

T505

www.tungaloy.com

Tungaloy Report No. 539-G

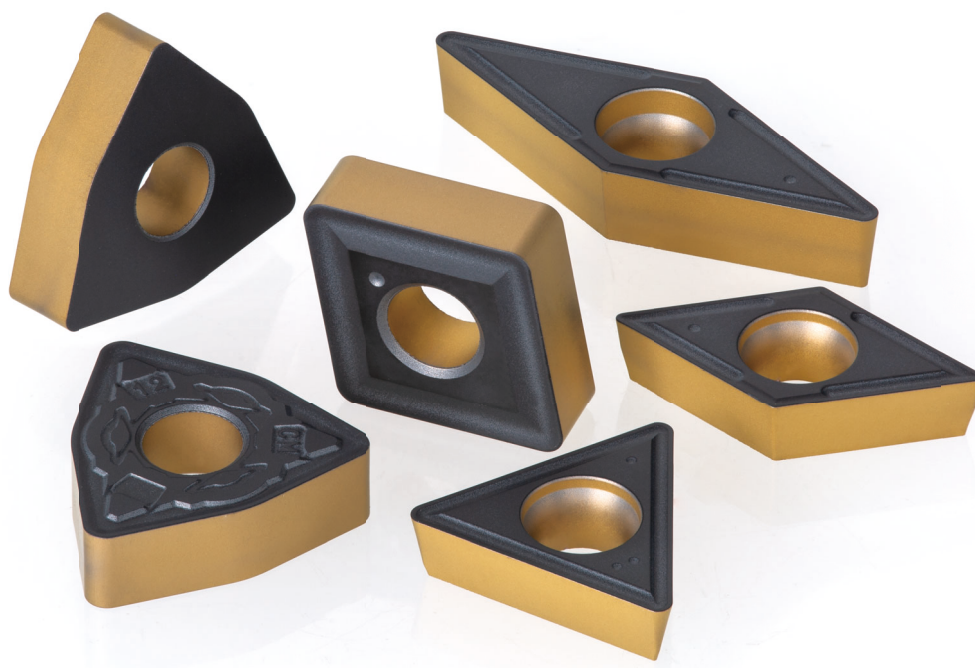
T505 - the latest grade with outstanding wear resistance for cast iron turning



INDUSTRY 4.0
FEED the SPEED!

