2023

SOLID CARBIDE INSERTS

BEIJING WORLDIA DIAMOND TOOLS CO., LTD.

Tel.: +86 10-58411388 ext. 8082

Email: info@worldia-tools.com

Office Address: Room H-03, 5F, M7 Building, No.1 Jiuxianqiao East Road, Chaoyang District Beijing, China 100015

WORLDIA EUROPE GMBH

Tel.: +49-7032-2890690

Email: info@worldia-tools.eu

Office Address: Benzstraße, 38, 71083, Herrenberg Germany

COMPANY INTRODUCTION

Beijing Worldia Diamond Tools Co., Ltd. was founded in 2006 in Beijing Zhongguancun Science and Technology Park;

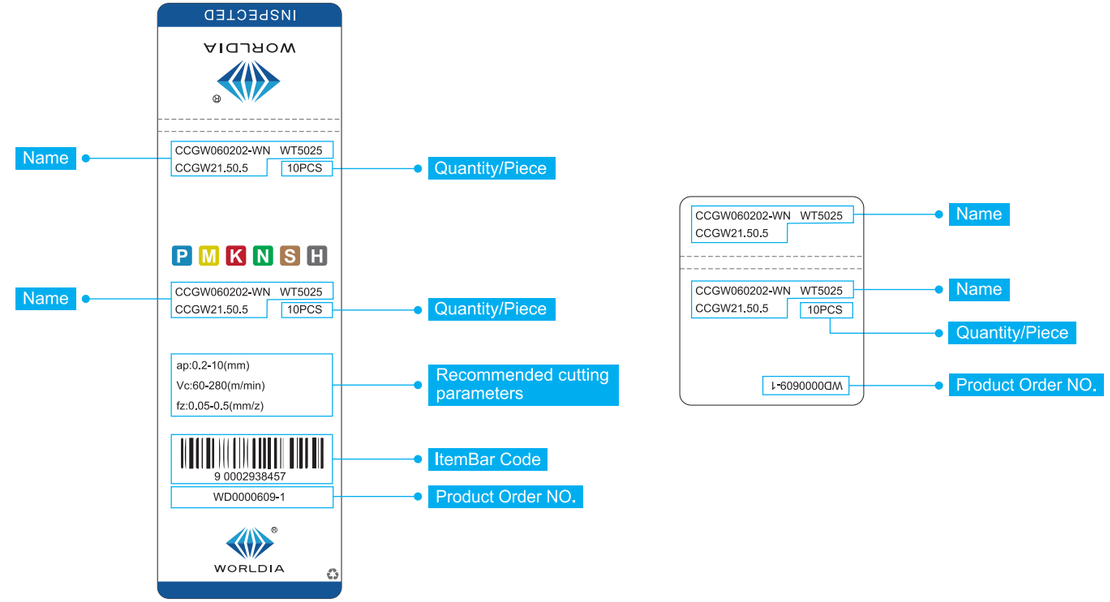
The Worldia Group currently has one branch and several wholly-owned subsidiaries. Among them, the two largest subsidiaries are Jiaxing Worldia Diamond Tools Co., Ltd. and Langfang Supower Diamond Technology Co., Ltd.;

The company is a high-tech enterprise mainly engaged in the research and development, production and sales of superhard cutting tools and superhard material products;

The products are involved in many well-known enterprises in the fields of optoelectronic display industry, photovoltaic, wind power, semiconductor, electronic equipment manufacturing at home and abroad, and have formed long-term and stable cooperative relations;

On July 22, 2019, worldia was officially listed on the STAR Market in Shanghai Stock Exchange. (Stock Code: 688028)

Package Introduction



PVD Coated Carbide

WT5025 NEW

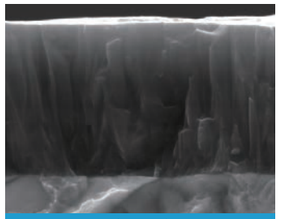
P15-P35 M15-M35 S15-S35 ISO范围

First recommendation for general purpose machining, widely used for milling, grooving and U-drilling inserts

Scanning electron micrographs for metallographic structure

Basic features

- Submicron grade, good wear resistance

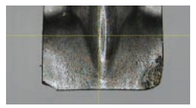
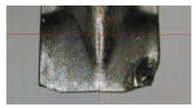


