

Appropriative inserts for steel turning

Safety precautions:

- Very hot or lengthy chips may be discharged while the machine is in operation. So, safety goggles or other protective covers must be used.
- In cutting process, sparks and hot chips may cause fire and explosion hazard. Therefore please make sure the fire extinguishers are ready for use.
- Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.
- Please handle with care as this product has sharp edges.



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Zhuzhou Huarui Cemented Carbide Tools Co.,Ltd.

INTRODUCTION

Zhuzhou Huarui Cemented Carbide Tools Co.,Ltd. is a high and new tech enterprise engaged in the production of cemented carbide cutting tools for CNC machinery, the municipal supporting institution of Zhuzhou Carbide Precision Cutting tool Engineering Technology Research Center. Also the production line has been named key project of “Manufacture makes Hunan stronger”. In the market, its “Hardstone” Brand products with excellent properties have been widely used in industries of automobiles, aviation & aerospace, rail traffic, heavy equipment, mold manufacture, power equipment,etc. and have been accepted by customers. Therefore they are selling to various overseas markets.

With its good development prospects, the company has won great favor from various investors. The well-known domestic equity investment funds invested a large sum of money for company in 2011, 2015 and 2017, which has speeded up the introduction of high-tech manufacturing equipments and quality test instruments. Therefore, the product quality has climbed one storey higher & reached the first- class in Asia.

The company has in its possession a strong technical strength & has forged a top domestic specialized & high-level R & D team of old, middle-aged & young professional personnel. They included experts enjoying special allowance of the state council & introduced outstanding CNC talents. The company has its own R&D Center consisting of material research, products design, mould design & manufacture, cutting experiments & technical application service, etc. ensuring the provision to customers of the best solutions to products & technical service. At present, the company has 22 nationally authorized patents.

The company has its quality control system covering the whole processes with independent intellectual property rights to guarantee the stability and consistency of its products. The company was awarded ISO9001:2000 quality management system certificate.2014, enterprise have passed 2008 quality standard system certificate.

The company has experienced sales engineers and technical application engineers, and has set up its product and technical service branched in China’s major industrial cities to provide the most professional and efficient service.

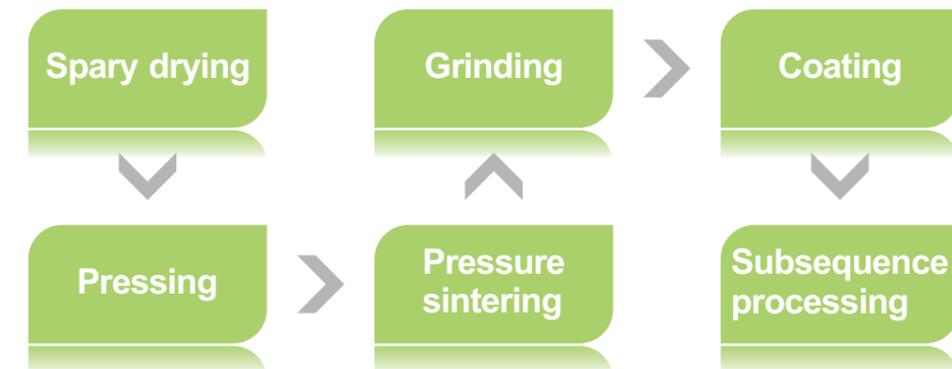


EQUIPMENT

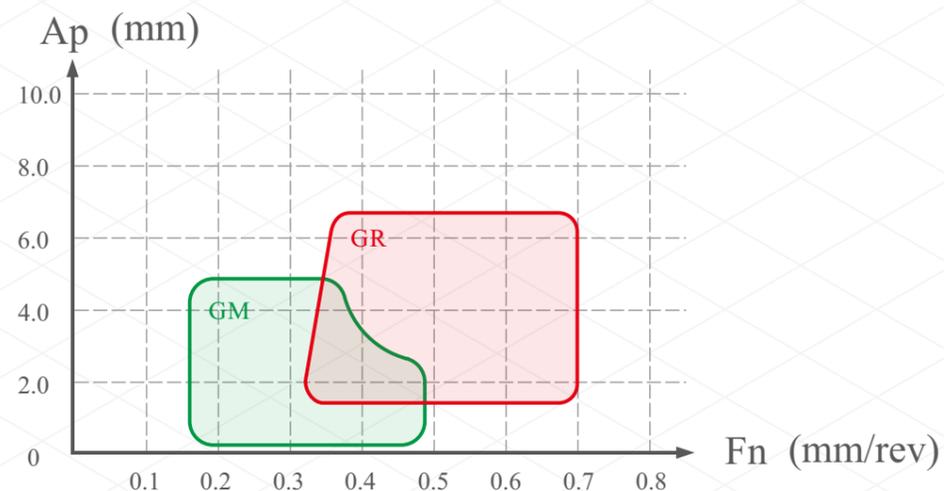
The company has a full set of high-level producing equipments ranging from raw power material preparation, mould manufacture, pressing, pressure sintering, grinding to post processing. We use spray drying tower in mixing process. Its advanced technique ascertains the best performance behavior of material in physical property and formability.

