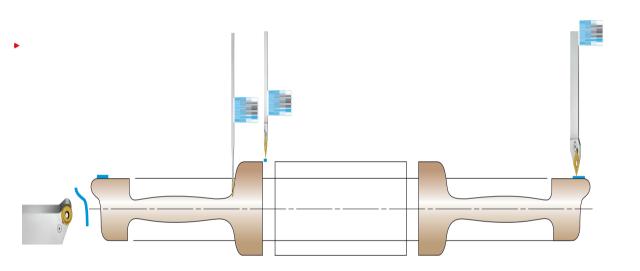
## 2024 TURNING INSERTS



#### 株洲大有新材料有限公司

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Valley), No. 899, XianYue Huan road, TianYuan District, Zhuzhou City, Hunan Province, P.R.CHINA Tel: +86-731-22283721 Fax: +86-731-22283721 Post code: 412000

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株洲大有新材料有限公司 ZHUZHOU OTOMO ADVANCED MATERIAL CO.,LTD

## Авоит отомо

Located in Zhuzhou China, where a city famous for its tungsten carbide industry, we, Zhuzhou OTOMO Advanced Material Co., Ltd, a Manufacturers Representative Company which has devoted 10 years to oversea market and has full line Supply chain of CNC cutting tools. Our company has a young but dedicated and professional staff group. Our main managements were worked for famous cutting tools factories as technical engineers. The company's tools are mainly applied in the automobile manufacturing industry mold manufacturing industry, defense industry, steel manufacturing industry, and other special fields. As a developing enterprise, ZHUZHOU OTOMO has always adhered to a high starting point with high standards, and we make every piece of our products in high performance and take every requirements of our customers' seriously. Meanwhile, we can tailored kinds of customized carbide tools according to clients' requirements. Now OTOMO products exported to more than 80 countries and regions of the world.

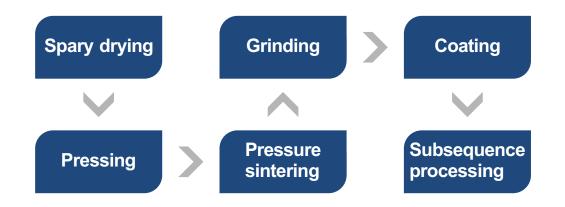
This is where working with a trusted cutting tool & metals supplier who can help to ensure that your requests are covered .By gathering insight from the right individuals and department representatives, accurately calculating the costs and choosing the right cutting tools&accessories&metals, we can ensure that your investment and its outcome will be well worth it.

### **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.



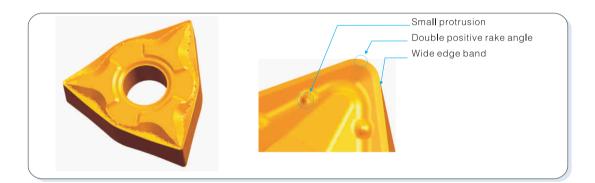




# Processing Sword for Stainless Steel

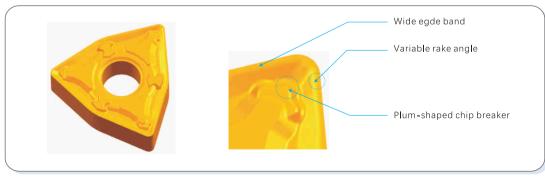
#### 1 Chip Breaker Features of Stainless Steel Finishing -BF

- Double large positive rake angle, fully ensure the sharpness of the edge
- Small protrusions are more conducive to chip breaks
- Large cutting edge inclination can guide the chip flow very well
- Low cutting resistance, high surface finish of machined parts



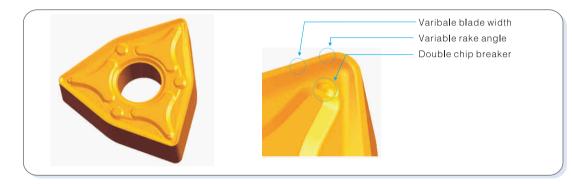
#### 2 Chip Breaker Features of Stainless Steel Semi-Finishing -BM

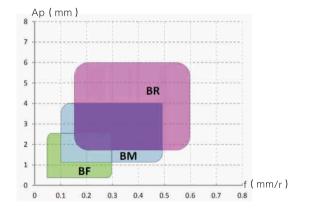
- The combination of variable blade width and variable rake angle takes into account the sharpness and strength of the cutting edge.
- Plum-shaped chip breaker structure, widen the chip breaking range of the insert
- Suitable for semi-finishing of stainless steel.



#### 3 Chip Breaker Features of Stainless Steel Finishing -BR

- Variable blade width and variable rake angle design, taking into account the sharpness and strength of the blade
- Large chip breaker and chip pocket design provides excellent chip breaking effect.
- Double chip breaker design expands the backbreaking range.
- Suitable for semi-finishing to rough machining of stainless steel





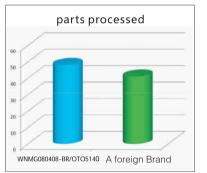
#### Case No.1

A Turning Insert

Workpiece material:stainless steel SUS304 Workpiece: Flange Cooling type:Fluid cooling Original blade:A foreign brand OTO insert:WNMG080408-BR/OT05140

Cutting parameter:Vc:153m/min, F:0.2mm/r , Ap:1 -2mm

Conclusion: Used for boring, uneven cutting allowance, our inserts processed 48 pieces, a foreign brand processed 41 pieces, tool life increased by 17%, and has the advantage of cost performance.



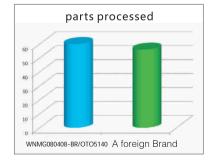


#### Case No.2

Workpiece material:stainless steel SUS304

- Workpiece:Flange
- Cooling type:Fluid cooling
- Original blade:A foreign brand
- OTO insert:WNMG080408-BR/OTO5140
- Cutting parameter:Vc:170m/min , F:0.2mm/r, Ap:1-1.5mm

Conclusion: Processing stainless steel flange end face, our inserts processed 69 pieces, a foreign brand processed 56 pieces, tool life increased by 23%, the advantage is obvious and the customer is very satisfied.



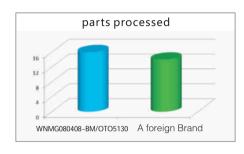


#### Case No.3

Workpiece material:stainless steel SUS304 Workpiece: Flange Cooling type:Fluid cooling Original blade:A foreign brand OTO insert:WNMG080408-BM/OTO5130

Cutting parameter:Vc:220m/min F:0.2-0.3mm/r Ap:0.8-1.5mm

Conclusion: processing flange outer circle, our inserts processed 16 pieces, a foreign brand processed 14 pieces, tool life increased by 14%, and our inserts processing work piece surface finish better than competitors.





#### Case No.4

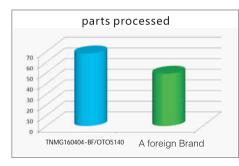
Workpiece material:stainless steel SUS304 Workpiece:pipe joint Cooling type:Fluid cooling

Original blade:A foreign brand

OTO insert:TNMG160404-BF/OTO5140

Cutting parameter:Vc:47m/min F:0.1mm/rAp:1mm

Conclusion: Machining the outer circle of pipe joint, our inserts processed 68 pieces, a foreign brand processed 49 pieces, the tool life increased by 39%, the cost performance advantage is obvious.







### The Features of CVD Coating

ISO	Grade	Colour	Coating structure	Electron microscopy images	Features.Application
	OTO8215	Yellow Black	TiCN+AI₂O₃+ ( TiN )		Wear-resistant substrate with resistance to plastic deformation, strong and tough coating with excellent bonding force. High-speed, high-efficiency turning of finishing-roughing steel.
	OT08225	Yellow Black	TiCN+AI₂O₃+ ( TiN )		A matrix with both wear resistance and chipping resistance, and a tough coating with excellent adhesion. Intermittent steel – the first choice for general turning operations.
P Steel	OTO8235	Yellow Black	TiCN+Al₂O₃+ ( TiN )		High toughness substrate, strong and tough coating with excellent bonding force, extremely high processing safety. Heavy-duty machining of steel and interrupted turning.
	OTO8315	Yellow	TiCN+AI₂O₃+TiN		Wear-resistant substrate that resists plastic deformation, thickened high- hardness and tough coating. High-speed, high-efficiency turning of finishingroughing steel.
	OTO8325	Yellow	TiCN+AI <sub>2</sub> O <sub>3</sub> +TiN		Both wear-resistant and chipping-resistant substrate, thickened high- hardness and tough coating. Longer life steel interruptions – general turning, easy to use for heavy duty machining.
к	OTO3315	Yellow	TiCN+AI₂O₃+TiN		Extremely wear-resistant material after Optimized, nano thick film CVD coating. Continuous or lightly interrupted turning of Grey and Ductile cast iron, easy to wear to identify the yellow surface.
K Cast Iron	OTO3415	Yellow Black	TiCN+Al <sub>2</sub> O <sub>3</sub> + ( TiN )		Extremely wear-resistant material after Optimized, nano-thick film CVD coating. Continuous or lightly interrupted turning of Grey and Ductile cast iron.
				Part international statements	





### The Features of PVD Coating

ISO	Grade	Colour	Coating structure	Electron microscopy images	Features.Application
	OTO5133	Bronze	AITiMeN		Ultra-fine grain matrix with special strength and toughness, enhanced red hardness, and the latest high wear-resistant coating. Universal high-performance machining for efficient milling of steel, stainless steel and heat-resistant alloys, as well as turning of stainless
	OT05525	Purple Black	AlTiMeN		steel. Ultra-fine grain matrix, nano-multilayer coating with good wear resistance and oxidation resistance.
M Stainless					Stable, long-life milling of steel and stainless steel.
Steel	OTO5130	Bronze	AlTiMeN		Ultra-fine grain matrix, newly upgraded nano-composite coating with high heat resistance and high toughness. Suitable for general milling of cast iron, steel and stainless steel, with better wear resistance. Supplementary grade for stainless steel turning.
	OTO5140	Bronze	AlTiMeN		Submicron matrix, newly upgraded nanocomposite coating with high heat resistance and high toughness. The grade of choice for turning stainless steels and can also be used for complementary machining of milder steels.
	OTO1010	Black	AITiN		The ultra-fine grain matrix strengthened by the bonding phase has excellent heat resistance and wear resistance. It is suitable for finishing/semi-finishing turning of heat-resistant alloys and hardened materials, and general-purpose milling.
S Heat Resistant	OTO1520	Purple Black	AlTiMeN		Improved thermal conductivity and toughness of the substrate, nano multilayer coating with good wear resistance and oxidation resistance. It is suitable for machining turbine shell, as well as titanium alloys and
Alloy					high-temp alloys.
	OTO1525	Purple Black	AITiMeN		Ultra-fine grain matrix with optimized heat resistance and toughness, nano-multilayer coating with good wear resistance and oxidation resistance. The first choice for general processing of heat-resistant alloys.
					The first choice for general processing of heat-resistant alloys.

