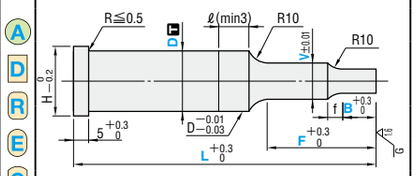
# DOUBLE-STEPPED SHOULDER PUNCHES
—RW COATING・DLC COATING—

PRODUCTS DATA
P.1605 ～ 1609

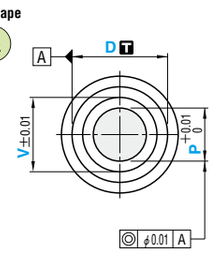
| Type | Shank diameter D T tolerance | M H | Catalog No. Type: RW coating surface 3100HV | Catalog No. Type: DLC coating surface 3000HV ～ | Tip shape |
|---|---|---|---|---|---|
| —RW coating— RoHS  —DLC coating—  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$. | Dm5 | Equivalent to SKH51 61 ～ 64HRC | RW—SHTW | N—SHTW —Foundation WPC®— NW—SHTW | A D R E G |
| | | Powderd high-speed steel 64 ～ 67HRC | RW—PHTW | N—PHTW —Foundation WPC®— NW—PHTW | |
| | $D^{+0.005}_{0}$ | Equivalent to SKH51 61 ～ 64HRC | ARW—SHTW | AN—SHTW —Foundation WPC®— ANW—SHTW | |
| | | Powderd high-speed steel 64 ～ 67HRC | ARW—PHTW | AN—PHTW —Foundation WPC®— ANW—PHTW | |

The tip shape can be selected from Tip shape A～G in the figure below.

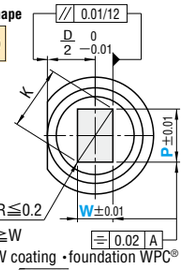



- The tip end is ground before the coating is applied.
- The tip edge of a RW coating or DLC foundation WPC® are slightly rounded.

