

Tangen-Pro **TP2P**

Tangential Shoulder Milling Tool

This milling tool series with its tangential clamping system increases stable machining and productivity, while improving perpendicularity

- **Superior Clamping Stability**

The tangential clamping system enables high speed and high feed machining with its wedge-shaped inserts

- **Improved Perpendicularity**

A high quality milling tool and optimized blade design improves surface finish and perpendicularity

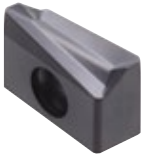
- **Higher Productivity**

High speed and high feed machining result in an exceptional chip removal rate per minute



Tangen-Pro TP2P

Tangential Shoulder Milling Tool **Tangen-Pro TP2P**



Insert



Shank



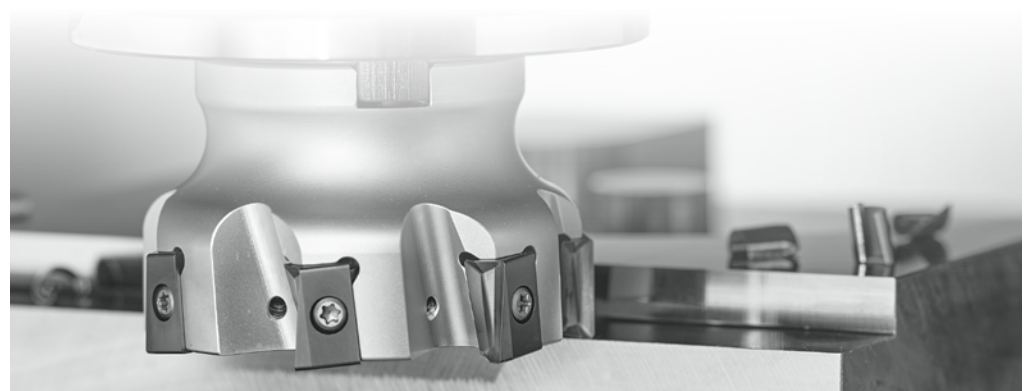
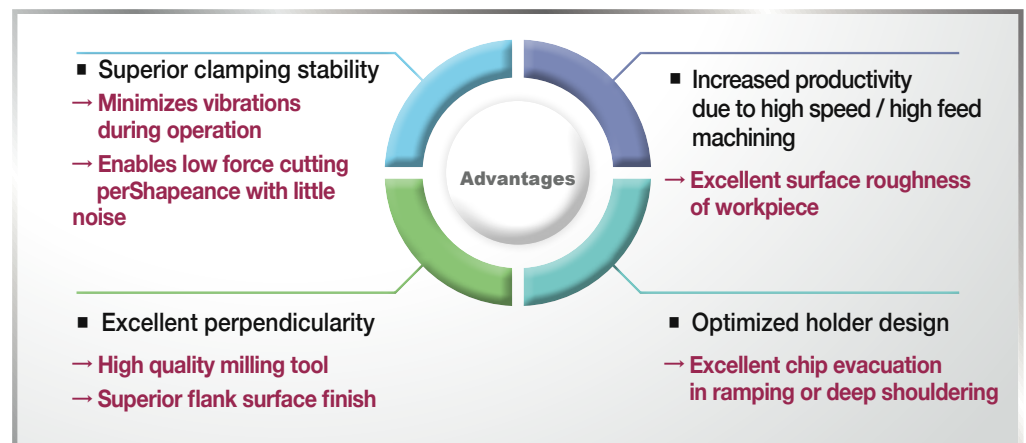
Cutter

The accelerated development of industrial structures have complicated the Shaping of the workpiece shapes more than ever before. The clamping area for a jig or a vise becomes narrow and leads to tool vibration and imperfect machining conditions. Workpiece materials are also evolving to hard-to-cut materials and high hardness in order to achieve higher durability for industrial components. This is often said to be the major cause of shortened tool life and unexpected tool breakage in many modern metal cutting applications. So companies dealing with unstable workpiece clamping and hard-to-cut materials have growing demands for cutting tools that are able to solve these problems.

TP2P responds to these demands by using the tangential clamping system and wedge-shaped inserts to improve the clamping stability of the tool itself. Therefore; Unstable clamping of the workpiece can be off-set by a strong clamping force of the tool. In addition, a sharp chip breaker and high helix angle were applied to the insert design for stable cutting perShapeance in hard-to-cut materials and high hardened workpieces. These design details lead to exceptional increases in tool life.

