

TURNING

Insert Shapes/Sizes

CNMG 431, 432, 433
DNMG 431, 432, 433, 441,
442, 443
VNMG 331, 332
VNMX 2.531, 2.532

Chipbreakers

MGP - Medium applications
MLP - Semi-finishing to
medium applications
FX - Ball stud and pulley
applications

Coating

PVD - AlTiN

ISO Code

H05-H10

ISO TURN™

New Carbide Grade TT2010 for Hardened Steel Machining

- » Extremely high wear resistance
- » Designed for machining 40-62 HRC hardened steel
- » Economical alternative to ceramic and CBN

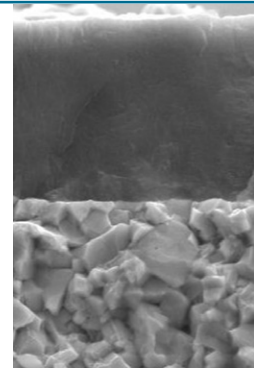


Ingersoll introduces the TT2010 carbide grade for hardened steel machining.

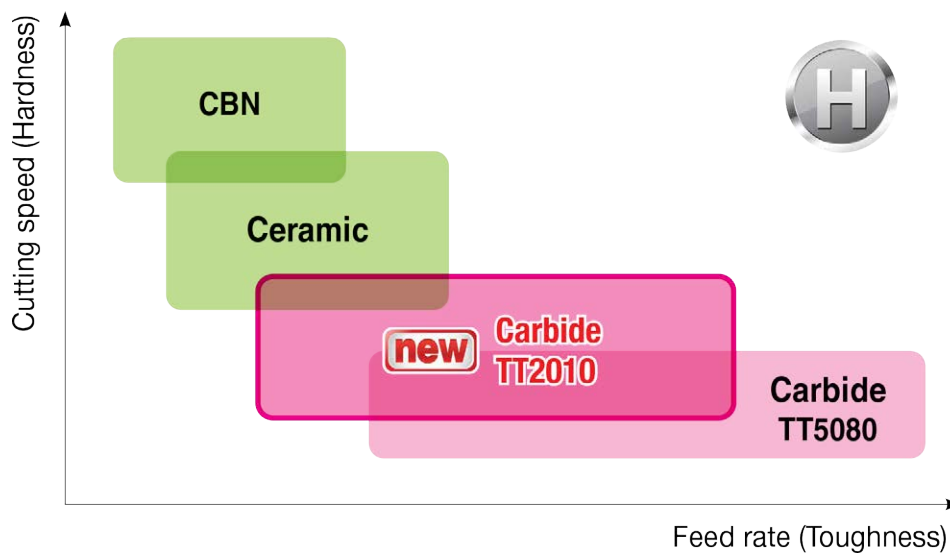
The TT2010 carbide grade offers exceptional hardness and sufficient toughness, delivering longer tool life when machining heat-treated hardened steel compared to conventional carbide grades. As a cost-effective alternative to ceramic and CBN grades, it provides an economical solution for customers seeking performance without the premium price. TT2010 also performs better at lower cutting speeds, enabling deeper cuts than CBN and improved chip breaking compared to ceramic options.

TT2010 Grade Features

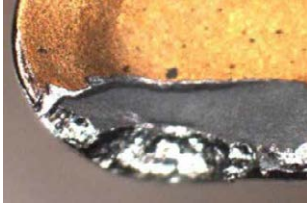
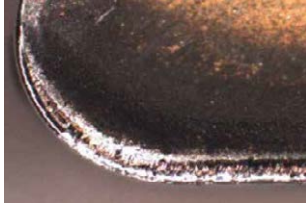
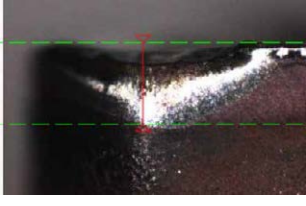
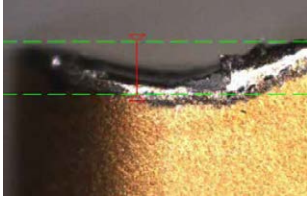
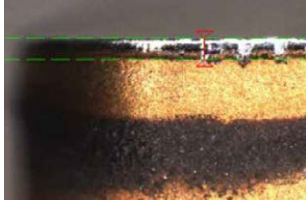
- Ultra fine-grained substrate for extremely high wear resistance
- An AlTiN-based PVD coating layer enables high deformation resistance
- ISO H05-H10 turning grade is optimally designed for HRC 40-62 hardened steel
- Excellent machining performance in finish and light interrupted cutting



