DIA EDGE

TOOL NEWS

2023.8 Update
B275G

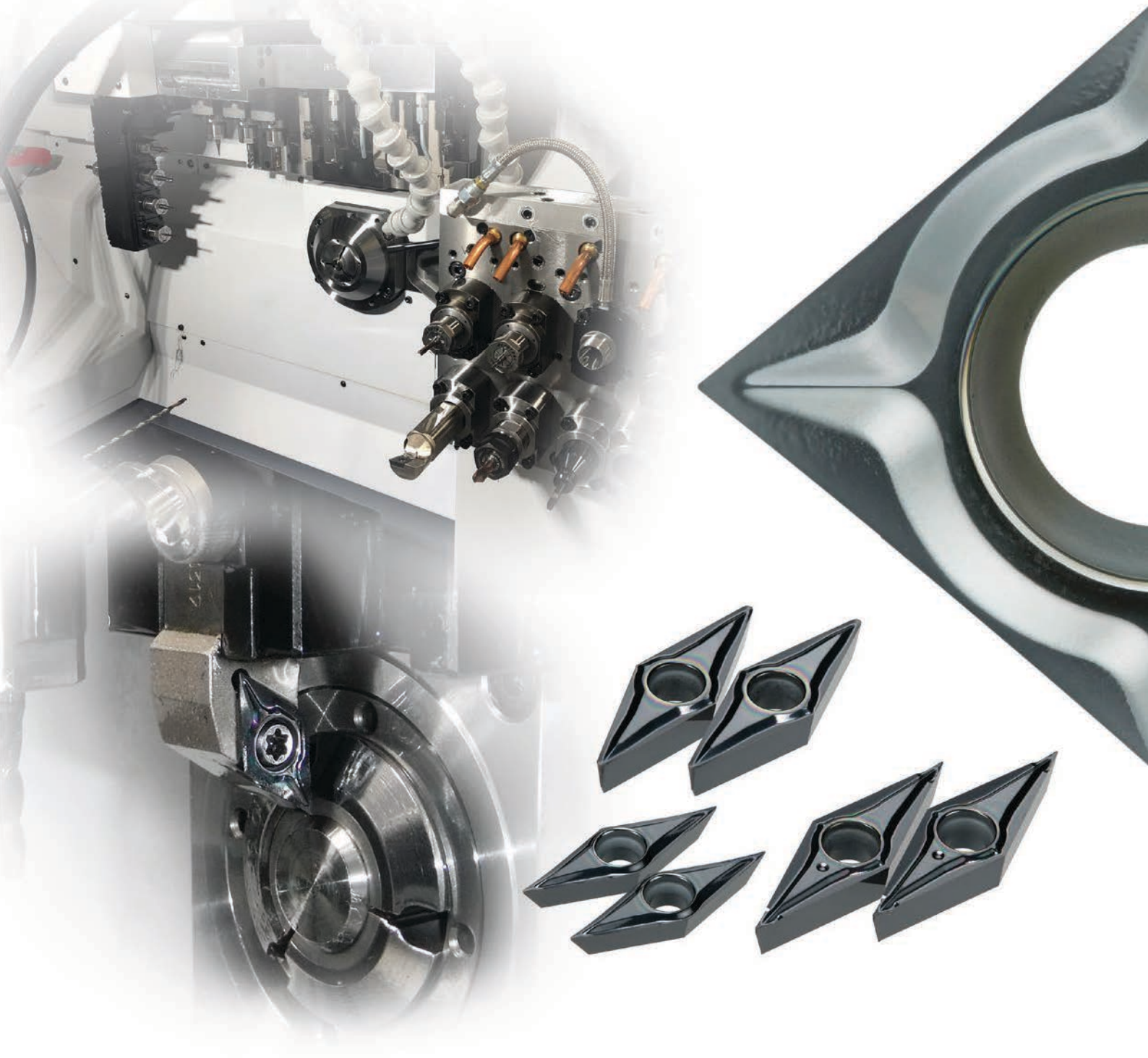
MS Series - PVD Coated Grades for High Precision and Small Parts Machining

MS6015/MS7025/MS9025

Environmentally Friendly Product

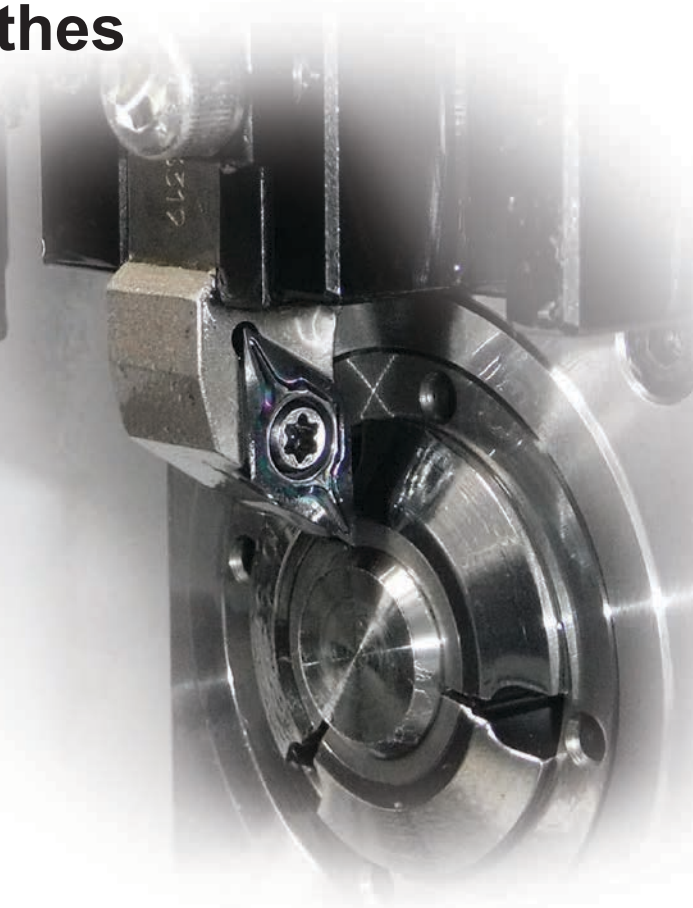
Item Expansion

Contemporary Machining of High Precision Small Parts



MITSUBISHI MATERIALS CORPORATION

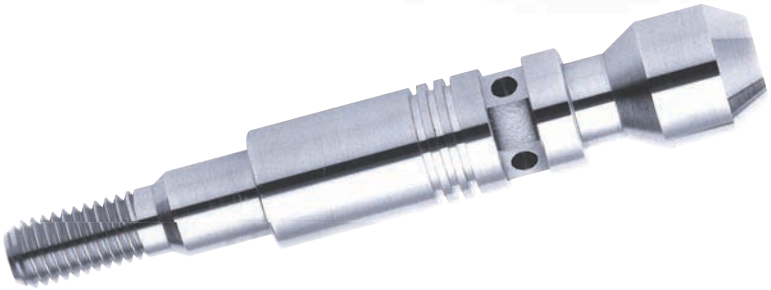
Transformation of Machining on Swiss-Type Automatic Lathes



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 commercialisation 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
- Optimisation 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

NEW

2022-017 JTA ECO PRODUCT (一社) 日本機械工具工業会 (JTA) 環境調和製品

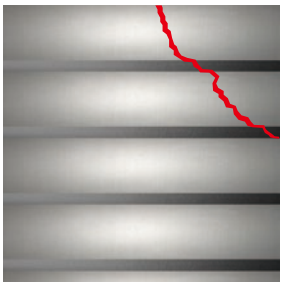
Please refer to the last page for more information on certified environmentally friendly products.

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

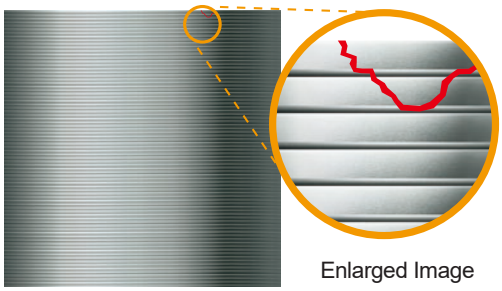
Features

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

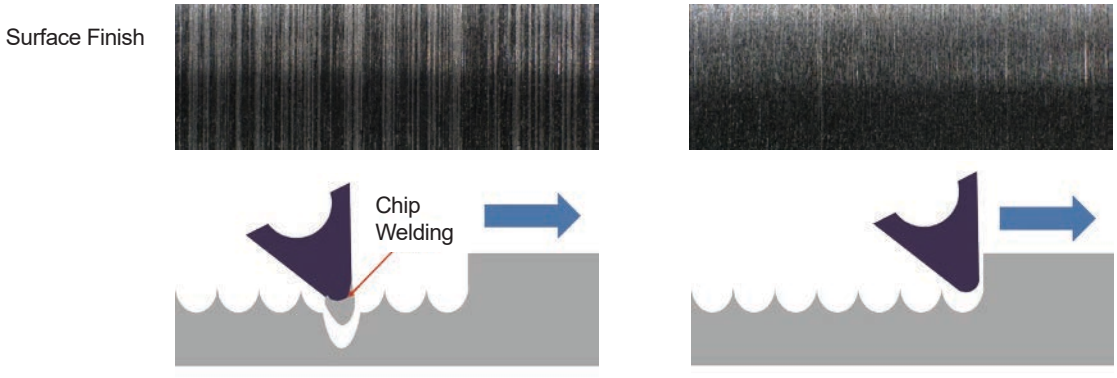


Enlarged Image

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

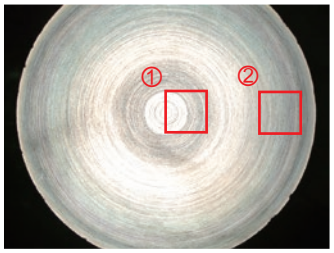
MS7025

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.

