

New Product Announcement

Oct 4th, 2023_NPAI 2310

TM4
YG MILL



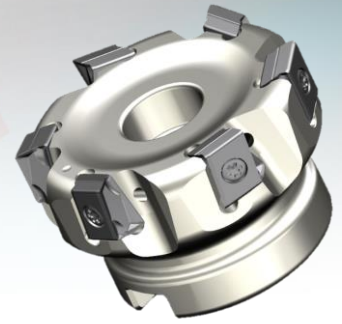
NEW 4 Cutting Edge **High Productivity Tangential Insert**

YG-1 has developed a 4 cutting edge tangential type milling inserts in response to market demand for higher productivity





The New Tangential type Milling inserts TM4 Mill



90° shoulder milling Tangential insert



YG-1 has developed and launched a 4-corner 90° shoulder milling concept with tangential mounted insert for various milling applications.

TM4 Mill was developed with numerous advantages that can greatly help improve productivity and part quality.

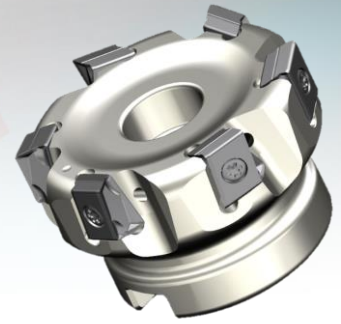
TM4 Mill is designed to reduce cutting forces, leading to a smooth cut due to a high rake angle cutting edge combined with large depth of cut through an elongated cutting edge. In addition, the curved cutting edge design minimizes mismatch, and the wide wiper allows for excellent surface finish.

The tangential type cutter is designed to achieve high productivity. The core diameter is greatly increased to improve rigidity, and due to extra close pitch, the productivity is improved. In addition, the wedge-type pocket improves clamping stability, enabling stable machining elevated feed rates.

The new TM4 Mill will provide increased machining efficiency and market leading performance.



The New Tangential type Milling inserts TM4 Mill

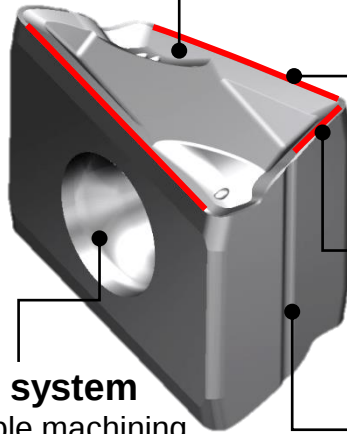


Insert & Holder



Key Technology

- ✓ **High positive rake face**
 - Optimal chip curl & minimized burrs

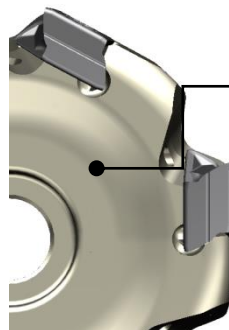
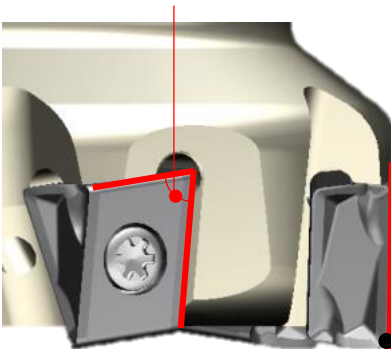


- ✓ **High helix cutting edge**
 - Low cutting force and Smooth cutting
- ✓ **Curved cutting edge**
 - Minimized mismatch
- ✓ **Long length of cutting edge**
 - Larger depth of cut
- ✓ **Wide wiper flat cutting edge**
 - Excellent surface quality

