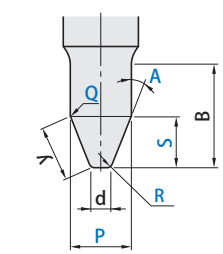



- F≤L−S−2
- Q≥(P−V)/2
- B≥L−F+ℓ+2
- d≥dmin.(Table 1·2)

⚠ R=0 and Q=0→2A R=0→4D Q=0→5D

$\ell = \sqrt{(P-V)[Q-(P-V)/4]}$
d= V−2{Rtan[(90−A)/2]+StanA}

### 7C

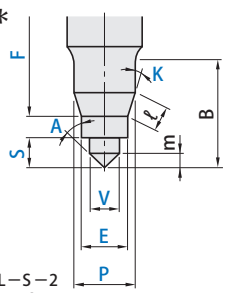



- B≥S+QtanA/2+2
- y≥1
- d≥dmin.(Table 1·2)

⚠ 0.5≤R≤15 and Q=0→7B
⚠ R=0 and Q=0→2A
⚠ S= dim. before Q

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

### 2D ✻

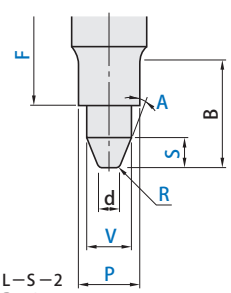



- F≤L−S−2
- S≥m+2
- A≥20°
- B≥L−F+ℓ+2
- V≤P−0.6

NO LKC N/A

m=(V/2)tan(90−A)
$0.2 \leqslant \ell = [(P-E)/2\sin K]$

### 5D

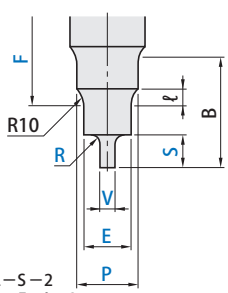



- F≤L−S−2
- S≥R+1
- B≥L−F+2
- V≤P−0.6
- d≥dmin.(Table 1·2)

⚠ R=0 → 2C

d=V−2{Rtan[(90−A)/2]+StanA}

### 9D




- F≤L−S−2
- B≥L−F+ℓ+2
- $R \geqslant (E-V)/2 \rightarrow S \geqslant \sqrt{(E-V)R[-(E-V/4)]}+1$
- R<(E−V)/2 → S≥R+1

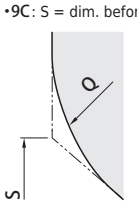
NO R≠0
NO FKC N/A

$\ell = \sqrt{10(P-E)-(P-E)^2/4}$

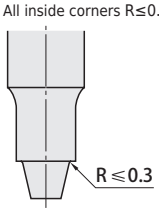
| | T Tol. | in |
|---|---|---|
| F | $^{+0.3}_{0}$ | 0.1 |
| S | $^{+0.3}_{0}$ | 0.1 |
| V | $^{+0.01}_{0}$ | 0.01 |
| E | $^{+0.01}_{0}$ | 0.01 |
| P | $^{+0.01}_{0}$ | 0.01 |

| | T Tol. | in |
|---|---|---|
| A | ±30′ | 1 (0<A<90) |
| K | ±30′ | 1 (0<K<90) |
| R | ±0.5 | 0.1<br>R=0 or 0.5≤R≤15 |
| Q | ±0.5 | 0.1<br>Q=0 or 0.5≤Q≤15 |

⚠ 7C・9C: S = dim. before Q




⚠ All inside corners R≤0.3



# Drawing Punches

## DRAWING PUNCHES



▶ Headed / Screw-retained

| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

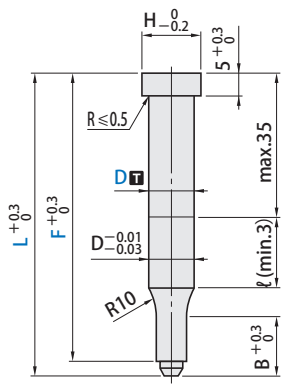
SKH40:Powder-metallurgy HSS(JIS G4403.2000)

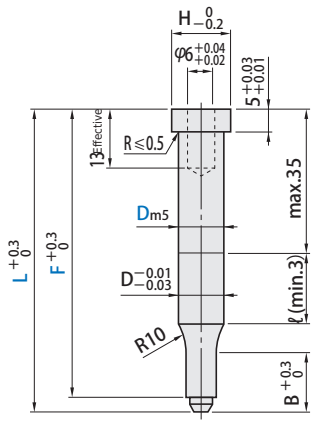
▶ Dowel-pin located

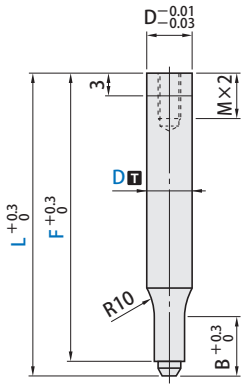
| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |

A Accessory: MMS6-25

| Headed | Dowel-pin located | Screw-retained |
|---|---|---|




| Tol. · Material (Shank dia. tol. T) | Code No. Code | Shape | B | D | L in 0.1 | P in 0.01 | Vmin. | H | M |
|---|---|---|---|---|---|---|---|---|---|
| Point Length S | Headed (D3～25) / Dowel-pin located (D10～25) / Screw-retained (D5～25) | | | | | | | | |
| SKD11 | KSP / KSP — C / KMP | | 8 | 3 | 40.0～ 80.0 | 2.00～ 3.00 | 1.00 | 5 | — |
| Dm5 SKH51 | KSH / KMSH | | | 4 | | 2.00～ 4.00 | 1.00 | 7 | |
| SKH40 | KPH / KMPH | | | 5 | | 2.00～ 5.00 | 1.20 | 8 | 3 |
| SKD11 | KA — SP / KA — MP | | | 6 | | 2.00～ 6.00 | 1.20 | 9 | |
| D +0.005 0 SKH51 | KA — SH / KA — MSH | | 13 | 8 | | 3.00～ 8.00 | 1.50 | 11 | 4 |
| SKH40 | KA — PH / KA — MPH | | | 10 | | 3.00～10.00 | 1.50 | 13 | 5 |
| | | | | 13 | (40.0～ 49.9) 50.0～100.0 | 6.00～13.00 | 2.00 | 16 | 6 |
| | | | 19 | 16 | | 10.00～16.00 | 3.00 | 19 | |
| | | | | 20 | | 13.00～20.00 | 3.00 | 23 | |
| | | 2A・4A・5A 2B～7B 2C～9C 2D～7D・9D | | 25 | | 18.00～25.00 | 4.00 | 28 | |
| Point Length L | Headed (D3～25) / Dowel-pin located (D10～25) / Screw-retained (D5～25) | | | | | | | | |
| SKD11 | KSPL / KSPL — C / KMPL | | 13 | 3 | 50.0～ 80.0 | 2.00～ 3.00 | 1.00 | 5 | — |
| Dm5 SKH51 | KSHL / KMSHL | | | 4 | | 2.00～ 4.00 | 1.00 | 7 | |
| SKH40 | KPHL / KMPHL | | | 5 | | 2.00～ 5.00 | 1.20 | 8 | 3 |
| SKD11 | KA — SPL / KA — MPL | | | 6 | | 2.00～ 6.00 | 1.20 | 9 | |
| D +0.005 0 SKH51 | KA — SHL / KA — MSHL | | 19 | 8 | 50.0～100.0 | 3.00～ 8.00 | 1.50 | 11 | 4 |
| SKH40 | KA — PHL / KA — MPHL | | | 10 | | 3.00～10.00 | 1.50 | 13 | 5 |
| | | | | 13 | | 6.00～13.00 | 2.00 | 16 | 6 |
| | | | 25 | 16 | 60.0～100.0 | 10.00～16.00 | 3.00 | 19 | |
| | | | | 20 | | 13.00～20.00 | 3.00 | 23 | |
| | | | | 25 | | 18.00～25.00 | 4.00 | 28 | |

⚠ For L (40.0-49.9), point length B=8 ⚠ P＞D−0.03: no press-in lead($D^{-0.01}_{-0.03}$) ⚠ P＝D: P tol. same as D tol., no press-in lead($D^{-0.01}_{-0.03}$)

ORDER

| Code No. | L | P | V・A・E・F・K・Q・R・S |
|---|---|---|---|
| KSP2A6 | — 40.0 — | P3.80 — | A20—F38.0 |

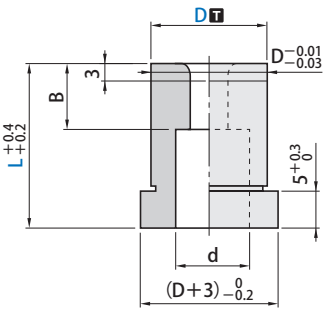


| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH40 | 64～67HRC |

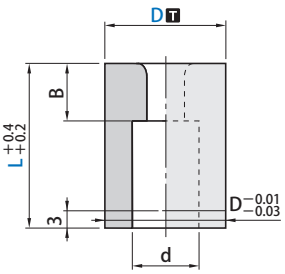
SKH40: Powder-metallurgy HSS (JIS G4403.2000)

## Point length (B) standard

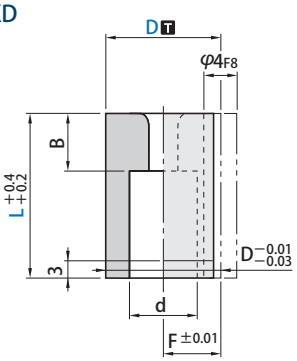
### Headed
**KHD KA—HD**
**KPHD KA—PHD**




### Headless
**KSD KA—SD**
**KPSD KA—PSD**

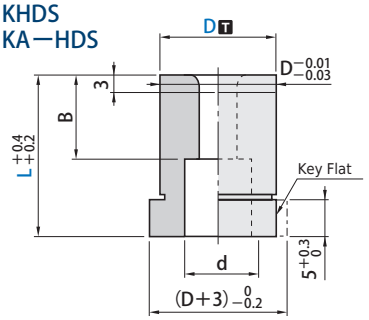



### Pin-keyed
**KKD**

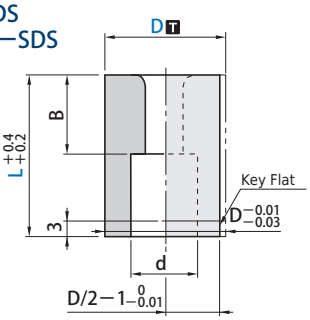



## Point length (B) extended

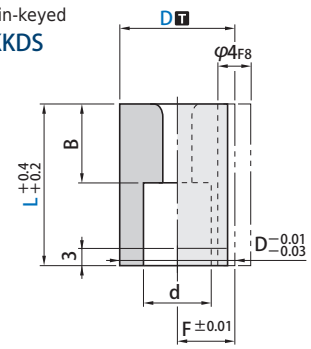
### Headed
**KHDS**
**KA—HDS**



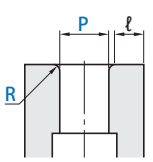

### Headless
**KSDS**
**KA—SDS**




### Pin-keyed
**KKDS**



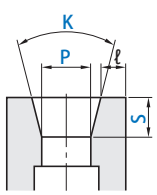

### 2A




- $\ell\,\text{min.} \leqslant \ell = \frac{D}{2} - \frac{P}{2} - R$
- $R \leqslant B-2$

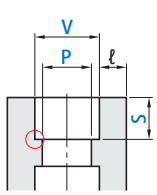
⚠ Specifiable R=0

### 3A



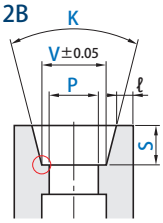

- $\ell\text{min} \leqslant \ell = \frac{D}{2} - \frac{P}{2} - \text{Stan}\frac{K}{2}$
- $S \leqslant B-2$

### 4A



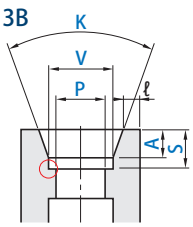

- $P < V$
- $\ell\text{min.} \leqslant \ell = \frac{D}{2} - \frac{V}{2}$
- $S \leqslant B-2$

### 2B



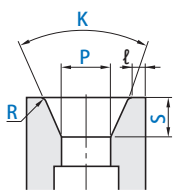

- $P < V$
- $\ell\,\text{min} \leqslant \ell = \frac{D}{2} - \frac{P}{2} - \text{Stan}\frac{K}{2}$
- $S \leqslant B-2$

### 3B



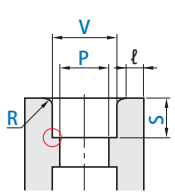

- $P < V$
- $\ell\,\text{min} \leqslant \ell = \frac{D}{2} - \frac{V}{2} - \text{Atan}\frac{K}{2}$
- $S \leqslant B-2$
- $S - A \geqslant 2$

### 4B



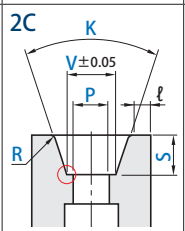

- $\ell\text{min} \leqslant \ell = \frac{D}{2} - \frac{P}{2} - \text{Stan}\frac{K}{2} - \text{Rtan}\frac{180°-K}{4}$
- $S \leqslant B-2$

### 5B



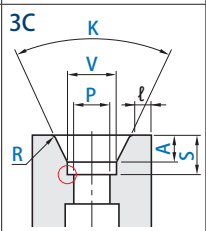

- $P < V$
- $\ell\,\text{min.} \leqslant \ell = \frac{D}{2} - \frac{V}{2} - R$
- $S \leqslant B-2$

### 2C



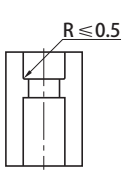

- $P < V$
- $\ell\text{min} \leqslant \ell = \frac{D}{2} - \frac{V}{2} - \text{Stan}\frac{K}{2} - \text{Rtan}\frac{180°-K}{4}$
- $S \leqslant B-2$

### 3C




- $P < V$
- $\ell\text{min} \leqslant \ell = \frac{D}{2} - \frac{V}{2} - \text{Atan}\frac{K}{2} - \text{Rtan}\frac{180°-K}{4}$
- $S \leqslant B-2$
- $S - A \geqslant 2$

⚠ Inside corners marked ○ R≤0.5




| | Range | T | in |
|---|---|---|---|
| R | 0.2⩽R⩽10 | ±0.05 | 0.1 |
| K | 1⩽K⩽179 | ±30′ | 1 |
| S | S⩾2 | ±0.1 | 0.1 |
| A | — | ±0.1 | 0.1 |
| P | — | +0.01 0 | 0.01 |
| V | — | +0.01 0 | 0.01 |

ℓ ··· ·HHD·SSD ·HHDS ·PPHD ·PPSD ·AA—HD·AA—SD·AA—HDS ·AA—PHD·AA—PSD ····· ℓmin=0.5

·SSDS ·AA—SDS ····· ℓmin=1.5

·KKD ·KKDS ····· ℓmin=2.5

⚠ SSD ·PPSD ·AA—SD·AA—PSD
With alterations SKC·KC·WKC:, ℓmin=1.5

# Drawing Dies

## DRAWING BUTTON DIES

| Type · Material | Code No. Code | | Shape | D | L | P 0.01 | B Point Length Standard | B Point Length Extended | F | d |
|---|---|---|---|---|---|---|---|---|---|---|
| | Dm5 | $D^{+0.005}_{0}$ | | 10 | | 2.00～ 6.00 | 6 | | 6 | 6.4 |
| SKD11 | L16～35 KHD | KA — HD | | 13 | | 3.00～ 8.00 | | 10 | 7.5 | 8.4 |
| Headed SKH40 | L16～35 KPHD | KA — PHD | | 16 | | 5.00～10.00 | | | 8 | 10.6 |
| SKD11 | L40 KHDS | KA — HDS | 2A～4A | 20 | 16 20 22 25 (28) 30 (32) 35 (40) | 7.00～12.00 | | 12 | 10 | 12.6 |
| | Dn5 | $D^{+0.005}_{0}$ | | 25 | | 10.00～16.00 | | | 12.5 | 16.6 |
| SKD11 | L16～35 KSD | KA — SD | 2B～5B | 32 | | 15.00～20.00 | 8 | 15 | 16 | 20.6 |
| Headless SKH40 | L16～35 KPSD | KA — PSD | | | | | | | | |
| SKD11 | L16～40 KSDS | KA — SDS | 2C・3C | 38 | | 19.00～26.00 | | | 19 | 26.6 |
| | Dn5 | | | 45 | | 25.00～35.00 | | 20 | 22.5 | 36.0 |
| Pin-keyed SKD11 | L16～35 KKD | | | 50 | 20 22 25 30 35 (40) | 33.00～40.00 | | | 25 | 41.0 |
| | L16～40 KKDS | | | 56 | | 38.00～45.00 | | | 28 | 46.0 |

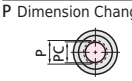
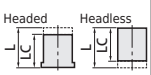
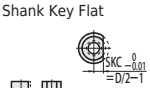
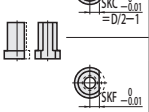
⚠ SKH40 when Dmax.=25 ⚠ L (28) (32 For point length (B) standard

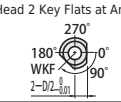
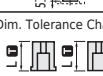
ORDER

| Code No. | L | P・V・R・K・S・A |
|---|---|---|
| KHD3B10 — | 20 — | P2.00—V6.00—K30—S4.0—A2.0 |

ADDITIONS ORDER

| Code No. | L (C) | P・V・R・K・S・A | (HC・TC ⋯etc) |
|---|---|---|---|
| KHD3B10 — | 20 — | P2.00—V6.00—K30—S4.0—A2.0 — | HC12.0—TKC |

| Add. | Code | Alteration Description |
|---|---|---|
| P Dimension Change  | PC (4) | Reduce point dim. "P"<br>$P > PC \geqslant \frac{Pmin.}{2} \geqslant 1.90$<br>0.01 |
| L Dimension Change  | LC (4) | Reduce overall length "L"<br>Headed: L—[B—S (R)]+2≤LC＜L<br>0.1→w/ LKC, LKP: allows 0.01<br>⚠ B dim. and press-in lead reduced accordingly(L-LC )<br>Headless · Pin-keyed: 10≤LC ＜L<br>0.1→w/ LKC, LKP: allows 0.01<br>⚠ Press-in lead reduced accordingly(L-LC ) |
| H Dimension Change  | HC (4) | Reduce head dia. "H"<br>D≤HC＜H<br>0.1<br>⚠ Headed type only |
| T Dimension Change  | TC (4) | Reduce head thickness "T"<br>2≤TC＜5<br>0.1→w/ TKC (M): allows 0.01<br>⚠ L reduced accordingly (5-TC); with LC, LC unchanged<br>⚠ Headed type only |
| Shank Key Flat  | SKC (19) | Add 1 key flat on shank<br>⚠ For D ≥ 8, L ≥ 20 (machining width 1.0)<br>⚠ Headed type only<br>NO Cannot be combined with KC, WKC, CKC, WKF, SKF |
|  | SKF (25)<br>Headless Extended | Add 1 key flat of specified size on shank<br>0.1<br>⚠ For D ≥ 8, L ≥ 20 (machining width 1.0)<br>NO Cannot be combined with KC, WKC, SKC, CKC, WKF<br>NO N/A for pin-keyed type |
| Head Key Flat  | KC (6) | Add 1 key flat<br>NO N/A for extended point (B) and pin-keyed types<br>NO Cannot be combined with WKC, CKC, WKF, SKC, SKF |

| Add. | Code | Alteration Description |
|---|---|---|
| Head 2 Parallel Key Flats  | WKC<br>Standard(12)<br>Extended(6) | Add 2 parallel key flats<br>NO N/A for pin-keyed type<br>NO Cannot be combined with KC, CKC, WKF, SKC, SKF |
| Head 2 Key Flats at 90°  | CKC<br>Standard(12)<br>Extended(6) | Add 2 key flats at 90° on head<br>NO Cannot be combined with WKC, WKF, SKC, SKF |
| Head 2 Key Flats at Angle  | WKF<br>Standard(19)<br>Extended(12) | Add 2 key flats at specified angle on head<br>0＜WKF＜360<br>1<br>NO Cannot be combined with KC, WKC, CKC, SKC, SKF |
| Shank Key Flat Tol. Change  | SKKC (12) | ⚠ Must be combined with SKC, SKF<br>NO N/A for pin-keyed type |
| Head thickness machined to retainer face  | RC (6) | ⚠ Head thk. tolerance changed to retainer face<br>⚠ Headed type only ⚠ Applies to L≥30<br>NO $D^{+0.005}_{0}$ N/A |
| L Dim. Tolerance Change  | LKC (12)<br>LKP (19) | $L\ ^{+0.4}_{+0.2} \rightarrow\ ^{+0.05}_{0}$<br>$L\ ^{+0.4}_{+0.2} \rightarrow\ ^{+0.01}_{0}$ |
| T Dim. Tolerance Change  | TKC (6)<br>TKCM (6) | $T\ ^{+0.3}_{0} \rightarrow\ ^{+0.02}_{0}$ ⚠ Headed type only<br>$T\ ^{+0.3}_{0} \rightarrow\ ^{0}_{-0.02}$ ⚠ Headed type only |