Scanning electron micrograph for coating structure

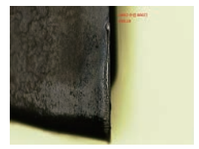
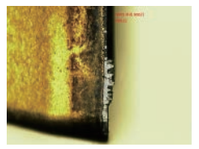
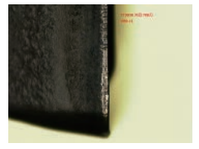
Coating features

- Composite nanostructures, high aluminium content
- Smooth coating surface, low coefficient of friction, long tool life
- Suitable for a wide range of materials to be processed

Processing cases

Tool brand	WORLDIA	Compare brand
Machine model	H50W	
Processing materials	42CrMo	
Material hardness	HB=200-240	
Insert model	CMGDN 400030-C WT5025	DGN 4003 ****
V(m/min)	150	150
Fn(mm/r)	0.12	0.12
a_p(mm)	8	8
Cooling method	External cooling	External cooling
Processing life	60min/cutting edge	60min/cutting edge
Wear value	0.22	0.33
Wear pattern	Flank wear	Flank wear, chipping
Outer edge		
VB value	0.22	0.33

Metal Processing Case

Tool brand	WORLDIA-WT5025	WORLDIA-WT5030	Compare brand
Machine model	SNS1160		
Tool holder model	BT50-SLN20-100		
Processing materials	20CrMnTi		
Material hardness	HB=190-210		
Cutter arbor	J3D-145-SP05		
Cutter arbor diameter(mm)	14.5		
Inster Model	SPMG 050204-UD WT5025	SPMG 050204-UD WT5030	SPMG 050204-*D T**30
Vc(m/min)	160	160	160
Fn(mm/r)	0.07	0.07	0.07
a_p(mm)	30	30	30
Cooling method	External cooling	External cooling	External cooling
Tool life	24m/blade	27m/blade	21m/blade
Lifetime ratio	114%	128%	100%
Wear value	0.10	0.11	0.11
Wear pattern	Crater wear, Flank wear	Crater wear, Flank wear and built-up edge	Crater wear, Flank wear
Outer edge			
VB value	0.10	0.11	0.11

Milling Grades Introduction

PVD coated carbide grades

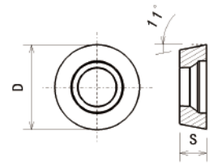
Grades	Appearance	ISO	Characteristics & Applications
WT5025		P15-P35 M15-M35 S15-S35	• Submicron grade, good wear resistance • For general milling of steel, stainless steel and high temperature alloys
WT5030		M15-M40 P15-P40 S15-S40	• Submicron grade, good wear resistance • For general milling of steel, stainless steel and high temperature alloys
WT5035		M25-M45 P25-P45	• Medium-coarse grained carbide as the substrate, good impact resistance • For interrupted machining and roughing of stainless steel and steel
WT7020		K10-K30	• Medium-coarse grained carbide as the substrate, good impact resistance and wear resistance • For general milling of rebated and nodular cast iron
WT3020		P10-P25 H15-H25	• Submicron grade, good wear resistance • For semi-finishing of steel and hardened steel
WT3010		P05-P15 H05-H15	• harden steel, high strength, high wear resistance • For high speed machining and finishing of steel parts and Ultra-fine grade

CVD coated carbide grades

Grades	Appearance	ISO	Characteristics & Applications
WT4020		K15-K35	• Milling Grades Cast Iron • For high speed milling of grey and nodular cast iron • For dry cutting

Milling Inserts

R Round shape, Positive
RPMW/RPMT

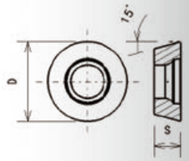


Inster	Designation		Dimensions d mm	Dimensions s mm	Cutting parameter fz (mm/z)	Cutting parameter ap (mm)	Grade WT5025	Grade WT5030	Grade WT5035	Grade WT7020	Grade WT3020	Grade WT3010
	RPMW	1003M0	10	3.18	0.20-0.70	0.20-5.00	☑					
		10T3M0	10	3.97	0.20-0.70	0.20-5.00	☑					
		1204M0	12	4.76	0.30-0.85	0.20-6.00	☑					
	RPMT	10T3M0-MM	10	3.97	0.20-0.70	0.20-5.00	☑	☑				☑
		1204M0-MM	12	4.76	0.30-0.85	0.20-6.00	☑	☑				☑
	RPMT	10T3M0-MP	10	3.97	0.20-0.70	0.20-5.00	☑				☑	☑
		1204M0-MP	12	4.76	0.30-0.85	0.20-6.00	☑				☑	☑

