MITSUBISHI MATERIALS

MS6015/MS7025/ MS9025

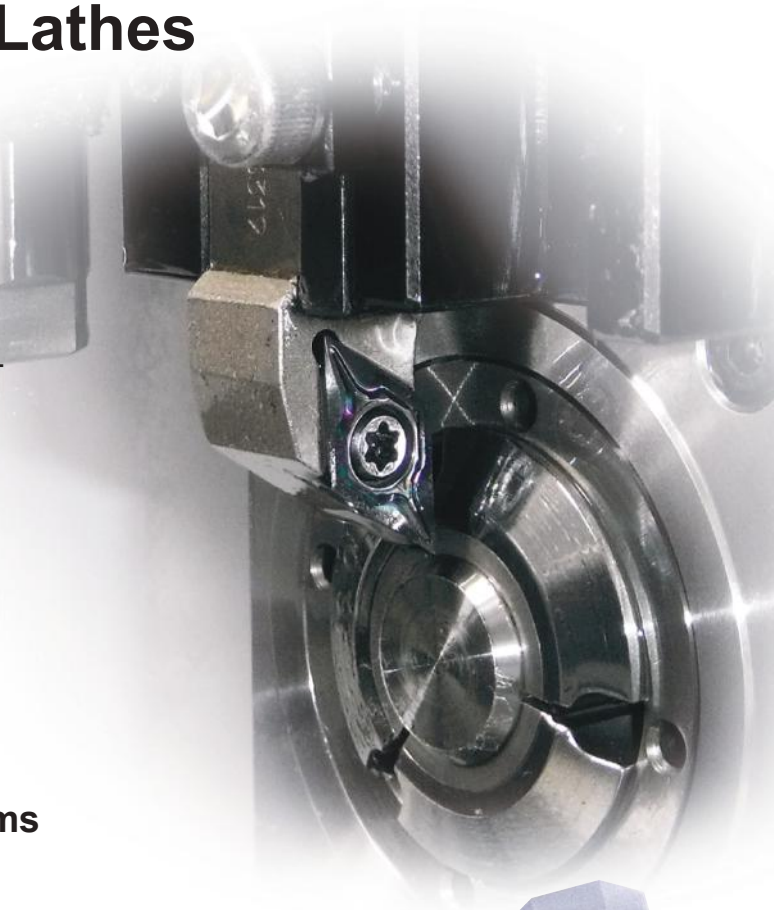


MS SERIES - PVD COATED GRADES FOR HIGH PRECISION AND SMALL PARTS MACHINING



TOOL NEWS **B275A**

Transformation of Machining on Swiss-Type Automatic Lathes



The first parts to be machined on swiss-type automatic lathes were watch components. Their use soon expanded to machining electrical parts for home appliances, printers as well as automobile component applications such as sensors and electrification technology parts. The high precision capability of swiss-type lathes has also lent itself to the machining of parts essential to daily life. These parts include robotic and medical implants as well as simple, but essential, parts for water taps. Expanding the type of applications is not the only modern advancement, even higher precision, productivity and quality has become necessary.

Due to changes in materials and component geometries, various problems have arisen that need solutions:

- Complex workpiece shapes
- Ever more difficult-to-cut materials
- Tighter dimensional tolerances



MITSUBISHI MATERIALS is committed to product development and the commercialization of new tools that have the cutting capability and machine tool adaptability that customers desire.

- Development of new coatings adapted to workpiece materials and machining methods
- Optimization of welding, wear and fracture resistance
- High precision machining enabled by developments of high quality cutting edge geometries





MS Series - PVD Coated Grades for High Precision and Small Parts Machining

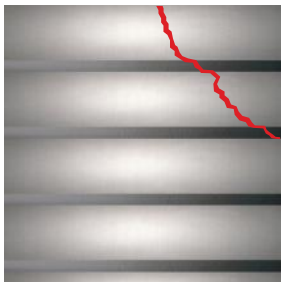
MS7025

Dramatically improved welding and wear resistance in low feed machining with a more precise nano-multilayer coating

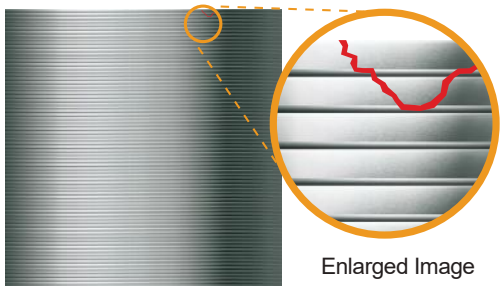
Features

Nano-Multilayer Coating

By combining the high lubrication layer with excellent welding resistance, and the high hardness layer with a greater wear resistance that suppresses the progress of wear at the nano-level, the film damage is significantly reduced and the welding and wear resistance are dramatically improved.



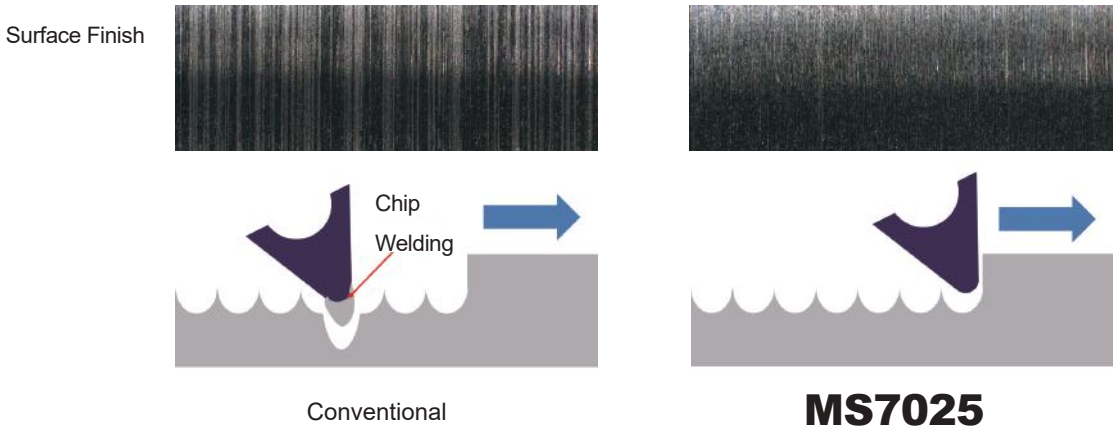
Conventional Multilayer Coating



Nano-multilayer Coating

Effects of the High Lubrication Layer

The nano-level, high lubrication layer suppresses built-up edge caused by chip welding which tends to occur in low feed machining and in addition reduces machining marks on the component surface.



Conventional

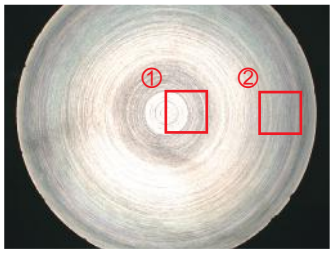
MS7025

Cutting Performance

Comparison of End Face Machined Surfaces Using 3D Analysis

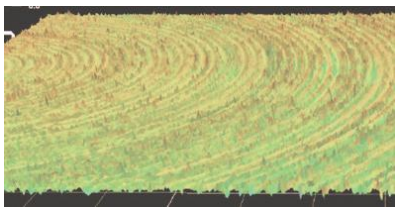
Achieves stable machining even during end face machining where the cutting speed is liable to change.

Material : AISI 1045

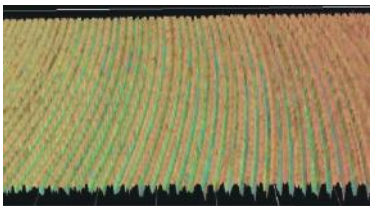


MS7025

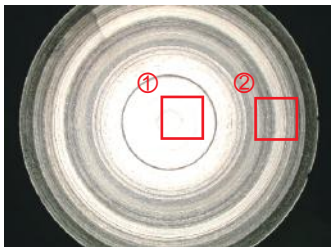
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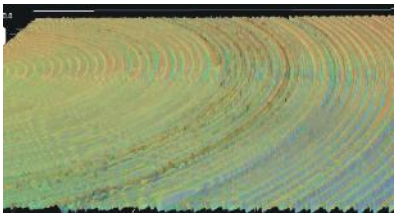
②



Good Surface Finish



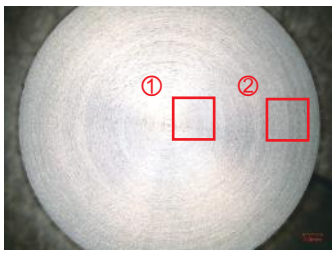
Conventional





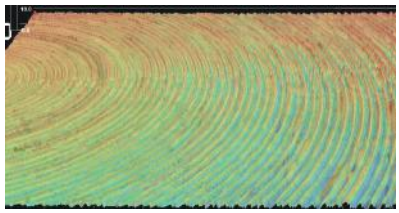
Changes in surface quality caused by machining marks

Material : AISI 304

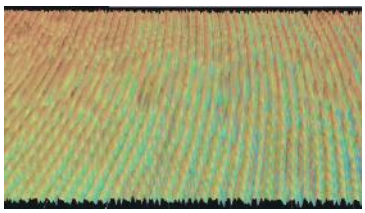


MS7025

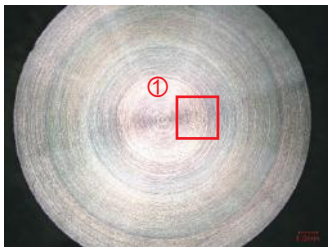
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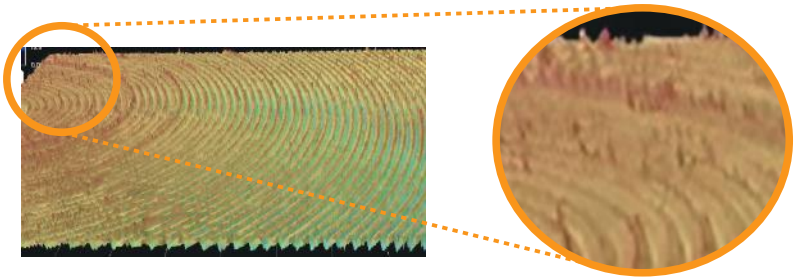
②



Good Surface Finish



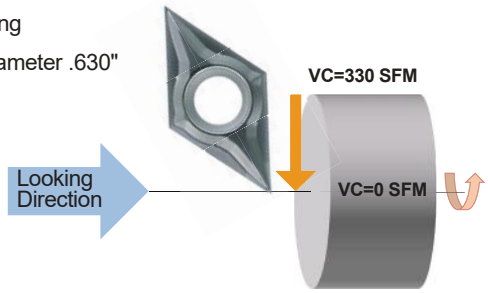
Conventional



Roughness can occur in the low speed area (near the center)

Image of Facing

Workpiece Diameter .630"



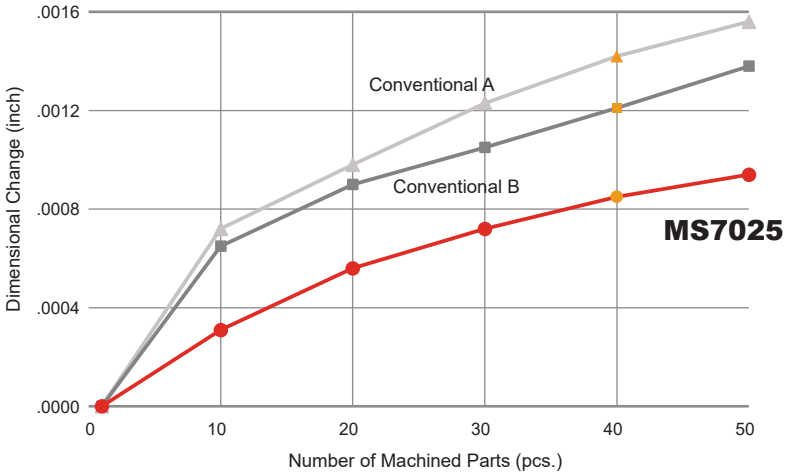
<Cutting Conditions>

Material	: Notation Above
Inserts	: DCGT32.50.5
Cutting Speed	: vc = Max. 330 SFM
Feed per Rev.	: f = .0008 IPR
Depth of Cut	: ap = .008 inch
Cutting Mode	: Wet Cutting (Oil)

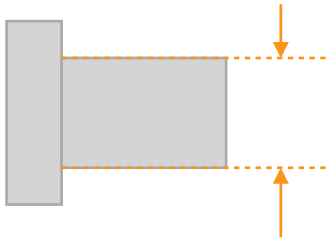
Comparison of Dimensional Change in Low Feed Machining

When machining at low feed rate conditions, dimensional changes are reduced and the quality of the machined surface is improved.

