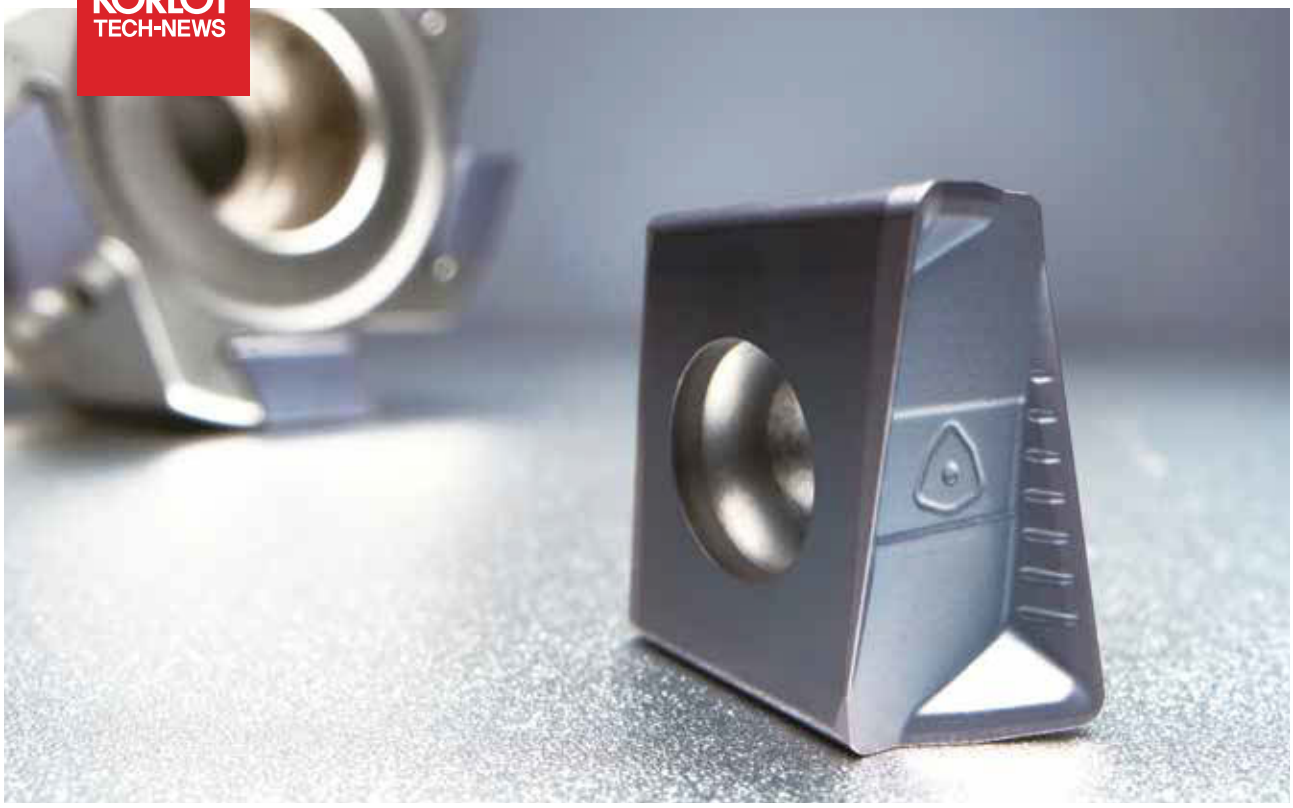
Tangential Double - Sided 4 - Corner Shoulder Milling Tool

TP4P Tangen-Pro series

KORLOY TECH-NEWS



- High depth-of-cut (up to 12 mm) shoulder milling by high helix chip-breaking double-sided inserts.
- Enhanced productivity through strong clamping force of the tangential type and multi-insert application.