Additionally, the tangential-type clamping system facilitates securing chip pockets and enables multiple-corner use to boost productivity. TP2P features low force cutting perShapeance even at high speeds and high feeds thanks to its optimized blade design that effectively reduces vibration and cutting resistance during operations. Now productivity can be improved over non-tangential designs by more than 30% due to increases in table feeds, stable clamping, and high speed/high feed rates. The Tangen-Pro TP2P shows excellent perShapeance in P, M, K type materials with its specialized design and grades developed specifically for the most challenging metal cutting applications.

KORLOY's **Tangen-Pro TP2P** is one of the most advanced tangential type milling tools available to meet the demand of the industrial market today.



Code System

* A.A. = setting angle

Insert

L	N	K	T	17	07	- 08	P	N	R - MM
Insert shape L: L type	Tolerance K: K Class		Shape of cross section T: T Type	Cutting edge length 17: 17mm	Height of cutting edge 07: 7mm	Nose R 08: R0.8	Relief angle of minor cutting edge A.A.* N: 0° P: 90°	Relief angle of major cutting edge N: 0°	Hand R: Right handed Chip breaker MM: General cutting ML: light cutting

Shank type

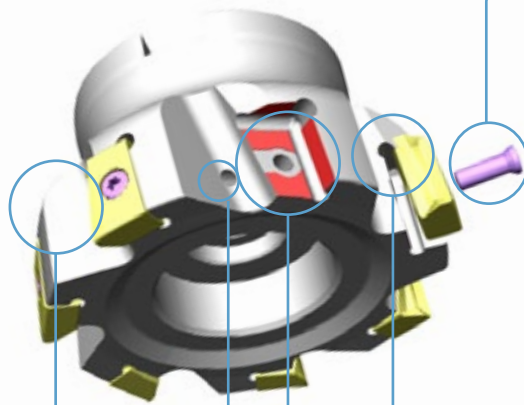
TP	2	P	S	050	R	- 2	W	32	- 130	- LN17
Tangen-Pro	No. of corner 2: 2 corner	Approach angle P: 90°	Type S: Shank	Machining depth. 050: Ø50	Oil hole & Hand R: With oil hole, Right-handed NR: Without oil hole, Right-handed	No. of tooth 2: 2 teeth	Shank type W: Weldon C: Cylinder	Shank diameter 032: Ø32	Overall length 130: 130mm	Applicable insert LN17: LNKT17

Cutter type

TP	2	P	C	M	080	R	- 22	- 7	- LN17
Tangen-Pro	No. of corner 2: 2 corner	Approach angle P: 90°	Type C: Cutter	Arbor type M: Metric A: Inch None: Asia	Machining depth. 080: Ø80	Oil hole & Hand R: With oil hole, Right-handed NR: Without oil hole, Right-handed	No. of tooth 7: 7 teeth	Internal diameter 22: 22mm	Applicable insert LN17: LNKT17

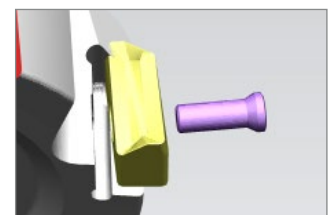
Cutter Features

- Tangential clamping system, wedge-shaped inserts and wide seat area
→ **Higher clamping stability**
→ **Lower vibrations and cutting resistance during machining**
- Optimized H/D design with curved surface for smooth chip flow
→ **Excellent chip evacuation in ramping or deep shouldering**