Using powder compacting press with Electro-Servo Motor Direct Drive, the most advanced machine for press shaping in the world, which meet the high requirements on precision, performance and stability. For sintering, we equipped the most advanced devices to meet the quality requirements on chemical and physical performance.

For grinding and machining, we equipped Fully auto CNC periphery insert grinder, CNC two-wheel flat lapping machine etc. to ensure product shape and precision demand. We also use the most advanced PVD/CVD coating machines. The state-of-the-art subsequence process devices equipped for better performance.



Chipbreaker application range



Turning inserts for steel machining (negative inserts)

80° CN** inserts with hole

Inserts shape	Type	Dimension (mm)					Cutting parameters	Shape
		L	IC	S	Φd	Re		
	CNMG120404-GM	12.9	12.7	4.76	5.16	0.4	ap: 0.5~ 5.5; fn: 0.15~ 0.25	
	CNMG120408-GM	12.9	12.7	4.76	5.16	0.8	ap: 0.5~ 5.5; fn: 0.15~ 0.40	
	CNMG120412-GM	12.9	12.7	4.76	5.16	1.2	ap: 0.5~ 5.5; fn: 0.15~ 0.50	
	CNMG160608-GM	12.9	15.875	6.35	6.35	0.8	ap: 1.0~ 7.0; fn: 0.15~ 0.40	
	CNMG160612-GM	12.9	15.875	6.35	6.35	1.2	ap: 1.0~ 7.0; fn: 0.15~ 0.60	
	CNMG120408-GR	12.9	12.7	4.76	5.16	0.8	ap: 1.0~ 5.5; fn: 0.25~ 0.40	
	CNMG120412-GR	12.9	12.7	4.76	5.16	1.2	ap: 1.3~ 5.5; fn: 0.25~ 0.50	
	CNMG190612-GR	19.3	19.05	6.35	7.94	1.2	ap: 2.0~ 8.0; fn: 0.30~ 0.70	

55° DN** inserts with hole

Inserts shape	Type	Dimension (mm)					Cutting parameters	Shape
		L	IC	S	Φd	Re		
	DNMG150404-GM	15.5	12.7	4.76	5.16	0.4	ap: 0.5~ 5.5; fn: 0.15~ 0.25	
	DNMG150408-GM	15.5	12.7	4.76	5.16	0.8	ap: 0.5~ 5.5; fn: 0.15~ 0.40	
	DNMG150604-GM	15.5	12.7	6.35	5.16	0.4	ap: 0.5~ 5.5; fn: 0.15~ 0.25	
	DNMG150608-GM	15.5	12.7	6.35	5.16	0.8	ap: 0.5~ 5.5; fn: 0.15~ 0.40	
	DNMG150612-GM	15.5	12.7	6.35	5.16	1.2	ap: 0.5~ 5.5; fn: 0.15~ 0.50	

60° TN** inserts with hole

Inserts shape	Type	Dimension (mm)					Cutting parameters	Shape
		L	IC	S	Φd	Re		
	TNMG160404-GM	16.5	9.525	4.76	3.81	0.4	ap: 0.5~ 5.5; fn: 0.15~ 0.25	
	TNMG160408-GM	16.5	9.525	4.76	3.81	0.8	ap: 0.5~ 5.5; fn: 0.15~ 0.40	
	TNMG160412-GM	16.5	9.525	4.76	3.81	1.2	ap: 0.5~ 5.5; fn: 0.15~ 0.50	
	TNMG220412-GM	22.0	12.7	4.76	5.16	1.2	ap: 2.5~ 7.0; fn: 0.25~ 0.6	
	TNMG160408-GR	16.5	9.525	4.76	3.81	0.8	ap: 1.0~ 5.0; fn: 0.25~ 0.40	
	TNMG160412-GR	16.5	9.525	4.76	3.81	1.2	ap: 1.0~ 5.0; fn: 0.25~ 0.50	