### **Product and Chip Breaker**

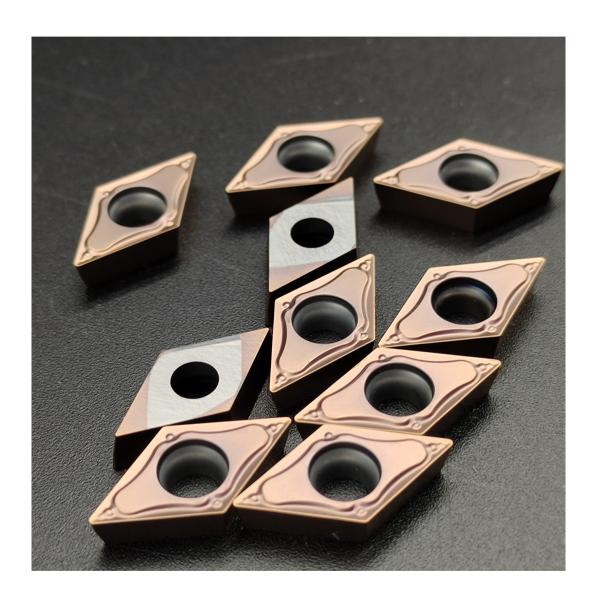
Finishing								
	CNMG-AF	DNMG-AF	SNMG-AF	TNMG-AF	VNMG-AF	WNMG-AF		
Length	09、12	15	12	16	16	08		
		_	_	_	_	_		
Finishing	101	2	0			<b>L</b>		
	CNMG-BF	DNMG-BF	SNMG-BF	TNMG-BF	VNMG-BF	WNMG-BF		
Length	09、12	15	12	16	16	06、08		
Semi– finishing				joj		23		
	CNMG-AS	CNMG-BM	CNMG-CM	CNMG-DM	DNMG-AS	DNMG-BM		
Length	12、16、19	12、16	12、16、19	12	15	15		
Semi– finishing			Ó	<b>JOR</b>				
	DNMG-CM	DNMG-DM	SNMG-AS	SNMG-BM	SNMG-CM	SNMG-DM		
Length	15	15	12、15	12、15	12	12、15		
Semi– finishing								
	TNMG-AS	TNMG-BM	TNMG-CM	VNMG-AS	VNMG-CM	WNMG-AS		
Length	16、22	16、22	16、22	11、16	16	08		

### **Product and Chip Breaker**

Simin Interpretation         Image: second seco							
Length06.08080808111RoughingII<	Semi– finishing						
NoteImage: section of the		WNMG-BM	WNMG-CM	WNMG-DM			
Image: constraint of the symbol is and the	Length	06、08	08	08			
Image: constraint of the symbol is and the		-	-	-			
Length         12, 16, 19         12, 16         15         15         12, 15, 19         12, 15           Roughing $4$ $4$ $4$ $4$ $4$ $4$ $4$ $4$ Roughing $4$	Roughing		0				
NomeImage: section of the		CNMG-AR	CNMG-BR	DNMG-AR	DNMG-BR	SNMG-AR	SNMG-BR
Image: Rest of the second s	Length	12、16、19	12、16	15	15	12、15、19	12、15
Image: Rest of the second s							
Length       16, 22       16, 22       06, 08       06, 08 $100, 08$ Heavy Heavy Hoad       Image: CNMM-AR       Image: CNMM-AR <t< td=""><td>Roughing</td><td>LO.</td><td>A</td><td></td><td></td><td></td><td></td></t<>	Roughing	LO.	A				
Heavy -loadImage: Constraint of the second		TNMG-AR	TNMG-BR	WNMG-AR	WNMG-BR		
Image: Constraint of the system         Image: Consthe system         Image: Constraint of the	Length	16、22	16、22	06、08	06、08		
Image: Constraint of the system         Image: Consthe system         Image: Constraint of the							
Length         19, 25         19, 25         Image: Constraint of the state of the st	Heavy –load		0				
Semi- finishingImage: Semi- 		CNMM-AR	SNMM-AR				
CCMT-GM     DCMT-GM     TCMT-GM	Length	19、25	19、25				
CCMT-GM     DCMT-GM     TCMT-GM							
	Semi– finishing						
Length         06、09、12         07、11         09、12         09、11、16		CCMT-GM	DCMT-GM	SCMT-GM	TCMT-GM		
	Length	06、09、12	07、11	09、12	09、11、16		

### **Product and Chip Breaker**

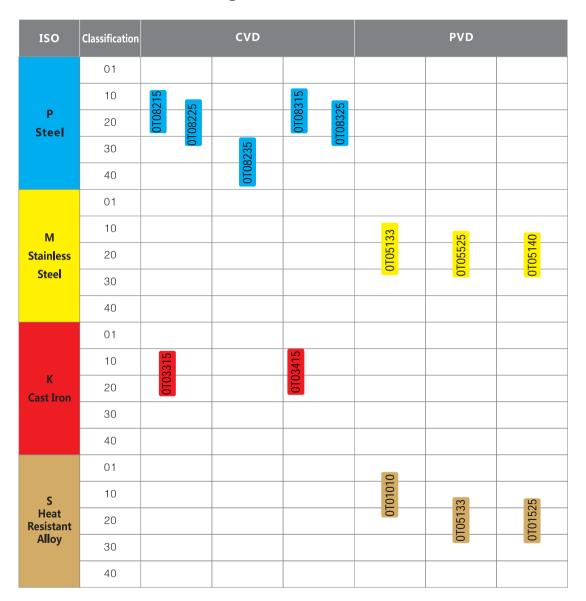
M Finishing					
	CCMT-GF	DCMT-GF	SCMT-GF	TCMT-GF	
Length	06、09	07、11	09	09、11、16	
Train Wheel Hub Machining	0			Carlos Carlos	
	RCMX	175.32-22	175.32-24	175.32–28	
Length	08-32	19	19	19	





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#### **Recommended Turning Insert Grade**



#### **General Turning Insert**

Item No.	Application	Chipbreaker	Feature/Shape of insert
		AF	P-type Material Finishing
1	Steel Finishing		M-level double-sided chipbreaker, two-stage bump effect for stable chip handling in a wide range of feeds.
		AS	P-type Material Semi-finishing
2	Steel Semi-finishing	0	M-level double-sided chipbreaker, negative chamfer design, high edge strength, suitable for semi-finishing occasions with unstable working conditions.
		AR	P-type Material Roughing
3	Steel Roughing	O	The preferred chip breaker for lightload roughing, wide margin design, good edge strength, high metal removal rate, good wear resistance and cutting life.
	Steel Heavy-load	AR ( Single Side )	P-type Material Heavy-load
4		Ĩ	M-level single-sided chipbreaker, negative chamfer design, under the large cutting depth and large feed processing parameters, high edge strength and high metal removal rate can be obtained.





### **General Turning Insert**

Item No.	Application	Chipbreaker	Feature/Shape of insert						
	BF		M type material finishing						
5	Stainless steel finishing	6	M-level double-sided chipbreaker, small edge width double positive rake angle, sharp blade edge, low cuttir resistance, special edge inclination design, can obta high-quality machined surface.						
		BM	M type material semi-finishing						
6	6 Stainless steel semi-finishing		M-level double-sided chipbreaker, double positive rake angle, higher edge strength, widely application for the general processing of stainless steel.						
		BR	M type materail roughing						
7	Stainless steel roughing	50	M-level double-sided chipbreaker, variable blade width + variable rake angle design,suitable for semi-finishing and roughing of stainless steel						
		DM	S type material semi-finishing						
8	High temperature alloy semi-finishing		M-level double-sided chipbreaker.Adopting the double positive rake angle combines the sharpness and strength of the insert;the cutting resistance is small, and the wider chipbreaker ensures enough space for chip deformation,reducing groove wear.						

### General Inner Hole Turning Insert

Item No.	Application	Chipbreaker	Feature/Shape of insert				
		GM	General chipbreaker				
9	General semi-finishing		M-level single-sided chipbreaker, suitable forsemi- finishing of inner holes and outer circles of P, M and K type materials				
		GF	M type material finishing				
10	Stainless steel finishing		M-level single-sided chipbreaker, suitable for innerhole and outer circle finishing of stainless steel.				

### Special Turning Insert

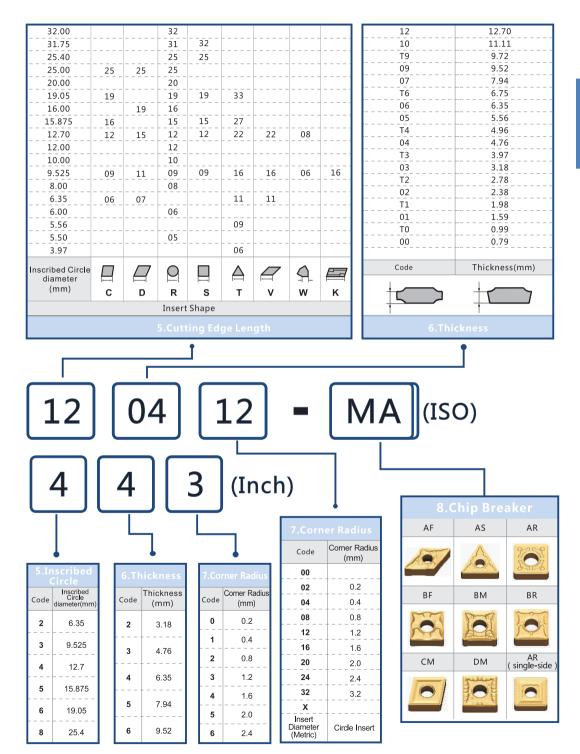
Item No.	Application	Chipbreaker	Feature/Shape of insert
		175.32 series	Chipbreaker for finishing of P type materal
11	Train wheel		M-level double-sided chipbreaker, vertical cutting inserts, especially suitable for the trimming of train wheels.
	hub machining	RCMX series	Chipbreaker for heavy-load machining of P type material
12		0	M-level single-sided chipbreaker, negative chamfer design,high edge strength, first choice for profiling.