Processing materials		Application	WT5025	WT5030	WT5035	WT7020	WT3020	WT3010
P	Steel	● Stable cutting ◕ General cutting ✠ Unstable cutting	◕	◕	✠		●	●
M	Stainless steel		◕	◕	✠			
K	Cast iron					◕		●
N	Non-ferrous alloys							
S	High temperature alloys		◕		✠			
H	Hardened steel					◕	●	●

☑ Regular stock

Profile milling, Positive
RDMW/RDMT

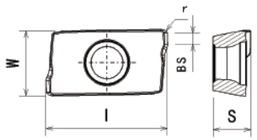


Insert	Designation		Dimensions d mm	Dimensions s mm	Cutting parameters fz (mm/z)	Cutting parameters ap (mm)	Grade WT5025	Grade WT5030	Grade WT5035	Grade WT7020	Grade WT3020	Grade WT3010
	RDMW	0501M0	5	1.59	0.20-0.50	0.15-2.00	☑					☑
		0702M0	7	2.38	0.20-0.60	0.20-3.00	☑					☑
		10T3M0T	10	3.97	0.20-0.70	0.20-5.00						☑
		1204M0T	12	4.76	0.25-0.80	0.25-6.00						☑
	RDMT	0803M0-TM	8	2.58	0.10-0.60	0.20-4.00	☑					
		10T3M0-TM	10	3.97	0.20-0.70	0.20-5.00	☑		☑		☑	☑
		1204M0-TM	12	4.76	0.25-0.80	0.25-6.00	☑		☑		☑	☑
		1605M0-TM	16	5.56	0.30-1.10	0.30-8.00	☑		☑			

Processing materials		Application	WT5025	WT5030	WT5035	WT7020	WT3020	WT3010
P	Steel	● Stable cutting	◐	◐	✠		●	●
M	Stainless steel	◐ General cutting	◐	◐	✠			
K	Cast iron	✠ Unstable cutting				◐		●
N	Non-ferrous alloys							
S	High temperature alloys		◐		✠			
H	Hardened steel					◐	●	●

☑ Regular stock

Shoulder milling, Positive

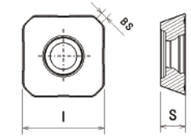


Apmt	Designation		Dimensions W mm	Dimensions l mm	Dimensions S mm	Dimensions r	Dimensions BS	Cutting parameters fz (mm/z)	Cutting parameters ap (mm)	Grade WT5025	Grade WT5030	Grade WT5035	Grade WT7020	Grade WT3020	Grade WT3010
	APMT	1135PDER-MP	6.27	11.3	3.5	0.8	1.3	0.05-0.5	0.2-10	☑		☑	☑	☑	☑
		1604PDER-MP	9.37	16.4	4.76	0.8	1.6	0.06-1.0	0.2-15	☑		☑	☑	☑	☑
	APMT	1135PDER-JM	6.21	11	3.5	0.8	1.2	0.05-0.5	0.2-10	☑				☑	☑
		1604PDER-JM	9.27	16.5	4.76	0.8	1.4	0.06-1.0	0.2-15	☑				☑	☑
	APMT	1135PDER-JH	6.21	11	3.5	0.8	1.5	0.06-0.6	0.2-10	☑		☑	☑	☑	☑
		1604PDER-JH	9.27	16.5	4.76	0.8	1.7	0.08-1.2	0.2-15	☑		☑	☑	☑	☑

Processing materials		Application	WT5025	WT5030	WT5035	WT7020	WT3020	WT3010
P	Steel	● Stable cutting	◐	◐	✠		●	●
M	Stainless steel	◐ General cutting	◐	◐	✠			
K	Cast iron	✠ Unstable cutting				◐		●
N	Non-ferrous alloys							
S	High temperature alloys		◐		✠			
H	Hardened steel					◐	●	●

☑ Regular stock

Face milling, Positive
SEMT type

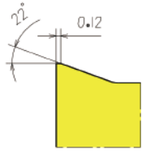
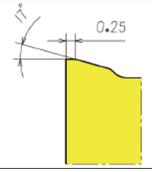


