CARBIDE PUNCHES

CARBIDE PUNCHES



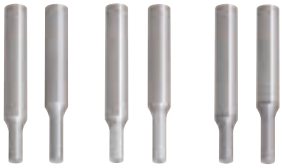
Product name / Type	CARBIDE SHOULDER PUNCHES —NORMAL— —LAPPING—	CARBIDE SHOULDER PUNCHES —TiCN COATING—	CARBIDE SHOULDER PUNCHES WITH AIR HOLES —NORMAL— —LAPPING—
Page	419	421	423




CARBIDE SHOULDER PUNCHES WITH AIR HOLES —TiCN COATING—	CARBIDE JECTOR PUNCHES —NORMAL— —LAPPING— —TiCN COATING—	CARBIDE SHOULDER QUILL PUNCHES —NORMAL— —LAPPING— —TiCN COATING—	CARBIDE SHOULDER PUNCHES —MIRROR FINISH—
425	427	429	431




CARBIDE SHOULDER PUNCHES —SHORT TYPE— —NORMAL— —LAPPING— —TiCN COATING—	CARBIDE DOUBLE-STEPPED PUNCHES —NORMAL— —TiCN COATING—	CARBIDE KEY FLAT SHANK SHOULDER PUNCHES —NORMAL— —TiCN COATING—	CARBIDE KEY FLAT SHANK SHOULDER PUNCHES WITH AIR HOLES —NORMAL— —TiCN COATING—
433	435	437	439

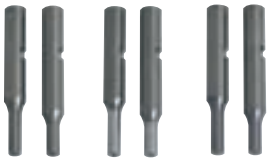





CARBIDE TAPPED PUNCHES —NORMAL— —LAPPING— —TiCN COATING—	CARBIDE PUNCHES WITH KEY GROOVES —NORMAL— —LAPPING—	CARBIDE PUNCHES WITH KEY GROOVES —TiCN COATING—	CARBIDE PUNCHES WITH KEY GROOVES —MINUS D TOLERANCE— —NORMAL— —LAPPING— —TiCN COATING—
441	443	445	447



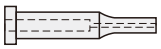
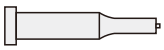
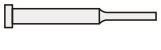
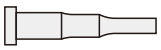
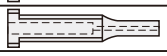
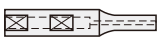
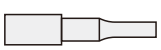
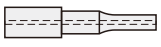
CARBIDE DOUBLE-STEPPED PUNCHES WITH KEY GROOVES —NORMAL— —TiCN COATING—	CARBIDE PUNCHES WITH KEY GROOVES AND AIR HOLES —NORMAL— —LAPPING—	CARBIDE PUNCHES WITH KEY GROOVES AND AIR HOLES —TiCN COATING—
449	451	453



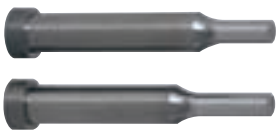

CARBIDE PUNCHES WITH KEY GROOVES AND AIR HOLES — MINUS D TOLERANCE— —NORMAL— —LAPPING— —TiCN COATING—	CARBIDE FLANGE STOPPER PUNCHES —NORMAL— —WITH AIR HOLE TYPE— —TiCN COATING—	CARBIDE FLANGE STOPPER PUNCHES — MINUS D TOLERANCE — —NORMAL— —WITH AIR HOLE TYPE— —TiCN COATING—	CARBIDE STRAIGHT PUNCHES —NORMAL— —LAPPING— —TiCN COATING—
455	457	457	458

CARBIDE PUNCHES —GUIDE—

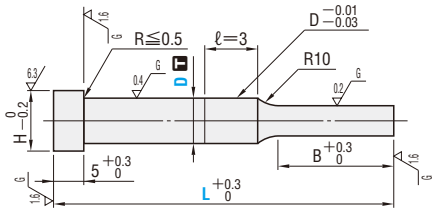
■Carbide punches list

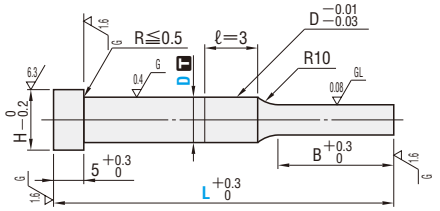
Shank type		M	Shank dia. tolerance	Standard (Normal)		Lapping, mirror finish (green)		TiCN coating	
Carbide shoulder punches		V30 (HIP)	D_{m5}	WP□□	P.419	L—WP□□ M—WPA□	P.419 P.431	H—WP□□	P.421
		Super fine grain (HIP)		WXP□□		L—WXP□□ M—WXPA□		H—WXP□□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WP□□		AL—WP□□ AM—WPA□		AH—WP□□	
		Super fine grain (HIP)		A—WXP□□		AL—WXP□□ AM—WXPA□		AH—WXP□□	
Carbide shoulder punches with air holes		V30 (HIP)	D_{m5}	WJ□□	P.423	L—WJ□□	P.423	H—WJ□□	P.425
		Super fine grain (HIP)		WXJ□□		L—WXJ□□		H—WXJ□□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WJ□□		AL—WJ□□		AH—WJ□□	
		Super fine grain (HIP)		A—WXJ□□		AL—WXJ□□		AH—WXJ□□	
Carbide shoulder jector punches		V30 (HIP)	D_{m5}	WJP□□	P.427	L—WJP□□	P.427	H—WJP□□	P.427
			$D^{+0.005}_{0}$	A—WJP□□		AL—WJP□□		AH—WJP□□	
Carbide shoulder quill punches		V30 (HIP)	D_{m5}	WPA□ WPLTA□	P.429	L—WPA□ L—WPLTA□ M—WPA□ M—WPLTA□	P.429 P.431	H—WPA□ H—WPLTA□	P.429
		Super fine grain (HIP)		WXPA□		L—WXPA□ M—WXPA□		H—WXPA□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WPA□ A—WPLTA□		AL—WPA□ AL—WPLTA□ AM—WPA□ AM—WPLTA□		AH—WPA□ AH—WPLTA□	
		Super fine grain (HIP)		A—WXPA□		AL—WXPA□ AM—WXPA□		AH—WXPA□	
Carbide shoulder punches Short type		V30 (HIP)	D_{m5}	WSA□	P.433	L—WSA□	P.433	H—WSA□	P.433
		Super fine grain (HIP)		WXSA□		L—WXSA□		H—WXSA□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WSA□		AL—WSA□		AH—WSA□	
		Super fine grain (HIP)		A—WXSA□		AL—WXSA□		AH—WXSA□	
Carbide double-stepped punches		V30 (HIP)	D_{m5}	WPTW□	P.435	Alteration SC	P.436	H—WPTW□	P.435
		Super fine grain (HIP)		WXPTW□				H—WXPTW□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WPTW□				AH—WPTW□	
		Super fine grain (HIP)		A—WXPTW□				AH—WXPTW□	
Carbide key flat shank shoulder punches		V30 (HIP)	$D^{+0.005}_{0}$	G—WP□□	P.437	Alteration SC	P.438	GH—WP□□	P.437
		Super fine grain (HIP)		G—WXP□□				GH—WXP□□	
Carbide key flat shank shoulder punches with air holes		V30 (HIP)	$D^{+0.005}_{0}$	G—WJ□□	P.439	Alteration SC	P.440	GH—WJ□□	P.439
Carbide tapped punches		V30 (HIP)	$D^{+0.005}_{0}$	A—WM□□	P.441	AL—WM□□	P.441	AH—WM□□	P.441
		Super fine grain (HIP)		A—WXM□□		AL—WXM□□		AH—WXM□□	
Carbide punches with key grooves		V30 (HIP)	D_{m5}	WK□□	P.443	L—WK□□	P.443	H—WK□□	P.445
		Super fine grain (HIP)		WXK□□		L—WXK□□		H—WXK□□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WK□□		AL—WK□□		AH—WK□□	
		Super fine grain (HIP)		A—WXK□□		AL—WXK□□		AH—WXK□□	
		V30 (HIP)	$D^{-0.001}_{-0.006}$	B—WK□□	P.447	BL—WK□□	P.447	BH—WK□□	P.447
		Super fine grain (HIP)		B—WXK□□		BL—WXK□□		BH—WXK□□	
Carbide double-stepped punches with key grooves		V30 (HIP)	D_{m5}	WKTW□	P.449	Alteration SC	P.450	H—WKTW□	P.449
		Super fine grain (HIP)		WXKTW□				H—WXKTW□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WKTW□				AH—WKTW□	
		Super fine grain (HIP)		A—WXKTW□				AH—WXKTW□	
Carbide punches with key grooves and air holes		V30 (HIP)	D_{m5}	WJK□□	P.451	L—WJK□□	P.451	H—WJK□□	P.453
		Super fine grain (HIP)		WXJK□□		L—WXJK□□		H—WXJK□□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WJK□□		AL—WJK□□		AH—WJK□□	
		Super fine grain (HIP)		A—WXJK□□		AL—WXJK□□		AH—WXJK□□	
		V30 (HIP)	$D^{-0.001}_{-0.006}$	B—WJK□□	P.455	BL—WJK□□	P.455	BH—WJK□□	P.455
		Super fine grain (HIP)		B—WXJK□□		BL—WXJK□□		BH—WXJK□□	
Carbide flange stopper punches		Super fine grain (HIP)	$D^{+0.005}_{0}$	WXPHAL	P.457	Alteration SC	P.457	H—WXPHAL	P.457
			$D^{-0.001}_{-0.006}$	B—WXPHAL				BH—WXPHAL	
Carbide flange stopper punches with air holes		Super fine grain (HIP)	$D^{+0.005}_{0}$	WXJHAL	P.457	Alteration SC	P.457	H—WXJHAL	P.457
			$D^{-0.001}_{-0.006}$	B—WXJHAL				BH—WXJHAL	
Carbide straight punches		V30 (HIP)	—	WPC	P.458	L—WPC	P.458	H—WPC	P.458
		Super fine grain (HIP)		WXPC		L—WXPC		H—WXPC	

CARBIDE SHOULDER PUNCHES
—NORMAL・LAPPING—

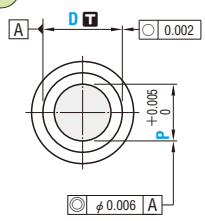
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ～ 89HRA	WP	A D R E G	S L X Tip length (B) X>L>S
		Super fine grain (HIP) 90 ～ 92HRA	WXP (D3 ～ 6)		
	$D\ ^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	A—WP		
		Super fine grain (HIP) 90 ～ 92HRA	A—WXP (D3 ～ 6)		
—Lapping— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ～ 89HRA	L—WP		
		Super fine grain (HIP) 90 ～ 92HRA	L—WXP (D3 ～ 6)		
	$D\ ^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	AL—WP		
		Super fine grain (HIP) 90 ～ 92HRA	AL—WXP (D3 ～ 6)		

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

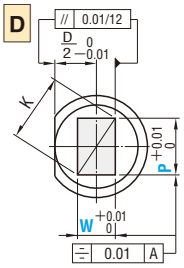




Tip shape A

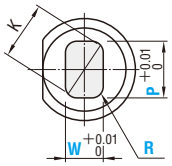


Tip shape D



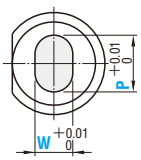
P≧W
K=$\sqrt{P^2+W^2}$

Tip shape R



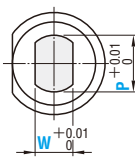
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	R	B	H
(D_{m5}) WP; ($D^{+0.005}_{0}$) A—WP; WXP (D3 ～ 6); A—WXP (D3 ～ 6)	A D R E G	S	3	40 50 60 70	1.000 ～ 2.990	—	—	$0.15\leqq R<\frac{W}{2}$ (Ⓡ only)	8	5
			4	40 50 60 70	1.000 ～ 3.990	3.97	1.50			7
			5	40 50 60 70	2.000 ～ 4.990	4.97	1.50			8
			6	40 50 60 70	2.000 ～ 5.990	5.97	1.50			9
			8	(40) 50 60 70 80	3.000 ～ 7.990	7.97	2.00		13	11
			10	(40) 50 60 70 80	3.000 ～ 9.990	9.97	2.50			13
			13	(40) 50 60 70 80	6.000 ～ 12.990	12.97	3.00			16
			16	(40) 50 60 70 80	10.000 ～ 15.990	15.97	4.00		19	19
—Lapping— L—WP; AL—WP; L—WXP; AL—WXP (D3 ～ 6)		L	3	40 50 60 70	1.000 ～ 2.990	—	—		13	5
			4	50 60 70	1.000 ～ 3.990	3.97	2.00			7
			5	50 60 70	2.000 ～ 4.990	4.97	2.00			8
			6	50 60 70	2.000 ～ 5.990	5.97	2.00			9
			8	50 60 70 80	3.000 ～ 7.990	7.97	2.50		19	11
			10	50 60 70 80	3.000 ～ 9.990	9.97	2.50			13
			13	50 60 70 80	6.000 ～ 12.990	12.97	3.00			16
			16	60 70 80	10.000 ～ 15.990	15.97	4.00		25	19
(D_{m5}) WP; ($D^{+0.005}_{0}$) A—WP	A	X	3	50 60 70	2.000 ～ 2.990	—	—	—	19	5
			4	50 60 70	2.000 ～ 3.990					7
			5	50 60 70	3.000 ～ 4.990				25	8
			6	50 60 70	3.000 ～ 5.990					9
—Lapping— L—WP; AL—WP			8	60 70 80	3.000 ～ 7.990				30	11
			10	60 70 80	3.000 ～ 9.990					13
			13	60 70 80	6.000 ～ 12.990					16
			16	70 80	10.000 ～ 15.990				40	19

L (40)…B=8 If full length is (40), tip length is 8mm in all cases.
Ⓐ: 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.
D R E G: 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.

Order

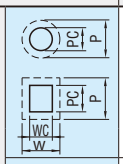
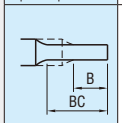
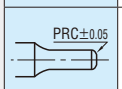
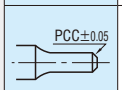
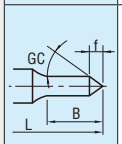
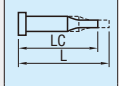
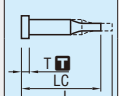
Catalog No.	—	L	—	P	—	W	—	R (Ⓡ only)
WPAS 10	—	60	—	P7.770				
A—WPEL 4	—	50	—	P3.65	—	W2.80		

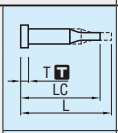
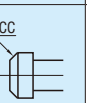
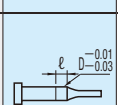
Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	—	L (LC·LCT·LMT)	—	P (PC)	—	W (WC)	—	R	—	(BC·HC·TC, etc.)
WPAS 8	—	50	—	PC1.800					—	TKC

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧Pmin./2 0.001mm increments ⊗ Cannot be used for tip X. P(PC) / Bmax. 0.500 ～ 0.999 / 4 1.000 ～ 1.999 / 13 2.000 ～ 2.999 / 19 3.000 ～ 3.999 / 30 4.000 ～ 5.999 / 40 6.000 ～ / 45	Tip dimension change PC/WC≧Wmin.×2/3≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC)·W(WC) / Bmax. 1.000 ～ 1.999 / 8 2.000 ～ 2.499 / 13 2.500 ～ 3.999 / 19 4.000 ～ / 25	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·GC.	—	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓡ PCC≦(P—0.2)/2 ⊗ Cannot be combined with PRC·GC.	—	
		GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°—GC°) Ⓡ With lapping, tip edges are rounded. ⊗ Cannot be used for P≦1.000. ⊗ Cannot be combined with LKC·LKZ·LCT·LMT·PRC·PCC.	—	
		PKC	Tip tolerance change (P dimension can be selected in 0.001mm increments.) $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$	Tip tolerance change (P·W dimensions can be selected in 0.001mm increments.) $P\cdot W^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	
		PKV	Tip tolerance change $P^{+0.005}_{0}$ ⇨±0.002 Ⓡ P dimension increment remains the same.	Tip tolerance change $P\cdot W^{+0.01}_{0}$ ⇨±0.005 Ⓡ P dimension increment remains the same.	
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·LKZ, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1 mm 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 $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		

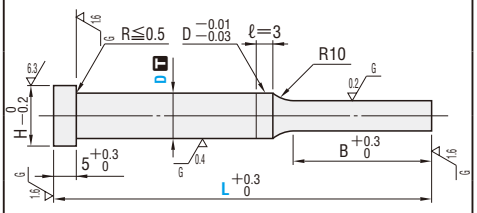
Alteration		Code	Ⓐ	DREG	1Code
Alterations to full length		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		
Alterations to head		KC	Addition of single key flat to head ⊗ Cannot be combined with KFC.	Key flat position change 1° increments ⊗ Cannot be combined with KFC.	Quotation
		WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KFC.	Double key flats in parallel Can be combined with KC. ⊗ Cannot be combined with KFC.	
		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		
		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.		
		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.1097 0.1mm increments 0.5≦TCC≦(H—D)/2 Ⓡ If H≦5, then TCC is 0.5.		
Shank		NDC	No press-in lead ℓ=3 ⇨ ℓ=0		

CARBIDE SHOULDER PUNCHES
—TiCN COATING—

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
—TiCN coating— RoHS	D_{m5}	V30 (HIP) 88 ～ 89HRA Surface 3000HV	H—WP	A D R E G	S
		Super fine grain (HIP) 90 ～ 92HRA Surface 3000HV	H—WXP (D3 ～ 6)		L
	$D^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA Surface 3000HV	AH—WP		X
		Super fine grain (HIP) 90 ～ 92HRA Surface 3000HV	AH—WXP (D3 ～ 6)		Tip length (B) X>L>S

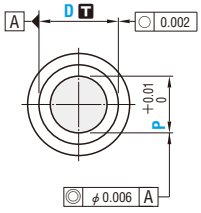
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

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

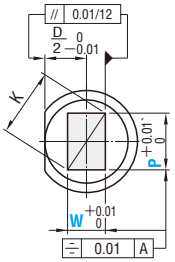


The tip end is ground before the coating is applied.

Tip shape A

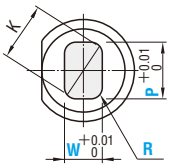


Tip shape D



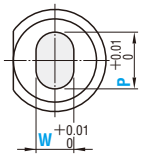
P≧W
K=$\sqrt{P^2+W^2}$

Tip shape R



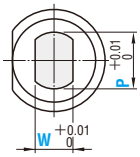
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·K max.	D R E G P·W min.	R R	B	H
(D_{m5}) H—WP H—WXP (D3 ～ 6)	A D R E G	S	3	40 50 60 70	1.00 ～ 2.99	—	—	0.15≦R<$\frac{W}{2}$ (R only)	8	5
			4	40 50 60 70	1.00 ～ 3.99	3.97	1.50			7
			5	40 50 60 70	2.00 ～ 4.99	4.97	1.50			8
			6	40 50 60 70	2.00 ～ 5.99	5.97	1.50			9
			8	(40) 50 60 70 80	3.00 ～ 7.99	7.97	2.00		13	11
			10	(40) 50 60 70 80	3.00 ～ 9.99	9.97	2.50			13
			13	(40) 50 60 70 80	6.00 ～ 12.99	12.97	3.00			16
			16	(40) 50 60 70 80	10.00 ～ 15.99	15.97	4.00		19	19
($D^{+0.005}_{0}$) AH—WP AH—WXP (D3 ～ 6)		L	3	40 50 60 70	1.00 ～ 2.99	—	—		13	5
			4	50 60 70	1.00 ～ 3.99	3.97	2.00			7
			5	50 60 70	2.00 ～ 4.99	4.97	2.00			8
			6	50 60 70	2.00 ～ 5.99	5.97	2.00			9
			8	50 60 70 80	3.00 ～ 7.99	7.97	2.50		19	11
			10	50 60 70 80	3.00 ～ 9.99	9.97	2.50			13
			13	50 60 70 80	6.00 ～ 12.99	12.97	3.00			16
			16	60 70 80	10.00 ～ 15.99	15.97	4.00		25	19
(D_{m5}) H—WP ($D^{+0.005}_{0}$) AH—WP	A	X	3	50 60 70	2.00 ～ 2.99	—	—	—	19	5
			4	50 60 70	2.00 ～ 3.99					7
			5	50 60 70	3.00 ～ 4.99				25	8
			6	50 60 70	3.00 ～ 5.99					9
			8	60 70 80	3.00 ～ 7.99				30	11
			10	60 70 80	3.00 ～ 9.99					13
			13	60 70 80	6.00 ～ 12.99					16
			16	70 80	10.00 ～ 15.99				40	19

L (40)···B=8 If full length is (40), tip length is 8mm in all cases.
Ⓐ: 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.
D R E G: 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.