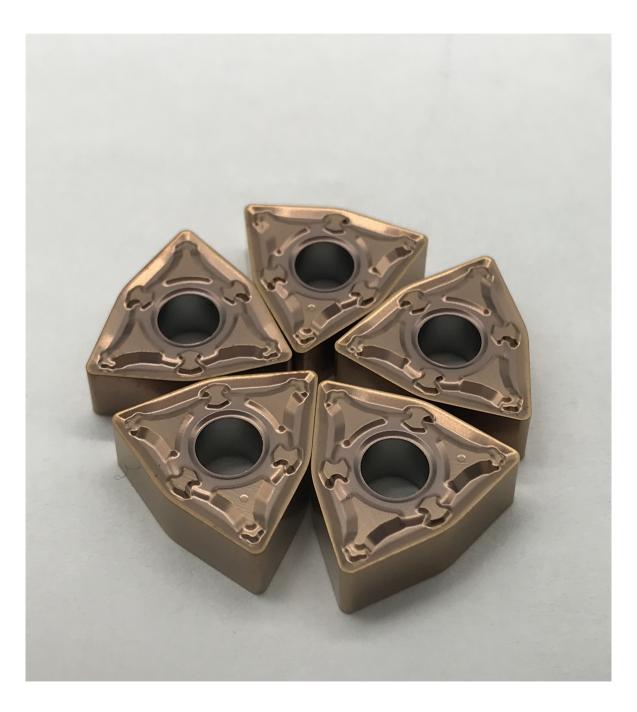


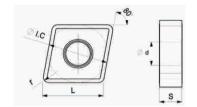
#### Turning Insert Code Kay

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Code Clearance Code Clearance Angle B	A F	±0.005 ±0.005	d : t(	=I.C S ( 0.025 ± 0.013 ±	(mm) 0.025	Inscribed	aI.C	Square <u>±0.08</u> <u>±0.08</u>		55°	35°	G
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Code Clearance Angle Code Clearance A $3^{\circ}$ B $5^{\circ}$ C $7^{\circ}$ D $7^{\circ}$	A F C H	±0.005 ±0.005 ±0.013 ±0.013	d : 	=I.C S ( 0.025 ± 0.013 ± 0.025 ± 0.013 ±	(mm) 0.025 0.025 0.025	Inscribed Circle 6.35 9.525 12.7 15.875	Regular Triangle ±0.08 ±0.13 ±0.15	±0.08 ±0.08 ±0.13 ±0.15	Rhombus ±0.08 ±0.08 ±0.13 ±0.15	$55^{\circ}$ Rhombus $\pm 0.11$ $\pm 0.11$ $\pm 0.15$ $\pm 0.18$	35° sRhombus ±0.16 ±0.16	G
Code Clearance Angle Code Clearance A 3° B 5° C D D	A F C H E	±0.005 ±0.005 ±0.013 ±0.013 ±0.025	b b c c c c c c c c c c c c c	=I.C S ( 0.025 ± 0.013 ± 0.025 ± 0.013 ± 0.013 ± 0.025 ±	(mm) 0.025 0.025 0.025 0.025	Inscribed Circle 6.35 9.525 12.7 15.875 19.05	Regular Triangle ±0.08 ±0.08 ±0.13	±0.08 ±0.08 ±0.13 ±0.15 ±0.15	Rhombus ±0.08 ±0.08 ±0.13	55° Rhombus ±0.11 ±0.11 ±0.15	35° sRhombus ±0.16 ±0.16	G
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CodeClearance AngleCodeClearance AngleA $3^{\circ}$ B $5^{\circ}$ C $7^{\circ}$ D $5^{\circ}$ E $20^{\circ}$ F $25^{\circ}$	A F C H E	$\pm 0.005$ $\pm 0.005$ $\pm 0.013$ $\pm 0.013$ $\pm 0.025$ $\pm 0.025$	d =	=I.C S ( 0.025 ± 0.013 ± 0.025 ± 0.013 ± 0.025 ± 0.013 ± 0.025 ± 0.	(mm) :0.025 :0.025 :0.025 :0.025 :0.025 :0.025 :±0.13	Inscribed Circle 6.35 9.525 12.7 15.875 19.05 25.4 • Toler Inscribed	Regular Triangle ±0.08 ±0.08 ±0.13 ±0.15 ±0.15 ±0.15	±0.08 ±0.08 ±0.13 ±0.15 ±0.15 ±0.18 f Inscri	Rhombus ±0.08 ±0.08 ±0.13 ±0.15 ±0.15  bed Circo 80°	55° Rhombu: ±0.11 ±0.15 ±0.18 ±0.18 ±0.18 Cle(mm) 55°	35° Rhombus ±0.16 ±0.16         	
Code Clearance Angle Code Clearance Angle B Code Clearance Angle B Code Clearance Angle D Code Clearance Angle D C	A F C H E G	±0.005 ±0.005 ±0.013 ±0.013 ±0.025 ±0.025 ±0.025	d : + + C + + + C + + + + + + + + + + + + + + + + + + +	$= I.C \qquad S \\ 0.025 \qquad \pm \\ 0.02$	(mm) 0.025 0.025 0.025 0.025 0.025 0.025 ±0.13 0.025	Inscribed Circle 6.35 9.525 12.7 15.875 19.05 25.4 • Toler Inscribed	Regular Triangle ±0.08 ±0.08 ±0.13 ±0.15 ±0.15 ±0.15 	$\pm 0.08$ $\pm 0.08$ $\pm 0.13$ $\pm 0.15$ $\pm 0.15$ $\pm 0.15$ $\pm 0.18$	Rhombus ±0.08 ±0.08 ±0.13 ±0.15 ±0.15  bed Circo 80°	55° Rhombu: ±0.11 ±0.15 ±0.18 ±0.18 ±0.18 Cle(mm) 55°	s Rhombus ±0.16 ±0.16   	
Code Clearance Angle Code Clearance Angle B Code Clearance Angle B C $- \frac{1}{3^3}$ B C $- \frac{1}{7^3}$ D $- \frac{1}{15^3}$ E $- \frac{1}{25^3}$ F $- \frac{1}{25^3}$ G N N	A F C H E G J	$\pm 0.005$ $\pm 0.005$ $\pm 0.013$ $\pm 0.025$ $\pm 0.025$ $\pm 0.025$ $\pm 0.005$ $\pm 0.013$	$\begin{array}{c c} & & & \\ & & \pm 0 \\ & & & \pm 0 \\ & & & & \\ \end{array}$	=I.C S ( 0.025 ± 0.013 ± 0.025 ± 0.013 ± 0.025 ± 0.013 ± 0.025 ± 0.025 ± 0.013 ± 0.025 ± 0.025 ± 0.013 ± 0.025 ± 0.	(mm) :0.025 :0.025 :0.025 :0.025 :0.025 :0.025 :0.025 :0.025 :0.025	Inscribed Circle 6.35 9.525 12.7 15.875 25.4 • Toler Inscribed Circle	Regular Triangle ±0.08 ±0.08 ±0.13 ±0.15 ±0.15 ±0.15 ±0.15	±0.08 ±0.13 ±0.15 ±0.15 ±0.15 ±0.18 f Inscri	Rhombus           ±0.08           ±0.08           ±0.13           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.05           ±0.05	55° Rhombur ±0.11 ±0.15 ±0.18 ±0.18 ±0.18  cle(mm 55° Rhombur ±0.05 ±0.05	35° s Rhombus ±0.16 ±0.16      35° s Rhombus	
Code Clearance Angle Code Clearance Angle B Code Clearance Angle B C D D C D D C D D D C D D D D C D D D D	A F C H E G J	$\begin{array}{c} \pm 0.005 \\ \pm 0.005 \\ \pm 0.013 \\ \pm 0.013 \\ \pm 0.025 \\ \pm 0.025 \\ \pm 0.005 \\ \pm 0.013 \end{array}$	$\begin{array}{c c} & & & \\ & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & &$	$=I.C \qquad S = 0$ $=I.C \qquad S = 0$ $=I.C \qquad S = 0$ $= 0.025 \qquad \pm 0.013 \qquad \pm 0.025 \qquad \pm 0.013 \qquad \pm 0.025 \qquad \pm 0.013 \qquad \pm 0.025 \qquad$	(mm) 0.025 0.025 0.025 0.025 0.025 0.025 0.025 0.025 0.025 0.025 0.025 0.025 0.025 0.025 0.025	Inscribed Circle 6.35 9.525 12.7 15.875 19.05 25.4 • Toler Inscribed Circle 6.35 9.525 12.7	Regular Triangle ±0.08 ±0.13 ±0.15 ±0.15 ±0.15 ±0.15 ±0.15 ±0.05 ±0.05 ±0.05 ±0.08	$\pm 0.08$ $\pm 0.03$ $\pm 0.13$ $\pm 0.15$ $\pm 0.15$ $\pm 0.18$ f Inscri Square $\pm 0.05$ $\pm 0.05$ $\pm 0.08$	Rhombus           ±0.08           ±0.08           ±0.13           ±0.15           ±0.15           ±0.15           ±0.15           ±0.05           ±0.05           ±0.08	55° Rhombu: ±0.11 ±0.15 ±0.18 ±0.18 ±0.18 ±0.18 cle (mm: 55° Rhombu: ±0.05 ±0.05 ±0.08	35° sRhombus ±0.16 ±0.16    s. Rhombus ±0.05 ±0.05 ±0.05 	   ±0.05 ±0.08
Code Clearance Angle Code Clearance Angle B Code Clearance Angle B C D D C D D C D D D C D D D D C D D D D	A F C H E G J K	±0.005 ±0.013 ±0.013 ±0.025 ±0.025 ±0.025 ±0.013 ±0.025 ±0.025	$\begin{array}{c} + \\ + \\ + \\ + \\ + \\ + \\ + \\ + \\ + \\ + $	=I.C S ( 0.025 ± 0.013 ± 0.025 ± 0.013 ± 0.025 ± 0.013 ± 0.025 ± 0.025 ± 0.025 ± 0.013 ± 5±0.13 ± 5±0.13 ± 5±0.13 ± 5±0.13 ±	(mm) :0.025 :0.025 :0.025 :0.025 :0.025 :0.025 :0.025 :0.025 :0.025 :0.025 :0.025 :0.025 :0.025 :0.025	Inscribed Circle 6.35 9.525 12.7 15.875 19.05 25.4 • Toler Inscribed 6.35 9.525	Regular Triangle ±0.08 ±0.08 ±0.13 ±0.15 ±0.15 ±0.15 ±0.15 ±0.15 ±0.05	±0.08 ±0.08 ±0.13 ±0.15 ±0.15 ±0.18 f Inscri Square ±0.05 ±0.05	Rhombus           ±0.08           ±0.08           ±0.13           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.15           ±0.05           ±0.05	55° Rhombur ±0.11 ±0.15 ±0.18 ±0.18 ±0.18  cle(mm 55° Rhombur ±0.05 ±0.05	35° sRhombus ±0.16 ±0.16    sRhombus ±0.05 ±0.05 ±0.05	    ±0.05







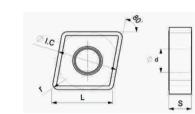
	Size(mm)								
Length	IC	S	d	r					
9	9.525	3.18	3.81	0.4-0.8					
12	12.7	4.76	5.16	0.4-1.2					

#### 80° CN $\Box\Box$ With Hole

	Туре	Ap (mm)	Fn (mm/rev)	Grade										
Shape				CVD						PVD				
				OTO8215	OTO8315	OT08225	OT08325	OT08235	OTO8335	OTO5120	OT05525	OTO5130	OTO1010	OT01525
	CNMG090304-AF	0.26-3.2	0.05-0.15	٠	0	٠		0	0					
	CNMG090308-AF	0.52-3.2	0.1-0.30	٠	0	•		0	0					
2 mg	CNMG120404-AF	0.26-3.2	0.05-0.15	٠	0	•		0	0					
PROPERTY	CNMG120408-AF	0.52-3.2	0.1-0.30	٠	0	•		0	0					
	CNMG120412-AF	0.78-3.2	0.15-0.45	٠	0	•		0	0					
Р														
Finishing														
linishing														

Note: •Recommended grade ready to stock

#### **Negative Inserts**



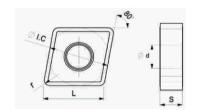
		Size	(mm)	
Length	IC	S	d	r
12	12.7	4.76	5.16	0.4-1.6
16	15.875	6.35	6.35	0.8-1.6
19	19.05	6.35	7.94	0.8-1.6

#### 80° CN $\Box$ With Hole

									Gra	de					
Shape	Туре	Ар	Fn			C١	√D					P١	/D		
		(mm)	(mm/rev)	OT08215	OTO8315	OT08225	OTO8325	OT08235	OT08335	OTO5120	OTO5525	OTO5133	OTO5130	OTO5140	OTO1010
	CNMG120404-AS	0.60-6.40	0.10-0.30	٠	0	٠		0	0						
	CNMG120408-AS	1.20-6.40	0.20-0.60	•	0	•		0	0						
5 mil	CNMG120412-AS	1.80-6.40	0.30-0.90	•	0	•		0	0						
YON	CNMG120416-AS	2.40-6.40	0.12-0.40		0	•		0	0						
	CNMG160608-AS	1.20-8.10	0.10-0.30	٠	0	•		0	0						
	CNMG160612-AS	1.80-8.10	0.20-0.60	٠	0	•		0	0						
P Semi	CNMG160616-AS	2.40-8.10	0.30-0.90	٠	0	•		0	0						
-finishing	CNMG190608-AS	1.20-9.70	0.20-0.60		0			0	0						
	CNMG190612-AS	1.80-9.70	0.30-0.90	٠	0	•		0	0						
	CNMG190616-AS	2.40-9.70	0.40-1.20	٠	0	•		0	0						

Note: •Recommended grade ready to stock

#### **Negative Inserts**

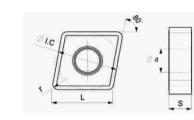


		Size	(mm)	
Length	IC	S	d	r
12	12.7	4.76	5.16	0.8–1.6
16	15.875	6.35	6.35	0.8–1.6
19	19.05	6.35	7.94	0.8-2.4

#### $80^{\circ}$ CN $\Box\Box$ With Hole

									Gra	de					
Shape	Туре	Ар	Fn			C	VD					P١	/D		
	51	(mm)	(mm/rev)	OTO8215	OTO8315	OTO8225	OTO8325	OTO8235	OTO8335	OTO5120	OT05525	OTO5133	OTO5130	OTO5140	OTO1010
	CNMG120408-AR	1.45-5.20	0.15-0.32			•	0								
	CNMG120412-AR	2.15-5.20	0.25-0.50			•	0								
2000	CNMG120416-AR	2.90-5.20	0.30-0.65			•	0								
1995	CNMG160608-AR	1.45-6.40	0.15-6.35			•	0								
	CNMG160612-AR	2.15-6.40	0.24-0.50			•	0								
	CNMG160616-AR	2.90-6.40	0.30-0.65			•	0								
P Roughing	CNMG190608-AR	1.45-7.70	0.15-0.35			•	0								
Roughing	CNMG190612-AR	2.15-7.70	0.25-0.50			•	0								
	CNMG190616-AR	2.90-7.70	0.30-0.65			•	0								
	CNMG190624-AR	4.30-7.70	0.45-0.95			•	0								