Material : AISI 440C



Dimensional Change
The amount of dimensional change is based on the first component machined



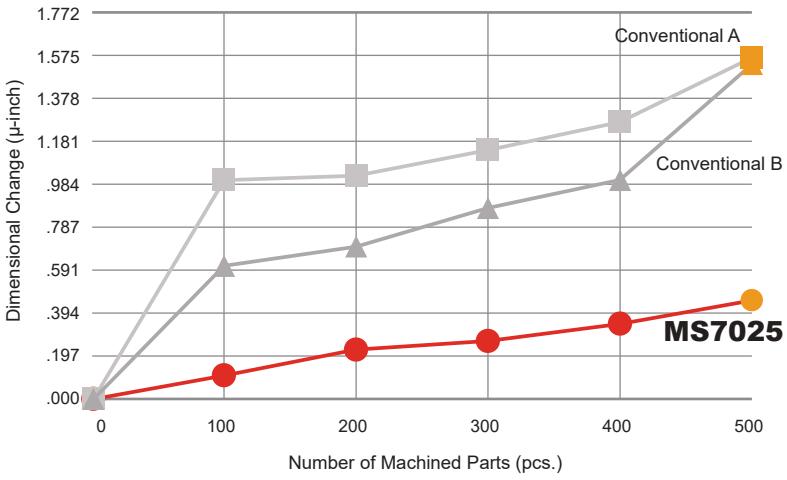
<Cutting Conditions>
Material : AISI 440C
Inserts : DCGT32.50.2
Cutting Speed : vc = 230 SFM
Feed per Rev. : f = .0008 IPR
Depth of Cut : ap = .059 inch
Cutting Mode : Wet Cutting (Oil)

After 40 pieces machining



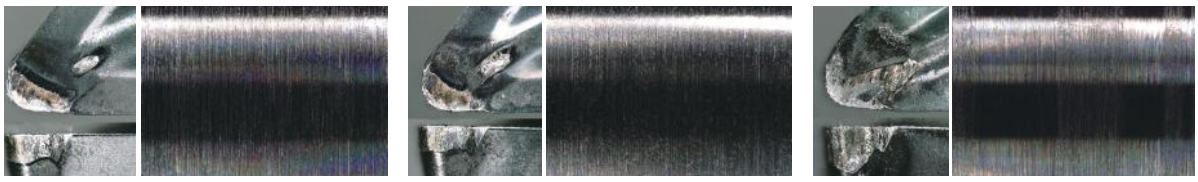
MS7025 Conventional A Conventional B

Material : ELCH2S



<Cutting Conditions>
Material : ELCH2S
Inserts : DCGT32.50.5
Cutting Speed : vc = 785 SFM
Feed per Rev. : f = .0012 IPR
Depth of Cut : ap = .012 inch
Workpiece Material Length : .591 inch
Cutting Mode : Wet Cutting (Oil)

After 500 pieces machining



MS7025 Conventional A Conventional B

MS Series - PVD Coated Grades for High Precision and Small Parts Machining

MS9025

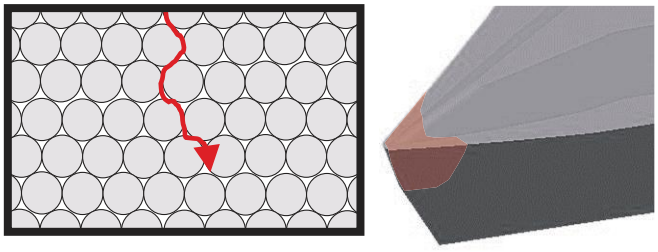
Effective reduction of notch wear with a balance of wear and fracture resistance.

Features

Improved Cemented Carbide

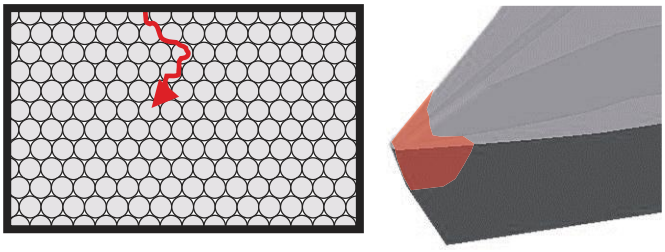
Thermal conductivity has been improved by optimizing the grain size and therefore reducing the boundary contact between the WC particles. This optimization reduces the temperature of the cutting edge during machining.

MS9025



Reducing the cutting edge temperature with improved thermal conductivity.

Conventional



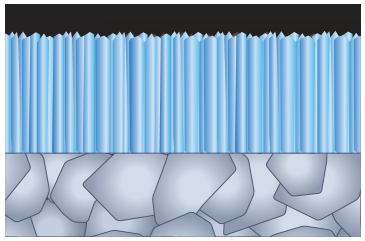
Higher cutting edge temperatures due to more particle boundary contact.

Smooth Surface of The Coating

The even surface of the coating has been achieved by first making the the carbide substrate smooth, then by promoting straight growth of the coating crystals. This leads to excellent welding resistance.

*By Image

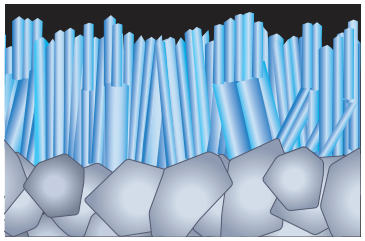
MS9025



Smooth Cemented Carbide

Straight crystal growth.
Smooth carbide surface.
Excellent welding resistance.

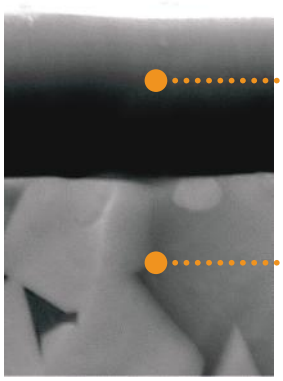
Conventional



Rough Cemented Carbide

Random crystal growth direction.
Performance is variable due to defects and voids in the surface.

High Al-rich(Al,Ti)N Single Layer Coating Technology

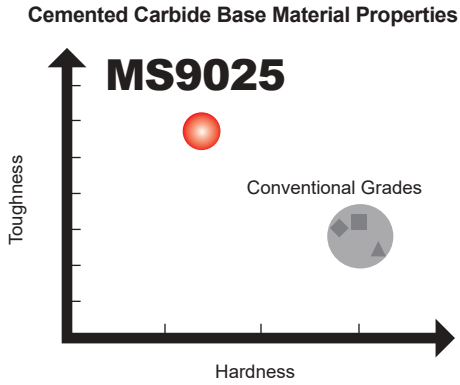


Al-rich (Al,Ti)N

Superior Flank Wear Resistance
Superior Crater Wear Resistance
Excellent Welding Resistance

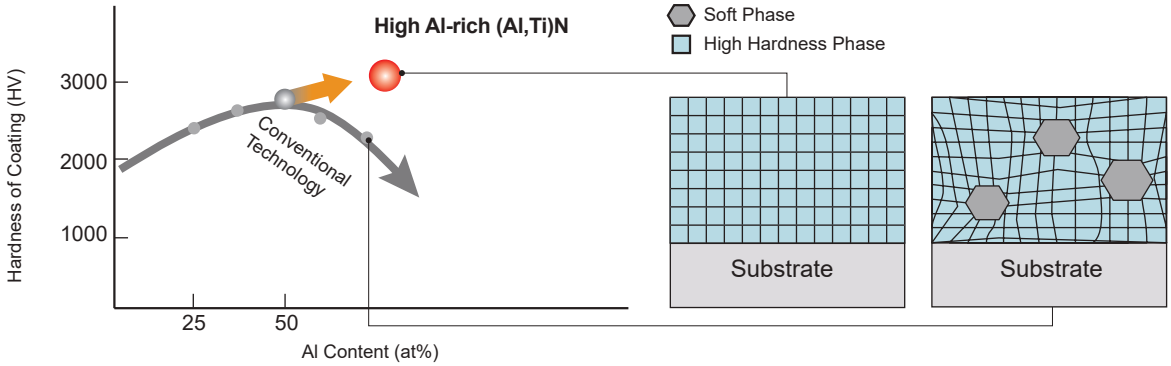
Special Cemented Carbide for MS9025

Superior Fracture Resistance
Excellent Chipping Resistance



High Al and Conventional Coating Comparison

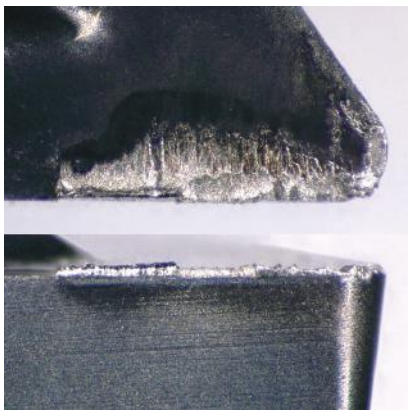
The high Al-rich (Al,Ti)N single layer coating provides stabilization of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.



Stainless Steel AISI 304, Cutting Edge Comparison

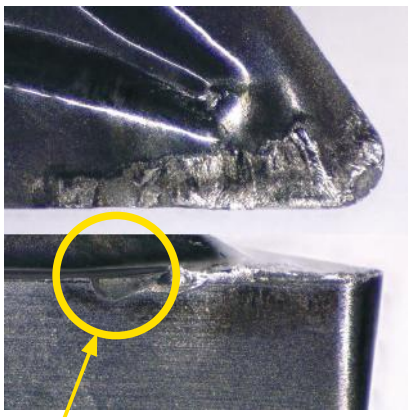
After machining 500 parts

MS9025



VB=.001 inch

Conventional



Notch Wear

VB=.003 inch

<Cutting Conditions>

Material	: AISI 304
Inserts	: DCGT32.50.5
Machining Methods	: External Continuous Cutting
Cutting Speed	: vc =185 SFM
Feed per Rev.	: fr=.0012 IPR
Depth of Cut	: Rough ap =.002 inch Finish ap =.001 inch
Cutting Mode	: Wet Cutting (Oil)

MS Series - PVD Coated Grades for High Precision and Small Parts Machining

MS6015

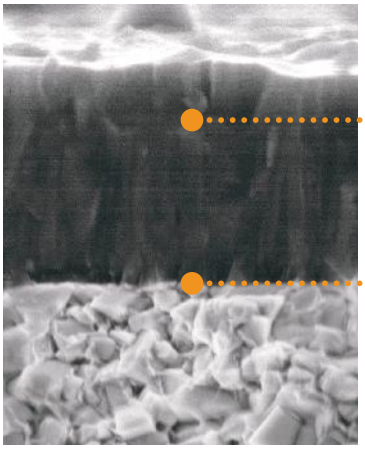
Ideal for turning pure iron, carbon and free cutting steels while also providing excellent dimensional accuracy and good surface finishes.