KORLOY

KORLOY
TECH-NEWS

Tangential Double-Sided 4-Corner Shoulder Milling Tool

TP4P Tangen-Pro series

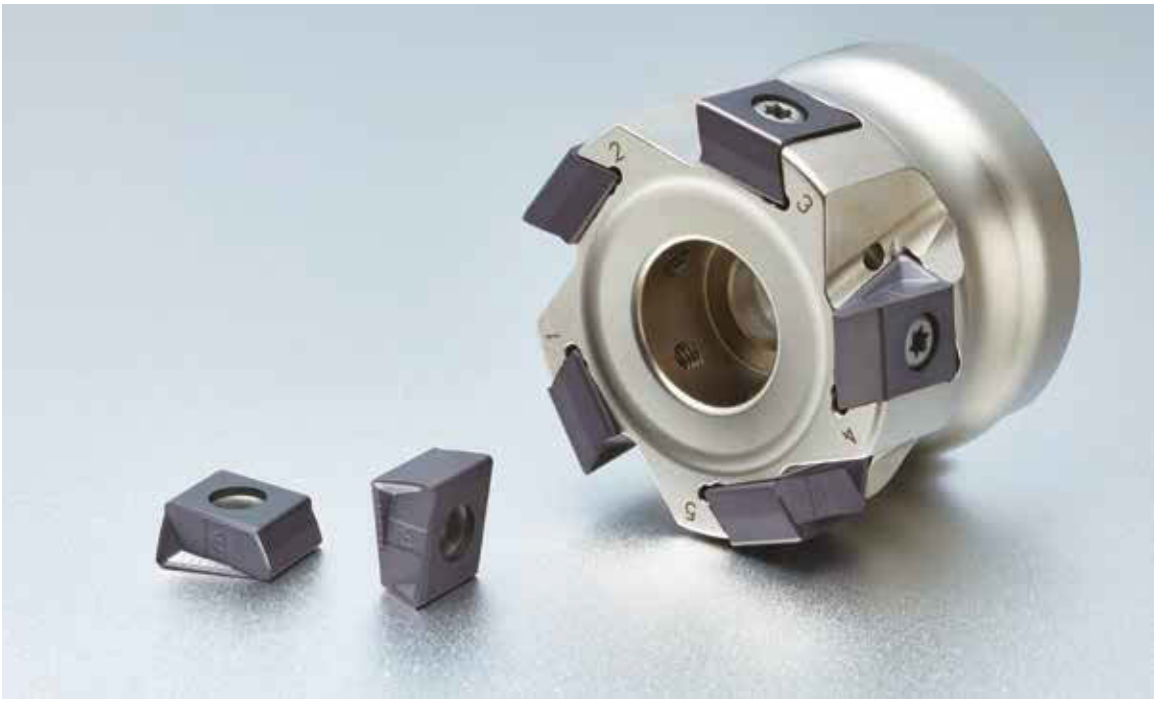
Based on KORLOY's differentiated manufacturing technology, we have launched **Tangen-Pro TP4P**, a tangential double-sided and 4-corner shoulder milling cutter.

Generally, the tangential type makes it easier to secure chip pocket space compared to the radial type, offers excellent clamping stability, and enables multi-insert clamping for the same cutting diameter, resulting in improved productivity through high table feed rates.

TP4P is equipped with the advantages of the tangential type but also features a chip-breaking edge design that effectively reduces vibration and cutting forces, providing superior machinability. Its optimized wide base and side clamping structure maintain strong clamping force even in high-speed/high-feed machining, ensuring stable machining.

In addition, the combination with KORLOY's various specialized grades makes it applicable not only to steel and cast iron but also to various workpieces such as stainless steel and titanium alloys. It demonstrates outstanding performance, especially in roughing.

Thus, TP4P provides over 30% productivity improvement compared to the radial type through high speed / high feed machining by increasing table feed, stable clamping, and a chip-breaking edge.



Excellent cutting performance

- Application of High Helix and Chip-breaking Chip Breakers

Various holder lineup

- Enhanced adaptability through a diverse lineup of holders

Stable clamping

- Ensures wide clamping side

Excellent Economical Efficiency

- Up to 4 usable corners due to double-sided design

Code system

Cutter type (Single-edge)

TP4	P	C	M	063	R	22	6	LN13
TP4 Tangen-Pro	**Approach angle** P: 90˚	**Type** C: Cutter	**Arbor** M: Metric A: Inch None: Asia	**Machining dia.** 063: Ø63 mm	**Oil hole & Hand** R: With oil hole, right-handed NR: Without oil hole, right-handed	**Internal dia.** 22: Ø22 mm	**No. of tooth** 6: 6 Teeth	**Available insert** LN13: LNGX13

Cutter type (Multi-edge)

TP4	P	C	M	050	M	22	4F	47	LN13
TP4 Tangen-Pro	**Approach angle** P: 90˚	**Type** C: Cutter	**Arbor** M: Metric A: Inch None: Asia	**Machining dia.** 050: Ø50 mm	**Oil hole & Hand** M: With oil hole, Multi-edge NM: Without oil hole, Multi-edge	**Internal dia.** 22: Ø22 mm	**No. of flute** 4F: 4 Flute	**APMX** 47: 47 mm	**Available insert** LN13: LNGX13