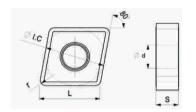
		Size	(mm)	
Length	IC	S	d	r
19	19.05	6.35	7.94	1.2-2.4
25	25.4	7.94-9.52	9.12	2.4-3.2

#### 80° CN $\Box$ With Hole

									Gra	de					
Shape	Туре	Ap (mm)	Fn			C	٧D					P١	/D		
		(mm)	(mm/rev)	OTO8215	OTO8315	OTO8225	OTO8325	OTO8235	OTO8335	OTO5120	OTO5525	OTO5133	OTO5130	OTO5140	OTO1010
	CNMM190612-AR	2.40-9.70	0.25-0.60			•	0	•							
	CNMM190616-AR	3.20-9.70	0.35-0.80			•	0	•							
	CNMM190624-AR	4.80-9.70	0.50-1.20			•	0	•							
	CNMM250724-AR	4.80-12.90	0.50-1.20			•	0	•							
	CNMM250924-AR	4.80-12.90	0.50-1.20			•	0	•							
	CNMM250932-AR	4.80-12.90	0.50 <b>-</b> 1.20			٠	0								
P Heavy															
-load															

Note: •Recommended grade ready to stock

#### **Negative Inserts**



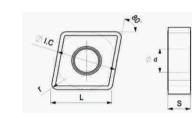
		Size	(mm)	
Length	IC	S	d	r
9	9.525	3.18	3.81	0.4-0.8
12	12.7	4.76	5.16	0.4-1.2

#### 80° CN $\Box\Box$ With Hole

									Ģ	Grad	е					
Shape	Туре	Ар	Fn		C١	/D						PVD				
		(mm) (mm/rev)	OT08215	OT08315	OT08225	OT08325	OTO5120	OT05525	OTO5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525		
	CNMG090304-BF	0.25-2.40	0.05-0.15						٠	0	•		0	0		
	CNMG090308-BF	0.50-2.40	0.10-0.30						•	0	•		0	0		
100	CNMG120404-BF	0.25-3.20	0.05-0.15						•	0	٠		0	0		
200	CNMG120408-BF	0.50-3.20	0.10-0.30						•	0	•		0	0		
	CNMG120412-BF	0.75-3.20	0.15-0.45						٠	0	٠		0	0		
M Finishing																

Note: •Recommended grade ready to stock





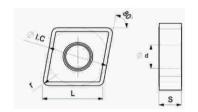
		Size	(mm)	
Length	IC	S	d	r
12	12.7	4.76	5.16	0.4-1.2
16	15.875	6.35	6.35	0.8–1.6

#### 80° CN $\Box$ With Hole

									(	Grad	е					
Shape	Туре	Ар	Fn		C١	/D						PVD				
		(mm)	(mm/rev)	OT08215	OT08315	OT08225	OT08325	OTO5120	OT05525	OTO5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525	
	CNMG120404-BM	0.30-4.30	0.08-0.25						0	0	0	•	0		0	
	CNMG120408-BM	0.65-4.30	0.15-0.45						0	0	0	•	0		0	
2001	CNMG120412-BM	0.95-4.30	0.20-0.65						0	0	0	٠	0		0	
223	CNMG160608-BM	0.65-5.30	0.15-0.45						0	0	0	٠	0		0	
	CNMG160612-BM	0.95-5.30	0.25-0.65						0	0	0	٠	0		0	
	CNMG160616-BM	1.30-5.30	0.30-0.90						0	0	0	٠	0		0	
M Semi-																
finishing																

Note: •Recommended grade ready to stock

#### **Negative Inserts**

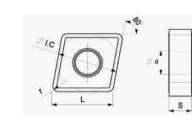


		Size	(mm)	
Length	IC	S	d	r
12	12.7	4.76	5.16	0.4-1.6
16	15.875	6.35	6.35	0.8–1.6
19	19.05	6.35	7.94	0.8-1.6

#### 80° CN $\Box\Box$ With Hole

							Gra	ade			
Shape	Туре	Ар	Fn	C١	/D						
		(mm)	(mm/rev)		OTO3315	OTO3415					
	CNMG120404-CM	0.40-4.30	0.08-0.25		٠						
	CNMG120408-CM	0.80-4.30	0.15-0.45		٠						
	CNMG120412-CM	1.20 <b>-</b> 4.30	0.20-0.65		٠						
	CNMG160612-CM	1.20-5.30	0.25-0.65		٠						
	CNMG160616-CM	1.60–5.30	0.30-0.90		٠						
	CNMG190612-CM	1.20-6.40	0.25-0.65		٠						
K Semi-											
finishing											





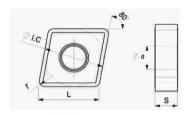
	Size(mm)								
Length	IC	S	d	r					
12	12.7	4.76	5.16	0.4-1.2					
16	15.875	6.35	6.35	0.8–1.6					

#### 80° CN $\Box$ With Hole

								(	Grade							
Shape	pe Type Ap			Туре			C١	/D					PVD			
		(mm)	(mm/rev) -	OTO8215	OTO8315	OT08225	OTO8325	OTO5120	OTO5525	OTO5133	OTO5140	OTO1010	OTO1525			
	CNMG120404-BR	0.30-4.30	0.08-0.25					0	0	0	•		0			
	CNMG120408-BR	0.65-4.30	0.15-0.45					0	0	0	•		0			
100	CNMG120412-BR	0.95-4.30	0.25-0.65					0	0	0	•		0			
191	CNMG160608-BR	0.65-5.30	0.15-0.45					0	0	0	•		0			
	CNMG160612-BR	0.95-5.30	0.25-0.65					0	0	0	•		0			
	CNMG160616-BR	1.25-5.30	0.30-0.90					0	0	0	•		0			
M Roughing																
Noughing																

Note: •Recommended grade ready to stock

#### **Negative Inserts**

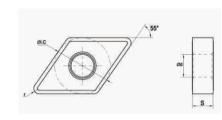


	Size(mm)										
Length	IC	S	d	r							
12	12.7	4.76	5.16	0.4-1.6							

#### $80^{\circ}$ CN $\Box\Box$ With Hole

									Gra	ade									
Shape			Туре Ар		Туре		Fn		C١	/D					P١	/D			
	21	(mm) (mm/rev)	OTO8215	OTO8315	OTO8225	OTO8325	OTO5120	OT05525	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525						
	CNMG120404-DM	0.40-4.30	0.08-0.25					0			0	0		٠					
	CNMG120408-DM	0.80-4.30	0.15-0.45					0			0	0		٠					
Tai	CNMG120412-DM	1.20-4.30	0.25-0.65					0			0	0		٠					
104	CNMG120416-DM	1.60-4.30	0.30-0.90					0			0	0		٠					
S Semi- finishing																			





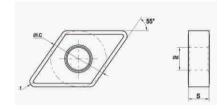
		Size	(mm)	
Length	IC	S	d	r
15	12.7	4.76	5.16	0.8-1.2
15	12.7	6.35	5.16	0.4-1.2

#### 55° DN $\Box$ With Hole

								(	Grade	9						
Shape	Shape Type					CVD						PVD				
		(mm)	(mm/rev)	OTO8215	OTO8315	OTO8225	OTO8325	OTO8235	OTO8335	OTO5120	OTO5525	OTO5130	OTO1010	OT01525		
	DNMG150404-AF	0.26-3.1	0.05-0.15	•	0	٠		0	0							
	DNMG150408-AF	0.52-3.1	0.10-0.30	•	0	٠		0	0							
101	DNMG150412-AF	0.78–3.1	0.15-0.45	•	0	٠		0	0							
	DNMG150604-AF	0.26-3.1	0.05-0.15	•	0	٠		0	0							
	DNMG150608-AF	0.52-3.1	0.10-0.30	•	0	٠		0	0							
	DNMG150612-AF	0.78–3.1	0.15-0.45	•	0	٠		0	0							
P Finishing																
rinsning																

Note: •Recommended grade ready to stock

#### **Negative Inserts**



	Size(mm)										
Length	IC	S	d	r							
15	12.7	4.76-6.35	5.16	0.4-1.2							

#### 55° DN $\Box$ With Hole

									Gra	de											
Shape		Туре	Ар	Fn			C١	/D					P∖	′D							
		(mm) (	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm) (mm/rev)	OTO8215	OTO8315	OTO8225	OTO8325	OTO8235	OTO8335	OTO5120	OTO5525	OTO5133	OTO5130	OTO5140	OTO1010
	DNMG150404-AS	0.60-5.40	0.10-0.30	•	0	•		0	0												
	DNMG150408-AS	1.20-5.40	0.20-0.60	•	0	•		0	0												
01	DNMG150412-AS	1.80-5.40	0.30-0.90	•	0	٠		0	0												
	DNMG150604-AS	0.60-5.40	0.10-0.30	•	0	•		0	0												
	DNMG150608-AS	1.20-5.40	0.20-0.60	•	0	٠		0	0												
	DNMG150612-AS	1.80-5.40	0.30-0.90	•	0	٠		0	0												
P Semi-																					
finishing																					



# all and a second second

		Size	(mm)	
Length	IC	S	d	r
15	12.7	4.76-6.35	5.16	0.8-1.2

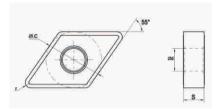
#### 55° DN $\Box$ With Hole

**Negative Inserts** 

									Gra	de											
Shape	Туре	Ар	Fn			C١	/D					P∨	′D								
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm) (	(mm/rev)	OTO8215	OTO8315	OT08225	OTO8325	OTO8235	OTO8335	ОТО5120	OTO5525	OTO5130	OTO1010	OTO1525	
	DNMG150408-AR	0.80-4.0	0.15-0.50	•	0	٠		0	0												
	DNMG150412-AR	1.20-4.0	0.15-0.65	•	0	٠		0	0												
01	DNMG150608-AR	0.80-4.0	0.15-0.50	•	0	•		0	0												
	DNMG150612-AR	1.20-4.0	0.15-0.65	•	0	٠		0	0												
_																					
P Roughing																					
Roughing																					

Note: •Recommended grade ready to stock

#### **Negative Inserts**



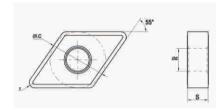
		Size	(mm)				
Length	IC	IC S d					
15	12.7	4.76-6.35	5.16	0.4-1.2			

									Ģ	Grad	е					
Shape	Туре	Ар	Fn		C١	/D						PVD				
		(mm)	(mm/rev)	OTO8215	OTO8315	OTO8225	OTO8325	OTO5120	OTO5525	OTO5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525	
	DNMG150404-BF	0.25-2.90	0.05-0.15						٠	0	•		0		0	
	DNMG150408-BF	0.50-2.90	0.10-0.30						•	0	•		0		0	
101	DNMG150412-BF	0.75–2.90	0.15-0.45						•	0	•		0		0	
	DNMG150604-BF	0.25-2.90	0.05-0.15						•	0	•		0		0	
	DNMG150608-BF	0.50-2.90	0.10-0.30						•	0	•		0		0	
	DNMG150612-BF	0.75–2.90	0.15-0.45						•	0	•		0		0	
M Finishing																