Features

The unique combination of a special carbide substrate and a new PVD coating that greatly improves wear resistance.

	MS6015	Conventional
Coating	TiCN Multilayer	TiAlN
Hardness (HV)	3000	2800
Wear Coefficient (Carbon steel)	Low	High
Base Material Hardness (HRA)	92.0	92.0
T.R.S (GPa)	2.0	2.0

Ti-C-N Multilayer Coating



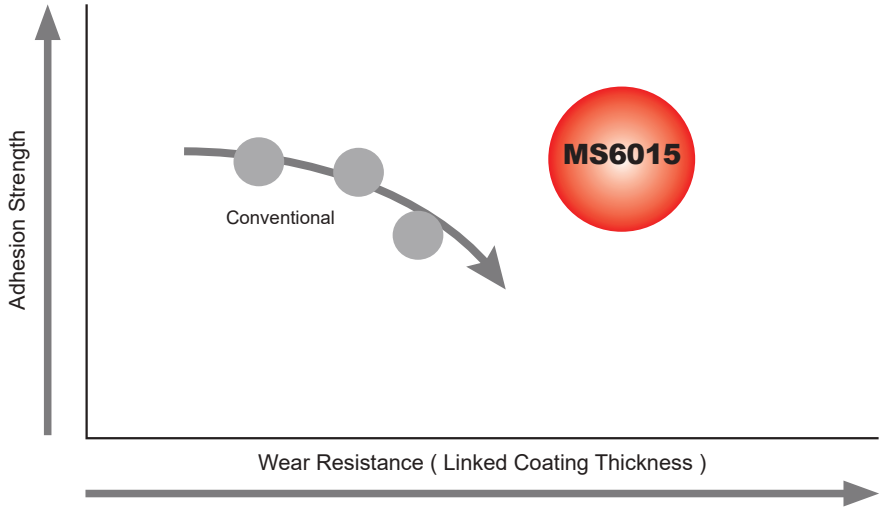
Demonstrates superior wear and welding resistance and provides the best possible results for carbon steel.

Micro multi-layers greatly improves adhesion between the coating layers.

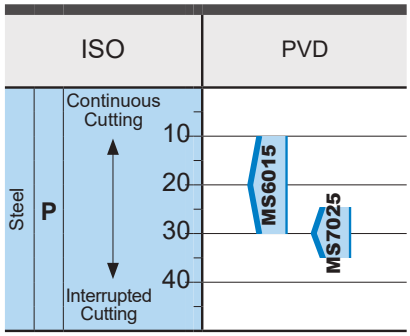
Excellent chip discharge with a reduced coefficient of friction creates a stable component surface finish.

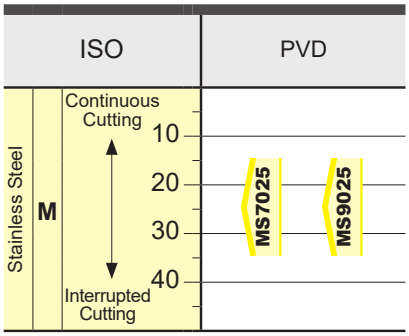
Optimizing the Laminated Structure

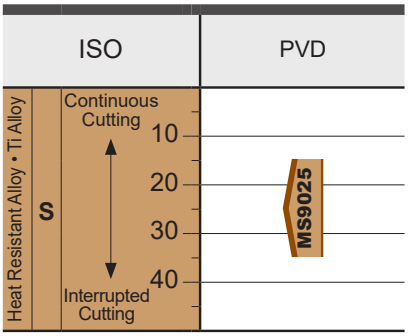
Optimizing the laminated structure enables thickening of the coating which leads to a significant improvement of wear resistance.



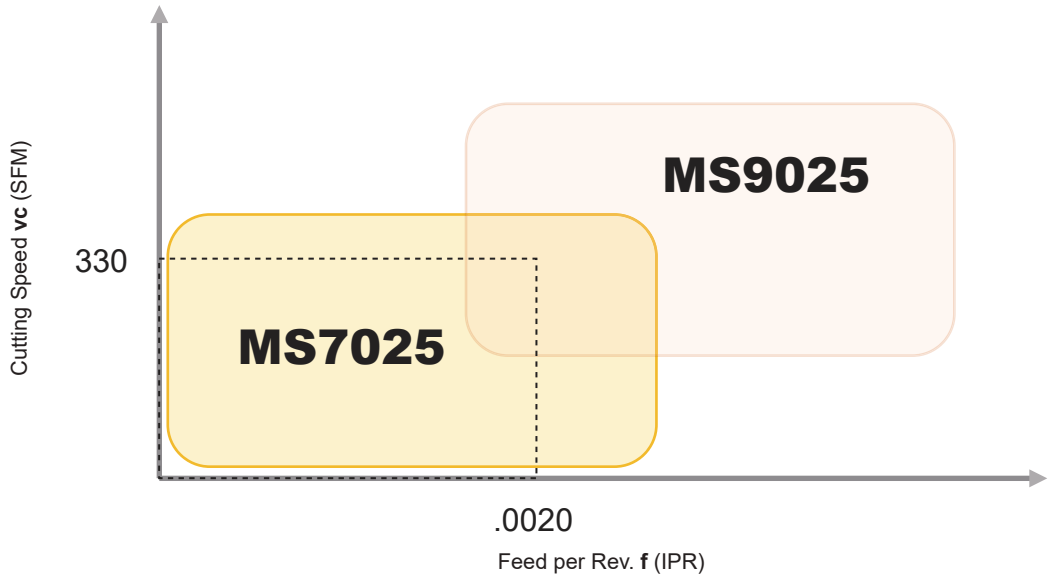
Application Range







Application range for Machining Stainless Steel



PVD Coated Grade for High Precision and Small Parts Machining

MS6015/MS7025/MS9025

Ideal Inserts for Turning Small Parts.

Set the corner radius to a minus tolerance.

Order Number

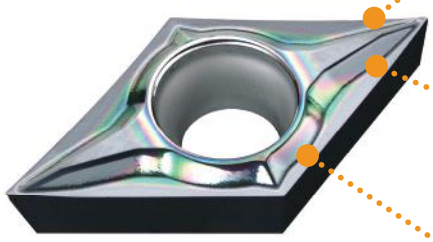
DCGT32.50.5 M R-SN → **50.5M R.008 inch (R.006-R.008 inch)**
DCGT32.51 M -SMG → **51M R.016 inch (R.014-R.016 inch)**

New Chipbreaker System for Front Turning

FS-P, LS-P

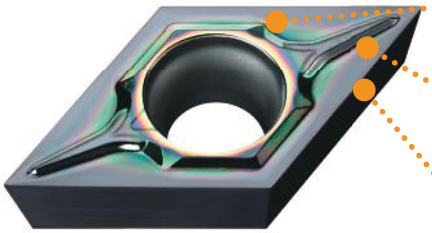
For Micro-Low Depth of Cut

FS-P



For Medium to High Depth of Cut

LS-P



Curved Cutting Edge

The curved cutting edge reduces cutting resistance and enables smooth chip evacuation. It also enables good initial entry to the workpiece and resists vibration and oscillation during machining.

High Chipbreaker Wall

The high chipbreaker wall ensures that the chips separate properly and prevents the workpiece from being damaged when chips are discharged.

Polishing (Mirror-Surface)

Welding resistance and chip evacuation are greatly improved.

Large Pocket

The large pocket enhances chip evacuation during high depths of cut and suppresses chip clogging.

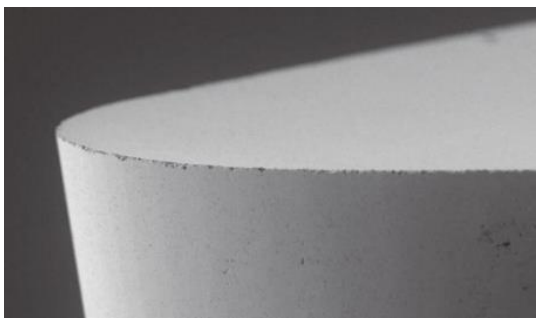
Parallel Cutting Edge

The parallel cutting edge greatly improves fracture resistance during high depths of cut.

Extremely High Quality Cutting Edge

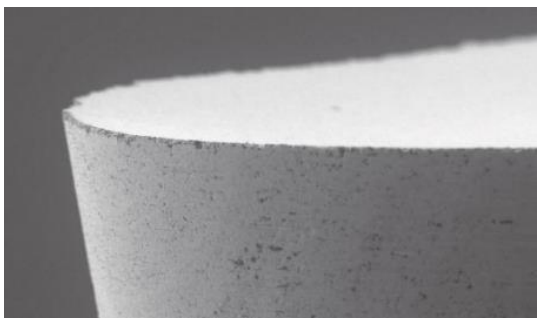
Technology that provides superior dimensional stability and reduces burrs.

MS9025



Rz=.006 µ-inch

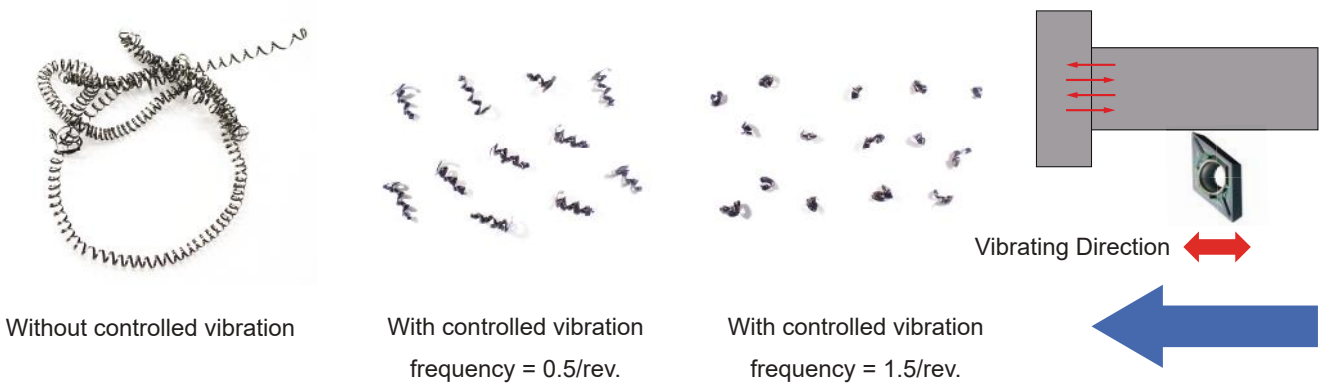
Conventional



Rz=.024 µ-inch

New Technology - Controlled Vibration of the Cutting Tool

Using new machine technology to deliberately vibrate the tool in relation to the cutting direction is an effective way of breaking chips.
This reduces production costs by reducing chip entanglement.



Without controlled vibration

With controlled vibration
frequency = 0.5/rev.

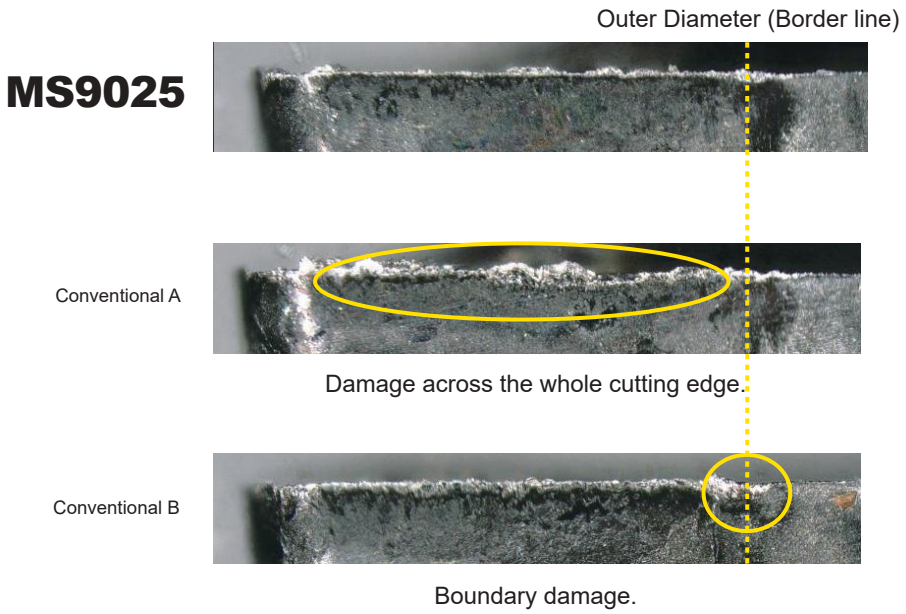
With controlled vibration
frequency = 1.5/rev.