Insert	Designation		Dimensions W mm	Dimensions l mm	Dimensions S mm	Dimensions d	Dimensions BS	Cutting parameters fz (mm/z)	Cutting parameters ap (mm)	Grade WT5025	Grade WT5030	Grade WT5035	Grade WT7020	Grade WT3020	Grade WT3010
	SEKT	1204AFTN-JM		12.7	4.76	5.5	1.7	0.2-1.5	0.5-6.5	☑		☑	☑		☑
	SEMT	13T3AGSN-JM		13.4	3.97	4.4	2	0.2-1.5	0.5-6.5	☑			☑		☑

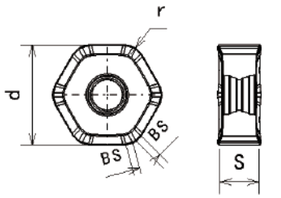
Processing materials		Application	WT5025	WT5030	WT5035	WT7020	WT3020	WT3010
P	Steel	● Stable cutting	◐	◐	✠			●
M	Stainless steel	◐ General cutting	◐	◐	✠			
K	Cast iron	✠ Unstable cutting				◐		
N	Non-ferrous alloys							
S	High temperature alloys		◐		✠			
H	Hardened steel					◐		●

☑ Regular stock

Chip breaker
HN_U

Applications	Chip breaker		Cutting edge information	Application features
General machining	JM			• The first recommended chip breaker for general purpose milling of steel, stainless steel, cast iron and difficult-to-cut materials • Positive front angle design, low cutting resistance, universal machining for milling
Stability machining	JR			• Recommended for rough machining of cast iron and steel • Negative chamfered cutting edge for stable machining

Face milling, Negative
HN_U



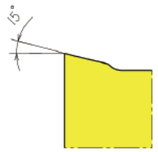
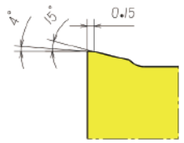
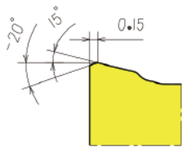
Insert	Designation		Geometric dimensions			Grade						
			d	S	BS	WT5025	WT5030	WT5035	WT7020	WT4020	WT3020	WT3010
	HNMU	0906ANSN-JM	16.5	6.35	1.20	☑			☑			
	HNGU	0906ANSN-JM	16.5	6.35	1.20	☑		☑	☑			
	HNMU	0906ANSN-JR	16.5	6.35	1.20	☑		☑	☑	☑		
	HNGU	0906ANSN-JR	16.5	6.35	1.20	☑		☑	☑	☑		

Processing materials			Application									
	P	Steel	● Stable cutting ◔ General cutting ✠ Unstable cutting			◔	◔	✠			●	●
	M	Stainless steel				◔	◔	✠				
	K	Cast iron							◔	◔		●
	N	Non-ferrous alloys										
	S	High temperature alloys				◔		✠				
	H	Hardened steel							◔		●	●

☑ Regular stock

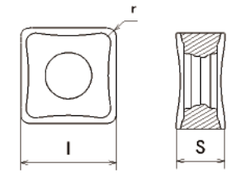
Chipbreakers Introduction

Chip breakers
SN_X type

Application	Chip breaker		Cutting edge information	Application features
Light cut machining	ML			• Recommended for steel, stainless steel, difficult-to-cut materials • Positive front angle design with sharp cutting edge
General machining	MP			• The first recommended chipbreaker for steel, stainless steel, cast iron and through-win milling • Positive front angle design, low cutting resistance, universal machining for milling
Stable machining	MR			• Recommended for rough machining of cast iron and steel parts • Negative chamfered cutting edge for stable machining

Milling Inserts

Face Milling Negative
SN_X type



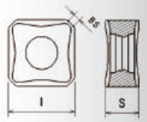
Insert	Designation		Geometric dimensions				Grade					
			l	S	BS	r	WT5025	WT5030	WT5035	WT7020	WT3020	WT3010
	SNMX	120512-ML	12.70	6.35		1.2	☑		☑	☑		
	SNMX	120512-MP	12.70	6.35		1.2	☑		☑	☑		
		120520-MP	12.70	6.35		2.0	☑					
	SNMX	120512-MR	12.70	6.35		1.2	☑		☑	☑		
		120520-MR	12.70	6.35		2.0	☑					
	SNGX	120512-MP	12.70	6.35		1.2	☑		☑	☑		