Workpiece Material : JIS S45C



MS7025

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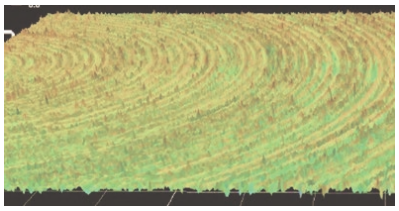

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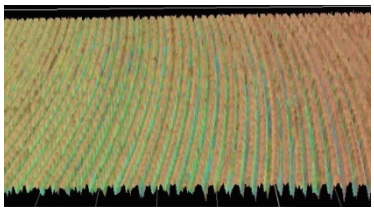
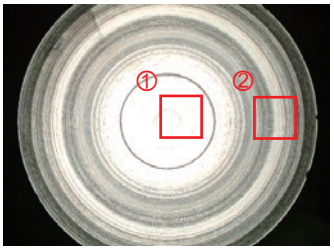
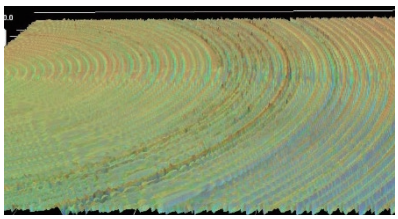
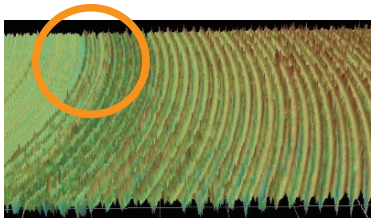


Good Surface Finish



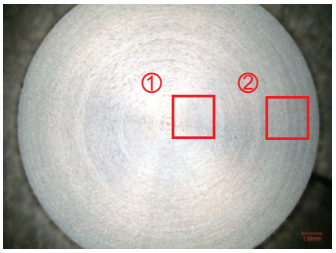
Conventional





Changes in surface quality caused by machining marks

Workpiece Material : JIS SUS304



MS7025

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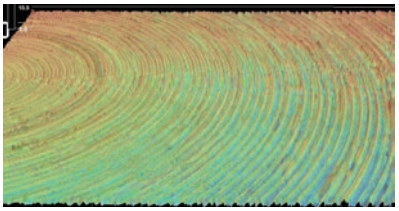

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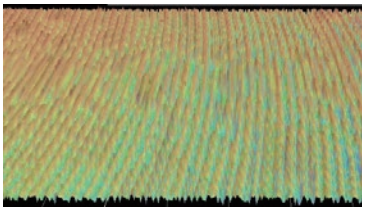
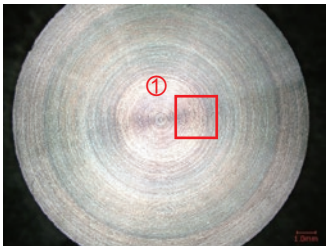
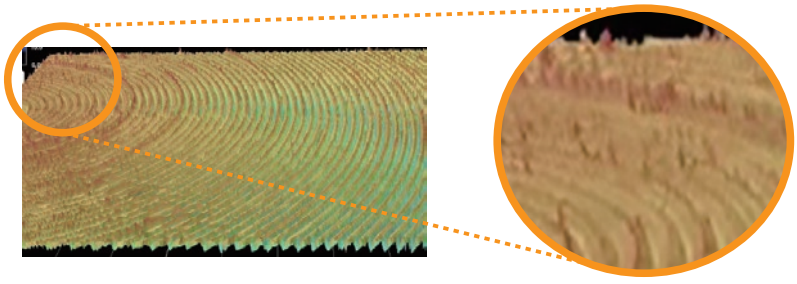


Good Surface Finish

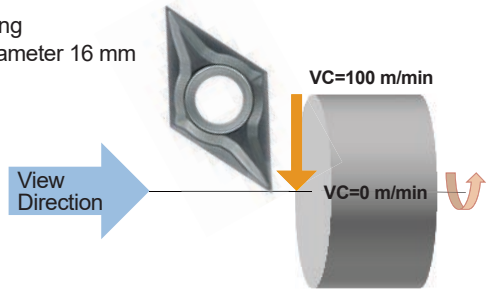


Conventional



Rougness can occur in the low speed area (near the centre)

Image of Facing
Workpiece Diameter 16 mm



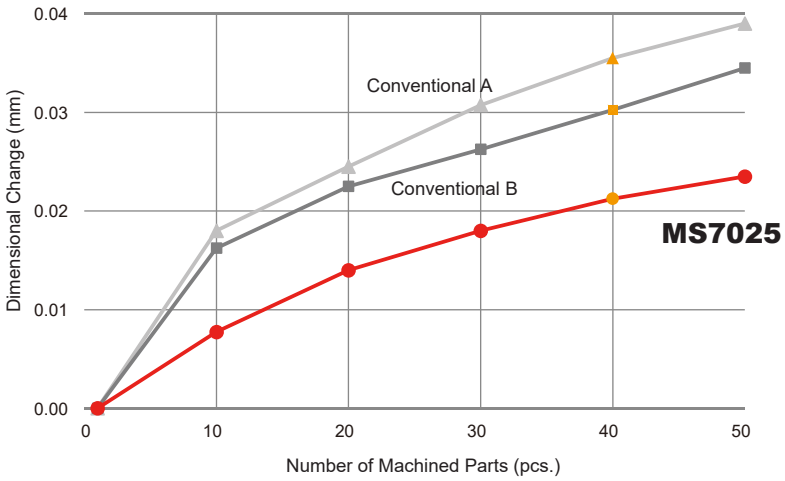
<Cutting Conditions>

Workpiece Material	: Notation Above
Inserts	: DCGT11T302
Cutting Speed	: vc = Max. 100 m/min
Feed per Rev.	: f =0.02 mm/rev
Depth of Cut	: ap = 0.2 mm
Cutting Mode	: Wet Cutting (Oil)

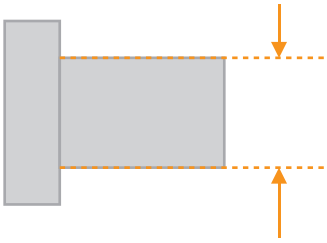
Comparison of Dimensional Change in Low Feed Machining

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

Workpiece Material : JIS SUS440C



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



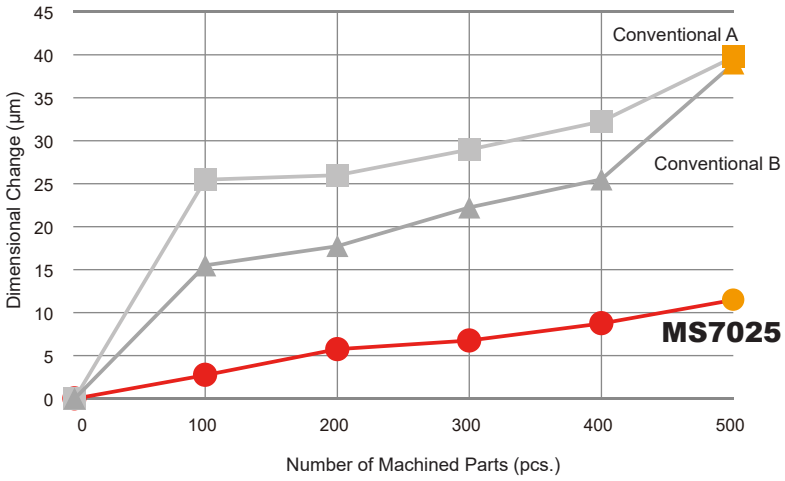
<Cutting Conditions>

Workpiece Material	: JIS SUS440C
Inserts	: DCGT11T301
Cutting Speed	: vc = 70 m/min
Feed per Rev.	: f =0.02 mm/rev
Depth of Cut	: ap = 1.5 mm
Cutting Mode	: Wet Cutting (Oil)

After 40 piece machining

MS7025 Conventional A Conventional B

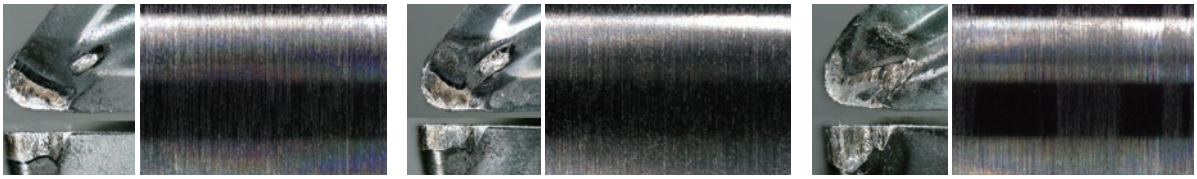
Workpiece Material : ELCH2S



<Cutting Conditions>

Workpiece Material	: ELCH2S
Inserts	: DCGT11T302
Cutting Speed	: vc = 240 m/min
Feed per Rev.	: f =0.03 mm/rev
Depth of Cut	: ap = 0.3 mm
Workpiece Material Length	: 15 mm
Cutting Mode	: Wet Cutting (Oil)

After 500 piece machining



MS7025 Conventional A Conventional B

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

MS9025

Please refer to the last page for more information on certified environmentally friendly products.

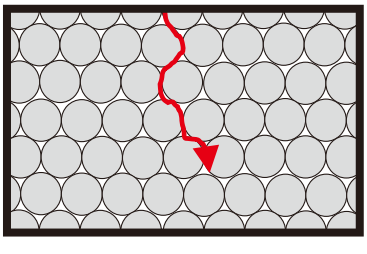
Effective reduction of notch wear with a balance of wear and fracture resistance.

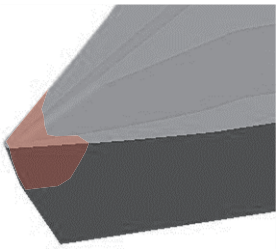
Features

Improved Cemented Carbide

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

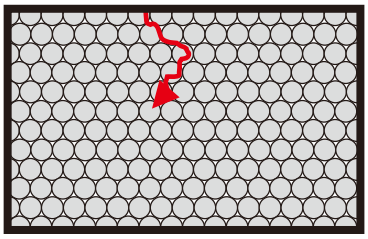
MS9025

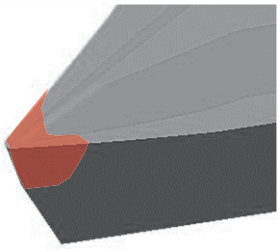




Reducing the cutting edge temperature by improved thermal conductivity.

Conventional





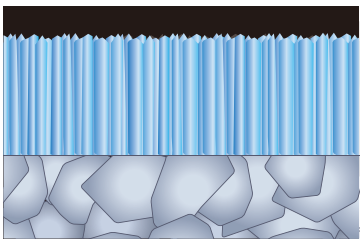
Higher cutting edge temperatures due to more particle boundary contact.