Order

Catalog No.	L	P	W	R(Ⓡ only)
H—WPAS 10	— 60	— P7.77		

Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	L(LC·LCT·LMT)	P(PC)	W(WC)	R	(BC·HC·TC, etc.)
H—WPAS 8	— 50	— PC1.95		—	TKC

Alterations to tip

Code	Ⓐ	DREG	1Code
PC WC	Tip dimension change PC≧Pmin./2≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) ⊗ Cannot be used for D3·4. ⊗ Cannot be used for tip X. P(PC) / Bmax.: 1.000～1.999 / 13; 2.000～2.999 / 19; 3.000～3.999 / 30; 4.000～ / 40	Tip dimension change PC/WC ≧ P/W min.×2/3 ≧1.00 0.01mm increments P(PC)·W(WC) / Bmax.: 1.00～1.99 / 8; 2.00～2.49 / 13; 2.50～3.99 / 19; 4.00～ / 25	Quotation
BC	Tip length change 2≦BC≦Bmax.≦L/2 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.	
SC	Tip roughness change 0.2 G ⇨ 0.08 GL The base material is finished before the coating is applied.		
PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓡ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC·GC.	—	
PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓡ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC·GC.	—	
GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) Ⓡ If combined with SC, tip edges are rounded. ⊗ Cannot be used for P≦1.00. ⊗ Cannot be combined with LKC·LCT·LMT·PRC·PCC.	—	
PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 Ⓡ (P dimension can be selected in 0.001mm increments.) ⊗ Cannot be used for D16.	—	
PKV	Tip tolerance change P +0.01 0 ⇨ ±0.005 ⊗ P dimension increment remains the same.	—	
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, 0.01 mm 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).	

Alterations to full length

Code	Ⓐ	DREG	1Code
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 + Full length change + LC: 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 + Full length change + LC: Full length tolerance change L +0.3 0 ⇨ +0.1 0		
LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		

Alterations to head

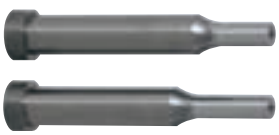
Code	Ⓐ	DREG	1Code
KC	Addition of single key flat to head ⊗ Cannot be combined with KFC.	Key flat position change 0°, 90°, 180°, 270° 1° increments ⊗ Cannot be combined with KFC.	Quotation
WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KFC.	Double key flats in parallel Can be combined with KC. ⊗ Cannot be combined with KFC.	
KFC	Double key flats at 0° and a selected angle 0°, 90°, 180°, 270° 1° increments ⊗ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 0°, 90°, 180°, 270° 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<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.		
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.1097 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓡ If H≦5, then TCC is 0.5.		

Shank

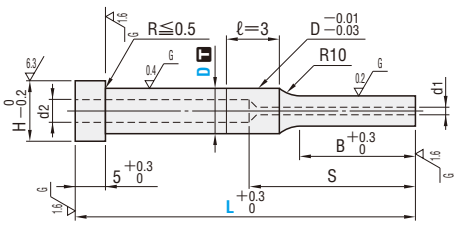
Code	Ⓐ	DREG	1Code
NDC	No press-in lead ℓ=3 ⇨ ℓ=0		

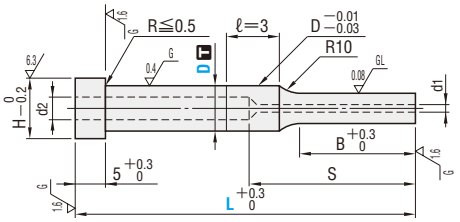
CARBIDE SHOULDER PUNCHES WITH AIR HOLES

—NORMAL・LAPPING—

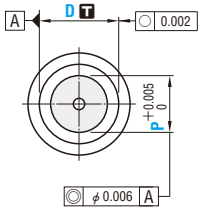
Type	Shank diameter D T tolerance	M / H	Catalog No. Type	Tip shape	B Tip length
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ～ 89HRA	WJ	A D R E G	S L X
		Super fine grain (HIP) 90 ～ 92HRA	WXJ (D4 ～ 6)		
	$D^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	A—WJ		
		Super fine grain (HIP) 90 ～ 92HRA	A—WXJ (D4 ～ 6)		
—Lapping— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ～ 89HRA	L—WJ		Tip length (B) X>L>S
		Super fine grain (HIP) 90 ～ 92HRA	L—WXJ (D4 ～ 6)		
	$D^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	AL—WJ		
		Super fine grain (HIP) 90 ～ 92HRA	AL—WXJ (D4 ～ 6)		

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

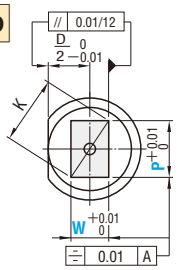




Tip shape A

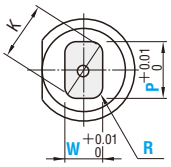


Tip shape D



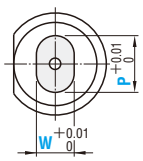
Ⓟ P≧W
Ⓟ $K=\sqrt{P^2+W^2}$

Tip shape R



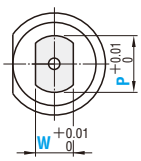
Ⓟ P≧W
Ⓟ $0.15 \leqq R < \frac{W}{2}$
Ⓟ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



Ⓟ P>W

Tip shape G



Ⓟ P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	R	B	d_1	S	d_2	H
(D_{m5}) ($D^{+0.005}_{0}$) WJ A—WJ WXJ A—WXJ (D4 ～ 6) (D4 ～ 6) —Lapping— L—WJ AL—WJ L—WXJ AL—WXJ (D4 ～ 6) (D4 ～ 6)	A D R E G	S	3	40 50 60 70	1.000 ～ 2.990	—	—	$0.15 \leqq R < \frac{W}{2}$ (R only)	8	0.3	—	0.3	5
			4	40 50 60 70	1.500 ～ 3.990	3.97	1.50			0.5	20	1.2	7
			5	40 50 60 70	2.000 ～ 4.990	4.97	2.00			0.8		2.1	8
			6	40 50 60 70	2.000 ～ 5.990	5.97	2.00					2.6	9
			8	(40) 50 60 70 80	3.000 ～ 7.990	7.97	3.00		13	1.2	27	3.4	11
			10	(40) 50 60 70 80	3.000 ～ 9.990	9.97	3.00			1.6	28	4.4	13
			13	(40) 50 60 70 80	6.000 ～ 12.990	12.97	6.00			1.9			16
			16	(40) (50) 60 70 80	10.000 ～ 15.990	15.97	6.00		19	2.9	36		19
		L	3	40 50 60 70	1.000 ～ 2.990	—	—		13	0.3	—	0.3	5
			4	50 60 70	1.500 ～ 3.990	3.97	2.00			0.5	20	1.2	7
			5	50 60 70	2.000 ～ 4.990	4.97	2.00			0.8		2.1	8
			6	50 60 70	2.000 ～ 5.990	5.97	2.00					2.6	9
			8	50 60 70 80	3.000 ～ 7.990	7.97	3.00		19	1.2	27	3.4	11
			10	50 60 70 80	3.000 ～ 9.990	9.97	3.00			1.6	28	4.4	13
			13	50 60 70 80	6.000 ～ 12.990	12.97	6.00			1.9			16
			16	60 70 80	10.000 ～ 15.990	15.97	6.00		25	2.9	36		19
(D_{m5}) ($D^{+0.005}_{0}$) WJ A—WJ —Lapping— L—WJ AL—WJ	A	X	4	50 60 70	2.000 ～ 3.990	—	—	—	19	0.5	26	1.2	7
			5	50 60 70	3.000 ～ 4.990				25	0.8	32	2.1	8
			6	50 60 70	3.000 ～ 5.990							2.6	9
			8	60 70 80	3.000 ～ 7.990					1.2		3.4	11
			10	60 70 80	3.000 ～ 9.990				30	1.6	40		13
			13	60 70 80	6.000 ～ 12.990					1.9		4.4	16
			16	70 80	10.000 ～ 15.990				40	2.9	50		19

Ⓟ If L is (40) or (50), tip length B and S dimension are as follows.

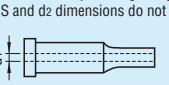
L	(40)	(50)
B	8	13

D \ L	(40)
8 ～ 16	S=17

D \ L	(50)
16	S=24

Ⓟ Ⓐ: 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.
Ⓟ D R E G: 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.

Ⓟ Air hole of super fine grain type is straight. S and d_2 dimensions do not exist.



Order

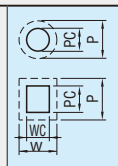
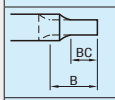
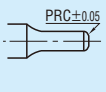
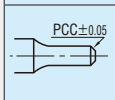
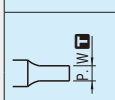
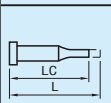
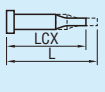
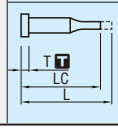
Catalog No.	L	P	W	R (Ⓡ only)
WJDS 10	60	P8.00	W3.00	

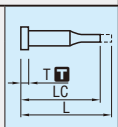
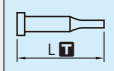
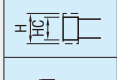
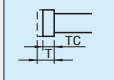
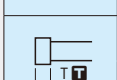
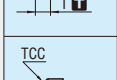
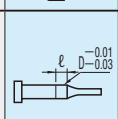
Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	L (LC・LCX・LCT・LMT)	P (PC)	W (WC)	R	(BC・HC・TC, etc.)
WJDS 10	60	P8.00	W3.00		BC10

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.001mm increments ⊗ Cannot be used for D3・4. ⊗ Cannot be used for tip X. D / PCmin.: 5 1.800; 6 1.800; 8 2.300; 10 2.800; 13 5.000; 16 8.000	Tip dimension change PC, WC≧PC・WCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) ⊗ Cannot be used for D4. D / PC・WCmin.: 5 1.80; 6 1.80; 8 2.50; 10 2.80; 13 5.00; 16 5.00	
		BC	Tip length change 2≦BC＜B 0.1mm increments (P) If combined with LC, B dimension is shortened by (L—LC).		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments (P) PRC≦(P—d_1—0.5)/2 ⊗ Cannot be combined with PCC.	—	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments (P) PCC≦(P—d_1—0.5)/2 ⊗ Cannot be combined with PRC.	—	Quotation
		PKC	Tip tolerance change $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) $P \cdot W^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	
		PKV	Tip tolerance change $P^{+0.005}_{0}$ ⇨ ±0.002 (P) P dimension increment remains the same.	Tip tolerance change $P \cdot W^{+0.01}_{0}$ ⇨ ±0.005 (P) P dimension increment remains the same.	
Alterations to full length		LC	Full length change 25+B(BC)≦LC＜L 0.1mm increments (P) B and S dimensions are shortened by L—(LC). (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC＜L 0.1mm increments (P) B and S dimensions are shortened by L—(LC).	
		LCX	Full length change with the same tip length B 25+B(BC)≦LCX＜L 0.1mm increments (P) If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length—25mm). (If combined with LKC・LKZ, 0.01mm increments can be selected.) ⊗ Cannot be used for V30.	Full length change with the same tip length B 30+B(BC)≦LCX＜L 0.1mm increments (P) 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 (P) 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 $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		

Alteration		Code	Ⓐ	DREG	1Code
Alterations to full length		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 (P) 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 $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		
Alterations to head		KC	Addition of single key flat to head ⊗ Cannot be combined with KFC.	Key flat position change 0°, 90°, 180°, 270° 1° increments ⊗ Cannot be combined with KFC.	
		WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KFC.	Double key flats in parallel Can be combined with KC. ⊗ Cannot be combined with KFC.	
		KFC	Double key flats at 0° and a selected angle 0°, 90°, 180°, 270° 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 0°, 90°, 180°, 270° 1° increments ⊗ Cannot be combined with KC・WKC.	Quotation
		NKC	—	No key flat	
		HC	Head diameter change D≦HC＜H 0.1mm increments		
		TC	Head thickness change 2≦TC＜5 0.1mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) (P) Full length L is shortened by (5—TC). If combined with LC・LCT・LMT, full length remains as specified.		
		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.1097 0.1mm increments 0.5≦TCC≦(H—D)/2 (P) If H ≦ 5, then TCC is 0.5.		
Shank		NDC	No press-in lead ℓ=3 ⇨ ℓ=0		

CARBIDE SHOULDER PUNCHES WITH AIR HOLES

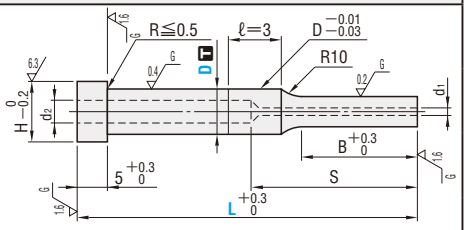
—TiCN COATING—

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
—TiCN coating— RoHS	D_{m5}	V30 (HIP) 88 ～ 89HRA Surface 3000HV	H—WJ	A D R E G	S L X
		Super fine grain (HIP) 90 ～ 92HRA Surface 3000HV	H—WXJ (D4 ～ 6)		
	$D^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA Surface 3000HV	AH—WJ		
		Super fine grain (HIP) 90 ～ 92HRA Surface 3000HV	AH—WXJ (D4 ～ 6)		

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

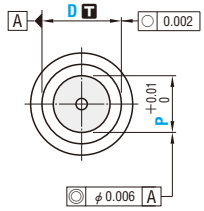
The tip shape can be selected from tip shapes A ～ G in the figure below.

Tip length (B) X>L>S

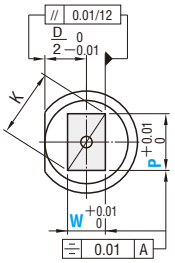


The tip end is ground before the coating is applied.

Tip shape A



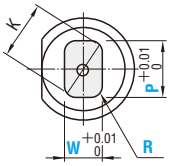
Tip shape D



P≧W

K=$\sqrt{P^2+W^2}$

Tip shape R

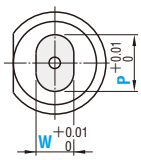


P≧W

0.15≦R<$\frac{W}{2}$

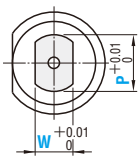
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	d_1	S	d_2	H
(D_{m5}) H—WJ H—WXJ (D4 ～ 6)	A D R E G	S	3	40 50 60 70	1.00 ～ 2.99	—	—	0.15≦R<$\frac{W}{2}$ (R only)	8	0.3	—	0.3	5
			4	40 50 60 70	1.50 ～ 3.99	3.97	1.50			0.5	20	1.2	7
			5	40 50 60 70	2.00 ～ 4.99	4.97	2.00			0.8		2.1	8
			6	40 50 60 70	2.00 ～ 5.99	5.97	2.00					2.6	9
			8	(40) 50 60 70 80	3.00 ～ 7.99	7.97	3.00		13	1.2	27	3.4	11
			10	(40) 50 60 70 80	3.00 ～ 9.99	9.97	3.00			1.6	28	4.4	13
			13	(40) 50 60 70 80	6.00 ～ 12.99	12.97	6.00			1.9			16
			16	(40) (50) 60 70 80	10.00 ～ 15.99	15.97	6.00		19	2.9	36		19
($D^{+0.005}_{0}$) AH—WJ AH—WXJ (D4 ～ 6)		L	3	40 50 60 70	1.00 ～ 2.99	—	—		13	0.3	—	0.3	5
			4	50 60 70	1.50 ～ 3.99	3.97	2.00			0.5	20	1.2	7
			5	50 60 70	2.00 ～ 4.99	4.97	2.00			0.8		2.1	8
			6	50 60 70	2.00 ～ 5.99	5.97	2.00					2.6	9
			8	50 60 70 80	3.00 ～ 7.99	7.97	3.00		19	1.2	27	3.4	11
			10	50 60 70 80	3.00 ～ 9.99	9.97	3.00			1.6	28	4.4	13
			13	50 60 70 80	6.00 ～ 12.99	12.97	6.00			1.9			16
			16	60 70 80	10.00 ～ 15.99	15.97	6.00		25	2.9	36		19
(D_{m5}) H—WJ ($D^{+0.005}_{0}$) AH—WJ	A	X	4	50 60 70	2.00 ～ 3.99	—	—	—	19	0.5	26	1.2	7
			5	50 60 70	3.00 ～ 4.99				25	0.8	32	2.1	8
			6	50 60 70	3.00 ～ 5.99							2.6	9
			8	60 70 80	3.00 ～ 7.99				30	1.2	40	3.4	11
			10	60 70 80	3.00 ～ 9.99					1.6		4.4	13
			13	60 70 80	6.00 ～ 12.99					1.9			16
			16	70 80	10.00 ～ 15.99				40	2.9	50		19

If L is (40) or (50), tip length B and S dimension are as follows.

L	(40)	(50)
B	8	13

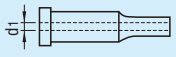
D \ L	(40)
8 ～ 16	S=17

D \ L	(50)
16	S=24

Ⓐ: 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.

D R E G: 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.

Air hole of super fine grain type is straight. S and d_2 dimensions do not exist.



Order

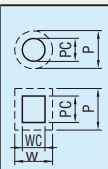
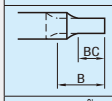
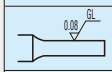
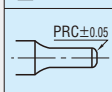
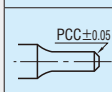
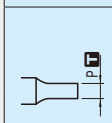
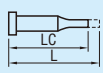
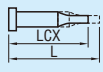
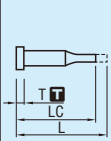
Catalog No.	L	P	W	R (Ⓡ only)
H—WJDS 10 —	60	— P8.00	— W3.00	

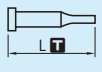
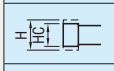
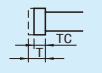
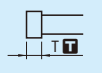
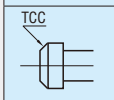
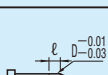
Days to Ship Quotation

Price Quotation

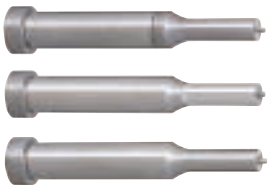
Alterations

Catalog No.	L (LC・LCX・LCT・LMT)	P (PC)	W (WC)	R	(BC・HC・TC, etc.)
H—WJDS 10 —	60	— P8.00	— W3.00	—	BC10

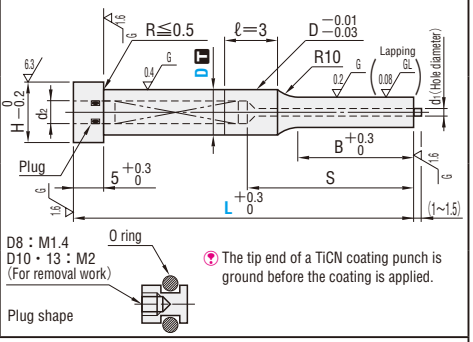
Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) ⊗ Cannot be used for D3・4. ⊗ Cannot be used for tip X. D / PCmin.: 5 / 1.80; 6 / 1.80; 8 / 2.30; 10 / 2.80; 13 / 5.00; 16 / 8.00	Tip dimension change PC, WC≧PC・WCmin. 0.01mm increments ⊗ Cannot be used for D4. D / PC・WCmin.: 5 / 1.80; 6 / 1.80; 8 / 2.50; 10 / 2.80; 13 / 5.00; 16 / 5.00	
		BC	Tip length change 2≦BC＜B 0.1mm increments		
		SC	Tip roughness change The base material is finished before the coating is applied.	0.2 G ⇨ 0.08 GL	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments (P) PRC≦(P−d1−0.5)/2 ⊗ Cannot be combined with PCC.	—	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments (P) PCC≦(P−d1−0.5)/2 ⊗ Cannot be combined with PRC.	—	
		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (P) P dimension can be selected in 0.001mm increments. ⊗ Cannot be used for D16.	—	Quotation
		PKV	Tip tolerance change P +0.01 0 ⇨ ±0.005 (P) P dimension increment remains the same.	—	
Alterations to full length		LC	Full length change 25+B(BC)≦LC＜L 0.1mm increments (P) B and S dimensions are shortened by L−(LC).	Full length change 30+B(BC)≦LC＜L 0.1mm increments (P) B and S dimensions are shortened by L−(LC).	
			(If combined with LKC, 0.01 mm increments can be selected.)		
		LCX	Full length change with the same tip length B 25+B(BC)≦LCX＜L 0.1mm increments (P) If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).	Full length change with the same tip length B 30+B(BC)≦LCX＜L 0.1mm increments (P) If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
			(If combined with LKC, 0.01mm increments can be selected.) ⊗ Cannot be used for V30.		
		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 (P) are the same as for LC. TKC (Head thickness tolerance change) T +0.3 0 ⇨ +0.02 0 + Full length change + LC (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 (P) are the same as for LC. TKM (Head thickness tolerance change) T +0.3 0 ⇨ 0 −0.02 + Full length change + LC (Full length tolerance change) L +0.3 0 ⇨ +0.1 0		

Alteration		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 ⊗ Cannot be combined with KFC.	Key flat position change 1° increments ⊗ Cannot be combined with KFC.	Quotation
		WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KFC.	Double key flats in parallel Can be combined with KC. ⊗ Cannot be combined with KFC.	
		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		
		TC	Head thickness change 2≦TC＜5 0.1mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) (P) Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified.		
		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.1097 0.1mm increments 0.5≦TCC≦(H−D)/2 (P) If H ≦ 5, then TCC is 0.		
Shank		NDC	No press-in lead ℓ=3 ⇨ ℓ=0		

CARBIDE JECTOR PUNCHES
—NORMAL・LAPPING・TiCN COATING—

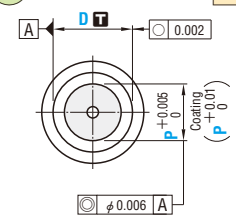
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Punch V30(HIP) 88 ～ 89HRA Plug Equivalent to SUM23 O-ring Fluorine rubber	WJP Lapping L—WJP TiCN coating H—WJP	A D R E G	S
	$D^{+0.005}_{0}$		A—WJP Lapping AL—WJP TiCN coating AH—WJP		L Tip length (B) L>S

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

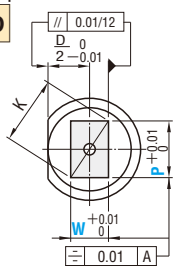


The tip end of a TiCN coating punch is ground before the coating is applied.

