

# SHOULDER PUNCHES

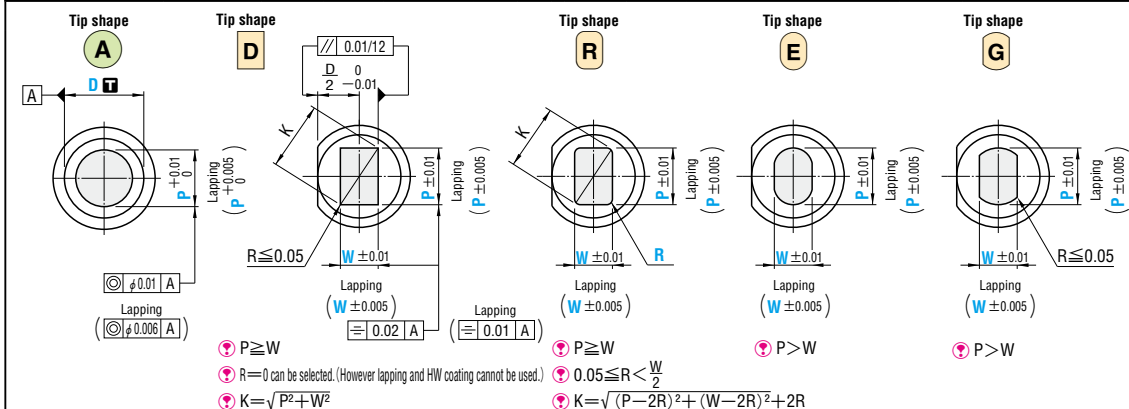
—QUILL PUNCHES, NORMAL · TiCN COATING · LAPPING · HW COATING—

**PRODUCTS DATA**  
P.1601-1604-1605

Type	Shank diameter D Tolerance	Catalog No.				The tip shape can be selected from Tip shape A~G in the figure below.
		Type	Type Head thickness 5mm	Tip shape	B Tip length	
—Normal— <b>RoHS</b>	Dm5	Equivalent to SKH51 61~64HRC	SH Lapping L-SH	SHLT Lapping L-SHLT	S	
		Equivalent to SKH51 61~64HRC Surface 3000HV	TiCN coating H-SH HW-SH	TiCN coating H-SHLT HW-SHLT		
—Lapping—	Dm5	Powdered high-speed steel 64~67HRC	PH Lapping L-PH	PHLT Lapping L-PHLT	L	
		Powdered high-speed steel 64~67HRC Surface 3000HV	TiCN coating H-PH HW-PH	TiCN coating H-PHLT HW-PHLT		
—TiCN coating— —HW coating—	D+0.005/0	Equivalent to SKH51 61~64HRC	A-SH Lapping AL-SH	A-SHLT Lapping AL-SHLT	E	
		Equivalent to SKH51 61~64HRC Surface 3000HV	TiCN coating AH-SH AHW-SH	TiCN coating AH-SHLT AHW-SHLT		
		Powdered high-speed steel 64~67HRC	A-PH Lapping AL-PH	A-PHLT Lapping AL-PHLT	Tip length (B) L > S	
		Powdered high-speed steel 64~67HRC Surface 3000HV	TiCN coating AH-PH AHW-PH	TiCN coating AH-PHLT AHW-PHLT		

D	R1	D R E G	R2
1.6	(A)	—	—
2.0	2~3	≤16	≤0.2
2.5	—	—	—
3	—	—	≤0.5

\* The tip end of a TiCN coating punch is ground before the coating is applied.  
 \* The tip edge of an HW coating punch is very slightly rounded.



Type	Tip shape	Tip length	D	Catalog No.										H	T												
				L																							
				0.01mm increments (0.001mm increments for lapping)					0.01mm																		
(Dm5) (D+0.005/0)	S	A	1.6	(20)	(25)	30	35	40	50	60	0.30 (1.00) ~ 1.59	6	—	—	—	0.05 ≤ R < W/2 (R only)	2.6	3									
			2.0	(20)	(25)	30	35	40	50	60	0.50 (1.00) ~ 1.99	8	1.97	0.30 (1.00)	4				3.0	5							
			2.5	(20)	(25)	30	35	40	50	60	0.80 (1.00) ~ 2.49	—	2.47	0.50 (1.00)	6						3.5	5					
			3	—	—	40	50	60	70	80	(≧ P.55, 59, 67)	—	2.97	0.70 (1.00)	8								5	5			
			1.6	—	—	30	35	40	50	60	0.50 (1.00) ~ 1.59	8	—	—	—										2.6	3	
			2.0	—	—	30	35	40	50	60	0.80 (1.00) ~ 1.99	10	1.97	0.30 (1.00)	6												3.0
	2.5	—	—	30	35	40	50	60	0.80 (1.00) ~ 2.49	13	2.47	0.50 (1.00)	8	3.5	5												
	3	—	—	50	60	70	80	(≧ P.55, 59, 67)	—	2.97	0.70 (1.00)	8	5				5										
	L	A	1.6	(20)	(25)	30	35	40	50	60	0.30 (1.00) ~ 1.59	6						—	—	—	0.05 ≤ R < W/2 (R only)	2.6					
			2.0	(20)	(25)	30	35	40	50	60	0.50 (1.00) ~ 1.99	8						1.97	0.30 (1.00)	4			3.0	5			
			2.5	(20)	(25)	30	35	40	50	60	0.80 (1.00) ~ 2.49	—						2.47	0.50 (1.00)	6					3.5	5	
			3	—	—	40	50	60	70	80	(≧ P.55, 59, 67)	—						2.97	0.70 (1.00)	8							5
1.6			—	—	30	35	40	50	60	0.50 (1.00) ~ 1.59	8	—		—	—	2.6		3									
2.0			—	—	30	35	40	50	60	0.80 (1.00) ~ 1.99	10	1.97	0.30 (1.00)	6	3.0		3										
2.5	—	—	30	35	40	50	60	0.80 (1.00) ~ 2.49	13	2.47	0.50 (1.00)	8	3.5	5													
3	—	—	50	60	70	80	(≧ P.55, 59, 67)	—	2.97	0.70 (1.00)	8	5							5								