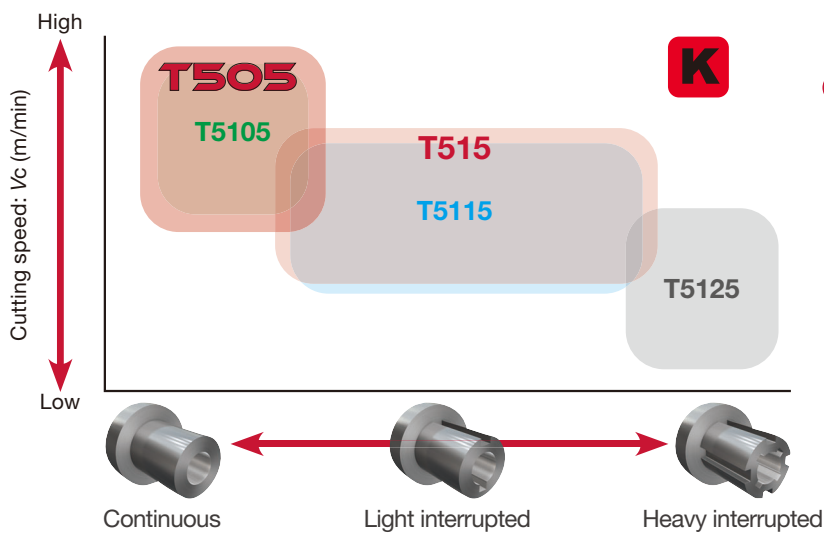


ACCELERATED MACHINING



New T505 grade complementing T515
for cast iron turning

New T505 - an optimal CVD grade for high speed machining of cast iron



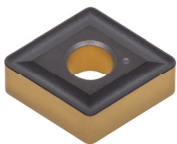
New

T505

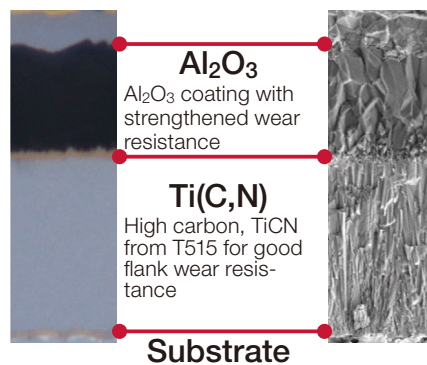
- Complementary grade to T515
- High wear resistance
- The best grade for high speed machining of K05 - K20

The thickest coating layer of all Tungaloy's CVD grades ever

New



T505's coating thickness is 1.5 times thicker than conventional grades.



Outstanding wear resistance!!

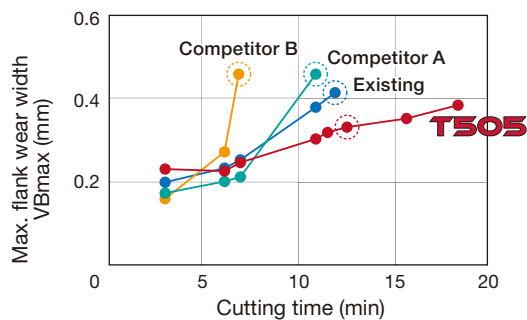
- Thickest coating layer of all Tungaloy's grades
- Al₂O₃ coating with strengthened wear resistance
- TiCN layer with high carbon content
- New substrate with high thermal conductivity

ISO	Grade	Substrate			Coating layer	
		Specific gravity	Hardness (HRA)	T.R.S. (GPa)	Main Composition	Thickness (μm)
K	T505	15	91	2.4	Continuously formed columnar crystal TiCN + Al ₂ O ₃	23

CUTTING PERFORMANCE

New CVD grade - Versatility at work in cast iron turning!

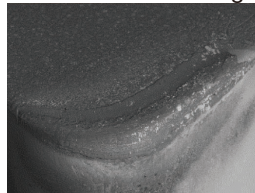
K FC200 / GG25



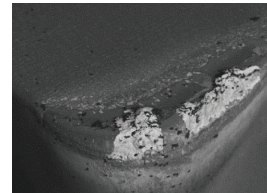
Workpiece material : FC200 / GG25
 Cutting speed : $V_c = 700$ m/min
 Feed : $f = 0.3$ mm/rev
 Depth of cut : $a_p = 2$ mm
 Machining : Continuous cutting
 Coolant : Wet

T505 showed excellent wear resistance in high speed machining of cast iron.

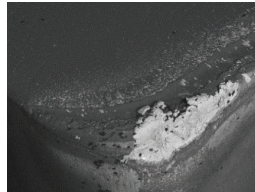
T505
12.5 min. machining



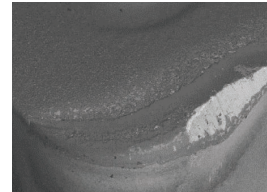
Existing
12 min. machining



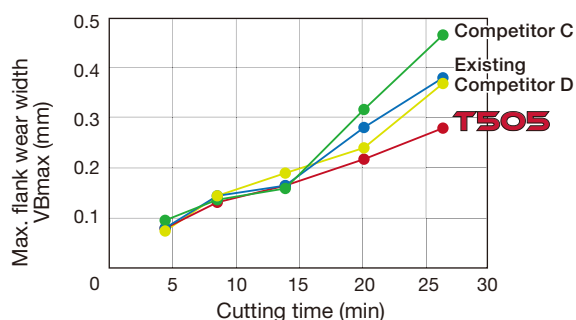
Competitor A
11 min. machining



Competitor B
7 min. machining



K FCD600 / GGG60

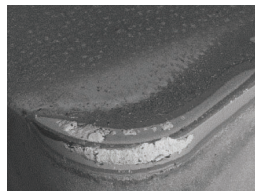


Workpiece material : FCD600 / GGG60
 Cutting speed : $V_c = 150$ m/min
 Feed : $f = 0.3$ mm/rev
 Depth of cut : $a_p = 2$ mm
 Machining : Continuous cutting
 Coolant : Wet

