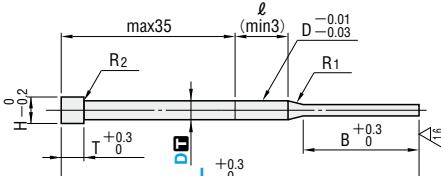


SHOULDER PUNCHES

—QUILL TYPE·RW COATING·DLC COATING—

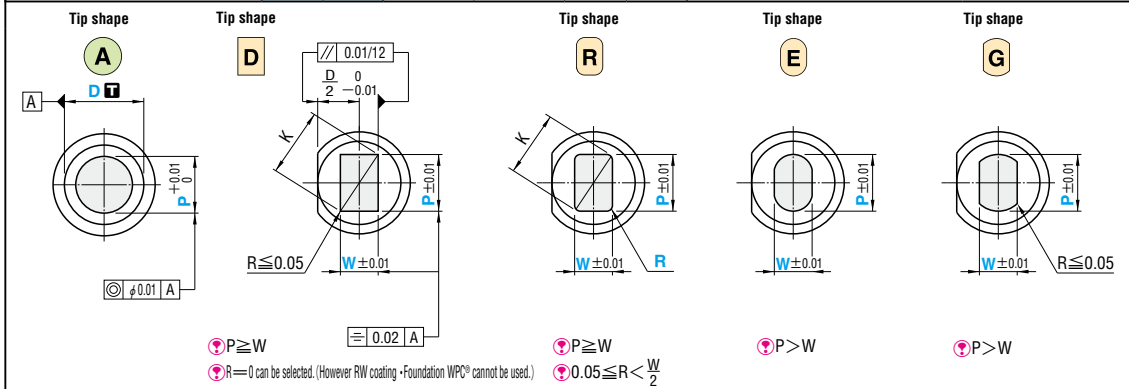


Type	Shank diameter D tolerance	Catalog No.				The tip shape can be selected from [Tip shape] A~G in the figure below.
		Type	Type Head thickness 5mm	Tip shape	B Tip length	
RW coating	Dm5	Equivalent to SKH51 61~64HRC	RW-SH	RW-SHLT	A D R E G	S L
		Equivalent to SKH51 61~64HRC Surface 3000HV	N-SH NW-SH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



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.								H	T						
			L															
			0.01mm increments (0.001mm increments for lapping)				0.01mm											
RW coating RW-SH ARW-SH RW-PH ARW-PH DLC coating N-SH AN-SH N-PH AN-PH DLC coating foundation WPC® NW-SH ANW-SH NW-PH ANW-PH	A	S	1.6	(20)	(25)	30	35	40	50	60	1.00~1.59	6	—	—	—	0.05 ≤ R < W/2 (R only)	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	—		3.5	
			3	—	—	40	50	60	70	80	(P.55-59-67)	—	2.97	1.00	—		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	
	DLC coating foundation WPC® NW-SH ANW-SH NW-PH ANW-PH	L	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		—	3.5
				3	—	—	50	60	70	80	(P.55-59-67)	—	2.97	1.00	—		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 0.1 mm 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 of 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 0.001 mm 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. 0.1 mm 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.	—	—

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.	⚡ 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 < T 0.1 mm increments (if combined with TKC/TKM/LCT/LMT, 0.01 mm 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