Challenge of controlled vibration machining:
Compared to standard machining there is a greater chance of edge chipping due to the extra stress on the cutting edge and the impact of work hardening.

Benefits of using MS9025 for Controlled Vibration Machining

1. Excellent fracture resistance due to the inherent toughness of the base material.
2. Effectively suppresses boundary wear damage during machining of difficult-to-cut materials. This is achieved by the optimized cemented carbide grain size that reduces thermal conductivity and heating of the cutting edge.

After 500 passes at 49 feet per pass

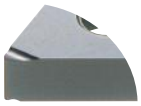
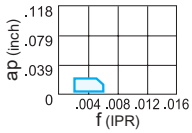
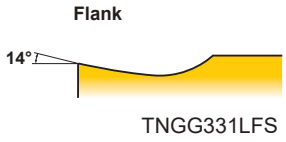


<Cutting Conditions>

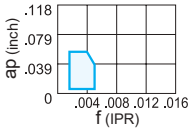
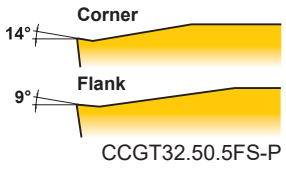
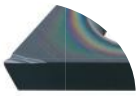
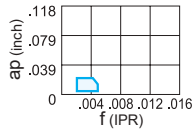
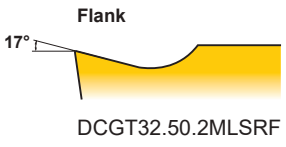
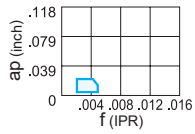
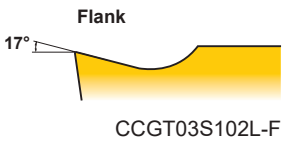
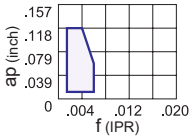
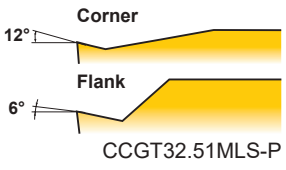
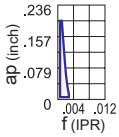
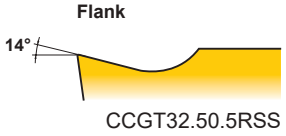
Material	: AISI 304
Inserts	: DCGT32.50.5M
Cutting Speed	: vc =330 SFM
Feed per Rev.	: fr=.0031 IPR
Depth of Cut	: ap =.039 inch
The Number of Vibration	: Mode 1
Cutting Mode	: External Continuous Cutting Wet Cutting (Oil)

Chipbreaker System

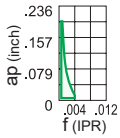
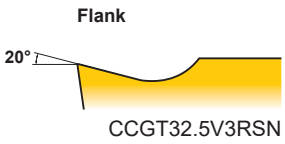
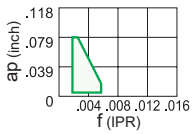
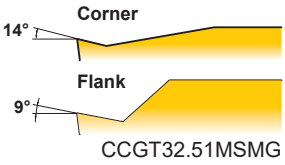
Negative Inserts

Application	Tolerance	Chipbreaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	G	**R/L-FS** 	**Precise finishing** Double-sided chipbreaker. A narrow angled chipbreaker for good control. The sharp edge produces a good surface finish.	Carbon Steel·Alloy Steel  

Positive Inserts

Application	Tolerance	Chipbreaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	G	**FS-P** 	**First recommendation for finishing titanium alloys** Ideal for Cobalt chromium alloy and Copper alloy. The sharp edge produces a good surface finish. The curved edge allows smooth chip discharge. Lapping of the top surface gives a mirror finish for improved welding resistance.	Titanium alloy  
	E G	**R/L-SRF** 	**Finish Cutting - Automatic Lathe Machining** Lead chipbreaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel·Alloy Steel  
	G	**R/L-F** 	**Chipbreaker for finishing** Lead chipbreaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel·Alloy Steel  
Light Cutting	G	**LS-P** 	**First recommendation for light cutting of titanium alloys** Ideal for titanium alloys and copper alloys. Parallel cutting edge. Achieves stable chip control in a wide range of areas from low to medium depth of cut. Lapping of the top surface gives a mirror finish for improved welding resistance.	Titanium alloy  
	G	**R/L-SS** 	**Chipbreaker for light cutting of automatic lathe machining** A parallel chipbreaker. Excellent chip control at low feed rates.	Carbon Steel·Alloy Steel  

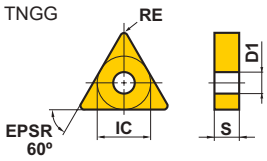
Positive Inserts

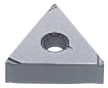
Application	Tolerance	Chipbreaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	G	**R/L-SN** 	**General purpose for swiss-type lathe machining** The parallel chipbreaker. Excellent chip control for low to medium feed rates.	Carbon Steel·Alloy Steel  
Medium Cutting	G	**SMG** 	**Medium cutting for swiss-type lathes machining** 3D molded chipbreaker provides good chip control. G class insert gives sharp cutting action, allowing high precision machining. Chipbreaker geometry appropriate for copying and back turning. M = minus radius tolerance	Carbon Steel·Alloy Steel  

MS6015/MS7025/MS9025

Negative Inserts (With Hole)

G Class



Finish		
R/L-FS		
		

(inch)

Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE	D1
TNGG330.5RFS	F	●			.375	.187	.008	.150
TNGG330.5LFS	F	●			.375	.187	.008	.150
TNGG331RFS	F	●			.375	.187	.016	.150
TNGG331LFS	F	●			.375	.187	.016	.150
TNGG332RFS	F	●			.375	.187	.031	.150
TNGG332LFS	F	●			.375	.187	.031	.150

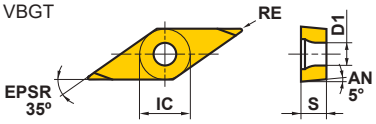
● : USA Stock ★ : Stocked in Japan
(10 inserts in one case)

5° Positive Inserts (With Hole)

G Class

Finish		
FS-P 		

VBGT



(inch)

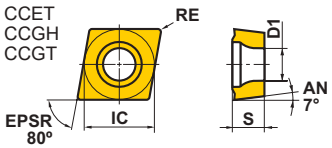
Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE	D1
VBGT220.2MFS-P	F			★	.250	.125	.004	.114
VBGT220.5MFS-P	F			●	.250	.125	.008	.114
VBGT221MFS-P	F			●	.250	.125	.016	.114
VBGT330.2MFS-P	F			●	.375	.187	.004	.173
VBGT330.5MFS-P	F			●	.375	.187	.008	.173
VBGT331MFS-P	F			●	.375	.187	.016	.173
VBGT332MFS-P	F			●	.375	.187	.031	.173

MS6015/MS7025/MS9025

7° Positive Inserts (With Hole)

E, G Class

Finish	Finish	Finish
FS-P	R/L-SRF	R/L-F
		



(inch)

Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE*2	D1
CCGT21.50.2MFS-P	F		●	●	.250	.094	.004	.110
CCGT21.50.5MFS-P	F		●	●	.250	.094	.008	.110
CCGT21.51MFS-P	F		●	●	.250	.094	.016	.110
CCGT32.50.2MFS-P	F		●	●	.375	.156	.004	.173
CCGT32.50.5MFS-P	F		●	●	.375	.156	.008	.173
CCGT32.51MFS-P	F		●	●	.375	.156	.016	.173
CCET21.50.2MRSRF	F			●	.250	.094	.004	.110
CCET21.50.2MLSRF	F			●	.250	.094	.004	.110
CCET21.50.5MRSRF	F			●	.250	.094	.008	.110
CCET21.50.5MLSRF	F			●	.250	.094	.008	.110
CCET21.51MRSRF	F			★	.250	.094	.016	.110
CCET21.51MLSRF	F			★	.250	.094	.016	.110
CCET32.50.2MRSRF	F			●	.375	.156	.004	.173
CCET32.50.2MLSRF	F			●	.375	.156	.004	.173
CCET32.50.5MRSRF	F			●	.375	.156	.008	.173
CCET32.50.5MLSRF	F			●	.375	.156	.008	.173
CCET32.51MRSRF	F			●	.375	.156	.016	.173
CCET32.51MLSRF	F			★	.375	.156	.016	.173
CCGT03S101MR-F	F	●			.141	.055	.004	.079
CCGT03S101ML-F	F	●			.141	.055	.004	.079
CCGT03S102MR-F	F	●			.141	.055	.008	.079
CCGT03S102ML-F	F	●			.141	.055	.008	.079
CCGT03S104MR-F	F	●			.141	.055	.016	.079
CCGT03S104ML-F	F	●			.141	.055	.016	.079
CCGT04T001MR-F	F	●			.172	.070	.004	.094
CCGT04T001ML-F	F	●			.172	.070	.004	.094
CCGT04T002MR-F	F	●			.172	.070	.008	.094
CCGT04T002ML-F	F	●			.172	.070	.008	.094
CCGT04T004MR-F	F	●			.172	.070	.016	.094
CCGT04T004ML-F	F	●			.172	.070	.016	.094
CCGH21.50.5MRF	F	●			.250	.094	.008	.110
CCGH21.50.5MLF	F	●			.250	.094	.008	.110
CCGH21.51MRF	F	●			.250	.094	.016	.110
CCGH21.51MLF	F	●			.250	.094	.016	.110

*1 Diameter of inscribed circle is non-ISO standard. (For SCLC type)

*2 Nominal Value (Max.)