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

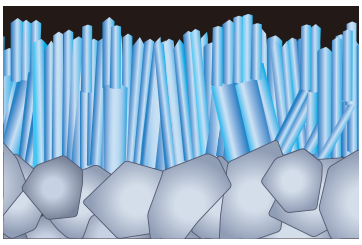
MS9025



Smooth Cemented Carbide

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

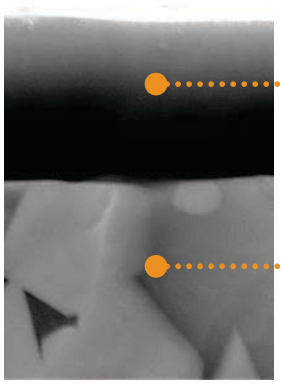
Conventional



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

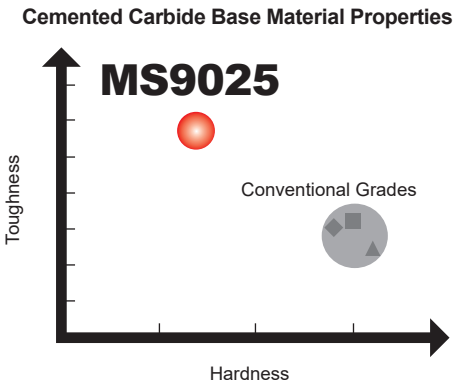


Al-rich (Al,Ti)N

Superior Flank Wear Resistance
Superior Crater Wear Resistance
Excellent Welding Resistance

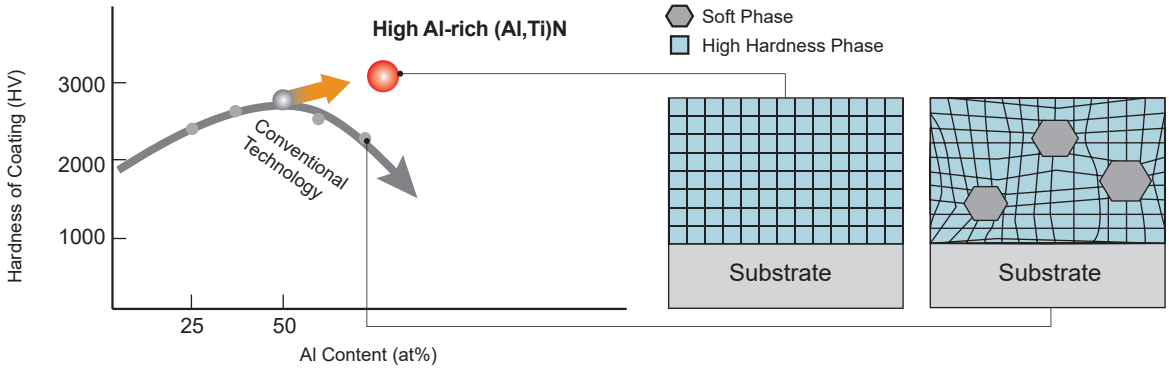
Special Cemented Carbide for MS9025

Superior Fracture Resistance
Excellent Chipping Resistance



High Al and Conventional Coating Comparison

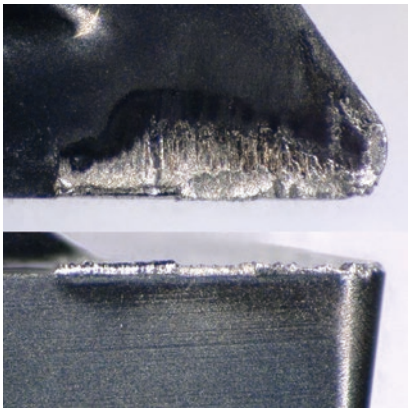
The high Al-rich (Al,Ti)N single layer coating provides stabilization of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.



Stainless Steel SUS304, Cutting Edge Comparison

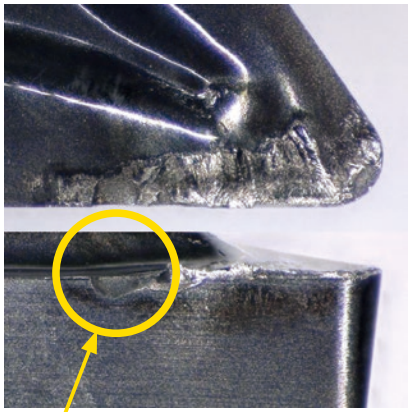
After machining 500 parts

MS9025



VB=0.03mm

Conventional



Notch Wear

VB=0.07mm

<Cutting Conditions>

Workpiece Material	: JIS SUS304
Inserts	: DCGT11T302
Machining Methods	: External Continuous Cutting
Cutting Speed	: vc = 57 m/min
Feed per Rev.	: f =0.03 mm/rev
Depth of Cut	: Rough ap = 0.05 mm Finish ap = 0.02 mm
Cutting Mode	: Wet Cutting (Oil)

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

MS6015

Please refer to the last page for more information on certified environmentally friendly products.

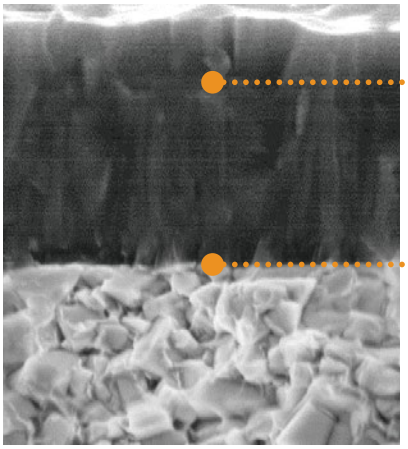
Ideal for turning pure iron, carbon and free cutting steels whilst also providing excellent dimensional accuracy and good surface finishes.

Features

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

	MS6015	Conventional
Coating	TiCN Multi-layer	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 Multi-layer Coating



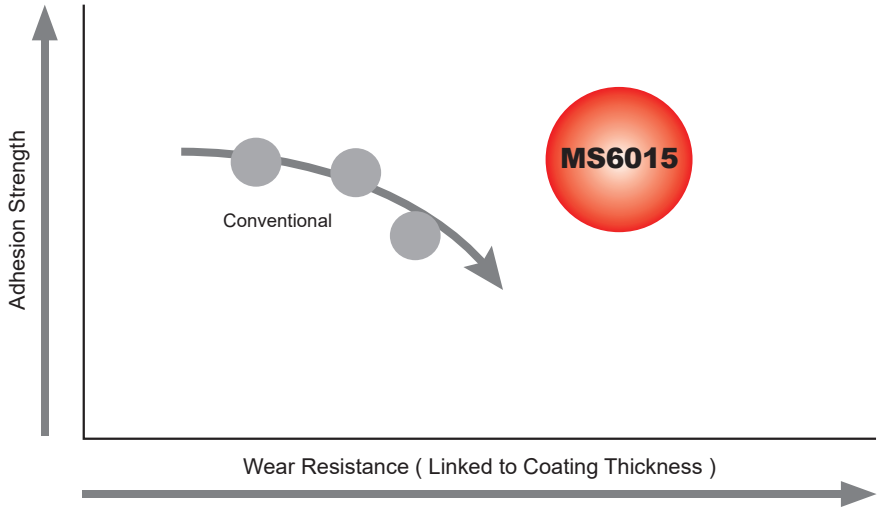
Demonstrates superior wear and welding resistance and provides the best possible results for carbon steel.

Micro multi-layers remarkably improve adhesion between the coating layers.

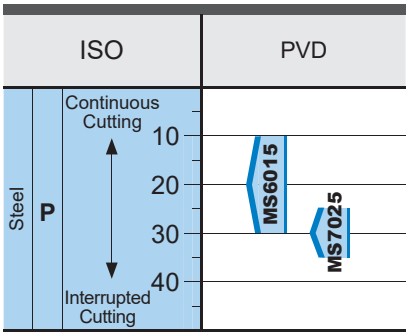
Excellent chip discharge with a reduced coefficient of friction creates a stable component surface finish.

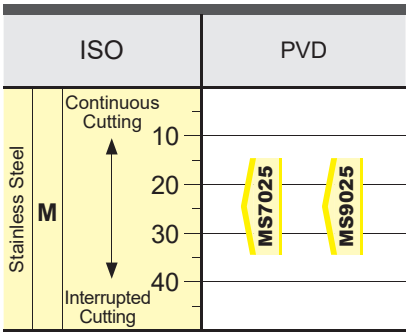
Optimising the Laminated Structure

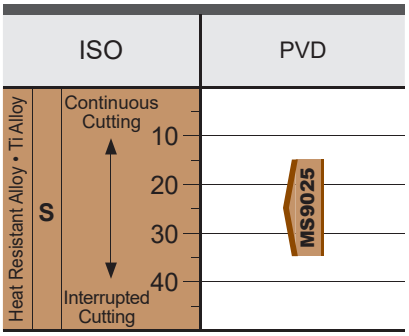
Optimising the laminated structure enables the thickening of coating which leads to significant improvement of wear resistance.



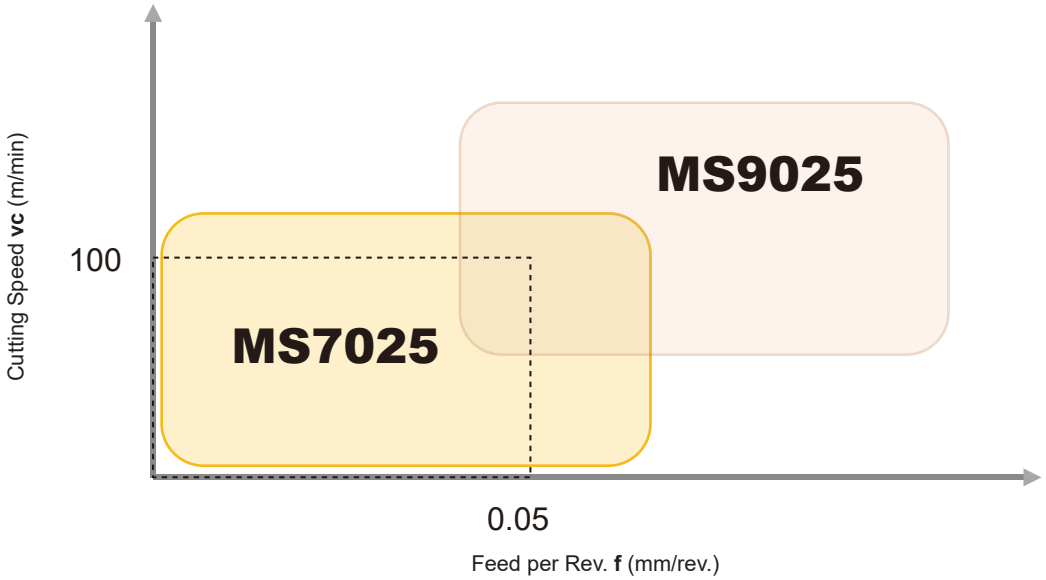
Application Range







Correct Use for Cutting 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

DCGT11T302 M R-SN
DCGT11T304 M -SMG

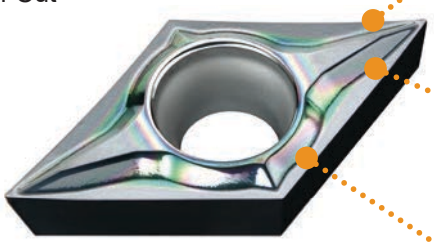
02M R0.2mm (R0.15 – R0.20mm)
04M R0.4mm (R0.35 – R0.40mm)

New Breaker System for Front Turning

FS-P Breaker **LS-P** Breaker

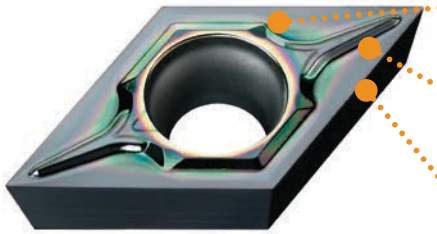
For Micro-Low Depth of Cut

FS-P Breaker



For Medium to High Depth of Cut

LS-P Breaker



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 Breaker Wall

The high chip breaker 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.