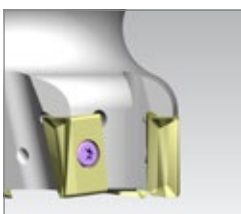
Tangential clamping

- Multi-corner use
→ High feed machining availability



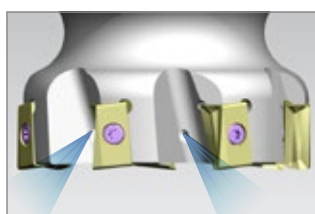
Efficient holder design

- Smoother chip evacuation in slotting or deep shouldering



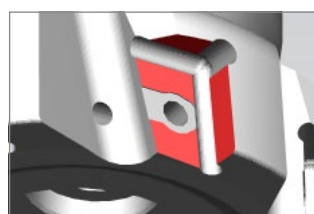
Through coolant system

- Improved chip evacuation
- Longer tool life due to insert cooling



Wide seat area

- Strong clamping force



Wedge type clamping

- Stable insert life

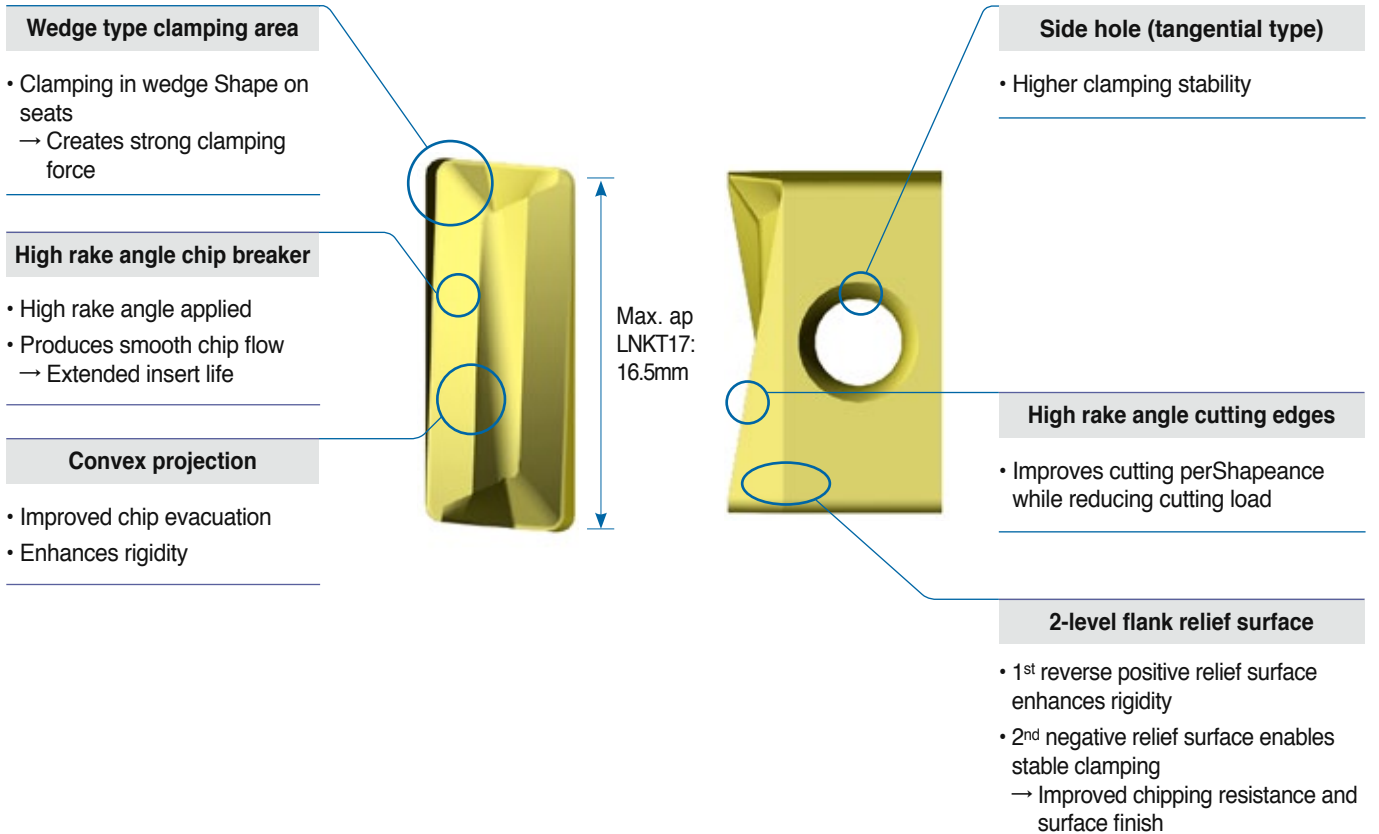


Tangen-Pro TP2P

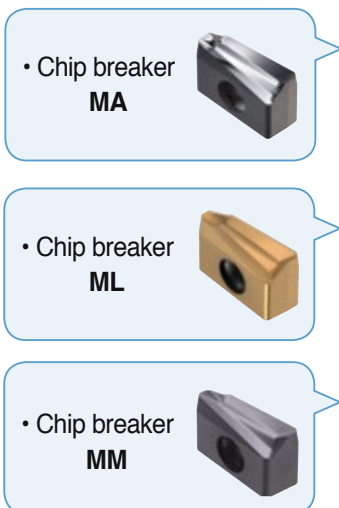
Features

- **Clamping stability** gained through tangential clamping system and wedge-shaped inserts
- **Excellent surface finish** nearly perfect perpendicularity, and highly even flank surface compared to competitors designs
- **Improved productivity** due to high rake angles and sharp cutting edges which lead to lower cutting resistance → Ideally suited for high speed and high feed machining