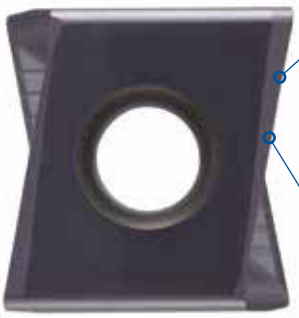
Shank type

TP4	P	S	032	R	3	W	32	110	LN13
TP4 Tangen-Pro	**Approach angle** P: 90˚	**Type** S: Shank	**Machining dia.** 032: Ø32 mm	**Oil hole & Hand** R: With oil hole, Right-handed NR: Without oil hole, Right-handed	**No. of tooth** 3: 3 Teeth	**Shank type** W: Weldon C: Cylinder	**Shank dia.** 32: Ø32 mm	**Overall length** 110: 110 mm	**Available insert** LN13: LNGX13

Features

Heat Dispersion Chip Breaker Structure
- Installation of multiple dimples
- Prevents thermal cracks and Increases tool life

Excellent Clamping Stability
- Ensures a large clamping surface area

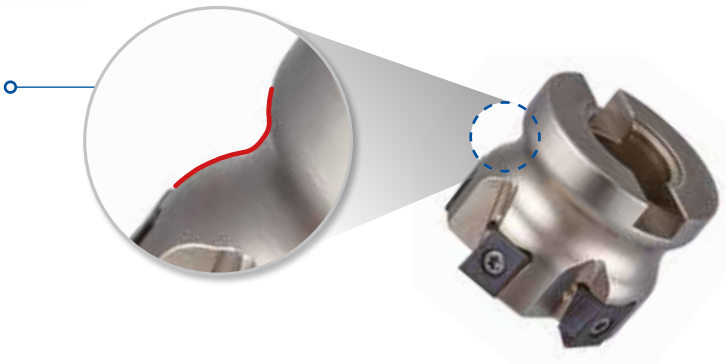


High Depth-of-Cut Structure and Optimized Perpendicularity
- APMX 12 mm
- Perpendicularity within 30㎛

Reinforced Edge Geometry
- Double Negative-Positive Edge Structure
- Improves chipping resistance and Prevents from sudden breakage

KORLOY Identity symbol mark

Streamlined holder Structure
- Smooth chip evacuation



Application and features of chip breakers

Chip breaker		Cutting edge	Application	Feature
MA			For Aluminum	Sharp cutting edges for excellent cutting performance in aluminum machining. Buffed surface for excellent chip flow and welding resistance.
ML			For HRSA and Titanium	Guarantees high quality of performance from applying suitable for low cutting resistance chip breaker for HRSA cutting and high hardness cutting edge.
MM			For general cutting	Suitable for general cutting range from design structure for general high feed cutting.

Recommended grade and cutting edge

Recommended grade and cutting edge (●: 1st recommendation)

P		M		K		S		N	
Chip breaker	**Grade**	**Chip breaker**	**Grade**	**Chip breaker**	**Grade**	**Chip breaker**	**Grade**	**Chip breaker**	**Grade**
● MM ○ ML	● PC3700 ○ PC5300	● ML	● PC5535 ○ PC5300	● ML ○ MM	● PC6100 ○ PC5535	● ML	● SPC830 ○ SPC845 ○ PC5300	● MA	● H05 ○ H01

Recommended cutting conditions

Workpiece				Specific cutting force (N/mm^2)	Brinell hardness (HB)	Grade	Chip breaker		Grade	Chip breaker		MM/ML
ISO	Workpiece meterial	ISO	AISI			PC3700	MM	ML	PC5300	MM	ML	
						vc (m/min)	fz (mm/t)		vc (m/min)	fz (mm/t)		APMX (mm)
P	Non-ferrous alloy steel Mn < 1.65	C25	1025	1500	125	230	0.3	0.3	210	0.3	0.3	12
						305	0.2	0.2	280	0.2	0.2	
						380	0.1	0.1	350	0.1	0.1	
		C45	1045	1700	190	210	0.3	0.3	190	0.3	0.3	
						280	0.2	0.2	255	0.2	0.2	
						350	0.1	0.1	320	0.1	0.1	
	Low alloy steel ≤ 5%	42CrMo4	4140	1700	175	160	0.3	0.3	150	0.3	0.3	
						215	0.2	0.2	195	0.2	0.2	
						270	0.1	0.1	240	0.1	0.1	
	High alloy steel > 5%	X40CrMoV5-1	D2, H13	1950	200	120	0.3	0.3	110	0.3	0.3	
						160	0.2	0.2	150	0.2	0.2	
						200	0.1	0.1	190	0.1	0.1	