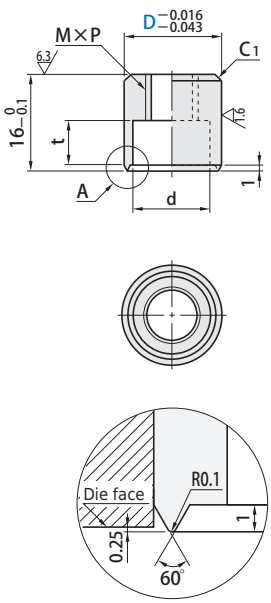




| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |

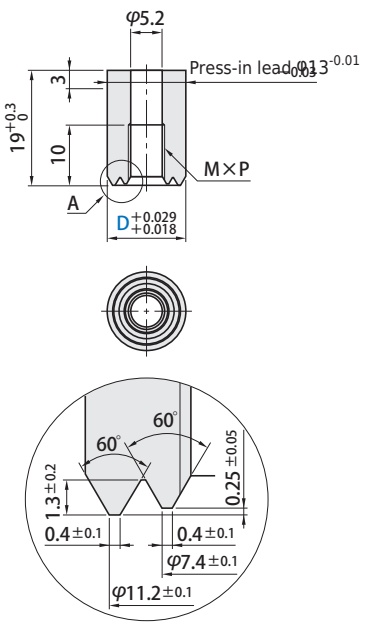
⚠ Set screw must sit above mounting face 0.25mm
⚠ Use a plastic mallet when pressing in

## KDCBA




A detail (enlarged)

## KDCBAW




A detail (enlarged)

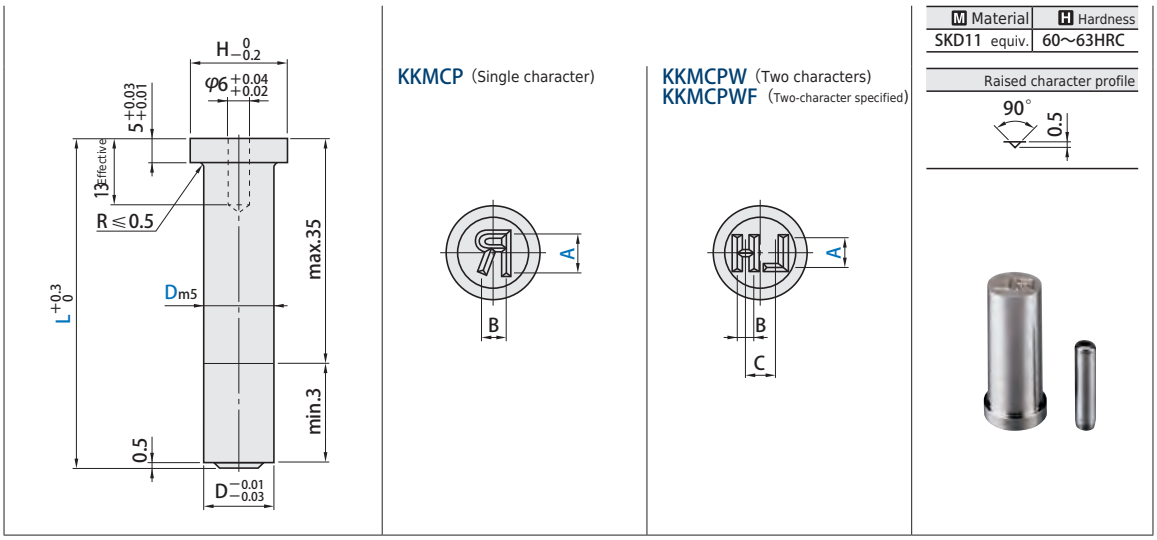
| Code No. | | d | M×P | t |
|---|---|---|---|---|
| Code | D | | | |
| KDCBAW | 13 | — | 6×P1.0 | — |
| KDCBA | 16 | 11 | 8×P1.25 | 8 |
| | 18 | 13.5 | 10×P1.5 | 10 |

ORDER

| Code No. |
|---|
| KDCBA18 |

# Marking Punches

## ENGRAVING PUNCHES



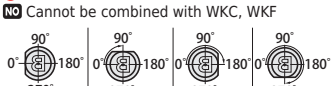

| Code No. Code | D | L in 0.5 | A | Characters (bold) CHR | H | B | C |
|---|---|---|---|---|---|---|---|
| Single character **KKMCP** | 10 | 30.0～120.0 | 5 | 1234567890 ABCDEFGHIJKLM NOPQRSTUVWXYZ | 13 | 3.3 | — |
| | | | 6 | | | 4 | |
| | 13 | | 8 | | 16 | 5.3 | |
| | 16 | | 10 | | 19 | 6.5 | |
| | 20 | | 13 | | 23 | 8.5 | |
| Two characters **KKMCPW** | 10 | 30.0～120.0 | 4 | | 13 | 2.5 | 3.5 |
| | 13 | | 5 | | 16 | 3.3 | 5 |
| | 16 | | 6 | | 19 | 4 | 6 |
| | 20 | | 8 | | 23 | 5.3 | 8 |
| | 25 | | 10 | | 28 | 6.5 | 10 |
| Two-character specified **KKMCPWF** | 10 | 30.0～120.0 | 4 | | 13 | 2.5 | 3.5 |
| | 13 | | 5 | | 16 | 3.3 | 5 |
| | 16 | | 6 | | 19 | 4 | 6 |
| | 20 | | 8 | | 23 | 5.3 | 8 |
| | 25 | | 10 | | 28 | 6.5 | 10 |

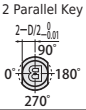
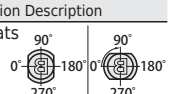
ORDER

| Code No. | L | A | CHR |
|---|---|---|---|
| KKMCP13 | — 40.0 | — A8 | — R |

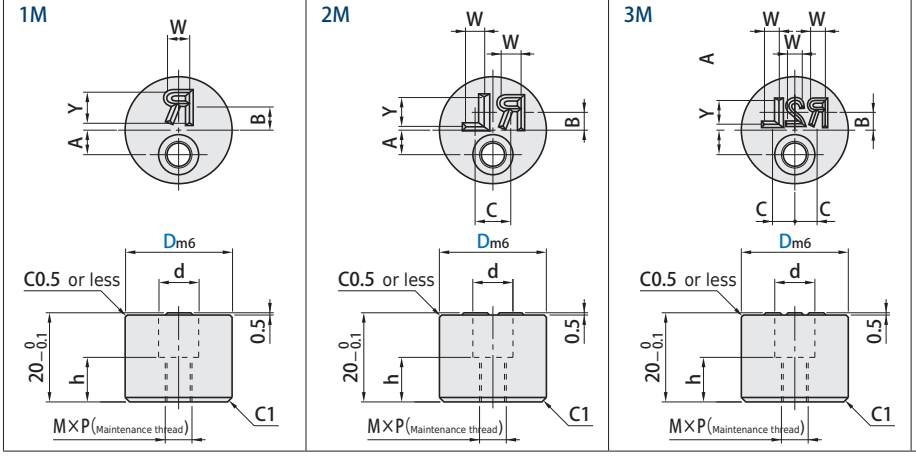
ADDITIONS ORDER

| Code No. | L | A | CHR | (HC・TC…etc) |
|---|---|---|---|---|
| KKMCP16 | — 40.0 | — A10 | — R | — KC90 |

| Add. | Code | Alteration Description |
|---|---|---|
| H Dimension Change  | HC (4) | Reduce head dia. "H"<br>D≤HC＜H<br>in 0.1 |
| T Dimension Change  | TC (4) | Reduce head thickness "T"<br>2≤TC＜5<br>in 0.1 |
| Head Key Flat  | KC (6) | Add 1 key flat<br>0≤KC＜360<br>in 90 ⚠ Can be combined with CKC<br>NO Cannot be combined with WKC, WKF<br>  <br>KC0 KC90 KC180 KC270 |

| Add. | Code | Alteration Description |
|---|---|---|
| Head 2 Parallel Key Flats  | WKC (12) | Add 2 parallel key flats<br>0 and 90<br>in 90<br>NO Not with KC, CKC, WKF<br>  <br>WKC0 WKC90 |
| Head 2 Key Flats at 90°  | CKC (12) | Add 2 key flats on head<br>⚠ Can be combined with KC<br>NO Cannot be combined with WKC, WKF<br>  |
| Head 2 Key Flats at Angle WKF (19)  | | Add 2 key flats at specified angle<br>0＜WKF＜360<br>in 1<br>NO Cannot be combined with KC, WKC, CKC |
| Press-in lead $(D^{-0.01}_{-0.03})$ removed  | NDC (0) | Remove press-in lead $(D^{-0.01}_{-0.03})$ |

| 1 characters | 2 characters | 3 characters |
|---|---|---|
| 1M | 2M | 3M |




| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |

Raised character profile

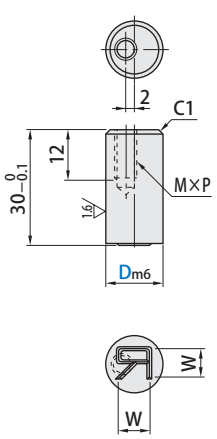




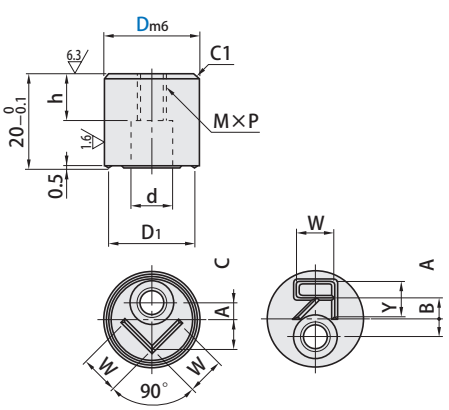

| Code No. | | Characters (bold) | No. of characters | A | B | C | M×P | d | h | W | Y | Dm6 | | Mounting Screw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | D | CHR | | | | | | | | | | | | |
| KTCPBS | 16 | 0123456789 ABCDEFGHIJKLM NOPQRSTUVWXYZ | 1M | 2 | 5.2 | — | M 6×P1.0 | 9 | 10 | 2.5 | 3.5 | 16 | +0.018 +0.007 | M5 |
| | 20 | | | 3.5 | 5.2 | — | | | | 4 | 6 | 20 | +0.021 +0.008 | |
| | 24 | | | 5.5 | 4 | — | | | | 6 | 8 | 24 | | |
| KTCPBW | 20 | | 2M | 3.5 | 4.75 | 5.6 | | | | 4 | 5.5 | 20 | | |
| | 24 | | | 5.5 | 4 | 8 | | | | 6 | 8 | 24 | | |
| KTCPCT | 24 | | 3M | 5.5 | 4 | 5 | | | | 4 | 6 | 24 | | |
| KTCPBWT | 24 | | 2M | 4.5 | 5.8 | 8 | M10×P1.5 | 13.5 | 7 | 5.5 | 5.5 | 24 | +0.021 +0.008 | M8 |
| KTCPCTT | 24 | | 3M | 4.5 | 6 | 5 | | | | 3.3 | 5 | 24 | | |

▶ R・L Type

KTCPA




KTCPB
KTCPBT (Punches marking L·R have no border)




| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |

Character examples

Ⓛ R

⚠ Punches marking R have no border

Raised character profile






| Code No. | | CHR | A | B | C | M×P | h | d | D1 | W | Y | Dm6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | D | | | | | | | | | | | | |
| KTCPA | 10 | R L | — | — | — | M 4×P0.7 | — | — | 8 | 5 | 3 | 10 | +0.015 +0.006 |
| | 14 | | — | — | — | M 6×P1.0 | — | — | 12 | 8 | 6 | 14 | +0.018 +0.007 |
| KTCPB | 16 | | 1.5 | 4.5 | 5.7 | | 10 | 9 | 14 | 4 | 3.2 | 16 | +0.018 +0.007 |
| | 20 | | 3.5 | 4 | 6.5 | | | | 18 | 8 | 8 | 20 | +0.021 +0.008 |
| KTCPBT | 20 | | 2.5 | 6.5 | 8.5 | M10×P1.5 | 7 | 13.5 | — | 5.5 | 5 | 20 | +0.021 +0.008 |

ORDER

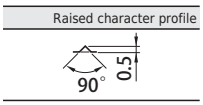
| Code No. | CHR |
|---|---|
| KTCPBS20 — | R |
| KTCPA14 — | R |

# Square Marking Punches - Screw-Retained-

## ENGRAVING BLOCK PUNCHES—FIXED with BOLT—

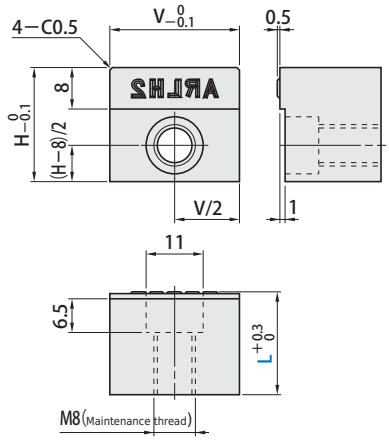




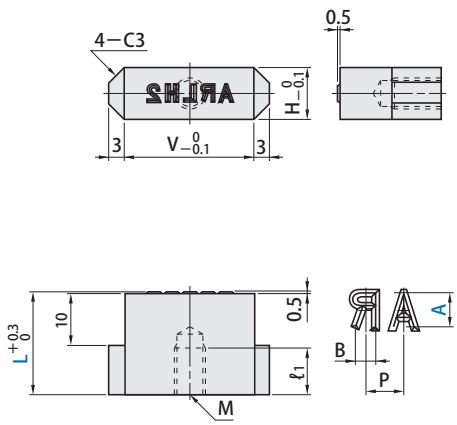



| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |

### KOCP □M




### KBCP □M




⚠ L20: ℓ1 ≥ M×1.5
L25: ℓ1 ≥ M×2

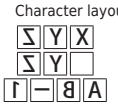
| Code No. Code | No. of characters | A | L | Characters (bold) CHR | Mounting Screw | V | H | P | B |
|---|---|---|---|---|---|---|---|---|---|
| KOCP | 3M | 3 | 20 25 | 0123456789 ABCDEFGHIJKLM NOPQRSTUVWXYZ | M6 | 16 | 22 | 3.5 | 2 |
| | 4M | | | | | 25 | | | |
| | 5M | | | | | 32 | | | |
| | 6M | | | | | | | | |
| | 7M | | | | | | | | |
| | 8M | | | | | | | | |
| KBCP | 3M | 3 | 20 25 | | M6 | 16 | 10 | 3.5 | 2 |
| | 4M | | | | | 25 | | | |
| | 5M | | | | | 32 | | | |
| | 6M | | | | | | | | |
| | 7M | | | | | | | | |
| | 8M | | | | | | | | |
| | 3M | 6 | | | M8 | 25 | 13 | 6.0 | 4 |
| | 4M | | | | | 32 | | | |
| | 5M | | | | | | | | |

| Name | Marking character order code |
|---|---|
| Space | □ |
| Hyphen | — |
| | # |

ORDER

| Code No. | A | L | CHR |
|---|---|---|---|
| KOCP3M — | 3 | — 20 | — XYZ |
| KOCP3M — | 3 | — 20 | — %YZ |
| KOCP4M — | 3 | — 20 | — AB#1 |

Character layout

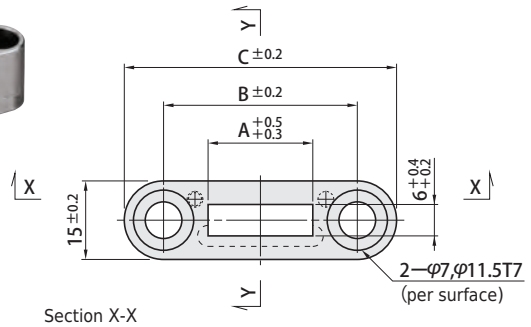


# Marking Punch Retainers

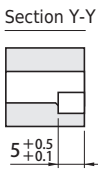


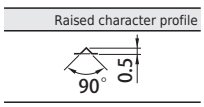
KAYAN

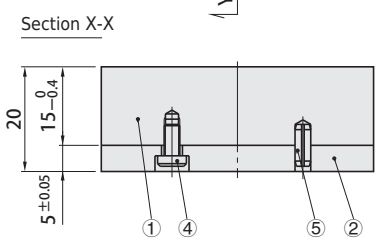


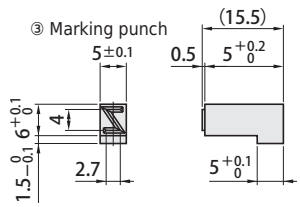



| Components | M Material | H Hardness |
|---|---|---|
| ① Punch holder | S45C | — |
| ② Backing plate | SK4 | 58～62HRC |
| ③ Marking Punches | SKD11 | 60～63HRC |
| ④ Mounting screw(CCBS3 —6) | — | — |
| ⑤ Spring pin(φ3×8) | | |




▶ Marking Punch Retainers(① ② ④ ⑤)

| Code No. | | A | B | C |
|---|---|---|---|---|
| Code | No. of characters | | | |
| KHCFPH | 2 | 10 | 27 | 42 |
| | 4 | 20 | 37 | 52 |
| | 6 | 30 | 47 | 62 |
| | 8 | 40 | 57 | 72 |

ORDER

| Code No. | CHR | |
|---|---|---|
| KHCFPH6 | | |
| KHCFS4 | — | X |

▶ Marking Punches for Punch Retainers(③)

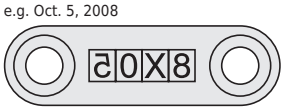
| Code No. | Characters (bold) |
|---|---|
| | CHR |
| KHCFS4 | 0123456789<br>XYZ |

▶ Marking Punch Set (4 characters)

●「Year-Month-Day" Marking Punch Set (□Y □M □□D)
201□Qty. required for year marking
(X: 10 M Y: Nov. Z: Dec.)

| CHR | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | X | Y | Z | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Qty. | 2 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 34 |

