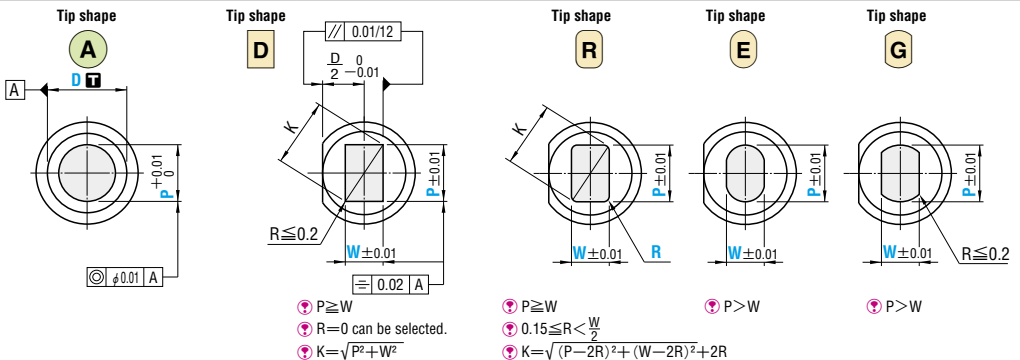
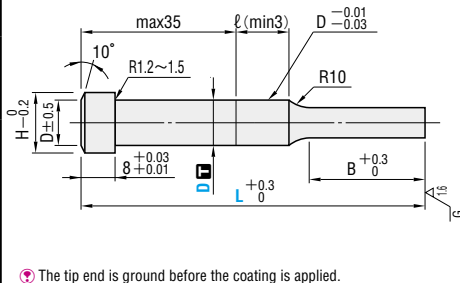


PUNCHES FOR HEAVY LOAD

— FINISHED FOR RETAINERS · 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	
 RoHS Equivalent to SKH51 61~64HRC Surface 3000HV Powdered high-speed steel 64~67HRC Surface 3000HV	Dm5	H	H-AP	A	S	
			H-APH	D		
	D ^{+0.005} ₀	H	AH-AP	E	L	
			AH-APH	G		



Type	Tip shape	B Tip length	D	L										0.01mm increments				B	H				
														A	D	R	E			G	R		
														min. P	max. P	P-Kmax.	P-Wmin.			R			
(Dm5) H-AP H-APH	A, D	S	5	50	60	70	80	90	100				2.00	4.99	4.97	1.20	0.15 ≤ R < W/2 (R only)	8	10				
			6	50	60	70	80	90	100	2.00	5.99	5.97	1.50	11									
			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				
			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				
			25	(50)	60	70	80	90	100	110	120	130	18.00	24.99	24.97	6.00			30				
			(D ^{+0.005} ₀) AH-AP AH-APH	E, G	L	5	60	70	80	90	100				2.00	4.99			4.97	1.20	0.15 ≤ R < W/2 (R only)	13	10
						6	60	70	80	90	100	2.00	5.99	5.97	1.50	11							
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							
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								

Ⓢ L(50)→B=8 If the full length is (50), the tip length is 8mm in all cases.
 Ⓢ A: 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.
 Ⓢ D R E G: 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.

Alterations Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC, etc.)
 H-APAS 20 — LC82 — PC12.00 — BC13

Alteration	Code	A	D R E G	1Code																				
Alterations to tip	PC WC	Tip dimension change PC ≥ P _{min.} For D5-6, PC ≥ 1.50 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Tip dimension change PC ≥ P·W _{min.} For D5-6, PC ≥ 1.00 0.01mm increments	1Code																				
		<table border="1"> <tr><th>P(PC)</th><th>Bmax.</th></tr> <tr><td>1.500~1.999</td><td>20</td></tr> <tr><td>2.000~3.999</td><td>35</td></tr> <tr><td>4.000~5.999</td><td>45</td></tr> <tr><td>6.000~</td><td>60</td></tr> </table>	P(PC)		Bmax.	1.500~1.999	20	2.000~3.999	35	4.000~5.999	45	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.																						
	1.500~1.999	20																						
	2.000~3.999	35																						
	4.000~5.999	45																						
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. 0.1 mm increments Full length L must be at least 35mm longer than tip length BC.	Tip length change 2 ≤ BC ≤ Bmax. 0.1 mm increments Full length L must be at least 40mm longer than tip length BC.	1Code																					
	<table border="1"> <tr><th>P(PC)</th><th>Bmax.</th></tr> <tr><td>1.500~1.999</td><td>20</td></tr> <tr><td>2.000~3.999</td><td>35</td></tr> <tr><td>4.000~5.999</td><td>45</td></tr> <tr><td>6.000~</td><td>60</td></tr> </table>	P(PC)		Bmax.	1.500~1.999	20	2.000~3.999	35	4.000~5.999	45	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	5.00~
P(PC)	Bmax.																							
1.500~1.999	20																							
2.000~3.999	35																							
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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																							
SC	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.		1Code																					
PRC	Rounding of tip side edge 0.3 ≤ PRC ≤ 1 0.1 mm increments PCC ≤ (P-0.2)/2 Cannot be combined with PCC.																							
PCC	Chamfering of tip side edge 0.3 ≤ PCC ≤ 1 0.1 mm increments PCC ≤ (P-0.2)/2 Cannot be combined with PRC.		1Code																					
PKC	Tip tolerance change P+0.01 → +0.005 0 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 0																						

Alteration	Code	A	D R E G	1Code
Alterations to full length	LC	Full length change 35+B(BC) ≤ LC < L 0.1 mm increments If difference between full length and tip length is 35mm or less, tip length is adjusted to (Full length-35mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 40+B(BC) ≤ LC < L 0.1 mm increments If difference between full length and tip length is 40mm or less, tip length is adjusted to (Full length-40mm).	1Code
		Full length tolerance change L+0.3 → +0.05 0		
Alterations to head	K C W K C K F C N K C	Addition of single key flat to head 90° Key flat position change 1° increments	90° Key flat position change 1° increments	1Code
		Addition of double key flats in parallel 90° Double key flats in parallel Can be combined with KC.	90° Double key flats in parallel Can be combined with KC.	
		Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC·WKC.	90° Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC·WKC.	
		No key flat	No key flat	
		Single key flat on shank D/2 -0.5/-0.01 D5·6 P ≤ D-1.2 W ≤ D-1.2 (Machining width 0.5) D8 ~ P ≤ D-2.2 W ≤ D-2.2 (Machining width 1) Cannot be combined with KC·WKC·KFC.		
Alterations to shank	NDC	No press-in lead ℓ ≥ 3 → ℓ = 0		1Code

P Price **Quotation**

Order Catalog No. — L — P — W — R (R only)
 H-APAS 20 — 80 — P15.00

Days to Ship **Quotation**