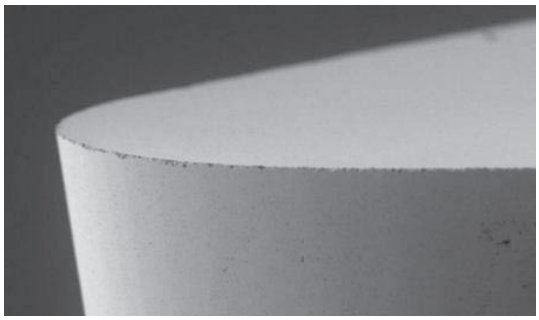
Parallel Cutting Edge

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

Extremely High Quality Cutting Edge

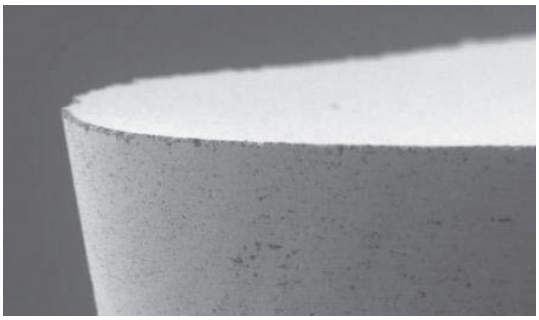
Technology that provides superior dimensional stability and reduces burrs.

MS9025



Rz=0.14 µm

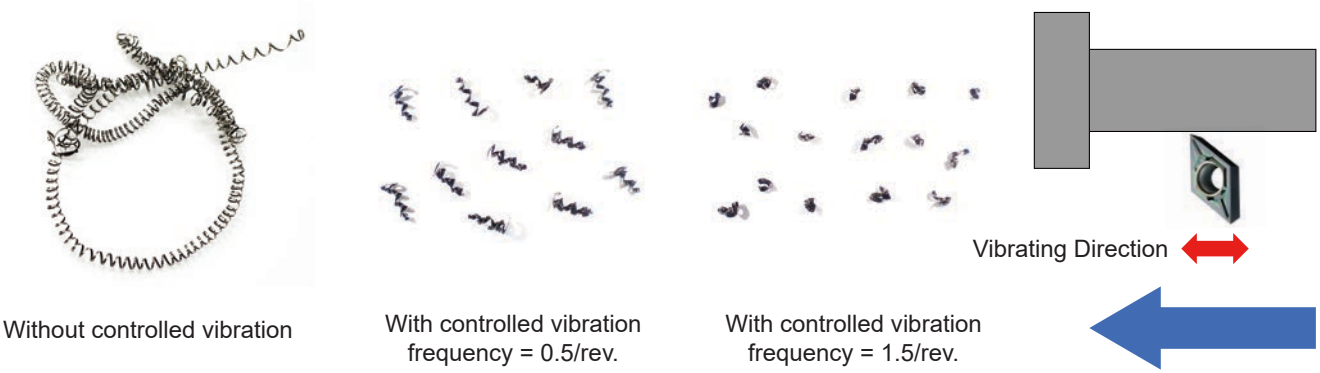
Conventional



Rz=0.61 µm

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.

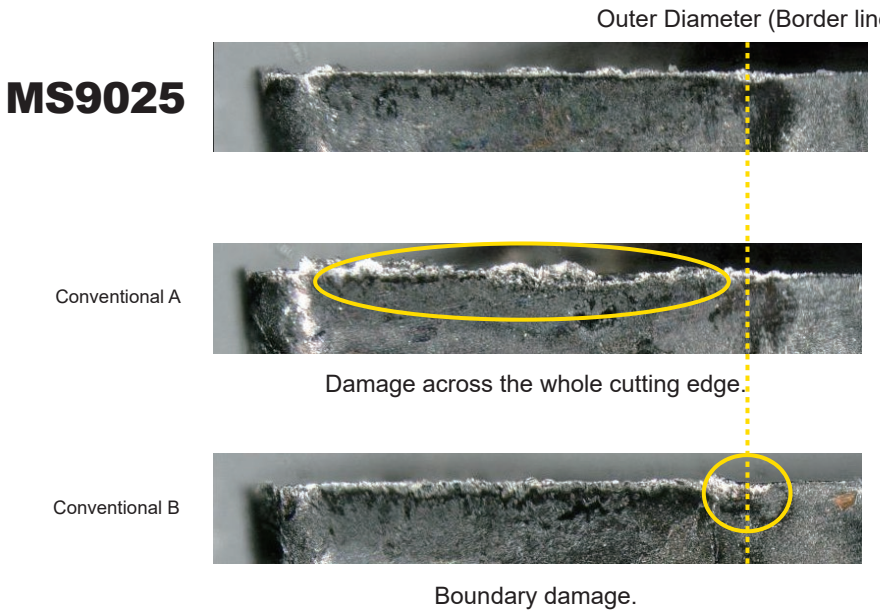
With controlled vibration
frequency = 1.5/rev.

Challenges 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 also because of 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 optimised cemented carbide grain size that reduces thermal conductivity and heating of the cutting edge.

After 500 passes at 15m per pass

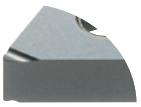
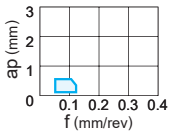
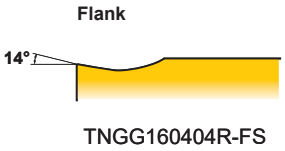


<Cutting Conditions>

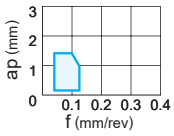
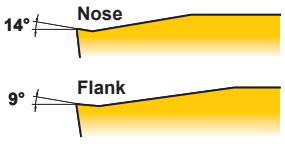
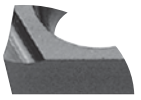
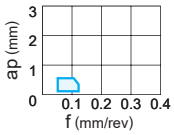
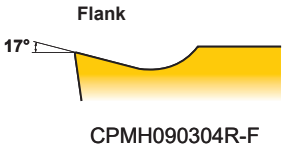
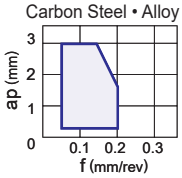
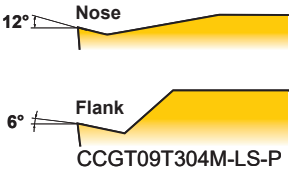
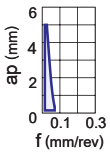
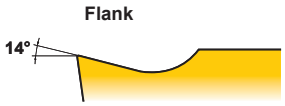
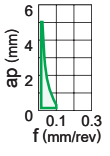
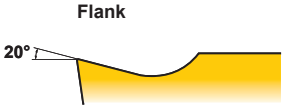
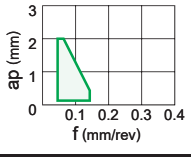
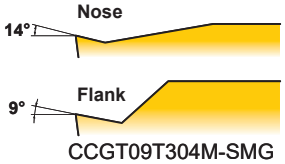
Workpiece Material	: JIS SUS304
Inserts	: DCGT11T302M
Cutting Speed	: vc = 100 m/min
Feed per Rev.	: f =0.05 mm/rev
Depth of Cut	: ap = 1.0 mm
Cutting Mode	: External Continuous Cutting Wet Cutting (Oil)

Chip Breaker System

Negative Inserts

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	G	R/L-FS 	**Precise Finishing** Double-sided chip breaker. A narrow lead chip breaker for good chip control. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel   TNGG160404R-FS

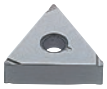
Positive Inserts

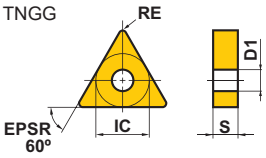
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	G	FS-P 	**First recommendation for finishing titanium alloys** Ideal for Cobalt chromium alloy and Copper alloy. The sharp edge produces a good surface finish. The curved edge allows smooth chip discharge. Lapping of the top surface gives a mirror finish for improved welding resistance.	Titanium alloys   CCGT09T302M-FS-P
	G	R/L-F 	**Finish Cutting - Automatic Lathe Machining** Lead chip breaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel • Alloy Steel   CPMH090304R-F
Light Cutting	G	LS-P 	**Light Cutting - Automatic Lathe Machining** Designed with parallel cutting edges. Achieves stable chip control over a wide range from low to medium depths of cut. Polished (mirror-surface) finish of insert surface drastically improves welding resistance extending tool life.	Carbon Steel • Alloy Steel   CCGT09T304M-LS-P
	G	R/L-SS 	**Light Cutting - Automatic Lathe Machining** A parallel chip breaker. Excellent chip control at low feed rates.	Carbon Steel • Alloy Steel   CCGT09T302R-SS
Medium Cutting	G	R/L-SN 	**Medium Cutting - Automatic Lathe Machining** A parallel chip breaker. Excellent chip control at low to medium feed rates.	Carbon Steel • Alloy Steel   CCGT09T3V3R-SN
	G	SMG 	**Medium Cutting - Automatic Lathe Machining** 3D moulded chip breaker provides good chip control. G class insert gives sharp cutting action, allowing high precision machining. Breaker geometry appropriate for copying and back turning.	Carbon Steel • Alloy Steel   CCGT09T304M-SMG

MS6015/MS7025/MS9025

Negative Inserts (With Hole)

G Class

Finish		
R/L-FS		
		



(mm)

Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE	D1
TNGG160402R-FS	F	●			9.525	4.76	0.2	3.81
TNGG160402L-FS	F	●			9.525	4.76	0.2	3.81
TNGG160404R-FS	F	●			9.525	4.76	0.4	3.81
TNGG160404L-FS	F	●			9.525	4.76	0.4	3.81
TNGG160408R-FS	F	●			9.525	4.76	0.8	3.81
TNGG160408L-FS	F	●			9.525	4.76	0.8	3.81

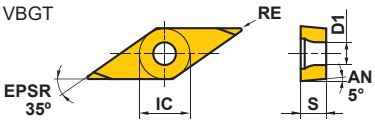
● : Inventory maintained in Japan. (10 inserts in one case)

MS6015/MS7025/MS9025

5° Positive Inserts (With Hole)

G Class

Finish		
FS-P 		



(mm)

Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE	D1
VBGT110301M-FS-P	F			●	6.35	3.18	0.1	2.9
VBGT110302M-FS-P	F			●	6.35	3.18	0.2	2.9
VBGT110304M-FS-P	F			●	6.35	3.18	0.4	2.9
VBGT160401M-FS-P	F			●	9.525	4.76	0.1	4.4
VBGT160402M-FS-P	F			●	9.525	4.76	0.2	4.4
VBGT160404M-FS-P	F			●	9.525	4.76	0.4	4.4
VBGT160408M-FS-P	F			●	9.525	4.76	0.8	4.4

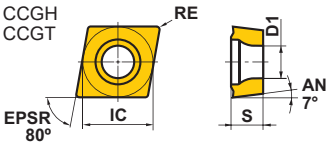
● = NEW

● : Inventory maintained in Japan. (10 inserts in one case)