90° S N** inserts with hole

Inserts shape	Type	Dimension (mm)					Cutting parameters	Shape
		L	IC	S	Φd	Re		
	SNMG120404-GM	12.7	12.7	4.76	5.16	0.4	ap: 0.5~ 5.5; fn: 0.15~ 0.25	
	SNMG120408-GM	12.7	12.7	4.76	5.16	0.8	ap: 0.5~ 5.5; fn: 0.15~ 0.40	
	SNMG120412-GM	12.7	12.7	4.76	5.16	1.2	ap: 0.5~ 5.5; fn: 0.15~ 0.50	

80° WN** inserts with hole

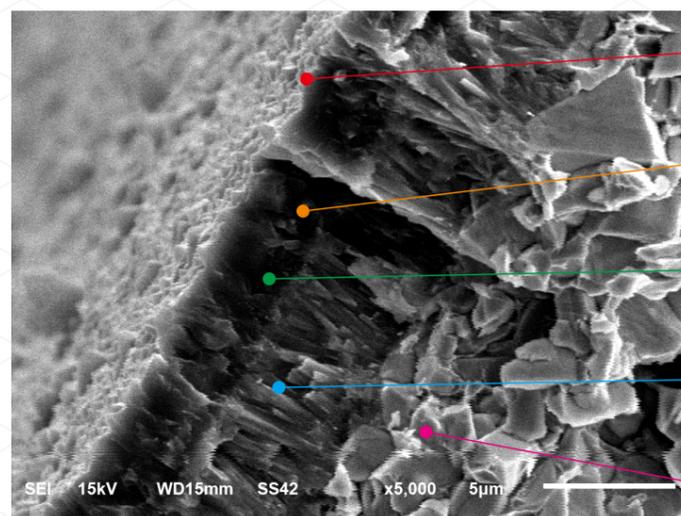
Inserts shape	Type	Dimension (mm)					Cutting parameters	Shape
		L	IC	S	Φd	Re		
	WNMG080404-GM	8.7	12.7	4.76	5.16	0.4	ap: 0.5~ 5.5; fn: 0.15~ 0.25	
	WNMG080408-GM	8.7	12.7	4.76	5.16	0.8	ap: 0.5~ 5.5; fn: 0.15~ 0.40	
	WNMG080412-GM	8.7	12.7	4.76	5.16	1.2	ap: 0.5~ 5.5; fn: 0.15~ 0.50	
	WNMG080408-GR	8.7	12.7	4.76	5.16	0.8	ap: 1.0~ 5.5; fn: 0.25~ 0.40	
	WNMG080412-GR	8.7	12.7	4.76	5.16	1.2	ap: 1.3~ 5.5; fn: 0.25~ 0.50	

The inserts' features

- ◆ GM-chipbreaker inserts have sharp cutting edge, achieving easy and fast cutting in semi-finishing machining. It optimized the small cutting deep machining machinability, especially have excellent performance when processing the workpiece material like soft steel etc.
- ◆ GR-chipbreaker optimized the structure of cutting edge and improved the edge strength, more safety and reliability in intermittent rough turning.
- ◆ Specific chipbreaker can effectively control chipping flow direction, which achieves easy and fast cutting and improve the inserts' service life.
- ◆ Small cutting force reduces the cutting vibration and obtains high quality finished workpiece surface.
- ◆ The combination of optimized substrate and coating increases the binding force, reducing the accidental processing failure caused by coating disbonding in cutting machining.

WS8125 Grade Features

- ◆ The cemented carbide substrate with ultrafine grain structure, which has high hardness and high strength. Good performance for rough machining to finishing of stainless steel and cast iron.
- ◆ Using fine cemented carbide substrate with unique process and excellent CVD coating, which achieved a better impact resistance and wear resistance. Effectively prevents edge chip break and abrasion.



Smooth TiN coating layer for excellent welding resistance

Smooth and tough α -Al₂O₃ layer features excellent heat and wear resistance.

Special ingredient interlayer increases the binding force and resistance to stripping.

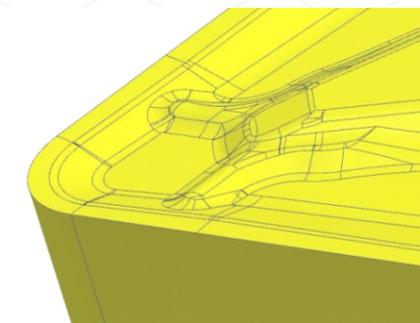
Ultra-fine TiCN coating layer increases the resistance to chipping and wearing.

A tough substrate with high wear resistance performance and excellent strength.

