

ISO^{CO}ETURN

Tungaloy Report No. 426S3-G

Introducing GNMG and FNMG inserts



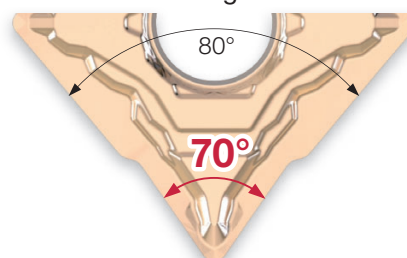


New **GNMG** and **FNMG** insert shapes for **ISO-EcoTurn**, an economical insert series

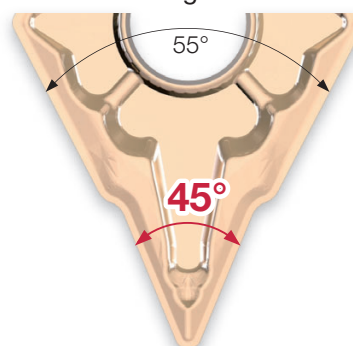
Innovative insert designs with reduced corner angles for better chip control and machining stability

- **GNMG0904** insert with **70° corners**: good alternative to CNMG with 80° corners
- **FNMG1104** insert with **45° corners**: good alternative to DNMG with 55° corners
- 70° and 45° corner angles provide the inserts with larger clearances with the workpiece
- Better chip control and chip flow generated by larger clearances of the insert side and end eliminate part damage. In addition, reduced corner angles help reduce the radial force that acts on the insert during machining, eliminating chatter, while providing stability

New GNMG type
Corner angle: **70°**

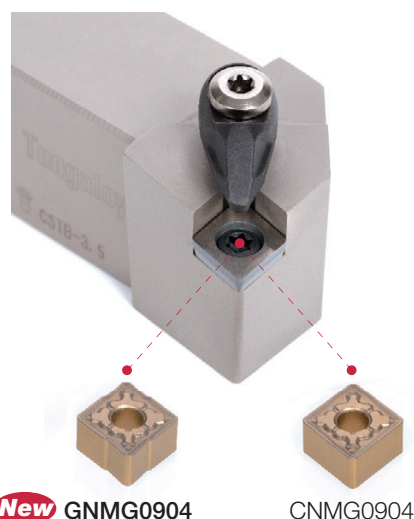


New FNMG type
Corner angle: **45°**



Versatility and economy

- The new inserts can be used with existing **ISO-EcoTurn** toolholders for CNMG0904 or DNMG1104
- **ISO-EcoTurn** decreases cost per insert on the production line without compromising insert performance
- Three types of insert grades are available for machining of a wide range of materials



CUTTING PERFORMANCE

1. Excellent chip control during profiling (longitudinal turning and outward face turning)



New FNMG type
Corner angle: 45°

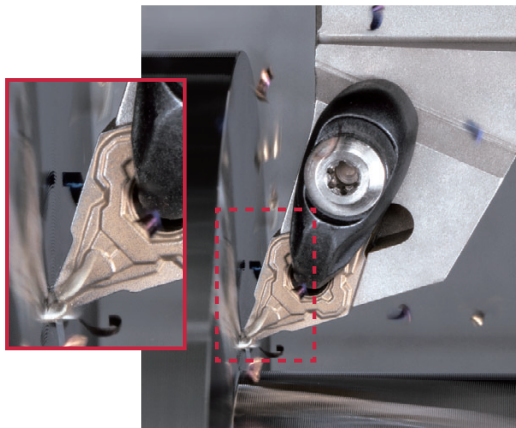
GNMG and **FNMG** inserts provide larger clearances for low cutting force and excellent chip control during profile machining.