7° Positive Inserts (With Hole)

G Class

Finish	Finish	
FS-P	R/L-F	
		



(mm)

Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE*2	D1
CCGT060201M-FS-P	F		●	●	6.35	2.38	0.1	2.8
CCGT060202M-FS-P	F		●	●	6.35	2.38	0.2	2.8
CCGT060204M-FS-P	F				6.35	2.38	0.4	2.8
CCGT09T301M-FS-P	F		●	●	9.525	3.97	0.1	4.4
CCGT09T302M-FS-P	F		●	●	9.525	3.97	0.2	4.4
CCGT09T304M-FS-P	F		●	●	9.525	3.97	0.4	4.4
CCGT03S101MR-F	F	●			3.57*1	1.39	0.1	2.0
CCGT03S101ML-F	F	●			3.57*1	1.39	0.1	2.0
CCGT03S102MR-F	F	●			3.57*1	1.39	0.2	2.0
CCGT03S102ML-F	F	●			3.57*1	1.39	0.2	2.0
CCGT03S104MR-F	F	●			3.57*1	1.39	0.4	2.0
CCGT03S104ML-F	F	●			3.57*1	1.39	0.4	2.0
CCGT04T001MR-F	F	●			4.37*1	1.79	0.1	2.4
CCGT04T001ML-F	F	●			4.37*1	1.79	0.1	2.4
CCGT04T002MR-F	F	●			4.37*1	1.79	0.2	2.4
CCGT04T002ML-F	F	●			4.37*1	1.79	0.2	2.4
CCGT04T004MR-F	F	●			4.37*1	1.79	0.4	2.4
CCGT04T004ML-F	F	●			4.37*1	1.79	0.4	2.4
CCGH060202MR-F	F	●			6.35	2.38	0.2	2.8
CCGH060202ML-F	F	●			6.35	2.38	0.2	2.8
CCGH060204MR-F	F	●			6.35	2.38	0.4	2.8
CCGH060204ML-F	F	●			6.35	2.38	0.4	2.8

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

*2 Nominal Value (Max.)

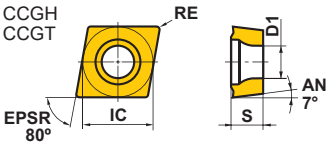
● = NEW

MS6015/MS7025/MS9025

7° Positive Inserts (With Hole)

G Class

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



(mm)

Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE*	D1
CCGT0602V5M-LS-P	L			●	6.35	2.38	0.05	2.8
CCGT060201M-LS-P	L	●	●	●	6.35	2.38	0.1	2.8
CCGT060202M-LS-P	L	●	●	●	6.35	2.38	0.2	2.8
CCGT09T301M-LS-P	L	●	○	●	9.525	3.97	0.1	4.4
CCGT09T302M-LS-P	L	●	●	●	9.525	3.97	0.2	4.4
CCGT09T304M-LS-P	L	●	●	●	9.525	3.97	0.4	4.4
CCGT060201MR-SS	L	●			6.35	2.38	0.1	2.8
CCGT060201ML-SS	L	●			6.35	2.38	0.1	2.8
CCGT060202MR-SS	L	●			6.35	2.38	0.2	2.8
CCGT060202ML-SS	L	●			6.35	2.38	0.2	2.8
CCGT09T301MR-SS	L	●			9.525	3.97	0.1	4.4
CCGT09T301ML-SS	L	●			9.525	3.97	0.1	4.4
CCGT09T302MR-SS	L	●			9.525	3.97	0.2	4.4
CCGT09T302ML-SS	L	●			9.525	3.97	0.2	4.4
CCGT09T304MR-SS	L	●			9.525	3.97	0.4	4.4
CCGT09T304ML-SS	L	●			9.525	3.97	0.4	4.4
CCGT060201MR-SN	M	●	●	●	6.35	2.38	0.1	2.8
CCGT060201ML-SN	M	●			6.35	2.38	0.1	2.8
CCGT060202MR-SN	M	●	●	●	6.35	2.38	0.2	2.8
CCGT060202ML-SN	M	●			6.35	2.38	0.2	2.8
CCGT09T301MR-SN	M	●	●	●	9.525	3.97	0.1	4.4
CCGT09T301ML-SN	M	●			9.525	3.97	0.1	4.4
CCGT09T302MR-SN	M	●	●	●	9.525	3.97	0.2	4.4
CCGT09T302ML-SN	M	●			9.525	3.97	0.2	4.4
CCGT09T304MR-SN	M	●	●	●	9.525	3.97	0.4	4.4
CCGT09T304ML-SN	M	●			9.525	3.97	0.4	4.4
CCGT060201M-SMG	M	●			6.35	2.38	0.1	2.8
CCGT060202M-SMG	M	●			6.35	2.38	0.2	2.8
CCGT060204M-SMG	M	●			6.35	2.38	0.4	2.8
CCGT09T301M-SMG	M	●			9.525	3.97	0.1	4.4
CCGT09T302M-SMG	M	●			9.525	3.97	0.2	4.4
CCGT09T304M-SMG	M	●			9.525	3.97	0.4	4.4

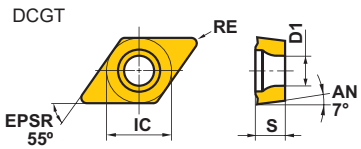
* Nominal Value (Max.)

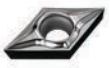
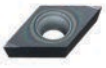
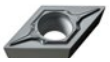
● = NEW

● : Inventory maintained in Japan. (10 inserts in one case)

7° Positive Inserts (With Hole)

G Class



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

(mm)

Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE*	D1
DCGT070201M-FS-P	F		●	●	6.35	2.38	0.1	2.8
DCGT070202M-FS-P	F		●	●	6.35	2.38	0.2	2.8
DCGT070204M-FS-P	F		●	●	6.35	2.38	0.4	2.8
DCGT11T301M-FS-P	F		●	●	9.525	3.97	0.1	4.4
DCGT11T302M-FS-P	F		●	●	9.525	3.97	0.2	4.4
DCGT11T304M-FS-P	F		●	●	9.525	3.97	0.4	4.4
DCGT11T301MR-SRF	F		●	●	9.525	3.97	0.1	4.4
DCGT11T302MR-SRF	F		●	●	9.525	3.97	0.2	4.4
DCGT11T304MR-SRF	F		●	●	9.525	3.97	0.4	4.4
DCGT0702V5M-LS-P	L			●	6.35	2.38	0.05	2.8
DCGT070201M-LS-P	L	●	●	●	6.35	2.38	0.1	2.8
DCGT070202M-LS-P	L	●	●	●	6.35	2.38	0.2	2.8
DCGT070204M-LS-P	L	●	●	●	6.35	2.38	0.4	2.8
DCGT11T301M-LS-P	L	●	●	●	9.525	3.97	0.1	4.4
DCGT11T302M-LS-P	L	●	●	●	9.525	3.97	0.2	4.4
DCGT11T304M-LS-P	L	●	●	●	9.525	3.97	0.4	4.4
DCGT070201MR-SS	L	●			6.35	2.38	0.1	2.8
DCGT070201ML-SS	L	●			6.35	2.38	0.1	2.8
DCGT070202MR-SS	L	●			6.35	2.38	0.2	2.8
DCGT070202ML-SS	L	●			6.35	2.38	0.2	2.8
DCGT11T301MR-SS	L	●			9.525	3.97	0.1	4.4
DCGT11T301ML-SS	L	●			9.525	3.97	0.1	4.4
DCGT11T302MR-SS	L	●			9.525	3.97	0.2	4.4
DCGT11T302ML-SS	L	●			9.525	3.97	0.2	4.4
DCGT11T304MR-SS	L	●			9.525	3.97	0.4	4.4
DCGT11T304ML-SS	L	●			9.525	3.97	0.4	4.4

* Nominal Value (Max.)

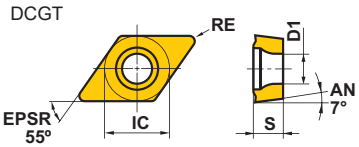
● = NEW

MS6015/MS7025/MS9025

7° Positive Inserts (With Hole)

G Class

Medium	Medium	
R/L-SN	SMG	
		



(mm)

Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE*	D1
DCGT070201MR-SN	M	●	●	●	6.35	2.38	0.1	2.8
DCGT070201ML-SN	M	●	●	●	6.35	2.38	0.1	2.8
DCGT070202MR-SN	M	●	●	●	6.35	2.38	0.2	2.8
DCGT070202ML-SN	M	●	●	●	6.35	2.38	0.2	2.8
DCGT070204MR-SN	M		●	●	6.35	2.38	0.4	2.8
DCGT11T301MR-SN	M	●	●	●	9.525	3.97	0.1	4.4
DCGT11T301ML-SN	M	●	●	●	9.525	3.97	0.1	4.4
DCGT11T302MR-SN	M	●	●	●	9.525	3.97	0.2	4.4
DCGT11T302ML-SN	M	●	●	●	9.525	3.97	0.2	4.4
DCGT11T304MR-SN	M	●	●	●	9.525	3.97	0.4	4.4
DCGT11T304ML-SN	M	●	●	●	9.525	3.97	0.4	4.4
DCGT070201M-SMG	M	●			6.35	2.38	0.1	2.8
DCGT070202M-SMG	M	●			6.35	2.38	0.2	2.8
DCGT070204M-SMG	M	●			6.35	2.38	0.4	2.8
DCGT11T301M-SMG	M	●			9.525	3.97	0.1	4.4
DCGT11T302M-SMG	M	●			9.525	3.97	0.2	4.4
DCGT11T304M-SMG	M	●			9.525	3.97	0.4	4.4

* Nominal Value (Max.)

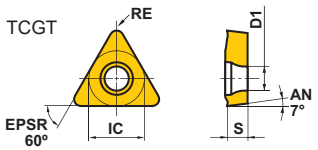
● = NEW

● : Inventory maintained in Japan. (10 inserts in one case)

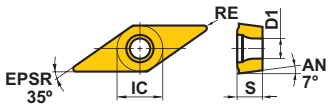
7° Positive Inserts (With Hole)

G Class

TCGT



VCGT



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

(mm)

Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE*	D1
TCGT060101MR-F	F	●			3.97	1.59	0.1	2.3
TCGT060101ML-F	F	●			3.97	1.59	0.1	2.3
TCGT060102MR-F	F	●			3.97	1.59	0.2	2.3
TCGT060102ML-F	F	●			3.97	1.59	0.2	2.3
TCGT060104MR-F	F	●			3.97	1.59	0.4	2.3
TCGT060104ML-F	F	●			3.97	1.59	0.4	2.3
VCGT110301M-FS-P	F		●	●	6.35	3.18	0.1	2.8
VCGT110302M-FS-P	F			●	6.35	3.18	0.2	2.8
VCGT110304M-FS-P	F			●	6.35	3.18	0.4	2.8
VCGT110301M-LS-P	L		●	●	6.35	3.18	0.1	2.8
VCGT110302M-LS-P	L		●	●	6.35	3.18	0.2	2.8
VCGT110304M-LS-P	L		●	●	6.35	3.18	0.4	2.8
VCGT130301M-LS-P	L			●	7.94	3.18	0.1	3.4
VCGT130302M-LS-P	L			●	7.94	3.18	0.2	3.4
VCGT130304M-LS-P	L			●	7.94	3.18	0.4	3.4

* Nominal Value (Max.)