Tip shape A

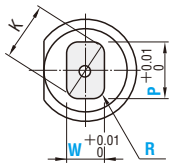


Tip shape D



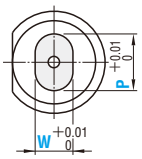
P≧W
K=$\sqrt{P^2+W^2}$

Tip shape R



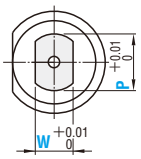
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.01mm increments DREG P・Kmax.	0.01mm increments DREG P・Wmin.	R Ⓡ R	B	d_1	S	d_2	H
(D_{m5}) WJP	A D R E G	S	8	(40) 50 60 70 80	3.000 ～ 7.990	7.97	3.00	0.15≦R<W/2 (Ⓡ only)	13	1.2	27	3.4	11
($D^{+0.005}_{0}$) A—WJP			10	(40) 50 60 70 80	3.000 ～ 9.990	9.97	3.00			1.6	28	4.4	13
—Lapping— L—WJP AL—WJP			13	(40) 50 60 70 80	6.000 ～ 12.990	12.97	6.00			1.9			16
—TiCN coating— H—WJP AH—WJP		L	8	50 60 70 80	3.000 ～ 7.990	7.97	3.00		19	1.2	27	3.4	11
			10	50 60 70 80	3.000 ～ 9.990	9.97	3.00			1.6	28	4.4	13
			13	50 60 70 80	6.000 ～ 12.990	12.97	6.00			1.9			16

If L=(40), tip length B is 8 and S is 17. For TiCN coating, P dimension can be selected in 0.01mm increments.
Ⓐ: 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.
DREG: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.

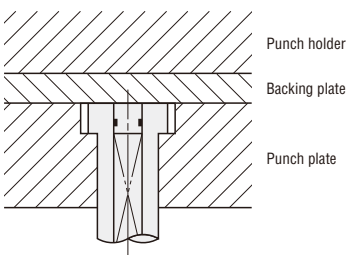
Order Catalog No. — L — P — W — R(Ⓡ only)
WJPDS 10 — 60 — P8.00 — W3.00

Days to Ship Quotation

Price Quotation

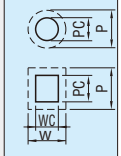
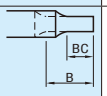
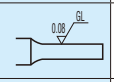
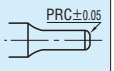
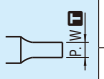
■Features
- Because the jector pin and spring are integrated with the punch, scrap retention can be easily added even to carbide punches. (It is not necessary to install a spring from the punch holder.)
- Because the head tapping is eliminated, the loss of head strength is minimized.
- The plug holding the spring is only for provisional holding only. When using the punch, be sure to support both the head and the spring with a backing plate. (If the spring is not supported, the plug and spring may come off during use.)

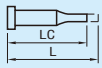
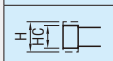
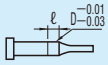
■Example of use
Use a backing plate to support the plug as well.



Alterations

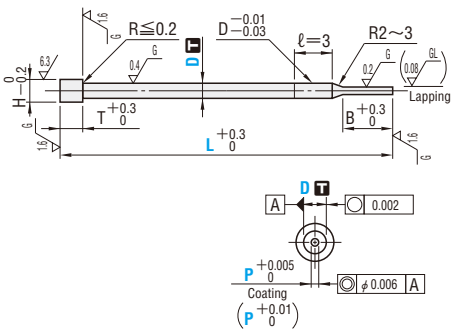
Catalog No.	L(LC・LCT・LMT)	P(PC)	W(WC)	R	(BC・HC・TC, etc.)
WJPDS 10	60	P8.00	W3.00		BC10

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.001mm increments D / PCmin.: 8 / 2.300; 10 / 2.800; 13 / 5.000	Tip dimension change PC,WC≧PC・WCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) D / PC・WCmin.: 8 / 2.50; 10 / 2.80; 13 / 5.00	
		BC	Tip length change 2≦BC＜B 0.1mm increments If combined with LC, B dimension is shortened by (L−LC).		
		SC	Tip roughness change 0.2G ⇨ 0.08GL The base material is finished before the coating is applied. Can be used for coating types only.		Quotation
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−d_1−0.5)/2	—	
		PKC	Tip tolerance change Normal $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ TiCN coating $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) $P・W^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Cannot be used with TiCN coating.	
		PKV	Tip tolerance change Normal $P^{+0.005}_{0}$ ⇨ ±0.002 TiCN coating $P^{+0.01}_{0}$ ⇨ ±0.005	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) $P・W^{+0.01}_{0}$ ⇨ ±0.005 Cannot be used with TiCN coating.	
			P dimension increment remains the same.		

Alteration		Code	Ⓐ	DREG	1Code
Alterations to full length		LC	Full length change 25+B(BC)≦LC＜L 0.1mm increments B and S dimensions are shortened by L−(LC). (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC＜L 0.1mm increments B and S dimensions are shortened by L−(LC).	
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ Cannot be used with TiCN coating.		
Alterations to head		KC	Addition of single key flat to head	90°, 0°, 180°, 270° Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		NKC	—	No key flat	
		HC	Head diameter change D≦HC＜H 0.1mm increments		
		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.1097 0.1mm increments 0.5≦TCC≦(H−D)/2		
Shank		NDC	No press-in lead ℓ=3⇨ℓ=0		

CARBIDE SHOULDER QUILL PUNCHES

—NORMAL・LAPPING・TiCN COATING—

Type	Shank diameter D T tolerance	M H	Catalog No. Type: Head thickness T=3mm	Catalog No. Type: Head thickness T=5mm	Tip shape	B Tip length	Shape
RoHS —Lapping— (D≧1.6) —TiCN coating— For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ～ 89HRA	WP Lapping L—WP TiCN coating H—WP	WPLT Lapping L—WPLT TiCN coating H—WPLT	A	S L Tip length (B) L>S	
		Super fine grain (HIP) 90 ～ 92HRA	WXP Lapping L—WXP TiCN coating H—WXP	—			
	$D^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	A—WP Lapping AL—WP TiCN coating AH—WP	A—WPLT Lapping AL—WPLT TiCN coating AH—WPLT			
		Super fine grain (HIP) 90 ～ 92HRA	A—WXP Lapping AL—WXP TiCN coating AH—WXP	—			

The tip end of a TiCN coating punch is ground before the coating is applied.

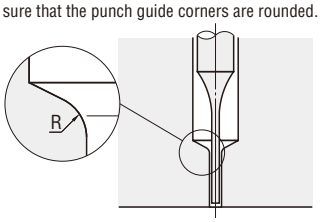
B	H	Catalog No. Type: Head thickness T=3mm	Catalog No. Type: Head thickness T=5mm	D	L	0.001mm increments (0.01mm increments) Ⓐ min. P max. (TiCN coating)
3	2.0	S (D_{m5}) ($D^{+0.005}_{0}$)	S (D_{m5}) ($D^{+0.005}_{0}$)	1.0	20 25 30 35 40	0.150 ～ 0.990
	2.6	WPAS A—WPAS WXPAS A—WXPAS (D≧1.6) (D≧1.6)	WPLTAS A—WPLTAS (D≧1.6) (D≧1.6)	1.1	20 25 30 35 40	0.150 ～ 1.090 (1.00 ～ 1.09)
4				1.2	20 25 30 35 40	0.150 ～ 1.190 (1.00 ～ 1.19)
		—Lapping— (D≧1.6) L—WPAS AL—WPAS L—WXPAS AL—WXPAS	—Lapping— (D≧1.6) L—WPLTAS AL—WPLTAS	1.3	20 25 30 35 40	0.150 ～ 1.290 (1.00 ～ 1.29)
				1.4	20 25 30 35 40	0.150 ～ 1.390 (1.00 ～ 1.39)
				1.5	20 25 30 35 40	0.150 ～ 1.490 (1.00 ～ 1.49)
		—TiCN coating— (D≧1.1) H—WPAS AH—WPAS H—WXPAS AH—WXPAS	—TiCN coating— (D≧1.6) H—WPLTAS AH—WPLTAS	1.6	20 25 30 35 40 50 60	0.300 ～ 1.590 (1.00 ～ 1.59)
6	3.0			2.0	20 25 30 35 40 50 60	0.500 ～ 1.990 (1.00 ～ 1.99)
8	3.5	(D≧1.6) (D≧1.6)		2.5	20 25 30 35 40 50 60	0.800 ～ 2.490 (1.00 ～ 2.49)
5	2.0	L (D_{m5}) ($D^{+0.005}_{0}$)	L (D_{m5}) ($D^{+0.005}_{0}$)	1.0	20 25 30 35 40	0.250 ～ 0.990
	2.6	WPAL A—WPAL WXPAL A—WXPAL (D≧1.6) (D≧1.6)	WPLTAL A—WPLTAL (D≧1.6) (D≧1.6)	1.1	20 25 30 35 40	0.250 ～ 1.090 (1.00 ～ 1.09)
6				1.2	20 25 30 35 40	0.250 ～ 1.190 (1.00 ～ 1.19)
		—Lapping— (D≧1.6) L—WPAL AL—WPAL L—WXPAL AL—WXPAL	—Lapping— (D≧1.6) L—WPLTAL AL—WPLTAL	1.3	20 25 30 35 40	0.250 ～ 1.290 (1.00 ～ 1.29)
				1.4	20 25 30 35 40	0.250 ～ 1.390 (1.00 ～ 1.39)
				1.5	20 25 30 35 40	0.250 ～ 1.490 (1.00 ～ 1.49)
		—TiCN coating— (D≧1.1) H—WPAL AH—WPAL H—WXPAL AH—WXPAL	—TiCN coating— (D≧1.6) H—WPLTAL AH—WPLTAL	1.6	30 35 40 50 60	0.500 ～ 1.590 (1.00 ～ 1.59)
8	3.0			2.0	30 35 40 50 60	0.500 ～ 1.990 (1.00 ～ 1.99)
13	3.5	(D≧1.6) (D≧1.6)		2.5	30 35 40 50 60	0.800 ～ 2.490 (1.00 ～ 2.49)

Ⓐ: 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.
If P dimension is 0.150 ～ 0.249 for a tip S type, B dimension (4) is 3mm.
If P dimension is 0.250 ～ 0.399 for a tip L type, B dimension (6) is 5mm.
For TiCN coating, P min. is 1.00mm.
P dimension increments⋯For TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)
For the available shank diameters (D dimension) of each type, refer to the table below.

S	M	Type		Head thickness Tmm	Available range of D
Normal	V30	WPA□	A—WPA□	3	D1.0 ～ 2.5
		WPLTA□	A—WPLTA□	5	D1.6 ～ 2.5
	Super fine grain	WXP□	A—WXP□	3	
Lapping	V30	L—WPA□	AL—WPA□	3	D1.6 ～ 2.5
		L—WPLTA□	AL—WPLTA□	5	
	Super fine grain	L—WXP□	AL—WXP□	3	
TiCN coating	V30	H—WPA□	AH—WPA□	3	D1.1 ～ 2.5
		H—WPLTA□	AH—WPLTA□	5	D1.6 ～ 2.5
	Super fine grain	H—WXP□	AH—WXP□	3	

If P is 0.3 or less, pay particular attention to possible tip breakage.

(1) Pay particular attention to the tip when measuring it with a micrometer.
(2) Be sure to place the punch on a soft surface.
(3) Always use the punch with its tip inserted into the punch guide.
(4) Be sure that the punch guide corners are rounded.



PRODUCTS DATA
P.1094

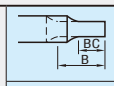
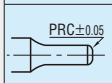
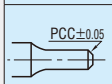
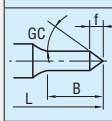
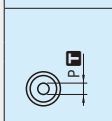
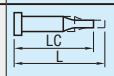
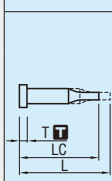
Order

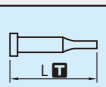
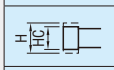
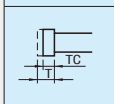
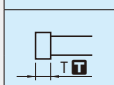
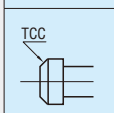
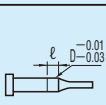
Catalog No.	—	L	—	P
L—WPAS 2.5	—	50	—	P1.600

Days to Ship Quotation

Alterations

Catalog No.	—	L(LC・LCT・LMT)	—	P	—	(BC・HC・TC, etc.)
L—WPAS 2.5	—	LC45	—	P1.600	—	BC6.0—PKC

Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change 2≦BC＜B 0.1mm increments	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P—0.2)/2 Cannot be combined with PCC・GC.	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P—0.2)/2 Cannot be combined with PRC・GC.	
		GC	20°≦GC＜90° 1° increments Tip length B≧f+2 f=P/2×tan(90°—GC°) With lapping, tip edges are rounded. Cannot be used for P≦1.000. Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.	Quotation
		PKC	Tip tolerance change ・Normal ・Lapping ・Coating $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P dimension can be selected in 0.001 mm increments.)	
		PKV	Tip tolerance change ・Normal ・Lapping ・Coating $P^{+0.005}_{0}$ ⇨ ±0.002 $P^{+0.01}_{0}$ ⇨ ±0.005 P dimension increment remains the same.	
Alterations to full length		LC	Full length change 20≦LC＜L 0.1mm increments (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 (P) 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 (P) 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 $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	

Alteration		Code	Spec.	1Code
Alterations to full length		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ Cannot be used with TiCN coating.	
Alterations to head		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		KFC	90° 0° 180° 270° Double key flats at 0°and a selected angle1° increments Cannot be combined with KC・WKC.	
		HC	Head diameter change D≦HC＜H 0.1mm increments	Quotation
		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 $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	
		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.1097 0.1mm increments 0.5≦TCC≦(H—D)/2 If H≦5, then TCC is 0.5. Cannot be used for H＜2.6.	
Shank		NDC	No press-in lead $\ell^{-0.01}_{-0.03}$ ℓ=3 ⇨ ℓ=0	

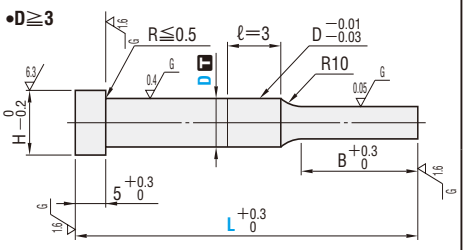
Price Quotation

CARBIDE SHOULDER PUNCHES
—MIRROR FINISHED—

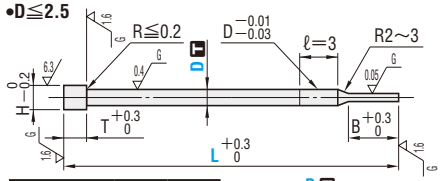
Type	Shank diameter D T tolerance	M H	Catalog No. Type: Head thickness T=3mm	Catalog No. Type: Head thickness T=5mm	Tip shape	B Tip length
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ~ 89HRA	M—WP (D2.0・2.5)	M—WP (D≧3) M—WPLT (D2.0・2.5)	A D R E G	S  L  Tip length (B) L>S
		Super fine grain (HIP) 90 ~ 92HRA	M—WXP (D2.0・2.5)	M—WXP (D≧3)		
	$D\ ^{+0.005}_{0}$	V30 (HIP) 88 ~ 89HRA	AM—WP (D2.0・2.5)	AM—WP (D≧3) AM—WPLT (D2.0・2.5)		
		Super fine grain (HIP) 90 ~ 92HRA	AM—WXP (D2.0・2.5)	AM—WXP (D≧3)		

Shape

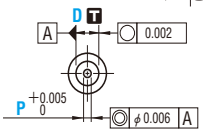
•D≦3



•D≦2.5



Catalog No.	D	Head thickness
M—WPA□ M—WXPA□ AM—WPA□	2.0	3
	2.5	
AM—WXPA□	≧3	5
M—WPLTA□ AM—WPLTA□	2.0	5
	2.5	



B Tip length	Catalog No. Type: Head thickness T=3mm	Catalog No. Type: Head thickness T=5mm	D	L	0.001mm increments Ⓐ min. P max.	B	H
S 	(D_{m5}) M—WPAS M—WXPAS ($D^{+0.005}_{0}$) AM—WPAS AM—WXPAS	(D_{m5}) M—WPLTAS ($D^{+0.005}_{0}$) AM—WPLTAS	2.0	40 50 60	0.500 ~ 1.990	6	3
			2.5	40 50 60	0.800 ~ 2.490	8	3.5
	—	(D_{m5}) M—WPAS M—WXPAS ($D^{+0.005}_{0}$) AM—WPAS AM—WXPAS	3	40 50 60 70	1.000 ~ 2.990		5
			4	40 50 60 70	1.000 ~ 3.990		7
			5	40 50 60 70	2.000 ~ 4.990		8
			6	40 50 60 70	2.000 ~ 5.990		9
			(8)	(40) 50 60 70 80	3.000 ~ 7.990	13	11
			(10)	(40) 50 60 70 80	3.000 ~ 9.990		13
L 	(D_{m5}) M—WPAL M—WXPAL ($D^{+0.005}_{0}$) AM—WPAL AM—WXPAL	(D_{m5}) M—WPLTAL ($D^{+0.005}_{0}$) AM—WPLTAL	2.0	40 50 60	0.500 ~ 1.990	8	3
			2.5	40 50 60	0.800 ~ 2.490	13	3.5
	—	(D_{m5}) M—WPAL M—WXPAL ($D^{+0.005}_{0}$) AM—WPAL AM—WXPAL	3	40 50 60 70	1.000 ~ 2.990		5
			4	50 60 70	1.000 ~ 3.990		7
			5	50 60 70	2.000 ~ 4.990		8
			6	50 60 70	2.000 ~ 5.990		9
			(8)	50 60 70 80	3.000 ~ 7.990	19	11
			(10)	50 60 70 80	3.000 ~ 9.990		13

(?) D (8) and (10) are specifications available for M—WP and AM—WP only.
(?) L (40)…B=8 If full length is (40), tip length is 8mm in all cases. (?) Ⓐ: 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.

Order Catalog No. — L — P

M—WPAS2.5 — 50 — P1.600

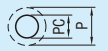
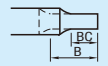
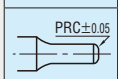
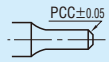
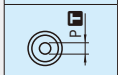
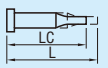
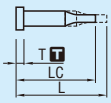
Days to Ship Quotation

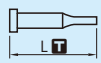
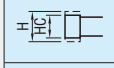
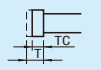
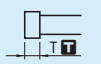
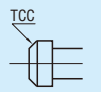
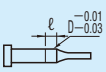
Price Quotation

Alterations

Catalog No. — L(LC・LCT・LMT) — P(PC) — (BC・HC・TC, etc.)

M—WPAS2.5 — LC45 — P1.600 — BC6.0

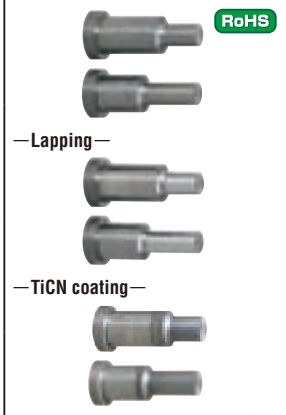
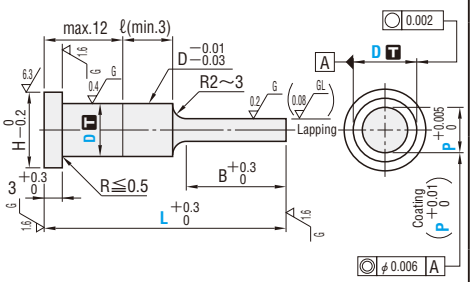
Alteration		Code	Spec.	1Code
Alterations to tip		PC	Tip dimension change PC≧Pmin./2 0.001mm increments ⊗ Cannot be used for D≦2.5. P / Bmax.: 0.500 ～ 0.999 / 4; 1.000 ～ 1.999 / 13; 2.000 ～ 2.999 / 19; 3.000 ～ 3.999 / 30; 4.000 ～ 5.999 / 40; 6.000 ～ / 45	Quotation
		BC	Tip length change ・If D≦2.5, 2≦BC＜B ・If D≧3, 2≦BC≦Bmax. 0.1mm increments (?) Full length L must be at least 25mm 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.	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments (?) PCC≦(P—0.2)/2 ⊗ Cannot be combined with PRC.	
		PKV	Tip tolerance change $P^{+0.005}_{0} \Rightarrow \pm 0.002$	
Alterations to full length		LC	Full length change ・If D≦2.5, 20≦LC＜L ・If D≧3.0, 25+B(BC)≦LC＜L (?) If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length—25mm). 0.1mm increments (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 (Head thickness tolerance change) $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ + LC (Full length change) + Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$	
		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) $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ + LC (Full length change) + Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$	

Alteration		Code	Spec.	1Code
Alterations to full length		LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$	
		LKZ	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.01}_{0}$	
Alterations to head		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.	Quotation
		TKC	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$	
		TKM	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$	
		TCC	Chamfering of head This improves the strength of the punch head. P.1097 0.1mm increments 0.5≦TCC≦(H—D)/2 (?) If H≦5, then TCC is 0.5. ⊗ Cannot be used for H＜2.6.	
Shank		NDC	No press-in lead ℓ=3 ⇨ ℓ=0	

■Features

- The tip surface roughness of these punches is finished by grinding to a level equivalent to or smaller than lapping. (The tip gloss may be slightly inferior to lapping.)
- Because the tip is ground, there are none of the slight tip undulations which can be seen in lapping punches.