Processing materials		Application									
P	Steel	◔	◔	✠			
M	Stainless steel	◔	◔	✠			
K	Cast iron				◔		
N	Non-ferrous alloys						
S	High temperature alloys	◔		✠			
H	Hardened steel				●		

● Stable cutting ◔ General cutting ✠ Unstable cutting

☑ Regular stock

Face Milling Negative
SN_X type



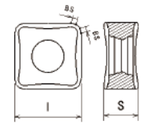
Insert	Designation		Geometric dimensions				Grade					
			I	S	BS	r	WT5025	WT5030	WT5035	WT7020	WT3020	WT3010
	SNMX	1205ANN-ML	12.70	6.35	1.60		☑		☑	☑		
	SNGX	1205ANN-ML	12.70	6.35	1.60		☑		☑	☑		
	SNMX	1205ANN-MP	12.70	6.35	1.60		☑		☑	☑		
	SNGX	1205ANN-MP	12.70	6.35	1.60		☑		☑	☑		
	SNMX	1205ANN-MR	12.70	6.35	1.60		☑		☑	☑		
	SNGX	1205ANN-MR	12.70	6.35	1.60		☑		☑	☑		

Processing materials		Application										
P	Steel											
M	Stainless steel											
K	Cast iron											
N	Non-ferrous alloys											
S	High temperature alloys											
H	Hardened steel											

● Stable cutting ◔ General cutting ✠ Unstable cutting

☑ Regular stock

Face Milling Negative
SN_X type



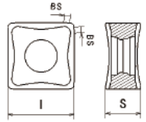
Insert	Designation		Geometric dimensions				Grade					
			I	S	BS	r	WT5025	WT5030	WT5035	WT7020	WT3020	WT3010
	SNGX	1205ENN-ML	12.70	6.35	1.20		☑			☑		
	SNGX	1205ENN-MP	12.70	6.35	1.20		☑		☑	☑		
	SNGX	1205ENN-MR	12.70	6.35	1.20		☑		☑	☑		

Processing materials		Application										
P	Steel											
M	Stainless steel											
K	Cast iron											
N	Non-ferrous alloys											
S	High temperature alloys											
H	Hardened steel											

● Stable cutting ◔ General cutting ✠ Unstable cutting

☑ Regular stock

Face Milling Negative
SN_X type



Insert	Designation		Geometric dimensions				Grade					
			I	S	BS	r	WT5025	WT5030	WT5035	WT7020	WT3020	WT3010
	SNGX	1205ZNN-ML	12.70	6.35	1.20		☑			☑		
	SNGX	1205ZNN-MP	12.70	6.35	1.20		☑		☑	☑		
	SNGX	1205ZNN-MR	12.70	6.35	1.20		☑		☑	☑		

Processing materials		Application										
P	Steel											
M	Stainless steel											
K	Cast iron											
N	Non-ferrous alloys											
S	High temperature alloys											
H	Hardened steel											

● Stable cutting ◔ General cutting ✠ Unstable cutting

☑ Regular stock

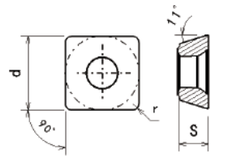
U-Drill Inserts Introduction

PVD coated carbide grades

Grade	Appearance	ISO	Characteristics & Applications
WT5025		P15-P35 M15-M35 S15-S35	• Submicron grade, good wear resistance • Recommended for drilling steel, cast iron, stainless steel and high-temperature alloys for more stable working conditions
WT5030		P15-P40 M15-M40 S15-S40	• Submicron grade, good wear resistance • Recommended for drilling steel, cast iron, stainless steel and high-temperature alloys for more stable working conditions
WT5035		P25-P45 P25-P45 M25-M45	• Highly toughness substrates • Recommended for drilling steel, cast iron, stainless steel and high temperature alloys in unstable conditions

U-Drill Insert

U-drill insert , Positive
SPMG-UD

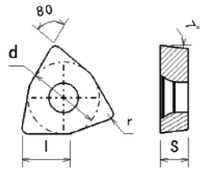


Insert	Designation		Cutting parameters	Geometric dimensions			Grade					
			fn (mm/rev)	d	s	r	WT5025	WT5030	WT3035	WT7020	WT3020	WT3010
	SPMG	050204	0.05-0.11	5.00	2.38	0.4	☑		☑			
		060204	0.06-0.14	6.00	2.38	0.4	☑		☑			
		07T308	0.06-0.18	7.94	3.97	0.8	☑		☑			
		090408	0.07-0.20	9.80	4.30	0.8	☑		☑			
		110408	0.08-0.22	11.50	4.80	0.8	☑		☑			
		140512	0.08-0.24	14.30	5.20	1.2	☑		☑			

