

High depth of cut milling tool with 3 corners for perpendicularity

Triple Mill

KORLOY
TECH-NEWS



- Economical milling tool with 3 corners with positive cutting edge for high depth of cut machining
- Stable machinability in high feed machining due to enhanced chip evacuation and thicker insert
- High precision machining from less cutting load due to high helix and sharp cutting edge

High depth of cut milling tool with 3 corners for perpendicularity

Triple Mill

Workpieces made of casting used for automobile components and large metal molds machining have uneven surface which causes chattering. Also in casting machining, tools for high depth of cut machining is needed due to its irregular depth of machining. However, it is hard to use the existing tool in high depth of cut machining because of high cutting load. In this cutting condition with interruption, impact and chattering actualize worse surface finish and fracture of tool due to lower machinability rigidity of tool.

KORLOY's newly launched Triple Mill creates the solutions for those troubles and realizing high depth of cut machining.

Triple Mill has applied a cutting edge with high depth of cut (Max. 15.5 mm) in single cutting with 3 corners allowing it to meet the most competitive price. In addition, the independent high rake chip breaker and high helix cutting edge reduces the cutting resistance and controls chattering in high depth of cut machining effectively. Its precise cutting edge with right angle ensures milling with high quality.

Specialized Triple Mill in high depth of cut machining and its optimized grade applied with each different cutting condition actualize excellent performance and increase customer's productivity.



Economical tool

- High depth of cut cutting edge with 3 corners (Max. 15.5 mm)

Enhanced machinability

- Lowered cutting load by applying high helix cutting edge and sharp chip break
- Excellent chip control due to high rake chip breaker

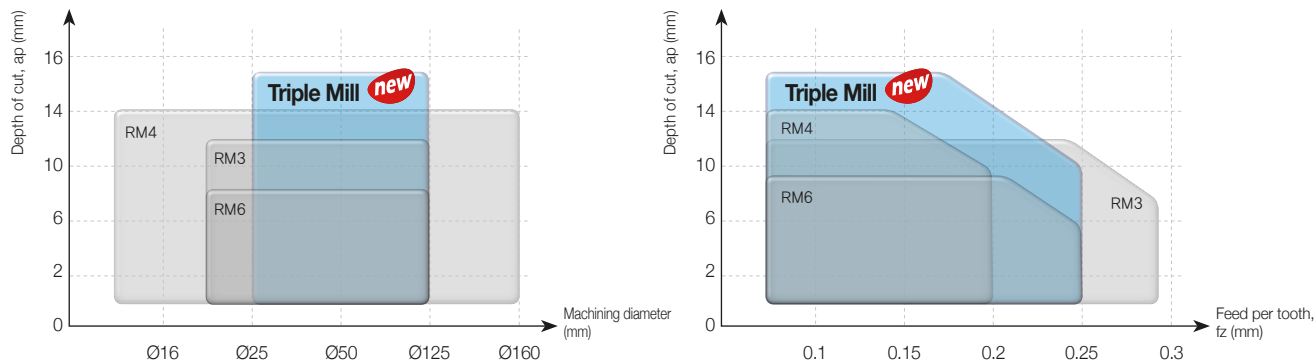
High quality surface finish

- Excellent perpendicularity and surface finish from high precision cutting edge

Stable machining

- Stable clamping structure with wide clamping side
- Thicker insert

Application range



Code system

【Insert】

T	N	K	T	20	07	08	P	E	S	R	-	MM
Insert shape T: T type	Relief angle N: 0°	Tolerance K: K grade	Cross section type T: T type	Cutting-edge length 20: 20 mm	Height of cutting-edge 07: 7.0 mm	Nose R 08: R0.8	Approach angle P: 90°	Relief angle of minor cutting edge E: 20°	Edge preparation S: Negative land honing E: Honing	Hand R: Right	-	Chip breaker MM: for general cutting ML: for finishing