CARBIDE SHOULDER PUNCHES
—SHORT TYPE, NORMAL・LAPPING・TiCN COATING—

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	Shape
 RoHS —Lapping— —TiCN coating— For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ～ 89HRA	WS Lapping L—WS TiCN coating H—WS	A	S	
		Super fine grain (HIP) 90 ～ 92HRA (D3 ～ 6)	WXS Lapping L—WXS TiCN coating H—WXS			
	$D\ ^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	A—WS Lapping AL—WS TiCN coating AH—WS		L	
		Super fine grain (HIP) 90 ～ 92HRA (D3 ～ 6)	A—WXS Lapping AL—WXS TiCN coating AH—WXS		Tip length (B) L＞S	

The tip end of a TiCN coating punch is ground before the coating is applied.

Catalog No. Type	D	L	0.001mm increments Ⓐ min. P max.	B	H
S (Dm5) WSAS WXSAS (D3 ～ 6) (D+0.005 0) A—WSAS A—WXSAS (D3 ～ 6) —Lapping— L—WSAS L—WXSAS (D3 ～ 6) AL—WSAS AL—WXSAS (D3 ～ 6) —TiCN coating— H—WSAS H—WXSAS (D3 ～ 6) AH—WSAS AH—WXSAS (D3 ～ 6)	3	25 30 35	1.000 ～ 2.990	8	5
	4		2.000 ～ 3.990		7
	5		2.000 ～ 4.990		8
	6		2.500 ～ 5.990		9
	8		5.000 ～ 7.990		11
	10		7.000 ～ 9.990		13
L (Dm5) WSAL WXSAL (D3 ～ 6) (D+0.005 0) A—WSAL A—WXSAL (D3 ～ 6) —Lapping— L—WSAL L—WXSAL (D3 ～ 6) AL—WSAL AL—WXSAL (D3 ～ 6) —TiCN coating— H—WSAL H—WXSAL (D3 ～ 6) AH—WSAL AH—WXSAL (D3 ～ 6)	3	30 35 40	1.000 ～ 2.990	13	5
	4		2.000 ～ 3.990		7
	5		2.000 ～ 4.990		8
	6		2.500 ～ 5.990		9
	8		5.000 ～ 7.990		11
	10		7.000 ～ 9.990		13

P dimension increments···With TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

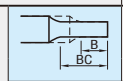
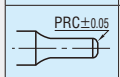
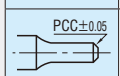
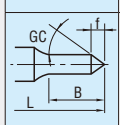
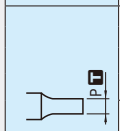
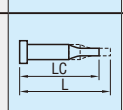
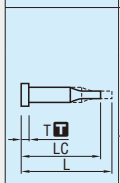
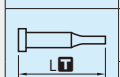
Order

Catalog No.	—	L	—	P
WSAS 4	—	30	—	P2.000

Days to Ship **Quotation**

Alterations

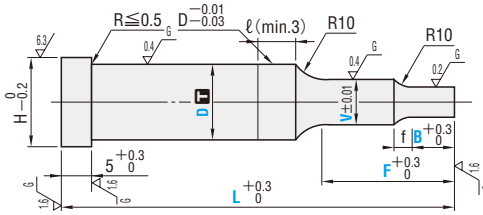
Catalog No. — L(LC・LCT・LMT) — P — (BC・HC・TC, etc.)
WSAS 4 — LC28 — P3.020 — BC10—KFC150

Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change 2≦BC＜Bmax. 0.1mm increments P: 1.000 ～ 1.199 → Bmax. 15; 1.200 ～ → Bmax. 20 Full length L must be at least 15mm 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・GC.	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 ⊗Cannot be combined with PRC・GC.	
		GC	20°≦GC＜90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) ⊗Cannot be used for P≦1.000 With lapping, tip edges are rounded. ⊗Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.	
		PKC	Tip tolerance change ・Normal P +0.005 0 ⇨ +0.003 0 ・Lapping ・Coating P +0.01 0 ⇨ +0.005 0 (P dimension can be selected in 0.001mm increments.)	Quotation
		PKV	Tip tolerance change ・Normal P +0.005 0 ⇨ ±0.002 ・Lapping ・Coating P +0.01 0 ⇨ ±0.005 P dimension increment remains the same.	
Alterations to full length		LC	Full length change 15 + B(BC) ≦LC＜L 0.1mm increments If difference between full length and tip length is 15mm or less, tip length is adjusted to (Full length−15mm). (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 (Head thickness tolerance change T +0.3 0 ⇨ +0.02 0) + LC (Full length change L +0.3 0 ⇨ +0.1 0) = Full length tolerance change	
		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 L +0.3 0 ⇨ +0.1 0) = Full length tolerance change	
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0 ⊗Cannot be used with TiCN coating.	

Alteration		Code	Spec.	1Code
Alterations to head		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		KFC	90° 0° 180° 270° Double key flats at 0° and a selected angle 1° increments ⊗Cannot be combined with KC・WKC.	
		HC	Head diameter change D≦HC＜H 0.1mm increments	
		TC	Head thickness change 2≦TC＜3 0.1mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) Full length L is shortened by (3−TC). If combined with LC・LCT・LMT, full length remains as specified.	Quotation
		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.1097 0.1mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5.	
Alterations to shank		SKC	Single key flat on shank Ⓐ D/2 −0.5 −0.01 ・D3 ～ 6 P≦D−1.2 (Machining width 0.5) D/2 −1 −0.01 ・D8 ～ P≦D−2.2 (Machining width 1) ⊗Cannot be combined with KC・WKC・KFC.	
		NDC	No press-in lead ℓ≧3⇨ℓ=0	

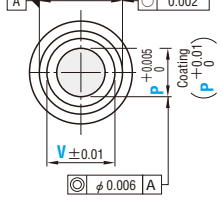
Price Quotation

CARBIDE DOUBLE-STEPPED PUNCHES
—NORMAL·TiCN COATING—

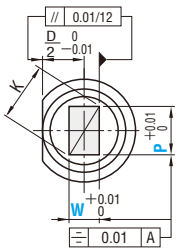
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Catalog No. Tip shape	The tip shape can be selected from tip shapes A ～ G in the figure below.
RoHS  —TiCN coating—  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30(HIP) 88 ～ 89HRA	WPTW TiCN coating H—WPTW	A D R E G	
		Super fine grain (HIP) 90 ～ 92HRA (D3 ～ 6)	WXPTW TiCN coating H—WXPTW		
	$D\ ^{+0.005}_{0}$	V30(HIP) 88 ～ 89HRA	A—WPTW TiCN coating AH—WPTW		
		Super fine grain (HIP) 90 ～ 92HRA (D3 ～ 6)	A—WXPTW TiCN coating AH—WXPTW		

The tip end of a TiCN coating punch is ground before the coating is applied.

Tip shape A



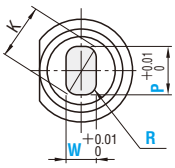
Tip shape D



P≧W

K=$\sqrt{P^2+W^2}$

Tip shape R

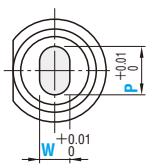


P≧W

0.15≦R<$\frac{W}{2}$

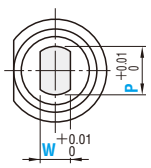
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	D	L (Selection)	0.001mm increments Ⓐ P	0.1mm increments Ⓐ B	Diagonal Kmax.	0.01mm increments D R E G P·W	0.01mm increments R	0.1mm increments D R E G B	0.01mm increments V	0.1mm increments F	H
(D_{m5}) WPTW WXPTW (D3 ～ 6)	A D R E G	3	40·50·60	0.500 ～ 0.749	2.0 ～ 5.0	2.96	1.00 ～ 1.99	0.15≦R<$\frac{W}{2}$ (R only)	2.0 ～ 8.0	Round: D>V>P+0.01 V≧1.00 Shaped: D>V>(P,K)+0.03 V≧1.00	Round: B+f+2<F≦Fmax. Shaped: B+f+3.5<F≦Fmax. & Round: F≦L−25 Shaped: F≦L−30	5
				0.750 ～ 0.999	2.0 ～ 8.0							
				1.000 ～ 1.999	2.0 ～ 13.0		2.00 ～ 2.49		2.0 ～ 13.0			
				2.000 ～ 2.980	2.0 ～ 19.0		2.50 ～ 2.96		2.0 ～ 19.0			
		4	40·50·60·70	0.500 ～ 0.749	2.0 ～ 5.0	3.96	1.00 ～ 1.99		2.0 ～ 8.0			7
				0.750 ～ 0.999	2.0 ～ 8.0							
				1.000 ～ 1.999	2.0 ～ 13.0		2.00 ～ 2.49		2.0 ～ 13.0			
				2.000 ～ 2.999	2.0 ～ 19.0		2.50 ～ 3.96		2.0 ～ 19.0			
				3.000 ～ 3.980	2.0 ～ 30.0		2.50 ～ 3.96		2.0 ～ 19.0			
Coating TiCN coating H—WPTW H—WXPTW (D3 ～ 6)		5	40·50·60·70	1.000 ～ 1.999	2.0 ～ 13.0	4.96	1.00 ～ 1.99		2.0 ～ 8.0			8
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0			
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0			
				4.000 ～ 4.980	2.0 ～ 40.0		4.00 ～ 4.96		2.0 ～ 25.0			
($D^{+0.005}_{0}$) A—WPTW A—WXPTW (D3 ～ 6)		6	40·50·60·70	1.000 ～ 1.999	2.0 ～ 13.0	5.96	1.00 ～ 1.99		2.0 ～ 8.0		V F	9
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0			
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0			
				4.000 ～ 5.980	2.0 ～ 40.0		4.00 ～ 5.96		2.0 ～ 25.0			
		8	40·50·60·70·80	1.500 ～ 1.999	2.0 ～ 13.0	7.96	1.40 ～ 1.99		2.0 ～ 8.0			11
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0			
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0			
				4.000 ～ 5.999	2.0 ～ 40.0		4.00 ～ 7.96		2.0 ～ 25.0			
				6.000 ～ 7.980	2.0 ～ 45.0		4.00 ～ 7.96		2.0 ～ 25.0			
Coating TiCN coating AH—WPTW AH—WXPTW (D3 ～ 6)		10	40·50·60·70·80	1.500 ～ 1.999	2.0 ～ 13.0	9.96	1.70 ～ 1.99		2.0 ～ 8.0			13
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0			
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0			
				4.000 ～ 5.999	2.0 ～ 40.0		4.00 ～ 9.96		2.0 ～ 25.0			
				6.000 ～ 9.980	2.0 ～ 45.0		4.00 ～ 9.96		2.0 ～ 25.0			
		13	40·50·60·70·80	3.000 ～ 3.999	2.0 ～ 30.0	12.96	2.00 ～ 2.49		2.0 ～ 13.0			16
				4.000 ～ 5.999	2.0 ～ 40.0		2.50 ～ 3.99		2.0 ～ 19.0			
				6.000 ～ 15.980	2.0 ～ 45.0		4.00 ～ 12.96		2.0 ～ 25.0			
		16	40·50·60·70·80	4.000 ～ 5.999	2.0 ～ 40.0	15.96	2.70 ～ 3.99		2.0 ～ 19.0			19
				6.000 ～ 15.980	2.0 ～ 45.0		4.00 ～ 15.96		2.0 ～ 25.0			

V	Fmax.
1.00 ～ 1.99	19
2.00 ～ 2.99	30
3.00 ～ 3.99	40
4.00 ～ 5.99	45
6.00 ～	45

For **f**, refer to the punch R lengths in [Products Data] on P.1208 and verify the following.
Round punch: (V−P)/2=X
Shaped punch: (V−W)/2=X

V>D−0.03···ℓ=0 If V>D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included. For TiCN coating, P min. is 1.00mm.

P dimension increments···For TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

PRODUCTS DATA
P.1094

Order

Catalog No.	L	P	W	B	V	F	R(Ⓡ only)
WPTWA 10	80	P9.500		B25	V9.80	F40	
A—WPTWR13	80	P10.50	W7.34	B10	V12.00	F30	R0.5

Days to Ship Quotation

Alterations

Catalog No.	L(LC・LCT・LMT)	P	W	B	V	F	R	(HC・TC・KC, etc.)
WPTWA 10	LC72	P4.800		B10	V6.80	F40		HC12

Alteration		Code	Ⓐ	ⒹⓇⒺⒼ	1Code
Alterations to tip	PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments (?) PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	—	
	PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments (?) PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.	—	
	GC, f, B, L	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) (?) If combined with SC, tip edges are rounded. ⊗ Cannot be used for P≦1.000. ⊗ Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.	—	
	0.08 GL	SC	Tip roughness change 0.2 G ⇨ 0.08 GL		
	P.W T	PKC	Tip tolerance change Normal $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ Coating $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ Coating cannot be used for D16.	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) $P\cdot W^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ Cannot be used with coating.	Quotation
		PKV	Tip tolerance change Normal $P^{+0.005}_{0}$ ⇨ ±0.002 Coating $P^{+0.01}_{0}$ ⇨ ±0.005 (?) P dimension increment remains the same.	Tip tolerance change $P\cdot W^{+0.01}_{0}$ ⇨ ±0.005 ⊗ Cannot be used with coating (?) P dimension increment remains the same.	
	T	VKC	V dimension tolerance change V±0.01 ⇨ $^{+0.005}_{0}$ (?) V dimension can be selected in 0.001mm increments.	V dimension tolerance change V±0.01⇨±0.005 ⊗ Cannot be used with TiCN coating.	
Alterations to full length	LC, L	LC	Full length change 25+F≦LC<L 0.1mm increments (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 30+F≦LC<L 0.1mm increments	
	T LC L	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 + Full length change + LC Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ 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 + Full length change + LC Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		

Alteration		Code	Ⓐ	ⒹⓇⒺⒼ	1Code
Alterations to full length	L T	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used with TiCN coating.		
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments (0°, 90°, 180°, 270°)	
		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 (0°, 90°, 180°, 270°) ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments (0°, 90°, 180°, 270°) ⊗ Cannot be combined with KC・WKC.	
		NKC	—	No key flat	
	H HC	HC	Head diameter change D≦HC<H 0.1mm increments		Quotation
	T TC	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) (?) Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length is equal to LC.		
	T T	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	TCC	Chamfering of head This improves the strength of the punch head. P.1097 0.1mm increments 0.5≦TCC≦(H−D)/2 (?) If H≦5, then TCC is 0.5.		
Alterations to shank		SKC	Single key flat on shank Ⓐ ⒹⓇⒺⒼ $\frac{D}{2}-0.5^{\ 0}_{-0.01}$ ・D3～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) $\frac{D}{2}-1^{\ 0}_{-0.01}$ ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC・KFC.		
	ℓ D $^{-0.01}_{-0.03}$	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

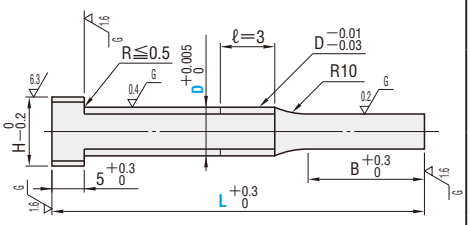
Price Quotation

CARBIDE KEY FLAT SHANK SHOULDER PUNCHES

—NORMAL・TiCN COATING—

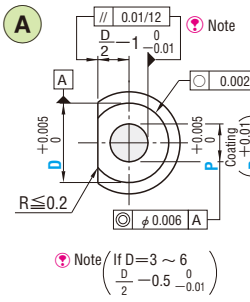
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS 	$D\ ^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	G—WP	A D R E G	S 
			TiCN coating GH—WP		
		Super fine grain 90 ～ 92HRA	G—WXP (D3 ～ 6)		L 
			TiCN coating GH—WXP (D3 ～ 6)		Tip length (B) L＞S

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



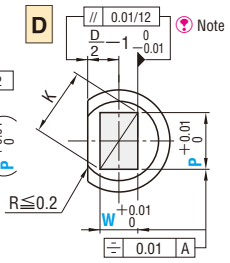
The tip end of a TiCN coating punch is ground before the coating is applied.

Tip shape A



Note If D=3 ～ 6 $\left(\frac{D}{2}-0.5\ ^{0}_{-0.01}\right)$

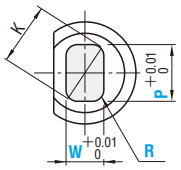
Tip shape D



P≧W

K=$\sqrt{P^2+W^2}$

Tip shape R

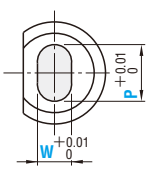


P≧W

0.15≦R＜$\frac{W}{2}$

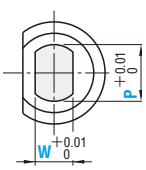
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P＞W

Tip shape G



P＞W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min.	0.01mm increments D R E G P・Kmax.	W max.	P・Wmin.	R R	B	H
G—WP	A D R E G	S	3	40 50 60 70	1.000 ～ 1.800	—	—	—	$0.15\leqq R<\frac{W}{2}$ (Ⓡ only)	8	5
			4	40 50 60 70	1.000 ～ 2.800	3.97	2.80	1.50			7
			5	40 50 60 70	2.000 ～ 3.800	4.97	3.80	1.50			8
			6	40 50 60 70	2.000 ～ 4.800	5.97	4.80	1.50			9
G—WXP (D3 ～ 6)			8	(40) 50 60 70 80	3.000 ～ 5.800	7.97	5.80	2.00		13	11
			10	(40) 50 60 70 80	3.000 ～ 7.800	9.97	7.80	2.50			13
			13	(40) 50 60 70 80	6.000 ～ 10.800	12.97	10.80	3.00			16
—TiCN coating—			16	(40) 50 60 70 80	10.000 ～ 13.800	15.97	13.80	4.00		19	19
GH—WP		L	3	50 60 70	1.000 ～ 1.800	—	—	—		13	5
			4	50 60 70	1.000 ～ 2.800	3.97	2.80	2.00			7
			5	50 60 70	2.000 ～ 3.800	4.97	3.80	2.00			8
GH—WXP (D3 ～ 6)			6	50 60 70	2.000 ～ 4.800	5.97	4.80	2.00			9
			8	50 60 70 80	3.000 ～ 5.800	7.97	5.80	2.50		19	11
			10	50 60 70 80	3.000 ～ 7.800	9.97	7.80	2.50			13
			13	50 60 70 80	6.000 ～ 10.800	12.97	10.80	3.00			16
			16	60 70 80	10.000 ～ 13.800	15.97	13.80	4.00		25	19

Ⓡ L(40)⋯B=8 If full length is (40), tip length is 8mm in all cases.

Ⓡ D R E G: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.

Ⓡ

D=3 ～ 6⋯a=0.5 If D dimension is 3 ～ 6, a is 0.5mm.

D=8 ～ 16⋯a=1 When D dimension is 8 ～ 16, a is 1mm.