Tip shape A

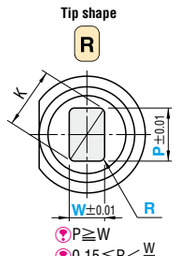



Tip shape D



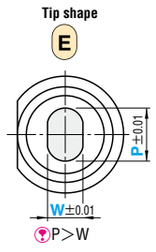

- P≧W
- RW coating・foundation WPC®
- $K=\sqrt{P^2+W^2}$

Tip shape R



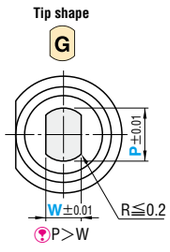

- P≧W
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E




- P＞W

Tip shape G




- P＞W

| Catalog No. Type | Tip shape | D | L (Selection) | 0.01mm increments Ⓐ P | 0.1mm increments Ⓐ B | Diagonal Kmax. | 0.01mm increments D R E G P・W | R R | 0.01mm increments D R E G B | 0.01mm increments V | 0.1mm increments F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (Dm5) —RW coating— RW—SHTW RW—PHTW —DLC coating— N—SHTW N—PHTW —DLC coating— Foundation WPC® NW—SHTW NW—PHTW | A D R E G | 3 | 40・50・60・70・80 | (0.50～ 0.999) | 2.0～10.0 | 2.96 | 1.00～ 1.49 | 0.15≦R＜W/2 (R only) | 2.0～ 8.0 | Ⓐ: D＞V＞P+0.01 D R E G: D＞V＞(P,K)+0.03 | 8+f+2＜F≦Fmax & Ⓐ: F≦L−25 D R E G: F≦L−30 | 5 |
| | | | | 1.00～ 1.999 | 2.0～20.0 | | 1.50～ 1.99 | | 2.0～ 13.0 | | | |
| | | | | 2.00～ 2.98 | 2.0～35.0 | | 2.00～ 2.96 | | 2.0～ 19.0 | | | |
| | | 4 | 40・50・60・70・80 | (0.50～ 0.999) | 2.0～10.0 | 3.96 | 1.00～ 1.49 | | 2.0～ 8.0 | | | 7 |
| | | | | 1.00～ 1.999 | 2.0～20.0 | | 1.50～ 1.99 | | 2.0～ 13.0 | | | |
| | | | | 2.00～ 3.98 | 2.0～35.0 | | 2.00～ 3.49 | | 2.0～ 19.0 | | | |
| | | | | 2.00～ 3.98 | 2.0～35.0 | | 3.50～ 3.96 | | 2.0～ 25.0 | | | |
| | | 5 | 40・50・60・70・80 | 1.00～ 1.999 | 2.0～20.0 | 4.96 | 1.00～ 1.49 | | 2.0～ 8.0 | | | 8 |
| | | | | 2.00～ 3.999 | 2.0～35.0 | | 1.50～ 1.99 | | 2.0～ 13.0 | | | |
| | | | | 4.00～ 4.98 | 2.0～45.0 | | 2.00～ 3.49 | | 2.0～ 19.0 | | | |
| | | | | 4.00～ 4.98 | 2.0～45.0 | | 3.50～ 4.96 | | 2.0～ 25.0 | | | |
| | | 6 | 40・50・60・70・80 | 1.00～ 1.999 | 2.0～20.0 | 5.96 | 1.00～ 1.49 | | 2.0～ 8.0 | | | 9 |
| | | | | 2.00～ 3.999 | 2.0～35.0 | | 1.50～ 1.99 | | 2.0～ 13.0 | | | |
| | | | | 4.00～ 5.98 | 2.0～45.0 | | 2.00～ 3.49 | | 2.0～ 19.0 | | | |
| | | | | 4.00～ 5.98 | 2.0～45.0 | | 3.50～ 4.99 | | 2.0～ 25.0 | | | |
| | | | | 4.00～ 5.98 | 2.0～45.0 | | 5.00～ 5.96 | | 2.0～ 30.0 | | | |
| ($D^{+0.005}_{0}$) —RW coating— ARW—SHTW ARW—PHTW —DLC coating— AN—SHTW AN—PHTW —DLC coating— Foundation WPC® ANW—SHTW ANW—PHTW | | 8 | 40・50・60・70・80 90・100 | 1.00～ 1.999 | 2.0～20.0 | 7.96 | 1.00～ 1.49 | | 2.0～ 8.0 | | | 11 |
| | | | | 2.00～ 3.999 | 2.0～35.0 | | 1.50～ 1.99 | | 2.0～ 13.0 | | | |
| | | | | 4.00～ 5.999 | 2.0～45.0 | | 2.00～ 3.49 | | 2.0～ 19.0 | | | |
| | | | | 6.00～ 7.98 | 2.0～60.0 | | 3.50～ 4.99 | | 2.0～ 25.0 | | | |
| | | | | 6.00～ 7.98 | 2.0～60.0 | | 5.00～ 7.96 | | 2.0～ 30.0 | | | |
| | | 10 | 40・50・60・70・80 90・100 | 1.50～ 1.999 | 2.0～20.0 | 9.96 | 1.20～ 1.49 | | 2.0～ 8.0 | | | 13 |
| | | | | 2.00～ 3.999 | 2.0～35.0 | | 1.50～ 1.99 | | 2.0～ 13.0 | | | |
| | | | | 4.00～ 5.999 | 2.0～45.0 | | 2.00～ 3.49 | | 2.0～ 19.0 | | | |
| | | | | 6.00～ 9.98 | 2.0～60.0 | | 3.50～ 4.99 | | 2.0～ 25.0 | | | |
| | | | | 6.00～ 9.98 | 2.0～60.0 | | 5.00～ 9.96 | | 2.0～ 30.0 | | | |
| | | 13 | 40・50・60・70・80 90・100 | 3.00～ 3.999 | 2.0～35.0 | 12.96 | 1.50～ 1.99 | | 2.0～ 13.0 | | | 16 |
| | | | | 4.00～ 5.999 | 2.0～45.0 | | 2.00～ 3.49 | | 2.0～ 19.0 | | | |
| | | | | 6.00～12.98 | 2.0～60.0 | | 3.50～ 4.99 | | 2.0～ 25.0 | | | |
| | | | | 6.00～12.98 | 2.0～60.0 | | 5.00～ 12.96 | | 2.0～ 30.0 | | | |
| | | 16 | 40・50・60・70・80 90・100 | 5.00～ 5.999 | 2.0～45.0 | 15.96 | 2.00～ 3.49 | | 2.0～ 19.0 | | | 19 |
| | | | | 6.00～15.98 | 2.0～60.0 | | 3.50～ 4.99 | | 2.0～ 25.0 | | | |
| | | | | 6.00～15.98 | 2.0～60.0 | | 5.00～ 15.96 | | 2.0～ 30.0 | | | |
| | | 20 | 40・50・60・70・80 90・100 | 6.50～19.98 | 2.0～60.0 | 19.96 | 2.50～ 3.49 | | 2.0～ 19.0 | | | 23 |
| | | | | 6.50～19.98 | 2.0～60.0 | | 3.50～ 4.99 | | 2.0～ 25.0 | | | |
| | | | | 6.50～19.98 | 2.0～60.0 | | 5.00～ 19.96 | | 2.0～ 30.0 | | | |
| | | 25 | 40・50・60・70・80 90・100 | 9.00～24.98 | 2.0～60.0 | 24.96 | 3.00～ 3.49 | | 2.0～ 19.0 | | | 28 |
| | | | | 9.00～24.98 | 2.0～60.0 | | 3.50～ 4.99 | | 2.0～ 25.0 | | | |
| | | | | 9.00～24.98 | 2.0～60.0 | | 5.00～ 24.96 | | 2.0～ 30.0 | | | |