DNMG type
Corner angle: 55°

P	Toolholder	: ADJNL2525M1104-A
	Insert	: FNMG110404E-TSF T9215 DNMG110404E-TSF T9215
	Workpiece material	: SCM440 / 42CrMo4
	Cutting speed	: ① Vc = 250 m/min, ② Vc = 150 m/min
	Feed	: ① f = 0.3 mm/rev, ② f = 0.25 mm/rev
	Depth of cut	: ① ap = 0.5 mm, ② ap = 0.25 mm
	Machining	: ① External turning, ② Face turning
	Coolant	: Dry

2. Excellent chip evacuation during face turning



New FNMG type
Corner angle: 45°

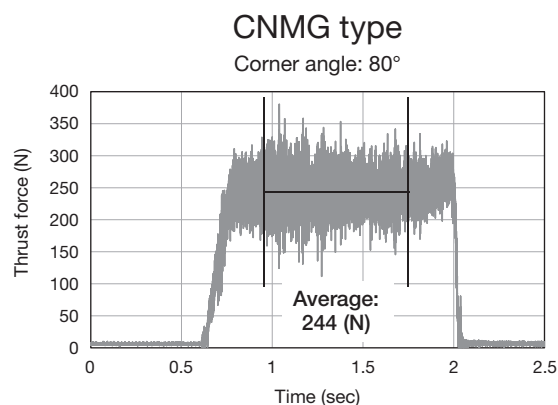
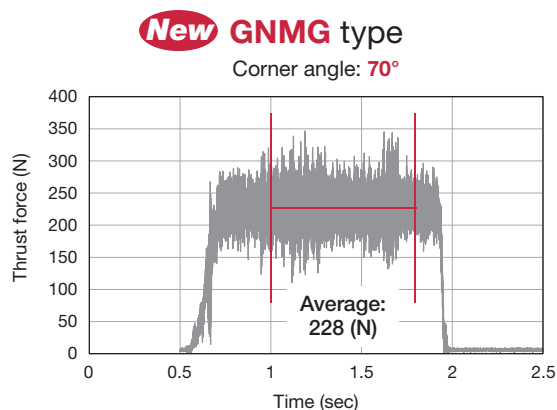
GNMG and **FNMG** inserts provide larger clearances for the chips to smoothly flow and evacuate out of the cutting zone. This significantly reduces chip re-cutting when the insert is fed in any direction.



DNMG type
Corner angle: 55°

P	Toolholder	: ADQNL2525M1104-A
	Insert	: FNMG110404E-TSF T9215 DNMG110404E-TSF T9215
	Workpiece material	: SCM440 / 42CrMo4
	Cutting speed	: Vc = 150 m/min
	Feed	: f = 0.25 mm/rev
	Depth of cut	: ap = 0.25 mm
	Machining	: Face turning
	Coolant	: Dry

3. Cutting force (thrust force)



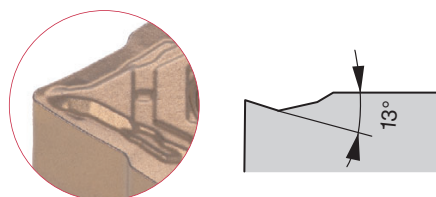
Reduced corner angles of **GNMG** and **FNMG** inserts enable less cutting contact with the workpiece. This lowers the radial cutting force that applies on the insert during machining, eliminating chatter, while improving machining stability.

P	Toolholder	: ACLNL2525M0904-A
	Insert	: GNMG090408E -TM T9215 CNMG090408E-TM T9215
	Workpiece material	: SCM440 / 42CrMo4
	Cutting speed	: $V_c = 300$ m/min
	Feed	: $f = 0.2$ mm/rev
	Depth of cut	: $a_p = 3$ mm
	Machining	: External turning
	Coolant	: Dry

APPLICATION AREA

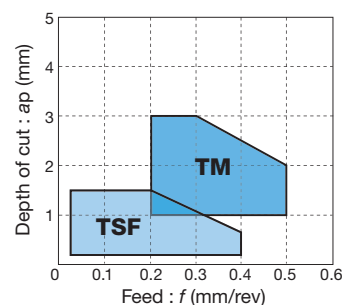
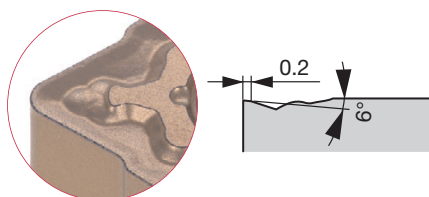
TSF chipbreaker

Excellent chip control and low cutting force geometry for finish machining.



