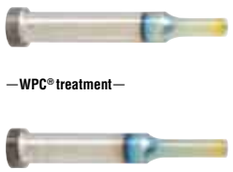
SHOULDER PUNCHES
—DLC COATING—

PRODUCTS DATA P.1605・1609

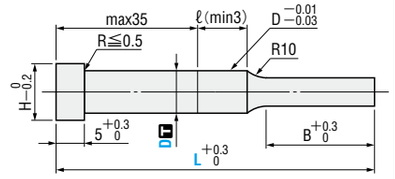
Type	M H	Catalog No. Type: Shank dia. T D_{m5}	Catalog No. Type: Shank dia. T $D^{+0.005}_{0}$
RoHS  —WPC® treatment— For shank diameter tolerance D T, select either m5・$^{+0.005}_{0}$	Equivalent to SKH51 61 ～ 64HRC Surface 3000HV and above	N—SH	AN—SH
	Powdered highspeed steel 64 ～ 67HRC Surface3000HV and above	N—PH	AN—PH
	Equivalent to SKH51 61 ～ 64HRC Surface3000HV and above	NW—SH	ANW—SH
	Powdered highspeed steel 64 ～ 67HRC Surface 3000HV and above	NW—PH	ANW—PH

Catalog No. Shape Tip shape: A D R E G

B Tip length: S L X

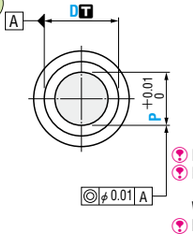
Tip length (B) X>L>S

The tip shape can be selected from Tip shape A～G in the figure below.



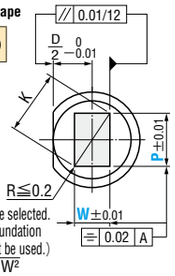
- The tip end is ground before the coating is applied.
- The tip edges of substrate WPC® treatment are slightly rounded.

Tip shape A

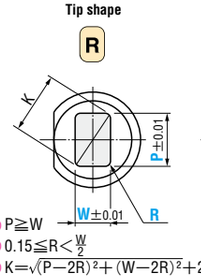


- P≧W
- R=0 can be selected. (However, foundation WPC® cannot be used.)
- K=√(P²+W²)

Tip shape D

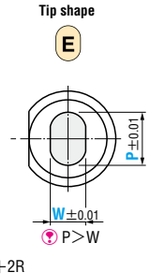


Tip shape R



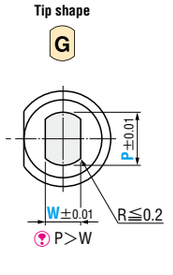
- P≧W
- 0.15≦R<W/2
- K=√((P−2R)²+(W−2R)²+2R

Tip shape E



- P>W

Tip shape G



- P>W

Catalog No. Type	Shape Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	ⒹⓇⒺⒼ P・Kmax.	ⒹⓇⒺⒼ P・Wmin.	R	B	H
(Dm5) N—SH, N—PH —Foundation WPC®— NW—SH, NW—PH (D +0.005 0) AN—SH, AN—PH —Foundation WPC®— ANW—SH, ANW—PH	A D R E G	S	3	40 50 60 70 80 90 100	1.00 ～ 2.99	—	—	0.15≦R<W/2 (Ⓡ only)	8	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		13	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	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
		L	3	50 60 70 80 90 100	1.00 ～ 2.99	—	—		13	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		19	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		25	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	—	—		19	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		25	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		30	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	———			40	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 8mm in all cases.

Order: Catalog No. — L — P — W — R(Ⓡ only)
AN—SHEL 16 — 70 — P12.00 — W6.00

Days to Ship: Quotation

■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

Alterations — Catalog No. — L(LC・LCT・LMT) — P(PC) — W(WC) — R — (BC・HC…etc.)
N—SHDS 10 — LC72 — P2.8 — W2.7 — BC8—KC45

Alterations	Code	Ⓐ	ⒹⓇⒺⒼ	1Code
Alterations to tip	PC WC	Tip dimension change PC≧Pmin./2≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC) 1.000～1.999 Bmax 20; 2.000～3.999 35; 4.000～4.999 45; 5.000～5.999 50; 6.000～ 60	Tip dimension change PC・WC≧P・Wmin./2≧1.00 0.01mm increments ⊗ Cannot be used for tip X. P(PC)・W(WC) 1.00～1.49 Bmax 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	Quotation
	BC	Tip length change 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L must be at least 30mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC. ⊗ It is PRC±0.1 for substrate WPC® treatment.	———	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC. ⊗ Cannot be used for foundation WPC®.	———	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) Ⓨ If combined with SC, tip edgesare rounded. ⊗ Cannot be combined with LKC・LCT・LMT・PRC・PCC. ⊗ Cannot be used for foundation WPC®.	———	
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 ⊗ (P dimension can be selected in 0.001mm increments.)	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
	SC	Tip lapping Ⓨ P dimension tolerance & increments remain unchanged. ⊗ Cannot be combined with foundation WPC®. ⊗ Tip Ⓓ shape corner R=0 cannot be selected		
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments Ⓨ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1mm increments Ⓨ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
	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 Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 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 Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		

Alterations	Code	Ⓐ	ⒹⓇⒺⒼ	1Code
Alterations to full length	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 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 ⊗ Cannot be combined with KC・WKC.	
	NKC	———	No key flat	
	HC	Head diameter change D≦HC<H 0.1mm increments ⊗ Cannot be used for retainer set products		Quotation
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) Ⓨ Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified. ⊗ Cannot be used for retainer set products		
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm 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 +0.005 0		
Alterations to shank	UC	Modification for urethane stripper (USN) installation Ⓨ For details P.750 ⊗ Can be used for D10 ～ 25.		
	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Price: Quotation