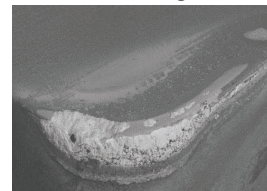
T505 showed good wear resistance in machining ductile cast iron.

26 min. machining

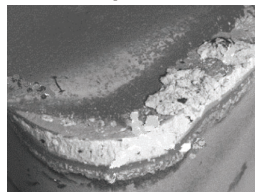
T505



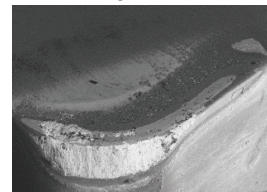
Existing



Competitor C



Competitor D



STANDARD CUTTING CONDITIONS

Negative inserts

Chipbreaker	Grades	Corner radius	Depth of cut ap (mm)	Feed f (mm/rev)	Cutting speed: Vc (m/min)	
		RE			Grey cast iron	Ductile cast iron
CM	T505	0.4	1 - 5	0.1 - 0.25	180 - 700	180 - 400
	T505	0.8	1 - 5	0.15 - 0.4	180 - 700	180 - 400
	T505	1.2	1 - 5	0.15 - 0.5	180 - 700	180 - 400
All-round	T505	0.4	1 - 6	0.2 - 0.3	180 - 700	180 - 400
	T505	0.8	1 - 6	0.2 - 0.5	180 - 700	180 - 400
	T505	1.2	1 - 6	0.2 - 0.5	180 - 700	180 - 400
	T505	1.6	1 - 6	0.3 - 0.5	180 - 700	180 - 400
Flat-top	T505	0.8	0.05 - 2	0.2 - 0.45	180 - 700	180 - 400
	T505	1.2	0.05 - 2	0.2 - 0.6	180 - 700	180 - 400

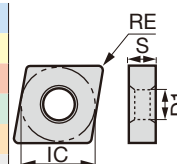
Positive insert

Chipbreaker	Grades	Corner radius	Depth of cut ap (mm)	Feed f (mm/rev)	Cutting speed: Vc (m/min)	
		RE			Grey cast iron	Ductile cast iron
CM	T505	0.4	0.05 - 2	0.05 - 0.2	180 - 700	180 - 400
	T505	0.8	0.05 - 2	0.05 - 0.3	180 - 700	180 - 400
	T505	1.2	0.05 - 2	0.05 - 0.3	180 - 700	180 - 400

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



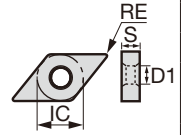
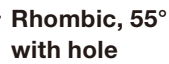
P	Steel
M	Stainless
K	Cast iron
N	Non-ferrous
S	Superalloy
H	Hard material

[illegible]

●: New
●: Line up

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

P	Steel
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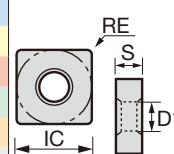
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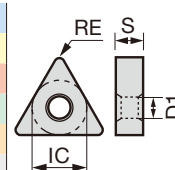


**Square, 90°
with hole**

[illegible][illegible]

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- ⊗ : Heavy interrupted cutting