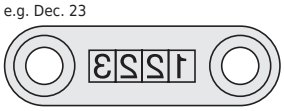
e.g. Oct. 5, 2008




●「Month-Day" Marking Punch Set (□□M □□D)
01 Qty. required for Jan. 1 - Dec. 31

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

e.g. Dec. 23



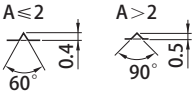

⚠ Punch holder not included

# Square Marking Punches - Single Character-

## ENGRAVING BLOCK PUNCHES—SINGLE CHARACTER TYPE—



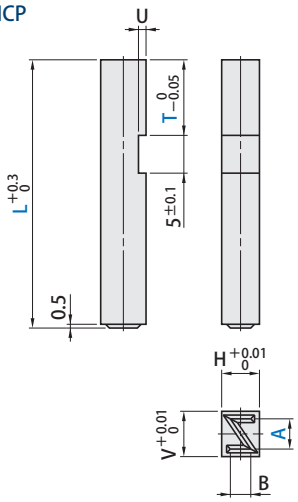
Raised character profile




| Material | Hardness |
|---|---|
| SKH51 | 61～64HRC |

### Key-slot

KHCP




⚠A1.5: not specifiable K0·K180

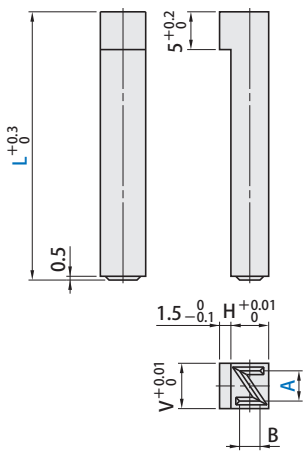
Key-slot position



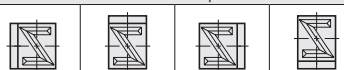
K0 K90 K180 K270

### Single Shoulder

KHCF



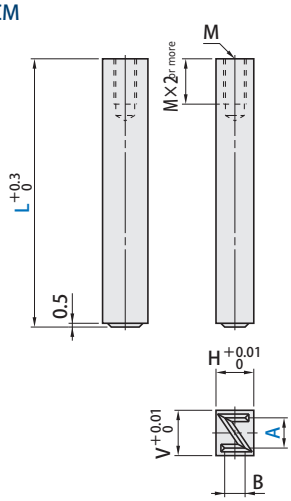

Shoulder position



F0 F90 F180 F270

### Screw-retained

KHCM




| Code No. Code | A | L (in 0.1) | T | Characters (bold) CHR | U | M | V | H | B |
|---|---|---|---|---|---|---|---|---|---|
| Key-slot KHCP | 1.5 | 16.0～40.0 | 2.0≤T<L−5.4 | 0123456789 ABCDEFGHIJKLM NOPQRSTUVWXYZ | 0.8 | — | 3 | 2 | 1 |
| | 2 | 16.0～50.0 | | | | | 4 | 3 | 1.3 |
| | 3 | 16.0～60.0 | | | 1.0 | | 5 | 4 | 2 |
| | 4 | 16.0～70.0 | | | | | 6 | 5 | 2.7 |
| Single Shoulder KHCF | 2 | 16.0～50.0 | — | | — | — | 4 | 3 | 1.3 |
| | 3 | 16.0～60.0 | | | | | 5 | 4 | 2 |
| | 4 | 16.0～70.0 | | | | | 6 | 5 | 2.7 |
| | 5 | 16.0～70.0 | | | | | 8 | 6 | 3.4 |
| Screw-retained KHCM | 2 | 16.0～50.0 | — | | — | 3 | 5 | 5 | 1.3 |
| | 3 | 16.0～60.0 | | | | | 6 | 5 | 2 |
| | 4 | 16.0～70.0 | | | | | | | 2.7 |
| | 5 | 16.0～70.0 | | | | 4 | 8 | 6 | 3.4 |

ORDER

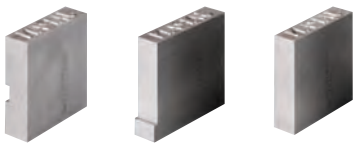
| Code No. | L | T | CHR | K |
|---|---|---|---|---|
| KHCP4 — | 35.0 — | T15.0 — | M — | K0PM |

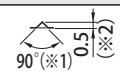
⚠Key slot removed:, T=L

# Square Marking Punches - Multi-Character-

## ENGRAVING BLOCK PUNCHES—MULTIPLE CHARACTERS TYPE—

KAYAN

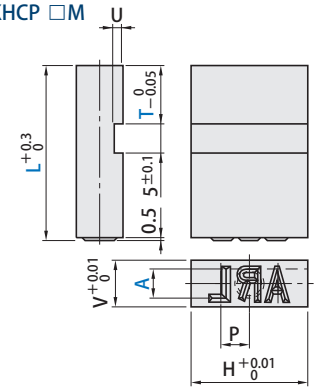


| Raised character profile |
|---|
|  |
| (※1) A=2→60° (※2) A=2→0.4 |

| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |

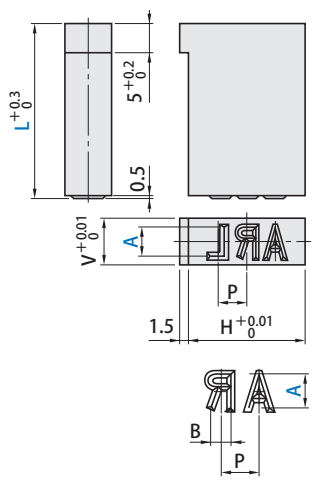
### Key-slot

KHCP □M



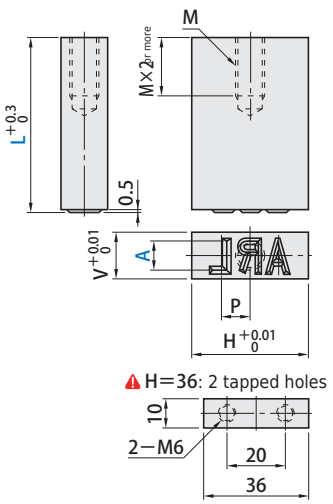
### Single Shoulder

KHCF □M



### Screw-retained

KHCM □M



### Key-slot position



K0 K90 K180 K270

### Shoulder position



F0 F90 F180 F270

| Code No. Code | No. of characters | A | L | T | Characters (bold) CHR | U | M | V | H | P | B |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | in 0.1 | | | | | | | | |
| Key-slot KHCP / Single Shoulder KHCF / Screw-retained KHCM | 2M | 2 | 20.0～70.0 | 2.0≦T＜L−5.4 | 0123456789 ABCDEFGHIJKLM NOPQRSTUVWXYZ | 1.0 | 3 | 5 | 8 | 2.5 | 1.3 |
| | 3M | | | | | | | | 10 | | |
| | 4M | | | | | | | | 16 | | |
| | 5M | | | | | | | | | | |
| | 6M | | | | | | | | | | |
| | 2M | 3 | | | | | | | 8 | 3.5 | 2 |
| | 3M | | | | | | | | 16 | | |
| | 4M | | | | | | | | 22 | | |
| | 5M | | | | | | | | | | |
| | 6M | | | | | | | | | | |
| | 2M | 5 | | | | 1.5 | 5 | 8 | 12 | 4.9 | 3.4 |
| | 3M | | | | | | | | 20 | | |
| | 4M | | | | | | | | 30 | | |
| | 5M | | | | | | | | | | |
| | 6M | | | | | | | | | | |
| | 2M | 6 | | | | | 6 | 10 | 16 | 6.0 | 4.0 |
| | 3M | | | | | | | | 25 | | |
| | 4M | | | | | | | | 36 | | |
| | 5M | | | | | | | | | | |
| | 6M | | | | | | | | | | |

| Name | Marking character order code |
|---|---|
| Space | □ % |
| Hyphen | — # |

ORDER

| Code No. | A | L | T | CHR | K・F |
|---|---|---|---|---|---|
| KHCP3M | 2 | 50.5 | T10.5 | ABC | K0 |
| KHCF3M | 3 | 60.0 | | R#L | F0 |
| KHCP4M | 5 | 50.0 | T15.0 | %XYQ | |
| KHCM5M | 3 | 35.5 | | PUNCH | |

Character layout ⚠ Key slot removed:, T=L



# Precision Square Marking Punches

## PRECISION ENGRAVING BLOCK PUNCHES



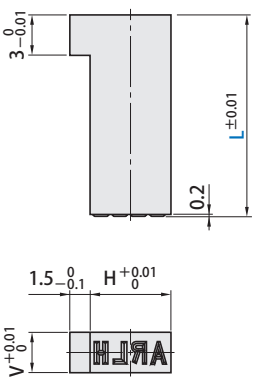
Raised character profile




| Material | Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |

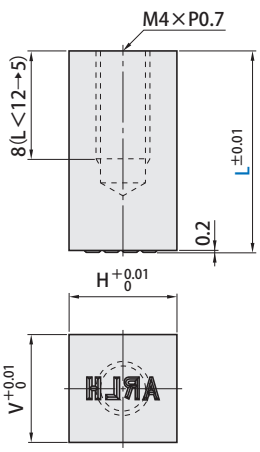
### Single Shoulder

KVCF □M




### Screw-retained

KVCM □M

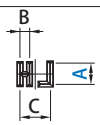



### No. of characters

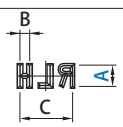
1M



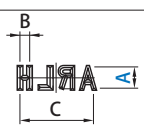

2M




3M




4M



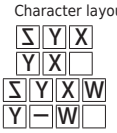

| Code No. Code | No. of characters | A | L 0.1 | Characters (bold) CHR | V | H | B | C |
|---|---|---|---|---|---|---|---|---|
| Single Shoulder KVCF | 1M | 1.0 | 8.0～30.0 | 0123456789 ABCDEFGHIJKLM NOPQRSTUVWXYZ | 3 | 2 | 0.7 | — |
| | | 1.2 | | | | | 0.8 | |
| | | 1.5 | | | | | 1.0 | |
| | 2M | 1.0 | | | | 3 | 0.7 | 1.8 |
| | | 1.2 | | | | | 0.8 | 2.0 |
| | | 1.5 | | | | | 1.0 | 2.4 |
| | 3M | 1.0 | | | | 6 | 0.7 | 3.0 |
| | | 1.2 | | | | | 0.8 | 3.3 |
| | | 1.5 | | | | | 1.0 | 3.9 |
| | 4M | 1.0 | | | | | 0.7 | 4.1 |
| | | 1.2 | | | | | 0.8 | 4.5 |
| | | 1.5 | | | | | 1.0 | 5.3 |
| Screw-retained KVCM | 1M | 1.0 | | | 8 | 8 | 0.7 | — |
| | | 1.2 | | | | | 0.8 | |
| | | 1.5 | | | | | 1.0 | |
| | 2M | 1.0 | | | | | 0.7 | 1.8 |
| | | 1.2 | | | | | 0.8 | 2.0 |
| | | 1.5 | | | | | 1.0 | 2.4 |
| | 3M | 1.0 | | | | | 0.7 | 3.0 |
| | | 1.2 | | | | | 0.8 | 3.3 |
| | | 1.5 | | | | | 1.0 | 3.9 |
| | 4M | 1.0 | | | | | 0.7 | 4.1 |
| | | 1.2 | | | | | 0.8 | 4.5 |
| | | 1.5 | | | | | 1.0 | 5.3 |

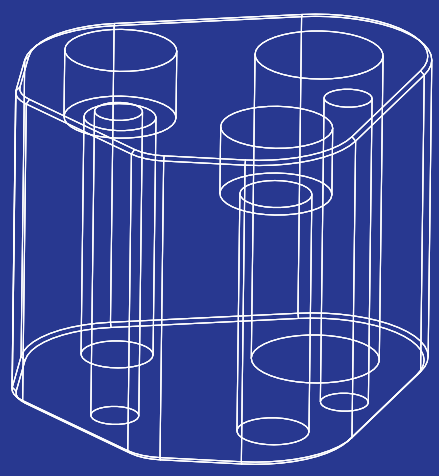
| Name | Marking character order code |
|---|---|
| Space | □ % |
| Hyphen | — # |

ORDER

| Code No. | A | L | CHR |
|---|---|---|---|
| KVCF3M — | 1.5 — | 20.0 — | XYZ |
| KVCF3M — | 1.5 — | 20.0 — | %XY |
| KVCM4M — | 1.5 — | 20.0 — | WXYZ |
| KVCM4M — | 1.5 — | 20.0 — | %W#Y |

Character layout





# Retainers
## RETAINERS


78 Retainer Selection Chart
79 NC Retainers (for machining)
80 Retainers (for point-match machining)
81 NC Retainers (for machining) - Heavy-Gauge Punches-
82 NC Universal Retainers (for machining)
83 Universal Retainers (for point-match machining)
84 Square Retainers
85 Multi-Punch Retainers - Shoulder Punches-

# Retainer Selection Chart

## RETAINERS GUIDE

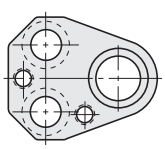
⚠ Codes below are retainer sets (retainer, backing plate, screws, dowels, plugs)

| Page | Product | Dowel hole Dia. | Shape | NC For machining (dowel hole finishing) | | | | Main features |
|---|---|---|---|---|---|---|---|---|
| | | | | For round punches | For shaped punches | For round die buttons | For shaped die buttons | |
| P.85 | NC Retainers (for machining) | φ6$^{H7}$ ($^{+0.012}_{0}$) | A | KDP—AP | KDP—FP | KDP—AD | KDP—FD | |
| P.87 | NC Retainers (for machining) — For heavy-gauge punches- | | A | KAP—AP | KAP—FP | — | — | Counterbore depth $^{+0.05}_{+0.03}$ |
| | NC Retainers (for machining) — For shaped punches / die buttons- | | B | — | KPRSTP | — | KPRSTD | |
| P.88 | NC Universal Retainers (for machining) | | C | KPRSRP | KPRSFP | KPRSRD | KPRSFD | |
| P.90 | Square Retainers | φ8 ($^{+0.02}_{+0.01}$) | F | KSR—AP | KSR—FP | KSR—AD | KSR—FD | |
| | Square Retainers — For heavy-gauge punches- | | F | KSA—AP | KSA—FP | — | — | Counterbore depth $^{+0.05}_{+0.03}$ |

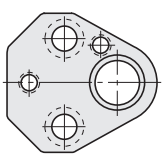
| Page | Product | Dowel hole Dia. | Shape | NC For machining (dowel hole finishing) | | | | Main features |
|---|---|---|---|---|---|---|---|---|
| | | | | For round punches | For shaped punches | For round die buttons | For shaped die buttons | |
| | Retainers (for point-match machining) | φ5.8 Pilot hole | A | KCP—AP | KCP—FP | KCP—AD | KCP—FD | |
| P.89 | Universal Retainers (for point-match machining) | | C | KGRDRP | KGRDFP | KGRDRD | KGRDFD | |

For round punches / die buttons

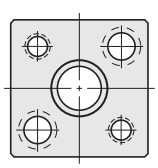
A



C

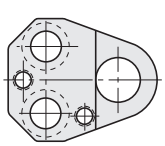


F

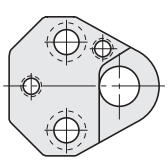


For shaped punches / die buttons

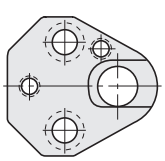
A



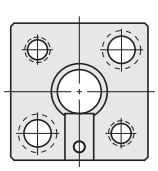
B



C



F



A Accessory

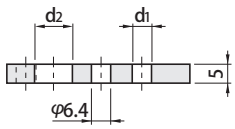
| D | ③ Socket head cap screw | ④ Dowel pin | ⑤ Screw plug |
|---|---|---|---|
| 10・13 | LLB 8×40 | MMSTM6−30 (Tapped) | M8×8 |
| 16〜25 | LLB 10×40 | | |
| 32〜45 | LLB 12×40 | | |

| | M Material | H Hardness | S Surface treatment |
|---|---|---|---|
| ① | S45C | — | Black oxide($Fe_3O_4$) |
| ② | SKS3 | 56〜60HRC | — |

## For round punches / die buttons

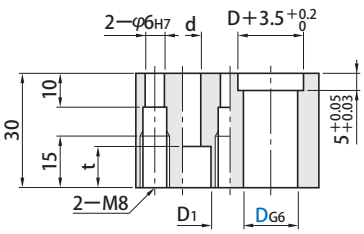
② Backing plate

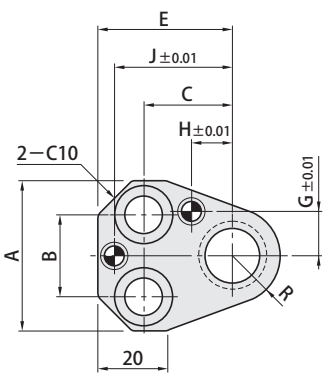





① Retainers



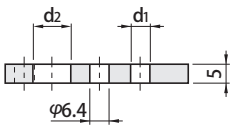



## For shaped punches / die buttons

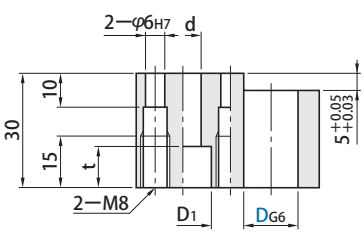
② Backing plate

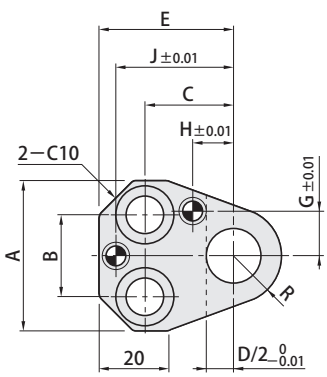





① Retainers






| Type · Components | Code No. Code Round | Code No. Code Shaped | D | DG6 | A | B | C | E | G | H | J | R | D1 | d | t | d2 | d1 BBPC | d1 BBDC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| For punches ①②③④⑤ | KDP — AP | KDP — FP | 10 | +0.014 +0.005 | 37 | 20 | 21 | 35 | 10 | 9 | 29 | 9.5 | 14 | 9 | 10 | 10 | 6.2 | 7.4 |
| ① ③④⑤ ② | KDPAR | KDPFR | 13 | +0.017 +0.006 | 43 | 26 | 23 | 38 | 13 | 11 | 32 | 12 | | | | | | 9.4 |
| | KBPC | KBPC | 16 | | 44 | 24 | 26 | 40 | | 12 | 34 | 14 | 17 | 11 | 12 | 12 | | 11.6 |
| | | | 20 | +0.020 +0.007 | 48 | 28 | 27 | 42 | 16 | 14 | 36 | 17 | | | | | | 13.6 |
| For die buttons ①②③④⑤ ② | KDP — AD | KDP — FD | 25 | | 50 | 30 | 30 | 46 | 18 | 17 | 39 | 19.5 | | | | | | 17.6 |
| | KBDC | KBDC | 32 | +0.025 +0.009 | 54 | | 33 | 48 | 21 | 20 | 42 | 23 | 20 | 14 | 14 | 14 | | 21.6 |
| | | | 38 | | 58 | | 35 | 52 | 23 | 23 | 46 | 26 | | | | | 10.2 | 27.6 |
| Body only ① | KDP — AN | KDP — FN | 45 | | 64 | 34 | 38 | 56 | 26 | 27 | 50 | 29.5 | | | | | | 37.0 |

ORDER

| Code No. |
|---|
| KDP —AP13 |

# Retainers (for point-match machining)

## END RETAINER SETS for MANUAL PROCESS

**A** Accessory

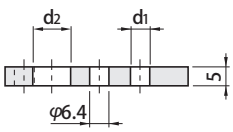
| D | ③ Socket head cap screw | ④ Dowel pin | ⑤ Screw plug |
|---|---|---|---|
| 10・13 | LLB 8×40 | MMSTM6−30 (Tapped) | M8×8 |
| 16〜25 | LLB 10×40 | | |
| 32〜45 | LLB 12×40 | | |

| | M Material | H Hardness | S Surface treatment |
|---|---|---|---|
| ① | S45C | — | Black oxide($Fe_3O_4$) |
| ② | SKS3 | 56〜60HRC | — |