【Shank type】

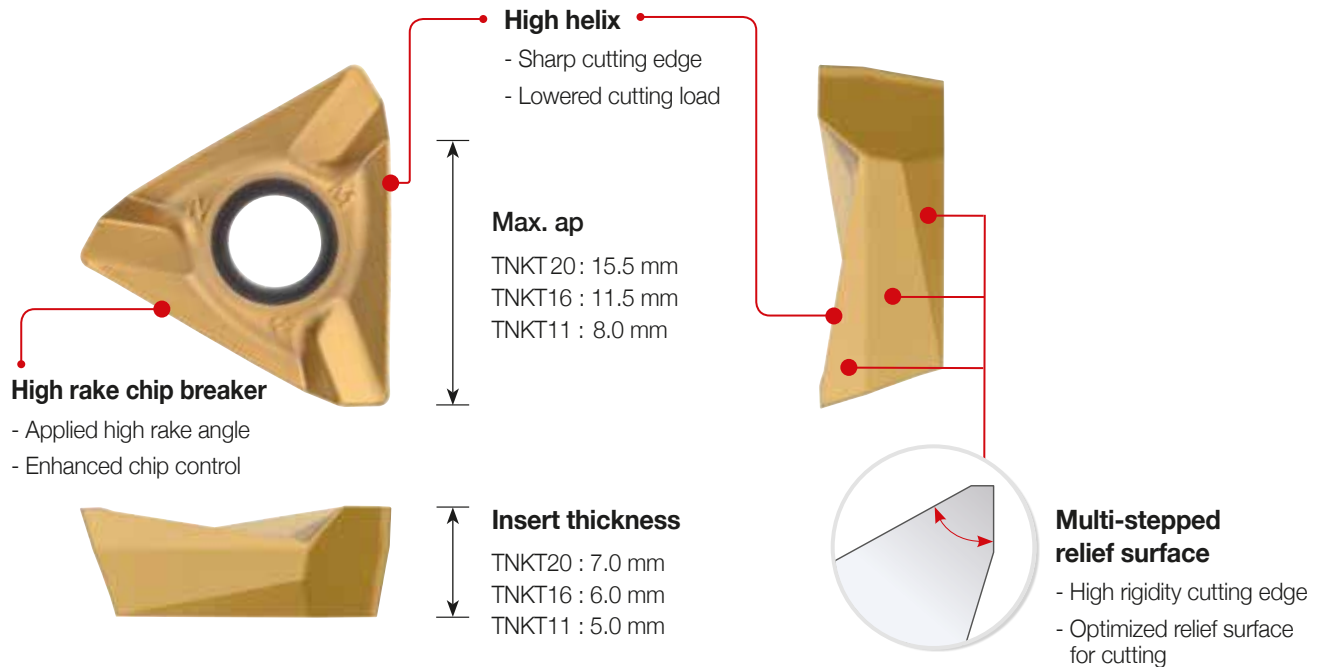
TPM	S	032	R	-	3	W	32	-	130	-	TN11
Triple Mill	Type S: Shank	Machining diameter 032: Ø32 mm	Oil hole & Hand R: With oil hole, Right-handed NR: Without oil hole, Right-handed	-	No. of tooth 3: 3 tooth	Shank type W: Weldon C: Cylinder	Shank dia. R 032: Ø32 mm	-	Shank length 130: 130 mm	-	Insert TN11: TNKT11