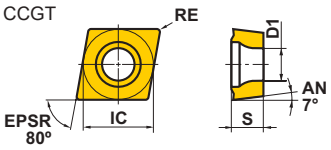
● = NEW

● : USA Stock ★ : Stocked in Japan
(10 inserts in one case)

7° Positive Inserts (With Hole)

G Class

Light	Light	Medium
LS-P	R/L-SS	R/L-SN
		
Medium		
SMG		
		



(inch)

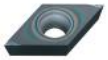
Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE*	D1
CCGT21.5V5MLS-P	L			★	.250	.094	.002	.110
CCGT21.50.2MLS-P	L	●	●	●	.250	.094	.004	.110
CCGT21.50.5MLS-P	L	●	●	●	.250	.094	.008	.110
CCGT21.51MLS-P	L		●	●	.250	.094	.016	.110
CCGT32.50.2MLS-P	L	●	●	●	.375	.156	.004	.173
CCGT32.50.5MLS-P	L	●	●	●	.375	.156	.008	.173
CCGT32.51MLS-P	L	●	●	●	.375	.156	.016	.173
CCGT21.50.2MRSS	L	●			.250	.094	.004	.110
CCGT21.50.2MLSS	L	●			.250	.094	.004	.110
CCGT21.50.5MRSS	L	●			.250	.094	.008	.110
CCGT21.50.5MLSS	L	●			.250	.094	.008	.110
CCGT32.50.2MRSS	L	●			.375	.156	.004	.173
CCGT32.50.2MLSS	L	●			.375	.156	.004	.173
CCGT32.50.5MRSS	L	●			.375	.156	.008	.173
CCGT32.50.5MLSS	L	●			.375	.156	.008	.173
CCGT32.51MRSS	L	●			.375	.156	.016	.173
CCGT32.51MLSS	L	●			.375	.156	.016	.173
CCGT21.50.2MRSN	M	●	●	●	.250	.094	.004	.110
CCGT21.50.2MLSN	M	●			.250	.094	.004	.110
CCGT21.50.5MRSN	M	●	●	●	.250	.094	.008	.110
CCGT21.50.5MLSN	M	●			.250	.094	.008	.110
CCGT32.50.2MRSN	M	●	●	●	.375	.156	.004	.173
CCGT32.50.2MLSN	M	●			.375	.156	.004	.173
CCGT32.50.5MRSN	M	●	●	●	.375	.156	.008	.173
CCGT32.50.5MLSN	M	●			.375	.156	.008	.173
CCGT32.51MRSN	M	●	●	●	.375	.156	.016	.173
CCGT32.51MLSN	M	●			.375	.156	.016	.173
CCGT21.50.2MSMG	M	●			.250	.094	.004	.110
CCGT21.50.5MSMG	M	●			.250	.094	.008	.110
CCGT21.51MSMG	M	●			.250	.094	.016	.110
CCGT32.50.2MSMG	M	●			.375	.156	.004	.173
CCGT32.50.5MSMG	M	●			.375	.156	.008	.173
CCGT32.51MSMG	M	●			.375	.156	.016	.173

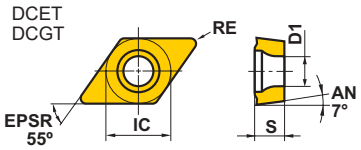
* Nominal Value (Max.)

MS6015/MS7025/MS9025

7° Positive Inserts (With Hole)

E, G Class

Finish	Finish	Light
FS-P	R/L-SRF	LS-P
		
Light		
R/L-SS		
		



(inch)

Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE*	D1
DCGT21.50.2MFS-P	F		●	●	.250	.094	.004	.110
DCGT21.50.5MFS-P	F		●	●	.250	.094	.008	.110
DCGT21.51MFS-P	F		●	●	.250	.094	.016	.110
DCGT32.50.2MFS-P	F		●	●	.375	.156	.004	.173
DCGT32.50.5MFS-P	F		●	●	.375	.156	.008	.173
DCGT32.51MFS-P	F		●	●	.375	.156	.016	.173
DCET21.50.2MRSRF	F			●	.250	.094	.004	.110
DCET21.50.2MLSRF	F			★	.250	.094	.004	.110
DCET21.50.5MRSRF	F			●	.250	.094	.008	.110
DCET21.50.5MLSRF	F			★	.250	.094	.008	.110
DCET21.51MRSRF	F			●	.250	.094	.016	.110
DCET21.51MLSRF	F			★	.250	.094	.016	.110
DCET32.50.2MLSRF	F			★	.375	.156	.004	.173
DCET32.50.5MLSRF	F			★	.375	.156	.008	.173
DCET32.51MLSRF	F			●	.375	.156	.016	.173
DCGT32.50.2MRSRF	F		●	●	.375	.156	.004	.173
DCGT32.50.5MRSRF	F		●	●	.375	.156	.008	.173
DCGT32.51MRSRF	F		●	●	.375	.156	.016	.173
DCGT21.5V5MLS-P	L			★	.250	.094	.002	.110
DCGT21.50.2MLS-P	L	●	●	●	.250	.094	.004	.110
DCGT21.50.5MLS-P	L	●	●	●	.250	.094	.008	.110
DCGT21.51MLS-P	L	●	●	●	.250	.094	.016	.110
DCGT32.50.2MLS-P	L	●	●	●	.375	.156	.004	.173
DCGT32.50.5MLS-P	L	●	●	●	.375	.156	.008	.173
DCGT32.51MLS-P	L	●	●	●	.375	.156	.016	.173
DCGT21.50.2MRSS	L	●			.250	.094	.004	.110
DCGT21.50.2MLSS	L	●			.250	.094	.004	.110
DCGT21.50.5MRSS	L	●			.250	.094	.008	.110
DCGT21.50.5MLSS	L	●			.250	.094	.008	.110
DCGT32.50.2MRSS	L	●			.375	.156	.004	.173
DCGT32.50.2MLSS	L	●			.375	.156	.004	.173
DCGT32.50.5MRSS	L	●			.375	.156	.008	.173
DCGT32.50.5MLSS	L	●			.375	.156	.008	.173
DCGT32.51MRSS	L	●			.375	.156	.016	.173
DCGT32.51MLSS	L	●			.375	.156	.016	.173

★ Nominal Value (Max.)

● = NEW

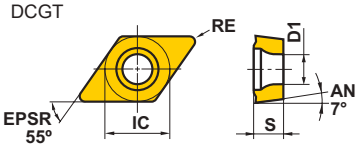
● : USA Stock ★ : Stocked in Japan
(10 inserts in one case)

7° Positive Inserts (With Hole)

G Class

Medium	Medium	
R/L-SN	SMG	
		

DCGT



(inch)

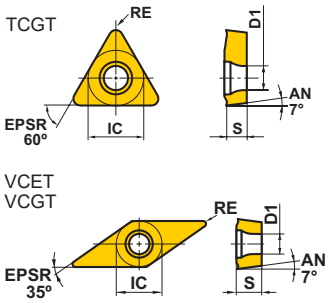
Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE*	D1
DCGT21.50.2MRSN	M	●	●	●	.250	.094	.004	.110
DCGT21.50.2MLSN	M	●	●	●	.250	.094	.004	.110
DCGT21.50.5MRSN	M	●	●	●	.250	.094	.008	.110
DCGT21.50.5MLSN	M	●	●	●	.250	.094	.008	.110
DCGT21.51MRSN	M		●	●	.250	.094	.016	.110
DCGT32.50.2MRSN	M	●	●	●	.375	.156	.004	.173
DCGT32.50.2MLSN	M	●	●	●	.375	.156	.004	.173
DCGT32.50.5MRSN	M	●	●	●	.375	.156	.008	.173
DCGT32.50.5MLSN	M	●	●	●	.375	.156	.008	.173
DCGT32.51MRSN	M	●	●	●	.375	.156	.016	.173
DCGT32.51MLSN	M	●	●	●	.375	.156	.016	.173
DCGT21.50.2MSMG	M	●			.250	.094	.004	.110
DCGT21.50.5MSMG	M	●			.250	.094	.008	.110
DCGT21.51MSMG	M	●			.250	.094	.016	.110
DCGT32.50.2MSMG	M	●			.375	.156	.004	.173
DCGT32.50.5MSMG	M	●			.375	.156	.008	.173
DCGT32.51MSMG	M	●			.375	.156	.016	.173

* Nominal Value (Max.)

MS6015/MS7025/MS9025

7° Positive Inserts (With Hole)

E, G Class



Finish	Finish	Finish
R/L-F	FS-P	R/L-SRF
		
Light		
LS-P		
		

(inch)

Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE*	D1
TCGT1.210.2MRF	F	●			.156	.063	.004	.091
TCGT1.210.2MLF	F	●			.156	.063	.004	.091
TCGT1.210.5MRF	F	●			.156	.063	.008	.091
TCGT1.210.5MLF	F	●			.156	.063	.008	.091
TCGT1.211MRF	F	●			.156	.063	.016	.091
TCGT1.211MLF	F	●			.156	.063	.016	.091
VCGT220.2MFS-P	F		●	★	.250	.125	.004	.110
VCGT220.5MFS-P	F		●	★	.250	.125	.008	.110
VCGT221MFS-P	F			★	.250	.125	.016	.110
VCET1.51.50.5MRSRF	F			★	.187	.094	.008	.094
VCET1.51.50.5MLSRF	F			★	.187	.094	.008	.094
VCET1.51.51MRSRF	F			★	.187	.094	.016	.094
VCET1.51.51MLSRF	F			★	.187	.094	.016	.094
VCET220.2MRSRF	F			★	.250	.125	.004	.110
VCET220.2MLSRF	F			★	.250	.125	.004	.110
VCET220.5MRSRF	F			●	.250	.125	.008	.110
VCET220.5MLSRF	F			★	.250	.125	.008	.110
VCET221MRSRF	F			★	.250	.125	.016	.110
VCET221MLSRF	F			★	.250	.125	.016	.110
VCGT220.2MLS-P	L		●	●	.250	.125	.004	.110
VCGT220.5MLS-P	L		●	●	.250	.125	.008	.110
VCGT221MLS-P	L		●	●	.250	.125	.016	.110
VCGT2.520.2MLS-P	L			★	.313	.125	.004	.134
VCGT2.520.5MLS-P	L			●	.313	.125	.008	.134
VCGT2.521MLS-P	L			●	.313	.125	.016	.134

* Nominal Value (Max.)

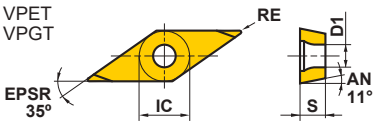
● = NEW

● : USA Stock ★ : Stocked in Japan
(10 inserts in one case)

11° Positive Inserts (With Hole)

E, G Class

Finish	Finish	
FS-P	R/L-SRF	
		



(inch)

Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE	D1
VPGT1.51.50.2MFS-P	F			★	.187	.094	.004∗1	.095
VPGT1.51.50.5MFS-P	F			★	.187	.094	.008∗1	.095
VPGT220.2MFS-P	F			●	.250	.125	.004∗1	.112
VPGT220.5MFS-P	F			●	.250	.125	.008∗1	.112
VPET22V3RSRF	F			★	.250	.125	.001∗2	.112
VPET22V3LSRF	F			★	.250	.125	.001∗2	.112
VPET1.51.50.2MRSRF	F			★	.187	.094	.004∗1	.095
VPET1.51.50.2MLSRF	F			★	.187	.094	.004∗1	.095
VPET1.51.50.5MRSRF	F			★	.187	.094	.008∗1	.095
VPET1.51.50.5MLSRF	F			★	.187	.094	.008∗1	.095
VPET220.2MRSRF	F			★	.250	.125	.004∗1	.112
VPET220.2MLSRF	F			★	.250	.125	.004∗1	.112
VPET220.5MRSRF	F			●	.250	.125	.008∗1	.112
VPET220.5MLSRF	F			★	.250	.125	.008∗1	.112

∗1 Nominal Value (Max.)
∗2 Nominal Value (Med.)