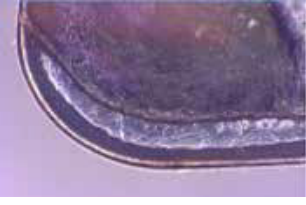
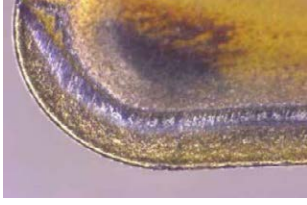
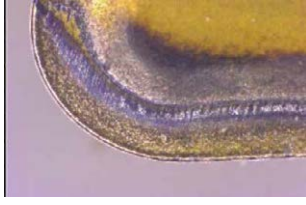
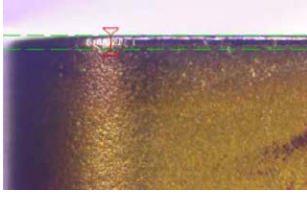
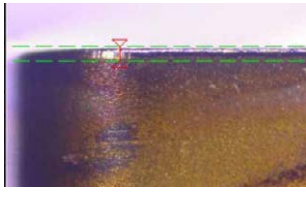
For Hardenend Steel (HRC 40-62)



Case Study 1

		Competitor	Ingersoll	Ingersoll
Material		Mold Steel (HRC 61-63)		
Application		External Turning		
Insert		CNMG432		
Grades		Carbide (for ISO H)	TT5080	TT2010
Cutting speed	V (sfm)	165		
Feed rate	f (ipr)	.004		
Depth of cut	ap (inch)	.079		
Coolant		Wet		
Wear	Top			
	Side			

Case Study 2

		Competitor	Ingersoll	Ingersoll
Material		Alloy Steel (HRC 45-50)		
Application		External Turning		
Insert		CNMG432		
Grades		Carbide (for ISO H)	TT5080	TT2010
Cutting speed	V (sfm)	260		
Feed rate	f (ipr)	.008		
Depth of cut	ap (inch)	.079		
Coolant		Wet		
Wear	Top			
	Side			

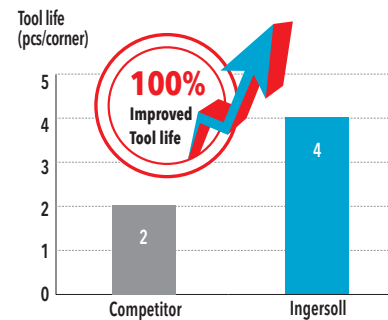
Case Study 3

		Competitor	Ingersoll	Ingersoll
Material		Alloy Steel (HRC 60)		
Application		Face Turning		
Insert		CNGA432	CNGA433	CNMG432
Grades		CBN	Ceramic	TT2010
Cutting speed	V (sfm)	525	395	165
Feed rate	f (ipr)	.004		
Depth of cut	ap (inch)	.003		
Coolant		Dry		
No. of Corners		2	4	4
Tool Life (pcs/corner)		350	60	175
Tool Life (pcs/insert)		700	240	700



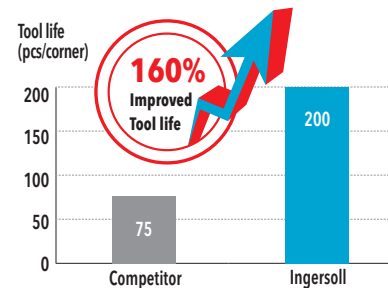
Case Study 4

		Competitor	Ingersoll
Material		Carburizing Steel (HRC 55-60)	
Application		External Turning & Face Turning	
Insert		CNMG432	
Grades		Carbide (for ISO H)	TT2010
Cutting speed	V (sfm)	225	
Feed rate	f (ipr)	.005	
Depth of cut	ap (inch)	.020	
Coolant		Wet	
Tool Life (pcs/corner)		2	4