Workpiece				Specific cutting force (N/mm^2)	Brinell hardness (HB)	Grade	Chip breaker		Grade	Chip breaker		MM/ML
ISO	Workpiece meterial	ISO	AISI			PC5535	MM	ML	PC5300	MM	ML	
						vc (m/min)	fz (mm/t)		vc (m/min)	fz (mm/t)		APMX (mm)
M	Ferritic/ martensitic	X6CrAl13 X6Cr17	405,430	1800	200	120	0.2	0.2	130	0.2	0.2	12
						160	0.15	0.15	170	0.15	0.15	
						200	0.1	0.1	210	0.1	0.1	
		X12CrS13 X6CrMo17-1	416,434	2850	330	110	0.2	0.2	120	0.2	0.2	
						150	0.15	0.15	160	0.15	0.15	
						190	0.1	0.1	200	0.1	0.1	
		X12Cr13	403, 410	2350	330	110	0.2	0.2	120	0.2	0.2	
						150	0.15	0.15	160	0.15	0.15	
						190	0.1	0.1	200	0.1	0.1	
	Austenitic	X5CrNI18-9 X2CrNI18-9 X5CrNiMo17-12-2 XCrNiMo17-12-3	304, 316	2000	180	100	0.2	0.2	105	0.2	0.2	
						135	0.15	0.15	140	0.15	0.15	
						170	0.1	0.1	175	0.1	0.1	
	Austenitic/ ferritic (Duplex)	-	S31803, S32750	2450	260	75	0.2	0.2	80	0.2	0.2	
						105	0.15	0.15	110	0.15	0.15	
						135	0.1	0.1	140	0.1	0.1	

Recommended cutting conditions

Workpiece				Specific cutting force (N/mm²)	Brinell hardness (HB)	Grade	Chip breaker		Grade	Chip breaker		MM/ML
ISO	Workpiece meterial	ISO	AISI			PC6100	MM	ML	PC5535	MM	ML	
						vc (m/min)	fz (mm/t)		vc (m/min)	fz (mm/t)		APMX (mm)
K	Gray cast iron	200	No 30 B	900	180	180	0.3	0.3	150	0.3	0.3	12
						240	0.2	0.2	200	0.2	0.2	
						300	0.1	0.1	250	0.1	0.1	
	Nodular graphite cast iron	500-7	80-55-06	870	155	120	0.3	0.3	100	0.3	0.3	
						160	0.2	0.2	150	0.2	0.2	
						200	0.1	0.1	200	0.1	0.1	

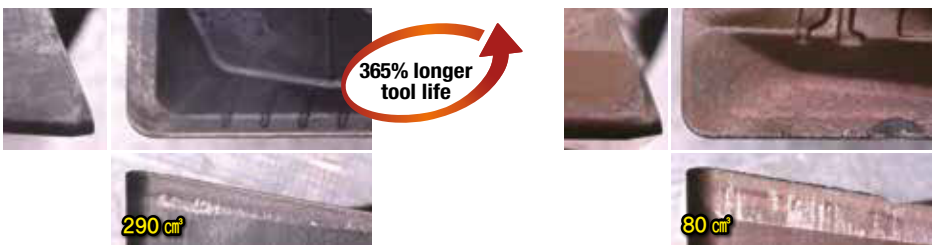
Workpiece				Specific cutting force (N/mm²)	Brinell hardness (HB)	Grade	Chip breaker		MM/ML
ISO	Workpiece meterial	ISO	AISI			UPC830	MM	ML	
						vc (m/min)	fz (mm/t)		APMX (mm)
S	Nickel based	15156-3	15156-3	2650	250	30	0.2	0.2	12
						40	0.15	0.15	
						50	0.1	0.1	
		9723	9723	3000	320	25	0.2	0.2	
						35	0.15	0.15	
						45	0.1	0.1	
	Cobalt based alloy	Stellite	Stellite	3000 - 3100	300 - 320	25	0.2	0.2	
						35	0.15	0.15	
						45	0.1	0.1	
	Titanium alloy steel	5832-3	ASTM B265	1400	320	45	0.2	0.2	
						55	0.15	0.15	
						65	0.1	0.1	

Workpiece				Specific cutting force (N/mm²)	Brinell hardness (HB)	Grade	Chip breaker	MA
ISO	Workpiece meterial	ISO	AISI			H05	MA	
						vc (m/min)	fz (mm/t)	APMX (mm)
N	Aluminum	AlMg1SiCu	6061	125 - 310	30 - 65	500	0.25	12
						700	0.15	
						1,000	0.05	
		AlZn5.5MgCu	7075	230 - 570	60 - 150	500	0.25	
						700	0.15	
						1,000	0.05	