Processing materials		Application								
P	Steel	● Stable cutting	◔ General cutting	✠ Unstable cutting			◔		✠			
M	Stainless steel						◔		✠			
K	Cast iron						◔		✠			
N	Non-ferrous alloys											
S	High temperature alloys						◔		✠			
H	Hardened steel											

☑ Regular stock

U-drill insert , Positive
WCMT-PD



Insert	Designation		Cutting parameters	Geometric dimensions			Grade					
			fn (mm/rev)	d	s	r	WT5025	WT5030	WT3035	WT7020	WT3020	WT3010
	WCMT	030208	0.04-0.10	5.56	2.38	0.8		☑	☑			
		040208	0.05-0.12	6.35	2.38	0.8		☑	☑			
		050308	0.07-0.15	7.94	3.18	0.8		☑	☑			
		06T308	0.08-0.18	9.525	3.97	0.8		☑	☑			
		080412	0.09-0.20	12.7	4.76	1.2		☑	☑			

Processing materials		Application								
P	Steel	● Stable cutting	◔ General cutting	✠ Unstable cutting				◔	✠			
M	Stainless steel							◔	✠			
K	Cast iron							◔	✠			
N	Non-ferrous alloys											
S	High temperature alloys							◔	✠			
H	Hardened steel											

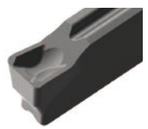
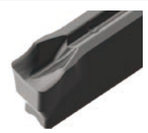
☑ Regular stock

Parting & Grooving Insert Introduction

PVD coated carbide Groove cutter grades

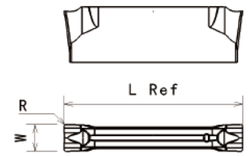
Grades	Appearance	ISO	Characteristics & Applications
WT5030		P15-P40 M15-M40 S15-S40	• Preferred grades for general machining • Recommended for slotting steel, stainless steel and high temperature alloys under more stable working conditions
WT5035		P25-P45 M25-M45	• High toughness substrate for intermittent cutting and unstable working conditions • Recommended for interrupted rough machining of stainless steel and steel parts
WT7020		K10-K30	• Special grade for cast iron Grooving for grey cast iron and nodular cast iron
WT3010		S05-S25 H05-H25	• High Hardness ultra-fine Grades • Recommended for grooving of high temperature alloys, titanium alloys and hardened steels

Chipbreakers Introduction

Application	Chipbreaker		Application features
Medium feed	C		• Grooving, cutting off the first recommended chipbreaker • Suitable for grooving and cutting of alloy steel, carbon steel, stainless steel and cast iron materials • Specification 1.5mm-6mm
Medium low feed	J		• First recommended chipbreaker for soft materials, thin-walled parts • Suitable for grooving and cutting of low carbon alloy steel, low carbon steel, stainless steel • Specification 1.5mm-6mm

Parting & Grooving Inserts

CMMN-J/C
CMDGN-J/C



Insert	Designation		Cutting parameters f (mm/rev)	Cutting parameters Tmax	Geometric dimensions W	Geometric dimensions R	Geometric dimensions L	Grade WT5025	Grade WT5030	Grade WT5035	Grade WT7020	Grade WT3020	Grade WT3010
	CMMN	150015-C	0.05-0.20	15.0	1.50	0.15	16.0	✓					
		200020-C	0.06-0.20	15.0	2.00	0.20	16.0	✓		✓			
		250020-C	0.06-0.20	17.0	2.50	0.25	18.0	✓					
		300040-C	0.07-0.22	20.0	3.00	0.40	21.0	✓		✓	✓		
		400040-C	0.08-0.25	20.0	4.00	0.40	21.0	✓		✓	✓		
		500080-C	0.09-0.30	25.0	5.00	0.80	26.0	✓			✓		
		600080-C	0.11-0.35	25.0	6.00	0.80	26.0	✓					
	CMMN	150015-J	0.04-0.15	15.0	1.50	0.15	16.0	✓					
		200020-J	0.04-0.15	15.0	2.00	0.20	16.0	✓					
		250020-J	0.04-0.18	17.0	2.50	0.25	18.0	✓					
		300040-J	0.05-0.20	20.0	3.00	0.40	21.0	✓					
		400040-J	0.06-0.20	20.0	4.00	0.40	21.0	✓					
		500080-J	0.07-0.22	25.0	5.00	0.80	26.0	✓					
		600080-J	0.07-0.22	25.0	6.00	0.80	26.0	✓					
	CMGDN	200020-C	0.05-0.20	19.0	2.00	0.20	20.0	✓					
		300020-C	0.06-0.22	19.0	3.00	0.20	20.0	✓			✓		
		400030-C	0.07-0.25	18.0	4.00	0.30	19.0	✓			✓		
		500030-C	0.08-0.30	18.0	5.00	0.30	19.0	✓			✓		
	CMGDN	200020-J	0.04-0.12	19.0	2.00	0.20	20.0	✓		✓			✓
		300020-J	0.04-0.15	19.0	3.00	0.20	20.0	✓		✓			✓
		400030-J	0.05-0.16	18.0	4.00	0.30	19.0	✓		✓			✓
		500030-J	0.05-0.18	18.0	5.00	0.30	19.0	✓					