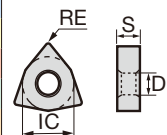
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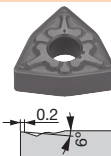
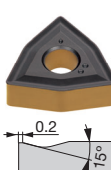
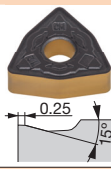
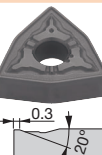
Application	Chipbreaker	Designation	Coated														Dimension (mm)				
			T505	T515														RE	IC	S	D1
Medium cutting	All-round	TNMG160404	●	●														0.4	9.525	4.76	3.81
		TNMG160408	●	●														0.8	9.525	4.76	3.81
		TNMG160412	●	●														1.2	9.525	4.76	3.81
		CM	TNMG160404-CM	●	●													0.4	9.525	4.76	3.81
		TNMG160408-CM	●	●														0.8	9.525	4.76	3.81
		TNMG160412-CM	●	●														1.2	9.525	4.76	3.81
		CH	TNMG160404-CH		●													0.4	9.525	4.76	3.81
		TNMG160408-CH		●														0.8	9.525	4.76	3.81
TNMG160412-CH			●														1.2	9.525	4.76	3.81	
Finishing to medium cutting	Flat-top	TNMA110404E		●														0.4	6.35	4.76	2.26
		TNMA110408E		●														0.8	6.35	4.76	2.26
		TNMA110412E		●														1.2	6.35	4.76	2.26
		TNMA160404	●	●														0.4	9.525	4.76	3.81
	TNMA160408	●	●														0.8	9.525	4.76	3.81	
	TNMA160412	●	●														1.2	9.525	4.76	3.81	

●: New
●: Line up

- : Continuous cutting
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- ⊗ : Heavy interrupted cutting

P	Steel
M	Stainless
K	Cast iron
N	Non-ferrous
S	Superalloy
H	Hard material

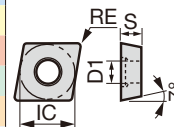


Application	Chipbreaker		Coated														Dimension (mm)				
		Designation	T505	T515																	
Finishing	TSF	WNMG080404-TSF	●															RE	IC	S	D1
		WNMG080408-TSF	●															0.4	12.7	4.76	5.16
		WNMG080412-TSF	●															0.8	12.7	4.76	5.16
				●														1.2	12.7	4.76	5.16
Finishing to medium cutting (wiper)	SW	WNMG080408-SW	●															0.8	12.7	4.76	5.16
		WNMG080412-SW	●															1.2	12.7	4.76	5.16
		*Wiper																			
Medium cutting	TM	WNMG080404-TM	●															0.4	12.7	4.76	5.16
		WNMG080408-TM	●															0.8	12.7	4.76	5.16
		WNMG080412-TM	●															1.2	12.7	4.76	5.16
		WNMG080416-TM	●															1.6	12.7	4.76	5.16
		All-round WNMG080404	●	●														0.4	12.7	4.76	5.16
		WNMG080408	●	●														0.8	12.7	4.76	5.16
		WNMG080412	●	●														1.2	12.7	4.76	5.16
		WNMG080416	●	●														1.6	12.7	4.76	5.16
		CM	WNMG080408-CM	●	●													0.8	12.7	4.76	5.16
		WNMG080412-CM	●	●														1.2	12.7	4.76	5.16
Medium to heavy cutting	TH	WNMG080408-TH	●															0.8	12.7	4.76	5.16
		WNMG080412-TH	●															1.2	12.7	4.76	5.16
		WNMG080416-TH	●															1.6	12.7	4.76	5.16

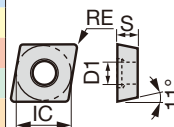
●: New
●: Line up

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

P	Steel
M	Stainless
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N	Non-ferrous
S	Superalloy
H	Hard material

[illegible]

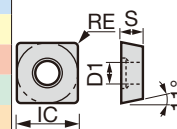
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[illegible]

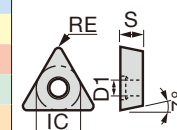
●: New
●: Line up

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

**Square, 90°
with hole
Positive 11°**

[illegible][illegible]

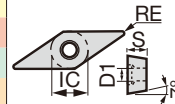
**Triangular, 60°
with hole
Positive 7°**