【Cutter type】

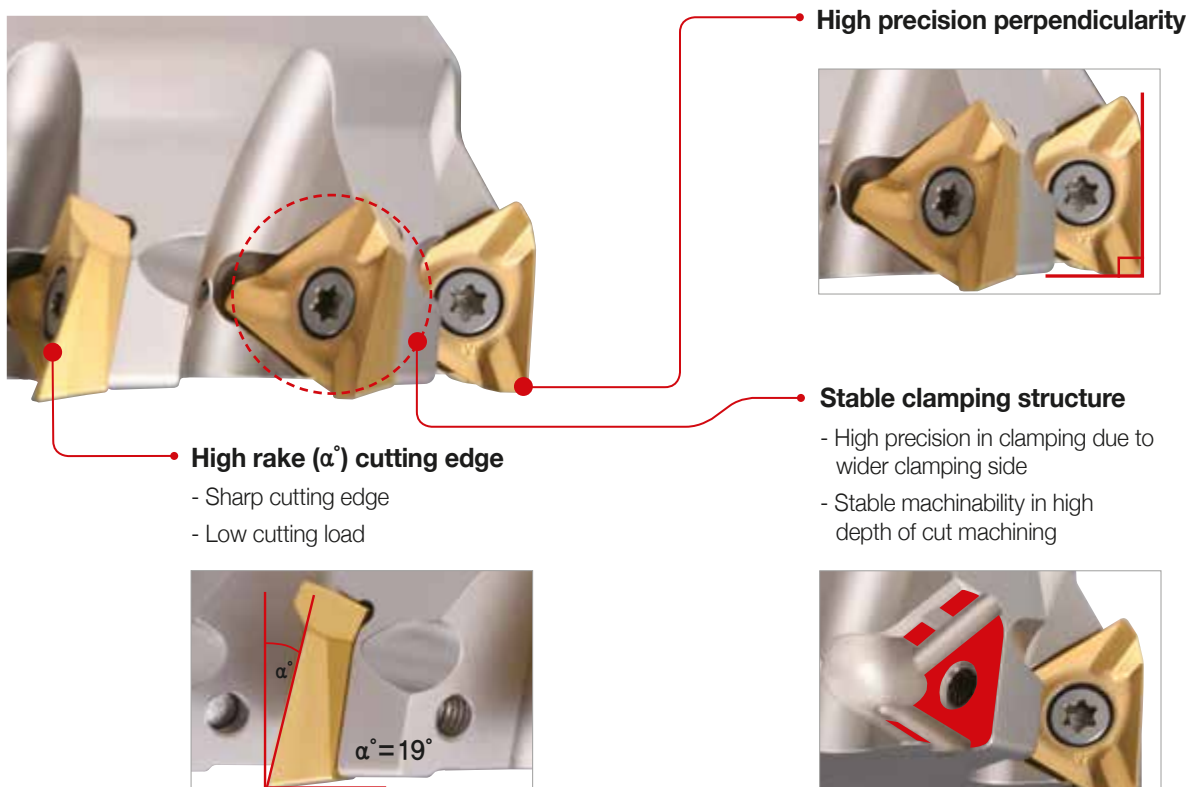
TPM	C	M	080	-	R	27	-	7	-	TN20
Triple Mill	Type C: Cutter	Arbors type M: Metric A: Inch None: Asia	Machining diameter 080: Ø80 mm	-	Oil hole & Hand R: With oil hole, Right-handed NR: Without oil hole, Right-handed	Internal 27: 27 mm	-	No. of tooth 7: 7 tooth	-	Insert TN20: TNKT20

Insert features

- Economical insert with 3 corners due to high depth of cut cutting edge
- Lowered cutting load and enhanced chip evacuation by sharp chip breaker and high helix cutting edge
- Stable machinability even in high cutting conditions from high rigidity design



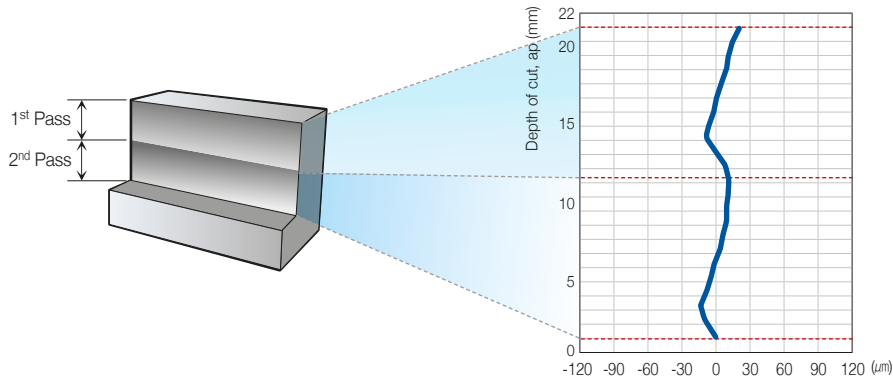
Cutter features



Performance evaluation

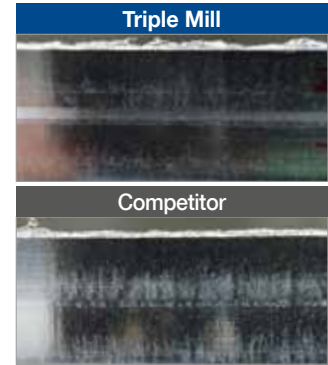
Perpendicularity

- **Workpiece** Alloy steel (SCM440, HB200), 300(L)x200(W)x100(H)
- **Cutting conditions** vc (m/min) = 200, fz (mm/t) = 0.2, ap (mm) = 12 mm x 2 Passes (Total 24 mm), ae (mm) = 5, dry
- **Tools** **Insert** TNKT200708PESR-MM (PC5300) **Holder** TPMCM080R-27-7-TN20