TM chipbreaker

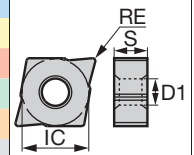
Excellent chip control and stable machining for medium machining.



GRADES

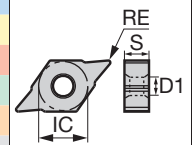
Grade	Recommended workpiece material	Feature
PREMIUMTEC T9215	P M K	- Well-balanced between wear and chipping resistance - First choice for steel - High versatility for a wide range of applications
PREMIUMTEC T9225	P	- First choice for roughing to medium cutting - High fracture resistance
PREMIUMTEC AH8015	P M K S	- PVD coated grade with a balanced resistance to wear and fracture - First choice for stainless steel and heat-resistant superalloys

- : Continuous cutting
- ◐ : Light interrupted cutting
- ⊕ : Heavy interrupted cutting

[illegible]

Make sure to offset the cutting edge position after insert change. ● : New product
Do not use ISO-EcoTurn cartridge set for CNMG09 (AD-CL-4/3-SET or -SET-S) with GNMG09 insert.
The insert may move during machining.

P	Steel	● ● ● ●
M	Stainless	● ● ●
K	Cast iron	● ●
N	Non-ferrous	
S	Superalloys	●
H	Hard materials	



Make sure to offset the cutting edge position after insert change. ● : New product
Please note that the insert shim may interfere with the workpiece when FNMG insert is used with Q-style toolholder to undercut a work diameter of 50 mm or smaller.

STANDARD CUTTING CONDITIONS

ISO	Operation	Chipbreaker	Grade	Depth of cut ap (mm)	Feed f (mm/rev)	Cutting speed: Vc (m/min)		
						Low carbon steel, alloy steel	Medium carbon steel, alloy steel	High carbon steel, alloy steel
	Finishing	TSF	T9215	0.2 - 1.5	0.08 - 0.4	150 - 400	150 - 400	120 - 300
			T9225	0.2 - 1.5	0.08 - 0.4	120 - 300	120 - 300	100 - 250
	Medium cutting	TM	T9215	1 - 3	0.2 - 0.5	150 - 400	150 - 400	120 - 300
			T9225	1 - 3	0.2 - 0.5	120 - 300	120 - 300	100 - 250
Stainless steel								
	Finishing	TSF	T9215	0.2 - 1.5	0.08 - 0.4		100 - 250	
			T9225	0.2 - 1.5	0.08 - 0.4		100 - 250	
			AH8015	0.2 - 1.5	0.08 - 0.4		90 - 190	
	Medium cutting	TM	T9215	1 - 3	0.2 - 0.5		100 - 250	
			T9225	1 - 3	0.2 - 0.5		100 - 250	
			AH8015	1 - 3	0.2 - 0.5		90 - 190	
Cast iron								
	Finishing	TSF	T9215	0.2 - 1.5	0.08 - 0.4		140 - 500	
			T9225	0.2 - 1.5	0.08 - 0.4		140 - 500	
	Medium cutting	TM	T9215	1 - 3	0.2 - 0.5		140 - 500	
			T9225	1 - 3	0.2 - 0.5		140 - 500	
Heat-resistant alloys								
	Finishing	TSF	AH8015	0.2 - 1.5	0.08 - 0.4		20 - 80	
	Medium cutting	TM	AH8015	1 - 3	0.2 - 0.5		20 - 80	

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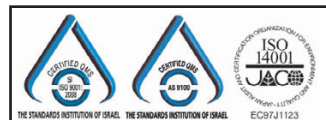
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