Chipbreaker features

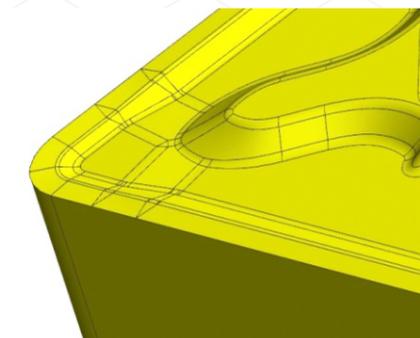
GM

- ◆ Y-Type chipbreaker which improved the cutting chipping processing ability of small cut deep machining.
- ◆ The inserts with the sharp cutting edge, which can achieved better quality of workpiece surface.
- ◆ Fine guide groove.
- ◆ Sharp cutting edge.
- ◆ Uniform cutting edge passivation.



GR

- ◆ Handle rough machining easily with its large space for swarf.
- ◆ Optimized convex plate of chipbreaker
- ◆ Wide space for debris
- ◆ Solid cutting edge
- ◆ Uniform cutting edge passivation



Application case

Gear turning

Workpiece material	Car drive shaft fourth gear 20CrMo	
Machining way	Emulsion turning end face	
Inserts type/Grade	WNMG080408-GM WS8115	
Cutting parameters	Vc=310m/min, f=0.45mm/r, ap=1mm	
Result of cutting	Hardstone, 24~30 pieces/cutting edge Brand S, 25~30 pieces/cutting edge	

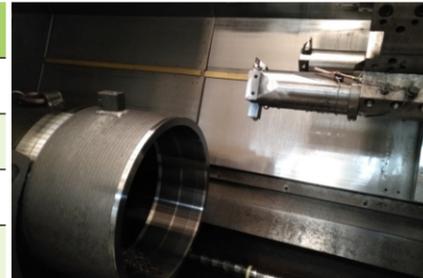
Wheel axle

Workpiece material	35CrMo
Machining way	Dry external rough turning
Inserts type/Grade	DNMG150612-GR WS8115
Cutting parameters	Vc=160m/min, f=0.336mm/r, ap=2mm
Result of cutting	Hardstone, 2 pieces/cutting edge, normal wear Company C, 2 pieces/cutting edge, normal wear



Cylinder bore rough turning

Cylinder material	30CrMnSi
Machining way	Wet cylinder bore rough turning
Inserts type/Grade	CNMG160612-GM WS8125
Cutting parameters	Vc=114m/min, f=0.3mm/r, ap=3.5mm
Result of cutting	Hardstone, 13 pieces/cutting edge Brand Z, 7-8 pieces/cutting edge



Cylinder bore finish turning

Cylinder material	30CrMnSi
Machining way	Wet finish turning cylinder bore
Inserts type/Grade	DNMG150608-GM WS8115
Cutting parameters	Vc=200m/min, f=0.13mm/r, ap=0.2mm
Result of cutting	Hardstone, 16 pieces/cutting edge Brand Z, 12 pieces/cutting edge



Guiding sleeve rough turning

Cylinder material	42CrMo
Machining way	Wet rough turning
Inserts type/Grade	CNMG120408-GM WS8125
Cutting parameters	Vc=196m/min, f=0.3mm/r, ap=2mm
Result of cutting	Hardstone, 40 pieces/cutting edge Brand Z, 25 pieces/cutting edge



Automobile Hub unit turning

Workpiece material	steel 55#
Machining way	Wet continuous/ intermittent semi-finish external turning
Inserts type/Grade	WNMG080408-GM WS8125
Cutting parameters	Vc=220-300m/min, f=0.15-0.28mm/r, ap=0.8mm
Result of cutting	Hardstone, 80-100 pieces/cutting edge Brand T, 70-90 pieces/cutting edge



Automobile hub unit hole turning

Cylinder material	Automobile Hub unit steel 65Mn
Machining way	Wet continuous semi-finish turning
Inserts type/Grade	VNMG160408-GM WS8115
Cutting parameters	Vc=300m/min, f=0.24mm/r, ap=0.5mm
Result of cutting	Hardstone, 160-180 pieces/cutting edge Brand T, 160-180 pieces/cutting edge



Ball Cage steel turning

Cylinder material	Ball Cage steel CF53
Machining way	Wet continuous/ intermittent semi-finish external turning
Inserts type/Grade	DNMG150408-GM WS8125
Cutting parameters	Vc=286m/min, f=0.33mm/r, ap=0.2mm
Result of cutting	Hardstone, 48-63 pieces/cutting edge Brand T, 40-50 pieces/cutting edge



Bearing turning

Cylinder material	Bearing GCr15
Machining way	Wet rough turning
Inserts type/Grade	WNMG080408-GM WS8125
Cutting parameters	Vc=260m/min, f=0.32mm/r, ap=2mm
Result of cutting	Hardstone, 130-150 pieces/cutting edge Brand T, 130-150 pieces/cutting edge

