

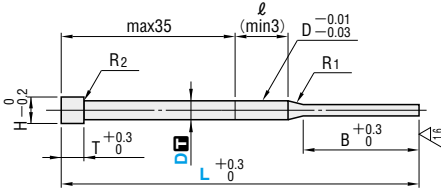


# SHOULDER PUNCHES

—QUILL TYPE·RW COATING·DLC COATING—

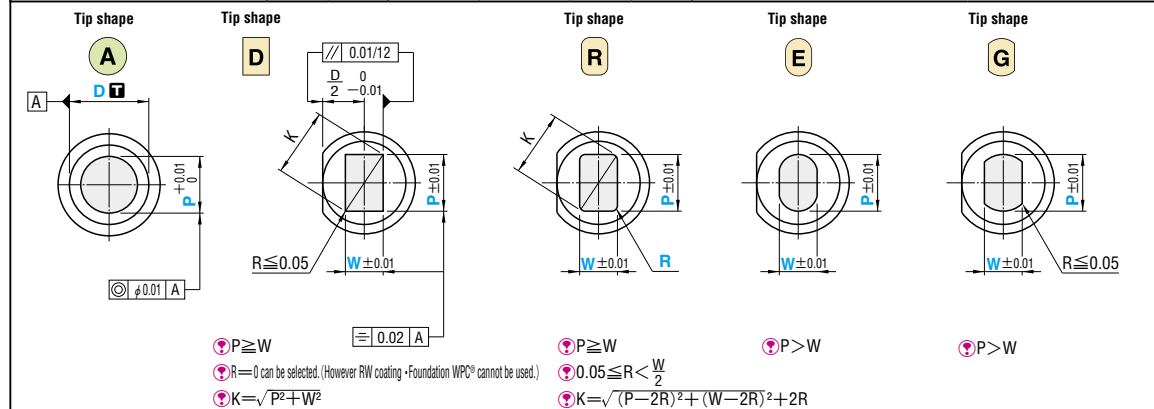


Type	Shank diameter D Tolerance	Catalog No.				The tip shape can be selected from [Tip shape] A~G in the figure below.
		Type	Type Head thickness 5mm	Tip shape	B Tip length	
RW coating	Dm5	Equivalent to SKH51 61~64HRC	RW-SH	RW-SHLT	A D R E G	S L
		Foundation WPC®	N-SH	N-SHLT		
		Surface 3000HV	NW-SH	NW-SHLT		
		Powdered high-speed steel 64~67HRC	RW-PH	RW-PHLT		
		Powdered high-speed steel 64~67HRC	N-PH	N-PHLT		
		Foundation WPC®	NW-PH	NW-PHLT		
DLC coating	D+0.005 0	Equivalent to SKH51 61~64HRC	ARW-SH	ARW-SHLT	A D R E G	S L
		Foundation WPC®	AN-SH	AN-SHLT		
		Surface 3000HV	ANW-SH	ANW-SHLT		
		Powdered high-speed steel 64~67HRC	ARW-PH	ARW-PHLT		
		Powdered high-speed steel 64~67HRC	AN-PH	AN-PHLT		
		Foundation WPC®	ANW-PH	ANW-PHLT		



D	R1	R2
1.6	(A)	—
2.0	2~3	≦0.2
2.5	—	≦16
3	—	≦0.5

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



Type	Tip shape	Tip length	Catalog No.								L	0.01mm increments (0.001mm increments for lapping)				H	T		
			L									min.	P max.	B	P·Kmax.			P·Wmin.	B
			1.6	2.0	2.5	3	4	5	6	7									
(Dm5) (D+0.005) —RW coating— RW-SH ARW-SH RW-SHLT ARW-SHLT —DLC coating— N-SH AN-SH N-PH AN-PH —DLC coating foundation WPC®— NW-SH ANW-SH NW-PH ANW-PH	A D R E G	S	1.6	(20)	(25)	30	35	40	50	60	1.00~1.59	6	—	—	—	—	2.6		
			2.0	(20)	(25)	30	35	40	50	60	1.00~1.99	8	1.97	1.00	4	3.0			
			2.5	(20)	(25)	30	35	40	50	60	1.00~2.49	—	2.47	1.00	6	3.5			
			3	—	—	40	50	60	70	80	(P.55-59-67)	—	2.97	1.00	8	5			
			1.6	—	—	30	35	40	50	60	1.00~1.59	8	—	—	—	2.6			
			2.0	—	—	30	35	40	50	60	1.00~1.99	10	1.97	1.00	6	3.0			
	A D R E G	L	1.6	—	—	30	35	40	50	60	1.00~1.59	8	—	—	—	2.6			
			2.0	—	—	30	35	40	50	60	1.00~1.99	10	1.97	1.00	6	3.0			
			2.5	—	—	30	35	40	50	60	1.00~2.49	13	2.47	1.00	8	3.5			
			3	—	—	50	60	70	80	(P.55-59-67)	—	2.97	1.00	8	5				
			1.6	—	—	30	35	40	50	60	1.00~1.59	8	—	—	—	2.6			
			2.0	—	—	30	35	40	50	60	1.00~1.99	10	1.97	1.00	6	3.0			

⊕ 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.  
 ⊕ 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.

Order Catalog No. — L — P — W — R (R only)  
 R — PHDL 2.0 — 40 — P1.240 — W0.830

Alterations Catalog No. — L(LC-LCT-LMT) — P — W — R — (BC-HC-TC...etc.)  
 RW-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 0 → 0 ⊕ P dimension can be selected in 0.001mm increments. ⊕ Cannot be used with Lapping.	Tip tolerance change P·W±0.01 → +0.01 0 → 0	—	—
	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 (⊕) are the same as for LC. TKC LC Full length tolerance change T+0.3 → +0.02 + Full length change + L+0.3 → +0.1 0 → 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 (⊕) are the same as for LC. TKM LC Full length tolerance change T+0.3 → 0 + Full length change + L+0.3 → +0.1 0 → -0.02 0 → 0	—	—
		SKC	Single key flat on shank ·D3 W≦D-1.2 (Machining width 0.5) ⊕ Only D3 can be used. ⊕ Cannot be combined with KC-WKC-KFC. ⊕ HW coating cannot be used.	—	—

P 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	—	—
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.	—	—
	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.	—	—
	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.	—	—
	Alterations to shank	SKC	Single key flat on shank ·D3 W≦D-1.2 (Machining width 0.5) ⊕ Only D3 can be used. ⊕ Cannot be combined with KC-WKC-KFC. ⊕ HW coating cannot be used.	—
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