► Perpendicularity error is less than 40 μm.

[Graph of measured perpendicularities]



[Comparison picture of flank surface finish]

Wear resistance

- **Workpiece** Alloy steel (SCM440, HB200), 300(L)x200(W)x100(H)
- **Cutting conditions** vc (m/min) = 200, fz (mm/t) = 0.2, ap (mm) = 7, ae (mm) = 10, dry
- **Tools** **Insert** TNKT160608PESR-MM (PC5300) **Holder** TPMCM063R-22-6-TN16



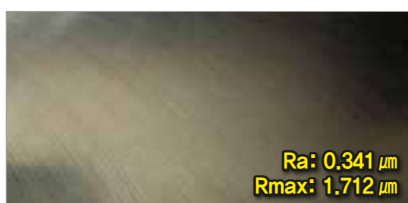
[Triple Mill]



[Competitor]

Surface finish

- **Workpiece** Alloy steel (SCM440, HB200), 300(L)x200(W)x100(H)
- **Cutting conditions** vc (m/min) = 200, fz (mm/t) = 0.2, ap (mm) = 7, ae (mm) = 10, dry
- **Tools** **Insert** TNKT160608PESR-MM (PC5300) **Holder** TPMCM063R-22-6-TN16



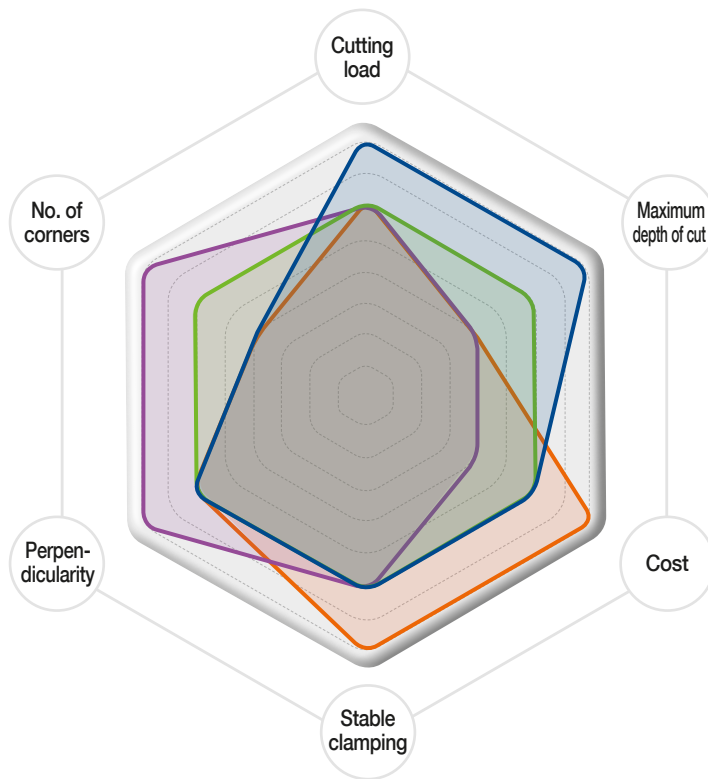
[Triple Mill]



[Competitor]

Perpendicularity tool selection guide

— Triple Mill — RM3 — RM4 — RM6



Triple Mill ^{new}

- Low cutting load
- Maximum depth of cut



RM3

- Stable clamping
- Complete price



RM4

- For general machining



RM6

- Maximum no. of corners
- Enhanced surface finish



Tools	Cutting load	Maximum depth of cut	Cost	Stable clamping	Perpendicularity	No. of corners
Triple Mill ^{new}	★★★★★	★★★★★	★★★	★★★	★★★	★★
RM3	★★★	★★	★★★★★	★★★★★	★★★	★★
RM4	★★★	★★★	★★★	★★★	★★★	★★★
RM6	★★★	★★★	★★	★★★	★★★★★	★★★★★

