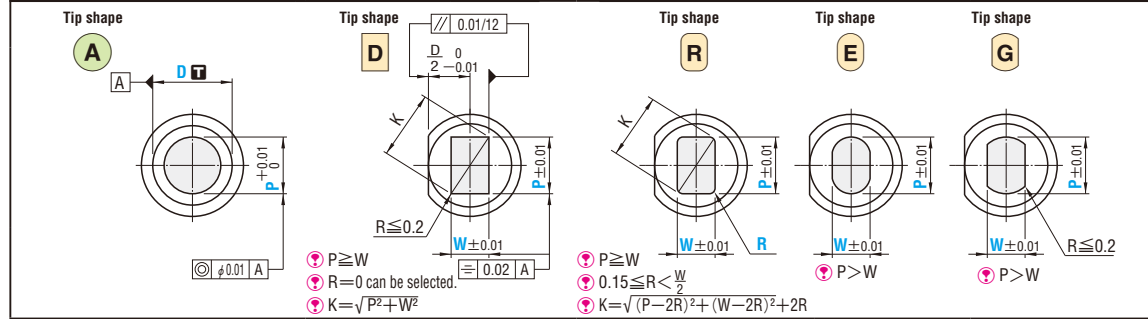


SHOULDER PUNCHES

—TiCN COATING—



Type	Shank diameter D Tolerance	M H	Catalog No.		The tip shape can be selected from Tip shape A~G in the figure below.
			Type	Tip shape Tip length	
—TiCN coating— RoHS	D _{m5}	SKH51 61~64HRC Surface 3000HV	H—SH	A	<p>The tip end is ground before the coating is applied.</p>
			H—PH	D	
	D ^{+0.005} ₀	SKH51 61~64HRC Surface 3000HV	AH—SH	E	
			AH—PH	G	



Type	Tip shape	Tip length	D	L										0.01 mm increments			B	H
														A	D R E G	R		
														min. P max.	P·Kmax.	P·Wmin.		
(D _{m5}) H—SH H—PH	A D R E G	S	3	40	50	60	70	80	90	100	1.00~	2.99	—	—	—	—	5	
			4	40	50	60	70	80	90	100	1.00~	3.99	3.97	1.00	—	7		
			5	40	50	60	70	80	90	100	2.00~	4.99	4.97	1.20	—	8		
			6	40	50	60	70	80	90	100	2.00~	5.99	5.97	1.50	—	9		
			8	40	50	60	70	80	90	100	3.00~	7.99	7.97	2.00	—	11		
		L	10	40	50	60	70	80	90	100	3.00~	9.99	9.97	2.50	—	13		
			13	40	50	60	70	80	90	100	6.00~	12.99	12.97	3.00	—	16		
			16	40	50	60	70	80	90	100	10.00~	15.99	15.97	4.00	—	19		
			20	40	50	60	70	80	90	100	13.00~	19.99	19.97	5.00	—	23		
			25	40	50	60	70	80	90	100	18.00~	24.99	24.97	6.00	—	28		
(D ^{+0.005}) ₀ AH—SH AH—PH	A D R E G	L	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			
			8	50	60	70	80	90	100	3.00~	7.99	7.97	2.50	—	11			
		X	10	50	60	70	80	90	100	3.00~	9.99	9.97	2.50	—	13			
			13	50	60	70	80	90	100	6.00~	12.99	12.97	3.00	—	16			
			16	50	60	70	80	90	100	10.00~	15.99	15.97	4.00	—	19			
			20	50	60	70	80	90	100	13.00~	19.99	19.97	5.00	—	23			
			25	50	60	70	80	90	100	18.00~	24.99	24.97	6.00	—	28			

ⓐ: P>D-0.03→ℓ=0 If P>D-0.03 for a round punch, D_{-0.03}^{-0.01} (press-in lead) is not included.
 ⓑ: P·K>D-0.05→ℓ=0 If P·K>D-0.05 for a shaped punch, D_{-0.03}^{-0.01} (press-in lead) is not included.
 Ⓒ: L(40)→B=8 If full length is (40), tip length is 8 mm in all cases.