Performance evaluation

Chipping resistance

Workpiece	Titanium alloy (5832-3), 100 (L) × 100 (W) × 100 (H) · Steel rectangular tube
Cutting condition	vc = 50 m/min · fz = 0.15 mm/t · ap = 10 mm · ae = 5 mm · wet
Tool	**Insert** LNGX130608PNR-ML (PC5300) **Holder** TP4PCM050R-22-5-LN13



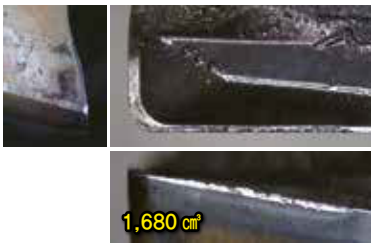
TP4P Competitor

Performance evaluation

Wear resistance

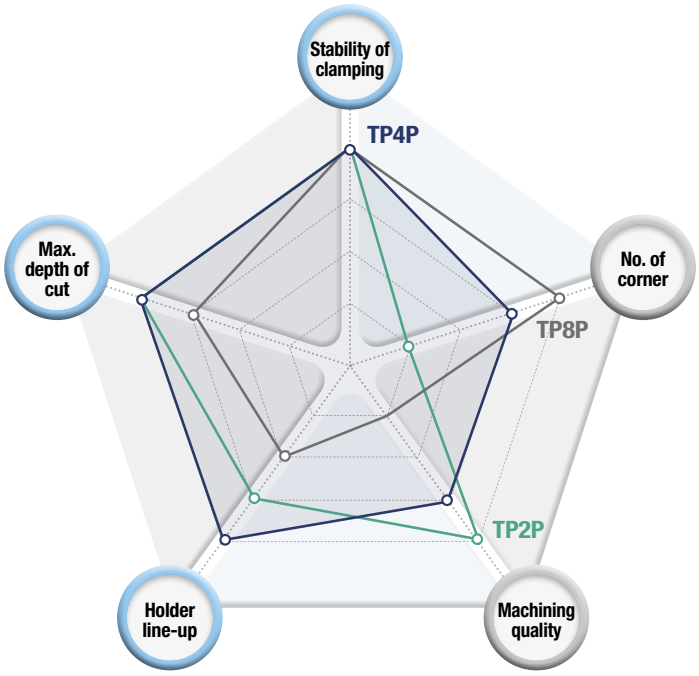
Workpiece	Alloy steel (SCM440), 300 (L) × 200 (W) × 100 (H) · Steel rectangular tube
Cutting condition	vc = 200 m/min · fz = 0.15 mm/t · ap = 7 mm · ae = 10 mm · dry
Tool	**Insert** LNGX130608PNR-MM (PC5300) **Holder** TP4PCM050R-22-5-LN13

TP4P



Competitor

Tool selection guide



TP4P new

- Standard Type
- Excellent machinability
- High clamping stability

TP8P

- Maximum no. of corners
- Highly stable clamping

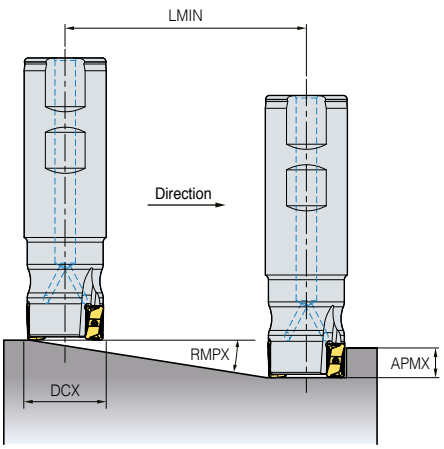
TP2P

- Highly stable clamping
- Good cutting performance
- Excellent surface finish

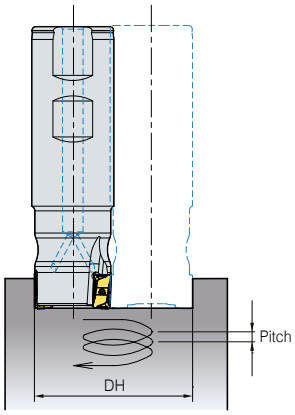
Tools	Stability of clamping	No. of corner	Machining quality	Holder line-up	Max. depth of cut
TP4P new	★★★★	★★★	★★★	★★★★	★★★★
TP8P	★★★★	★★★★	★	★★	★★★
TP2P	★★★★	★	★★★★	★★★	★★★★