[illegible][illegible]

●: New
●: Line up

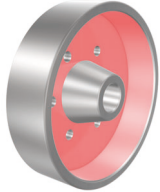
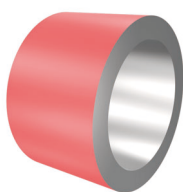
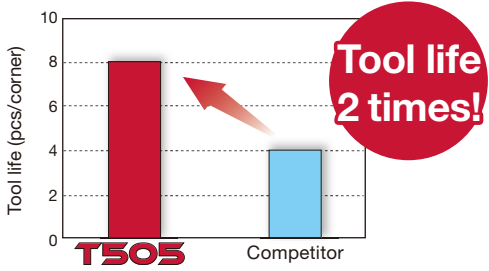
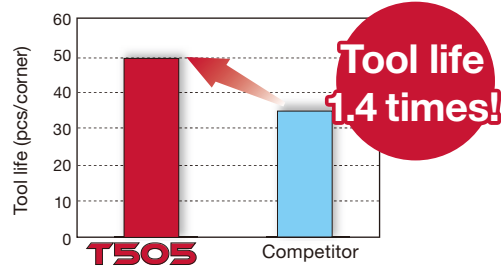
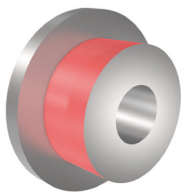
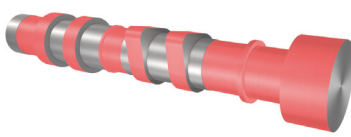
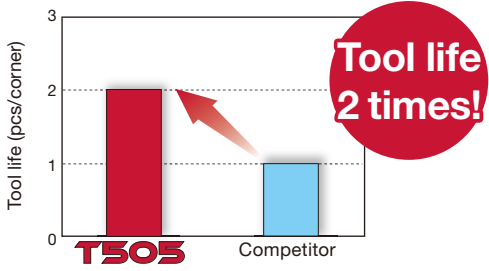
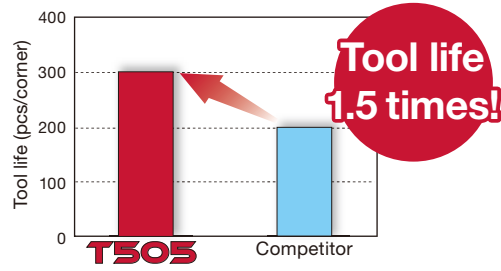
- : Continuous cutting
- ◐ : Light interrupted cutting
- ⊗ : Heavy interrupted cutting

**Rhombic, 35°
with hole
Positive 7°**



●: New
●: Line up

PRACTICAL EXAMPLES

Workpiece type		Fly wheel	Machine part
Insert		CNMG120408	CNMG120408-CM
Grade		T505	T505
Workpiece material		FC300 / GG30 / 300	FCD500
		 K	 K
Cutting conditions	Cutting speed: V_c (m/min)	200	100
	Feed : f (mm/rev)	0.25	0.5
	Depth of cut : a_p (mm)	3	2
	Machining	Internal and face turning	External turning
	Coolant	Wet	Dry
Results		 T505 machined 8 parts per edge, doubling tool life.	 T505 machined 50 parts per edge, increasing tool life by 1.4 times.
Workpiece type		Automotive part	Cam shaft
Insert		CNMA120408	DNMG150408
Grade		T505	T505
Workpiece material		FCD500	FCD700
		 K	 K
Cutting conditions	Cutting speed: V_c (m/min)	426	150 - 200
	Feed : f (mm/rev)	0.3	0.2 - 0.35
	Depth of cut : a_p (mm)	3	1
	Machining	External turning	External and face turning
	Coolant	Wet	Dry
Results		 T505 machined 2 parts per edge, doubling tool life.	 T505 machined 300 pcs per edge, improving tool life by 1.5 times over the competitor.

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