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

Days to Ship **Quotation**

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

Alteration	Code	A	D R E G	1Code																						
Alterations to tip	PC WC	Tip dimension change PC ≥ P _{min} ≥ 1.00 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.)	Tip dimension change PC = P·W _{min} ≥ 1.00 0.01 mm increments ⊗ Cannot be used for tip X.	1Code																						
		<table border="1"> <tr><th>P(PC)</th><th>Bmax.</th></tr> <tr><td>1.000~1.999</td><td>20</td></tr> <tr><td>2.000~3.999</td><td>35</td></tr> <tr><td>4.000~4.999</td><td>45</td></tr> <tr><td>5.000~5.999</td><td>50</td></tr> <tr><td>6.000~</td><td>60</td></tr> </table>	P(PC)		Bmax.	1.000~1.999	20	2.000~3.999	35	4.000~4.999	45	5.000~5.999	50	6.000~	60	<table border="1"> <tr><th>P(PC)·W(WC)</th><th>Bmax.</th></tr> <tr><td>1.00~1.49</td><td>8</td></tr> <tr><td>1.50~1.99</td><td>13</td></tr> <tr><td>2.00~3.49</td><td>19</td></tr> <tr><td>3.50~4.99</td><td>25</td></tr> <tr><td>5.00~</td><td>30</td></tr> </table>	P(PC)·W(WC)	Bmax.	1.00~1.49	8	1.50~1.99	13	2.00~3.49	19	3.50~4.99	25
	P(PC)	Bmax.																								
	1.000~1.999	20																								
	2.000~3.999	35																								
	4.000~4.999	45																								
5.000~5.999	50																									
6.000~	60																									
P(PC)·W(WC)	Bmax.																									
1.00~1.49	8																									
1.50~1.99	13																									
2.00~3.49	19																									
3.50~4.99	25																									
5.00~	30																									
BC	Tip length change 2 ≤ BC ≤ Bmax. ≤ L/2 0.1 mm increments ⓐ Full length L must be at least 25 mm longer than tip length BC.	Tip length change 2 ≤ BC ≤ Bmax. ≤ L/2 0.1 mm increments ⓐ Full length L must be at least 30 mm longer than tip length BC.																								
PRC	Rounding of tip side edge 0.3 ≤ PRC ≤ 1 0.1 mm increments ⓐ PRC ≤ (P-0.2)/2 ⊗ Cannot be combined with PCC-GC.																									
PCC	Chamfering to tip side edge 0.3 ≤ PCC ≤ 1 0.1 mm increments ⓐ PCC ≤ (P-0.2)/2 ⊗ Cannot be combined with PRC-GC.																									
GC	20° ≤ GC < 90° 1° increments Tip length B ≥ f+2 f = P/2 × tan(90° - GC°) ⓐ If combined with SC, tip edges are rounded. ⊗ Cannot be used for P < 1.0. ⊗ Cannot be combined with LKC·LCT·LMT·PRC·PCC.																									
Alterations to full length	PKC	Tip tolerance change P ₀ ^{+0.01} → +0.005 ⓐ (P dimension can be selected in 0.001 mm increments.) ⊗ Cannot be used for D > 13.	Tip tolerance change P·W ± 0.01 → +0.01 ⊗ Cannot be used for D > 13.																							
	LC	Full length change 25 + B(BC) ≤ LC < L 0.1 mm increments ⓐ If difference between full length and tip length is 25 mm or less, tip length is adjusted to (Full length - 25 mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 30 + B(BC) ≤ LC < L 0.1 mm increments ⓐ If difference between full length and tip length is 30 mm or less, tip length is adjusted to (Full length - 30 mm).																							
	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 ⓐ are the same as for LC.	Full length tolerance change LC	Full length tolerance change LC																						
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes ⓐ are the same as for LC.	Full length tolerance change TKM	Full length tolerance change LC																						
	LKC	Full length tolerance change L ₀ ^{+0.3} → +0.05 ⓐ																								
	Alterations to shank	SKC	Single key flat on shank ⓐ D3-6 P ≤ D-1.2 W ≤ D-1.2 (Machining width 0.5) ⓑ D8 and larger P ≤ D-2.2 W ≤ D-2.2 (Machining width 1) ⊗ Cannot be combined with KC-WKC-KFC.																							
UC		Modification for urethane stripper (USN) installation ⓐ For details, refer to P.630. ⓑ Can be used for D10~25.																								
NDC		No press-in lead ℓ ≥ 3 → ℓ = 0																								

Alteration	Code	A	D R E G	1Code
Alterations to head	KC	Addition of single key flat to head ⓐ Key flat position change 1° increments ⓑ 90°/180°		
	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 ⓐ Double key flats at 0° and a selected angle 1° increments ⓑ 90°/180°		
	NKC	No key flat		
	HC	Head diameter change D ≤ HC < H 0.1 mm increments		
	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.		
	TKC	Head thickness tolerance change T ₀ ^{+0.3} → +0.02		
	TKM	Head thickness tolerance change T ₀ ^{+0.3} → -0.02		
	TCC	Chamfering of head This improves the strength of the punch head. ⓐ P.1097 0.1 mm increments ⓑ 0.5 ≤ TCC ≤ (H-D)/2 ⓑ If H ≤ 5, then TCC is 0.5. ⊗ Cannot be combined with SRC.		
	RC	Head thickness is machined to a tolerance of -0.04~0 relative to the retainer surface. ⓐ Cannot be used for D ₀ ^{+0.005} types.		
Alterations to shank	SRC	Modification of head for use with select retainers (SLS) ⓐ For details, refer to P.629. ⓑ Can be used for D10~25. ⊗ Cannot be used for D ₀ ^{+0.005} types.		

Price **Quotation**