Ramping and helical cutting

Ramping



Helical cutting



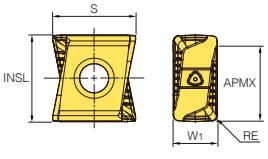
(mm)

Designation	DCX	APMX	Ramping		Helical cutting			
			RMPX (°)	LMIN	Min diameter (DHmin)	Max pitch	Max diameter (DHmax)	Max pitch
LNGX13	25	12	1.42	484	42	1.31	48	1.82
	32	12	0.9	765	56	1.18	62	1.5
	40	12	0.62	1,104	72	1.09	78	1.31
	50	12	0.46	1,488	92	1.06	98	1.23
	63	12	0.36	1,926	118	1.07	124	1.2
	80	12	0.27	2,528	152	1.07	158	1.17
	100	12	0.21	3,274	192	1.06	198	1.13
	125	12	0.17	4,068	242	1.08	248	1.14

- When ramping and helical milling, table feed, vf (ipm) should belowerthan 70% ofthe recommended cutting conditions.
- When helical milling, Max. pitch, DHmax should belower than max. depthofcut, APMX.
- When ramping, the depth of cut should belower than max. depth of cut, APMX.

- **Lmin** = APMX/tan (RMPX) (mm)
- **Lmin**: Min.length of ramping
- **APMX**: depth of cut Maximum
- **RMPX**: Max. rake angle in ramping

Inserts

Picture	Designation		Coated								Uncoated		Dimension (mm)					Geometry
			PC3700	PC6100	PC5300	PC5535	PC5400	PC9540	SPC830	SPC845	H01	H05	INSL	S	W1	RE	APMX	
	LNGX	130608PNR-MA									○	●	13.35	13.011	6.8	0.8	12	
	LNGX	130608PNR-ML	▲	●	●	▲		▲	●				13.35	13.011	6.8	0.8	12	
	LNGX	130608PNR-MM	▲	▲	●	▲	●		●	○			13.35	13.011	6.8	0.8	12	

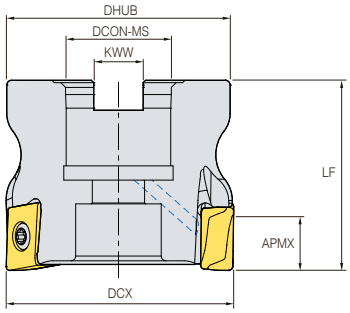
▲: Stock item Europe ●: Stock item Korea ○: Production on demand

●: Stock item

TP4PC(M)-LN13 (Single-edge)

KAPR 90°

- **GAMP** : -6°
- **GAMF** : -19° - -17°



(mm)

Designation		Stock	DCX	CICT	DCON-MS	DHUB	LF	KWW	APMX
TP4PCM	040R-16-4-LN13	●	40	4	16	38	40	8.4	12
	040R-16-5-LN13	▲	40	5	16	38	40	8.4	12
	050R-22-5-LN13	●	50	5	22	47	40	10.4	12
	050R-22-6-LN13	▲	50	6	22	47	40	10.4	12
	063R-22-6-LN13	▲	63	6	22	55	40	10.4	12
	063R-22-8-LN13	●	63	8	22	55	40	10.4	12
	080R-27-7-LN13	●	80	7	27	70	50	12.4	12
	080R-27-10-LN13	▲	80	10	27	70	50	12.4	12
	100R-32-8-LN13	●	100	8	32	78	50	14.4	12
	100R-32-13-LN13	▲	100	13	32	78	50	14.4	12
	125R-40-9-LN13	●	125	9	40	82	63	16.4	12
	125R-40-17-LN13	▲	125	17	40	82	63	16.4	12

Available inserts

LNGX-MA

LNGX-ML

LNGX-MM

Designation		Coated								Uncoated	
		PC3700	PC6100	PC5300	PC5535	PC5400	PC9540	SPC830	SPC845	H01	H05
LNGX	130608PNR-MA									○	●
	130608PNR-ML	▲	●	●	▲		▲	●			
	130608PNR-MM	▲	▲	●	▲	●		●	○		

Parts

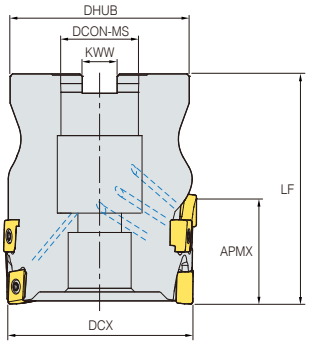
	ØD	Wrench	Screw
Specification	Ø40	TW15S	FTKA0410
	Ø50 - Ø125	TW15S	FTKA0412B