Case Study 5

		Competitor	Ingersoll
Material		Heat Treated Steel (HRC 35)	
Application		Face Turning Interrupted	
Insert		CNMG432	
Grades		Carbide (for ISO P25)	TT2010
Cutting speed	V (sfm)	720	
Feed rate	f (ipr)	.009	
Depth of cut	ap (inch)	.020	
Tool Life (pcs/corner)		60-90	200



CNMG MGP

NEGATIVE 80° RHOMBIC INSERTS FOR MEDIUM APPLICATIONS

Size	Dimensions (inch)		
	IC Inscribed Circle	S Thickness	RE Corner Radius
431	.500	.187	.016
432	.500	.187	.031
433	.500	.187	.047

Part Number		Depth of Cut		Feed Rate		Grade
ANSI	ISO	ap (inch)		fn (ipr)		TT2010
		Min.	Max.	Min.	Max.	
INCH						
CNMG431MGP	CNMG120404MGP	.016	.118	.004	.016	•
CNMG432MGP	CNMG120408MGP	.020	.118	.006	.022	•
CNMG433MGP	CNMG120412MGP	.024	.118	.007	.022	•

• = Standard Items

DNMG MGP

NEGATIVE 55° RHOMBIC INSERTS FOR MEDIUM APPLICATIONS

Size	Dimensions (inch)		
	IC Inscribed Circle	S Thickness	RE Corner Radius
431	.500	.187	.016
432	.500	.187	.031
433	.500	.187	.047
441	.500	.250	.016
442	.500	.250	.031
443	.500	.250	.047

Part Number		Depth of Cut		Feed Rate		Grade
ANSI	ISO	ap (inch)		fn (ipr)		TT2010
		Min.	Max.	Min.	Max.	
INCH						
DNMG431MGP	DNMG150404MGP	.016	.079	.004	.016	•
DNMG432MGP	DNMG150408MGP	.020	.079	.006	.020	•
DNMG433MGP	DNMG150412MGP	.024	.079	.007	.022	•
DNMG441MGP	DNMG150604MGP	.016	.079	.004	.016	•
DNMG442MGP	DNMG150608MGP	.020	.079	.006	.020	•
DNMG443MGP	DNMG150612MGP	.024	.079	.007	.022	•

• = Standard Items

VNMG MLP

NEGATIVE 35° RHOMBIC INSERTS FOR SEMI-FINISHING TO MEDIUM APPLICATIONS

Size	Dimensions (inch)		
	IC Inscribed Circle	S Thickness	RE Corner Radius
331	.375	.187	.016
332	.375	.187	.031

Part Number		Depth of Cut		Feed Rate		Grade
ANSI	ISO	ap (inch)		fn (ipr)		TT2010
		Min.	Max.	Min.	Max.	
INCH						
VNMG331MLP	VNMG160404MLP	.004	.059	.002	.008	•
VNMG332MLP	VNMG160408MLP	.008	.059	.003	.012	•

• = Standard Items

VNMX FX

NEGATIVE 35° RHOMBIC INSERTS FOR BALL STUD AND PULLEY APPLICATIONS

Size	Dimensions (inch)		
	IC Inscribed Circle	S Thickness	RE Corner Radius
2.531	.313	.187	.016
2.532	.313	.187	.031

Part Number		Depth of Cut		Feed Rate		Grade
ANSI	ISO	ap (inch)		fn (ipr)		TT2010
		Min.	Max.	Min.	Max.	
INCH						
VNMX2.531FX	VNMX130404FX	.004	.039	.002	.008	•
VNMX2.532FX	VNMX130408FX	.008	.039	.003	.008	•

• = Standard Items

Recommended Cutting Conditions

Materials			Condition	Tensile Strength (Kpsi)	Hardness	Vc Cutting Speed SFM	Trade Names
ISO	Mtl Group No.	Type					
H	38	Hardened Steel	Hardened		42-55 HRc	260-650	Hardox 400, Hardox 500, W1, W210
	39		Hardened		55-65 HRc	160-325	HSS, 90 MnV8

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases. Additionally, DOC and IPR may need to be revised to optimize the tools performance.