Insert Features



Chip Breaker Features

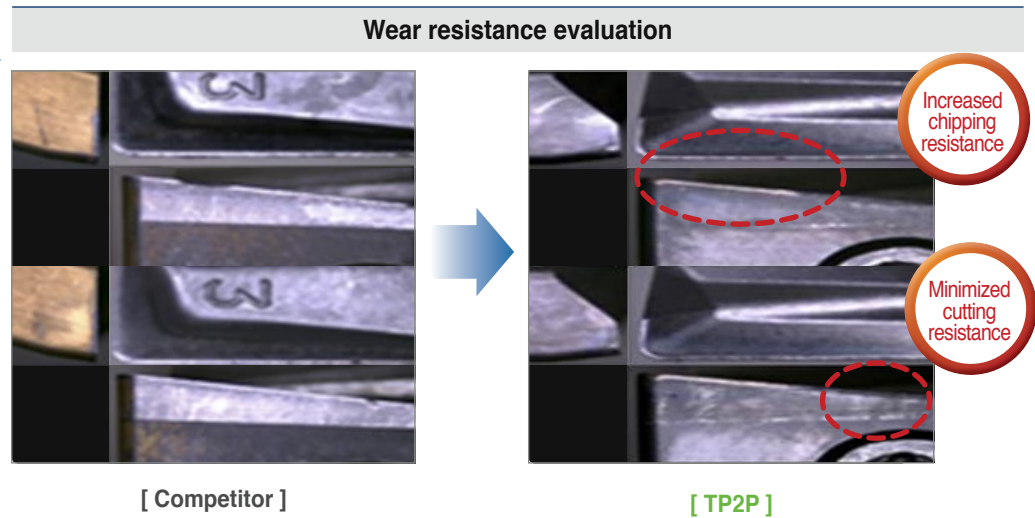


Chip Breaker	Cutting Edge Shape	Application	Features
MA		for aluminum	<ul style="list-style-type: none"> ▪ Sharp cutting edges for excellent cutting performance in aluminum machining ▪ Buffed surface for excellent chip flow and welding resistance
ML		for Light cutting	<ul style="list-style-type: none"> ▪ Chip breaker design for low cutting resistance that provides excellent tool life and quality surface finishes in light cutting and hard-to-cut materials
MM		for General cutting	<ul style="list-style-type: none"> ▪ Universal design for general shoulder milling operations, highly suitable in most applications