Recommended grade and chip breaker

(● : 1st Recommendation)

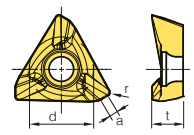
C/B	Cutting edge	P		M		K		N		S	
		Low carbon steel/ Mild steel		High carbon steel/ Alloy steel		Stainless steel		Cast iron		Non-ferrous metal	
		C/B	Grade	C/B	Grade	C/B	Grade	C/B	Grade	C/B	Grade
ML		-	● PC3700 ○ PC5300 ○ PC5400	-	● PC3700 ○ PC5300 ○ PC5400	●	● PC5300 ○ PC5400 ○ PC9540	-	● PC6510 ○ PC5300 ○ PC5400	-	-
MM		●	● PC3700 ○ PC5300 ○ PC5400	●	● PC3700 ○ PC5300 ○ PC5400	-	● PC5300 ○ PC5400 ○ PC9540	●	● PC6510 ○ PC5300 ○ PC5400	-	-
										-	● UPC845 ○ UNC840 ○ PC5300 ○ PC5400

Recommended cutting condition

Workpiece		Grade	Cutting speed vc (m/min)	TNKT11		TNKT16		TNKT20	
				fz (mm/t)	Max. ap (mm)	fz (mm/t)	Max. ap (mm)	fz (mm/t)	Max. ap (mm)
P	Steel	PC3700	160-270	0.25-0.1	8.0	0.25-0.1	11.5	0.25-0.1	15.5
		PC5300	140-240	0.25-0.1	8.0	0.25-0.1	11.5	0.25-0.1	15.5
M	Stainless steel	PC5300	90-150	0.2-0.05	8.0	0.2-0.05	11.5	0.2-0.05	15.5
		PC5400	70-120	0.2-0.05	8.0	0.2-0.05	11.5	0.2-0.05	15.5
		PC9540	70-120	0.2-0.05	8.0	0.2-0.05	11.5	0.2-0.05	15.5
K	Cast iron	PC6510	150-250	0.3-0.1	8.0	0.3-0.10	11.5	0.3-0.1	15.5
S	HRSA	PC5300	20-50	0.15-0.05	8.0	0.15-0.05	11.5	0.15-0.05	15.5
		UPC845	30-50	0.15-0.05	8.0	0.15-0.05	11.5	0.15-0.05	15.5
		UNC840	20-40	0.15-0.05	8.0	0.15-0.05	11.5	0.15-0.05	15.5

※ The above data refer to general cutting conditions and can be adjustable to the speed of 350 m/min and the feed per tooth of 0.3 mm/t depending on user environment.

Insert

Inserts	Designation		Coated						Dimensions (mm)				Geometries	
			PC3700	PC6510	PC9540	PC5300	PC5400	UNC840	UPC845	d	t	r		a
	TNKT	110508PEER-ML	●			●				8.0	4.500	0.8	1.3	
		160608PEER-ML	●			●				11.7	5.500	0.8	1.5	
		200708PEER-ML	●			●				14.5	7.000	0.8	2.0	
	TNKT	110508PESR-MM	●			●				8.0	4.531	0.8	1.3	
		160608PESR-MM	●			●				11.7	5.531	0.8	1.5	
		200708PESR-MM	●			●				14.5	7.031	0.8	2.0	

● : Stock item

TPMCM-TN16



• AR: 10°
• RR: -11°~-13.5°

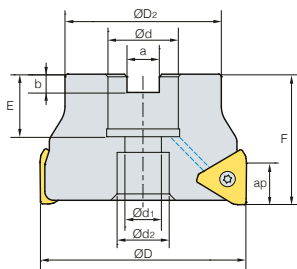


Fig. 1

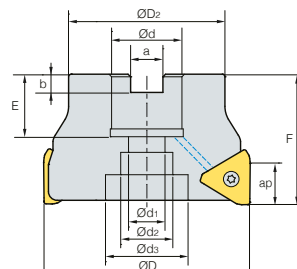


Fig. 2

(mm)