\* L (20) / (25) → B=4 If full length is (20) or (25), tip length is 4mm in all cases.  
 \* (A): P > D - 0.03 → ℓ=0 If P > D - 0.03 for a round punch, D - 0.01 (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 (press-in lead) is not included.  
 \* P · W (1.00) → For TiCN coating/HW coating, P · Wmin. is 1.00.

Order **Catalog No.** — L — P — W — R (R only)  
 SHAS 1.6 — 30 — P1.31  
 L-PHDL 2.0 — 40 — P1.240 — W0.830

Days to Ship **Quotation**

Alterations **Catalog No.** — L(LC-LCT-LMT) — P — W — R — (BC · HC · TC, etc.)  
 PHDL 2.0 — LC42 — P1.24 — W0.83 — HC2.8

Alteration	Code	(A)	D R E G	1Code
Alterations to tip	BC	Tip length change 2 ≤ BC < B 0.1mm increments	—	—
	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. * Can be used for TiCN coating types only.	—	—
	PRC	Rounding of tip side edge 0.3 ≤ PRC ≤ 1 0.1mm increments * PRC ≤ (P-0.2)/2 * For HW coating, the tolerance is PRC ± 0.1 * Cannot be combined with PCC · GC.	—	—
	PCC	Chamfering to tip side edge. 0.3 ≤ PCC ≤ 1 0.1mm increments * PCC ≤ (P-0.2)/2 * For HW coating, the tolerance is PCC ± 0.1 * Cannot be combined with PRC · GC.	—	—
	GC	20° ≤ GC < 90° 1° increments Tip length B ≥ f + 2 f = 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 · LKZ · LCT · LMT · PRC · PCC. * Cannot be used with HW coating.	—	—
	PKC	Tip tolerance change P + 0.01 → +0.005 * (P dimension can be selected in 0.01mm increments.) * Cannot be used with Lapping.	Tip tolerance change P · W ± 0.01 → +0.01	—
Alterations to full length	LC	Full length change Can be changed within the following range. 0.1mm increments D S L 1.6~2.5 20 < LC < 60 30 < LC < 60 3 36 < LC < 80 50 < LC < 80 * If LC is 25 or less, tip length B is 4mm in all cases. (If combined with LKC · LKZ, 0.01mm increments can be selected.)	—	—
	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 (A) are the same as for LC. TKC LC Full length tolerance change +0.3 → +0.02 + full length change + L + 0.3 → +0.1 0 0 0	—	—
	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 (A) are the same as for LC. TKM LC Full length tolerance change +0.3 → -0.02 + full length change + L + 0.3 → +0.1 0 0 0	—	—

Price **Quotation**

Alteration	Code	(A)	D R E G	1Code
Alterations to full length	LKC	Full length tolerance change L + 0.3 → +0.05 0 0	—	—
	LKZ	Full length tolerance change L + 0.3 → +0.01 0 0 * Cannot be used with TiCN · HW coating.	—	—
Alterations to head	KC	Addition of single key flat to head 90° Key flat position change 1° increments 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 90° Double key flats at 0° and a selected angle 1° increments 270°	—	—
	NKC	—	No key flat	—
	HC	Head diameter change D ≤ HC < H 0.1mm increments	—	—
	TC	Head thickness change 2 ≤ TC < T 0.1mm increments (If combined with TKC/TKM/LCT/LMT, 0.01mm increments can be selected.) * Full length L is shortened by (T-TC). If combined with LC-LCT-LMT, full length remains as specified.	—	—
Alterations to shank	TKC	Head thickness tolerance change T + 0.3 → +0.02 0 0	—	—
	TKM	Head thickness tolerance change T + 0.3 → 0 0 -0.02	—	—
	TCC	Chamfering of head (C0.5) This improves the strength of the punch head. P.1611 [Ordering method] TCC 0.5 * Cannot be used for H < 2.6.	—	—
	SKC	Single key flat on shank D3 W ≤ D - 1.2 (Machining width 0.5) D/2 - 0.5 - 0.01 * Only D3 can be used. * Cannot be combined with KC · WC · KFC. * HW coating cannot be used.	—	—
NDC	No press-in lead ℓ ≥ 3 → ℓ = 0	—	—	