➔ Performance Evaluation

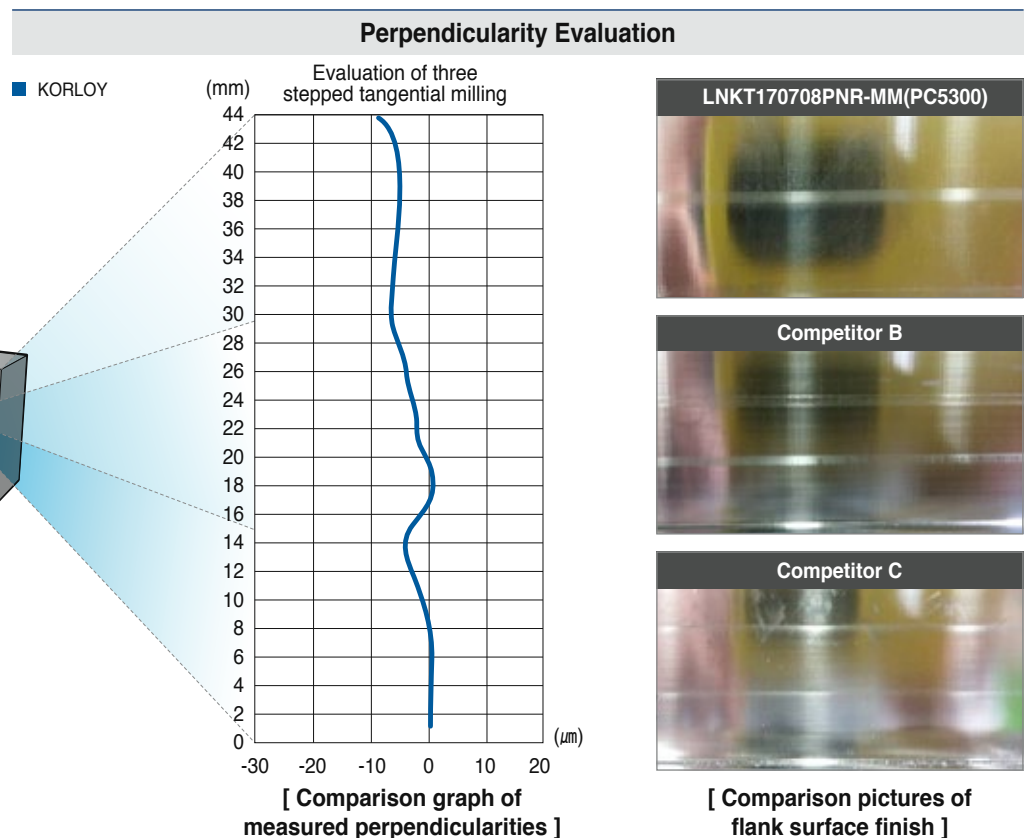
- **Workpiece** 42CrMo4(DIN), 300(L)x200(W)x100(h), Steel rectangular tube
- **Cutting conditions** $vc(m/min) = 250$, $fz(mm/t) = 0.2$, $ap(mm) = 14$, $ae(mm) = 10$, Dry
- **Machining method** Facing
- **Tools** Insert LNKT170708PNR-MM(PC5300) Holder TP2PCM080R-27-7-LN17

- Stable clamping improves chipping resistance under high speed cutting conditions over $vc(m/min) = 250$
→ **Minimized unexpected tool breakage**
- Optimized cutting edge design
→ **Minimized cutting resistance**



➔ Perpendicularity Evaluation

- **Workpiece** C45(ISO), 300(L)x200(W)x100(h), Steel rectangular tube
- **Cutting conditions** $vc(m/min) = 150$, $fz(mm/tooth) = 0.15$, $ap(mm) = 15$, $ae(mm) = 5$, Dry
- **Machining method** Multiple passes in depth, measured after three passes of 15mm each, in total 45mm (measurement of perpendicularity and flank surface roughness)
- **Tools** Insert LNKT170708PNR-MM(PC5300) Holder TP2PCM080R-27-7-LN17



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Grade Guideline by Workpiece Type

Cutting conditions		P		K
		Carbon steel	Alloy steel	Cast iron
Sorte	High speed cutting	PC5300	PC5300	PC6510
	General cutting	PC5400	PC5300	PC6510
	Interrupted cutting	PC5400	PC5400	PC5300

Recommended Cutting Conditions

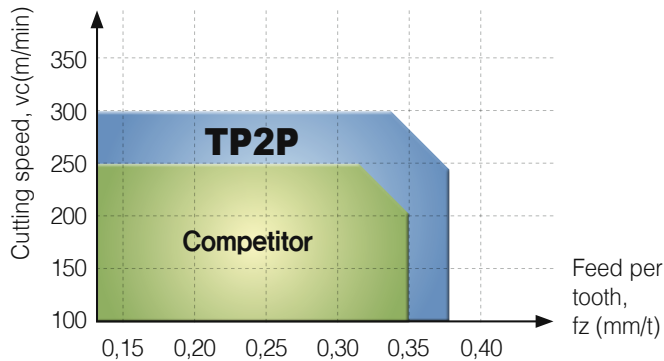
Workpiece	Grade	vc (m/min)	fz (mm/t)	Max. ap (mm)	Applicable insert
P Steel	PC5300	150 - 240	0.25 - 0.05	16.5	LNKT170708PNR-MM
	PC5400	130 - 210	0.25 - 0.05	16.5	
K Cast iron	PC6510	100 - 250	0.25 - 0.05	16.5	LNKT170708PNR-ML

※ The above data refer to general cutting conditions and can be adjustable to the speed of 300m/min and the feed per tooth of 0.5mm/t depending on user environment.