		Size	(mm)	
Length	IC	S	d	r
15	12.7	4.76-6.35	5.16	0.4-1.2

#### **Negative Inserts**



		Size	(mm)	
Length	IC	S	d	r
15	12.7	4.76-6.35	5.16	0.4-1.2

#### 55° DN□□ With Hole

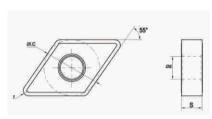
									Ģ	Grad	е						
Shape	Туре	Ар	Fn (mm (rou))			C١	/D						PVD				
			(mm/rev)	OTO8215	OTO8315	OT08225	OTO8325	OTO5120	OTO5525	OTO5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525		
	DNMG150404-BM	0.30-3.90	0.08-0.25						0	0	0	•	0		0		
	DNMG150408-BM	0.65-3.90	0.15-0.45						0	0	0	٠	0		0		
101	DNMG150412-BM	0.95-3.90	0.25-0.65						0	0	0	٠	0		0		
	DNMG150604-BM	0.30-3.90	0.08-0.20						0	0	0	•	0		0		
	DNMG150608-BM	0.65-3.90	0.15-0.45						0	0	0	٠	0		0		
	DNMG150612-BM	0.95–3.90	0.25-0.65						0	0	0	•	0		0		
M Semi-																	
finishing																	

Note: •Recommended grade ready to stock

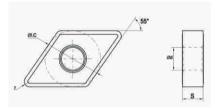
#### 55° DN $\Box$ With Hole

			- Fn						Grade	9				
Shape	Туре	Ар			C١	/D					PVD			
		(mm)	(mm/rev)	OTO8215	OTO8315	OT08225	OTO8325	OTO5120	OT05525	OTO5133	OTO5140	OTO1010	OT01525	
	DNMG150404-BR	0.30-3.90	0.08-0.25					0	0	0	٠		0	
	DNMG150408-BR	0.65-3.90	0.15-0.45					0	0	0	•		0	
101	DNMG150412-BR	0.95-3.90	0.25-0.65					0	0	0	٠		0	
	DNMG150604-BR	0.30-3.90	0.08-0.20					0	0	0	•		0	
	DNMG150608-BR	0.65-3.90	0.15-0.45					0	0	0	٠		0	
	DNMG150612-BR	0.95-3.90	0.25-0.65					0	0	0	•		0	
M Roughing														
Roughing														





		Size	(mm)	
Length	IC	S	d	r
15	12.7	6.35	5.16	0.8-1.2



		Size	(mm)	
Length	IC	S	d	r
15	12.7	4.76-6.35	5.16	0.4-1.2

#### 55° DN□□ With Hole

									Gra	de					
Shape	Туре	Ар	Fn (mm/rev)		C١	/D					Р١	/D			
		(mm)		OTO8215	OTO8315	OT08225	OTO8325	OTO5120	OT05525	OTO5130	OTO5140	OTO1010	OTO1520	OT01525	
	DNMG150404-DM	0.40–3.90	0.08-0.25					0			0	0		٠	
	DNMG150408-DM	0.80–3.90	0.15-0.45					0			0	0		•	
101	DNMG150412-DM	1.20–3.90	0.25-0.65					0			0	0		•	
	DNMG150604-DM	0.40-3.90	0.08-0.20					0			0	0		•	
	DNMG150608-DM	0.80–3.90	0.15-0.45					0			0	0		٠	
	DNMG150612-DM	1.20–3.90	0.25-0.65					0			0	0		•	
S Semi-															
finishing															

Note: •Recommended grade ready to stock

55°	With	Hole
55	vvi ci i	11010

**Negative Inserts** 

								Gra	de				
Shape	Туре	Ар	Fn		C١	/D				P١	/D		
	51	(mm)	(mm/rev)			OTO3315	OTO3415						
	DNMG150404-CM	0.40-3.90	0.08-0.25			٠	0						
	DNMG150408-CM	0.80-3.90	0.15-0.45			•	0						
01	DNMG150412-CM	1.20-3.90	0.25-0.65			٠	0						
	DNMG150604-CM	0.40-3.90	0.08-0.20			٠	0						
	DNMG150608-CM	0.80-3.90	0.15-0.45			٠	0						
	DNMG150612-CM	1.20-3.90	0.25-0.65			٠	0						
K Semi-													
finishing													



### 

		Size	(mm)	
Length	IC	S	d	r
12	12.7	4.76	5.16	0.8-1.2

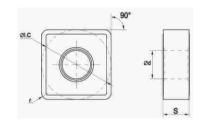
#### 90° SN🗆 With Hole

**Negative Inserts** 

				Grade											
Sh	nape	Туре	Ар	Fn			C١	/D					PVD		
	·		(mm)	(mm/rev)	OTO8215	OTO8315	OTO8225	OTO8325	OTO8235	OTO8335	OTO5120	OTO5525	OTO5130	OTO1010	OTO1525
		SNMG120404-AF	0.26-3.2	0.05-0.15	•	0	٠		0	0					
		SNMG120408-AF	0.52-3.2	0.10-0.30	•	0	٠		0	0					
E	1	SNMG120412-AF	0.78–3.2	0.15-0.45	٠	0	٠		0	0					
<b>F</b> <sup>t</sup>															
	Р														
Fini	ishing														

Note: •Recommended grade ready to stock

#### **Negative Inserts**



1 11		Size	(mm)	
Length	IC	S	d	r
12	12.7	4.76	5.16	0.8-1.6
15	15.875	6.35	6.35	0.8-1.2

#### 90° SN🗆 With Hole

									Gra	de					
Shape	Туре	Ар	Fn			C١	/D					P١	/D		
		(mm)	(mm/rev)	OTO8215	OTO8315	OT08225	OTO8325	OTO8235	OTO8335	OTO5120	OT05525	OTO5133	OTO5130	OTO5140	OTO1010
	SNMG120404-AS	1.00-5.00	0.12-0.40	•	0	•		0	0						
	SNMG120408-AS	1.20-5.00	0.15-0.55	•	0	•		0	0						
2002	SNMG120412-AS	1.50-5.00	0.20-0.55	•	0	•		0	0						
	SNMG150612-AS	2.00-7.00	0.30-0.65	•	0	•		0	0						
P Semi- finishing															

### 

		Size	(mm)	
Length	IC	S	d	r
12	12.7	4.76	5.16	0.8-1.6
15	15.875	6.35	6.35	0.8-1.2
19	19.05	6.35	7.94	1.2-1.6

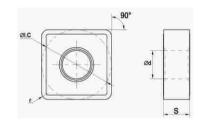
#### 90° SN $\Box\Box$ With Hole

**Negative Inserts** 

										Gra	ade					
	Shape	Туре	Ар	Fn			C١	/D					P۱	/D		
		21	(mm)	(mm/rev)	OTO8215	OT08315	OT08225	OTO8325	OT08235	OTO8335	OTO5120	OTO5525	OTO5133	OTO5130	OTO5140	OTO1010
		SNMG120408-AR	2.50–6.00	0.25-0.70			•	0								
		SNMG120412-AR	2.50-6.00	0.30-0.70			•	0								
	9258	SNMG120416-AR	2.50-6.00	0.40-0.70			•	0								
	192	SNMG150612-AR	2.15 <b>–</b> 6.40	0.25-0.50			•	0								
1		SNMG190612-AR	2.15 <b>–</b> 6.40	0.25-0.50			•	0								
		SNMG190616-AR	2.85-7.60	0.30-0.65				0								
F	P Roughing															

Note: •Recommended grade ready to stock

#### **Negative Inserts**



		Size	(mm)	
Length	IC	S	d	r
19	19.05	6.35	7.94	1.2-2.4
25	25.4	7.94-9.52	9.12	2.4-3.2

#### 90° SN $\Box\Box$ With Hole

									Gra	de					
Shape	Туре	Ар	Fn			C١	/D					P٧	'D		
cpc	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(mm)	(mm/rev)	OT08215	OTO8315	OTO8225	OTO8325	OTO8235	OT08335	OTO5120	OT05525	OTO5133	OTO5130	OTO5140	OTO1010
	SNMM190612-AR	2.40-9.50	0.25-0.60			•	0								
	SNMM190616-AR	3.20-9.50	0.35-0.80			•	0								
	SNMM190624-AR	4.80-9.50	0.53-1.20			•	0								
	SNMM250724-AR	4.80-12.70	0.53-1.20			•	0								
	SNMM250732-AR	4.80-12.70	0.53-1.20			•	0								
	SNMM250924-AR	4.35-12.70	0.53-1.20			•	0								
P Heavy-	SNMM250932-AR	4.35-12.70	0.53-1.20			•	0								
load															



# SIC S.

		Size	(mm)	
Length	IC	S	d	r
12	12.7	4.76	5.16	0.4-1.2

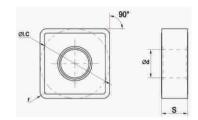
#### 90° SN🗆 With Hole

**Negative Inserts** 

Shape	Туре	Ар	Fn		C١	/D						PVD				
		(mm)	(mm/rev)	OT08215	OTO8315	OT08225	OTO8325	ОТО5120	OT05525	OTO5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525	
	SNMG120404-BF	0.25-3.20	0.05-0.15						•	0	•		0		0	
	SNMG120408-BF	0.50-3.20	0.10-0.30						•	0	•		0		0	
1	SNMG120412-BF	0.75–3.20	0.15-0.45						•	0	•		0		0	
hon																
M Finishing																
rinsting																

Note: •Recommended grade ready to stock

#### **Negative Inserts**



		Size	(mm)	
Length	IC	S	d	r
12	12.7	4.76	5.16	0.4-1.2
15	15.875	6.35	6.35	0.8-1.2

#### $90^{\circ}$ SN $\Box\Box$ With Hole

Shape	Туре	Ар	Fn		C١	/D						PVD				
		(mm)	(mm/rev)	OTO8215	OTO8315	OTO8225	OTO8325	OTO5120	OTO5525	OTO5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525	
	SNMG120404-BM	0.30–4.20	0.08-0.25						0	0	0	•	0		0	
	SNMG120408-BM	0.65-4.20	0.15-0.45						0	0	0	•	0		0	
T	SNMG120412-BM	0.95-4.20	0.25-0.65						0	0	0	•	0		0	
30%	SNMG150608-BM	0.65-5.20	0.15-0.45						0	0	0	•	0		0	
	SNMG150612-BM	0.95–5.20	0.25-0.65						0	0	0	٠	0		0	
M Semi- finishing																