### For round punches / die buttons

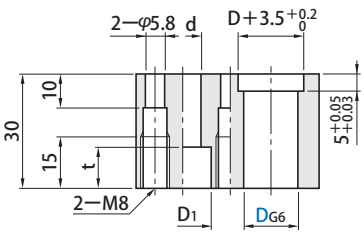
② Backing plate

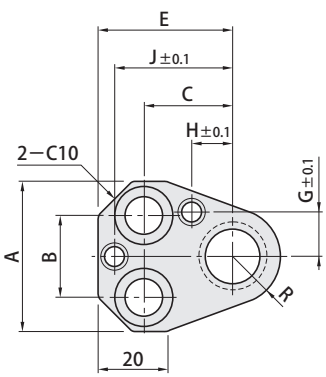





① Retainers



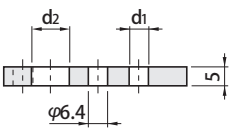



### For shaped punches / die buttons

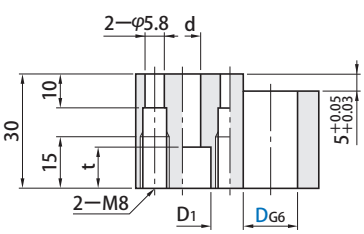
② Backing plate

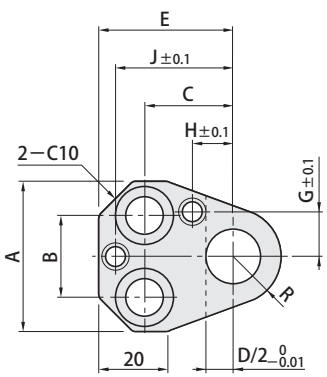





① Retainers






| Type · Components | Code No. Code | | D | DG6 | A | B | C | D | E | G | H | J | R | D1 | d | t | d2 | d1 BBPC | d1 BBDC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Round | Shaped | 10 | +0.014 +0.005 | 37 | 20 | 21 | 35 | 10 | 9 | 29 | 9.5 | 14 | 9 | 10 | 10 | 6.2 | 7.4 |
| For punches ①②③④⑤ | KCP — AP | KCP — FP | 13 | +0.017 +0.006 | 43 | 26 | 23 | 38 | 13 | 11 | 32 | 12 | | | | | | 9.4 |
| ① ③④⑤ | KCPAR | KCPFR | 16 | | 44 | 24 | 26 | 40 | | 12 | 34 | 14 | 17 | 11 | 12 | 12 | | 11.6 |
| ② | KBPC | KBPC | 20 | +0.020 +0.007 | 48 | 28 | 27 | 42 | 16 | 14 | 36 | 17 | | | | | | 13.6 |
| For die buttons ①②③④⑤ | KCP — AD | KCP — FD | 25 | | 50 | 30 | 30 | 46 | 18 | 17 | 39 | 19.5 | | | | | | 17.6 |
| ② | KBDC | KBDC | 32 | +0.025 +0.009 | 54 | | 33 | 48 | 21 | 20 | 42 | 23 | 20 | 14 | 14 | 14 | | 21.6 |
| | | | 38 | | 58 | | 35 | 52 | 23 | 23 | 46 | 26 | | | | | 10.2 | 27.6 |
| Body only ① | KCP — AN | KCP — FN | 45 | | 64 | 34 | 38 | 56 | 26 | 27 | 50 | 29.5 | | | | | | 37.0 |

ORDER

| Code No. |
|---|
| KCP —AP13 |

**A** Accessory

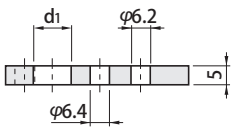
| D | ③ Socket head cap screw | ④ Dowel pin | ⑤ Screw plug |
|---|---|---|---|
| 10・13 | LLB 8×40 | MMSTM6—30 (Tapped) | M8×8 |
| 16～25 | LLB 10×40 | | |

| | M Material | H Hardness | S Surface treatment |
|---|---|---|---|
| ① | S45C | — | Black oxide($Fe_3O_4$) |
| ② | SKS3 | 56～60HRC | — |

## For round punches / die buttons

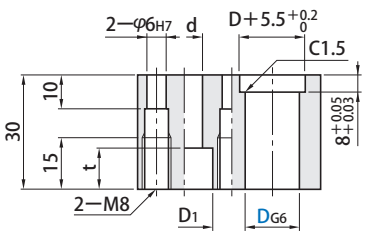
② Backing plate

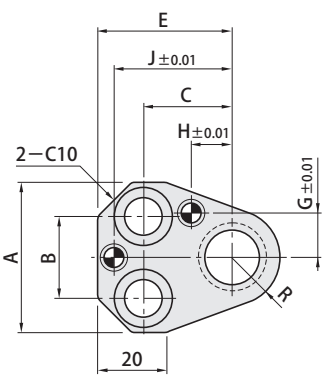





① Retainers



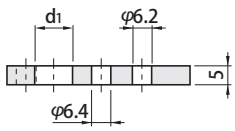



## For shaped punches / die buttons

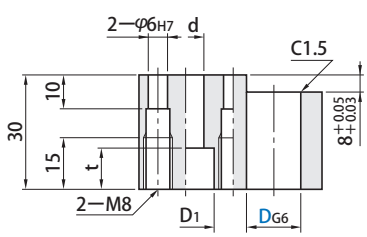
② Backing plate

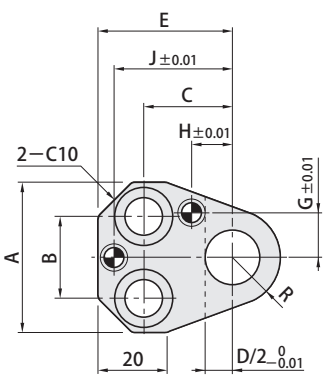





① Retainers






| Type · Components | Code No. Code | | D | DG6 | A | B | C | E | G | H | J | R | D1 | d | d1 | t |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Round | Shaped | 10 | +0.014 +0.005 | 37 | 20 | 21 | 35 | 10 | 9 | 29 | 9.5 | 14 | 9 | 10 | 10 |
| For punches ①②③④⑤ | KAP — AP | KAP — FP | 13 | +0.017 +0.006 | 43 | 26 | 23 | 38 | 13 | 11 | 32 | 12 | | | | |
| ① ③④⑤ | KAPAR | KAPFR | 16 | | 44 | 24 | 26 | 40 | | 12 | 34 | 14 | | | | |
| ② | KBPC | KBPC | 20 | +0.020 +0.007 | 48 | 28 | 27 | 42 | 16 | 14 | 36 | 17 | 17 | 11 | 12 | 12 |
| Body only ① | KAP — AN | KAP — FN | 25 | | 50 | 30 | 30 | 46 | 18 | 17 | 39 | 19.5 | | | | |

ORDER

| Code No. |
|---|
| KAP—AP16 |

# NC **Universal Retainers (for machining)**

## RETAINER SETS for NC PROCESS

**A** Accessory

| D | ③ Socket head cap screw | ④ Dowel pin | ⑤ Screw plug |
|---|---|---|---|
| 10～16 | LLB 8×35 | MMSTM6—20 (Tapped) | M8×8 |
| 20 | LLB 10×35 | | |
| 25・32 | LLB 12×35 | | |

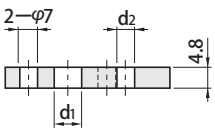
| | M Material | H Hardness | S Surface treatment |
|---|---|---|---|
| ① | S45C | — | Black oxide ($Fe_3O_4$) |
| ② | SKS3 | 56～60HRC | — |

⚠ Mounting hole spacing interchangeable with ANSI / NAAMS ball lock retainers
⚠ Shaped punch key flat parallel to retainer centerline

### For round punches / die buttons

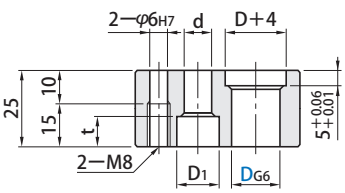
② Backing plate

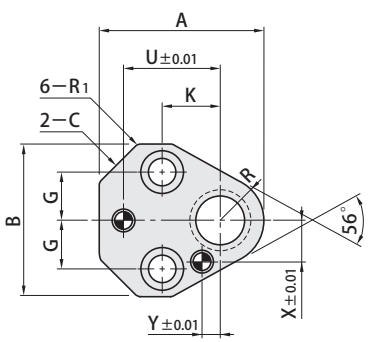





① Retainers



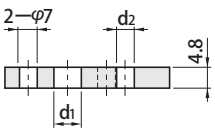



### For shaped punches / die buttons

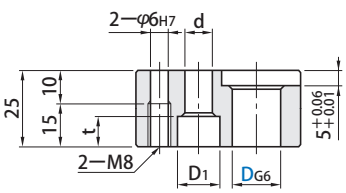
② Backing plate

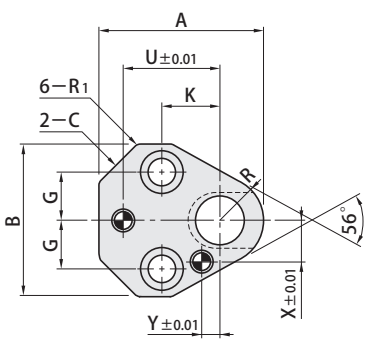





① Retainers






| Type · Components | Code No. Code | | D | DG6 | A | B | C | D1 | G | K | R | R1 | U | X | Y | t | d | d1 | d2 GRDBP | d2 GRDBD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Round | Shaped | | | | | | | | | | | | | | | | | | |
| For punches ①②③④⑤ | KPRSRP | KPRSFP | 10 | +0.014 +0.005 | 44.3 | 40 | 10 | | 11.12 | | 9.5 | 5 | 26.925 | 9.0 | 7.5 | | | | | 6.8 |
| ① ③④⑤ | KPRSR | KPRSF | 13 | +0.017 +0.006 | 50.4 | 47 | 12 | 14 | 14.27 | 19.0 | 12.6 | | 29.97 | 12.0 | 6.5 | 10 | 9 | 10 | | 9.0 |
| ② | KGRDBP | KGRDBP | 16 | | 53.5 | 50 | 12.5 | | 15.87 | | 14.1 | 6 | 31.75 | 13.5 | 6.0 | | | | 7 | 10.5 |
| For die buttons ①②③④⑤ | KPRSRD | KPRSFD | 20 | +0.020 +0.007 | 60.1 | 55 | 14 | 17 | 17.47 | | 17.4 | 8 | 33.53 | 16.5 | 5.0 | 12 | 11 | 12 | | 12.9 |
| ② | KGRDBD | KGRDBD | 25 | | 69.7 | 63 | 16 | 20 | 19.84 | 23.8 | 22.2 | | 40.64 | 22.0 | 7.0 | 14 | 14 | 14 | | 18.4 |
| Body only ① | KPRSR— N | | 32 | +0.025 +0.009 | | | | | | | | | | | | | | | | 21.6 |

ORDER

| Code No. |
|---|
| KPRSRP16 |

ADDITIONS ORDER

| Code No. | (MLC・KLC) |
|---|---|
| KPRSRP13 — | MLC |

| Add. | Code | Alteration Description |
|---|---|---|
| Accessory Screw Change | MLC (0) | Accessory screws (2 pcs) lengthened 5mm |
| Accessory Dowel Pin Change | KLC (0) | Accessory dowel pins (2 pcs) lengthened 10mm |

# Universal Retainers (for point-match machining)

RETAINER SETS for MANUAL PROCESS

KAYAN

**A** Accessory

| D | ③ Socket head cap screw | ④ Dowel pin | ⑤ Screw plug |
|---|---|---|---|
| 10～16 | LLB 8×35 | MMSTM6—20 (Tapped) | M8×8 |
| 20 | LLB 10×35 | | |
| 25・32 | LLB 12×35 | | |

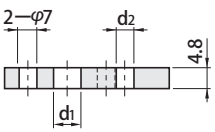
| | M Material | H Hardness | S Surface treatment |
|---|---|---|---|
| ① | S45C | — | Black oxide($Fe_3O_4$) |
| ② | SKS3 | 56～60HRC | — |

⚠ Mounting hole spacing interchangeable with ANSI / NAAMS ball lock retainers
⚠ Shaped punch key flat parallel to retainer centerline

For round punches / die buttons

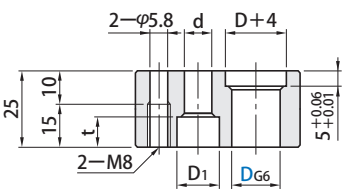
② Backing plate

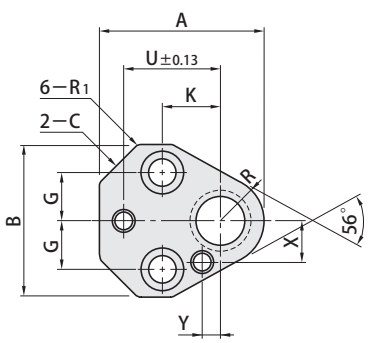





① Retainers



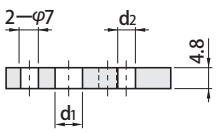



For shaped punches / die buttons

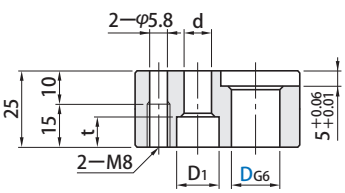
② Backing plate

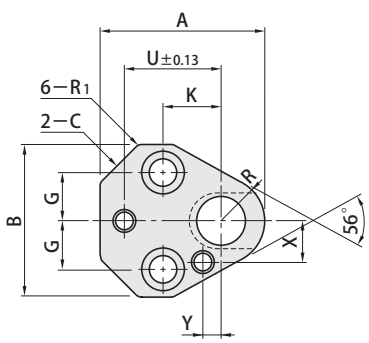





① Retainers






| Type · Components | Code No. Code | D | DG6 | A | B | C | D1 | G | K | R | R1 | U | X | Y | t | d | d1 | d2 GRDBP | d2 GRDBD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Round / Shaped | 10 | +0.014 +0.005 | 44.3 | 40 | 10 | | 11.12 | | 9.5 | 5 | 26.925 | 9.0 | 7.5 | | | | | 6.8 |
| For punches ①②③④⑤ | KRDRP / KRDFP | 13 | +0.017 +0.006 | 50.4 | 47 | 12 | 14 | 14.27 | 19.0 | 12.6 | | 29.97 | 12.0 | 6.5 | 10 | 9 | 10 | | 9.0 |
| ① ③④⑤ | KRDR / KRDF | 16 | | 53.5 | 50 | 12.5 | | 15.87 | | 14.1 | 6 | 31.75 | 13.5 | 6.0 | | | | | 10.5 |
| ② | KRDBP / KRDBP | 20 | +0.020 +0.007 | 60.1 | 55 | 14 | 17 | 17.47 | | 17.4 | 8 | 33.53 | 16.5 | 5.0 | 12 | 11 | 12 | 7 | 12.9 |
| For die buttons ①②③④⑤ | KRDRD / KRDFD | 25 | | 69.7 | 63 | 16 | 20 | 19.84 | 23.8 | 22.2 | | 40.64 | 22.0 | 7.0 | 14 | 14 | 14 | | 18.4 |
| ② | KRDBD / KRDBD | 32 | +0.025 +0.009 | | | | | | | | | | | | | | | | 21.6 |

ORDER

| Code No. |
|---|
| KRDRP20 |

ADDITIONS ORDER

| Code No. | (MLC・KLC) |
|---|---|
| KRDRP20 | — MLC |

| Add. | Code | Alteration Description |
|---|---|---|
| Accessory Screw Change | MLC (0) | Accessory screws (2 pcs) lengthened 5mm |
| Accessory Dowel Pin Change | KLC (0) | Accessory dowel pins (2 pcs) lengthened 10mm |

# Square Retainers

## SQUARE RETAINER SETS

**A** Accessory

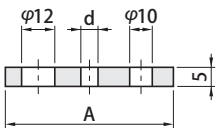
| ③ Socket head cap screw | ④ Dowel pin | ⑤ Screw plug |
|---|---|---|
| LLB 10 ×40 | MMSTM8—30 (Tapped) | MMSW M10×10 |

| | M Material | H Hardness | S Surface treatment |
|---|---|---|---|
| ① | S45C | — | Black oxide($Fe_3O_4$) |
| ② | SKS3 | 56～60HRC | — |
| ⑥ | S55C | 56～60HRC | Induction hardened |

For round / shaped punches & die buttons

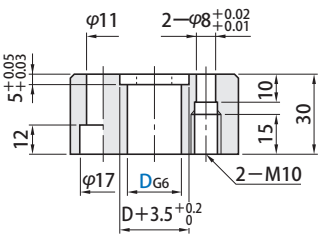
② Backing plate

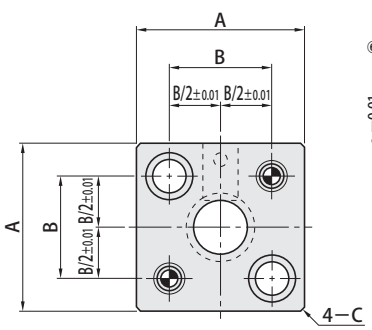




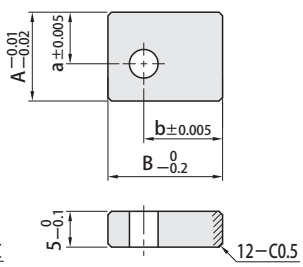

① Retainers






⑥ Anti-rotation key

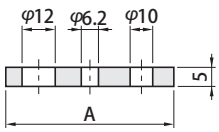



—FN KSR —FN KSA —FN

For heavy-gauge punches

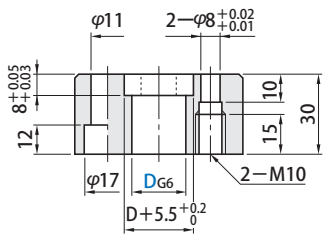
② Backing plate

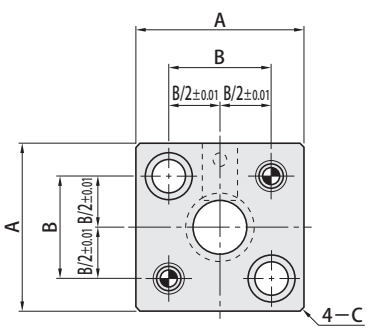





① Retainers






⚠ Induction hardened (hatched area only)

| Components | Code No. Code | D | DG6 | A | B | d MMPSP | d MMDSP |
|---|---|---|---|---|---|---|---|
| ①②③④⑤ ①③④⑤ ② ① | For round punches: KSR—AP KMPSR KMPSP KSR—AN | 10 | +0.014 +0.005 | 45 | 23 | 6.2 | 7.4 |
| | For round die buttons: KSR—AD KMPSR KMDSP KSR—AN | 13 | +0.017 +0.006 | | | | 9.4 |
| | For heavy-gauge punches: KSA—AP KASAR KMPSP KSA—AN | 16 | | 52 | 30 | | 11.6 |
| | | 20 | +0.020 +0.007 | | | | 13.6 |
| ①②③④⑤⑥ ①③④⑤⑥ ② ① | For shaped punches: KSR—FP KMPDR KMPSP KSR—FN | 25 | | 56 | 34 | | 17.6 |
| | For shaped die buttons: KSR—FD KMPDR KMDSP KSR—FN | 32 | +0.025 +0.009 | 65 | 43 | | 21.6 |
| | For heavy-gauge punches: KSA—FP KASFR KMPSP KSA—FN | 38 | | | | 10.2 | 27.6 |

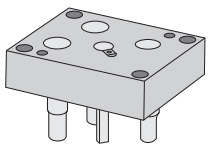
Heavy-gauge punch type: D10-25

| Code No. |
|---|
| KSR —AP16 |

▶ Anti-rotation key

| D | Applicable retainer | A | B | a | b |
|---|---|---|---|---|---|
| 10 | SSR —FP SSR —FD MMPDR SSA —FP AASFR | 10.3 | 17.5 | (A/2) +1 | 12.5 |
| 13 | | | 16 | | 11.0 |
| 16 | | 11.3 | 18 | | 13.0 |
| 20 | | 12.4 | 16 | | 11.0 |
| 25 | | 13.6 | 15.5 | | 10.5 |
| 32 | | 15.2 | 16.5 | | 11.5 |
| 38 | | 16.4 | 13.5 | | 8.5 |