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

TP4PCM-LN13 (Multi-edge)

KAPR 90°

- GAMP : -6°
- GAMF : -21° - -17°



(mm)

Designation		Stock	DCX	CICT	ZEFF	DCON-MS	DHUB	LF	KWW	APMX
TP4PCM	050M-22-3F32-LN13	○	50	9	3	22	48	56	10.4	32
	050M-22-4F43-LN13	○	50	16	4	22	48	68	10.4	43
	063M-27-5F53-LN13	○	63	25	5	27	58	80	12.4	53
	080M-32-5F64-LN13	○	80	30	5	32	74	111	14.4	64

Available inserts


LNGX-MA


LNGX-ML


LNGX-MM

Designation		Coated								Uncoated	
		PC3700	PC6100	PC5300	PC5535	PC5400	PC9540	SPC830	SPC845	H01	H05
LNGX	130608PNR-MA									○	●
	130608PNR-ML	▲	●	●	▲		▲	●			
	130608PNR-MM	▲	▲	●	▲	●		●	○		

Parts

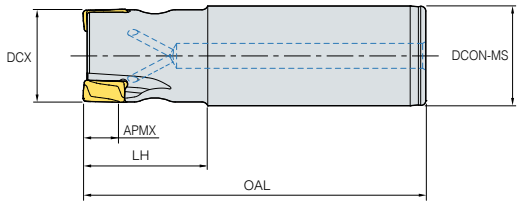
	ØD	Wrench	Screw
Specification	Ø50 - Ø80	TW15S	FTKA0412B

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

TP4PS-LN13

KAPR 90°

- GAMP : -6°
- GAMF : -32° - -21°



(mm)

Designation		Stock	DCX	CICT	DCON-MS	OAL	LH	APMX
TP4PS	025R-2C25-120-LN13	▲	25	2	25	120	35	12
	025R-2W25-95-LN13	▲	25	2	25	95	35	12
	032R-2C32-250-LN13	▲	32	2	32	250	50	12
	032R-2W32-110-LN13	▲	32	2	32	110	40	12
	032R-3C32-250-LN13	▲	32	3	32	250	50	12
	032R-3W32-110-LN13	▲	32	3	32	110	40	12
	040R-3C32-250-LN13	▲	40	3	32	250	50	12
	040R-3W32-115-LN13	▲	40	3	32	115	40	12
	040R-4C32-250-LN13	▲	40	4	32	250	50	12
	040R-4W32-115-LN13	●	40	4	32	115	40	12

Available inserts


LNGX-MA


LNGX-ML


LNGX-MM

Designation		Coated								Uncoated	
		PC3700	PC6100	PC5300	PC5535	PC5400	PC9540	SPC830	SPC845	H01	H05
LNGX	130608PNR-MA									○	●
	130608PNR-ML	▲	●	●	▲		▲	●			
	130608PNR-MM	▲	▲	●	▲	●		●	○		