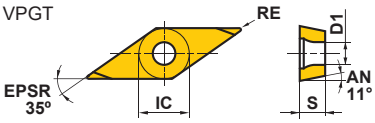
● = NEW

MS6015/MS7025/MS9025

11° Positive Inserts (With Hole)

G Class

Finish		
FS-P 		



(mm)

Order Number	Cutting Area	MS6015	MS7025	MS9025	IC	S	RE*	D1
VPGT080201M-FS-P	F			●	4.76	2.38	0.1	2.42
VPGT080202M-FS-P	F			●	4.76	2.38	0.2	2.42
VPGT110301M-FS-P	F			●	6.35	3.18	0.1	2.85
VPGT110302M-FS-P	F			●	6.35	3.18	0.2	2.85

* Nominal Value (Max.)

● = NEW

● : Inventory maintained in Japan. (10 inserts in one case)

Recommended Cutting Conditions

(mm)

	Workpiece Material	Properties	Cutting Area		Chip Breaker	Grade	Cutting Speed **vc** (m/min)	Feed per Rev. **f** (mm/rev)	Depth of Cut **ap**
P	Pure Iron Free Cutting Steel	–	●	F	R/L-FS	MS6015	150(50—200)	0.01—0.15	0.1—0.5
			●	F	R/L-F	MS6015	150(50—200)	0.01—0.15	0.1—0.5
			◐	L	LS-P	MS6015	150(50—200)	0.01—0.15	0.3—3.0
			◐	L	R/L-SS	MS6015	150(50—200)	0.01—0.15	0.2—1.0
			◐	M	R/L-SN	MS6015	150(50—200)	0.01—0.15	0.1—0.5
			◐	M	SMG	MS6015	150(50—200)	0.01—0.15	0.1—2.0
	Soft Magnetic Iron	–	●	F	R/L-FS	MS6015	200(150—250)	0.01—0.15	0.1—0.5
			●	F	FS-P	MS7025	200(100—300)	0.01—0.06	0.2—0.7
			●	F	R/L-F	MS6015	200(150—250)	0.01—0.15	0.1—0.5
			◐	F	R-SRF	MS7025	200(100—300)	0.01—0.06	0.1—0.5
			◐	L	LS-P	MS6015	200(150—250)	0.01—0.15	0.1—0.5
			◐	L	LS-P	MS7025	200(100—300)	0.01—0.06	0.1—0.5
			◐	L	R/L-SS	MS6015	200(150—250)	0.01—0.15	0.2—1.0
			◐	M	R/L-SN	MS6015	200(150—250)	0.01—0.15	0.1—0.5
			◐	M	R/L-SN	MS7025	200(100—300)	0.01—0.06	0.1—0.5
			◐	M	SMG	MS6015	200(150—250)	0.01—0.15	0.1—2.0
	Carbon Steel Alloy Steel	180—280HB	●	F	R/L-FS	MS6015	100(50—150)	0.01—0.15	0.1—0.5
			●	F	FS-P	MS7025	90(40—130)	0.01—0.06	0.2—0.7
			●	F	R/L-F	MS6015	100(50—150)	0.01—0.15	0.1—0.5
			◐	L	LS-P	MS6015	100(50—150)	0.01—0.15	0.3—3.0
			◐	L	LS-P	MS7025	90(40—130)	0.01—0.06	0.3—3.0
			◐	L	R/L-SS	MS6015	100(50—150)	0.01—0.15	0.2—1.0
			◐	M	R/L-SN	MS6015	100(50—150)	0.01—0.15	0.1—0.5
			◐	M	R/L-SN	MS7025	90(40—130)	0.01—0.06	0.1—0.5
			◐	M	SMG	MS6015	100(50—150)	0.01—0.15	0.1—2.0

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Recommended Cutting Conditions

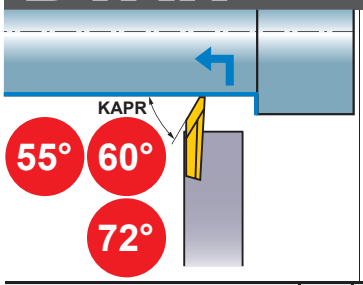
(mm)

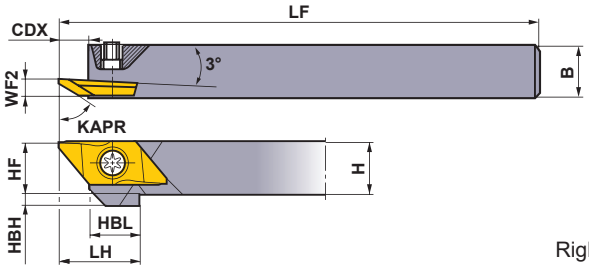
	Workpiece Material	Properties	Cutting Area		Chip Breaker	Grade	Cutting Speed **vc** (m/min)	Feed per Rev. **f** (mm/rev)	Depth of Cut **ap**
M	Austenitic Stainless Steel	–	●	F	FS-P	MS7025	60(40—100)	0.01—0.08	0.2—0.7
			●	F	FS-P	MS9025	100(60—150)	0.04—0.15	0.2—0.7
			●	F	R-SRF	MS7025	60(40—100)	0.01—0.08	0.1—0.5
			◐	F	R-SRF	MS9025	100(60—150)	0.04—0.15	0.1—0.5
			◐	L	LS-P	MS7025	60(40—100)	0.01—0.08	0.3—3.0
			◐	L	LS-P	MS9025	100(60—150)	0.05—0.15	0.3—3.0
			◐	M	R-SN	MS7025	60(40—100)	0.01—0.08	0.1—5.0
			◐	M	R-SN	MS9025	100(60—150)	0.05—0.15	0.1—5.0
	Ferritic and Martensitic Stainless Steel	–	●	F	FS-P	MS7025	60(40—100)	0.01—0.08	0.2—0.7
			◐	F	R-SRF	MS7025	60(40—100)	0.01—0.08	0.1—0.5
			◐	L	LS-P	MS7025	60(40—100)	0.01—0.08	0.3—3.0
			◐	M	R/L-SN	MS7025	60(40—100)	0.01—0.08	0.1—5.0
	Electromagnetic Stainless Steel (SUS440C, SUS420J2 etc.)	Hardness 230HBW	●	F	FS-P	MS9025	100(50—180)	0.04—0.12	0.2—1.8
			●	F	FS-P	MS7025	80(40—160)	0.02—0.08	0.2—1.8
			◐	F	R-SRF	MS9025	100(50—180)	0.04—0.12	0.1—0.5
			◐	F	R-SRF	MS7025	80(40—160)	0.03—0.08	0.1—0.5
			◐	L	LS-P	MS9025	100(50—180)	0.04—0.15	0.3—3.0
			◐	L	LS-P	MS7025	80(40—160)	0.02—0.10	0.3—3.0
			◐	M	R-SN	MS9025	100(50—180)	0.01—0.10	0.1—5.0
			◐	M	R-SN	MS7025	80(40—160)	0.01—0.10	0.1—5.0
	Precipitation Hardening Stainless Steel (SUS630、SUS631 etc.)	<450HB	●	F	FS-P	MS7025	60(40—80)	0.01—0.10	0.1—1.4
			●	F	FS-P	MS9025	70(50—100)	0.03—0.15	0.1—1.4
			◐	F	R-SRF	MS7025	60(40—80)	0.01—0.10	0.1—0.5
			◐	F	R-SRF	MS9025	70(50—100)	0.03—0.15	0.1—0.5
			◐	L	LS-P	MS7025	60(40—80)	0.04—0.10	0.2—3.0
			◐	L	LS-P	MS9025	70(50—100)	0.04—0.15	0.2—3.0
			◐	M	R-SN	MS7025	60(40—80)	0.03—0.10	0.3—3.0
			◐	M	R-SN	MS9025	70(50—100)	0.04—0.15	0.3—3.0
S	Heat Resistant Alloys (SUH etc.)	–	●	F	FS-P	MS9025	80(40—140)	0.04—0.12	0.2—1.4
			◐	F	R-SRF	MS9025	80(40—140)	0.05—0.12	0.1—0.5
			◐	L	LS-P	MS9025	80(40—140)	0.04—0.15	0.3—3.0
			◐	M	R-SN	MS9025	80(40—140)	0.01—0.10	0.1—5.0

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

EXTERNAL BACK TURNING

BTAH





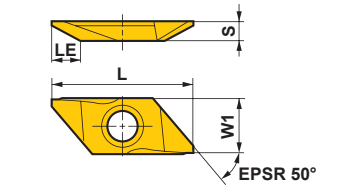
Right hand tool holder shown.

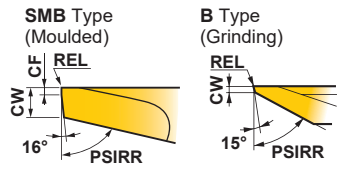
Order Number	Stock		Insert Number		Dimensions (mm)									*	
	R	L			H	B	LF	LH	HF	WF2	HBH	HBL	CDX	Clamp Screw	Wrench
BTAHR/L0810-50	●	●	BTAT	5528○○R/L-B	8	10	120	15	8	3.5	4	9.5	5.5	NS402W	NKY15S
BTAHR/L1010-50	●	●		6035○○R/L-B	10	10	120	15	10	3.5	2	9.5	5.5	NS402W	NKY15S
BTAHR/L1212-50	●	●		605000RX	12	12	120	15	12	3.5	—	9.5	5.5	NS403W	NKY15S
BTAHR/L1616-50	●			7235○○R-SMB	16	16	120	15	16	3.5	—	9.5	5.5	NS403W	NKY15S

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).
∗ Clamp Torque (N • m) : NS402W=1.0, NS403W=1.0

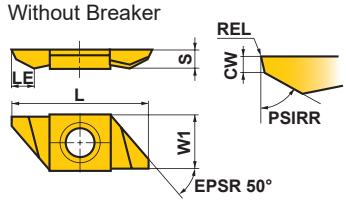
INSERTS

Order Number	Hand	Coated		Dimensions (mm)							*2 LE (mm)	Geometry
		VP15TF	MS6015	PSIRR/L*	RER/L	CF	L	W1	CW	S		
BTAT7235V5R-SMB	R	●		72°	0.05	0.3	20	8	1.4	2.5	3.5	With Breaker
BTAT723501MR-SMB	R	●		72°	0.1 ∗2	0.3	20	8	1.4	2.5	3.5	
BTAT723502MR-SMB	R	●		72°	0.2 ∗2	0.3	20	8	1.4	2.5	3.5	
BTAT552800R-B	R	●	●	55°	0	0	20	8	0.5	2.5	2.8	
BTAT552800L-B	L	●		55°	0	0	20	8	0.5	2.5	2.8	
BTAT552801R-B	R	●	●	55°	0.1	0	20	8	0.5	2.5	2.8	
BTAT552801L-B	L	●		55°	0.1	0	20	8	0.5	2.5	2.8	
BTAT603500R-B	R	●	●	60°	0	0	20	8	0.5	2.5	3.5	
BTAT603500L-B	L	●		60°	0	0	20	8	0.5	2.5	3.5	
BTAT603501MR-B	R		●	60°	0.1 ∗2	0	20	8	0.5	2.5	3.5	
BTAT603501R-B	R	●	●	60°	0.1	0	20	8	0.5	2.5	3.5	
BTAT603501L-B	L	●		60°	0.1	0	20	8	0.5	2.5	3.5	
BTAT605000RX	R	●		60°	0	0	20	8	1.25	2.5	5.0	Without Breaker





Right hand insert shown.