Ⓡ P dimension increments⋯With TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

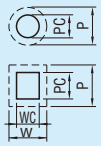
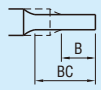
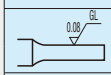
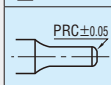
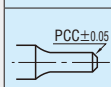
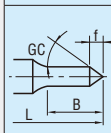
Order

Catalog No.	—	L	—	P	—	W	—	R (Ⓡ only)
G—WPAS 10	—	60	—	P7.770				

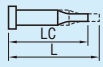
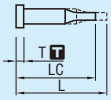
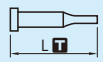
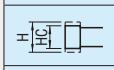
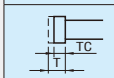
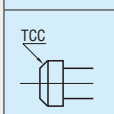
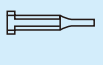
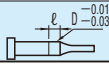
Days to Ship Quotation

Alterations

Catalog No.	—	L(LC・LCT・LMT)	—	P(PC)	—	W(WC)	—	R	—	(BC・HC・TC, etc.)
G—WPAS 8	—	50	—	PC2.950			—	BC15		

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧Pmin./2 0.001mm increments (Ⓨ) With coating, 0.01mm increments PC≧Pmin./2≧1.00 (Ⓝ) Coating cannot be used for D3・4. P(PC) / Bmax. 0.500 ～ 0.999 / 4 1.000 ～ 1.999 / 13 2.000 ～ 2.999 / 19 3.000 ～ 3.999 / 30 4.000 ～ 5.999 / 40 6.000 ～ / 45	Tip dimension change PC/WC≧Wmin.×2/3≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC)・W(WC) / Bmax. 1.000 ～ 1.999 / 8 2.000 ～ 2.499 / 13 2.500 ～ 3.999 / 19 4.000 ～ / 25	
		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.	
		SC	Tip roughness change 0.2G ⇨ 0.08GL (Ⓨ) With TiCN coating, the base material is finished before the coating is applied.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments (Ⓨ) PRC≦(P—0.2)/2 (Ⓝ) Cannot be combined with PCC・GC.	—	Quotation
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments (Ⓨ) PCC≦(P—0.2)/2 (Ⓝ) 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≦1.000. (Ⓝ) Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.	—	
		PKC	Tip tolerance change Normal P +0.005 0 ⇨ +0.003 0 Coating P +0.01 0 ⇨ +0.005 0 (Ⓝ) Coating cannot be used for D16.	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) P・W +0.01 0 ⇨ +0.005 0 (Ⓝ) Cannot be used with coating.	
		PKV	Tip tolerance change Normal P +0.005 0 ⇨ ±0.002 Coating P +0.01 0 ⇨ ±0.005 (Ⓨ) P dimension increment remains the same.	Tip tolerance change P・W +0.01 0 ⇨ ±0.005 (Ⓝ) Cannot be used with coating. (Ⓨ) P dimension increment remains the same.	

Price Quotation

Alteration		Code	Ⓐ	DREG	1Code
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・LKZ, 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		
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0 (Ⓝ) Cannot be used with TiCN coating.		
Alterations to head		WKC	Addition of double key flats in parallel		Quotation
		HC	Head diameter change D≦HC<H 0.1mm increments		
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) (Ⓨ) Full length L is shortened by (5—TC). If combined with LC・LCT・LMT, full length is equal to LC.		
		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.1097 0.1mm increments 0.5≦TCC≦(H—D)/2 (Ⓨ) If H≦5, then TCC is 0.5.		
Alterations to shank		SKF	Single key flat on shank, configurable size SKF 0 —0.01 Ⓐ P≦2(SKF—0.1) 0.1mm increments DREG W≦2(SKF—0.1) 0.1mm increments 0.3≦SKF≦D/2—0.1 (Ⓝ) Cannot be combined with WKC.		
		NDC	No press-in lead ℓ=3⇨ℓ=0		

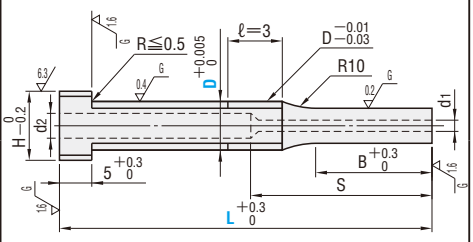
CARBIDE KEY FLAT SHANK SHOULDER PUNCHES WITH AIR HOLES

—NORMAL・TiCN COATING—

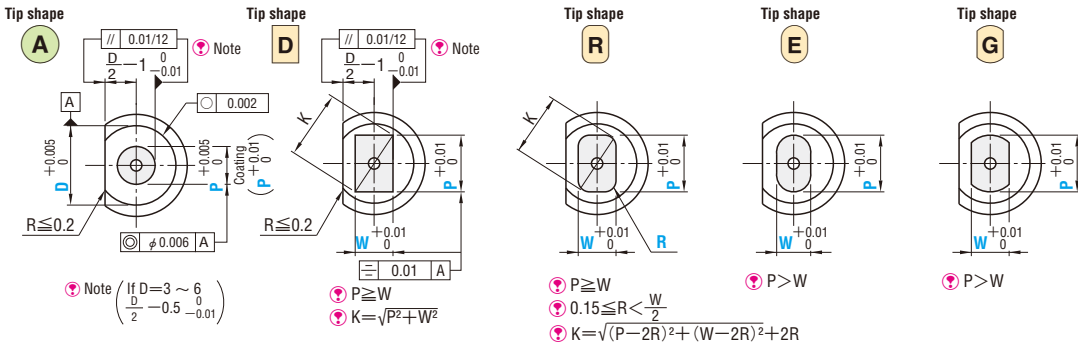
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D $^{+0.005}_{0}$	V30(HIP) 88 ～ 89HRA	G—WJ TiCN coating GH—WJ	A D R E G	S L

Tip length (B) L>S

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



The tip end of a TiCN coating punch is ground before the coating is applied.



Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min.	P max.	0.01mm increments D R E G P・Kmax.	W max.	P・Wmin.	R R	B	d1	S	d2	H
G—WJ —TiCN coating— GH—WJ	A D R E G	S	3	40 50 60 70	1.000 ～	1.800	—	—	—	0.15≦R<W/2 (R only)	8	0.3	—	0.3	5
			4	40 50 60 70	1.500 ～	2.800	3.97	2.80	1.50			0.5	20	1.2	7
			5	40 50 60 70	2.000 ～	3.800	4.97	3.80	2.00			0.8		2.1	8
			6	40 50 60 70	2.000 ～	4.800	5.97	4.80	2.00					2.6	9
			8	(40) 50 60 70 80	3.000 ～	5.800	7.97	5.80	3.00		13	1.2	27	3.4	11
			10	(40) 50 60 70 80	3.000 ～	7.800	9.97	7.80	3.00			1.6	28	4.4	13
			13	(40) 50 60 70 80	6.000 ～	10.800	12.97	10.80	6.00			1.9			16
			16	(40) (50) 60 70 80	10.000 ～	13.800	15.97	13.80	6.00		19	2.9	36		19
		L	3	40 50 60 70	1.000 ～	1.800	—	—	—		13	0.3	—	0.3	5
			4	50 60 70	1.500 ～	2.800	3.97	2.80	2.00			0.5	20	1.2	7
			5	50 60 70	2.000 ～	3.800	4.97	3.80	2.00			0.8		2.1	8
			6	50 60 70	2.000 ～	4.800	5.97	4.80	2.00					2.6	9
			8	50 60 70 80	3.000 ～	5.800	7.97	5.80	3.00		19	1.2	27	3.4	11
			10	50 60 70 80	3.000 ～	7.800	9.97	7.80	3.00			1.6	28	4.4	13
			13	50 60 70 80	6.000 ～	10.800	12.97	10.80	6.00			1.9			16
			16	60 70 80	10.000 ～	13.800	15.97	13.80	6.00		25	2.9	36		19

L(40)⋯B=8 If full length is (40), tip length is 8mm in all cases.

D R E G: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.

D=3 ～ 6⋯a=0.5 If D dimension is 3 ～ 6, a is 0.5mm.
D=8 ～ 16⋯a=1 When D dimension is 8 ～ 16, a is 1mm.

P dimension increments⋯With TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

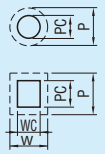
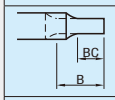
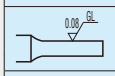
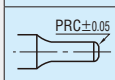
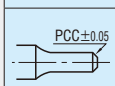
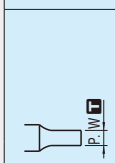
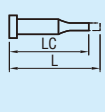
Order

Catalog No.	L	P	W	R (R only)
G—WJDS 10	60	P8.00	W3.00	

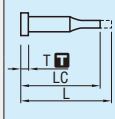
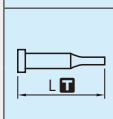
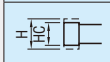
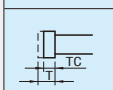
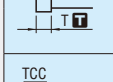
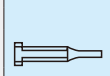
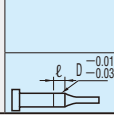
Days to Ship Quotation

Alterations

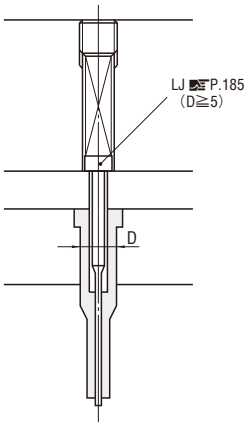
Catalog No.	L(LC·LCT·LMT)	P(PC)	W(WC)	R	(BC·HC·TC, etc.)
G—WJDS 10	60	P8.00	W3.00		BC10

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.001mm increments (Ⓡ) When coating is selected, the increments are 0.01mm. ⊗ Cannot be used for D3·4. D: 5 6 8 10 13 16 / PCmin.: 1.800 1.800 2.300 2.800 5.000 8.000	Tip dimension change PC/WC≧PC·WCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) ⊗ Cannot be used for D4. D: 5 6 8 10 13 16 / PC·WCmin.: 1.80 1.80 2.50 2.80 5.00 5.00	Quotation
		BC	Tip length change 2≦BC<B 0.1mm increments		
		SC	Tip roughness change 0.2G ⇨ 0.08GL (Ⓡ) With TiCN coating, the base material is finished before the coating is applied.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments (Ⓡ) PRC≦(P−d1−0.5)/2 ⊗ Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments (Ⓡ) PCC≦(P−d1−0.5)/2 ⊗ Cannot be combined with PRC.	——	
		PKC	Tip tolerance change Normal P +0.005 0 ⇨ +0.003 0 Coating P +0.01 0 ⇨ +0.005 0 ⊗ Coating cannot be used for D16.	Tip tolerance change (P·W dimensions can be selected in 0.001mm increments.) P·W +0.01 0 ⇨ +0.005 0 ⊗ Cannot be used with coating.	
		PKV	Tip tolerance change Normal P +0.005 0 ⇨ ±0.002 Coating P +0.01 0 ⇨ ±0.005 (Ⓡ) P dimension increment remains the same.	Tip tolerance change P·W +0.01 0 ⇨ ±0.005 ⊗ Cannot be used with coating. (Ⓡ) P dimension increment remains the same.	
Alterations to full length		LC	Full length change 25+B(BC)≦LC<L 0.1mm increments (Ⓡ) B and S dimensions are shortened by L−(LC). (If combined with LKC·LKZ, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1mm increments (Ⓡ) B and S dimensions are shortened by L−(LC).	

Price — Quotation

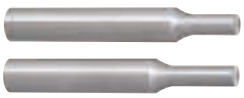
Alteration		Code	Ⓐ	DREG	1Code
Alterations to full length		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. TKC: Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + Full length change LC + Full length tolerance change L +0.3 0 ⇨ +0.1 0		Quotation
		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 + Full length change LC + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0 ⊗ Cannot be used with TiCN coating.		
Alterations to head		WKC	Addition of double key flats in parallel		Quotation
		HC	Head diameter change D≦HC<H 0.1mm increments		
		TC	Head tolerance 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.		
		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.1097 0.1mm increments 0.5≦TCC≦(H−D)/2 (Ⓡ) If H≦5, then TCC is 0.5.		
Alterations to shank		SKF	Single key flat on shank, configurable size SKF 0 −0.01 Ⓐ P≦2(SKF−0.1) 0.1mm increments D3～6 D/2−0.5≦SKF≦D/2−0.1 D8～16 D/2−1.0≦SKF≦D/2−0.1 DREG W≦2(SKF−0.1) 0.1mm increments ⊗ Cannot be combined with WKC.		
		NDC	No press-in lead ℓ=3⇨ℓ=0		

Example

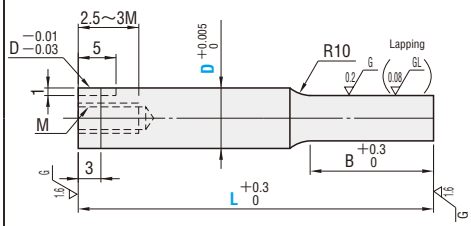


Can also be used in combination with a long jector pin. (Can be used for D≧5.)

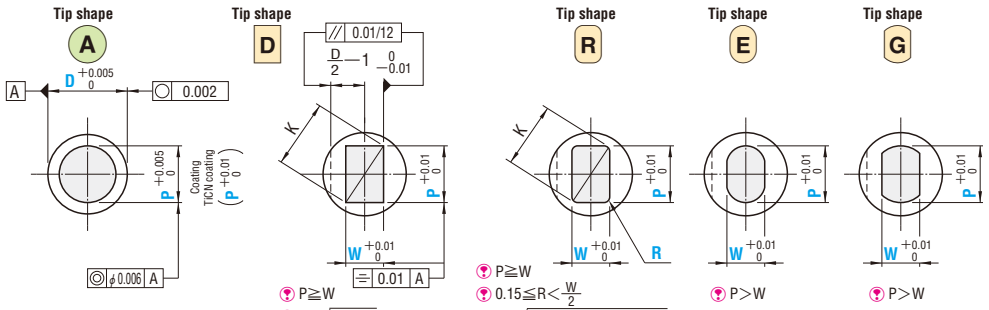
CARBIDE TAPPED PUNCHES
—NORMAL・LAPPING・TiCN COATING—

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS 	D $^{+0.005}_{0}$	V30(HIP) 88 ～ 89HRA	A—WMP	A D R E G	S 
		Super fine grain 90 ～ 92HRA	A—WXMP (D5 ～ 8)		
—Lapping— RoHS 		V30(HIP) 88 ～ 89HRA	AL—WMP		L 
		Super fine grain (HIP) 90 ～ 92HRA	AL—WXMP (D5 ～ 8)		Tip length (B) L>S
—TiCN coating— RoHS 		V30(HIP) 88 ～ 89HRA	AH—WMP		
		Super fine grain (HIP) 90 ～ 92HRA	AH—WXMP (D5 ～ 8)		

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



The tip end of a TiCN coating punch is ground before the coating is applied.



Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	0.01mm increments R R	B	M
—Normal— A—WMP A—WXMP (D5 ～ 8) —Lapping— AL—WMP AL—WXMP (D5 ～ 8) —TiCN coating— AH—WMP AH—WXMP (D5 ～ 8)	A D R E G	S	5	40 50 60 70	2.000 ～ 4.999	—	—	0.15≦R<W/2 (R only)	8	3
			6	40 50 60 70	2.000 ～ 5.999	5.97	1.50			
			8	(40) 50 60 70 80	3.000 ～ 7.999	7.97	2.00		13	4
			10	(40) 50 60 70 80	3.000 ～ 9.999	9.97	2.50			5
			13	(40) 50 60 70 80	6.000 ～ 12.999	12.97	3.00			6
			16	(40) 50 60 70 80	10.000 ～ 15.999	15.97	4.00		19	
		L	5	50 60 70	2.000 ～ 4.999	—	—		13	3
			6	50 60 70	2.000 ～ 5.999	5.97	2.00			
			8	50 60 70 80	3.000 ～ 7.999	7.97	2.50		19	4
			10	50 60 70 80	3.000 ～ 9.999	9.97	2.50			5
			13	50 60 70 80	6.000 ～ 12.999	12.97	3.00			6
			16	60 70 80	10.000 ～ 15.999	15.97	4.00		25	

L(40)…B=8 If full length is (40), tip length is 8mm in all cases.
P dimension increments…With TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

■Features

- Because the edge threads are machined by direct tapping (tapping before sintering), these punches are interchangeable with steel-tapped punches.
- If there is concern of thread looseness, use KC・SKC alterations (punch key flats).

PRODUCTS DATA
P.1094

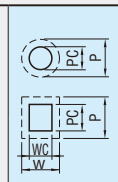
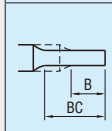
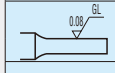
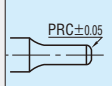
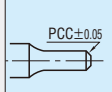
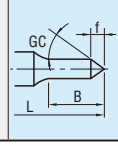
Order

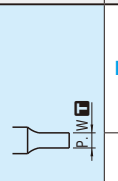
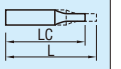
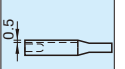
Catalog No.	L	P	W	R (Ⓡ only)
A—WMPAS 10	60	P7.770		

Days to Ship Quotation

Alterations

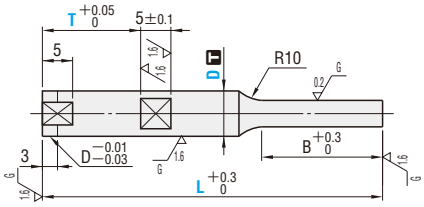
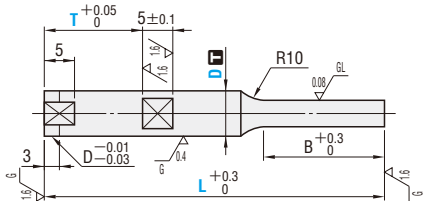
Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC・KC・WKC, etc.)
A—WMPAS 13	80	P8.24			KC—LKC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		PC WC	Tip dimension change PC≧Pmin./2 0.001mm increments When coating is selected, increments are 0.01mm. PC≧Pmin./2≧1.00 P (PC) / Bmax.: 1.000～1.999 / 13; 2.000～2.999 / 19; 3.000～3.999 / 30; 4.000～5.999 / 40; 6.000～ / 45	Tip dimension change PC, WC≧Wmin.×2/3≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P (PC)・W (WC) / Bmax.: 1.000～1.999 / 8; 2.000～2.499 / 13; 2.500～3.999 / 19; 4.000～ / 25	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.	
		SC	Tip roughness change 0.2S ⇨ 0.08GL With TiCN coating, the base material is finished before the coating is applied.	0.08GL Can be used for coating types only.	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 Cannot be combined with PCC・GC.	—	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 Cannot be combined with PRC・GC.	—	
		GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) If combined with SC, tip edges are rounded. Cannot be used for P≦1.000. Cannot be combined with LKC・LKZ・PRC・PCC.	—	

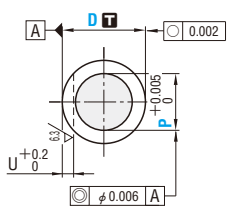
Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		PKC	Tip tolerance change Normal・lapping P +0.005 0 ⇨ +0.003 0 Coating P +0.01 0 ⇨ +0.005 0 Coating cannot be used for D16.	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) P・W +0.01 0 ⇨ +0.005 0 Cannot be used with coating.	
		PKV	Tip tolerance change Normal・lapping P +0.005 0 ⇨ ±0.002 Coating P +0.01 0 ⇨ ±0.005 P dimension increment remains the same.	Tip tolerance change P・W +0.01 0 ⇨ ±0.005 Cannot be used with coating. P dimension increment remains the same.	
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・LKZ, 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).	Quotation
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0		
Others		KC	Addition of single key flat Cannot be used for D5.	90° 0° 180° 270° Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel Cannot be used for D5.	Double key flats in parallel Can be combined with KC.	
		NKC	—	No key flat	
		SKC	Single key flat on shank Ⓐ D R E G D/2 −0.5 0 −0.01 ・D6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) D/2 −1 0 −0.01 Cannot be combined with KC・WKC.		

Price Quotation

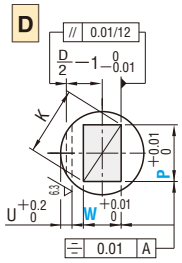
CARBIDE PUNCHES WITH KEY GROOVES

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from tip shapes A ~ G in the figure below.
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ~ 89HRA	WK	A D R E G	S	
		Super fine grain (HIP) 90 ~ 92HRA	WXK (D3 ~ 6)			
	$D^{+0.005}_{0}$	V30 (HIP) 88 ~ 89HRA	A—WK			
		Super fine grain (HIP) 90 ~ 92HRA	A—WXK (D3 ~ 6)			
—Lapping— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ~ 89HRA	L—WK		L Tip length (B) L>S	
		Super fine grain (HIP) 90 ~ 92HRA	L—WXK (D3 ~ 6)			
	$D^{+0.005}_{0}$	V30 (HIP) 88 ~ 89HRA	AL—WK			
		Super fine grain (HIP) 90 ~ 92HRA	AL—WXK (D3 ~ 6)			

Tip shape A



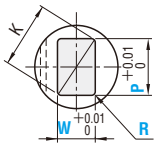
Tip shape D



P≧W

$K=\sqrt{P^2+W^2}$

Tip shape R

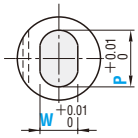


P≧W

$0.15 \leqq R < \frac{W}{2}$

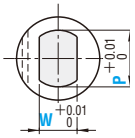
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.01mm increments R R	0.1mm increments T	B	U Key groove depth
(D_{m5}) ($D^{+0.005}_{0}$) WK A—WK WXK A—WXK (D3 ~ 6)	A D R E G	S	3	40 50 60	1.000 ~ 2.990	—	—	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	T≧5.0	8	0.5
			4	40 50 60 70	1.000 ~ 3.990	3.97	1.50				
			5	40 50 60 70	2.000 ~ 4.990	4.97	1.50				1.0
			6	40 50 60 70	2.000 ~ 5.990	5.97	1.50				
			8	(40) 50 60 70 80	3.000 ~ 7.990	7.97	2.00			13	1.5
			10	(40) 50 60 70 80	3.000 ~ 9.990	9.97	2.50				
			13	(40) 50 60 70 80	6.000 ~ 12.990	12.97	3.00				
			16	(40) 50 60 70 80	10.000 ~ 15.990	15.97	4.00			19	
—Lapping— L—WK AL—WK L—WXK AL—WXK (D3 ~ 6) (D3 ~ 6)		L	3	50 60	1.000 ~ 2.990	—	—			13	0.5
			4	50 60 70	1.000 ~ 3.990	3.97	2.00				
			5	50 60 70	2.000 ~ 4.990	4.97	2.00				1.0
			6	50 60 70	2.000 ~ 5.990	5.97	2.00				
			8	50 60 70 80	3.000 ~ 7.990	7.97	2.50			19	1.5
			10	50 60 70 80	3.000 ~ 9.990	9.97	2.50				
			13	50 60 70 80	6.000 ~ 12.990	12.97	3.00				
			16	60 70 80	10.000 ~ 15.990	15.97	4.00			25	

L (40)···B=8 If full length is (40), tip length is 8mm in all cases.
If no key groove is required, select T=L.