● = NEW

Recommended Cutting Conditions

(inch)

	Material	Properties	Cutting Area		Chipbreaker	Grade	Cutting Speed **vc** (SFM)	Feed per Rev. **f** (IPR)	Depth of Cut **ap**
P	Pure Iron Free Cutting Steel	—	●	F	R/L-FS	MS6015	490(165—655)	.0004—.0059	.004—.020
			●	F	R/L-F	MS6015	490(165—655)	.0004—.0059	.004—.020
			◐	L	LS-P	MS6015	490(165—655)	.0004—.0059	.012—.118
			◐	L	R/L-SS	MS6015	490(165—655)	.0004—.0059	.008—.039
			◐	M	R/L-SN	MS6015	490(165—655)	.0004—.0059	.004—.020
			◐	M	SMG	MS6015	490(165—655)	.0004—.0059	.004—.079
	Soft Magnetic Iron	—	●	F	R/L-FS	MS6015	655(490—820)	.0004—.0059	.004—.020
			●	F	FS-P	MS7025	655(330—985)	.0004—.0024	.008—.028
			●	F	R/L-F	MS6015	655(490—820)	.0004—.0059	.004—.020
			◐	F	R-SRF	MS7025	655(330—985)	.0004—.0024	.004—.020
			◐	L	LS-P	MS6015	655(490—820)	.0004—.0059	.004—.020
			◐	L	LS-P	MS7025	655(330—985)	.0004—.0024	.004—.020
			◐	L	R/L-SS	MS6015	655(490—820)	.0004—.0059	.008—.039
			◐	M	R/L-SN	MS6015	655(490—820)	.0004—.0059	.004—.020
			◐	M	R/L-SN	MS7025	655(330—985)	.0004—.0024	.004—.020
			◐	M	SMG	MS6015	655(490—820)	.0004—.0059	.004—.079
	Carbon Steel Alloy Steel	180—280HB	●	F	R/L-FS	MS6015	330(165—490)	.0004—.0059	.004—.020
			●	F	FS-P	MS7025	295(130—425)	.0004—.0024	.008—.028
			●	F	R/L-F	MS6015	330(165—490)	.0004—.0059	.004—.020
			◐	L	LS-P	MS6015	330(165—490)	.0004—.0059	.012—.118
			◐	L	LS-P	MS7025	295(130—425)	.0004—.0024	.012—.118
			◐	L	R/L-SS	MS6015	330(165—490)	.0004—.0059	.008—.039
			◐	M	R/L-SN	MS6015	330(165—490)	.0004—.0059	.004—.020
			◐	M	R/L-SN	MS7025	295(130—425)	.0004—.0024	.004—.020
			◐	M	SMG	MS6015	330(165—490)	.0004—.0059	.004—.079

(inch)

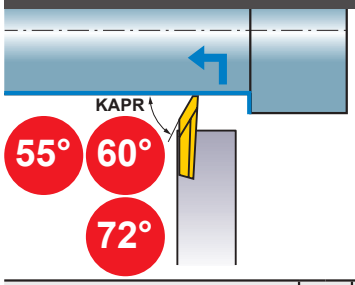
	Material	Properties	Cutting Area		Chipbreaker	Grade	Cutting Speed **vc** (SFM)	Feed per Rev. **f** (IPR)	Depth of Cut **ap**
M	Austenitic Stainless Steel	—	●	F	FS-P	MS7025	195(130—330)	.0004—.0031	.008—.028
			●	F	FS-P	MS9025	330(195—490)	.0016—.0059	.008—.028
			●	F	R-SRF	MS7025	195(130—330)	.0004—.0031	.004—.020
			◕	F	R/L-SRF	MS9025	330(195—490)	.0016—.0059	.004—.020
			◕	L	LS-P	MS7025	195(130—330)	.0004—.0031	.012—.118
			◕	L	LS-P	MS9025	330(195—490)	.0020—.0059	.012—.118
			◕	M	R-SN	MS7025	195(130—330)	.0004—.0031	.004—.197
			◕	M	R-SN	MS9025	330(195—490)	.0020—.0059	.004—.197
	Ferritic and Martensitic Stainless Steel	—	●	F	FS-P	MS7025	195(130—330)	.0004—.0031	.008—.028
			◕	F	R-SRF	MS7025	195(130—330)	.0004—.0031	.004—.020
			◕	L	LS-P	MS7025	195(130—330)	.0004—.0031	.012—.118
			◕	M	R/L-SN	MS7025	195(130—330)	.0004—.0031	.004—.197
	Electromagnetic Stainless Steel (SUS440C, SUS420J2 etc.)	Hardness 230HBW	●	F	FS-P	MS9025	330(165—590)	.0016—.0047	.008—.071
			●	F	FS-P	MS7025	260(130—525)	.0008—.0031	.008—.071
			◕	F	R/L-SRF	MS9025	330(165—590)	.0016—.0047	.004—.020
			◕	F	R-SRF	MS7025	260(130—525)	.0012—.0031	.004—.020
			◕	L	LS-P	MS9025	330(165—590)	.0016—.0059	.012—.118
			◕	L	LS-P	MS7025	260(130—525)	.0008—.0039	.012—.118
			◕	M	R-SN	MS9025	330(165—590)	.0004—.0039	.004—.197
			◕	M	R-SN	MS7025	260(130—525)	.0004—.0039	.004—.197
	Precipitation Hardening Stainless Steel (SUS630, SUS631 etc.)	<450HB	●	F	FS-P	MS7025	195(130—260)	.0004—.0039	.004—.055
			●	F	FS-P	MS9025	230(165—330)	.0012—.0059	.004—.055
			◕	F	R-SRF	MS7025	195(130—260)	.0004—.0039	.004—.020
			◕	F	R/L-SRF	MS9025	230(165—330)	.0012—.0059	.004—.020
			◕	L	LS-P	MS7025	195(130—260)	.0016—.0039	.008—.118
			◕	L	LS-P	MS9025	230(165—330)	.0016—.0059	.008—.118
			◕	M	R-SN	MS7025	195(130—260)	.0012—.0039	.012—.118
			◕	M	R-SN	MS9025	230(165—330)	.0016—.0059	.012—.118
S	Heat Resistant Alloys (SUH etc.)	—	●	F	FS-P	MS9025	260(130—460)	.0016—.0047	.008—.055
			◕	F	R/L-SRF	MS9025	260(130—460)	.0020—.0047	.004—.020
			◕	L	LS-P	MS9025	260(130—460)	.0016—.0059	.012—.118
			◕	M	R-SN	MS9025	260(130—460)	.0004—.0039	.004—.197

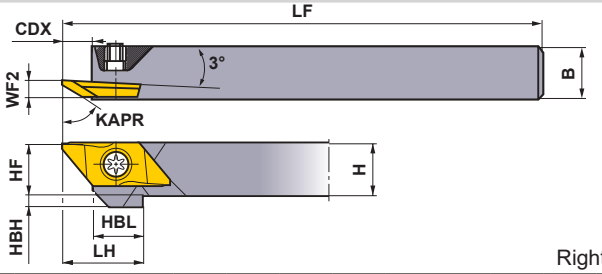
Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✤ : Unstable Cutting

BACK TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

BTAH





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)									*	
	R	L			H	B	LF	LH	HF	WF2	HBH	HBL	CDX	Clamp Screw	Wrench
BTAHR/L-062	●	●	BTAT	5528□□R/L-B	.375	.375	4.724	.591	.375	.138	.125	.374	.217	NS402W	NKY15S
BTAHR/L-082	●	●		6035□□R/L-B 605000RX	.500	.500	4.724	.591	.500	.138	—	.374	.217	NS403W	NKY15S
BTAHR/L-102	●			7235□□R-SMB	.625	.625	4.724	.591	.625	.138	—	.374	.217	NS403W	NKY15S

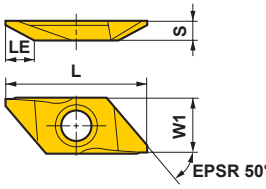
* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.

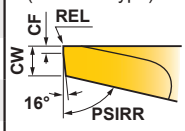
Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).

INSERTS

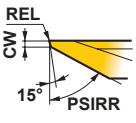
Order Number	Hand	Coated		Dimensions(inch)							LE* (inch)	Geometry
		VP15TF	MS6015	PSIRR/L*	REL	CF	L	W1	CW	S		
BTAT7235V5R-SMB	R	●		72°	.002	.012	.787	.315	.055	.098	.138	With Chipbreaker
BTAT723501MR-SMB	R	●		72°	.004*	.012	.787	.315	.055	.098	.138	
BTAT723502MR-SMB	R	●		72°	.008*	.012	.787	.315	.055	.098	.138	
BTAT552800R-B	R	●	●	55°	.000	.000	.787	.315	.020	.098	.110	
BTAT552800L-B	L	●		55°	.000	.000	.787	.315	.020	.098	.110	
BTAT552801R-B	R	●	●	55°	.004	.000	.787	.315	.020	.098	.110	
BTAT552801L-B	L	●		55°	.004	.000	.787	.315	.020	.098	.110	
BTAT603500R-B	R	●	●	60°	.000	.000	.787	.315	.020	.098	.138	
BTAT603500L-B	L	●		60°	.000	.000	.787	.315	.020	.098	.138	
BTAT603501MR-B	R		●	60°	.004*	.000	.787	.315	.020	.098	.138	
BTAT603501R-B	R	●	●	60°	.004	.000	.787	.315	.020	.098	.138	
BTAT603501L-B	L	●		60°	.004	.000	.787	.315	.020	.098	.138	
BTAT605000RX	R	●		60°	.000	.000	.787	.315	.049	.098	.197	Without Chipbreaker



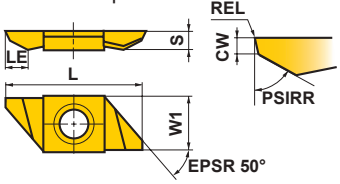
SMB Type (Pressed Type)



B Type (Ground Type)



Right hand insert shown.



* Numeric value set insert on holder.

* REL: Nominal Value (Max.)

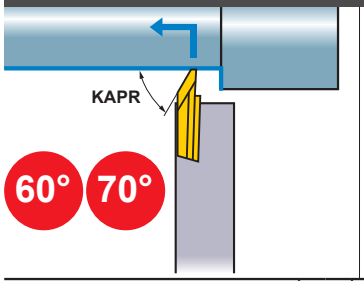
Note 1) REL, PSIRR dimensions for Right Hand Tool and RER, PSIRL dimensions for Left Hand Tool.

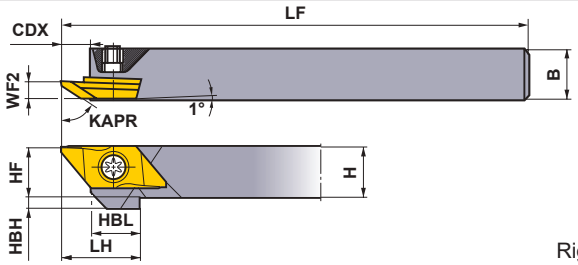
● : USA Stock

<5 inserts in one case>

INCH STANDARD

CTBH





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)									*	
	R	L			H	B	LF	LH	HF	WF2	HBH	HBL	CDX	Clamp Screw	Wrench
CTBHR/L-062	●	●	BTBT	60450○R/L-B	.375	.375	4.724	.768	.375	.133	.125	.472	.295	NS402W	NKY15S
CTBHR/L-082	●	●		606000R/L	.500	.500	4.724	.768	.500	.133	—	.472	.295	NS403W	NKY15S
CTBHR/L-102	●	●		7055○○R-SMB	.625	.625	4.724	.768	.625	.133	—	.472	.295	NS403W	NKY15S

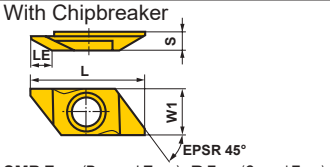
* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.

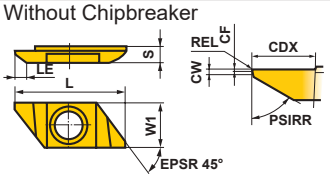
Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).

INSERTS

Order Number	Hand	Coated		Dimensions(inch)								LE*	Geometry
		VP15TF	MS6015	PSIRR/L*	REL	CF	L	W1	CW	S	CDX		
BTBT7055V5R-SMB	R	●		70°	.002	.012	.984	.370	.053	.138	.256	.217	With Chipbreaker
BTBT705501MR-SMB	R	●		70°	.004*	.012	.984	.370	.053	.138	.256	.217	
BTBT705502MR-SMB	R	●		70°	.008*	.012	.984	.370	.053	.138	.256	.217	
BTBT604500R-B	R	●	●	60°	.000	.008	.984	.370	.028	.138	.217	.177	
BTBT604500L-B	L	●		60°	.000	.008	.984	.370	.028	.138	.217	.177	
BTBT604501MR-B	R		●	60°	.004*	.012	.984	.370	.028	.138	.217	.177	
BTBT604501R-B	R	●	●	60°	.004	.012	.984	.370	.028	.138	.217	.177	
BTBT604501L-B	L	●		60°	.004	.012	.984	.370	.028	.138	.217	.177	
BTBT606000R	R	●		60°	.000	.008	.984	.370	.028	.138	.276	.236	Without Chipbreaker
BTBT606000L	L	●		60°	.000	.008	.984	.370	.028	.138	.276	.236	



Right hand insert shown.



