



ROUND PUNCHES

—NORMAL · TiCN COATING · HW COATING · DLC COATING—

PRODUCTS DATA

P.1601-1604-1605-1609

Type	M H	Catalog No.	Shape
	RoHS Powdered high-speed steel 64~67HRC Powdered high-speed steel 64~67HRC Surface 3000HV Powdered high-speed steel 64~67HRC Surface 3000HV~ DLC foundation WPC®	PHTAL	<p> The tip end is ground before the coating is applied. The tip edges of a HW coating or DLC foundation WPC® type are very slightly rounded. </p>
		TiCN coating H-PHTAL	
		HW coating HW-PHTAL	
		DLC coating N-PHTAL	
		NW-PHTAL	

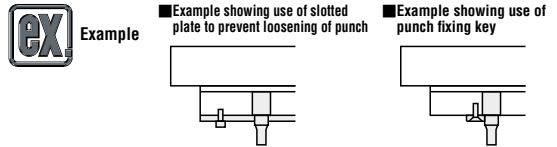
Catalog No. Type	D	L	0.01mm increments min. P max.	T				V	R	Base Unit Price 1~4			
				PHTAL	H-PHTAL	HW-PHTAL	N-PHTAL			NW-PHTAL			
PHTAL	4	40	0.50 (1.00) ~ 2.00	13	16	20	25	2	2~3				
		50		13	16	20	25	2		2~6			
—TiCN coating— H-PHTAL	5	40	1.00 ~ 3.00	13	16	20	25	3					
		50 60		13	16	20	25	2	2~8				
—HW coating— HW-PHTAL	6	40	1.50 ~ 4.00	13	16	20	25	4					
		50 60 70		13	16	20	25	2	2~10				
—DLC coating— N-PHTAL	8	40	2.00 ~ 6.00	13	16	20	25	6					
		50 60 70		13	16	20	25	2	2~13				
—DLC foundation WPC®— NW-PHTAL	10	40	3.00 ~ 8.00	13	16	20	25	8					
		50 60 70		13	16	20	25	2	2~13				
	13	40	3.00 ~ 10.00	13	16	20	25	11					
		50 60 70		13	16	20	25	2	2~13				
	16	40	6.00 ~ 13.00	13	16	20	25	14					
		50 60 70		13	16	20	25	2	2~13				
	20	40	10.00 ~ 16.00	13	16	20	25	18					
		50 60 70		13	16	20	25	2	2~13				
	25	40	13.00 ~ 23.00	13	16	20	25	23					
		50 60 70		13	16	20	25	2	2~13				

⊕ P (1.00) ---For TiCN coating, Pmin. is 1.00.

Order **Catalog No.** — L — P — T — B
PHTAL 5 — 60 — P3.00 — T20 — B5

Price **Quotation**

Days to Ship **Quotation**



Alterations **Catalog No.** — L(LC-LCT) — P — T(TC) — B(BC) — (PKC-LKC...etc.)
PHTAL 5 — 60 — P3.00 — TC15.0 — B5

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	Code	Spec.	1Code
	BC	Tip length change $0.50 \sim 0.999$ $2 \leq BC \leq B_{max}$ 0.1 mm increments $2.000 \sim 2.999$ $3.000 \sim 3.999$ $4.000 \sim 4.000$	
	SC	Lapping of tip Ⓢ P dimension tolerance and increment are the same. Ⓢ The base material is finished before coating is applied. Ⓢ R=0 cannot be selected for the tip Ⓢ corner-DLC foundation WPC.	
	PRC	Rounding of tip side edge $0.3 \leq PRC \leq 1$ 0.1 mm increments Ⓢ $PRC \leq (P-0.2)/2$ Ⓢ Cannot be combined with PCC-GC. Ⓢ For HW coating and DLC foundation WPC®, the tolerance is PRC±0.1.	Quotation
	PCC	Chamfering to tip side edge $0.3 \leq PCC \leq 1$ 0.1 mm increments Ⓢ $PCC \leq (P-0.2)/2$ Ⓢ Cannot be combined with PRC-GC. Ⓢ HW coating and DLC foundation WPC® cannot be used.	
	GC	$20^\circ \leq GC < 90^\circ$ 1° increments Tip length $B \geq f+2$ $f = P/2 \times \tan(90^\circ - GC)$ Ⓢ If combined with SC, tip edges are rounded. Ⓢ Cannot be combined with LKC-LKZ-LCT-PRC-PCC. Ⓢ Cannot be used for P<1.0. Ⓢ HW coating and DLC foundation WPC® cannot be used.	
	PKC	Tip tolerance change $P +0.01 \rightarrow +0.005$ $0 \rightarrow 0$	

Alterations	Code	Spec.	1Code
	LC	Full length change $40 < LC < L$ 0.1 mm increments (If combined with LKC-LKZ, 0.01 mm increments can be selected.) Ⓢ If $LC < 50$, T and TC must be 20 or less. Ⓢ If $LC < 50$ with D6·8, the allowable range of B is 2~10.	
	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 $T -0.05 \rightarrow 0$	
	LCZ	Full length tolerance change $L +0.3 \rightarrow +0.05$ $0 \rightarrow 0$	
	LKC	Full length tolerance change $L +0.3 \rightarrow +0.01$ $0 \rightarrow 0$	
	LKZ	Full length tolerance change $L +0.3 \rightarrow +0.01$ $0 \rightarrow 0$	Quotation
	TC	T dimension change $13 < TC < 25$ 0.1 mm increments Ⓢ If $L < 50$, the allowable range is $13 < TC < 20$. Ⓢ The full length L remains the same.	
	TKC	Head thickness tolerance change $T -0.05 \rightarrow 0$	
	VC	V dimension change $D4 \sim 6$ $V -0.5 \leq VC \leq D -1.2$ $D8 \sim V$ $V -2 \leq VC \leq D -1.2$ 0.1 mm increments	