Order

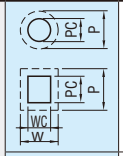
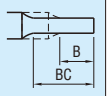
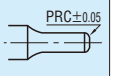
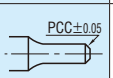
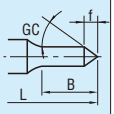
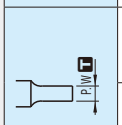
Catalog No.	—	L	—	P	—	W	—	R (Ⓡ only)	—	T
A—WKAS 8	—	70	—	P6.500			—		—	T20

If no key groove is required, select T=L.

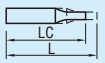
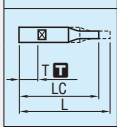
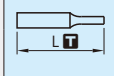
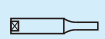
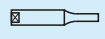
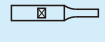
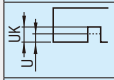
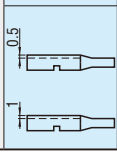
Days to Ship Quotation

Alterations

Catalog No.	L (LC・LCT)	P (PC)	W (WC)	R	T	(BC・KC・KD, etc.)
A—WKAS 8	LC65.5	P6.500			T20	PKC

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧Pmin./2 0.001mm increments P (PC) / Bmax.: 0.500～0.999 / 4; 1.000～1.999 / 13; 2.000～2.999 / 19; 3.000～3.999 / 30; 4.000～5.999 / 40; 6.000～ / 45	Tip dimension change $\frac{PC}{WC} \geqq \frac{P}{W}$ min.$\times\frac{2}{3} \geqq 1.00$ 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P (PC)・W (WC) / Bmax.: 1.000～1.999 / 8; 2.000～2.499 / 13; 2.500～3.999 / 19; 4.000～ / 25	
		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・GC.	—	Quotation
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 Cannot be combined with PRC・GC.	—	
		GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) With lapping, tip edges are rounded. Cannot be used for P≦1.000. Cannot be combined with LKC・LKZ・LCT・PRC・PCC.	—	
		PKC	Tip tolerance change $P^{+0.005}_{0} \Rightarrow {}^{+0.003}_{0}$	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) $P \cdot W^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	
		PKV	Tip tolerance change $P^{+0.005}_{0} \Rightarrow \pm 0.002$ P dimension increment remains the same.	Tip tolerance change $P \cdot W^{+0.01}_{0} \Rightarrow \pm 0.005$ P dimension increment remains the same.	

Price Quotation

Alteration		Code	Ⓐ	DREG	1Code
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).	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).	
			(If combined with LKC・LKZ, 0.01mm increments can be selected.)		
		LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes (▽) are the same as for LC. TKC T dimension tolerance change $T^{+0.05}_{0} \Rightarrow {}^{0}_{-0.02}$ + LC Full length change + Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$		
		LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.01}_{0}$		
Others		KC	—	90°, 0°, 180°, 270° Key flat position change 1° increments	Quotation
		NKC	—	No key flat	
		KD	—	90°, 0°, 180°, 270° Key groove position change 1° increments	
		WKD	Addition of double key grooves in parallel	Double key grooves in parallel. Can be combined with KD.	
		TKC	T dimension tolerance change $T^{+0.05}_{0} \Rightarrow {}^{0}_{-0.02}$		
		UK	Key groove depth change Cannot be used for D3. D / UK: 4・5 / 0.7; 6 / 1.2; 8～16 / 1.7		
		SKC	Single key flat on shank $\frac{D}{2}-0.5^{\ 0}_{-0.01}$ $\frac{D}{2}-1^{\ 0}_{-0.01}$ Ⓐ: ・D3～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) Cannot be combined with KC・KD・WKD.	DREG	

■Fixing keys for punches with key grooves
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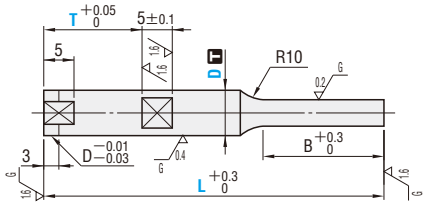
PSKB PSKBH 
PSKS PSKJ 
PSK PSKP PSKH 
PSKW 

CARBIDE PUNCHES WITH KEY GROOVES

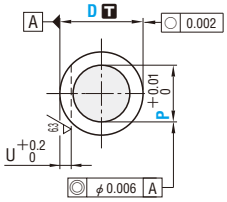
—TiCN COATING—

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from tip shapes A ~ G in the figure below.
—TiCN coating— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ~ 89HRA Surface 3000HV	H—WK	A D R E G	S L	
		Super fine grain (HIP) 90 ~ 92HRA Surface 3000HV	H—WXK (D3 ~ 6)			
	$D^{+0.005}_{0}$	V30 (HIP) 88 ~ 89HRA Surface 3000HV	AH—WK			
		Super fine grain (HIP) 90 ~ 92HRA Surface 3000HV	AH—WXK (D3 ~ 6)			

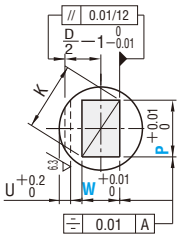
Tip length (B) L>S

The tip end is ground before the coating is applied.

Tip shape A



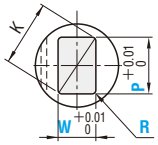
Tip shape D



P≧W

K=$\sqrt{P^2+W^2}$

Tip shape R

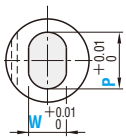


P≧W

0.15≦R<$\frac{W}{2}$

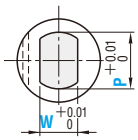
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.01mm increments Ⓡ R	0.1mm increments T	B	U Key groove depth
(D_{m5}) H—WK	A D R E G	S	3	40 50 60 70	1.00 ~ 2.99	—	—	0.15≦R<$\frac{W}{2}$ (Ⓡ only)	T≧5.0	8	0.5
			4	40 50 60 70	1.00 ~ 3.99	3.97	1.50				
			5	40 50 60 70	2.00 ~ 4.99	4.97	1.50				1.0
H—WXK (D3 ~ 6)			6	40 50 60 70	2.00 ~ 5.99	5.97	1.50				
			8	(40) 50 60 70 80	3.00 ~ 7.99	7.97	2.00			13	1.5
			10	(40) 50 60 70 80	3.00 ~ 9.99	9.97	2.50				
			13	(40) 50 60 70 80	6.00 ~ 12.99	12.97	3.00				
			16	(40) 50 60 70 80	10.00 ~ 15.99	15.97	4.00			19	
($D^{+0.005}_{0}$) AH—WK		L	3	50 60	1.00 ~ 2.99	—	—			13	0.5
			4	50 60 70	1.00 ~ 3.99	3.97	2.00				
			5	50 60 70	2.00 ~ 4.99	4.97	2.00				1.0
AH—WXK (D3 ~ 6)			6	50 60 70	2.00 ~ 5.99	5.97	2.00				
			8	50 60 70 80	3.00 ~ 7.99	7.97	2.50			19	1.5
			10	50 60 70 80	3.00 ~ 9.99	9.97	2.50				
			13	50 60 70 80	6.00 ~ 12.99	12.97	3.00				
			16	60 70 80	10.00 ~ 15.99	15.97	4.00			25	

L (40)···B=8 If full length is (40), tip length is 8mm in all cases.

If no key groove is required, select T=L.

Order

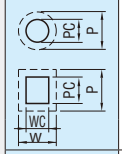
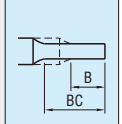
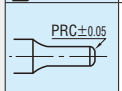
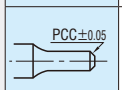
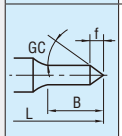
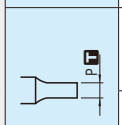
Catalog No.	L	P	W	R (Ⓡ) only	T
H—WKAS 8	70	P6.50			T20

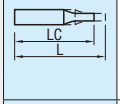
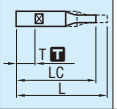
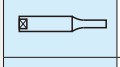
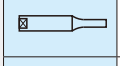
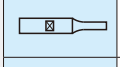
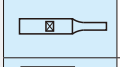
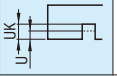
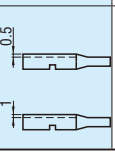
If no key groove is required, select T=L.

Days to Ship: Quotation

Alterations

Catalog No. — L(LC・LCT) — P(PC) — W(WC) — R — T — (BC・KC・KD, etc.)
H—WKAS 8 — LC65.5 — P6.50 — T20 — TKC

Alteration		Code	Ⓐ	DREG	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.) ⊗ Cannot be used for D3・4. P(PC) / Bmax. 1.000 ～ 1.999 / 13 2.000 ～ 2.999 / 19 3.000 ～ 3.999 / 30 4.000 ～ / 40	Tip dimension change $\frac{PC}{WC}$ ≧$\frac{P}{W}$min.×$\frac{2}{3}$ ≧1.00 0.01mm increments P(PC)・W(WC) / Bmax. 1.00 ～ 1.99 / 8 2.00 ～ 2.49 / 13 2.50 ～ 3.99 / 19 4.00 ～ / 25	Quotation
		BC	Tip length change 2≦BC≦Bmax.≦L/2 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.	
		SC	Tip roughness change 0.2G ⇨ 0.08GL The base material is finished before the coating is applied.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	—	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.	—	
		GC	20°≦GC＜90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) Ⓨ If combined with SC, tip edges are rounded. ⊗ Cannot be used for P≦1.00. ⊗ Cannot be combined with LKC・LCT・PRC・PCC.	—	
		PKC	Tip tolerance change P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓨ P dimension can be selected in 0.001mm increments. ⊗ Cannot be used for D16.	—	
		PKV	Tip tolerance change P $^{+0.01}_{0}$ ⇨±0.005 Ⓨ P dimension increment remains the same.	—	

Alteration		Code	Ⓐ	DREG	1Code
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, 0.01 mm 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).	Quotation
		LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓨ) are the same as for LC. TKC: T dimension tolerance change T $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ + LC: Full length change Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
Others		KC	—	90°, 0°, 180°, 270° Key flat position change 1° increments	Quotation
		NKC	—	No key flat	
		KD	—	90°, 0°, 180°, 270° Key groove position change 1° increments	
		WKD	Addition of double key grooves in parallel	Double key grooves in parallel. Can be combined with KD.	
		TKC	T dimension tolerance change T $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		
		UK	Key groove depth change ⊗ Cannot be used for D3. D / UK 4・5 / 0.7 6 / 1.2 8 ～ 16 / 1.7		
		SKC	Single key flat on shank Ⓐ $\frac{D}{2}-0.5\,^{0}_{-0.01}$ ・D3～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) $\frac{D}{2}-1\,^{0}_{-0.01}$ ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・KD・WKD.	DREG	

Price Quotation

■Fixing keys for punches with key grooves

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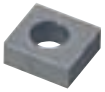
PSKB
PSKBH

PSKS
PSKJ

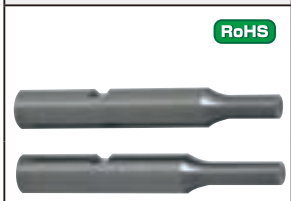
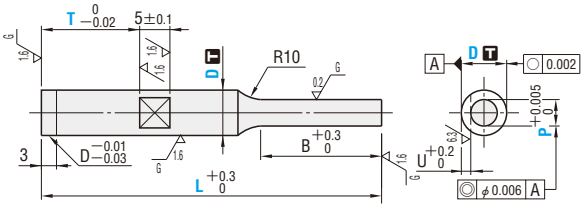
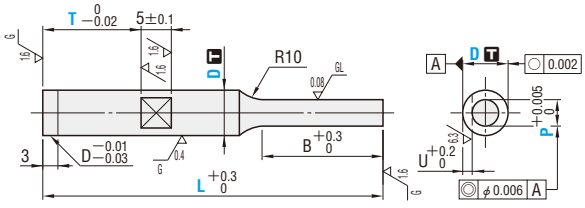
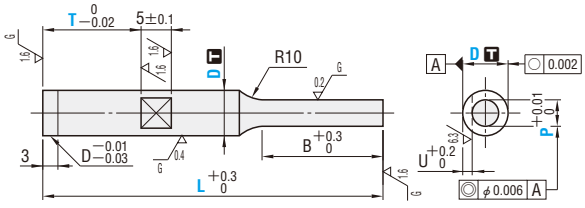
PSK
PSKP
PSKH



PSKW

CARBIDE PUNCHES WITH KEY GROOVES

—MINUS D TOLERANCE—

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
 RoHS	D$^{-0.001}_{-0.006}$	V30 (HIP) 88 ～ 89HRA	B—WKAS B—WKAL	 Tip length (B) L＞S
		Super fine grain (HIP) 90 ～ 92HRA	B—WXKAS B—WXKAL (D3 ～ 6)	
—Lapping— RoHS 	D$^{-0.001}_{-0.006}$	V30 (HIP) 88 ～ 89HRA	BL—WKAS BL—WKAL	 Tip length (B) L＞S
		Super fine grain (HIP) 90 ～ 92HRA	BL—WXKAS BL—WXKAL (D3 ～ 6)	
—TiCN coating— RoHS 	D$^{-0.001}_{-0.006}$	V30 (HIP) 88 ～ 89HRA Surface 3000HV	BH—WKAS BH—WKAL	 ℗ The tip end is ground before the coating is applied. Tip length (B) L＞S
		Super fine grain (HIP) 90 ～ 92HRA Surface 3000HV	BH—WXKAS BH—WXKAL (D3 ～ 6)	

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.1mm increments T	B	U Key groove depth
B—WK B—WXK (D3 ～ 6) —Lapping— BL—WK BL—WXK (D3 ～ 6) —TiCN coating— BH—WK BH—WXK (D3 ～ 6)	Ⓐ	S	3	40 50 60	1.000 ～ 2.990	T≧5.0	8	0.5
			4	40 50 60 70	1.000 ～ 3.990			
			5	40 50 60 70	2.000 ～ 4.990			1.0
			6	40 50 60 70	2.000 ～ 5.990			
			8	(40) 50 60 70 80	3.000 ～ 7.990		13	1.5
			10	(40) 50 60 70 80	3.000 ～ 9.990			
			13	(40) 50 60 70 80	6.000 ～ 12.990			
			16	(40) 50 60 70 80	10.000 ～ 15.990		19	
		L	3	50 60	1.000 ～ 2.990		13	0.5
			4	50 60 70	1.000 ～ 3.990			
			5	50 60 70	2.000 ～ 4.990			1.0
			6	50 60 70	2.000 ～ 5.990			
			8	50 60 70 80	3.000 ～ 7.990		19	1.5
			10	50 60 70 80	3.000 ～ 9.990			
			13	50 60 70 80	6.000 ～ 12.990			
			16	60 70 80	10.000 ～ 15.990		25	

℗ With TiCN coating, P dimension can be selected in 0.01mm increments. (If used with PKC alteration, 0.001mm increments can be selected.)
℗ If no key groove is required, select T=L.
℗ L (40)⋯B=8 If full length is (40), tip length is 8mm in all cases.

Order

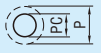
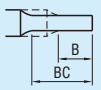
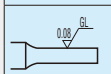
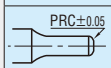
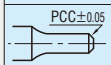
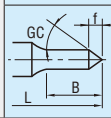
Catalog No.	—	L	—	P	—	T
B—WKAS 8	—	70	—	P6.500	—	T20

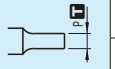
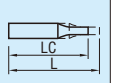
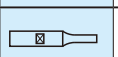
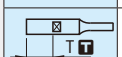
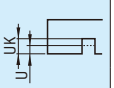
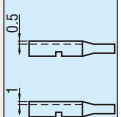
If no key groove is required, select T=L.

Days to Ship Quotation

Alterations

Catalog No.	—	L(LC)	—	P(PC)	—	T	—	(BC・WKD, etc.)
B—WKAS 8	—	LC65.5	—	P6.500	—	T20	—	PKC

Alteration		Code	Spec.	1Code
Alterations to tip		PC	Tip dimension change PC≧Pmin./2 With coating PC≧Pmin./2≧1.00 0.001mm increments P(PC) / Bmax.: 0.500～0.999 / 4; 1.000～1.999 / 13; 2.000～2.999 / 19; 3.000～3.999 / 30; 4.000～5.999 / 40; 6.000～ / 45	
		BC	Tip length change 2≦BC≦Bmax. With coating 2≦BC≦Bmax.≦L/2 0.1mm increments Full length L must be at least 25mm longer than tip length BC.	Quotation
		SC	Tip roughness change 0.2G ⇨ 0.08GL Can be only used with coating. The base material is finished before the coating is applied.	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.	
		GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) If combined with lapping or SC, edges are rounded. ⊗ Cannot be used for P≦1.000. ⊗ Cannot be combined with LKC・LKZ・PRC・PCC.	

Alteration		Code	Spec.	1Code
Alterations to tip		PKC	Tip tolerance change Normal・lapping $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ Coating $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	
		PKV	Tip tolerance change P dimension increment remains the same. Normal・lapping $P^{+0.005}_{0}$ ⇨ ±0.002 Coating $P^{+0.01}_{0}$ ⇨ ±0.005	
Alterations to full length		LC	Full length change 25+B(BC)≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).	
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	Quotation
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used with TiCN coating.	
Alterations to key groove		WKD	Addition of double key grooves in parallel	
		RTC	T dimension tolerance change $T^{0}_{-0.02}$ ⇨ $^{+0.05}_{0}$	
		UK	Key groove depth change D / UK: 4・5 / 0.7; 6 / 1.2; 8～16 / 1.7 ⊗ Cannot be used for D3.	
Shank		SKC	Single key flat on shank Ⓐ ・D3～6 P≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 (Machining width 1) ⊗ Cannot be combined with WKD.	

Price Quotation

■Fixing keys for punches with key grooves
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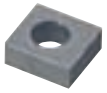
PSKB PSKBH

PSKS PSKJ

PSK PSKP PSKH



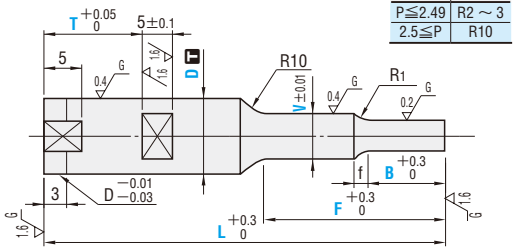
PSKW

CARBIDE DOUBLE-STEPPED PUNCHES WITH KEY GROOVES
—NORMAL・TiCN COATING—

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Catalog No. Tip shape
RoHS  —TiCN coating—  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ～ 89HRA	WKTW TiCN coating H—WKTW	A D R E G
		Super fine grain (HIP) 90 ～ 92HRA (D3 ～ 6)	WXKTW TiCN coating H—WXKTW	
	$D^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	A—WKTW TiCN coating AH—WKTW	
		Super fine grain (HIP) 90 ～ 92HRA (D3 ～ 6)	A—WXKTW TiCN coating AH—WXKTW	

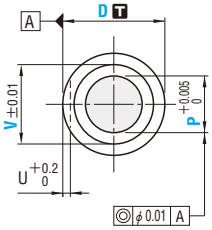
The tip shape can be selected from tip shapes A ～ G in the figure below.

P	R_1
P≦2.49	R2 ～ 3
2.5≦P	R10

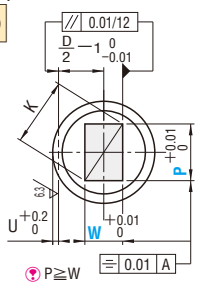


The tip end of a TiCN coating punch is ground before the coating is applied.