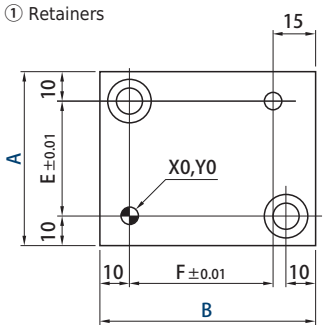
⚠ D = punch dia. of applicable retainer。

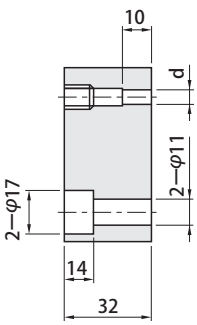


| Locating hole | Backing plate | LEFT TYPE (Left datum) | RIGHT TYPE (Right datum) |
|---|---|---|---|
| Machining d=φ8H7 | Yes | KSRGD —LP | KSRGD —RP |
| | No | KSRGD —L | KSRGD —R |
| Pilot hole d=φ7.8 | Yes | KSRND —LP | KSRND —RP |
| | No | KSRND —L | KSRND —R |

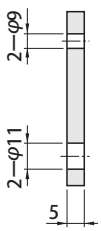
| | M Material | H Hardness |
|---|---|---|
| ① | S45C | — |
| ② | SKS3 | 56～60HRC |

① Retainers




② Backing plate

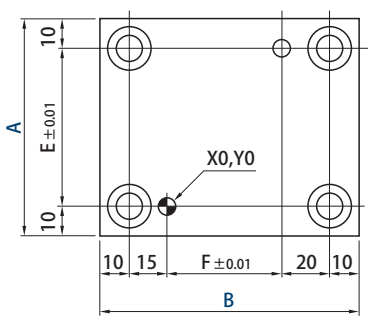


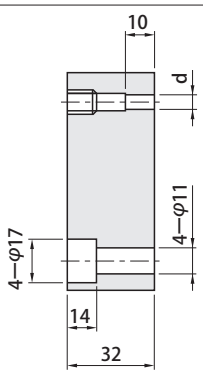

| A | B | E | F |
|---|---|---|---|
| 50 | 60 | 30 | 35 |
| | 80 | | 55 |
| 60 | 80 | 40 | 55 |
| | 100 | | 75 |

A Accessory

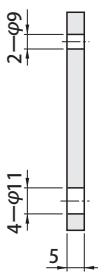
| | | |
|---|---|---|
| Socket head cap screw | M10×40 | 2 |
| Dowel pin (tapped) | φ8×30 | 2 pcs |
| Screw plug | M10×10 | 2 |

① Retainers




② Backing plate

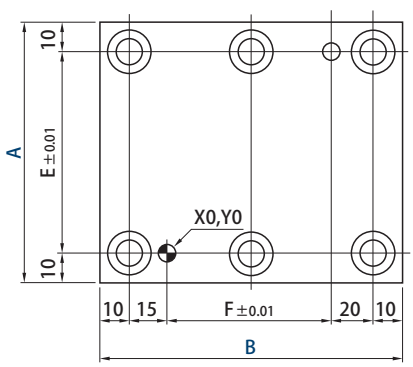


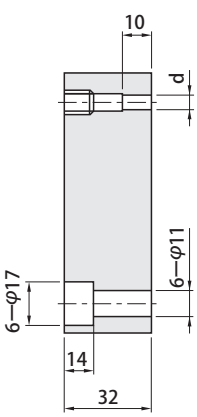

| A | B | E | F |
|---|---|---|---|
| 80 | 80 | 60 | 25 |
| | 100 | | 45 |
| | 125 | | 70 |
| 100 | 100 | 80 | 45 |
| | 125 | | 70 |
| | 150 | | 95 |

A Accessory

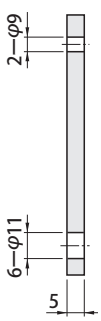
| | | |
|---|---|---|
| Socket head cap screw | M10×40 | 4 |
| Dowel pin (tapped) | φ8×30 | 2 pcs |
| Screw plug | M10×10 | 2 |

① Retainers




② Backing plate




| A | B | E | F |
|---|---|---|---|
| 125 | 150 | 105 | 95 |
| | 175 | | 120 |
| 150 | 175 | 130 | 120 |
| | 200 | | 145 |

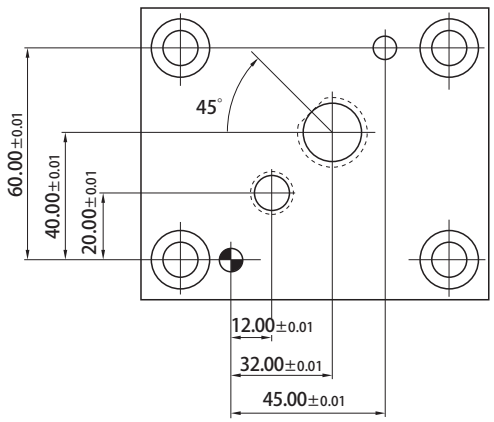
A Accessory

| | | |
|---|---|---|
| Socket head cap screw | M10×40 | 6 |
| Dowel pin (tapped) | φ8×30 | 2 pcs |
| Screw plug | M10×10 | 2 |

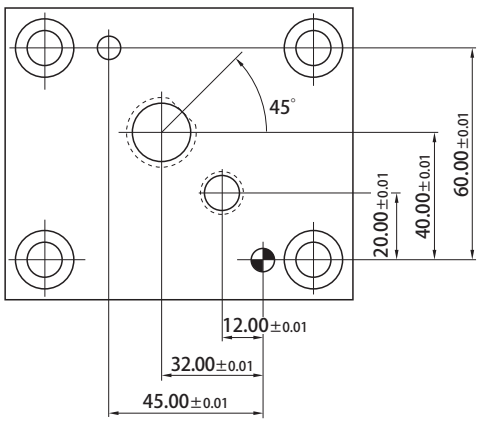
# Multi-Punch Retainers - Shoulder Punches-

## SPECIAL RETAINER SETS—for SHOULDER PUNCHES—

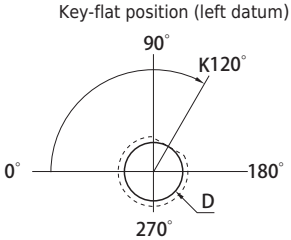
**EX 1** LEFT TYPE (Left datum)
d=φ8H7 SSRGD−L
d=φ7.8 SSRND−L



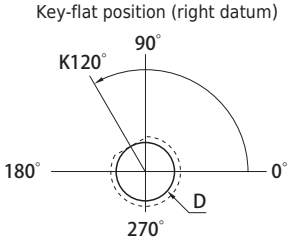

**EX 2** RIGHT TYPE (Right datum)
d=φ8H7 SSRGD−R
d=φ7.8 SSRND−R




Key-flat position (left datum)




Key-flat position (right datum)



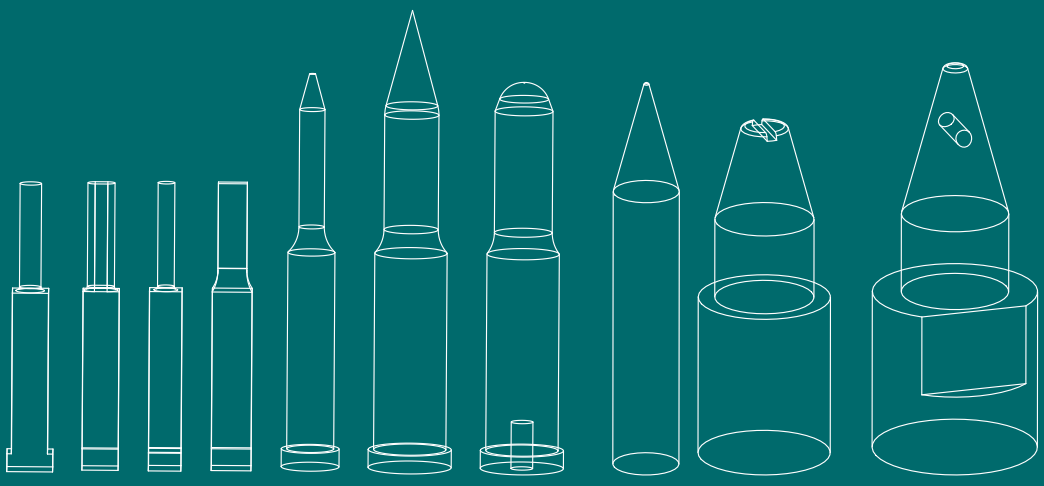

(1) Select retainer type (e.g. left/right datum, locating hole, with/without backing plate)。
(2) Select outline dims. from previous page
(3) Specify punch type (round / shaped) and punch dia.。
Round: R + punch shank dia.(D)
Shaped: F + punch shank dia.(D)
(4) Specify punch hole position
Round: datum hole position in 0.01 mm increments X, Y。
Shaped: datum hole position in 0.01 mm increments X, Y。
Key-flat position in 1° increments 。
To avoid interference, punch hole edge distance must exceed 2mm

**EX 1**

| Type | A·B | (R·F)D | X | — | Y | — | K |
|---|---|---|---|---|---|---|---|
| KSRGD −L(P) | — 80·125 — | R13 | — X12.00 | — | Y20.00 | | |
| | | — F20 | — X32.00 | — | Y40.00 | — | K45° |

**EX 2**

| Type | A·B | (R·F)D | X | — | Y | — | K |
|---|---|---|---|---|---|---|---|
| KSRGD −R(P) | — 80·125 — | R13 | — X12.00 | — | Y20.00 | | |
| | | — F20 | — X32.00 | — | Y40.00 | — | K45° |



# Pilots & Locating Pins

## PILOT PUNCHES & GUIDE PIN

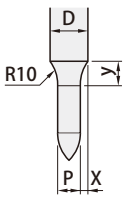

88 Pilot Alterations Overview
89 Pilots
90 Dowel-Pin Located Pilots
91 Straight Pilots
92 Economy Pilots
93 Locating Pilots

# Pilot Alterations Overview

## PILOT PUNCHES—DETAIL GUIDE of ADDITION—

| D | Tolerance Dm5 | Tolerance Dg6 |
|---|---|---|
| 1.6 | +0.006 +0.002 | −0.002 −0.008 |
| 2 | | |
| 2.5 | | |
| 3 | | |
| 4 | +0.009 +0.004 | −0.004 −0.012 |
| 5 | | |
| 6 | | |
| 8 | +0.012 +0.006 | −0.005 −0.014 |
| 10 | | |
| 13 | +0.015 +0.007 | −0.006 −0.017 |
| 16 | | |
| 20 | +0.017 +0.008 | −0.007 −0.020 |
| 25 | | |

Calculating shank-to-pilot blend radius length Calculating nose lead length




Calc. radius difference between shank and point X

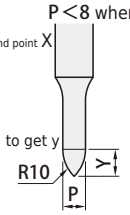
$X = \frac{(D-P)}{2}$

Substitute X into the formula to get y

$y = \sqrt{X(20-X)}$

P＜8 when

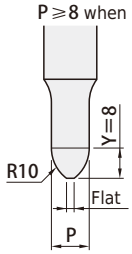
$Y = \sqrt{P(10-P/4)}$



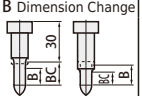
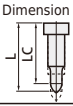
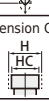
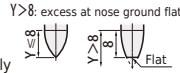
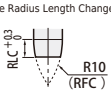
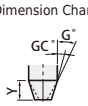
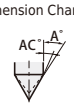

P≧8 when

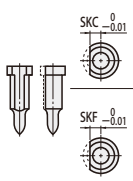
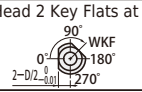
Y=8mm,

Excess at nose ground flat




| Code No. | L (C) | P (C) | A (C) | (R) | (RT) | (BC・HC・KNC…etc) |
|---|---|---|---|---|---|---|
| KSTASC10 | —LC75.0 | — P7.80 | | | — | KNC |

| Add. | Code | Alteration Description |
|---|---|---|
| P Dimension Change  | PC (4) | Reduce point dim. "P"<br>Radius nose<br>PC ≧ Pmin./2 ☞ Table 1<br>in 0.01→with PKC M) (Z combined: allows in 0.001<br>⚠ PC Dim. change may reduce pilot length B<br>Taper nose · Bullet nose<br>PC ≧ Pmin./2 ☞ Table 2<br>in 0.01→with PKC M) (Z combined: allows in 0.001<br>⚠ Y≦YCmax. (Taper nose)<br>⚠ PC Dim. change may reduce pilot length B |
| B Dimension Change  | BC (4) | Change pilot length "B"<br>2≦BC≦Bmax. ☞ Table 1, 2<br>in 0.1<br>⚠ Pilot length BC ≦L-30 |
| L Dimension Change  | LC (4) | Reduce length "L"<br>30+B (C) ≦LC＜L<br>in 0.1<br>⚠ If LC < 30+B(C), pilot length B=LC -30 |
| H Dimension Change  | HC (4) | Reduce head dia. "H"<br>D≦HC＜H<br>in 0.1 |
| T Dimension Change  | TC (4) | Reduce head thickness "T"<br>2≦TC＜5<br>in 0.1<br>⚠ L reduced accordingly (5-TC); with LC, LC unchanged |
| R Dimension Change  | RFC (6) | Change nose radius "R" ⚠ Nose radius length: $Y=\sqrt{P(RFC-P/4)}\leq 8$<br>2≦RFC ≦15 Y>8: excess at nose ground flat<br>2×RFC ＞P  <br>in 1<br>⚠ Radius nose type only |
| Nose Radius Length Change  | RLC (6) | Change nose radius length<br>2≦RLC＜$\sqrt{P(10-P/4)}$＜8<br>2≦RLC＜$\sqrt{P(RFC-P/4)}$＜8 (When combined with RFC)<br>in 0.1<br>⚠ Applies to radius nose type P<8 |
| Y Dimension Change  KTPA | YC (6) | Change nose taper length<br>$1\leq YC\leq \frac{P}{2\tan G(C)}-0.3\leq 18$<br>in 0.1<br>⚠ Taper nose type only |
| G Dimension Change  | GC (6) | Change nose taper angle<br>5≦GC≦45<br>2(YtanGC)＜P<br>in 1<br>⚠ Taper nose type only |
| A Dimension Change  | AC (12) | Change bullet nose angle<br>P＜16:15＜AC≦45<br>P≧16:20＜AC≦45<br>in 1<br>⚠ Bullet nose type only |

| Add. | Code | Alteration Description |
|---|---|---|
| Shank Key Flat  | SKC (19) | Add 1 key flat on shank<br>D: 10～25 / SKC: D/2—1.0 / Pmax.: P≦D—2.2<br>NO Cannot be combined with KC, WKC, CKC, WKF, SKF |
| | SKF (25) | Add 1 key flat of specified size on shank<br>D: 10～25 / SKF min.: D/2—1.0 / SKF max.: D/2—0.1 / Pmax.: P≦2(SKF —0.1)<br>in 0.1 NO Not with KC, WKC, CKC, WKF, SKC |
| Head Key Flat  | KC (6) | Add 1 key flat<br>NO Cannot be combined with WKC, CKC, WKF, SKC, SKF |
| Head 2 Parallel Key Flats  | WKC (12) | Add 2 parallel key flats<br>NO Cannot be combined with KC, CKC, WKF, SKC, SKF |
| Head 2 Key Flats at 90°  | CKC (12) | Add 2 key flats at 90° on head<br>NO Cannot be combined with KC, WKC, WKF, SKC, SKF |
| Head 2 Key Flats at  | Angle WKF | (19) Add 2 key flats at 0° and specified angle<br>0＜WKF＜360<br>in 1<br>NO Cannot be combined with KC, WKC, CKC, SKC, SKF |
| L Dim. Tolerance Change  | LKC (32) | L +0.3 0 →L +0.05 0 NO N/A for radius nose type |
| F Dim. Tolerance Change  | FKC (32) | F +0.3 0 →F +0.05 0 NO N/A for radius nose type |

| Add. | Code (@/P) |
|---|---|
| Press-in lead (D −0.01 −0.03) removed  ⚠ Remove press-in lead (D −0.01 −0.03) | NDC (0) |

| Add. | Code (@/P) |
|---|---|
| Shank Key Flat Tolerance Change  ⚠ Must be combined with SKC, SKF | SKKC (12) |

Table 1

| P | Bmax. |
|---|---|
| 1.50～1.99 | 20 |
| 2.00～3.99 | 35 |
| 4.00～5.99 | 45 |
| 6.00～ | 60 |

Table 2

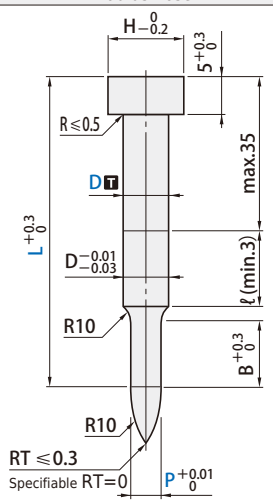
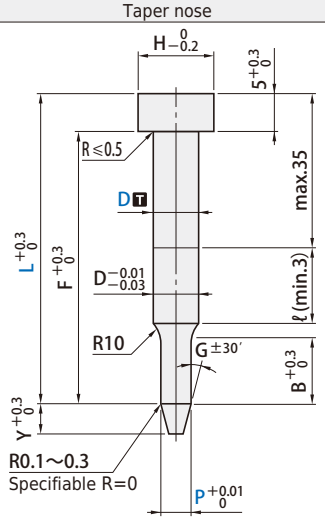
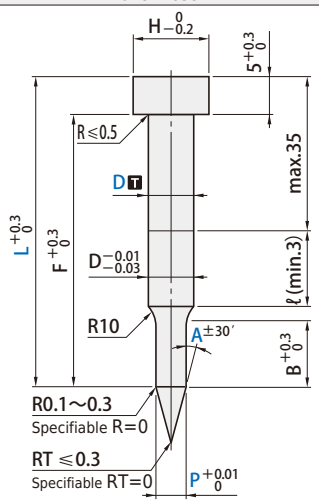
| P | Bmax. |
|---|---|
| 1.50～1.99 | 20 |
| 2.00～2.99 | 30 |
| 3.00～3.99 | 35 |
| 4.00～5.99 | 45 |
| 6.00～ | 60 |



| P | G |
|---|---|
| P≤1.99 | 10° |
| P≥2.00 | 15° |

| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

SKH40 Powder-metallurgy HSS(JIS G4403.2000)