Designation	Stock		ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg	Available insert	Fig.
TPMCM 050R-22-4-TN16		4	50	42	22	11	18	-	10.4	6.3	21	40	11.5	0.26	TNKT16	1
050R-22-5-TN16	●	5	50	42	22	11	18	-	10.4	6.3	21	40	11.5	0.26		1
063R-22-4-TN16		4	63	50	22	11	18	-	10.4	6.3	21	40	11.5	0.50		1
063R-22-6-TN16	●	6	63	50	22	11	18	-	10.4	6.3	21	40	11.5	0.48		1
080R-27-6-TN16		6	80	60	27	14	20	-	12.4	7	24	50	11.5	0.99		1
080R-27-8-TN16	●	8	80	60	27	14	20	-	12.4	7	24	50	11.5	0.99		1
100R-32-8-TN16		8	100	70	32	18	28	45	14.4	8	28	63	11.5	1.85		2
100R-32-10-TN16	●	10	100	70	32	18	28	45	14.4	8	28	63	11.5	1.83		2
125R-40-12-TN16		12	125	90	40	22	32	54	16.4	9	30	63	11.5	3.12		2
125R-40-14-TN16	●	14	125	90	40	22	32	54	16.4	9	30	63	11.5	3.10		2

●: Stock item

Available inserts



TNKT-ML



TNKT-MM

Designation	Coated						
	PC3700	PC6510	PC9540	PC5300	PC5400	UNC840	UPC845
TNKT 160608PEER-ML	●			●			
160608PESR-MM	●			●			

●: Stock item

Available arbors

Designation	Ød	Available arbors
TPMCM 050R-22-□-TN□□	22	BT□□-FMC22-□□
063R-22-□-TN□□		
080R-27-□-TN□□	27	BT□□-FMC27-□□
100R-32-□-TN□□	32	BT□□-FMC32-□□
125R-40-□-TN□□	40	BT□□-FMC40-□□

Parts

Parts	Screw	Wrench
Specification		
Ø50~Ø125	FTKA0410	TW15S

TPMCM-TN20



• AR: 10°
• RR: -10.5°~-14°

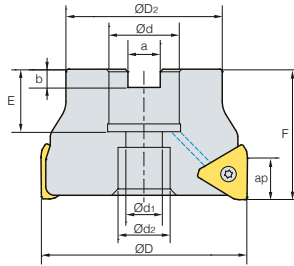


Fig. 1

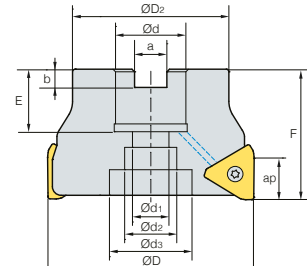


Fig. 2

(mm)

Designation	Stock		ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg	Available insert	Fig.
TPMCM 063R-22-5-TN20	●	5	63	50	22	11	18	-	10.4	6.3	21	50	15.5	0.57	TNKT20	1
063R-22-6-TN20	●	6	63	50	22	11	18	-	10.4	6.3	21	50	15.5	0.58		1
080R-27-5-TN20	●	5	80	60	27	14	20	-	12.4	7	24	50	15.5	0.92		1
080R-27-7-TN20	●	7	80	60	27	14	20	-	12.4	7	24	50	15.5	0.86		1
100R-32-7-TN20	●	7	100	70	32	18	28	45	14.4	8	28	63	15.5	1.79		2
100R-32-9-TN20	●	9	100	70	32	18	28	45	14.4	8	28	63	15.5	1.68		2
125R-40-8-TN20		8	125	90	40	22	32	52	16.4	9	30	63	15.5	3.08		2
125R-40-11-TN20		11	125	90	40	22	32	52	16.4	9	30	63	15.5	2.99		2

●: Stock item

Available inserts



TNKT-ML



TNKT-MM

Designation	Coated						
	PC3700	PC6510	PC9540	PC5300	PC5400	UNC840	UPC845
TNKT 200708PEER-ML	●			●			
200708PESR-MM	●			●			