Note 1) REL, PSIRR dimensions for Right Hand Tools and RER, PSIRL dimensions for Left Hand Tools.
∗ Angle when insert fixed on the holder.
∗2 Nominal Value (max.)

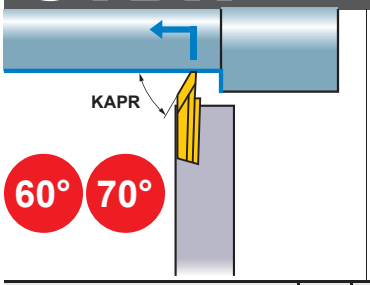
RECOMMENDED CUTTING CONDITIONS

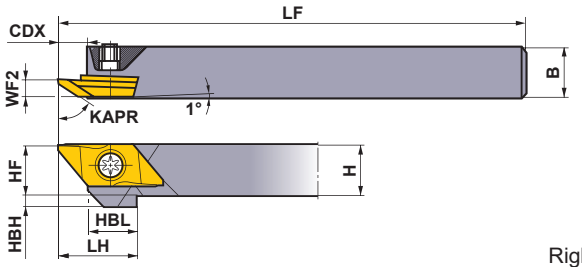
	Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/VP15TF**	100 (50–150)	0.08 (0.01–0.15)
	Free Cutting Steel	–	**MS6015**	110 (30–180)	0.08 (0.01–0.15)
M	Stainless Steel	≤200HB	**VP15TF**	80 (50–120)	0.06 (0.02–0.1)
N	Non-Ferrous Metal	–	**MS6015**	150 (70–230)	0.09 (0.03–0.15)

● : Inventory maintained in Japan. (5 inserts in one case)

EXTERNAL BACK TURNING

CTBH





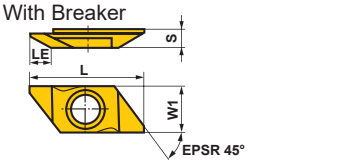
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)									*	
	R	L			H	B	LF	LH	HF	WF2	HBH	HBL	CDX	Clamp Screw	Wrench
CTBHR/L1010-160	●	●	BTBT	60450○R/L-B	10	10	120	19.5	10	3.4	2	12	7.5	NS402W	NKY15S
CTBHR/L1212-160	●	●		606000R/L	12	12	120	19.5	12	3.4	—	12	7.5	NS403W	NKY15S
CTBHR/L1616-160	●	●		7055○○R-SMB	16	16	120	19.5	16	3.4	—	12	7.5	NS403W	NKY15S

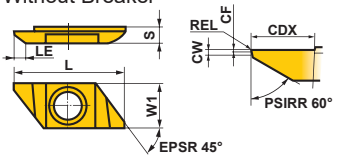
Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).
∗ Clamp Torque (N • m) : NS402W=1.0, NS403W=1.0

INSERTS

Order Number	Hand	Coated		Dimensions (mm)								∗2 LE (mm)	Geometry
		VP15TF	MS6015	PSIRR/L∗	RER/L	CF	L	W1	CW	S	CDX		
BTBT7055V5R-SMB	R	●		70°	0.05	0.3	25	9.4	1.35	3.5	6.5	5.5	With Breaker
BTBT705501MR-SMB	R	●		70°	0.1 ∗2	0.3	25	9.4	1.35	3.5	6.5	5.5	
BTBT705502MR-SMB	R	●		70°	0.2 ∗2	0.3	25	9.4	1.35	3.5	6.5	5.5	
BTBT604500R-B	R	●	●	60°	0	0.2	25	9.4	0.7	3.5	5.5	4.5	
BTBT604500L-B	L	●		60°	0	0.2	25	9.4	0.7	3.5	5.5	4.5	
BTBT604501MR-B	R		●	60°	0.1 ∗2	0.3	25	9.4	0.7	3.5	5.5	4.5	
BTBT604501R-B	R	●	●	60°	0.1	0.3	25	9.4	0.7	3.5	5.5	4.5	
BTBT604501L-B	L	●		60°	0.1	0.3	25	9.4	0.7	3.5	5.5	4.5	
BTBT606000R	R	●		60°	0	0.2	25	9.4	0.7	3.5	7	6.0	Without Breaker
BTBT606000L	L	●		60°	0	0.2	25	9.4	0.7	3.5	7	6.0	



Right hand insert shown.



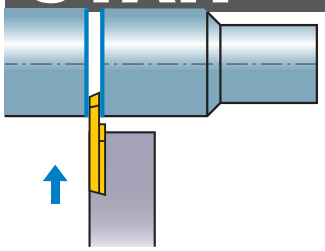
Right hand insert shown.

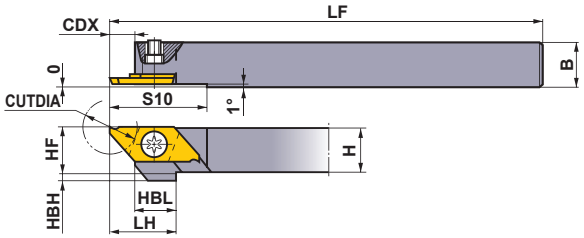
Note 1) REL, PSIRR dimensions for Right Hand Tools and RER, PSIRL dimensions for Left Hand Tools.
∗ Angle when insert fixed on the holder.
∗2 Nominal Value (max.)

● : Inventory maintained in Japan. (5 inserts in one case)

EXTERNAL CUTTING OFF

CTAH



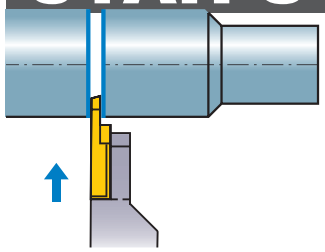


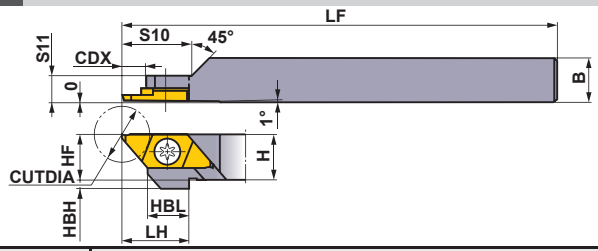
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)									CUTDIA (mm)	*2	
	R	L			H	B	HF	LF	LH	CDX	HBH	HBL	S10		Clamp Screw	Wrench
CTAHR/L0810-120	●	●	CTAT	○○○○	8	10	8	120	15	5.5	4	9.5	22	12 (8)*1	NS402W	NKY15S
CTAHR/L1010-120	●	●		○○○○	10	10	10	120	15	5.5	2	9.5	22		NS402W	NKY15S
CTAHR/L1212-120	●	●		○○○○	12	12	12	120	15	5.5	—	9.5	22		NS403W	NKY15S
CTAHR/L1616-120	●	●		○○○○	16	16	16	120	15	5.5	—	9.5	22		NS403W	NKY15S

*1 When the width of cutting off (CW) is 0.7mm.
*2 Clamp Torque (N • m) : NS402W=1.0, NS403W=1.0

CTAH-S





Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)										CUTDIA (mm)	*2	
	R			H	B	HF	LF	LH	CDX	HBH	HBL	S10	S11		Clamp Screw	Wrench
CTAHR1010-120S	●	CTAT	○○○○	10	10	10	80	15	16	2	9.5	16	5.5	12 (8)*1	NS401	NKY25R

*1 When the width of cutting off (CW) is 0.7mm.
*2 Clamp Torque (N • m) : NS401=3.5

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/VP15TF**	100 (50–150)	0.05 (0.02–0.09)
	Free Cutting Steel	–	**MS6015**	110 (30–180)	0.05 (0.01–0.09)
M	Stainless Steel	≤200HB	**VP15TF**	80 (50–120)	0.03 (0.02–0.05)
N	Non-Ferrous Metal	–	**MS6015**	150 (70–230)	0.07 (0.03–0.11)

