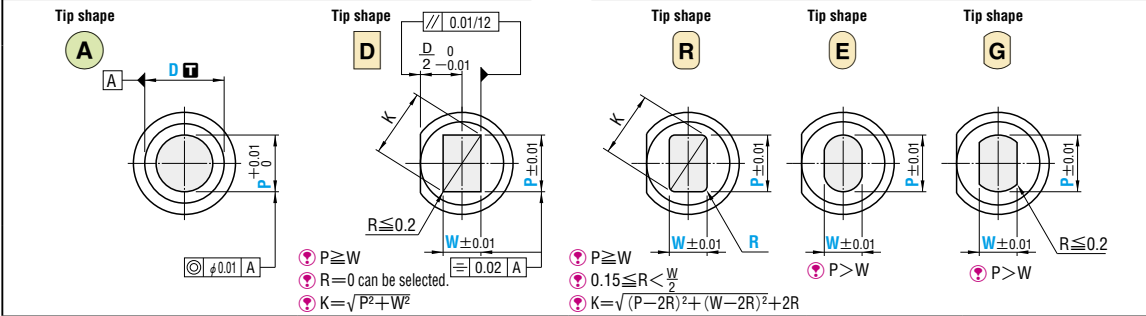


SHOULDER PUNCHES

—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 B Tip length	
	D _{m5}	Equivalent to SKH51 61~64HRC Surface 3000HV	H-SH	A	
			H-PH	D	
	D ^{+0.005} ₀	Equivalent to SKH51 61~64HRC Surface 3000HV	AH-SH	E	
			AH-PH	G	



Type	Tip shape	B Tip length	D	L										B	H
				0.01 mm increments											
				A		D R E G		R							
(D _{m5}) H-SH H-PH	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		
		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	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			
		10	50	60	70	80	90	100	3.00~9.99	9.97	2.50	13			
		13	50	60	70	80	90	100	6.00~12.99	12.97	3.00	16			
		16	60	70	80	90	100	10.00~15.99	15.97	4.00	19				
		20	60	70	80	90	100	13.00~19.99	19.97	5.00	23				
		25	60	70	80	90	100	18.00~24.99	24.97	6.00	28				
	X	3	50	60	70	80	90	100	1.20~2.99	—	—	—	5		
		4	50	60	70	80	90	100	1.20~3.99	3.97	2.00	7			
		5	60	70	80	90	100	2.00~4.99	4.97	3.50	8				
		6	60	70	80	90	100	2.00~5.99	5.97	3.50	9				
		8	60	70	80	90	100	3.00~7.99	7.97	5.00	11				
		10	60	70	80	90	100	3.00~9.99	9.97	5.00	13				
		13	60	70	80	90	100	6.00~12.99	12.97	5.00	16				
		16	70	80	90	100	10.00~15.99	—	—	19					
		20	70	80	90	100	13.00~19.99	—	—	23					
		25	70	80	90	100	18.00~24.99	—	—	28					

ⓐ: P>D-0.03→ℓ=0 If P>D-0.03 for a round punch, D_{-0.01/0.03} (press-in lead) is not included.
 ⓑ: P·K>D-0.05→ℓ=0 If P·K>D-0.05 for a shaped punch, D_{-0.01/0.03} (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.	1Code																							
	Lapping of tip ⓐ P dimension tolerance and increment are the same. The base material is finished before the coating is applied. ⊗ R=0 cannot be selected for the tip shape D corners.																									
SC	0.16 GL																									
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.			Quotation																						
	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 ≥ 1+2 ℓ = 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.			Quotation																						
	Tip tolerance change P +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.																								
Alterations to full length	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). (If combined with LKC, 0.01 mm increments can be selected.)	Quotation																						
		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 T +0.3 / -0.02 + Full length change + L +0.3 / ± 0.1																							
	LCT LMT	Full length tolerance change LCT T +0.3 / -0.02 + Full length change + L +0.3 / ± 0.1	Full length tolerance change LMT T +0.3 / -0.02 + Full length change + L +0.3 / ± 0.1																							
		Full length tolerance change LKC L +0.3 / ± 0.05																								

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	1Code
		WKC	Addition of double key flats in parallel	
	KFC		Double key flats at 0° and a selected angle 1° increments	Double key flats at 0° and a selected angle 1° increments
		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.		Quotation
		TKC	Head thickness tolerance change T +0.3 / -0.02	
	TKM	Head thickness tolerance change T +0.3 / -0.02		Quotation
		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 ^{+0.005} types.		Quotation
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 ⓐ P.750 ⓐ Can be used for D10~25.		Quotation
NDC		No press-in lead ℓ ≥ 3 ⇔ ℓ = 0		

Price **Quotation**