Processing materials			Application										
	P	Steel	● Stable cutting	◐ General cutting	✠ Unstable cutting			◐		✠			●
	M	Stainless steel						◐		✠			●
	K	Cast iron						◐			◐		
	N	Non-ferrous alloys											
	S	High temperature alloys						◐		✠			●
	H	Hardened steel						◐					●

✓ Regular stock

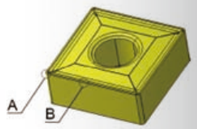
Turning Insert Introduction

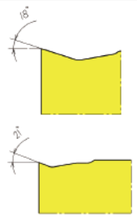
PVD Coated Carbide Grades

Grades	Appearance	ISO	Application features
WT5030		M15-M40 P15-P40 S15-S40	• Preferred grades for general machining • Recommended for general machining of steel, stainless steel and high temperature alloys under more stable working conditions
WT5035		M25-M45 P25-P45	• High toughness substrate, suitable for intermittent machining and unstable working conditions • Recommended for rough machining of stainless steel and steel parts
WT3010		S05-S20	• Ultra-fine grade, high hardness, high wear resistance • Recommended for high temperature alloys and stainless steel finishing

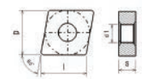
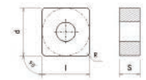
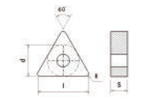
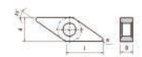
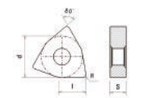
Chipbreakers Introduction

Chip breakers
Negative Turning insert



Applications	Chip breakers		Geometric angles	Application features
Finishing processes	FS			• The first recommended chipbreaker for stainless steel, high temperature alloys and soft steel • Positive front angle design, low cutting resistance, good Chip control

Turning Inserts

Insert		Designation		Cutting parameters		Grade						Geometric shapes
				f (mm/rev)	ap (mm)	WT5025	WT5030	WT5035	WT7020	WT3020	WT3010	
Finishing processes		CNMG	120404-FS	0.05-0.20	0.25-1.50						☑	
			120408-FS	0.07-0.30	0.50-1.50		☑				☑	
Finishing processes		DNMG	150404-FS	0.05-0.20	0.25-1.80						☑	
			150408-FS	0.07-0.30	0.50-1.80		☑				☑	
			150604-FS	0.05-0.20	0.25-1.80						☑	
			150608-FS	0.07-0.30	0.50-1.80		☑					
Finishing processes		SNMG	120408-FS	0.07-0.30	0.50-1.50		☑					
Finishing processes		TNMG	160404-FS	0.05-0.30	0.25-1.50		☑				☑	
			160408-FS	0.07-0.35	0.50-1.50		☑				☑	
Finishing processes		VNMG	160404-FS	0.05-0.30	0.25-1.80		☑					
			160408-FS	0.07-0.35	0.50-1.80		☑				☑	
Finishing processes		WNMG	080404-FS	0.05-0.20	0.25-1.50		☑				☑	
			080408-FS	0.07-0.30	0.50-1.50		☑				☑	

Processing materials		Application						
P	Steel							
M	Stainless steel							
K	Cast iron							
N	Non-ferrous alloys	● Stable cutting	◔ General cutting	✠ Unstable cutting				
S	High temperature alloys							
H	Hardened steel							