| Radius nose | Taper nose | Bullet nose |
|---|---|---|
|  |  |  |



⚠ Radius nose P ≥ 8: nose ground flat

| Type · Material | Code No. Type | | B | D | L | P in 0.01 | A | Y | H |
|---|---|---|---|---|---|---|---|---|---|
| | | | S | (6) | 1.6 | 42 52 62 | 0.30～ 1.59 | | (1) | 2.6 |
| | | | | 8 | 2.0 | 42 52 62 | 0.50～ 1.99 | | | 3 |
| | | | | | 2.5 | 42 52 62 | 1.00～ 2.49 | | 2 | 3.5 |
| | | | | 10 | 3 | 42 52 62 72 82 92 102 | 1.00～ 2.99 | | | 5 |
| | | | | | 4 | 42 52 62 72 82 92 102 | 1.00～ 3.99 | | | 7 |
| | | | | | 5 | 42 52 62 72 82 92 102 | 2.00～ 4.99 | | 3 | 8 |
| | | | | | 6 | 42 52 62 72 82 92 102 | 2.50～ 5.99 | | | 9 |
| | | | | 15 | 8 | (42) 52 62 72 82 92 102 | 3.00～ 7.99 | | 5 | 11 |
| | | | | | 10 | (42) 52 62 72 82 92 102 | 3.00～ 9.99 | | | 13 |
| | | | | | 13 | (42) 52 62 72 82 92 102 | 6.00～12.99 | | | 16 |
| Radius nose | Dm5 (shank dia. tol. T) | D +0.00 0 (shank dia. tol. T) | | 21 | 16 | (42) 52 62 72 82 92 102 | 10.00～15.99 | | 8 | 19 |
| SKD11 | KSTA | KA—STA | | | 20 | (42) 52 62 72 82 92 102 | 13.00～19.99 | | | 23 |
| SKH51 | KHSTA | KA—HSTA | | | 25 | (42) 52 62 72 82 92 102 | 18.00～24.99 | | | 28 |
| SKH40 | KPSTA | KA—PSTA | L | 8 | 1.6 | 42 52 62 | 0.50～ 1.59 | | (1) | 2.6 |
| | | | | 10 | 2.0 | 42 52 62 | 0.50～ 1.99 | (10) | | 3 |
| | | | | 13 | 2.5 | 42 52 62 | 1.00～ 2.49 | | 2 | 3.5 |
| Taper nose | | | | 15 | 3 | 52 62 72 82 92 102 | 1.00～ 2.99 | (15) | | 5 |
| SKD11 | KTPA | KA—TPA | | | 4 | 52 62 72 82 92 102 | 1.00～ 3.99 | 20 | | 7 |
| SKH51 | KHTPA | KA—HTPA | | | 5 | 52 62 72 82 92 102 | 2.00～ 4.99 | | 3 | 8 |
| SKH40 | KPTPA | KA—PTPA | | | 6 | 52 62 72 82 92 102 | 2.50～ 5.99 | 25 | | 9 |
| | | | | 21 | 8 | 52 62 72 82 92 102 | 3.00～ 7.99 | | 5 | 11 |
| Bullet nose | | | | | 10 | 52 62 72 82 92 102 | 3.00～ 9.99 | 30 | | 13 |
| SKD11 | KATA | KA—ATA | | | 13 | 52 62 72 82 92 102 | 6.00～12.99 | | | 16 |
| SKH51 | KHATA | KA—HATA | | 27 | 16 | 62 72 82 92 102 | 10.00～15.99 | | 8 | 19 |
| SKH40 | KPATA | KA—PATA | | | 20 | 62 72 82 92 102 | 13.00～19.99 | | | 23 |
| | | | | | 25 | 62 72 82 92 102 | 18.00～24.99 | | | 28 |
| | | | X | 21 | 3 | 52 62 72 82 92 102 | 1.20～ 2.99 | | 2 | 5 |
| | | | | | 4 | 52 62 72 82 92 102 | 1.20～ 3.99 | | | 7 |
| | | | | 27 | 5 | 62 72 82 92 102 | 2.00～ 4.99 | | 3 | 8 |
| | | | | | 6 | 62 72 82 92 102 | 2.50～ 5.99 | | | 9 |
| | | | | 32 | 8 | 62 72 82 92 102 | 3.00～ 7.99 | | 5 | 11 |
| | | | | | 10 | 62 72 82 92 102 | 3.00～ 9.99 | | | 13 |
| | | | | | 13 | 62 72 82 92 102 | 6.00～12.99 | | | 16 |
| | | | | 42 | 16 | 72 82 92 102 | 10.00～15.99 | | 8 | 19 |
| | | | | | 20 | 72 82 92 102 | 13.00～19.99 | | | 23 |
| | | | | | 25 | 72 82 92 102 | 18.00～24.99 | | | 28 |

⚠For L (42), pilot length B = 10 ⚠P > D-0.03: no press-in lead ($D^{-0.01}_{-0.03}$) ⚠P≥10.00: A (10) not available ⚠P≥16.00: A (15) not available

⚠Bullet nose length L≤82 ⚠D1.6-2.5 only for M SKH51、SKH40 ⚠B(6)→P < 0.5: B = 2 ⚠Y(1)→P < 0.5: Y = 0.5

ORDER

| Code No. | L | P | A | (R) | (RT) |
|---|---|---|---|---|---|
| KSTAS13 — | 102 — | P8.5 | | | |

# Dowel-Pin Located Pilots

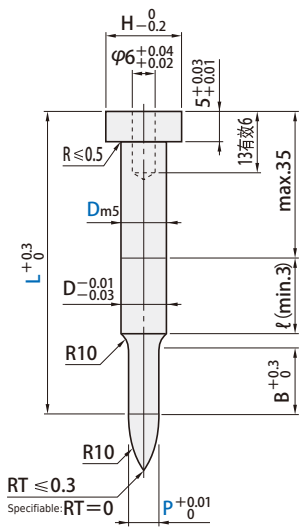
## PILOT PUNCHES with CENTER HOLE



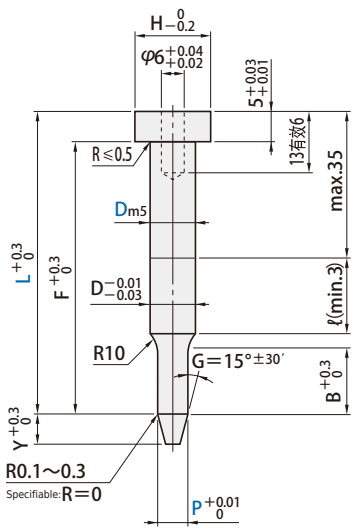
| M Material | H Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |

A Accessory: MMS6-25

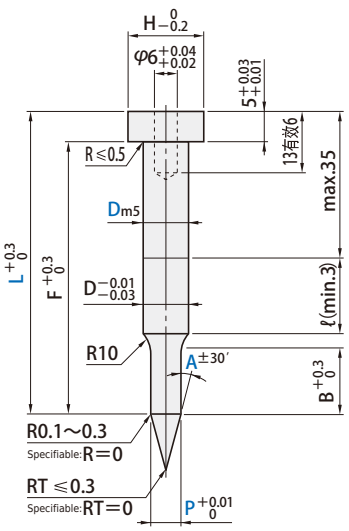
### Radius nose




### Taper nose




### Bullet nose




⚠Radius nose P≥8: nose ground flat

| Type · Material | Code No. Code | | B | D | L | P in 0.01 | A | Y | H |
|---|---|---|---|---|---|---|---|---|---|
| Radius nose (shank dia. tol. D) SKD11 | Dm5 KSTA | TiCN coated KH51 KH−PSA | SC 15 | 10 | (42) 52 62 72 82 92 102 112 122 132 142 | 3.00～ 9.99 | (10) (15) 20 25 30 | 5 | 13 |
| | | | | 13 | (42) 52 62 72 82 92 102 112 122 132 142 | 6.00～12.99 | | 8 | 16 |
| | | | SC 21 | 16 | (42) 52 62 72 82 92 102 112 122 132 142 | 10.00～15.99 | | | 19 |
| | | | | 20 | (42) 52 62 72 82 92 102 112 122 132 142 | 13.00～19.99 | | | 23 |
| | | | | 25 | (42) 52 62 72 82 92 102 112 122 132 142 | 18.00～24.99 | | | 28 |
| Taper nose SKD11 | KTPA | KH−PTA | LC 21 | 10 | 52 62 72 82 92 102 112 122 132 142 | 3.00～ 9.99 | | 5 | 13 |
| | | | | 13 | 52 62 72 82 92 102 112 122 132 142 | 6.00～12.99 | | 8 | 16 |
| | | | LC 27 | 16 | 62 72 82 92 102 112 122 132 142 | 10.00～15.99 | | | 19 |
| | | | | 20 | 62 72 82 92 102 112 122 132 142 | 13.00～19.99 | | | 23 |
| | | | | 25 | 62 72 82 92 102 112 122 132 142 | 18.00～24.99 | | | 28 |
| Bullet nose SKD11 | KAPA | KH−APA | XC 32 | 10 | 62 72 82 92 102 112 122 132 142 | 3.00～ 9.99 | | 5 | 13 |
| | | | | 13 | 62 72 82 92 102 112 122 132 142 | 6.00～12.99 | | 8 | 16 |
| | | | XC 42 | 16 | 72 82 92 102 112 122 132 142 | 10.00～15.99 | | | 19 |
| | | | | 20 | 72 82 92 102 112 122 132 142 | 13.00～19.99 | | | 23 |
| | | | | 25 | 72 82 92 102 112 122 132 142 | 18.00～24.99 | | | 28 |

⚠For L (42), pilot length B = 10 ⚠P > D-0.03: no press-in lead ($D^{-0.01}_{-0.03}$) ⚠P≥10.00: A (10) not available
⚠P≥16.00: A (15) not available ⚠Bullet nose length L≤122

ORDER

| Code No. | L | P | A | (R) | (RT) |
|---|---|---|---|---|---|
| KSTASC13 — | 82.0 — | P11.80 | | | |

# Straight Pilots

## STRAIGHT PILOT PUNCHES

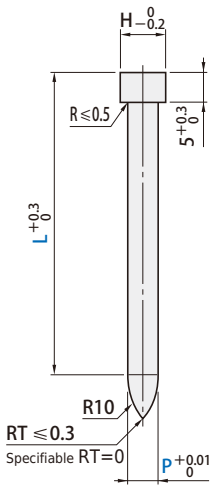
KAYAN



| Material | Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |
| SKH51 | 61～64HRC |
| SKH40 | 64～67HRC |

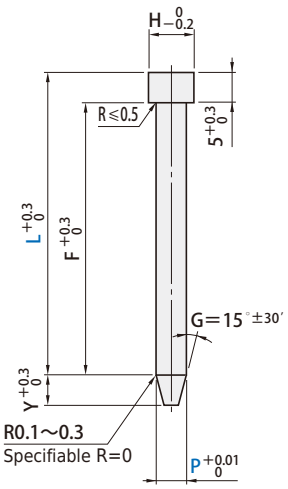
SKH40 Powder-metallurgy HSS(JIS G4403.2000)

### Radius nose

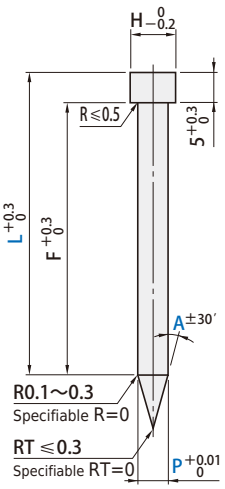



⚠ Radius nose P ≥ 8: nose ground flat

### Taper nose




### Bullet nose




| Type · Material | Code No. Code | | No. | L | | | | | | | P in 0.01 | A | Y | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P +0.01 0 | | 1.6 | 42 | 52 | 62 | | | | | 1.00～ 1.60 | | | 2.6 |
| Radius nose | (Shank dia. tol. P) | TiCN coated | 2.0 | 42 | 52 | 62 | | | | | 1.00～ 2.00 | | | 3 |
| SKD11 | KSTC | | 2.5 | 42 | 52 | 62 | | | | | 1.50～ 2.50 | | 2 | 3.5 |
| SKH51 | KHSTC | KH-HSTC | 3 | 42 | 52 | 62 | 72 | 82 | 92 | 102 | 2.00～ 3.00 | | | 5 |
| SKH40 | KPSTC | KH-PSTC | 4 | 42 | 52 | 62 | 72 | 82 | 92 | 102 | 3.00～ 4.00 | (10) | | 7 |
| Taper nose | | | 5 | 42 | 52 | 62 | 72 | 82 | 92 | 102 | 4.00～ 5.00 | (15) | 3 | 8 |
| SKD11 | KTTC | | 6 | 42 | 52 | 62 | 72 | 82 | 92 | 102 | 5.00～ 6.00 | 20 | | 9 |
| SKH51 | KHTTC | KH-HTTC | 8 | 42 | 52 | 62 | 72 | 82 | 92 | 102 | 6.00～ 8.00 | 25 | 5 | 11 |
| SKH40 | KPTTC | KH-PTTC | 10 | 42 | 52 | 62 | 72 | 82 | 92 | 102 | 8.00～10.00 | 30 | | 13 |
| Bullet nose | | | 13 | 42 | 52 | 62 | 72 | 82 | 92 | 102 | 10.00～13.00 | | 8 | 16 |
| SKD11 | KATC | | 16 | 42 | 52 | 62 | 72 | 82 | 92 | 102 | 13.00～16.00 | | | 19 |
| SKH51 | KHATC | KH-HATC | 20 | 42 | 52 | 62 | 72 | 82 | 92 | 102 | 16.00～20.00 | | | 23 |
| SKH40 | KPATC | KH-HATC | 25 | 42 | 52 | 62 | 72 | 82 | 92 | 102 | 20.00～25.00 | | | 28 |

⚠ No.1.6～2.5 Applies only to M SKH51 、SKH40 ⚠ P ≥ 10.00: not available A(10) ⚠ P ≥ 16.00: not available A(15) ⚠ Bullet nose length L≤82

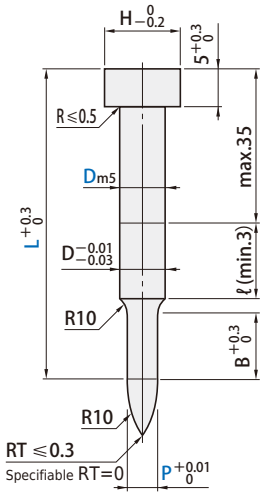
ORDER

| Code No. | L | P | A | (R) | (RT) |
|---|---|---|---|---|---|
| KSTC13 — | 42 | — P13.00 | | | |
| KTTC5 — | 52 | — P2.00 | | — R0 | |

# Economy Pilots

## ECONOMICAL PILOT PUNCHES






| Material | Hardness |
|---|---|
| SKD11 equiv. | 60～63HRC |

⚠Radius nose P ≥ 8: nose ground flat

| Material | Code No. Code | B | D | L | P | H | @/P (1～9P) |
|---|---|---|---|---|---|---|---|
| SKD11 | Dm5 (Shank dia. tol. D) KSTAZ | 15 | 3 | (42) 52 62 72 | 1.5 2.0 2.5 | 5 | 16.9 |
| | | | 4 | (42) 52 62 72 | 2.0 2.5 3.0 3.5 | 7 | 17.7 |
| | | | 5 | (42) 52 62 72 | 3.0 3.5 4.0 4.5 | 8 | 19.2 |
| | | | 6 | (42) 52 62 72 | 4.0 4.5 5.0 5.5 | 9 | 19.9 |
| | | 21 | 8 | 52 62 72 82 | 6.0 7.0 | 11 | 24.4 |
| | | | 10 | 52 62 72 82 | 8.0 9.0 | 13 | 31.0 |

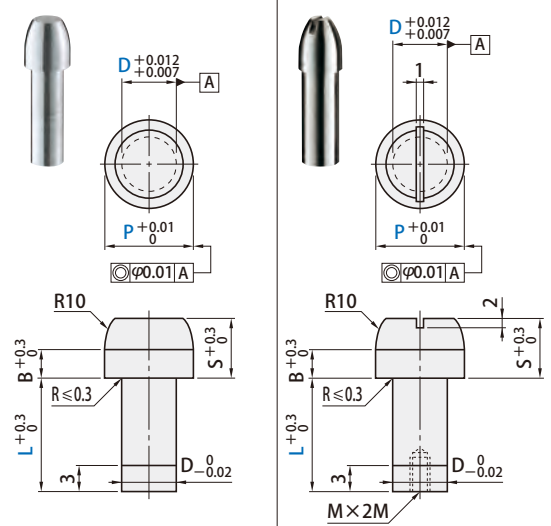
⚠L (42 : pilot length B=10

ORDER

| Code No. | L | P |
|---|---|---|
| KSTAZ4 — | 52 — | P3.0 |

| Material | Hardness |
|---|---|
| SDK11 equiv. | 60～63HRC |

| Without tapped hole | With tapped hole |
|---|---|
| KPST | KPSTM |




▶ Without tapped hole

| Code No. Code | D | L | P 0.01 | B | S |
|---|---|---|---|---|---|
| KPST | 1 | 12 | 1.50～3.00 | 1 | 4 |
| | 2 | 12 15 | 2.50～4.00 | | 5 |
| | 3 | | 4.00～6.00 | 2 | 6 |
| | 4 | | 5.00～7.00 | | 7 |
| | 5 | | 6.00～8.00 | | |
| | 6 | | 7.00～9.00 | | 8 |
| | 8 | 15 | 9.00～13.00 | 3 | 9 |
| | 10 | 18 | 11.00～15.00 | | |

▶ With tapped hole

| Code No. Code | D | L | P 0.01 | B | S | M |
|---|---|---|---|---|---|---|
| KPSTM | 5 | 12 | 6.00～8.00 | 2 | 7 | 3 |
| | 6 | 15 | 7.00～9.00 | | 8 | |
| | 8 | 15 | 9.00～13.00 | 3 | 9 | 4 |
| | 10 | 18 | 11.00～15.00 | | | 5 |

ORDER

| Code No. | L | P |
|---|---|---|
| KPST1 | — 12 — | P1.50 |

ADDITIONS ORDER

| Code No. | L | P (C) | (BC・PKC) |
|---|---|---|---|
| PPSTM8 | — 18 | —PC8.80 — | PKC |

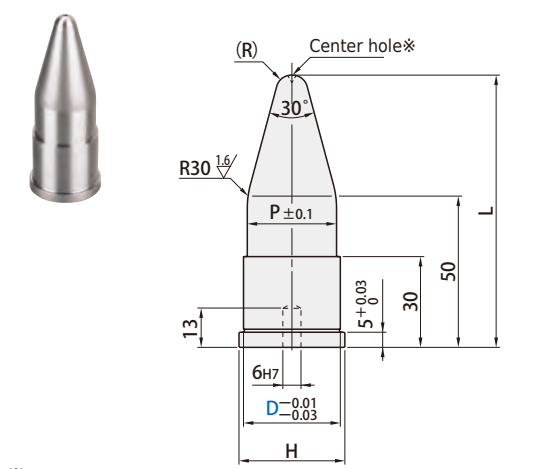
| Add. | Code (@/P) | Alteration Description |
|---|---|---|
| P Dimension Change | PC (4) | Reduce "P"<br>PC ≥ Pmin.−0.2<br>0.01 |
| B Dimension Change | BC (4) | Change "B"<br>1≤BC≤Bmax. Table 1<br>0.1 |

Table 1

| D | Bmax. |
|---|---|
| 1・2 | 3.0 |
| 3 | 4.0 |
| 4・5 | 5.0 |
| 6 | 6.0 |
| 8・10 | 7.0 |

| Add. | Code | Alteration Description |
|---|---|---|
| P Tolerance change | PKC (12) | $P^{+0.01}_{0} \rightarrow P^{+0.005}_{0}$ |

| Material | Hardness |
|---|---|
| SKS3 equiv. | 58HRC～ |




※May have a center hole。

| Code No. Code | D | H | L | (R) | P |
|---|---|---|---|---|---|
| KRFPP | 32 | 35 | 90 | 5 | 29.5 |
| | 45 | 48 | 110 | 8 | 44.5 |