Tip shape A

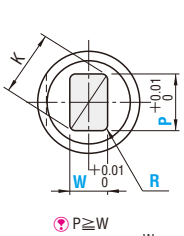


Tip shape D



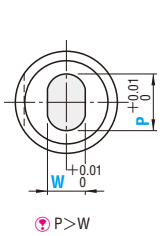
P≧W
K=$\sqrt{P^2+W^2}$

Tip shape R



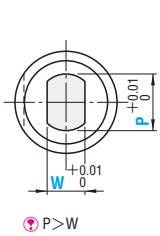
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	D	L (Selection)	0.001mm increments / 0.1mm increments Ⓐ P	Ⓐ B	Diagonal Kmax.	0.01mm increments D R E G P・W	0.01mm increments R	0.1mm increments D R E G B	0.01mm increments V	0.1mm increments F	T	U
(Dm5) WKTW WXKTW (D3 ～ 6) Coating TiCN coating H—WKTW H—WXKTW (D3 ～ 6) ($D^{+0.005}_{0}$) A—WKTW A—WXKTW (D3 ～ 6) Coating TiCN coating AH—WKTW AH—WXKTW (D3 ～ 6)	A D R E G	3	40・50・60	0.500 ～ 0.749	2.0 ～ 5.0	2.96	1.00 ～ 1.99	0.15≦R<$\frac{W}{2}$ (R only)	2.0 ～ 8.0	Round: D>V>P+0.01 V≧1.00 Shaped: D>V>(P,K)+0.03 V≧1.00	Round: B+f+2<F≦Fmax. Shaped: B+f+3.5<F≦Fmax. & Round: F≦L−25 Shaped: F≦L−30	T≧5	0.5
				0.750 ～ 0.999	2.0 ～ 8.0								
				1.000 ～ 1.999	2.0 ～ 13.0		2.00 ～ 2.49		2.0 ～ 13.0				
				2.000 ～ 2.980	2.0 ～ 19.0		2.50 ～ 2.96		2.0 ～ 19.0				
		4	40・50・60・70	0.500 ～ 0.749	2.0 ～ 5.0	3.96	1.00 ～ 1.99		2.0 ～ 8.0				
				0.750 ～ 0.999	2.0 ～ 8.0								
				1.000 ～ 1.999	2.0 ～ 13.0		2.00 ～ 2.49		2.0 ～ 13.0				
				2.000 ～ 2.999	2.0 ～ 19.0		2.50 ～ 3.96		2.0 ～ 19.0				
				3.000 ～ 3.980	2.0 ～ 30.0		2.50 ～ 3.96		2.0 ～ 19.0				
		5	40・50・60・70	1.000 ～ 1.999	2.0 ～ 13.0	4.96	1.00 ～ 1.99		2.0 ～ 8.0				
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0				
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0				
				4.000 ～ 4.980	2.0 ～ 40.0		4.00 ～ 4.96		2.0 ～ 25.0				
		6	40・50・60・70	1.000 ～ 1.999	2.0 ～ 13.0	5.96	1.00 ～ 1.99		2.0 ～ 8.0				1.0
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0				
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0				
				4.000 ～ 5.980	2.0 ～ 40.0		4.00 ～ 5.96		2.0 ～ 25.0				
		8	40・50・60・70・80	1.500 ～ 1.999	2.0 ～ 13.0	7.96	1.40 ～ 1.99		2.0 ～ 8.0				
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0				
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0				
				4.000 ～ 5.999	2.0 ～ 40.0		4.00 ～ 7.96		2.0 ～ 25.0				
				6.000 ～ 7.980	2.0 ～ 45.0		4.00 ～ 7.96		2.0 ～ 25.0				
		10	40・50・60・70・80	1.500 ～ 1.999	2.0 ～ 13.0	9.96	1.70 ～ 1.99		2.0 ～ 8.0				1.5
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0				
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0				
				4.000 ～ 5.999	2.0 ～ 40.0		4.00 ～ 9.96		2.0 ～ 25.0				
				6.000 ～ 9.980	2.0 ～ 45.0		4.00 ～ 9.96		2.0 ～ 25.0				
		13	40・50・60・70・80	3.000 ～ 3.999	2.0 ～ 30.0	12.96	2.00 ～ 2.49		2.0 ～ 13.0				
				4.000 ～ 5.999	2.0 ～ 40.0		2.50 ～ 3.99		2.0 ～ 19.0				
				6.000 ～ 12.980	2.0 ～ 45.0		4.00 ～ 12.96		2.0 ～ 25.0				
		16	40・50・60・70・80	4.000 ～ 5.999	2.0 ～ 40.0	15.96	2.70 ～ 3.99		2.0 ～ 19.0				
				6.000 ～ 15.980	2.0 ～ 45.0		4.00 ～ 15.96		2.0 ～ 25.0				

V	Fmax.
1.00 ～ 1.99	19
2.00 ～ 2.99	30
3.00 ～ 3.99	40
4.00 ～ 5.99	45
6.00 ～	45

For **f**, refer to the punch R length in [Products Data] on P.1066 and verify the following.
Round punch: (V−P)/2=X
Shaped punch: (V−W)/2=X

For TiCN coating, P min. is 1.00mm.
P dimension increments···→With TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

Order

Catalog No.	L	P	W	B	V	F	R (Ⓡ only)	T
WKTWA 10	80	P9.500		B25	V9.80	F40		T20
A—WKTWR13	80	P10.50	W7.34	B10	V12.00	F30	R0.5	T25

If no key groove is required, select T=L.

Days to Ship Quotation

Alterations

Catalog No.	L (LC・LCT・LMT)	P	W	B	V	F	R	T	(HC・TC・KC, etc.)
WKTWA 10	LC72	P4.800		B10	V6.80	F40		T20	

Alterations to tip

Alteration	Code	Ⓐ	DREG	1Code
PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓡ PRC≦(P−0.2)/2 Ⓧ Cannot be combined with PCC・GC.	—	
PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓡ PCC≦(P−0.2)/2 Ⓧ Cannot be combined with PRC・GC.	—	
GC, f, L, B	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≦1.000. Ⓧ Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.	—	Quotation
0.08, GL	SC	Tip roughness change 0.2G ⇨ 0.08GL		
P, W	PKC	Tip tolerance change Normal $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ Coating $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓧ Coating cannot be used for D16.	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) $P・W^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓧ Cannot be used with coating.	
	PKV	Tip tolerance change Normal $P^{+0.005}_{0}$ ⇨ ±0.002 Coating $P^{+0.01}_{0}$ ⇨ ±0.005 Ⓡ P dimension increment remains the same.	Tip tolerance change $P・W^{+0.01}_{0}$ ⇨ ±0.005 Ⓧ Cannot be used with coating Ⓡ P dimension increment remains the same.	
V	VKC	V dimension tolerance change $V^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ V dimension can be selected in 0.001mm increments. Ⓧ Cannot be used with TiCN coating.	V dimension tolerance change V±0.01⇨±0.005	

Alterations to full length

Alteration	Code	Ⓐ	DREG	1Code
LC, L	LC	Full length change 25+F≦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).	Full length change 30+F≦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).	
		(If combined with LKC・LKZ, 0.01mm increments can be selected.)		
T, LC, L	LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. TKC: T dimension tolerance change $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ LC: + Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
L, T	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
	LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ Ⓧ Cannot be used with TiCN coating.		

Others

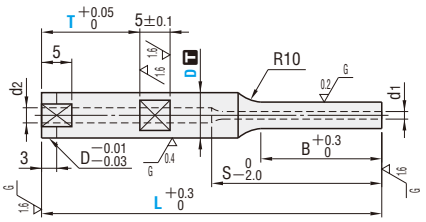
Alteration	Code	Ⓐ	DREG	1Code
	KC	—	90°, 0°, 180°, 270° Key flat position change 1° increments	Quotation
	NKC	—	No key flat	
	KD	—	90°, 0°, 180°, 270° Key groove position change 1° increments	
	WKD	Addition of double key grooves in parallel	Double key grooves in parallel Can be combined with KD.	
T	TKC	T dimension tolerance change $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		
UK, L	UK	Key groove depth change Ⓧ Cannot be used for D3.	D: 4・5 / 6 / 8～16 UK: 0.7 / 1.2 / 1.7	
0.5, 1	SKC	Single key flat on shank $\frac{D}{2}-0.5\ ^{0}_{-0.01}$ $\frac{D}{2}-1\ ^{0}_{-0.01}$ Ⓧ Cannot be combined with KC・KD・WKD.	Ⓐ ・D3～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1)	

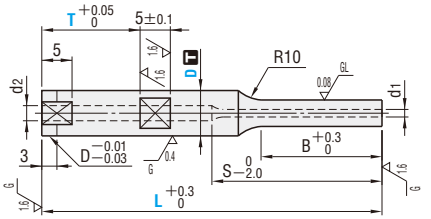
Price Quotation

CARBIDE PUNCHES WITH KEY GROOVES AND AIR HOLES

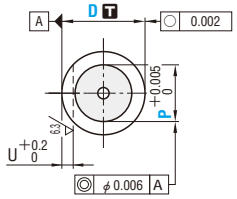
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ～ 89HRA	WJK	A D R E G	S
		Super fine grain (HIP) 90 ～ 92HRA	WXJK (D4 ～ 6)		
	$D^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	A—WJK		
		Super fine grain (HIP) 90 ～ 92HRA	A—WXJK (D4 ～ 6)		
—Lapping— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ～ 89HRA	L—WJK		L
		Super fine grain (HIP) 90 ～ 92HRA	L—WXJK (D4 ～ 6)		
	$D^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	AL—WJK		Tip length (B) L>S
		Super fine grain (HIP) 90 ～ 92HRA	AL—WXJK (D4 ～ 6)		

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

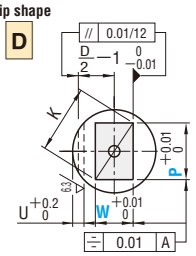




Tip shape A



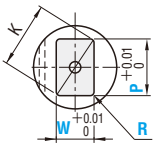
Tip shape D



P≧W

$K=\sqrt{P^2+W^2}$

Tip shape R

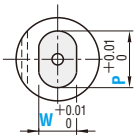


P≧W

$0.15 \leqq R < \frac{W}{2}$

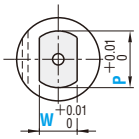
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	R R	T	B	d_1	S	d_2	U Key groove depth
(D_{m5}) ($D^{+0.005}_{0}$) WJK A—WJK WXJK A—WXJK (D4 ～ 6) (D4 ～ 6)	A D R E G	S	4	40 50 60	1.500 ～ 3.990	3.97	1.50	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	T≧5.0	8	0.5	20	1.2	0.5
			5	40 50 60 70	2.000 ～ 4.990	4.97	2.00				0.8		2.1	
			6	40 50 60 70	2.000 ～ 5.990	5.97	2.00						2.6	1.0
			8	(40) 50 60 70 80	3.000 ～ 7.990	7.97	3.00			13	1.2	27	3.4	1.5
			10	(40) 50 60 70 80	3.000 ～ 9.990	9.97	3.00				1.6	28	4.4	
			13	(40) 50 60 70 80	6.000 ～ 12.990	12.97	6.00				1.9			
			16	(40) (50) 60 70 80	10.000 ～ 15.990	15.97	6.00			19	2.9	36		
—Lapping— L—WJK AL—WJK L—WXJK AL—WXJK (D4 ～ 6) (D4 ～ 6)		L	4	50 60	1.500 ～ 3.990	3.97	2.00			13	0.5	20	1.2	0.5
			5	50 60 70	2.000 ～ 4.990	4.97	2.00				0.8		2.1	
			6	50 60 70	2.000 ～ 5.990	5.97	2.00						2.6	1.0
			8	50 60 70 80	3.000 ～ 7.990	7.97	3.00			19	1.2	27	3.4	1.5
			10	50 60 70 80	3.000 ～ 9.990	9.97	3.00				1.6	28	4.4	
			13	50 60 70 80	6.000 ～ 12.990	12.97	6.00				1.9			
			16	60 70 80	10.000 ～ 15.990	15.97	6.00			25	2.9	36		

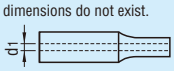
Ⓡ If L is (40) or (50), tip length B and S dimension are as follows.

D \ L	(40)
8 ～ 16	B=8 S=17

D \ L	(50)
16	B=13 S=24

Ⓡ If no key groove is required, select T=L.

Ⓡ Air hole of super fine grain type is straight. S and d_2 dimensions do not exist.



Order

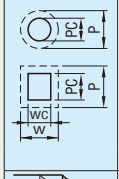
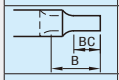
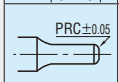
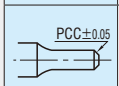
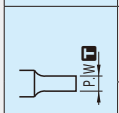
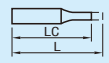
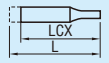
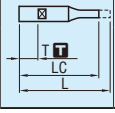
Catalog No.	L	P	W	R (Ⓡ) only	T
A—WJKEL16	70	P12.00	W6.00		T20

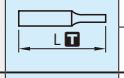
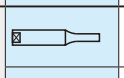
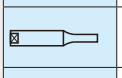
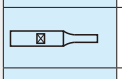
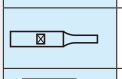
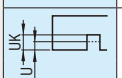
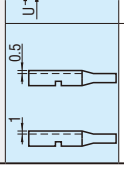
Ⓡ If no key groove is required, select T=L.

Days to Ship: Quotation

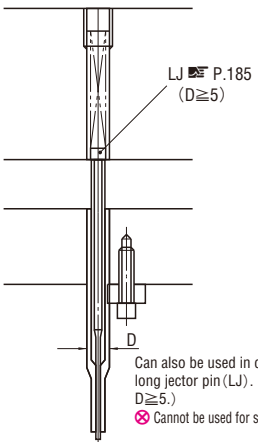
Alterations

Catalog No.	L (LC・LCX・LCT)	P (PC)	W (WC)	R	T	(BC・KC・KD, etc.)
A—WJKEL16	LC65.5	P12.00	W6.00		T20	PKC

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.001mm increments D / PCmin.: 5 / 1.800; 6 / 1.800; 8 / 2.300; 10 / 2.800; 13 / 5.000; 16 / 8.000 ⊗ Cannot be used for D4.	Tip dimension change PC, WC≧PC・WCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) D / PC・WCmin.: 5 / 1.80; 6 / 1.80; 8 / 2.50; 10 / 2.80; 13 / 5.00; 16 / 5.00 ⊗ Cannot be used for D4.	
		BC	Tip length change 2≦BC＜B 0.1mm increments		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments (P) PRC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments (P) PCC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PRC.	——	Quotation
		PKC	Tip tolerance change P +0.005 0 ⇨ +0.003 0	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) P・W +0.01 0 ⇨ +0.005 0	
		PKV	Tip tolerance change P +0.005 0 ⇨ ±0.002 (P) P dimension increment remains the same.	Tip tolerance change P・W +0.01 0 ⇨ ±0.005 (P) P dimension increment remains the same.	
Alterations to full length		LC	Full length change LC＜L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) (P) B and S dimensions are shortened accordingly.		
		LCX	Full length change with the same tip length B 25+B(BC)≦LCX＜L 0.1mm increments (P) If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).	Full length change with the same tip length B 30+B(BC)≦LCX＜L 0.1mm increments (P) If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
		LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKC: T dimension tolerance change T +0.05 0 ⇨ 0 −0.02 ＋ LC: Full length change ＋ Full length tolerance change L +0.3 0 ⇨ +0.1 0		

Alteration		Code	Ⓐ	DREG	1Code
Alterations to full length		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0		
Others		KC	——	Key flat position 0°, 90°, 180°, 270° change 1° increments	
		NKC	——	No key flat	
		KD	——	Key groove 0°, 90°, 180°, 270° position change 1° increments	Quotation
		WKD	Addition of double key grooves in parallel	Double key grooves in parallel. Can be combined with KD.	
		TKC	T dimension tolerance change T +0.05 0 ⇨ 0 −0.02		
		UK	Key groove depth change D / UK: 4・5 / 0.7; 6 / 1.2; 8 ～ 16 / 1.7 (P) Can be used for super fine grain types only.		
		SKC	Single key flat on shank Ⓐ DREG ・D4～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・KD・WKD.		

Example



Can also be used in combination with a long jector pin (LJ). (Can be used for D≧5.)
⊗ Cannot be used for super fine grain types.

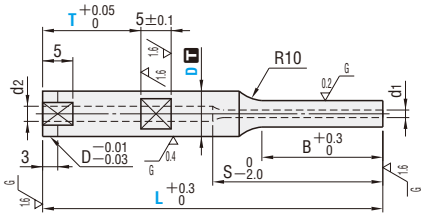
Price Quotation

CARBIDE PUNCHES WITH KEY GROOVES AND AIR HOLES
—TiCN COATING—

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
—TiCN coating— RoHS	D_{m5}	V30 (HIP) 88 ～ 89HRA Surface 3000HV	H—WJK	A D R E G	S
		Super fine grain (HIP) 90 ～ 92HRA Surface 3000HV	H—WXJK (D4 ～ 6)		
	$D^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA Surface 3000HV	AH—WJK		L
		Super fine grain (HIP) 90 ～ 92HRA Surface 3000HV	AH—WXJK (D4 ～ 6)		Tip length (B) L>S

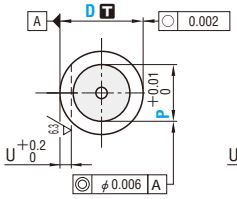
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

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

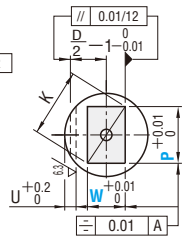


The tip end is ground before the coating is applied.

Tip shape A



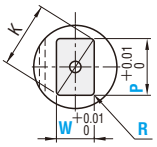
Tip shape D



P≧W

$K=\sqrt{P^2+W^2}$

Tip shape R

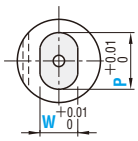


P≧W

$0.15 \leqq R < \frac{W}{2}$

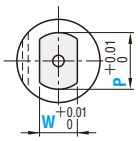
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	0.1mm increments T	B	d_1	S	d_2	U Key groove depth
(D_{m5}) H—WJK	A D R E G	S	4	40 50 60	1.50 ～ 3.99	3.97	1.50	0.15≦R<W/2 (Ⓡ only)	T≧5.0	8	0.5	20	1.2	0.5
H—WXJK (D4 ～ 6)			5	40 50 60 70	2.00 ～ 4.99	4.97	2.00				0.8		2.1	
			6	40 50 60 70	2.00 ～ 5.99	5.97	2.00						2.6	1.0
			8	(40) 50 60 70 80	3.00 ～ 7.99	7.97	3.00			13	1.2	27	3.4	1.5
			10	(40) 50 60 70 80	3.00 ～ 9.99	9.97	3.00				1.6	28	4.4	
			13	(40) 50 60 70 80	6.00 ～ 12.99	12.97	6.00				1.9			
			16	(40) (50) 60 70 80	10.00 ～ 15.99	15.97	6.00			19	2.9	36		
($D^{+0.005}_{0}$) AH—WJK		L	4	50 60	1.50 ～ 3.99	3.97	2.00			13	0.5	20	1.2	0.5
AH—WXJK (D4 ～ 6)			5	50 60 70	2.00 ～ 4.99	4.97	2.00				0.8		2.1	
			6	50 60 70	2.00 ～ 5.99	5.97	2.00						2.6	1.0
			8	50 60 70 80	3.00 ～ 7.99	7.97	3.00			19	1.2	27	3.4	1.5
			10	50 60 70 80	3.00 ～ 9.99	9.97	3.00				1.6	28	4.4	
			13	50 60 70 80	6.00 ～ 12.99	12.97	6.00				1.9			
			16	60 70 80	10.00 ～ 15.99	15.97	6.00			25	2.9	36		

If used with PKC alteration, P dimension can be selected in 0.001mm increments.

If L is (40) or (50), tip length B and S dimension are as follows.

D \ L	(40)
8 ～ 16	B=8 S=17

D \ L	(50)
16	B=13 S=24

Air hole of super fine grain type is straight. S and d_2 dimensions do not exist.

If no key groove is required, select T=L.

Order

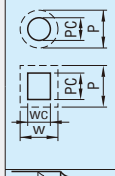
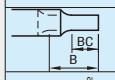
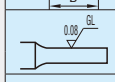
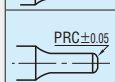
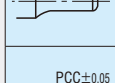
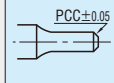
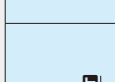
Catalog No.	L	P	W	R (Ⓡ only)	T
H—WJKEL16	70	P12.00	W6.00		T20

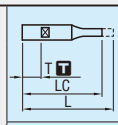
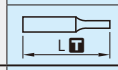
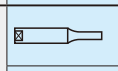
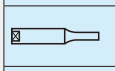
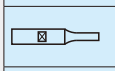
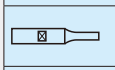
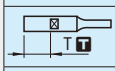
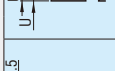
If no key groove is required, select T=L.