## 

		Size	(mm)	
Length	IC	S	d	r
12	12.7	4.76	5.16	0.4-1.2
15	15.875	6.35	6.35	0.8-1.2

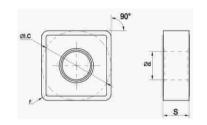
#### 90° SN $\Box\Box$ With Hole

**Negative Inserts** 

								(	Grade	è				
Shape	Туре	Ap (mm)	Fn		C١	/D					PVD			
·		(mm)	(mm/rev)	OT08215	OTO8315	OTO8225	OTO8325	OTO5120	OT05525	OTO5133	OTO5140	OTO1010	OT01525	
	SNMG120404-BR	0.30-4.20	0.08-0.25					0	0	0	•		0	
	SNMG120408-BR	0.65-4.20	0.15-0.45					0	0	0	•		0	
	SNMG120412-BR	0.95-4.20	0.23-0.66					0	0	0	•		0	
r <del>ç</del> î	SNMG150608-BR	0.65-5.20	0.15-0.44					0	0	0	•		0	
	SNMG150612-BR	0.95–5.20	0.23-0.66					0	0	0	•		0	
M oughing														
		SNMG120404-BR           SNMG120404-BR           SNMG120408-BR           SNMG120412-BR           SNMG150608-BR           SNMG150612-BR           M	Sinape         Type         (mm)           SNMG120404-BR         0.30-4.20           SNMG120408-BR         0.65-4.20           SNMG120412-BR         0.95-4.20           SNMG150608-BR         0.65-5.20           SNMG150612-BR         0.95-5.20           M	Shape         Type         (mm)         (mm/rev)           SNMG120404-BR         0.30-4.20         0.08-0.25           SNMG120408-BR         0.65-4.20         0.15-0.45           SNMG120412-BR         0.95-4.20         0.23-0.66           SNMG150608-BR         0.65-5.20         0.15-0.44           SNMG150612-BR         0.95-5.20         0.23-0.66           M         Image: Market	Shape         lype         (mm)         (mm/rev)         5000000000000000000000000000000000000	Shape         Type         Ap (mm)         Fn (mm/rev)         Fn 250         Special Special           SNMG120404-BR         0.30-4.20         0.08-0.25         I         I           SNMG120404-BR         0.65-4.20         0.15-0.45         I         I           SNMG120408-BR         0.65-4.20         0.15-0.45         I         I           SNMG120412-BR         0.95-4.20         0.23-0.66         I         I           SNMG150608-BR         0.65-5.20         0.15-0.44         I         I           SNMG150612-BR         0.95-5.20         0.23-0.66         I         I           M         I         I         I         I	Shape         Type         (mm)         (mm/rev)         "50000         500000         500000         500000	Shape         Type         Ap (mm)         Fn (mm/rev)         Fn (mm/rev) $\frac{1}{50}$	Shape         Type         Ap (mm)         Fn (mm/rev) $r< r< r<< r<<< r<<< r<<< r<<< r<<< r<<< r<<< r<<<< r<<< r<<<< $	Shape         Type         Ap (mm)         Fn (mm/rev) $CVU$ SV         SV <ths< td=""><td>Shape         Type         Ap (mm)         Fn (mm/rev)         Fn <math>m/rev</math>         If <math>S_{10}</math>         SS         SS<td>Shape         Type         Ap (mm)         Fn (mm/rev)         <math>C \cup D</math> <math>S S S S S S S S S S S S S S S S S S S </math></td><td>Shape         Type         Ap (m)         Fn (m)/rev         <math>\overline{CVD}</math> <math>\overline{CVD}</math> <math>\overline{CVD}</math> <math>\overline{V}</math> <th< td=""><td>Shape         Type         Ap (mm)         Fn (mm)rev         <math>\overline{57}</math> <th< td=""></th<></td></th<></td></td></ths<>	Shape         Type         Ap (mm)         Fn (mm/rev)         Fn $m/rev$ If $S_{10}$ SS         SS <td>Shape         Type         Ap (mm)         Fn (mm/rev)         <math>C \cup D</math> <math>S S S S S S S S S S S S S S S S S S S </math></td> <td>Shape         Type         Ap (m)         Fn (m)/rev         <math>\overline{CVD}</math> <math>\overline{CVD}</math> <math>\overline{CVD}</math> <math>\overline{V}</math> <th< td=""><td>Shape         Type         Ap (mm)         Fn (mm)rev         <math>\overline{57}</math> <th< td=""></th<></td></th<></td>	Shape         Type         Ap (mm)         Fn (mm/rev) $C \cup D$ $S S S S S S S S S S S S S S S S S S S $	Shape         Type         Ap (m)         Fn (m)/rev $\overline{CVD}$ $\overline{CVD}$ $\overline{CVD}$ $\overline{V}$ <th< td=""><td>Shape         Type         Ap (mm)         Fn (mm)rev         <math>\overline{57}</math> <th< td=""></th<></td></th<>	Shape         Type         Ap (mm)         Fn (mm)rev $\overline{57}$ <th< td=""></th<>

Note: •Recommended grade ready to stock

#### **Negative Inserts**



		Size	(mm)	
Length	IC	S	d	r
12	12.7	4.76	5.16	0.4-1.6

90°	SN	With Hole

							Gra	ade			
Shape	Туре	Ap	Fn	C	/D						
	.,,-	(mm)	(mm/rev)		OTO3315	OTO3415					
	SNMG120404-CM	0.40-4.20	0.08-0.25		٠	0					
	SNMG120408-CM	0.80-4.20	0.15-0.45		٠	0					
	SNMG120412-CM	1.20-4.20	0.25-0.65		٠	0					
K Semi-											
finishing											

## Øđ s

Length	IC	S	d	r
12	12.7	4.76	5.16	0.4-1.6
15	15.875	6.35	6.35	0.8-1.6

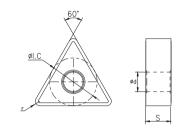
#### 90° SN□□ With Hole

**Negative Inserts** 

									Gra	ade						
Shape	Туре	Ap (mm)									PVD					
		(mm)	) (mm/rev)	OTO8215	OTO8315	OT08225	OTO8325	ОТО5120	OT05525	OTO5133	OTO5140	OTO1010	OTO1520	OTO1525		
	SNMG120404-DM	0.40-3.90	0.08-0.25					0			0	0		٠		
	SNMG120408-DM	0.80-3.90	0.15-0.45					0			0	0		٠		
The second	SNMG120412-DM	1.20-3.90	0.25-0.65					0			0	0		٠		
	SNMG120416-DM	1.80-3.90	0.30-0.90					0			0	0		٠		
	SNMG150608-DM	0.80-3.90	0.15-0.45					0			0	0		٠		
	SNMG150612-DM	1.20-3.90	0.25-0.65					0			0	0		٠		
S Semi-	SNMG150616-DM	1.80-3.90	0.30-0.90					0			0	0		٠		
finishing																

Note: •Recommended grade ready to stock

#### **Negative Inserts**



		Size(mm)								
Length	IC	S	d	r						
16	9.525	4.76	3.81	0.4-1.2						

#### $60^{\circ}$ TN $\Box\Box$ With Hole

								(	Grade	9				
Shape	Туре	Ар	Fn			C١	/D					PVD		
5p 5	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(mm)		OTO8215	OTO8315	OT08225	OT08325	OT08235	OT08335	OTO5120	OT05525	OTO5130	OTO1010	OT01525
	TNMG160404-AF	0.26-3.1	0.05-0.15	•	0	•		0	0					
	TNMG160408-AF	0.52-3.1	0.10-0.30	•	0	•		0	0					
	TNMG160412-AF	0.78–3.1	0.15-0.45	•	0	•		0	0					
P Finishing														

		Size	(mm)	
Length	IC	S	d	r
16	9.525	4.76	3.81	0.4-1.2
22	12.7	4.76	5.16	0.8–1.6

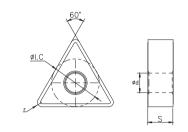
#### 60° TN🗆 With Hole

**Negative Inserts** 

									Gra	de					
Shape	· · · · (mm) (i		Fn			C١	/D					P١	/D		
		(mm/rev)	OT08215	OTO8315	OT08225	OTO8325	OT08235	OT08335	OTO5120	OT05525	OTO5133	OTO5130	OTO5140	OTO1010	
	TNMG160404-AS	0.60-5.80	0.10-0.30	•	0	•		0	0						
	TNMG160408-AS	1.20-5.80	0.20-0.60	•	0	•		0	0						
A	TNMG160412-AS	1.80-5.80	0.30-0.90	•	0	•		0	0						
<u>XOX</u>	TNMG220408-AS	1.20-7.70	0.20-0.60	•	0	•		0	0						
	TNMG220412-AS	1.80-7.70	0.30-0.90	•	0	•		0	0						
	TNMG220416-AS	2.40-7.70	0.40-1.20	•	0	٠		0	0						
P Semi-															
finishing															

Note: •Recommended grade ready to stock

#### **Negative Inserts**



	Size(mm)									
Length	IC	S	d	r						
16	9.525	4.76	3.81	0.8-1.2						
22	12.7	4.76	5.16	0.8-1.6						

#### 60° TN 🗆 With Hole

									Gra	ade					
Shape	Туре	Ap Fn (mm) (mm/rev)				C١	/D					Р∖	/D		
	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		OTO8215	OTO8315	OT08225	OTO8325	OTO8235	OTO8335	OTO5120	OTO5525	OTO5133	OTO5130	OTO5140	OTO1010	
	TNMG160408-AR	2.00-5.00	0.25-0.65			•	0								
	TNMG220408-AR	2.50-7.00	0.25-0.65			•	0								
	TNMG220412-AR	2.50-7.00	0.25-0.65			•	0								
P Roughing															

# Negative Inserts

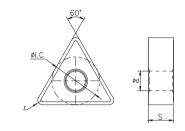
	Size(mm)								
Length	IC	S	d	r					
16	9.525	4.76	3.81	0.4-1.2					

#### $60^{\circ}$ TN $\Box\Box$ With Hole

										Ģ	Grade	е					
Shap	e Type		Ар	Fn	CVD PVD												
			(mm)	(mm/rev)	OT08215	OTO8315	OTO8225	OTO8325	OTO5120	OTO5525	OTO5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525	
	TNMG1604	04 <b>-</b> BF 0.	.25–3.10	0.05-0.15						٠	0	•		0		0	
	TNMG1604	08-BF 0.	.50 <b>–</b> 3.10	0.10-0.30						٠	0	•		0		0	
	TNMG1604	12 <b>-</b> BF 0.	.75–3.10	0.10-0.30						٠	0	•		0		0	
10	2																
M Finishi	ing																

Note: •Recommended grade ready to stock

#### **Negative Inserts**



[			Size	(mm)	
	Length	IC	S	d	r
	16	9.525	4.76	3.81	0.4-1.2
	22	12.7	4.76	5.16	0.8-1.6

#### $60^{\circ}$ TN $\Box\Box$ With Hole

									C	Grad	e					
Shape	Туре	Ар	Fn		C١	/D						PVD				
		(mm)	(mm/rev)	OTO8215	OTO8315	OTO8225	OTO8325	ОТО5125	OTO5525	ОТО5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525	
	TNMG160404-BM	0.30-4.10	0.08-0.25						0	0	0	•	0		0	
	TNMG160408-BM	0.65-4.10	0.15-0.45						0	0	0	•	0		0	
A	TNMG160412-BM	0.95-4.10	0.25-0.65						0	0	0	•	0		0	
291	TNMG220408-BM	0.65-4.90	0.15-0.45						0	0	0	٠	0		0	
	TNMG220412-BM	0.95-4.90	0.25-0.65						0	0	0	٠	0		0	
м																
Semi-																
finishing																

	Size(mm)									
Length	IC	S	d	r						
16	9.525	4.76	3.81	0.4-1.2						
22	12.7	4.76	5.16	0.8-1.6						

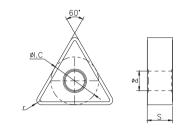
#### 60° TN🗆 With Hole

**Negative Inserts** 

							Gra	de			
Shape	Туре	Ар	Fn	CV	D						
		(mm)	(mm/rev)		OTO3315	OTO3415					
	TNMG160404-CM	0.40-4.10	0.08-0.25		٠	0					
	TNMG160408-CM	0.80-4.10	0.15-0.45		٠	0					
	TNMG160412-CM	1.20-4.10	0.25-0.65		٠	0					
	TNMG220412-CM	1.20-4.90	0.25-0.65		٠	0					
K Semi-											
finishing											

Note: •Recommended grade ready to stock

#### **Negative Inserts**

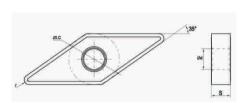


		Size	(mm)	
Length	IC	S	d	r
16	9.525	4.76	3.81	0.4-1.2
22	12.7	4.76	5.16	0.8-1.2

#### $60^{\circ}$ TN $\Box\Box$ With Hole

								(	Grade	9				
Shape	Туре	Ар	Fn		CVD PVD									
		(mm)	(mm/rev)	OTO8215	OTO8315	OT08225	OTO8325	OTO5120	OT 05525	OTO5133	OTO5140	OTO1010	OTO1525	
	TNMG160404-BR	0.30-4.10	0.08-0.25					0	0	0	٠		0	
	TNMG160408-BR	0.65-4.10	0.15-0.45					0	0	0	٠		0	
	TNMG160412-BR	0.95-4.10	0.25-0.65					0	0	0	٠		0	
<u>joi</u>	TNMG220408-BR	0.65-4.90	0.15-0.45					0	0	0	٠		0	
	TNMG220412-BR	0.95-4.90	0.25-0.65					0	0	0	•		0	
M Roughing														