- ✓ **Tangential clamping system**
 - Rigid clamping and stable machining

- ✓ **Thicker insert**
 - Ultra rigidity

- ✓ **Higher clamping stability with wedge shaped pocket**



- ✓ **Larger Core Diameter**
 - Increased rigidity

- ✓ **True 90° shoulder milling**



Internal Test Result

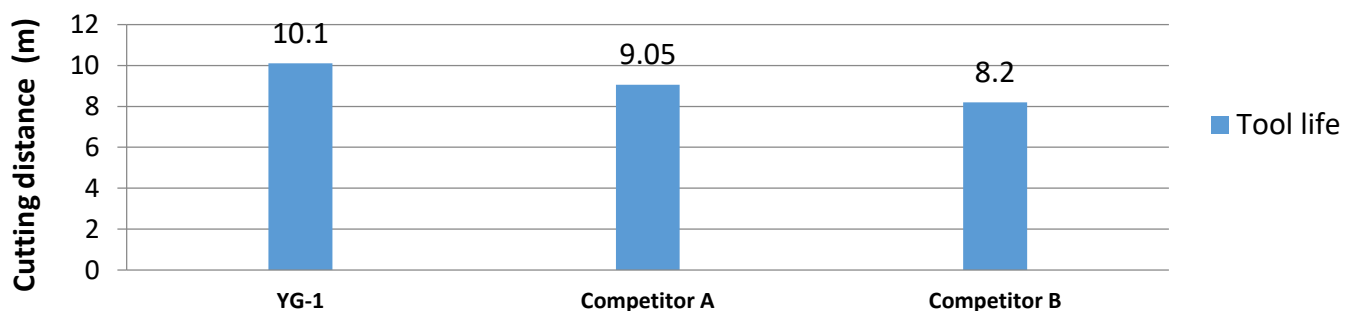


Test of Internal machining performance

- Test method : Wear resistance
- Work-piece material : SCM440 (HB224-231)
- Cutting condition :
 - √ Vc 250m/min (820sfm), fz 0.13mm/tooth (.005")
 - √ Ap 6mm (.236"), Ae 30mm (1.181"), Dry Condition
- Cutting operation : Shouldering & Facing
- Used tool :
Insert : LNKU130608R YG602
Cutter : F90-LNHU13R-D100Z8S32

- Test result

No.	1	2	3
Test Sample	YG-1 LNHU130608R YG602	Competitor A	Competitor B
Test result	100%	94%	82%





LNKU1306R & LNHU1306R



Success stories

Case 1

- Component name : Flange
- Work-piece material: High Tensile Strength Steel S690
- Existing insert : LNMT1306, PVD Coating
- Test Insert: LNHU130608R YG602
Test Cutter: F90-LNHU13R-D40Z4S16



Test Result

Cutting speed (m/min)	Feed (mm/tooth)	Depth of cut (mm)	Coolant	Rough/ Finishing	Tool life (pcs/edge)	
					TM4 Mill	Competitor
200	0.15	2	Dry	Roughing	18	14
656	0.006"	0.078"				

28% Better



LNKU1306R & LNHU1306R



Success stories

Case 2

- Component name : Pully
- Work-piece material: Nodular Cast Iron
- Existing insert : LNEXT1306, PVD Coating
- Test Insert: LNMU130608R YG5020
- Test Cutter: F90-LNHU13R-D63Z6S22



Test Result

Cutting speed (m/min)	Feed (mm/tooth)	Depth of cut (mm)	Coolant	Rough/ Finishing	Tool life (pcs/edge)	
					TM4 Mill	Competitor
200	0.12	3.0	Dry	Roughing	150	100
656	0.004"	0.118"				

50% Better



LNKU1306R & LNHU1306R



Success stories

Case 3

- Component name : Steering Knuckle
- Work-piece material: GGG45
- Existing insert : NNE324-100, PVD Coating
- Test Insert: LNKU130608R YG5020
Test Cutter: F90-LNHU13R-D80Z5S27



Test Result

Cutting speed (m/min)	Feed (mm/tooth)	Depth of cut (mm)	Coolant	Rough/ Finishing	Tool life (pcs/edge)	
					TM4 Mill	Competitor
188	0.25	6	Dry	Roughing	600	600
200	0.27					
616 SFM	0.009”	0.236”				
656 SFM	0.010”					

15% Higher
Productivity

Remark) Tool life was same but got 15% high productivity after increased cutting speed and feed rate.

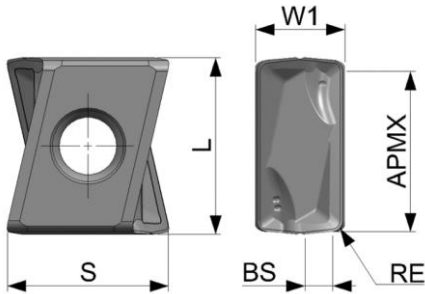


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LNKU1306R & LNHU1306R



Insert dimension and item list (Metric)



(mm)

Insert	L	W1	S	APMX	RE	BS
LNKU1306	13.2	6.7	12.1	11	0.8	2.09
LNHU1306					1.2	1.73

Insert item List

Insert	Designation	Cutting Conditions		Grades			
		ap (mm)	Feed (mm/z)	YG613	YG602	YG612	YG5020
	LNKU130608R	0.5-11.0	0.05 - 0.30	● 0741	○ 0739	● 0740	● 0742
	LNKU130612R	1.5-11.0		● 0765	○ 0763	● 0764	● 0766
	LNHU130608R	0.5-11.0			○ 0640	● 0723	

EDP : 1200....