Days to Ship: Quotation

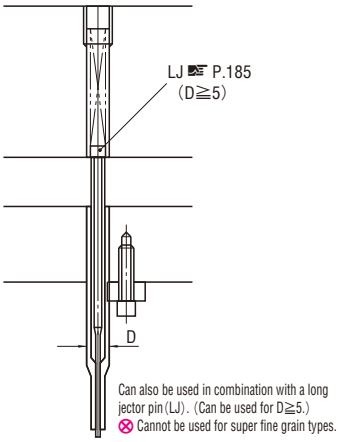
Alterations

Catalog No.	L(LC・LCX・LCT)	P(PC)	W(WC)	R	T	(BC・KC・LKC, etc.)
H—WJKEL16	LC65.5	P12.00	W6.00		T20	TKC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) ⊗ Cannot be used for D4. D: 5, 6, 8, 10, 13, 16 PCmin.: 1.800, 1.800, 2.300, 2.800, 5.000, 8.000	Tip dimension change PC・WC≧PC・WCmin. 0.01mm increments ⊗ Cannot be used for D4. D: 5, 6, 8, 10, 13, 16 PC・WCmin.: 1.80, 1.80, 2.50, 2.80, 5.00, 5.00	Quotation
		BC	Tip length change 2≦BC＜B 0.1mm increments		
		SC	Tip roughness change 0.2G ⇨ 0.08GL The base material is finished before the coating is applied.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PCC.	—	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PRC.	—	
		PKC	Tip tolerance change P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ P dimension can be selected in 0.001mm increments. ⊗ Cannot be used for D16.	—	
		PKV	Tip tolerance change P $^{+0.01}_{0}$ ⇨ ±0.005 P dimension increment remains the same.	—	
Alterations to full length		LC	Full length change LC＜L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) B and S dimensions are shortened accordingly.		
		LCX	Full length change with the same tip length B 25+B(BC)≦LCX＜L 0.1mm increments If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).	Full length change with the same tip length B 30+B(BC)≦LCX＜L 0.1mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
			(If combined with LKC, 0.01mm increments can be selected.)		

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to full length		LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKC T dimension tolerance change T $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ + Full length change + LC Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
Others		KC	—	90°, 0°, 180°, 270° Key flat position change 1° increments	
		NKC	—	No key flat	
		KD	—	90°, 0°, 180°, 270° Key groove position change 1° increments	Quotation
		WKD	Addition of double key grooves in parallel	Double key grooves in parallel. Can be combined with KD.	
		TKC	T dimension tolerance change T $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		
		UK	Key groove depth change D: 4・5, 6, 8～16 UK: 0.7, 1.2, 1.7 Can be used for super fine grain types only.		
		SKC	Single key flat on shank $\frac{D}{2}-0.5\,^{0}_{-0.01}$ $\frac{D}{2}-1\,^{0}_{-0.01}$ Ⓐ ・D4～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・KD・WKD.	D R E G	

Example



Can also be used in combination with a long jector pin (LJ). (Can be used for D≧5.)
⊗ Cannot be used for super fine grain types.

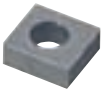
Price Quotation

■Fixing keys for punches with key grooves
P.189

PSKB
PSKBH

PSKS
PSKJ

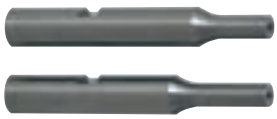
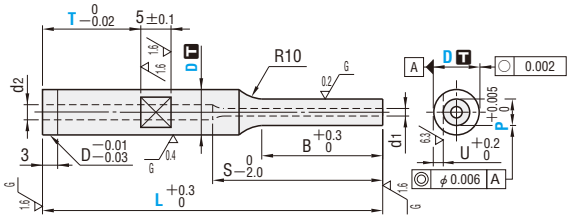
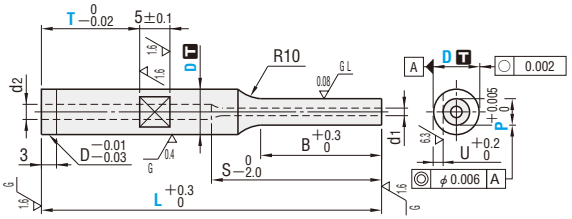
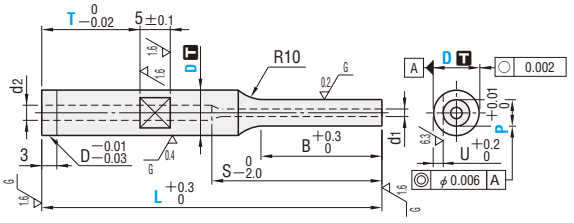
PSK
PSKP
PSKH



PSKW

CARBIDE PUNCHES WITH KEY GROOVES AND AIR HOLES

—MINUS D TOLERANCE—

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
RoHS 	$D^{-0.001}_{-0.006}$	V30 (HIP) 88 ~ 89HRA	B—WJKAS B—WJKAL	 Tip length (B) L>S
		Super fine grain (HIP) 90 ~ 92HRA	B—WXJKAS B—WXJKAL (D4 ~ 6)	
—Lapping— RoHS 	$D^{-0.001}_{-0.006}$	V30 (HIP) 88 ~ 89HRA	BL—WJKAS BL—WJKAL	 Tip length (B) L>S
		Super fine grain (HIP) 90 ~ 92HRA	BL—WXJKAS BL—WJXKAL (D4 ~ 6)	
—TiCN coating— RoHS 	$D^{-0.001}_{-0.006}$	V30 (HIP) 88 ~ 89HRA Surface 3000HV	BH—WJKAS BH—WJKAL	 The tip end is ground before the coating is applied. Tip length (B) L>S
		Super fine grain (HIP) 90 ~ 92HRA Surface 3000HV	BH—WXJKAS BH—WXJKAL (D4 ~ 6)	

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.1mm increments T	B	d_1	S	d_2	U Key groove depth
B—WJK B—WXJK (D4 ~ 6) —Lapping— BL—WJK BL—WXJK (D4 ~ 6) —TiCN coating— BH—WJK BH—WXJK (D4 ~ 6)	Ⓐ	S	4	40 50 60	1.500 ~ 3.990	T≧5.0	8	0.5	20	1.2	0.5
			5	40 50 60 70	2.000 ~ 4.990			0.8		2.1	
			6	40 50 60 70	2.000 ~ 5.990					2.6	1.0
			8	(40) 50 60 70 80	3.000 ~ 7.990		13	1.2	27	3.4	1.5
			10	(40) 50 60 70 80	3.000 ~ 9.990			1.6	28	4.4	
			13	(40) 50 60 70 80	6.000 ~ 12.990			1.9			
			16	(40) (50) 60 70 80	10.000 ~ 15.990		19	2.9	36		
		L	4	50 60	1.500 ~ 3.990		13	0.5	20	1.2	0.5
			5	50 60 70	2.000 ~ 4.990			0.8		2.1	
			6	50 60 70	2.000 ~ 5.990					2.6	1.0
			8	50 60 70 80	3.000 ~ 7.990		19	1.2	27	3.4	1.5
			10	50 60 70 80	3.000 ~ 9.990			1.6	28	4.4	
			13	50 60 70 80	6.000 ~ 12.990			1.9			
			16	60 70 80	10.000 ~ 15.990		25	2.9	36		

Ⓡ With TiCN coating, P dimension can be selected in 0.01mm increments. (If used with PKC alteration, 0.001mm increments can be selected.)

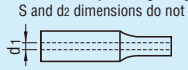
Ⓡ If L is (40) or (50), tip length B and S dimension are as follows.

D \ L	(40)
8 ~ 16	B=8 S=17

D \ L	(50)
16	B=13 S=24

Ⓡ If no key groove is required, select T=L.

Ⓡ Air hole of super fine grain type is straight. S and d_2 dimensions do not exist.



Order

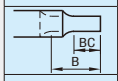
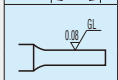
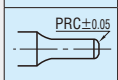
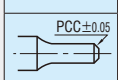
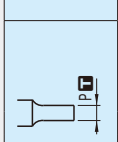
Catalog No.	L	P	T
B—WJKAL16	70	P12.000	T20

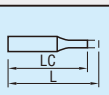
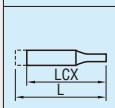
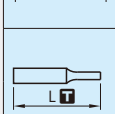
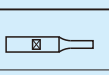
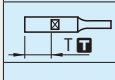
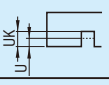
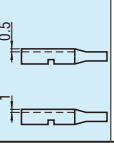
If no key groove is required, select T=L.

Days to Ship Quotation

Alterations

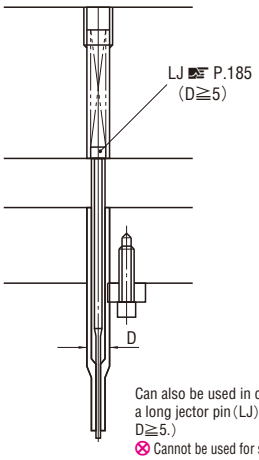
Catalog No.	L(LC・LCX)	P(PC)	T	(BC・WKD, etc.)
B—WJKAL16	LC65.5	P12.000	T20	PKC

Alteration		Code	Spec.	1Code
Alterations to tip		PC	Tip dimension change PC≧PCmin. 0.001mm increments ⊗ Cannot be used for D4. D / PCmin.: 5 / 1.800; 6 / 1.800; 8 / 2.300; 10 / 2.800; 13 / 5.000; 16 / 8.000	Quotation
		BC	Tip length change 2≦BC＜B 0.1mm increments	
		SC	Tip roughness change 6 ⇨ GL Can be only used with coating. The base material is finished before the coating is applied.	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 ⊗ Cannot be combined with PCC.	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 ⊗ Cannot be combined with PRC.	
		PKC	Tip tolerance change Normal・lapping $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ Coating $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	
		PKV	Tip tolerance change (P dimension increment remains the same.) Normal・lapping $P^{+0.005}_{0}$ ⇨ ±0.002 Coating $P^{+0.01}_{0}$ ⇨ ±0.005	

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change LC＜L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) B and S dimensions are shortened accordingly.	Quotation
		LCX	Full length change with the same tip length B 25+B(BC)≦LCX＜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・LKZ, 0.01mm increments can be selected.)	
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used with TiCN coating.	
Alterations to key groove		WKD	Addition of double key grooves in parallel	
		RTC	T dimension tolerance change $T^{0}_{-0.02}$ ⇨ $^{+0.05}_{0}$	
		UK	Key groove depth change D / UK: 4・5 / 0.7; 6 / 1.2; 8 ～ 16 / 1.7 Can be used for super fine grain types only.	
Shank		SKC	Single key flat on shank Ⓐ ・D4 ～ 6 P≦D−1.2 (Machining width 0.5) ・D8 ～ P≦D−2.2 (Machining width 1) ⊗ Cannot be combined with WKD.	

Price Quotation

Example



Can also be used in combination with a long jector pin (LJ). (Can be used for D≧5.)
⊗ Cannot be used for super fine grain types.

Fixing keys for punches with key grooves
P.189

PSKB
PSKBH

PSKS
PSKJ

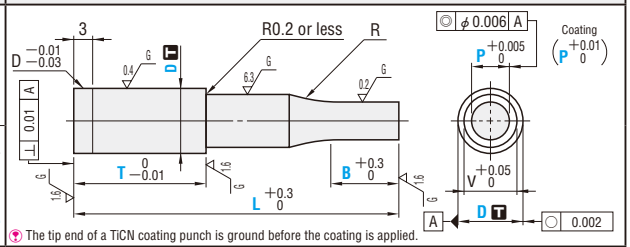
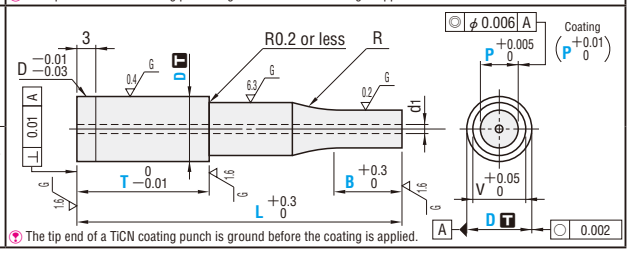
PSK
PSKP
PSKH

PSKW

CARBIDE FLANGE STOPPER PUNCHES

—NORMAL・TiCN COATING—

PRODUCTS DATA P.1094

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
RoHS 	$D^{+0.005}_{0}$	Super fine grain (HIP) 90 ～ 92HRA	WXPHAL TiCN coating H—WXPHAL	
	$D^{-0.001}_{-0.006}$		—Minus D tolerance— B—WXPHAL TiCN coating BH—WXPHAL	
—Air hole type— RoHS 	$D^{+0.005}_{0}$		WXJHAL TiCN coating H—WXJHAL	
	$D^{-0.001}_{-0.006}$		—Minus D tolerance— B—WXJHAL TiCN coating BH—WXJHAL	

The tip end of a TiCN coating punch is ground before the coating is applied.

Catalog No. Type	D	L	0.001mm increments Ⓐ min. P max.	T	1mm increments B	V	d_1	R	Base unit price 1 ～ 4 pieces WXPHAL B—WXPHAL	H—WXPHAL BH—WXPHAL	WXJHAL B—WXJHAL	H—WXJHAL BH—WXJHAL
WXPHAL B—WXPHAL —TiCN coating— H—WXPHAL BH—WXPHAL	4	40 50	0.500 (1.00) ～ 2.000	13 16 20 13 16 20 25	2 ～ 6 2 ～ 6	2	—	2 ～ 3	Quotation			
	5	40 50 60	1.000 ～ 3.000	13 16 20 13 16 20 25	2 ～ 8 2 ～ 8	3		10				
	6	40 50 60 70	1.500 ～ 4.000	13 16 20 13 16 20 25	2 ～ 10 2 ～ 13	4						
	8	40 50 60 70	2.000 ～ 6.000	13 16 20 13 16 20 25	2 ～ 10 2 ～ 13	6						
With air hole WXJHAL B—WXJHAL —TiCN coating— H—WXJHAL BH—WXJHAL	5	40 50 60	1.000 ～ 3.000	13 16 20 13 16 20 25	2 ～ 8 2 ～ 8	3	0.4	10				
	6	40 50 60 70	1.500 ～ 4.000	13 16 20 13 16 20 25	2 ～ 10 2 ～ 13	4	0.5					
	8	40 50 60 70	2.000 ～ 6.000	13 16 20 13 16 20 25	2 ～ 10 2 ～ 13	6	0.8					

P (1.00)…For TiCN coating, Pmin. is 1.00. P dimension increments…For TiCN coating, increments are 0.01mm.

Order

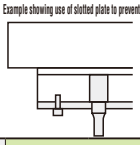
Catalog No.	—	L	—	P	—	T	—	B
WXPHAL4	—	40	—	P0.560	—	T16	—	B3
B—WXPHAL5	—	60	—	P3.000	—	T20	—	B5

Price Quotation

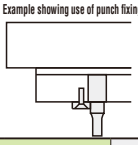
Days to Ship Quotation

Example

Example showing use of slotted plate to prevent loosening of punch



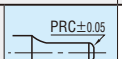
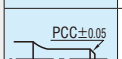
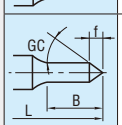
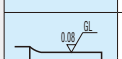
Example showing use of punch fixing key

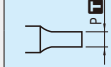
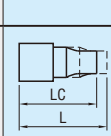
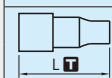


Alterations

Catalog No. — L(LC) — P — T(TC) — B — (LKC・SC, etc.)

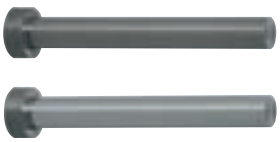
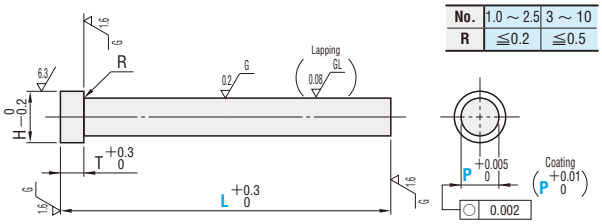
B—WXPHAL 5 — 60 — P3.000 — TC15.0 — B5

Alteration		Code	Spec.	1Code
Alterations to tip		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC. Ⓟ With air hole, PRC≦(P−d_1−0.5)/2	Quotation
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC. Ⓟ With air hole, PCC≦(P−d_1−0.5)/2	
		GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) Ⓟ When used with SC, tip edge are rounded. ⊗ Cannot be used for P≦1.000. ⊗ Cannot be combined with LKC・LKZ・PRC・PCC. ⊗ Cannot be combined with punches with air holes.	
		SC	Tip roughness change 0.2 G ⇨ 0.08 GL Ⓟ With TiCN coating, the base material is finished before the coating is applied.	

Alteration		Code	Spec.	1Code
Alterations to tip		PKC	Tip tolerance change Normal $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ Coating $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Quotation
		PKV	Tip tolerance change (Ⓟ P dimension increment remains the same.) Normal $P^{+0.005}_{0}$ ⇨ ±0.002 Coating $P^{+0.01}_{0}$ ⇨ ±0.005	
Alterations to full length		LC	Full length change 40<LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) Ⓟ If LC<50, T and TC are 20 or less. Ⓟ If LC<50 with D6・8, the allowable range of change for B is 2 ～ 10.	
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used with TiCN coating.	
Head		TC	Dimension T change 13<TC<25 0.1mm increments Ⓟ When L<50, the allowable range of change is 13<TC<20. Ⓟ The full length L remains the same.	

CARBIDE STRAIGHT PUNCHES
—NORMAL・LAPPING・TiCN COATING—

PRODUCTS DATA P.1094

Type	M H	Catalog No.	Shape
RoHS 	V30 (HIP) 88 ～ 89HRA	WPC Lapping L—WPC TiCN coating H—WPC (No.1.6 ～ 10)	
	Super fine grain (HIP) 90 ～ 92HRA	(No.1.6 ～ 6) WXPC Lapping L—WXPC TiCN coating H—WXPC	

No.	1.0 ～ 2.5	3 ～ 10
R	≦0.2	≦0.5

The tip end of a TiCN coating punch is ground before the coating is applied.

Catalog No. Type	No.	L	0.001mm increments Ⓐ min. P max.	H	T	Base unit price 1 ～ 4 pieces WPC	L—WPC	H—WPC	WXPC	L—WXPC	H—WXPC
WPC WXPC (No.1.6 ～ 6) —Lapping— L—WPC L—WXPC (No.1.6 ～ 6) —TiCN coating— H—WPC (No.1.6 ～ 10) H—WXPC (No.1.6 ～ 6)	1.0	20 25 30	0.500 ～ 1.000	2.0	3	Quotation					
	1.6	20 25 30 35	1.000 ～ 1.600	2.6							
	2.0	20 25 30 35 40 50	1.600 ～ 2.000	3.0							
	2.5	20 25 30 35 40 50 60	2.000 ～ 2.500	3.5							
	3	40 50 60	2.000 ～ 3.000	5	5						
	4	40 50 60 70	3.000 ～ 4.000	7							
	5	40 50 60 70	4.000 ～ 5.000	8							
	6	40 50 60 70	5.000 ～ 6.000	9							
	8	40 50 60 70 80	6.000 ～ 8.000	11							
	10	40 50 60 70 80	8.000 ～ 10.000	13							

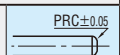
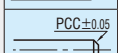
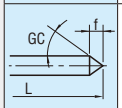
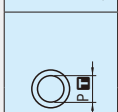
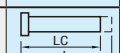
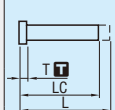
P dimension increments···For TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

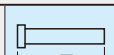
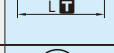
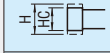
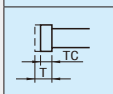
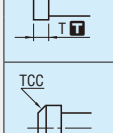
Order Catalog No. — L — P
WPC 2.5 — 40 — P2.050

Days to Ship Quotation

Price Quotation

Alterations Catalog No. — L(LC・LCT・LMT) — P — (HC・TC, etc.)
WPC 2.5 — 40 — P2.050 — PKC

Alteration		Code	Spec.	1Code
Alterations to tip		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.	
		GC	20°≦GC<90° 1° increments f=P/2×tan(90°−GC°) With lapping, tip edges are rounded. ⊗ Cannot be used for P≦1.000. ⊗ Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.	
		PKC	Tip tolerance change Normal・lapping $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ Coating $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Quotation
		PKV	Tip tolerance change (P dimension increment remains the same.) Normal・lapping $P^{+0.005}_{0}$ ⇨ ±0.002 Coating $P^{+0.01}_{0}$ ⇨ ±0.005	
Alterations to full length		LC	Full length change 20≦LC<L 0.1mm increments (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 (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 $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$)	

Alteration		Code	Spec.	1Code
Full length		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be used for No.1.0.	
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used with TiCN coating. ⊗ Cannot be used for No.1.0.	
Alterations to head		KC	Addition of single key flat to head ⊗ Cannot be used for No.1.0 ～ 2.5. ⊗ Cannot be combined with KFC.	Quotation
		WKC	Addition of double key flats in parallel ⊗ Cannot be used for No.1.0 ～ 2.5. ⊗ Cannot be combined with KFC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		HC	Head diameter change P≦HC<H 0.01mm increments ⊗ Cannot be used for No.1.0. For coating, 2.6≦HC<H	
		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 is equal to LC. For coating, 4≦TC<T ⊗ Cannot be used for No.1.0.	
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗ Cannot be used for No.1.0.	
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗ Cannot be used for No.1.0.	
		TCC	Chamfering of head. This improves the strength of the punch head. P.1097 0.1mm increments 0.5≦TCC≦(H−P)/2 If H≦5, then TCC is 0.5. ⊗ Cannot be used for No.1.0.	