		Size	(mm)	
Length	IC	S	d	r
16	9.525	4.76	3.81	0.4-1.2



		Size	(mm)	
Length	IC	S	d	r
16	9.525	4.76	3.81	0.4-1.2

#### 35° VN□□ With Hole

**Negative Inserts** 

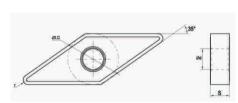
							Gra	ide			
Shape	Туре	Ар	Fn		C١	/D					
·		(mm)	(mm/rev)		OTO3315	OTO3415					
	VNMG160404-CM	0.40-3.30	0.08-0.25		•	0					
	VNMG160408-CM	0.80-3.30	0.15-0.45		•	0					
-	VNMG160412-CM	1.20 <b>–</b> 3.30	0.25-0.65		٠	0					
K Semi-											
finishing											
5											

Note: •Recommended grade ready to stock

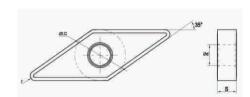
#### $35^{\circ}$ VN $\Box\Box$ With Hole

									Gra	de					
Shape	Туре	Ар	Fn			C١	/D					P۱	/D		
		(mm)	(mm/rev)	OT08215	OT08315	OT08225	OT08325	OT08235	OTO8335	OTO5120	OT05525	OTO5133	OTO5130	OTO5140	OTO1010
	VNMG160404-AF	0.26-2.1	0.05-0.15	•	0	•		0	0						
	VNMG160408-AF	0.52-2.1	0.10-0.30	•	0	•		0	0						
-	VNMG160412-AF	0.78–2.1	0.15-0.45	•	0	•		0	0						
P Finishing															





		Size	(mm)	
Length	IC	S	d	r
11	6.35	4.76	2.26	0.4-0.8
16	9.525	4.76	3.81	0.4-0.8



		Size	(mm)	
Length	IC	S	d	r
16	9.525	4.76	3.81	0.4-1.2

# 

#### 35° VN□□ With Hole

									C	Grad	е					
Shape	Туре	Ap Fn			C١	/D						PVD				
		(mm)	(mm/rev)	OTO8215	OT08315	OT08225	OT08325	OTO5120	OT05525	OTO5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525	
	VNMG160404-BF	0.25-3.30	0.05-0.15						•	0	•		0		0	
	VNMG160408-BF	0.55-3.30	0.10-0.30						•	0	•		0		0	
	VNMG160412-BF	0.75-3.30	0.15-0.45						٠	0	•		0		0	
M Finishing																
Thisming																

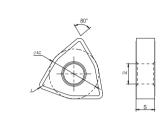
Note: •Recommended grade ready to stock

#### $35^{\circ}$ VN $\Box\Box$ With Hole

**Negative Inserts** 

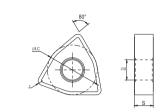
									Gra	de					
Shape	Туре	Ар	Fn			C١	٧D					P١	/D		
		(mm)	(mm/rev)	OT08215	OTO8315	OT08225	OT08325	OT08235	OTO8335	OTO5120	OTO5525	OTO5133	OTO5130	OTO5140	OTO1010
	VNMG110404-AS	0.80–2.50	0.15-0.36	•	0	•		0	0						
	VNMG110408-AS	1.00-2.50	0.17-0.36	•	0	•		0	0						
	VNMG160404-AS	0.80-3.00	0.15-0.36	•	0	٠		0	0						
	VNMG160408-AS	1.00-2.50	0.17-0.36	•	0	•		0	0						
P Semi- finishing															





		Size	(mm)	
Length	IC	S	d	r
8	12.7	4.76	5.16	0.4-1.2

#### **Negative Inserts**



		Size	(mm)	
Length	IC	S	d	r
8	12.7	4.76	5.16	0.4-1.6

#### 80° WN□□ With Hole

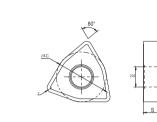
									Gra	de					
Shape	Туре	Ар	Fn			C١	/D					P∖	/D		
		(mm)	(mm/rev)	OTO8215	OTO8315	OTO8225	OTO8325	OTO8235	OTO8335	OTO5120	OTO5525	OTO5133	OTO5130	OTO5140	OTO1010
	WNMG080404-AF	0.26-2.2	0.05-0.15	•	0	•		0	0						
A	WNMG080408-AF	0.52-2.2	0.10-0.30	٠	0	•		0	0						
	WNMG080412-AF	0.78-2.2	0.15-0.45	٠	0	٠		0	0						
_															
P Finishing															
Thisming															

Note: •Recommended grade ready to stock

#### 80° WN $\Box\Box$ With Hole

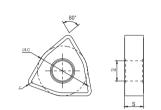
									Gra	de					
Shape	Туре	Ap (mm)	Fn			C١	/D					P∖	/D		
		(mm)	(mm/rev)	OTO8215	OTO8315	OTO8225	OTO8325	OT08235	OTO8335	OTO5120	OTO5525	OTO5133	OTO5130	OTO5140	OTO1010
	WNMG080404-AS	0.60-4.30	0.10-0.30	•	0	•		0	0						
	WNMG080408-AS	1.20-4.30	0.20-0.60	•	0	٠		0	0						
	WNMG080412-AS	1.80-4.30	0.30-0.90	•	0	٠		0	0						
	WNMG080416-AS	2.40-4.30	0.40-1.20	•	0	•		0	0						
P Semi-															
finishing															





		Size	(mm)	
Length	IC	S	d	r
6	9.525	4.76	3.81	0.8–1.2
8	12.7	4.76	5.16	0.8–1.2

#### **Negative Inserts**



		Size	(mm)	
Length	IC	S	d	r
6	9.525	4.76	3.81	0.4-0.8
8	12.7	4.76	5.16	0.4-1.6

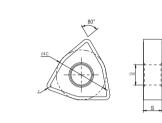
									Gra	de					
Shape	Туре	Ар	Fn			C١	/D					Р١	/D		
		(mm)	(mm/rev)	OTO8215	OT08315	OTO8225	OTO8325	OTO8235	OTO8335	OTO5120	OTO5525	OTO5133	OTO5130	OTO5140	OTO1010
	WNMG060408-AR	0.80-4.00	0.15-0.50			•	0								
	WNMG060412-AR	0.80-4.00	0.15-0.50				0								
A	WNMG080408-AR	0.80-4.50	0.15-0.55			•	0								
	WNMG080412-AR	0.80-4.50	0.20-0.55			•	0								
Р															
Roughing															
5 5															

Note: •Recommended grade ready to stock

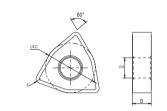
#### $80^{\circ}$ WN $\Box$ $\Box$ With Hole

									C	Grad	е					
Shape	Туре	Ap (mm)	Fn		C١	/D						PVD				
		(mm)	(mm/rev)	OTO8215	OTO8315	OT08225	OTO8325	OTO5120	OT05525	OTO5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525	
	WNMG060404-BF	0.25-2.40	0.05-0.15						٠	0	•		0		0	
	WNMG060408-BF	0.50-2.40	0.10-0.30						٠	0	•		0		0	
$\wedge$	WNMG080404-BF	0.25-3.20	0.05-0.15						٠	0	•		0		0	
202	WNMG080408-BF	0.50-3.20	0.10-0.30						٠	0	•		0		0	
	WNMG080412-BF	0.75–3.20	0.15-0.45						٠	0	•		0		0	
	WNMG080416-BF	1.05-3.20	0.20-0.60						٠	0	•		0		0	
M Finishing																
Finishing																





		Size	(mm)	
Length	IC	S	d	r
6	9.525	4.76	3.81	0.4-0.8
8	12.7	4.76	5.16	0.4-1.6



		Size	(mm)	
Length	IC	S	d	r
6	9.525	4.76	3.81	0.4-0.8
8	12.7	4.76	5.16	0.4-1.6

#### 80° WN $\Box\Box$ With Hole

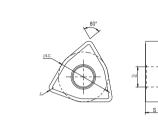
		Grade														
Shape	Туре	Ap	Fn (mm/rev)		C∖	D/D						PVD				
		(mm)		OTO8215	OT08315	OT08225	OT08325	OTO5120	OT05525	OTO5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525	
	WNMG060404-BM	0.30-2.10	0.10-0.30						0	0	0	•	0		0	
	WNMG060408-BM	0.65-2.10	0.15-0.45						0	0	0	٠	0		0	
A	WNMG080404-BM	0.30-2.90	0.10-0.30						0	0	0	٠	0		0	
221	WNMG080408-BM	0.65-2.90	0.15-0.45						0	0	0	٠	0		0	
	WNMG080412-BM	0.95-2.90	0.20-0.60						0	0	0	•	0		0	
	WNMG080416-BM	1.25-2.90	0.25-0.75						0	0	0	٠	0		0	
M Semi-																
finishing																

Note: •Recommended grade ready to stock

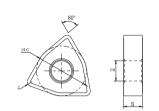
#### 80° WN $\Box\Box$ With Hole

								(	Grade	è				
Shape	Туре	Ар	Fn		C١	/D					PVD			
		(mm)	(mm/rev)	OTO8215	OTO8315	OT08225	OTO8325	OTO5120	OTO5525	OTO5133	OTO5140	OTO1010	OTO1525	
	WNMG060404-BR	0.30-2.10	0.10-0.30					0	0	0	٠		0	
	WNMG060408-BR	0.65-2.10	0.15-0.45					0	0	0	•		0	
5	WNMG080404-BR	0.30-2.90	0.10-0.30					0	0	0	٠		0	
201	WNMG080408-BR	0.65-2.90	0.15-0.45					0	0	0	•		0	
	WNMG080412-BR	0.95-2.90	0.20-0.60					0	0	0	٠		0	
	WNMG080416-BR	1.25-2.90	0.25-0.75					0	0	0	•		0	
M														
Roughing														





		Size	(mm)	
Length	IC	S	d	r
8	12.7	4.76	5.16	0.4-1.6



	Size(mm)									
Length	IC	S	d	r						
8	12.7	4.76	5.16	0.4-1.6						

#### 80° WN $\Box\Box$ With Hole

								Grade						
Shape	Туре	Ар	Ap Fn		C١	/D								
		(mm)	(mm/rev)			OTO3315	OTO3415							
	WNMG080404-CM	0.08–0.25	0.40-2.90			٠	•							
	WNMG080408-CM	0.15–0.45	0.80-2.90			٠	•							
	WNMG080412-CM	0.25-0.66	1.20-2.90			٠	٠							
K Semi-														
finishing														

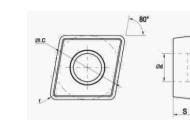
Note: •Recommended grade ready to stock

#### 80° WN $\Box\Box$ With Hole

									Gra	de					
Shape	Туре	Ар	Fn		C١	/D					P١	/D			
		(mm)	(mm/rev)	OTO8215	OTO8315	OTO8225	OTO8325	OTO5120	OTO5525	OTO5133	OTO5140	OTO1010	OTO1520	OTO1525	
	WNMG080404-DM	0.40-4.30	0.08-0.25					0			0	0		٠	
	WNMG080408-DM	0.80-4.30	0.15-0.45					0			0	0		•	
AN	WNMG080412-DM	1.20-4.30	0.25-0.66					0			0	0		•	
	WNMG080416-DM	1.60–4.30	0.30-0.90					0			0	0		٠	
S Semi- finishing															



#### **Positive Inserts**



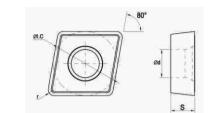
		Size	(mm)	
Length	IC	S	d	r
6	3.65	2.38	2.8	0.4-0.8
9	9.525	3.97	4.4	0.4-0.8
12	12.7	4.76	5.56	0.4-1.2