ORDER

| Code No. |
|---|
| RRFPP32 |

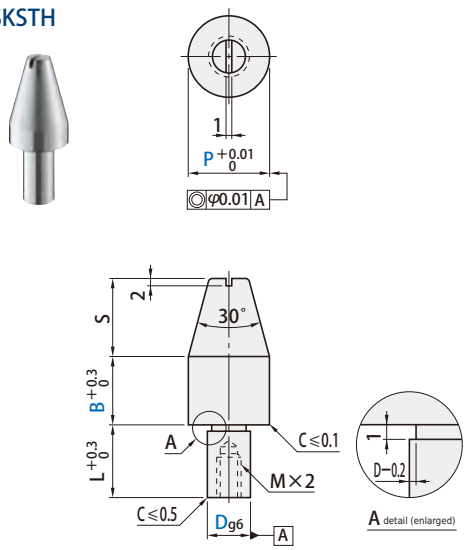
# Locating Pilots

## LOCATING PILOT PINS

| M Material | H Hardness |
|---|---|
| SKS3 | 60～63HRC |

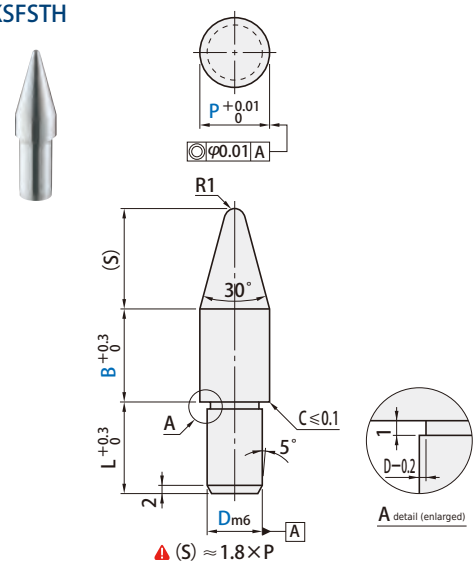
### Internal-Thread Retained

**KSKSTH**




### Press-Fit

**KSFSTH**




▶ Internal-Thread Retained

| Code No. | | P | B | $D_{g6}$ | | M | L | S |
|---|---|---|---|---|---|---|---|---|
| Code | D | in 0.01 | in 0.1 | | | | | |
| KSKSTH | 5 | 8.00～ 8.99 | 1.0～12.0 | 5 | $^{-0.004}_{-0.012}$ | 3 | 12 | 8 |
| | | 9.00～10.00 | | | | | | 10 |
| | 6 | 10.00～10.99 | 1.0～15.0 | 6 | | | | 10 |
| | | 11.00～12.00 | | | | | | 12 |
| | 8 | 12.00～12.99 | 1.0～15.0 | 8 | $^{-0.005}_{-0.014}$ | 4 | 15 | 15 |
| | | 13.00～16.00 | | | | | | 17 |
| | 10 | 14.00～14.99 | 1.0～20.0 | 10 | | 5 | | 17 |
| | | 15.00～20.00 | | | | | | 20 |
| | 13 | 16.00～16.99 | 1.0～20.0 | 13 | $^{-0.006}_{-0.017}$ | 6 | 20 | 20 |
| | | 17.00～20.00 | | | | | | 25 |
| | 16 | 18.00～20.00 | 1.0～20.0 | 16 | | 8 | 24 | 25 |

▶ Press-Fit

| Code No. | | P | B | $D_{m6}$ | | L |
|---|---|---|---|---|---|---|
| Code | D | in 0.01 | in 0.1 | | | |
| KSFSTH | 4 | 4.00～ 8.00 | 1.0～12.0 | 4 | $^{+0.012}_{+0.004}$ | 12 |
| | 5 | 5.00～10.00 | 1.0～12.0 | 5 | | |
| | 6 | 6.00～12.00 | 1.0～15.0 | 6 | | 15 |
| | 8 | 8.00～14.00 | 1.0～15.0 | 8 | $^{+0.015}_{+0.006}$ | |
| | 10 | 10.00～16.00 | 1.0～20.0 | 10 | | 20 |
| | 13 | 13.00～18.00 | 1.0～20.0 | 13 | $^{+0.018}_{+0.007}$ | |
| | 16 | 16.00～20.00 | 1.0～20.0 | 16 | | 24 |

ORDER

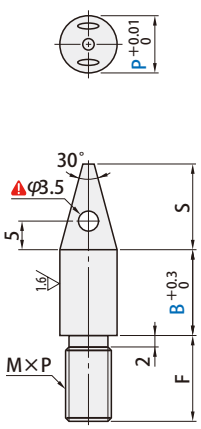
| Code No. | P | B |
|---|---|---|
| KSKSTH10 | — P14.99 — | B10.5 |
| KSFSTH8 | — P10.05 — | B12.5 |



| Material | Hardness | Type | Code |
|---|---|---|---|
| SKD61 | 37～43HRC | External-Thread Retained | KSLTL |
| SKS3 equiv. | 58HRC ～ | | KSLTLH |
| SKD61 | 37～43HRC | Insert External-Thread Retained | KSLPS |
| SKS3 equiv. | 58HRC ～ | | KSLPSH |

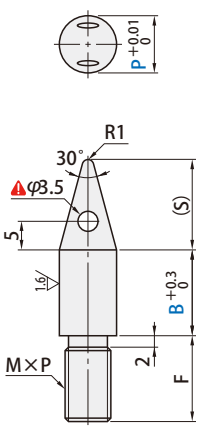
## External-Thread Retained

### KSLTL




⚠ KSLTL6 →φ2
⚠ KSLTL8 →φ2.5

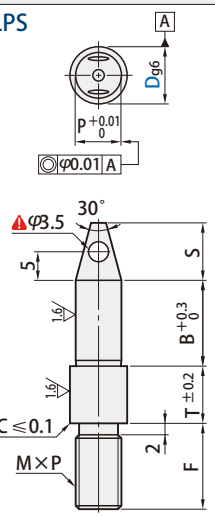
### KSLTLH




⚠ KSLTLH8 →φ2.5
⚠ (S)≈1.87P−2.86

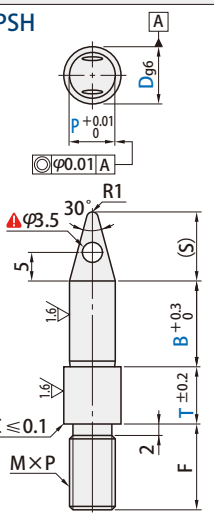
## Insert External-Thread Retained

### KSLPS




⚠ D8→φ2, D10→φ2.5

### KSLPSH




⚠ D8→φ2, D10→φ2.5
⚠ (S)≈1.87P−2.86

| Code No. Code | P | B | | M×P | F | S |
|---|---|---|---|---|---|---|
| KSLTL (P Fixed dim.) | 6 | 5 | 10 | 5×0.8 | 12 | 10 |
| | 8 | | | 6×1.0 | | |
| | 9 | 10 | 15 | 8×1.25 | 15 | |
| | 10 | | | 10×1.5 | | 15 |
| | 12 | 15 | 20 | 12×1.75 | | |
| | 14 | | | | | 17 |
| | 15 | | | | | |
| | 16 | 20 | 25 | | | |
| | 20 | 25 | 30 | 16×2.0 | 25 | 20 |

| Code No. Code | D | $D_{g6}$ | | M×P | F | P | B | T | S |
|---|---|---|---|---|---|---|---|---|---|
| KSLPS (P Fixed dim.) | 8 | 8 | −0.005 −0.014 | 6×1.0 | 12 | 6 | 5 | 3 | 10 |
| | 10 | 10 | | 8×1.25 | 15 | 8 | | 5 | |
| | 13 | 13 | −0.006 −0.017 | 12×1.75 | | 10 | | | 15 |
| | 16 | 16 | | | | 13 | | | 17 |
| | 20 | 20 | −0.007 −0.020 | 16×2.0 | 25 | 16 | 10 | 10 | 20 |
| | 25 | 25 | | | | 20 | | | 25 |

| Code No. Code | No. | P in 0.01 | B in 1 | M×P | F |
|---|---|---|---|---|---|
| KSLTLH (P•B Specified dim.) | 8 | 6.00～8.00 | 5～50 | 5×0.8 | 12 |
| | 10 | 8.00～10.00 | | 6×1.0 | |
| | 12 | 10.00～12.00 | | 8×1.25 | 15 |
| | 14 | 12.00～14.00 | | 10×1.5 | |
| | 16 | 14.00～16.00 | | 12×1.75 | |
| | 20 | 16.00～20.00 | | 16×2.0 | 25 |

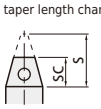
| Code No. Code | D | P in 0.01 | B in 1 | T in 1 | $D_{g6}$ | | M×P | F |
|---|---|---|---|---|---|---|---|---|
| KSLPSH (P•B•T Specified dim.) | 8 | 6.00～8.00 | 5～60 | 3～15 | 8 | −0.005 −0.014 | 6×1.0 | 12 |
| | 10 | 8.00～10.00 | | | 10 | | 8×1.25 | 15 |
| | 13 | 10.00～12.00 | | | 13 | −0.006 −0.017 | 12×1.75 | |
| | 16 | 12.00～14.00 | | | 16 | | | |
| | 20 | 14.00～16.00 | | | 20 | −0.007 −0.020 | 16×2.0 | 25 |
| | 25 | 16.00～20.00 | | | 25 | | | |

ORDER

| Code No. | P | B | T |
|---|---|---|---|
| KSLTL6 | — | B5 | |
| KSLTLH8 | — P7.00 — | B10 | |
| KSLPS8 | | | |
| KSLPSH8 | — P6.50 — | B8 — | T10 |

ADDITIONS ORDER

| Code No. | P | B | T | (SC) |
|---|---|---|---|---|
| KSLPSH10 | — P8.50 — | B10 — | T3 — | SC9 |

| Add. | Code | Alteration Description |
|---|---|---|
| Nose taper length change   | SC (6) | 8<SC <S<br>in 1<br>⚠ Applies to SSLTLH ·SSLPSH |

# Locating Pilots

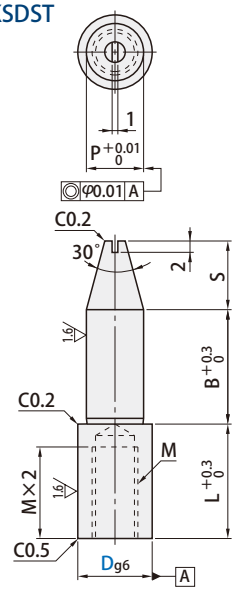
## LOCATING PILOT PINS



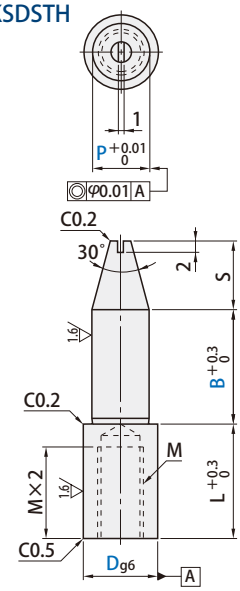
| Material | Hardness | Type | Code |
|---|---|---|---|
| SKS3 equiv. | 58HRC ～ | Small-Head Internal-Thread Retained | KSDST |
| | | | KSDSTH |
| | | Small-Head Single Shoulder | KSDKL |
| | | | KSDKLH |

### Small-Head Internal-Thread Retained

**KSDST**

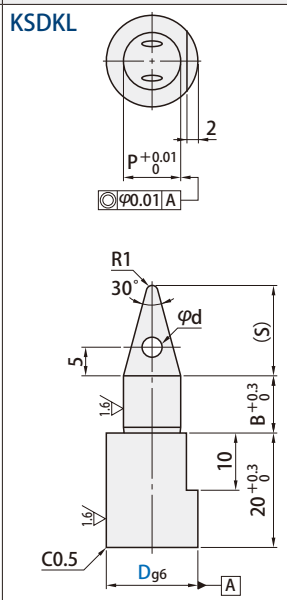



**KSDSTH**



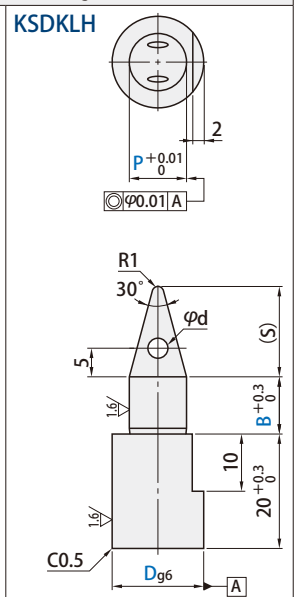

### Small-Head Single Shoulder

**KSDKL**




⚠ (S) ≈ 1.87P − 2.86

**KSDKLH**




⚠ (S) ≈ 1.87P − 2.86

| Code No. / Code | D | Dg6 | | M | P | L | S | B |
|---|---|---|---|---|---|---|---|---|
| KSDST (P Fixed dim.) | 8 | 8 | −0.005 −0.014 | 5 | 6 | 15 | 6 | 10 |
| | 10 | 10 | | 6 | 8 | | 8 | |
| | 13 | 13 | −0.006 −0.017 | 8 | 10 | 20 | 12 | |
| | 16 | 16 | | 10 | 12 | 24 | 17 | |
| | 20 | 20 | −0.007 −0.020 | 12 | 16 | | 20 | 15 |

| Code No. / Code | D | Dg6 | | P | B | d |
|---|---|---|---|---|---|---|
| KSDKL (P Fixed dim.) | 10 | 10 | −0.005 −0.014 | 6 | 10 | 2 |
| | 13 | 13 | −0.006 −0.017 | 8 | | 3.5 |
| | 16 | 16 | | 10 | | |
| | 20 | 20 | −0.007 −0.020 | 12 | | |
| | 25 | 25 | | 16 | 15 | |

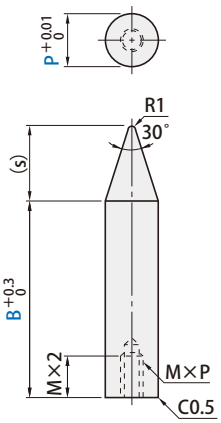
| Code No. / Code | D | P 0.01 | B 0.1 | Dg6 | | M | L | S |
|---|---|---|---|---|---|---|---|---|
| KSDSTH (P・B Specified dim.) | 8 | 6.00～ 7.00 | 3.0～20.0 | 8 | −0.005 −0.014 | 5 | 15 | 6 |
| | 10 | 7.00～ 9.00 | 3.0～30.0 | 10 | | 6 | | 8 |
| | 13 | 9.00～12.00 | 3.0～50.0 | 13 | −0.006 −0.017 | 8 | 20 | 12 |
| | 16 | 12.00～15.00 | | 16 | | 10 | 24 | 17 |
| | 20 | 15.00～18.00 | | 20 | −0.007 −0.020 | | | 20 |

| Code No. / Code | D | P 0.01 | B 0.1 | Dg6 | | d |
|---|---|---|---|---|---|---|
| KSDKLH (P・B Specified dim.) | 10 | 6.00～ 7.00 | 3.0～30.0 | 10 | −0.005 −0.014 | 2.5 |
| | 13 | 7.00～ 9.00 | | 13 | −0.006 −0.017 | 3.5 |
| | 16 | 9.00～12.00 | 3.0～50.0 | 16 | | |
| | 20 | 12.00～15.00 | | 20 | −0.007 −0.020 | |
| | 25 | 15.00～20.00 | | 25 | | |

ORDER

| Code No. | P | B |
|---|---|---|
| KSDST8 | | |
| KSDSTH8 | — P6.20 — | B12.0 |






| Material | Hardness | Code |
|---|---|---|
| SKS3 equiv. | 58HRC ～ | KSNST (P Fixed dim.) |
| | 60～63HRC | KSNSTH (P・B Specified dim.) |

⚠ (s) ≈ 1.87P－2.86

| Code No. Code | P | B | | M×P |
|---|---|---|---|---|
| KSNST (P Fixed dim.) | 6 | 10 | 15 | 4×0.7 |
| | 8 | | | 5×0.8 |
| | 10 | 15 | 20 | |
| | 12 | | | 6×1.0 |
| | 13 | 20 | 30 | |
| | 15 | | | |
| | 16 | 30 | 40 | |
| | 20 | 40 | 50 | 8×1.25 |

| Code No. Code | No. | P in 0.01 | B in 0.1 | M×P |
|---|---|---|---|---|
| KSNSTH (P・B Specified dim.) | 6 | 6.00～ 7.00 | 10.0～80.0 | 4×0.7 |
| | 8 | 7.00～ 8.00 | | 5×0.8 |
| | 10 | 8.01～10.00 | | |
| | 12 | 10.00～12.00 | | 6×1.0 |
| | 13 | 12.01～13.00 | | |
| | 15 | 13.01～15.00 | | |
| | 16 | 15.01～16.00 | | |
| | 20 | 16.00～20.00 | | 8×1.25 |

ORDER

| Code No. | P | B |
|---|---|---|
| KSNST8 | — | B15 |
| KSNSTH8 | — P7.53 | —B15.5 |



**Automotive Frame-Rail Punching**

# Solutions

## SOLUTIONS FOR AUTOMOBILE PARTS PRESS


99 Punch
102 Stripper Bushing
103 Die


For piercing automotive frame rails and structural parts: long-rail, cross-member and flat-plate punching of medium/heavy plate. Typical lines include Jinan Foundry, Jinan Tuowei, Soenen (Belgium), Whitney (USA) and other machines and lines.

## 1 Punches

### 1.1 Flat-Shoulder Round Punch

Structure per Fig. 1; key dims. per Table 1. Point size d can be selected within the specified range.

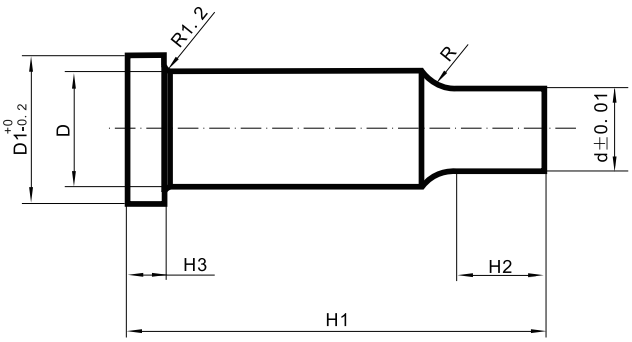



Fig. 1

Table 1 Key Dimensions - Flat-Shoulder Round Punch

| D | D1 | d | H1 | H2 | H3 | R |
|---|---|---|---|---|---|---|
| 20 | 29 | 7–19 | 90 | 19 | 8 | 13 |
| 25 | 32 | 7–23 | | | | |
| 27 | 34 | 23–26 | | | | |
| 56 | 64 | 25–55 | | | | |
| 62 | 69 | 56–62 | | | | |

| Product | D(mm) | d(mm) |
|---|---|---|
| Flat-Shoulder Round Punch | | |

Specify product name and key dims.

### 1.2 Flat-Shoulder Round Ejector Punch

Structure per Fig. 2; key dims. per Table 2. Point size d can be selected within the specified range. Ejector pin projects 1.5-2.0 mm beyond point face.

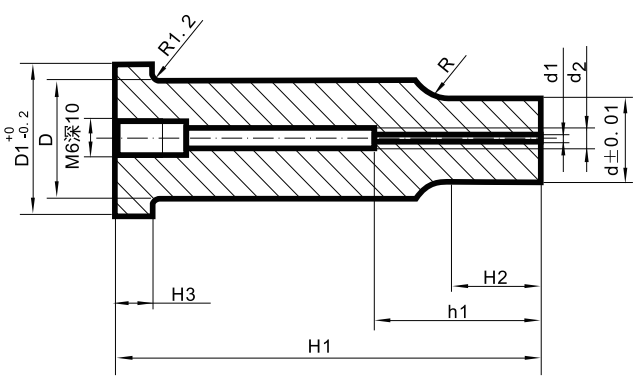



Fig. 2

Table 2 Key Dimensions - Flat-Shoulder Round Ejector Punch

| D | D1 | d | d1 | d2 | H1 | H2 | H3 | h1 | R |
|---|---|---|---|---|---|---|---|---|---|
| 20 | 29 | 7–12.5 | 2.0 | 5.2 | 90 | 19 | 8 | 35 | 13 |
| 20 | 29 | 13–19 | 3.0 | | | | | | |
| 25 | 32 | 7–12.5 | 2.0 | | | | | | |
| 25 | 32 | 13–23 | 3.0 | | | | | | |
| 27 | 34 | 23–26 | 3.0 | | | | | | |
| 56 | 64 | 25–55 | 3.0 | | | | | | |
| 62 | 69 | 56–62 | 3.0 | | | | | | |

| Product | D(mm) | d(mm) |
|---|---|---|
| Flat-Shoulder Round Ejector Punch | | |

Specify product name and key dims.