- V＞D−0.03 C ℓ＝0　If V＞D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.

| V | Fmax |
|---|---|
| 0.51～0.999 | 10 |
| 1.00～1.999 | 20 |
| 2.00～3.999 | 35 |
| 4.00～5.999 | 45 |
| 6.00～ | 60 |

For dimension f, refer to the punch R length in [Products data] on P.1592 and verify the following.
Ⓐ: (V−P)/2=X
D R E G: (V−W)/2=X

Order

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



Days to Ship: Quotation

Alterations: Catalog No. — L(LC・LCT・LMT) — P — W — B — V — F — R(R only) — (HC・TC・KC…etc.)
RW—SHTWA 10 — LC72 — P4.80 — B10 — V6.80 — F40 — HC12

| Alterations | | Code | Ⓐ | D R E G | 1Code |
|---|---|---|---|---|---|
| Alterations to tip | PRC±0.05 | PRC | Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2 For RW coating・DLC foundation WPC®, the tolerance is PRC±0.1 Cannot be combined with PCC・GC. | —— | |
| | PCC±0.05 | PCC | Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−0.2)/2 For RW coating・DLC foundation WPC®, the tolerance is PCC±0.1 Cannot be combined with PRC・GC. | —— | |
| | GC, g, L, B | GC | 20°≦GC＜90° 1° increments Tip length B≧g+2 g=P/2×tan(90°−GC°) When combined with SC, tip edges are rounded. Cannot be used for P＜1.0. Cannot be combined with LKC・LCT・LMT・PRC・PCC. Cannot be used with RW coating・DLC foundation WPC® | —— | |
| | P.W T | PKC | Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P dimension can be selected in 0.001 mm increments.) cannot be used with RE coating. | Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$ | Quotation |
| | 0.16 GL | SC | Lapping of tip P dimension tolerance and increment are the same. With coating, the base matelial is finished before coating is applied. R=0 cannot be selected for tip shape D corners. Cannot be used with RW coating・DLC foundatin WPC®. | | Quotation |
| Alterations to full length | LC, L | LC | Full length change 25+F≦LC＜L 0.1mm increments (If combined with LKC 0.01 mm increments can be selected.) | Full length change 30+F≦LC＜L 0.1mm increments | |
| | T T, LC, L | LCT | Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKC: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC: Full length change + $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Full length tolerance change | | |
| | | LMT | Changes to head thickness tolerance andfull length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKM: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC: Full length change + $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Full length tolerance change | | |
| | LT | LKC | Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ | | |

Price: Quotation

| Alterations | | Code | Ⓐ | D R E G | 1Code |
|---|---|---|---|---|---|
| Alterations to head | | KC | Addition of single key flat to head | Key flat position change 1° increments | |
| | | WKC | Addition of double key flats in parallel | Double key flats in parallel Can be combined with KC. | |
| | | KFC | Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC. | Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC. | |
| | | NKC | —— | No key flat | |
| | H, HC | HC | Head diameter change D≦HC＜H 0.1 mm increments | | |
| | T, TC | TC | Head thickness change 2≦TC＜5 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01 mm increments can be selected.) Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified. | | Quotation |
| | T T | TKC | Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ | | |
| | | TKM | Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ | | |
| | TCC | TCC | Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5. | | |
| | | RC | Head thickness is machined to a tolerance of −0.04 ～0 relative to the retainer surface. Cannot be used for $D^{+0.005}_{0}$ types. | | |
| Alterations to shank | | SKC | Single key flat on shank ・D3～6 V≦D−1.2 (Machining width 0.5) ・D8～ V≦D−2.2 (Machining width 1) Cannot be combined with KC・WKC・KFC. | | |
| | ℓ, D | NDC | No press-in lead ℓ≧3 ⇨ ℓ=0 | | |

■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance. See the product data for details. P.1607

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609