#### 80° CC $\Box\Box$ With Hole

								(	Grade	è				
Shape	Туре	Ар	Fn			CVD					P١	/D		
		(mm)	(mm/rev)	OTO8215	OTO8315	OTO8225	OTO8325	OTO8335	OTO5120	OTO5525	OTO5130	OTO5140	OTO1010	OTO1525
	CCMT060204-GM	0.40-2.10	0.05-0.18	٠	0	٠		0	0		•	0		0
	CCMT060208-GM	0.80-2.10	0.10-0.35	٠	0	٠		0	0		•	0		0
io.	CCMT09T304-GM	0.40-3.80	0.05-0.18	٠	0	٠		0	0		٠	0		0
	CCMT09T308-GM	0.80-3.20	0.10-0.35	٠	0	٠		0	0		٠	0		0
	CCMT120404-GM	0.40-4.30	0.05-0.18	٠	0	٠		0	0		٠	0		0
	CCMT120408-GM	0.80-4.30	0.10-0.35	٠	0	٠		0	0			0		0
General Semi-	CCMT120412-GM	1.20-4.30	0.15-0.55	٠	0	٠		0	0		•	0		0
finishing														

Note: •Recommended grade ready to stock

#### **Positive Inserts**



		Size	(mm)	
Length	IC	S	d	r
6	3.65	2.38	2.8	0.4-0.8
9	9.525	3.97	4.4	0.4-0.8

#### 80° CC $\Box$ With Hole

										Grad	le					
Shape	Туре	Ар	Fn		C١	/D						PVD				
	. 71 -	(mm)	(mm/rev)	OTO8215	OTO8315	OT08225	OT08325	OTO5120	OT05525	OTO5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525	
	CCMT060204-GF	0.30-1.60	0.05-0.15						•	0	•		0	0		
	CCMT060208-GF	0.60-1.60	0.10-0.30						•	0	•		0	0		
	CCMT09T304-GF	0.30-2.20	0.05-0.15						•	0	•		0	0		
	CCMT09T308-GF	0.60-2.40	0.10-0.30						•	0	•		0	0		
M Finishing																

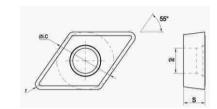
		Size	(mm)	
Length	IC	S	d	r
7	6.35	2.38	2.8	0.4-0.8
11	9.525	3.97	4.4	0.4-1.2

#### 55° DC $\Box\Box$ With Hole

					Grad					Grade	•				
Sł	паре	Туре	Ар	Fn			CVD					P١	/D		
	·		(mm)	(mm/rev)	OTO8215	OTO8315	OTO8225	OTO8325	OTO8335	OTO5120	OTO5525	OTO5130	OTO5140	OTO1010	OTO1525
		DCMT070204-GM	0.40-2.30	0.05-0.20	٠	0	٠		0	0		٠	0		0
		DCMT070208-GM	0.80-2.30	0.10-0.35		0	٠		0	0		٠	0		0
1	A/	DCMT11T304-GM	0.40-3.50	0.05-0.20	٠	0	٠		0	0		٠	0		0
-		DCMT11T308-GM	0.80-3.50	0.20-0.35	٠	0	٠		0	0		٠	0		0
		DCMT11T312-GM	1.20-3.50	0.25-0.55	٠	0	٠		0	0		٠	0		0
S	enera <b>l</b> emi- ishing														

Note: •Recommended grade ready to stock

#### **Positive Inserts**



	Size(mm)										
Length	IC	S	d	r							
7	6.35	2.38	2.8	0.4-0.8							
11	9.525	3.97	4.4	0.4-1.2							

#### 55° DC $\Box\Box$ With Hole

										Grad	е					
Shape	Туре	Type Ap (mm)			C١	/D						PVD				
		(mm)	(mm/rev)	OTO8215	OTO8315	OT08225	OTO8325	OTO5120	OT05525	OTO5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525	
	DCMT070204-GF	0.30-1.50	0.05-0.15						•	0	•		0	0		
	DCMT070208-GF	0.60-1.50	0.05-0.20						•	0	•		0	0		
01	DCMT11T304-GF	0.30-2.30	0.02-0.10						•	0	•		0	0		
	DCMT11T308-GF	0.60-2.30	0.05-0.26						•	0	•		0	0		
	DCMT11T312-GF	0.90-2.30	0.20-0.30						٠	0	٠		0	0		
M Finishing																

Note: •Recommended grade ready to stock

	Size(mm)								
Length	IC	S	d	r					
9	9.525	3.97	4.4	0.4-0.8					
12	12.7	4.76	5.56	0.4-1.2					

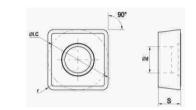
#### 90° SC $\Box\Box$ With Hole

**Positive Inserts** 

					Grade										
Sha	ape	Туре	Ap Fn				CVD					P١	/D		
			(mm)	(mm/rev)	OT08215	OTO8315	OTO8225	OTO8325	OTO8335	OTO5120	OTO5525	OTO5130	OTO5140	OTO1010	OTO1525
		SCMT09T304-GM	0.40-3.10	0.05-0.20	٠	0	•		0	0		٠	0		0
		SCMT09T308-GM	0.80-3.10	0.10-0.35	•	0	٠		0	0		•	0		0
20	34	SCMT120404-GM	0.40-4.20	0.05-0.20	٠	0	٠		0	0		•	0		0
35	24	SCMT120408-GM	0.80-4.20	0.10-0.30	٠	0	٠		0	0		٠	0		0
		SCMT120412-GM	1.20-4.20	0.15-0.55	٠	0	٠		0	0		٠	0		0
Se	neral mi- shing														

Note: •Recommended grade ready to stock

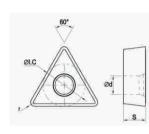
#### **Positive Inserts**



	Size(mm)									
Length	IC	S	d	r						
9	9.525	3.97	4.4	0.4-0.8						

#### 90° SC $\Box\Box$ With Hole

										Grad	le					
Shape	Туре	Ap Fn		C١	/D						PVD	)				
		(mm)	(mm/rev)	OT08215	OTO8315	OT08225	OTO8325	OTO5120	OT05525	OTO5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525	
	SCMT09T304-GF	0.30-2.40	0.05-0.15						•	0	•		0	0		
	SCMT09T308-GF	0.60-2.40	0.10-0.30						•	0	•		0	0		
M Finishing																



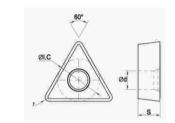
		Size	(mm)	
Length	IC	S	d	r
9	5.56	2.38	2.2	0.4-0.8
11	6.35	2.38	2.8	0.4-1.2
16	9.525	3.97	4.4	0.4-1.2

#### $60^{\circ}$ TC $\Box$ With Hole

								Grade									
Shape	Туре	Ар	Fn			CVD					Ρ١	/D					
		(mm)	(mm/rev)	OT08215	OTO8315	OT08225	OTO8325	OT08335	OTO5120	OT05525	OTO5130	OTO5140	OTO1010	OT01525			
	TCMT090204-GM	0.40-2.90	0.05-0.20	٠	0	٠		0	0		٠	0		0			
	TCMT090208-GM	0.80-2.90	0.10-0.35	٠	0	٠		0	0		•	0		0			
	TCMT110204-GM	0.40-3.30	0.05-0.20	٠	0	٠		0	0		•	0		0			
	TCMT110208-GM	0.80-3.30	0.10-0.35	•	0	٠		0	0		•	0		0			
	TCMT110212-GM	1.20-3.30	0.15-0.55	•	0	٠		0	0		•	0		0			
	TCMT16T304-GM	0.40-4.90	0.05-0.20	•	0	٠		0	0		•	0		0			
Gereral Semi-	TCMT16T308-GM	0.80-4.90	0.10-0.35	•	0	٠		0	0		•	0		0			
finishing	TCMT16T312-GM	1.20-4.90	0.15-0.55	•	0	٠		0	0		•	0		0			

Note: •Recommended grade ready to stock

#### **Positive Inserts**



	Size(mm)									
Length	IC	S	d	r						
9	5.56	2.38	2.2	0.4-0.8						
11	6.35	2.38	2.8	0.4-1.2						
16	9.525	3.97	4.4	0.4-1.2						

#### 60° TC 🗌 With Hole

										Grad	le					
Shape	Туре		Fn		C١	/D						PVD				
	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(mm)	(mm/rev)	OTO8215	OTO8315	OT08225	OTO8325	OTO5120	OTO5525	OTO5133	OTO5130	OTO5140	OTO1010	OTO1520	OTO1525	
	TCMT090204-GF	0.30-1.80	0.05-0.15						•	0	•		0	0		
	TCMT090208-GF	0.60-2.20	0.10-0.30						•	0	•		0	0		
	TCMT110204-GF	0.30-2.20	0.05-0.15						•	0	•		0	0		
	TCMT110208-GF	0.60-3.30	0.10-0.30						•	0	•		0	0		
	TCMT110212-GF	1.20-3.30	0.20-0.40						•	0	•		0	0		
	TCMT16T304-GF	0.30-3.30	0.05-0.15						•	0	•		0	0		
M	TCMT16T308-GF	0.60-3.30	0.10-0.30						•	0	•		0	0		
Finishing	TCMT16T312-GF	1.20-3.30	0.10-0.40						•	0	•		0	0		

Note: •Recommended grade ready to stock



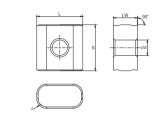
		Size(mm)	
Length	IC	S	d
8	8	3.18	3.36
10	10	3.18	4.4
12	12.7	4.76	4.4
16	16	6.35	5.5
20	20	6.35	6.5
25	25	7.94	7.2
32	32	9.52	9.5

#### $RC \square \square$ With Hole

Shape	Туре	Ap (mm)	Fn (mm/rev)	Grade												
						C١	/D			PVD						
				OTO8215	OTO8315	OT08225	OTO8325	OTO8235	OTO8335	OTO8235	OTO8335	OTO5120	OTO5525	OTO5130	OTO5140	
	RCMX0803MO	0.50-3.00	0.15-0.40	٠		٠										
	RCMX1003MO	1.50-4.00	0.25-0.50	٠		•										
	RCMX1204MO	2.50-5.00	0.30-0.60	•		•										
	RCMX1606MO	3.00-7.00	0.40-0.75	٠		٠										
	RCMX2006MO	3.50-9.00	0.48-0.90	٠		٠										
	RCMX2507MO	4.00-12.00	0.55-1.20	٠		٠										
Train Wheel	RCMX3209MO	5.00-15.00	0.65-1.50	٠		٠										
Profiling																
_																

Note: •Recommended grade ready to stock

#### Train Wheel Turning Inserts



	Size(mm)											
Length	L	I.W	S	d	r							
19	19.05	10	19.05	6.35	4							

Shape	Туре	Ap (mm)	Fn (mm/rev)	Grade																			
						C١	/D					Р١	/D										
				OTO8215	OTO8315	OTO8225	OTO8325	OTO8235	OTO8335	OTO8235	OTO8335	OTO5120	OTO5525	OTO5130	OTO5140								
	175.32-191940-28	2.00-5.00	0.20-0.60	•		٠																	
Train Whee <b>l</b> Trimming																							

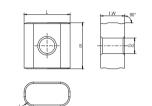


#### Train Wheel Turning Inserts

L	1.	<u>⊢ .w</u> →90
	s	Ød
	)	

Longth	Size(mm)											
Length	L	I.W	S	d	r							
19	19.05	10	19.05	6.35	4							

#### Train Wheel Turning Inserts



1	Size(mm)											
Length	L	I.W	S	d	r							
19	19.05	10	19.05	6.35	4							

	Туре	Ap (mm)	Fn (mm/rev)	Grade												
Shape						C١	/D				PVD					
				OT08215	OTO8315	OT08225	OT08325	OT08235	OTO8335	OT08235	OTO8335	OTO5120	OT05525	OTO5130	OTO5140	
	175.32-191940-24	2.00-5.00	0.20-0.60	•		٠										
Train												_				
Wheel Trimming																
mining																

Note: •Recommended grade ready to stock

Shape T	Туре	Ap (mm)	Fn (mm/rev)	Grade												
						C١	/D					PVD				
				OTO8215	OTO8315	OTO8225	OTO8325	OTO8235	OTO8335	OTO8235	OTO8335	OTO5120	OTO5525	OTO5130	OTO5140	
	175.32-191940-22	2.00-5.00	0.20-0.60	•		•										
Train																
Wheel Trimming																
inmming -																