## 1.3 Flat-Shoulder Shaped Punch

Structure per Fig. 3; key dims. per Table 3. Point size d selectable within specified range the specified range.

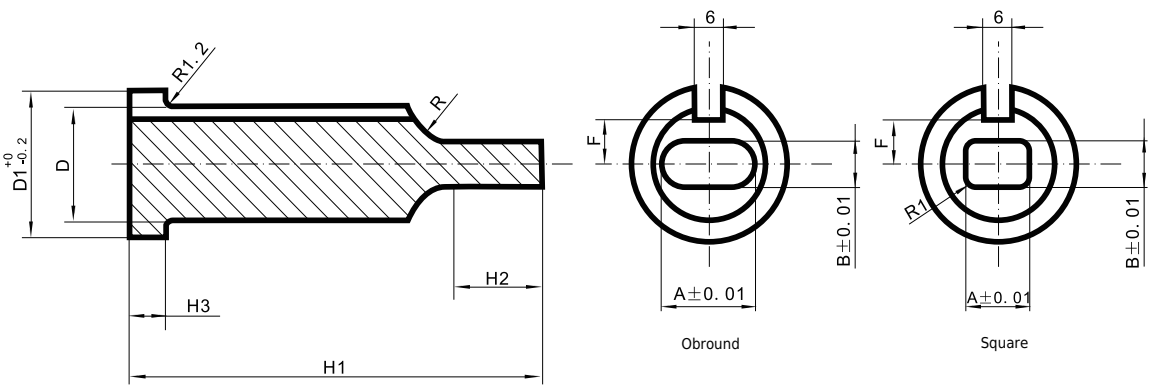



Fig. 3

Table 3 Key Dimensions - Flat-Shoulder Shaped Punch

| D | D1 | A | B | F | H 1 | H 2 | H 3 | R |
|---|---|---|---|---|---|---|---|---|
| 20 | 29 | 6–14 | A–20 | 7 | 90 | 19 | 8 | 13 |
| 25 | 32 | 6–19 | A–25 | 9. 5 | | | | |
| 27 | 34 | 6–21 | A–27 | 10. 5 | | | | |
| 56 | 64 | 6–51 | A–56 | 25 | | | | |
| 62 | 69 | 6–57 | A–62 | 31. 5 | | | | |

| Product | D(mm) | A(mm) | B(mm) |
|---|---|---|---|
| Flat-Shoulder Shaped Punch | | | |

Specify product name and key dims.

## 1.4 Taper-Shoulder Round Punch

Structure per Fig. 4; key dims. per Table 4. Point size d selectable within specified range the specified range.

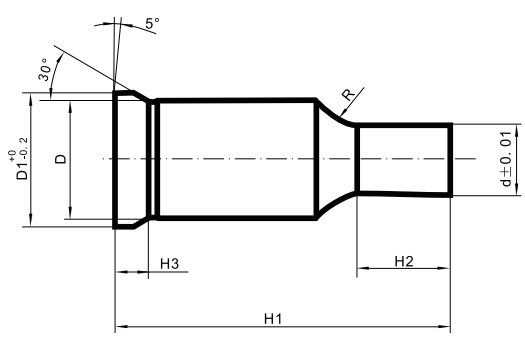



Fig. 4

Table 4 Key Dimensions - Taper-Shoulder Round Punch

| D | D 1 | d | H 1 | H 2 | H 3 | R |
|---|---|---|---|---|---|---|
| 28 | 29 | 7–19 | 90 | 19 | 8 | 13 |
| 25 | 32 | 7–23 | | | | |
| 27 | 34 | 23–26 | | | | |
| 56 | 64 | 25–55 | | | | |
| 62 | 69 | 56–62 | | | | |

| Product | D(mm) | d(mm) |
|---|---|---|
| Taper-Shoulder Round Punch | | |

Specify product name and key dims.

## 1.5 Taper-Shoulder Round Ejector Punch

Structure per Fig. 5; key dims. per Table 5. Point size d can be selected within the specified range.

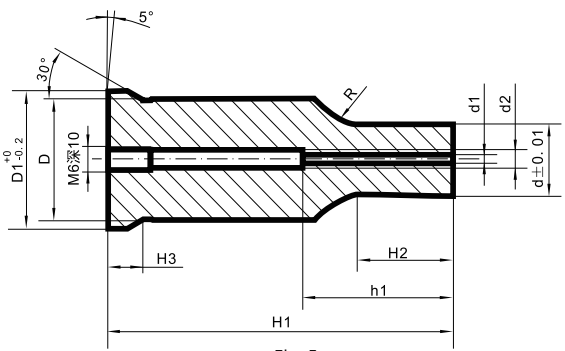



Fig. 5

| Product | D(mm) | d(mm) |
|---|---|---|
| Taper-Shoulder Round Ejector Punch | | |

Specify product name and key dims.

Table 5 Key Dimensions - Taper-Shoulder Round Ejector Punch

| D | D1 | d | d1 | d2 | H1 | H2 | H3 | h1 | R |
|---|---|---|---|---|---|---|---|---|---|
| 20 | 29 | 7–12.5 | 2.0 | 5.2 | 90 | 19 | 8 | 35 | 13 |
| | | 13–19 | 3.0 | | | | | | |
| 25 | 32 | 7–12.5 | 2.0 | 5.2 | | | | | |
| | | 13–23 | 3.0 | | | | | | |
| 27 | 34 | 23–26 | 3.0 | 5.2 | | | | | |
| 56 | 64 | 25–55 | 3.0 | 5.2 | | | | | |
| 62 | 69 | 56–62 | 3.0 | 5.2 | | | | | |

## 1.6 Taper-Shoulder Shaped Punch

Structure per Fig. 6; key dims. per Table 6. Point sizes A, B can be selected within the specified range.

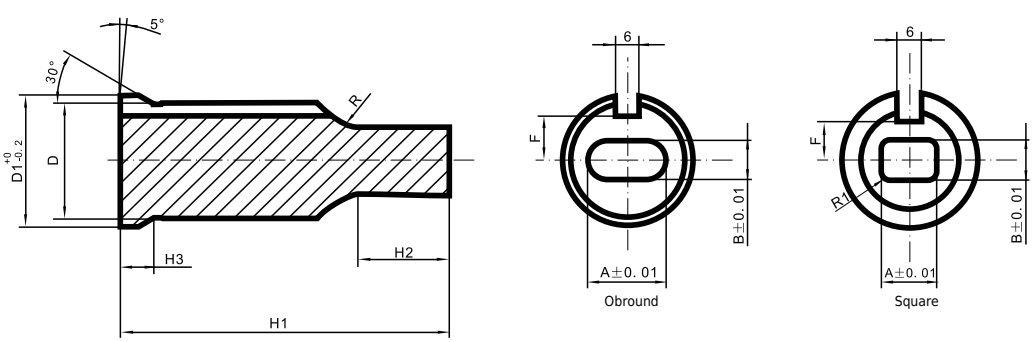



Fig. 6

| Product | D(mm) | A(mm) | B(mm) |
|---|---|---|---|
| Taper-Shoulder Shaped Punch | | | |

Specify product name and key dims.

Table 6 Key Dimensions - Taper-Shoulder Shaped Punch

| D | D1 | A | B | F | H1 | H2 | H3 | R |
|---|---|---|---|---|---|---|---|---|
| 20 | 29 | 6–14 | A–20 | 7 | 90 | 19 | 8 | 13 |
| 25 | 32 | 6–19 | A–25 | 9.5 | | | | |
| 27 | 34 | 6–21 | A–27 | 10.5 | | | | |
| 56 | 64 | 6–51 | A–56 | 25 | | | | |
| 62 | 69 | 6–57 | A–62 | 31.5 | | | | |

## 1.7 Other

Punches not covered above can be made to print.

## 2. Stripper Bushings

### 2.1 Taper-Shoulder Punch Bushing

Structure per Fig. 7; key dims. per Table 7.

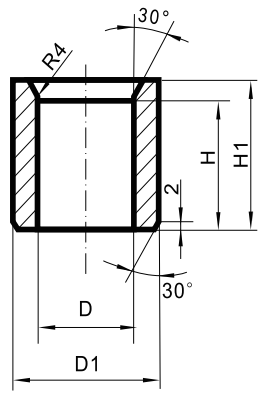



Fig. 7

Table 7 Key Dim.s - Taper-Shoulder Punch Bushing

| D | D 1 | H | H 1 |
|---|---|---|---|
| 20 | 29 | 36 | 32 |
| 25 | 32 | | |
| 27 | 34 | | |
| 56 | 64 | | |
| 62 | 69 | | |

| Product | D(mm) |
|---|---|
| Taper-Shoulder Punch Bushing | |

Specify product name and key dims.

### 2.2 Flat-Shoulder Punch Bushing

Structure per Fig. 8; key dims. per Table 8.

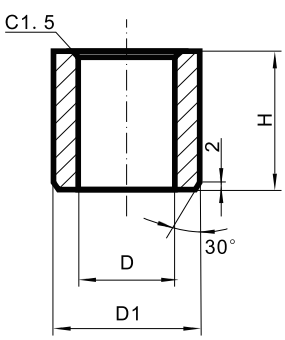



Fig. 8

Table 8 Key Dim.s - Flat-Shoulder Punch Bushing

| D | D 1 | H |
|---|---|---|
| 20 | 29 | 36 |
| 25 | 32 | |
| 27 | 34 | |
| 56 | 64 | |
| 62 | 69 | |

| Product | D(mm) |
|---|---|
| Flat-Shoulder Punch Bushing | |

Specify product name and key dims.

### 2.3 Other

Bushings not covered above can be made to print.

## 3. Dies

### 3.1 Round Die, Round Hole

Structure per Fig. 9; key dims. per Table 9. Point size d can be selected within the specified range.

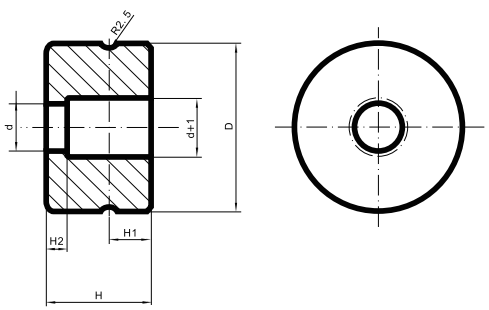



Fig. 9

Table 9 Key Dimensions - Round Die, Round Hole

| D | H | H1 | H2 | d |
|---|---|---|---|---|
| 34 | 25 | 10 | 5 | 7–13 |
| 40 | | | | 13–20 |
| 49 | | | | 20–25 |
| 66 | | | | 25–35 |
| 85 | | | | 35–62 |

| Product | D(mm) | d(mm) |
|---|---|---|
| Round Die, Round Hole | | |

Specify product name and key dims.

### 3.2 Round Die, Shaped Hole

Structure per Fig. 10; key dims. per Table 10. Point sizes A, B can be selected within the specified range.

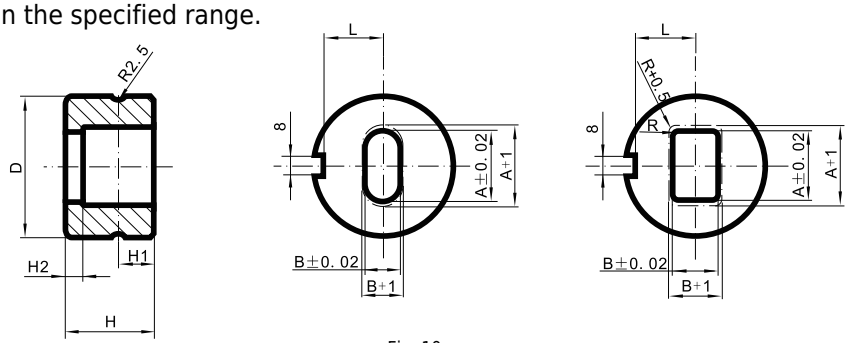



Fig. 10

Table 10 Key Dimensions - Round Die, Shaped Hole

| D | H | H1 | H2 | A | B | L | R |
|---|---|---|---|---|---|---|---|
| 34 | 25 | 10 | 5 | 7–15 | A–15 | 12. 5 | 0. 3–7. 5 |
| 40 | | | | 7–20 | A–20 | 17 | 0. 3–10 |
| 49 | | | | 20–25 | A–25 | 13. 5 | 0. 3–12. 5 |
| 66 | | | | 25–35 | A–35 | 30 | 0. 3–17. 5 |
| 85 | | | | 35–62 | A–62 | 39. 5 | 0. 3–31 |

| Product | D(mm) | A(mm) | B(mm) |
|---|---|---|---|
| Round Die, Shaped Hole | | | |

Specify product name and key dims.

## 3.3 Type I Square Die

Structure and accuracy per Fig. 11; key dims. per Table 11. Point size d selectable within the specified range.

Table 11 Key Dimensions - Type I Square Die

| D | A | B | A1 | B1 | H | H1 | d1 | d2 | C | d |
|---|---|---|---|---|---|---|---|---|---|---|
| 20. 5 | 40 | 40 | 24 | 24 | 33 | 28 | 10. 4 | 6. 4 | C≤ ( A/ 2−d/ 2−1 ) | 7–15 |
| 22. 5 | 40 | 40 | 25 | 25 | 33 | 28 | 10. 4 | 6. 4 | | 7–15 |
| 30 | 48 | 49 | 32 | 32 | 33 | 28 | 10. 4 | 6. 4 | | 15–23 |
| 32. 5 | 48 | 49 | 33 | 34 | 33 | 28 | 10. 4 | 6. 4 | | 15–23 |

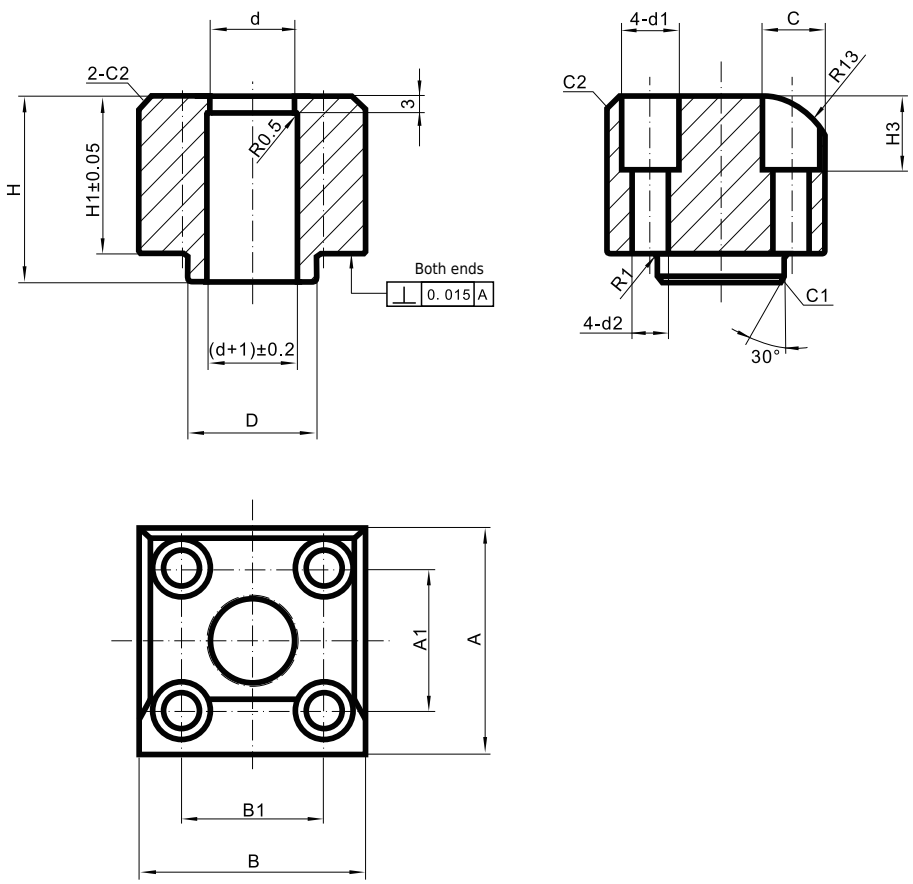



Fig. 11

| Product | D(mm) | d(mm) |
|---|---|---|
| Type I Square Die | | |

Specify product name and key dims.

## 3.4 Type II Square Die

Structure and accuracy per Fig. 12; key dims. per Table 12. Point size d selectable within the specified range.

Table 12 Key Dimensions - Type II Square Die

| D | A | B | A1 | B1 | H | H1 | d1 | d2 | C | d |
|---|---|---|---|---|---|---|---|---|---|---|
| 64. 5 | 78 | 97 | 56 | 70 | 33 | 28 | 10. 4 | 6. 4 | C≤ ( A/ 2–d/ 2–2 ) | 25–50 |
| 74. 5 | 78 | 102 | 56 | 70 | 33 | 28 | 10. 4 | 6. 4 | | 25–56 |
| 74. 5 | 90 | 102 | 56 | 70 | 33 | 28 | 10. 4 | 6. 4 | | 50–62 |

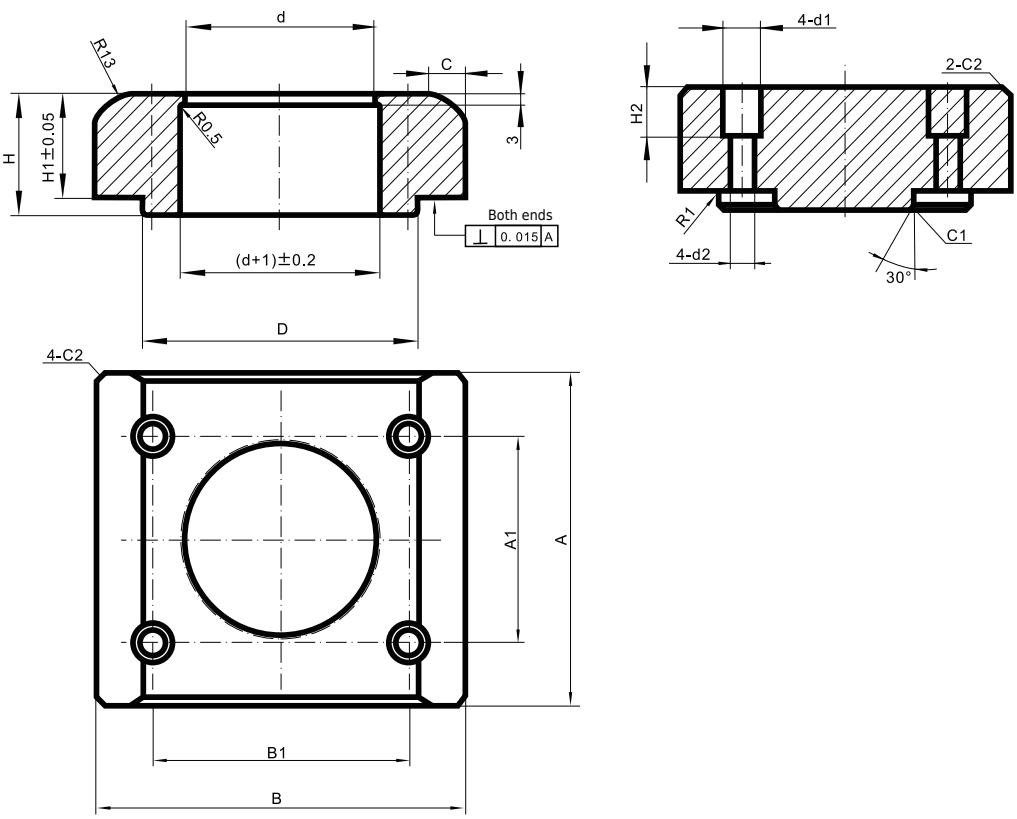



Fig. 12

| Product | D(mm) | d(mm) |
|---|---|---|
| Type II Square Die | | |

Specify product name and key dims.

## 3.5 Other

Dies not covered above can be made to print.

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