● Stock

Item Applications

- Shouldering
- Facing & Slotting
- Edging(Side facing)
- Trochoidal milling with extended flute cutters

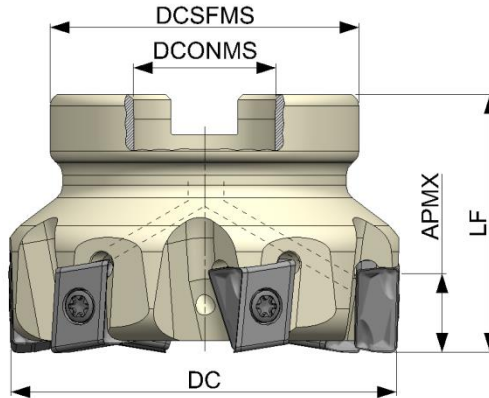


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LNKU1306R & LNHU1306R



Face mill cutters (Metric)



* CICT: Number of Teeth

EDP	Designation	CICT	Dimensions (mm)					Coolant	Mounting bolt	
			DC	DCSFMS	DCONMS	LF	APMX		Designation	EDP No.
17000787	F90-LNHU13R-D40Z4S16	4	40	37	18	40	11	●	YHBM08-L20	18000224
17000884	F90-LNHU13R-D40Z5S16	5	40	37	18	40	11	●	YHBM08-L20	18000224
17000793	F90-LNHU13R-D50Z5S22	5	50	45	20	40	11	●	YHBM10-L25	18000239
17000794	F90-LNHU13R-D50Z6S22	6	50	45	20	40	11	●	YHBM10-L25	18000239
17000795	F90-LNHU13R-D63Z6S22	6	63	48	20	40	11	●	YHBM10-L25	18000239
17000796	F90-LNHU13R-D63Z8S22	8	63	48	20	40	11	●	YHBM10-L25	18000239
17000885	F90-LNHU13R-D80Z10S27	10	80	60	23	50	11	●	YHBM12-L30	18000241
17000910	F90-LNHU13R-D80Z5S27	5	80	60	23	50	11	●	YHBM12-L30	18000241
17000797	F90-LNHU13R-D80Z7S27	7	80	60	23	50	11	●	YHBM12-L30	18000241
17000798	F90-LNHU13R-D80Z8S27	8	80	60	23	50	11	●	YHBM12-L30	18000241
17000846	F90-LNHU13R-D100Z13S32	13	100	67	26	50	11	●	YMBM16-L42	18000242
17000911	F90-LNHU13R-D100Z6S32	6	100	67	26	50	11	●	YMBM16-L42	18000242
17000845	F90-LNHU13R-D100Z8S32	8	100	67	26	50	11	●	YMBM16-L42	18000242
17000886	F90-LNHU13R-D100Z9S32	9	100	67	26	50	11	●	YMBM16-L42	18000242
17000887	F90-LNHU13R-D125Z11S40	11	125	89	29	63	11	●	YMBM20-L54	18000243
17000888	F90-LNHU13R-D125Z16S40	16	125	89	29	63	11	●	YMBM20-L54	18000243
17000889	F90-LNHU13R-D160Z13S40	13	160	89	29	63	11	X	X	X
17000890	F90-LNHU13R-D160Z18S40	18	160	89	29	63	11	X	X	X

Spare parts

• Recommended torque for tightening the screw is 3.0 Nm

< B.O.M of Wrench >

Part name	EDP No.	Designation
Screw	18000225	TP150412-GS
Wrench	18000217	TPWBTP15

Part name	EDP No.	Designation
Handle	18000210	DH-H6
Bit	18000208	DB-TP15



LNKU1306R & LNHU1306R



Recommended cutting conditions by work-piece materials

Cutting speed: Vc(m/min)

ISO	Material	VDI	YG602, YG612	YG613	YG5020
P	Non-alloy steel	1~5	180-280	100-210	
	Low alloy steel	6~9	150-250	70-180	
	High alloy steel	10~11	70-140	40-90	
M	Ferritic & Martensitic stainless steel	12~13	120-200	70-180	
	Austenitic stainless steel	14	130-250	70-200	
K	Grey cast iron	15~16	120-250		200-350
	Nodular cast iron	17~18	130-220		150-300
	Malleable cast iron	19~20			
N	Non-ferrous materials	21~30			
S	Super alloys & Titanium	31~37	25-45		
H	Hardened steel	38~41			