Right hand insert shown.

* Numeric value set insert on holder.
* REL: Nominal Value (Max.)

Note 1) REL, PSIRR dimensions for Right Hand Tool and RER, PSIRL dimensions for Left Hand Tool.

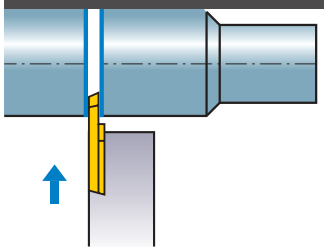
RECOMMENDED CUTTING CONDITIONS

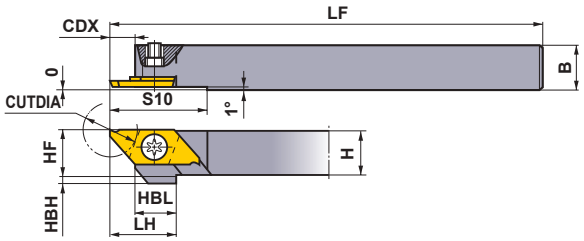
	Material	Properties	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	Hardness 180HB–280HB	**MS6015/VP15TF**	165–490	.0004–.006
	Free Cutting Steel	–	**MS6015**	100–590	.0004–.006
M	Stainless Steel	Hardness ≤200HB	**VP15TF**	165–395	.0008–.004
N	Non-Ferrous Metal	–	**MS6015**	230–755	.0012–.006

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

CTAH



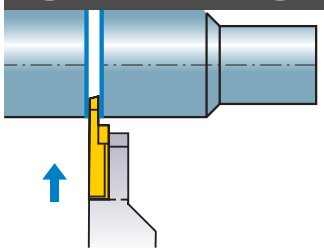


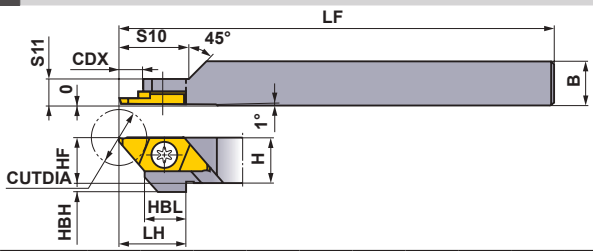
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)									CUTDIA (inch)	*2 Clamp Screw	Wrench
	R	L			H	B	HF	LF	LH	CDX	HBH	HBL	S10			
CTAHR/L-062	●	●	CTAT	○○○○	.375	.375	.375	4.724	.591	.217	.125	.374	.866	.472 (.315)*1	NS402W	NKY15S
CTAHR/L-082	●	●		○○○○	.500	.500	.500	4.724	.591	.217	—	.374	.866		NS402W	NKY15S
CTAHR/L-102	●	●		○○○○	.625	.625	.625	4.724	.591	.217	—	.374	.866		NS403W	NKY15S

*1 When the width of cutting off (CW) is .028 inch.
*2 Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

CTAH-S





Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (inch)										CUTDIA (inch)	*2 Clamp Screw	Wrench
	R			H	B	HF	LF	LH	CDX	HBH	HBL	S10	S11			
CTAHR-062S	●	CTAT	○○○○	.375	.375	.375	3.150	.591	.217	.125	.374	.630	.217	.472 (.315)*1	NS401	NKY25R
CTAHR-082S	●		○○○○	.500	.500	.500	3.150	.591	.217	—	.374	.630	.217		NS401	NKY25R

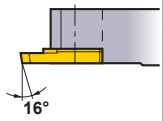
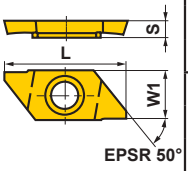
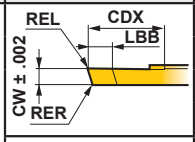
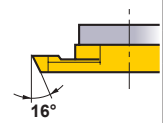
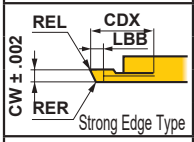
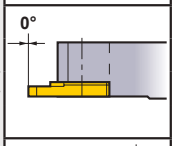
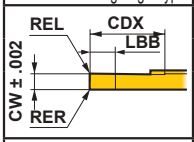
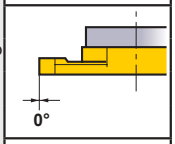
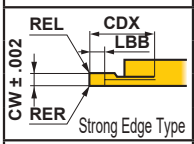
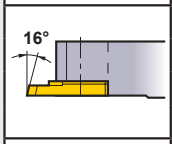
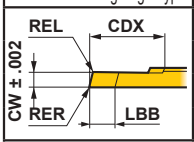
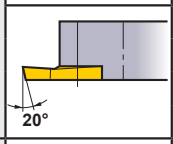
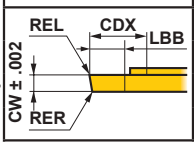
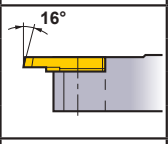
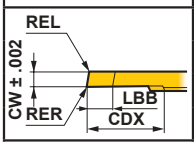
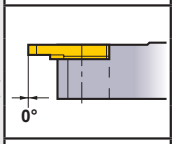
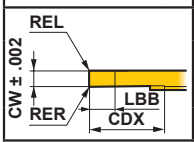
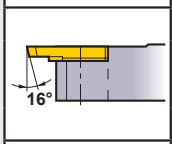
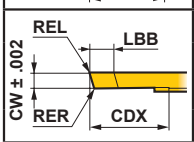
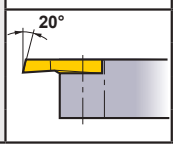
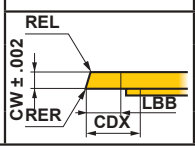
*1 When the width of cutting off (CW) is .028 inch.
*2 Clamp Torque (lbf-in) : NS401=31

RECOMMENDED CUTTING CONDITIONS

	Material	Properties	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	Hardness 180HB—280HB	**MS6015/VP15TF**	165—490	.0008—.0035
	Free Cutting Steel	—	**MS6015**	100—590	.0004—.0035
M	Stainless Steel	Hardness ≤200HB	**VP15TF**	165—395	.0008—.0019
N	Non-Ferrous Metal	—	**MS6015**	230—755	.0012—.0043

● : **USA Stock**
<5 inserts in one case>

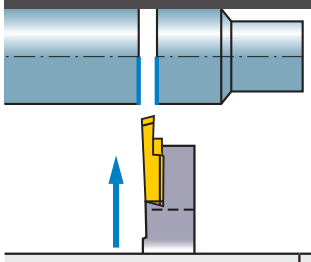
INSERTS

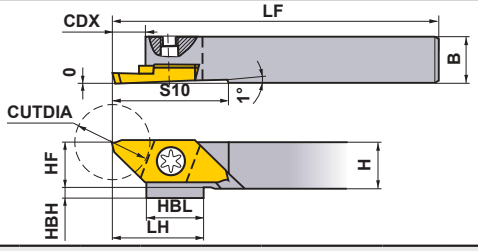
Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated		Dimensions (inch)							CUTDIA (inch)
							VP15TF	MS6015	CW	CDX	RER/L	L	W1	S	LBB	
Right Hand (R)		With Chipbreaker			CTAT07080V5RR-B	R	●		.028	.177	.002	.787	.315	.098	.059	.315
					CTAT10120V5RR-B	R	●	●	.039	.264	.002	.787	.315	.098	.059	.472
					CTAT15120V5RR-B	R	●	●	.059	.264	.002	.787	.315	.098	.059	.472
					CTAT20120V5RR-B	R	●	●	.079	.264	.002	.787	.315	.098	.059	.472
					CTAT15120V5RR-BX	R	●		.059	.264	.002	.787	.315	.098	.059	.472
					CTAT20120V5RR-BX	R	●		.079	.264	.002	.787	.315	.098	.059	.472
					CTAT10120V5RN-B	N	●	●	.039	.264	.002	.787	.315	.098	.059	.472
					CTAT15120V5RN-B	N	●	●	.059	.264	.002	.787	.315	.098	.059	.472
					CTAT20120V5RN-B	N	●	●	.079	.264	.002	.787	.315	.098	.059	.472
					CTAT15120V5RN-BX	N	●		.059	.264	.002	.787	.315	.098	.059	.472
					CTAT20120V5RN-BX	N	●		.079	.264	.002	.787	.315	.098	.059	.472
					CTAT10110V5RL-B	L	●		.039	.264	.002	.787	.315	.098	.059	.433
					CTAT15110V5RL-B	L	●		.059	.264	.002	.787	.315	.098	.059	.433
					CTAT20110V5RL-B	L	●		.079	.264	.002	.787	.315	.098	.059	.433
		Without			CTAT1012000RR	R	●	●	.039	.264	.000	.787	.315	.098	.138	.472
					CTAT1512000RR	R	●	●	.059	.264	.000	.787	.315	.098	.138	.472
					CTAT2012000RR	R	●	●	.079	.264	.000	.787	.315	.098	.138	.472
Left Hand (L)		With Chipbreaker			CTAT07080V5LL-B	L	●		.028	.177	.002	.787	.315	.098	.059	.315
					CTAT10120V5LL-B	L	●		.039	.264	.002	.787	.315	.098	.059	.472
					CTAT15120V5LL-B	L	●		.059	.264	.002	.787	.315	.098	.059	.472
					CTAT20120V5LL-B	L	●		.079	.264	.002	.787	.315	.098	.059	.472
					CTAT10120V5LN-B	N	●	●	.039	.264	.002	.787	.315	.098	.059	.472
					CTAT15120V5LN-B	N	●	●	.059	.264	.002	.787	.315	.098	.059	.472
					CTAT20120V5LN-B	N	●	●	.079	.264	.002	.787	.315	.098	.059	.472
					CTAT10110V5LR-B	R	●	●	.039	.264	.002	.787	.315	.098	.059	.433
					CTAT15110V5LR-B	R	●	●	.059	.264	.002	.787	.315	.098	.059	.433
					CTAT20110V5LR-B	R	●	●	.079	.264	.002	.787	.315	.098	.059	.433
		Without	Right hand insert shown.		CTAT1012000LL	L	●		.039	.264	.000	.787	.315	.098	.138	.472
					CTAT1512000LL	L	●		.059	.264	.000	.787	.315	.098	.138	.472
					CTAT2012000LL	L	●		.079	.264	.000	.787	.315	.098	.138	.472

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

CTBH



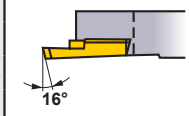
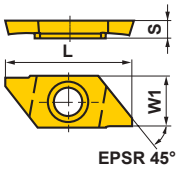
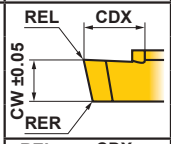
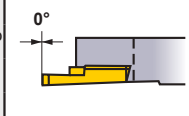
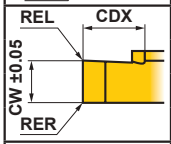
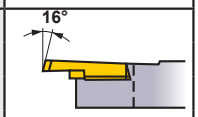
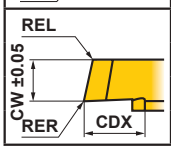
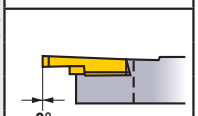
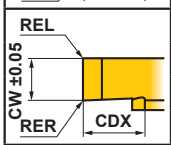
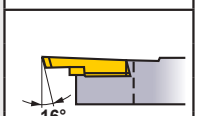
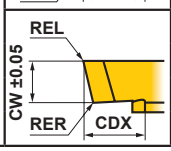


Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	HF	LF	LH	CDX	HBH	HBL	S10	CUTDIA (mm)	* Clamp Screw	Wrench
CTBHR/L1010-160	●	●	CTBT	○○○○	10	10	10	120	19.5	7.5	2	9.5	25	16	NS402W	NKY15S
CTBHR/L1212-160	●	●		○○○○	12	12	12	120	19.5	7.5	—	9.5	25	16	NS403W	NKY15S
CTBHR/L1616-160	●	●		○○○○	16	16	16	120	19.5	7.5	—	9.5	25	16	NS403W	NKY15S

* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

INSERTS

Holder	Setting Geometry	Chipbreaker	Geometry	Insert Geometry	Order Number	Hand	Coated VP15TF	Coated MS6015	Dimensions (mm) CW	CDX	RER/L	L	W1	S	CUTDIA (mm)
Right Hand (R)		With Chipbreaker			**CTBT15160V5RR-B**	R	●	●	1.5	9.2	0.05	25	9.4	3.5	16
					CTBT20160V5RR-B	R	●	●	2.0	9.2	0.05	25	9.4	3.5	16
					**CTBT20160V5RN-B**	N	●	●	2.0	9.2	0.05	25	9.4	3.5	16
Left Hand (L)					**CTBT20160V5LL-B**	L	●		2.0	9.2	0.05	25	9.4	3.5	16
					**CTBT20160V5LN-B**	N	●	●	2.0	9.2	0.05	25	9.4	3.5	16
			Right hand insert shown.		**CTBT20145V5LR-B**	R	●	●	2.0	9.2	0.05	25	9.4	3.5	14.5

RECOMMENDED CUTTING CONDITIONS

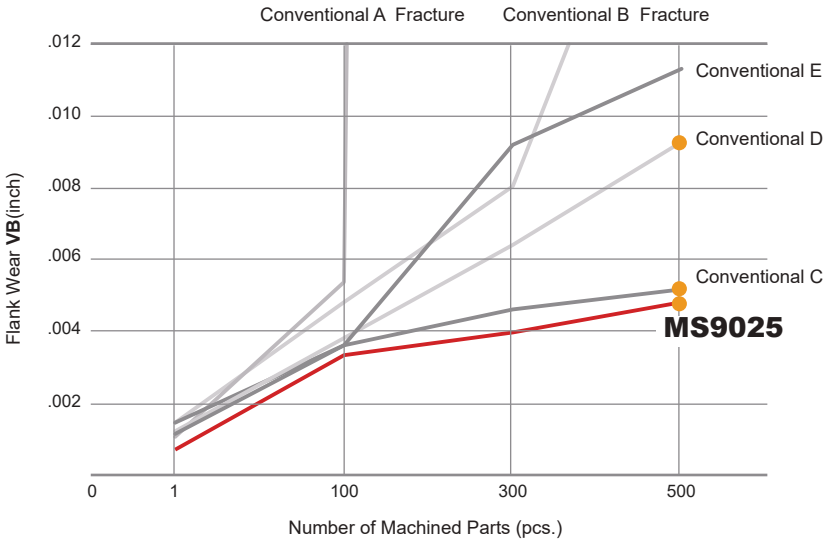
	Material	Properties	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	Hardness 180HB—280HB	**MS6015/VP15TF**	165—490	.0008 —.0035
	Free Cutting Steel	—	**MS6015**	100—590	.0004 —.0035
M	Stainless Steel	Hardness ≤200HB	**VP15TF**	165—395	.0008 —.0019
N	Non-Ferrous Metal	—	**MS6015**	230—755	.0012 —.0043

● : USA Stock

<5 inserts in one case>

Cutting Performance

Stainless Steel AISI 440C, Wear Resistance Comparison



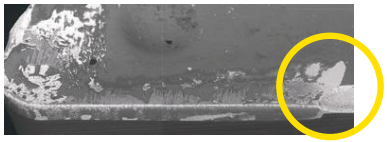
<Cutting Conditions>

Material	: AISI 440C
Inserts	: DCGT32.50.5
Machining Methods	: External Continuous Cutting
Cutting Speed	: vc =330 SFM
Feed per Rev.	: fr=.0031 IPR
Depth of Cut	: ap =.039 inch
Cutting Mode	: Wet Cutting (Oil)

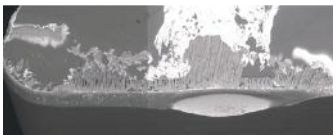
Taken after machining 500 Parts



MS9025

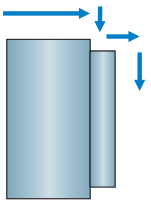
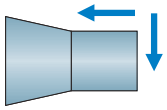
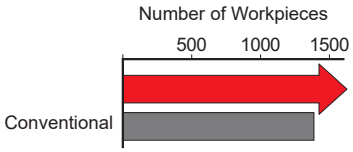


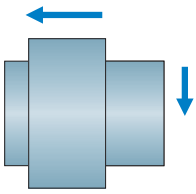
Conventional C : Flaking



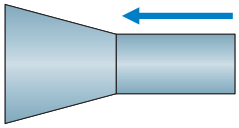
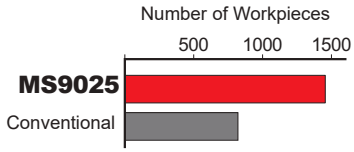
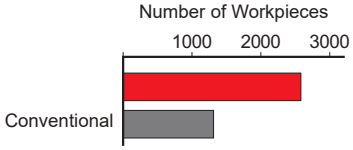
Conventional D : Base material exposure

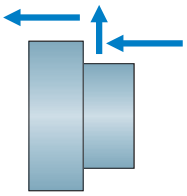
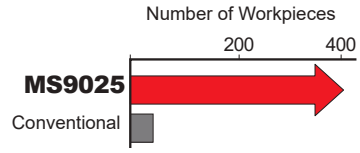
Application Examples

Insert		DCGT21.50.5MFS-P (MS7025)	DCGT32.50.5MFS-P (MS7025)
Workpiece		AISI 440C 	AISI 430F 
Component		Valve	Shaft Parts
Application		External and Face Turning	External and Face Turning
Cutting Conditions	Cutting Speed **vc** (SFM)	190	425
	Feed per Rev. **f** (IPR)	.0016	.0012
	Depth of Cut **ap** (inch)	.006	.022
Cutting Mode		Wet Cutting (Oil)	Wet Cutting (Oil)
Results		 Compared to conventional products, the dimensional accuracy is stable and high machining quality is maintained.	Chip control has been improved and the quality of the machined surface is also good.

Insert		DCGT32.50.5MFS-P (MS7025)
Workpiece		AISI 430 
Component		Machine Parts
Application		External and Face Turning
Cutting Conditions	Cutting Speed **vc** (SFM)	330
	Feed per Rev. **f** (IPR)	.0024
	Depth of Cut **ap** (inch)	.010
Cutting Mode		Wet Cutting (Oil)
Results		By suppressing chip welding, cutting edge damage is reduced and the surface quality can be improved.

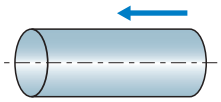
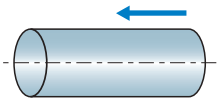
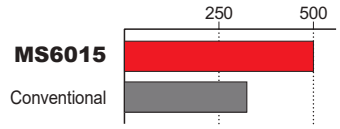
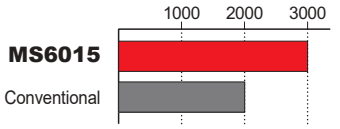
The application examples are from customers workpieces and can therefore differ from the recommended cutting conditions.

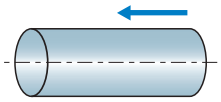
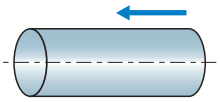
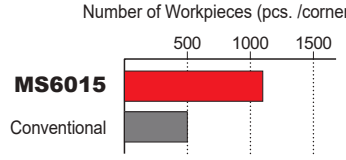
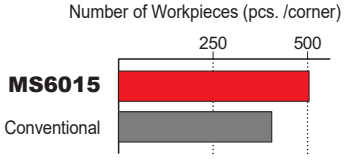
Insert		DCGT32.50.5MLS-P (MS9025)	DCGT21.50.2MFS-P (MS9025)
Workpiece		AISI 420 Stainless Steel 	AISI 440C Electromagnetic Stainless Steel 
Component		Solenoid Parts	Brake Parts
Application		External Continuous Turning	External Continuous Turning
Cutting Conditions	Cutting Speed **vc** (SFM)	385	125
	Feed per Rev. **f** (IPR)	.0039	.0020
	Depth of Cut **ap** (inch)	.008	.008
Cutting Mode		Wet Cutting (Oil)	Wet Cutting (Oil)
Results		 Improved wear resistance and tool life increased by a factor of 1.7.	 Improved welding resistance and double tool life when compared to a conventional tool.

Insert		DCGT32.51MLS-P (MS9025)
Workpiece		JIS SUH3 Heat Resistant Alloy 
Component		Valve
Application		External and Face Continuous Turning
Cutting Conditions	Cutting Speed **vc** (SFM)	260
	Feed per Rev. **f** (IPR)	.0047-.0059
	Depth of Cut **ap** (inch)	.012-.020
Cutting Mode		Wet Cutting (Oil)
Results		 Conventional products tend to deteriorate more during machining whilst MS9025 provides stability with 5 times longer tool life.

The application examples are from customers workpieces and can therefore differ from the recommended cutting conditions.

Application Examples

Insert (Grade)		DCGT32.50.5MSMG (MS6015)	DCGT32.50.2MRSN (MS6015)
Workpiece		Iron-based Soft Magnetic Material (ELCH2) 	Free Cutting Steel (AISI 12L14) 
Cutting Conditions	Cutting Speed **vc** (SFM)	645 (4500min^{-1})	410 (5000min^{-1})
	Feed per Rev. **f** (IPR)	.004	.002
	Depth of Cut **ap** (inch)	.004	.012
Cutting Mode		Wet Cutting (Water-insoluble)	Wet Cutting (Water-insoluble)
Machine		Swiss-Type Lathes	Swiss-Type Lathes
Results		Number of Workpieces (pcs. /corner)  An excellent finished surface and 1.4 times longer life compared with conventional products. Stable SMG breaker and chip discharge management.	Number of Workpieces (pcs. /corner)  MS6015 has minimal welding and maintains secure dimensional accuracy.

Insert (Grade)		DCGT32.50.5MRSN (MS6015)	DCGT32.50.5MSMG (MS6015)
Workpiece		Carbon Steel (AISI 1045) 	Mild Steel (AISI 1015) 
Cutting Conditions	Cutting Speed **vc** (SFM)	370 (3000min^{-1})	330 (1300min^{-1})
	Feed per Rev. **f** (IPR)	.001	.005
	Depth of Cut **ap** (inch)	.039	.051
Cutting Mode		Wet Cutting (Water-insoluble)	Wet Cutting (Water-insoluble)
Machine		Swiss-Type Lathes	Swiss-Type Lathes
Results		Number of Workpieces (pcs. /corner)  MS6015 has superior wear resistance and achieves double tool life when compared with conventional products.	Number of Workpieces (pcs. /corner)  MS6015 has superior welding resistance and achieves 1.3 times longer tool life compared with conventional products.

The application examples are from customers workpieces and can therefore differ from the recommended cutting conditions.

Memo

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FOR YOUR SAFETY

- Don't handle inserts and chips without gloves.
- Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage.
- Please use safety covers and wear safety glasses.
- When using compounded cutting oils, please take fire precautions.
- When attaching inserts or spare parts, please use only the correct wrench or driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

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Tools specifications subject to change without notice.

B275A-US-2024.10