●: Stock item

Available arbors

Designation	Ød	Available arbors
TPMCM 063R-22-□-TN□□	22	BT□□-FMC22-□□
080R-27-□-TN□□	27	BT□□-FMC27-□□
100R-32-□-TN□□	32	BT□□-FMC32-□□
125R-40-□-TN□□	40	BT□□-FMC40-□□

Parts

Specification	Parts	Screw	Wrench
Ø63~Ø125		FTGA0511-P	TW20-100

TPMS-TN11

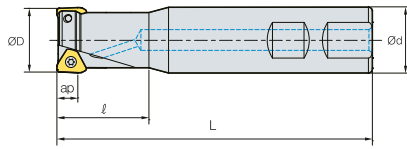


Fig. 1

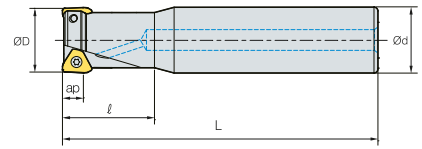


Fig. 2



• AR: 8°~10°
• RR: -14°~-15°

(mm)

	Designation	Stock		ØD	Ød	l	L	ap		Available insert	Fig.
TPMS	025R-2W25-120-TN11		2	25	25	35	120	8.0	0.37	TNKT11	1
	025R-2C25-200-TN11		2	25	25	35	200	8.0	0.65		2
	025R-3W25-120-TN11	●	3	25	25	35	120	8.0	0.36		1
	025R-3C25-200-TN11	●	3	25	25	35	200	8.0	0.64		2
	032R-2W32-130-TN11		2	32	32	40	130	8.0	0.71		1
	032R-2C32-200-TN11		2	32	32	40	200	8.0	1.12		2
	032R-3W32-130-TN11		3	32	32	40	130	8.0	0.70		1
	032R-3C32-200-TN11		3	32	32	40	200	8.0	1.14		2
	032R-4W32-130-TN11	●	4	32	32	40	130	8.0	0.70		1
	032R-4C32-200-TN11	●	4	32	32	40	200	8.0	1.11		2
	040R-4W40-130-TN11		4	40	40	40	130	8.0	1.12		1
	040R-5W40-130-TN11	●	5	40	40	40	130	8.0	1.11		1

●: Stock item

Available inserts



TNKT-ML



TNKT-MM

Designation		Coated					
		PC3700	PC6510	PC9540	PC5300	PC5400	UNC840
TNKT	110508PEER-ML	●			●		
	110508PESR-MM	●			●		

●: Stock item

Parts

Specification	Parts	Screw	Wrench
Ø25-Ø40		FTKA0307	TW09S

TPMS-TN16

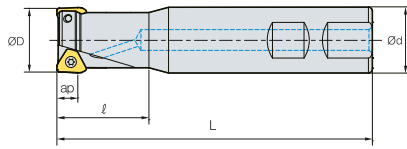


Fig. 1

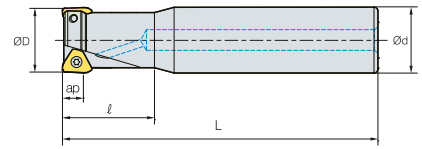


Fig. 2



• AR: 10°
• RR: -13.5°

(mm)

	Designation	Stock		ØD	Ød	l	L	ap		Available insert	Fig.
TPMS	032R-2W32-130-TN16	●	2	32	32	40	130	11.5	0.68	TNKT16	1
	032R-2C32-200-TN16		2	32	32	40	200	11.5	1.10		2
	040R-3W40-130-TN16		3	40	40	40	130	11.5	1.09		1
	040R-3C40-200-TN16		3	40	40	40	200	11.5	1.75		2
	040R-4W40-130-TN16	●	4	40	40	40	130	11.5	1.08		1

●: Stock item

Available inserts



TNKT-ML



TNKT-MM

Designation		Coated					
		PC3700	PC6510	PC9540	PC5300	PC5400	UNC840
TNKT	160608PEER-ML	●			●		
	160608PESR-MM	●			●		

●: Stock item

Parts

Specification	Parts	Screw	Wrench
			
Ø32-Ø40		FTKA0410	TW15S

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