Parts

	ØD	Wrench	Screw
Specification	Ø25	TW15S	FTKA0410
	Ø32 - Ø40	TW15S	FTKA0412B

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

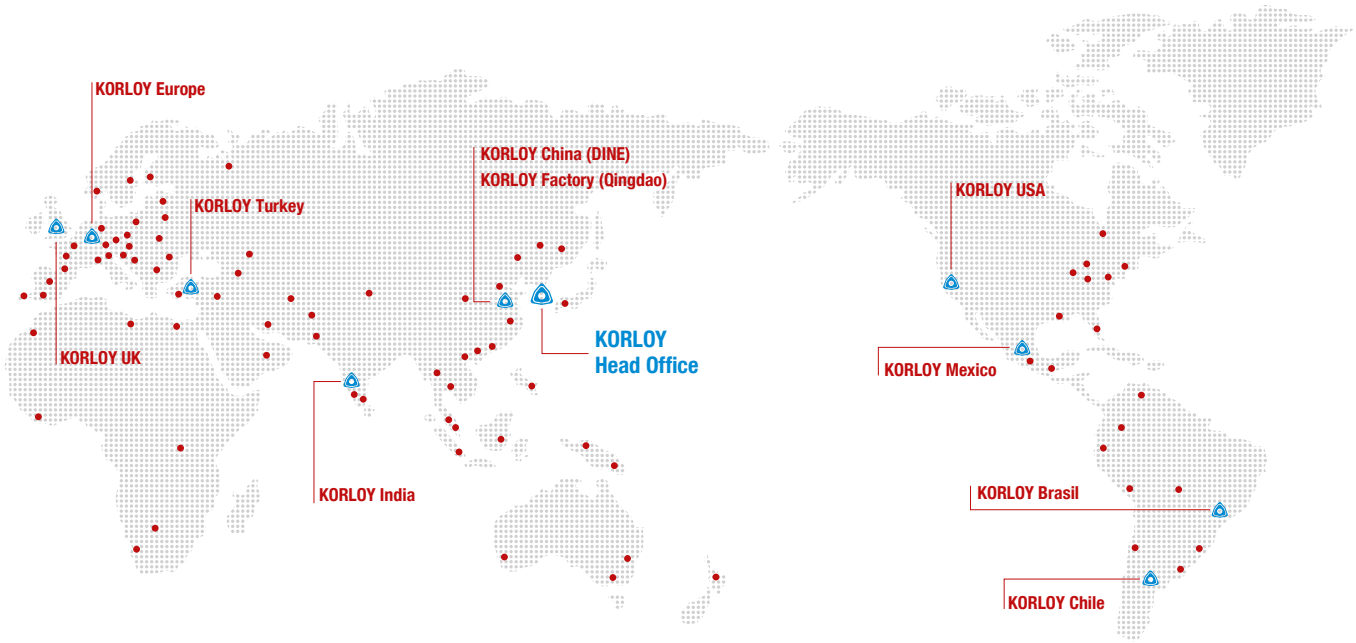
Notes

⚠ For the safe metalcutting

- Use safety supplies such as protective gloves to prevent possible injury while touching the edge of tools.
- Use safety glasess or safety cover to hedge possible dangers. Inappropriate usage or excessive cutting condition may lead tool's breakage or even the fragment's scattering.
- Clamp the workpiece tightly enough to prevent its movement while its machining.

Properly manage the tool change phase because the inordinately used tool can be easily broken under the excessive cutting load or severe wear, and it may threat the operator's safety.

- Use safety cover because chips evacuated during cutting are hot and sharp and may cause burns and cuts. To remove chips safely, stop machining, put on protective gloves, and use a hook or other tools.
- Prepare for fire prevention measures as the use of the non-water soluble cutting oil may cause fire.
- Use safety cover and other safety supplies because the spare parts or the inserts can be pulled out due to centrifugal force while high speed machining.



KORLOY Network

Head Office
Holystar B/D, 326, Seocho-daero,
Seocho-gu, Seoul, 06633, Korea,
Web: www.korloy.com

Cheongju Factory
55, Sandan-ro, Heungdeok-gu,
Cheongju-si, Chungcheongbuk-do,
28589, Korea

Jincheon Factory
54, Gwanghyewonsandan 2-gil,
Gwanghyewon-myeon, Jincheon-gun,
Chungcheongbuk-do, 27807, Korea

R & D Institute Seoul
Holystar B/D, 326, Seocho-daero,
Seocho-gu, Seoul, 06633, Korea

R & D Institute Cheongju
55, Sandan-ro, Heungdeok-gu,
Cheongju-si, Chungcheongbuk-do,
28589, Korea

Gurgaon Factory
Plot NO.415, Sector 8, IMT Manesar,
Gurgaon 122051, Haryana, India

KORLOY AMERICA
620, Maple Avenue, Torrance,
CA 90503, USA

KORLOY BRASIL
Av. Aruana 280, conj.12, WLC,
Alphaville, Barueri, CEP06460-010,
SP, Brasil

KORLOY CHILE
Av. Providencia 1650, Office 1009,
7500027 Providencia–Santiago, Chile

KORLOY INDIA
Ground Floor, Property No. 217, Udyog
Vihar Phase 4, Gurgaon 122016,
Haryana, India

KORLOY RUSSIA
Premises 1/2, Bldg. 4, Masterkova St.,
115280, Moskau, Russia

KORLOY TURKEY
Ziya Gökalp Mahallesi, Seyit Onbaşı
Caddesi, No:36, İç Kapı No: 5-6, Kat:3,
Başakşehir / İstanbul, Turkey

KORLOY UK
13 Approach Rd, Raynes Park, London
SW20 8BA, Great Britain

KORLOY MEXICO
Calle R. M. Clemencia Borja Taboada
522, Jurica Acueducto, 76230 Juriquilla,
Qro. Mexico

KORLOY EUROPE
Gablonzer Str. 25-27,
D-61440 Oberursel, Germany
Tel. +49-6171-27783-0
Fax +49-6171-27783-59
Mail: info@korloyeurope.com
Web: www.korloyeurope.eu

KTS - Korloy Total Service

Get our FREE App
Just download, install and use.

GET IT ON Google Play
Download on the App Store

20260427
TN121-EN-02