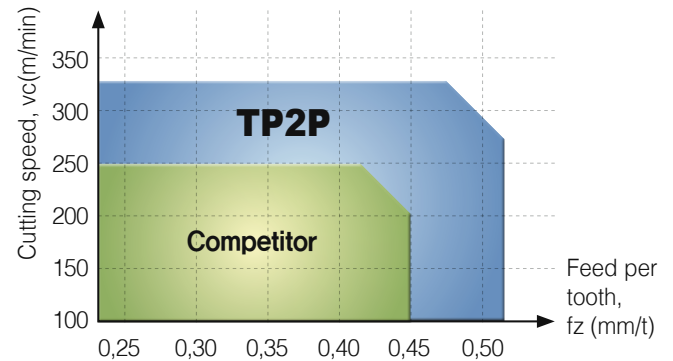
Application Range

- High speed / high feed capability improves productivity compared to competitors



• ap(mm) = 14, ae(mm) = 10



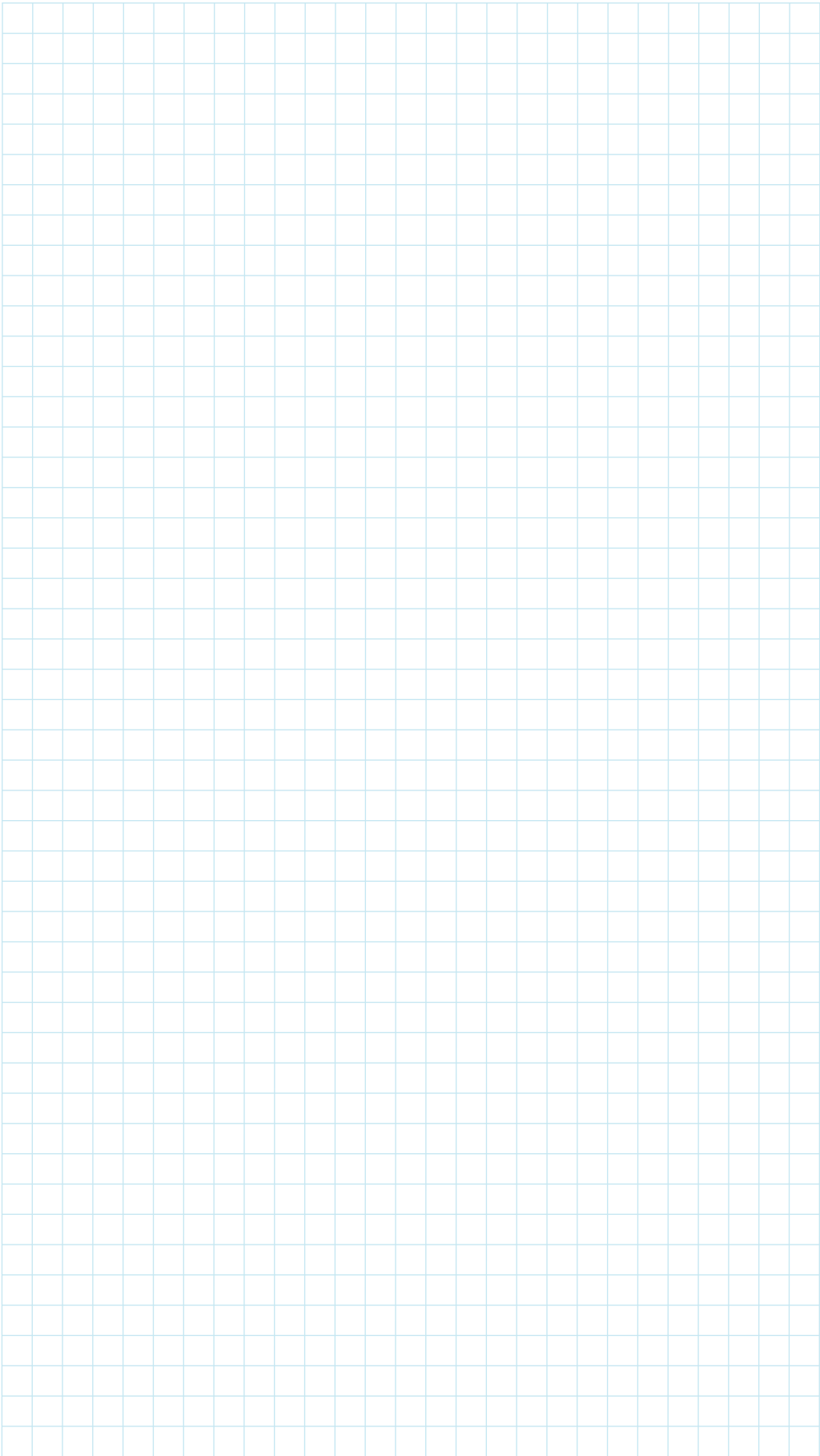
• ap(mm) = 8, ae(mm) = 10

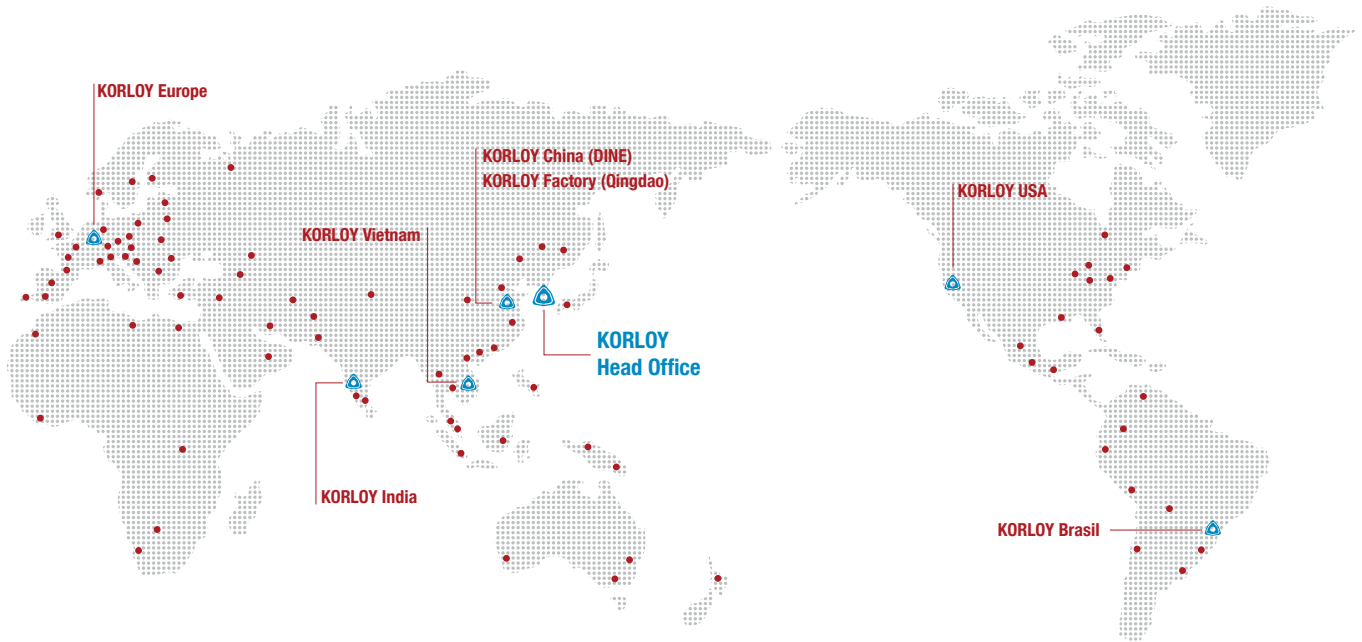


Applicable Tools

Designation	Figure	A.A.	Diameter Range	Insert	ap	Application				
						Face Milling	Shouldering	Slotting	Plunge Milling	Ramping, Circular Milling
TP2PCM		90°	Ø40 - Ø160	LNKT17	16,5	●	●	●	●	●
TP2PS		90°	Ø25 - Ø50	LNKT17	16,5	●	●	●	●	●

Notice






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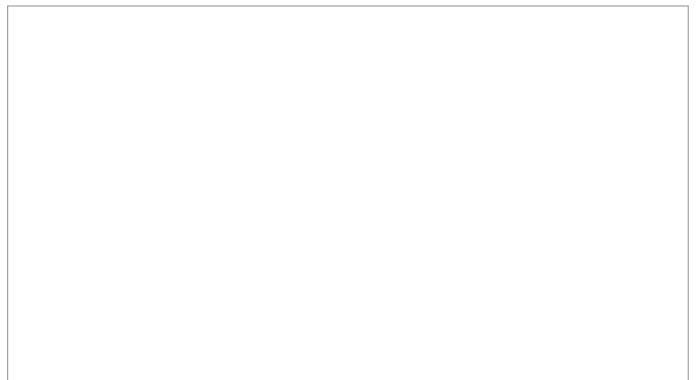
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