STRAIGHT PUNCHES

—NORMAL · LAPPING TYPE—

Type	M H	Catalog No.	Shape
—Normal—	RoHS Equivalent to SKD11 60~63HRC Equivalent to SKH51 61~64HRC	SPC	
		L-L-SPC	
—Lapping—	Powdered high-speed steel 64~67HRC	SHC	
		L-L-SHC	
		PHC	
		L-L-PHC	

No.	R	Effective lapping range		
		P	L (B)	H
1.0~2.5	≤0.2	0.500~0.999	20 ≤ L ≤ 30	8
3 ~ 25	≤0.5	1.000~2.499	20 ≤ L ≤ 30	13
		2.500~2.999	L ≤ 23	L ≤ 10
10.000~		3.000~9.999	25 ≤ L < 40	L ≤ 20
			L < 25	L ≤ 5
			25 ≤ L < 40	L ≤ 20
			L ≥ 40	L ≤ 25

Catalog No. Type	No.	L										0.01mm increments (0.001mm increments for lapping)		H	T	
		min. P max.														
SHC PHC	—Lapping— L-SHC L-PHC	1.0	20	25	30										2.0	3
		1.6	20	25	30	35	40	50	60						2.6	
		2.0	20	25	30	35	40	50	60						3.0	
		2.5	20	25	30	35	40	50	60						3.5	
		3					40	50	60	70	80				5	
SPC SHC PHC	—Lapping— L-SPC L-SHC L-PHC	4					40	50	60	70	80			7	5	
		5					40	50	60	70	80			8		
		6					40	50	60	70	80			9		
		8					40	50	60	70	80	90	100	11		
		10					40	50	60	70	80	90	100	13		
		13					40	50	60	70	80	90	100	16		
		16					40	50	60	70	80	90	100	19		
		20					40	50	60	70	80	90	100	23		
		25					40	50	60	70	80	90	100	28		

Order **Catalog No.** — L — P
PHC 6 — 40 — P5.50
L-PHC 6 — 40 — P5.50

Price **Quotation**

Days to Ship **Quotation**

Alterations **Catalog No.** — L(LC-LCT-LMT) — P — (HC-TC-GC...etc.)
SPC 6 — LC45 — P5.50 — PKC — LKC

Alterations	Code	Spec.	1Code
	PRC	Rounding of tip side edge $0.3 \leq PRC \leq 1$ 0.1 mm increments Ⓢ $PRC \leq (P-0.2)/2$ Ⓢ Cannot be combined with PCC-GC.	
	PCC	Chamfering to tip side edge $0.3 \leq PCC \leq 1$ 0.1 mm increments Ⓢ $PCC \leq (P-0.2)/2$ Ⓢ Cannot be combined with PRC-GC.	
	GC	$20^\circ \leq GC < 90^\circ$ 1° increments Ⓢ Cannot be combined with LKC-LKZ-LMT-PRC-PCC. Ⓢ Lapping cannot be used.	
	PKC	Tip tolerance change $P +0.01 \rightarrow +0.005$ (P dimension can be selected in 0.001 mm increments.) Ⓢ Lapping cannot be used.	
	LC	Full length change $20 \leq LC < L$ 0.1 mm increments (If combined with LKC-LKZ, 0.01 mm 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	Head thickness tolerance change $T +0.3 \rightarrow +0.02$ $0 \rightarrow 0$ $+0.3 \rightarrow +0.1$ $0 \rightarrow 0$	
	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 $T +0.3 \rightarrow 0$ $+0.3 \rightarrow +0.1$ $0 \rightarrow 0$	
	LKC	Full length tolerance change $L +0.3 \rightarrow +0.05$ $0 \rightarrow 0$	
	LKZ	Full length tolerance change $L +0.3 \rightarrow +0.01$ $0 \rightarrow 0$	Quotation

Alterations	Code	Spec.	1Code
	KC	Addition of single key flat to head Ⓢ Can be used for No.3 and above	
	WKC	Addition of double key flats in parallel Ⓢ Can be used for No.3 and above	
	KFC	Double key flats at 0° and a selected angle 1° increments Ⓢ Can be used for No.3 and above Ⓢ Cannot be combined with KC-WKC.	
	HC	Head diameter change $P \leq HC < H$ 0.1 mm increments	
	TC	Head thickness change $2 \leq TC < T$ 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 is equal to LC.	Quotation
	TKC	Head thickness tolerance change $T +0.3 \rightarrow +0.02$ $0 \rightarrow 0$	
	TKM	Head thickness tolerance change $T +0.3 \rightarrow 0$ $0 \rightarrow -0.2$	
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments $0.5 \leq TCC \leq (H-P)/2$ Ⓢ If $H \leq 5$, then TCC is 0.5.	