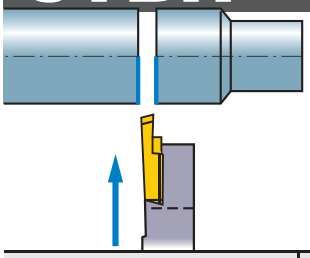
INSERTS

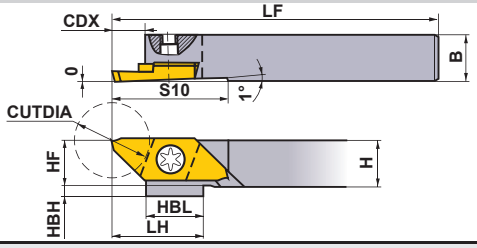
Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated		Dimensions (mm)							CUTDIA (mm)
							VP15TF	MS6015	CW	CDX	RER/L	L	W1	S	LBB	
Right Hand (R)	16°	With Breaker	L, S, W1, EPSR 50°	REL, CDX, LBB, CW ±0.05, RER	CTAT07080V5RR-B	R	●		0.7	4.5	0.05	20	8	2.5	1.5	8
					CTAT10120V5RR-B	R	●	●	1.0	6.7	0.05	20	8	2.5	1.5	12
					CTAT15120V5RR-B	R	●	●	1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5RR-B	R	●	●	2.0	6.7	0.05	20	8	2.5	1.5	12
	16°			REL, CDX, LBB, CW ±0.05, RER, Strong Edge Type	CTAT15120V5RR-BX	R	●		1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5RR-BX	R	●		2.0	6.7	0.05	20	8	2.5	1.5	12
	0°			REL, CDX, LBB, CW ±0.05, RER	CTAT10120V5RN-B	N	●	●	1.0	6.7	0.05	20	8	2.5	1.5	12
					CTAT15120V5RN-B	N	●	●	1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5RN-B	N	●	●	2.0	6.7	0.05	20	8	2.5	1.5	12
	0°			REL, CDX, LBB, CW ±0.05, RER, Strong Edge Type	CTAT15120V5RN-BX	N	●		1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5RN-BX	N	●		2.0	6.7	0.05	20	8	2.5	1.5	12
	16°			REL, CDX, CW ±0.05, RER, LBB	CTAT10110V5RL-B	L	●		1.0	6.7	0.05	20	8	2.5	1.5	11
					CTAT15110V5RL-B	L	●		1.5	6.7	0.05	20	8	2.5	1.5	11
					CTAT20110V5RL-B	L	●		2.0	6.7	0.05	20	8	2.5	1.5	11
	20°	Without Breaker		REL, CDX, LBB, CW ±0.05, RER	CTAT1012000RR	R	●	●	1.0	6.7	0	20	8	2.5	3.5	12
					CTAT1512000RR	R	●	●	1.5	6.7	0	20	8	2.5	3.5	12
					CTAT2012000RR	R	●	●	2.0	6.7	0	20	8	2.5	3.5	12
Left Hand (L)	16°	With Breaker		REL, CW ±0.05, RER, LBB, CDX	CTAT07080V5LL-B	L	●		0.7	4.5	0.05	20	8	2.5	1.5	8
					CTAT10120V5LL-B	L	●		1.0	6.7	0.05	20	8	2.5	1.5	12
					CTAT15120V5LL-B	L	●		1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5LL-B	L	●		2.0	6.7	0.05	20	8	2.5	1.5	12
	0°			REL, CW ±0.05, RER, LBB, CDX	CTAT10120V5LN-B	N	●	●	1.0	6.7	0.05	20	8	2.5	1.5	12
					CTAT15120V5LN-B	N	●	●	1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5LN-B	N	●	●	2.0	6.7	0.05	20	8	2.5	1.5	12
	16°			REL, LBB, CW ±0.05, RER, CDX	CTAT10110V5LR-B	R	●	●	1.0	6.7	0.05	20	8	2.5	1.5	11
					CTAT15110V5LR-B	R	●	●	1.5	6.7	0.05	20	8	2.5	1.5	11
					CTAT20110V5LR-B	R	●	●	2.0	6.7	0.05	20	8	2.5	1.5	11
	20°	Without Breaker	Right hand insert shown.	REL, CW ±0.05, RER, LBB, CDX	CTAT1012000LL	L	●		1.0	6.7	0	20	8	2.5	3.5	12
					CTAT1512000LL	L	●		1.5	6.7	0	20	8	2.5	3.5	12
					CTAT2012000LL	L	●		2.0	6.7	0	20	8	2.5	3.5	12

● : Inventory maintained in Japan. (5 inserts in one case)

EXTERNAL CUTTING OFF

CTBH



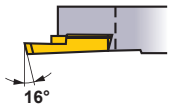
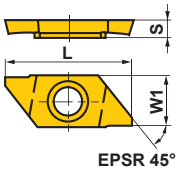
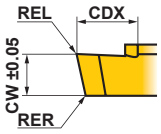
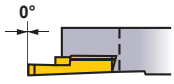
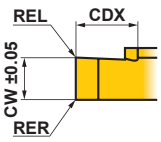
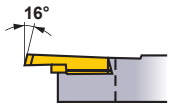
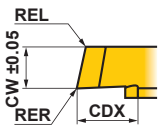
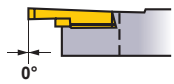
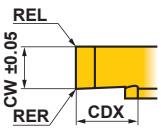
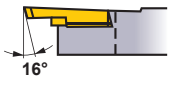
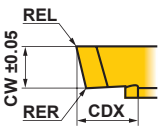


Right hand tool holder shown.

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

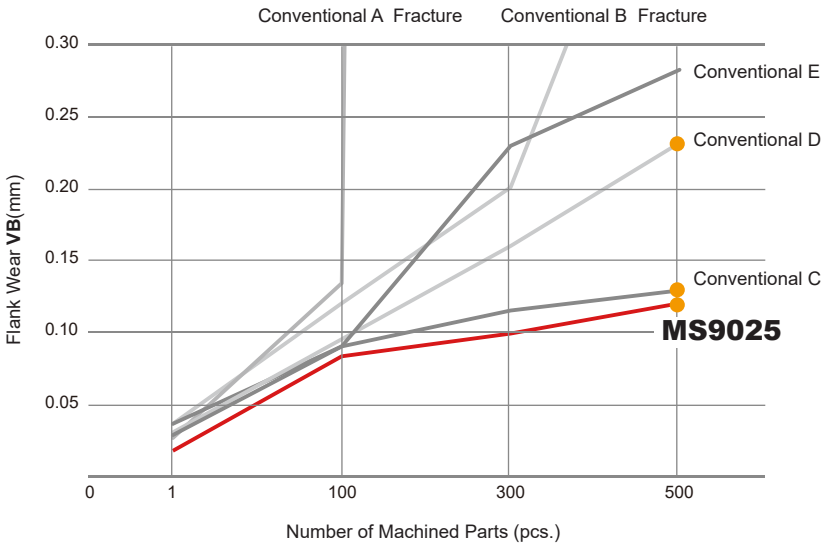
* Clamp Torque (N • m) : NS402W=1.0, NS403W=1.0

INSERTS

Holder	Setting Geometry	Breaker	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 Breaker			**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

Cutting Performance

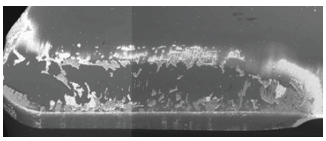
Stainless Steel SUS440C, Wear Resistance Comparison



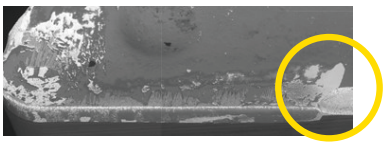
<Cutting Conditions>

Workpiece Material	: JIS SUS440C
Inserts	: DCGT11T302
Machining Methods	: External Continuous Cutting
Cutting Speed	: vc = 100 m/min
Feed per Rev.	: f =0.08 mm/rev
Depth of Cut	: ap = 1.0 mm
Cutting Mode	: Wet Cutting (Oil)

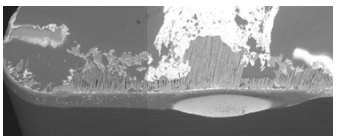
Taken after machining 500 Parts



MS9025

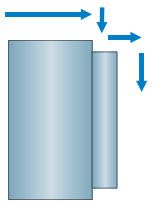
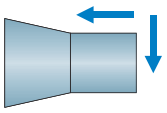


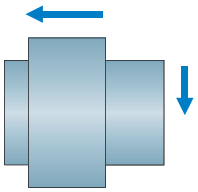
Conventional C : Flaking



Conventional D : Base material exposure

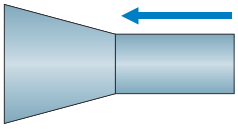
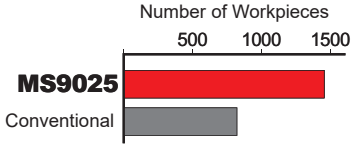
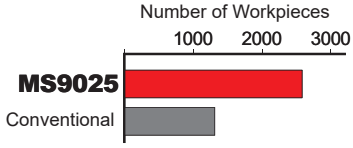
Application Examples

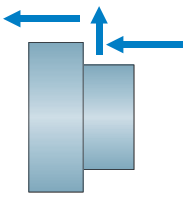
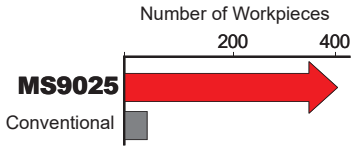
Insert		DCGT070202M-FS-P (MS7025)	DCGT11T302M-FS-P (MS7025)
Workpiece		JIS SUS440C 	JIS SUS430F 
Component		Valve	Shaft Parts
Application		External and Face Turning	External and Face Turning
Cutting Conditions	Cutting Speed **vc** (m/min)	58	130
	Feed per Rev. **f** (mm/rev)	0.04	0.03
	Depth of Cut **ap** (mm)	0.15	0.56
Cutting Mode		Wet Cutting (Oil)	Wet Cutting (Oil)
Results		Number of Workpieces 500 1000 1500 **MS7025** Conventional 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		DCGT11T302M-FS-P (MS7025)
Workpiece		JIS SUS430 
Component		Machine Parts
Application		External and Face Turning
Cutting Conditions	Cutting Speed **vc** (m/min)	100
	Feed per Rev. **f** (mm/rev)	0.06
	Depth of Cut **ap** (mm)	0.25
Cutting Mode		Wet Cutting (Oil)
Results		By suppressing chip welding, cutting edge damage is reduced and the component surface quality can be improved.

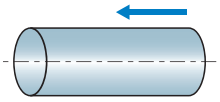
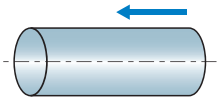
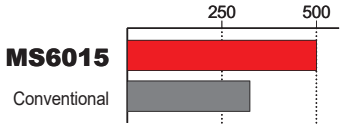
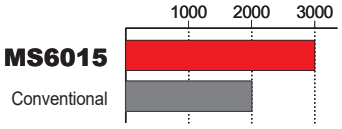
The application examples are from customers workpieces and can therefore differ from the recommended cutting conditions.

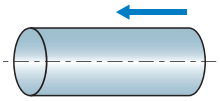
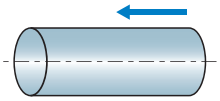
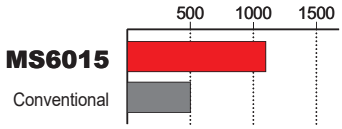
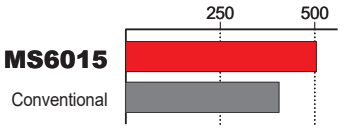
Application Examples

Insert	DCGT11T302M-LS-P (MS9025)	DCGT070201M-FS-P (MS9025)
Workpiece	JIS SUS420J2 Stainless Steel 	JIS SUS440C Electromagnetic Stainless Steel 
Component	Solenoid Parts	Brake Parts
Application	External Continuous Turning	External Continuous Turning
Cutting Conditions: Cutting Speed **vc** (m/min)	117	38
Cutting Conditions: Feed per Rev. **f** (mm/rev)	0.1	0.05
Cutting Conditions: Depth of Cut **ap** (mm)	0.2	0.2
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	DCGT11T304M-LS-P (MS9025)
Workpiece	SUH3 Heat Resistant Alloy 
Component	Valve
Application	External and Face Continuous Turning
Cutting Conditions: Cutting Speed **vc** (m/min)	80
Cutting Conditions: Feed per Rev. **f** (mm/rev)	0.12-0.15
Cutting Conditions: Depth of Cut **ap** (mm)	0.3-0.5
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.

Insert (Grade)		DCGT11T302M-SMG (MS6015)	DCGT11T301MR-SN (MS6015)
Workpiece		Iron-based Soft Magnetic Material (ELCH2) 	Free Cutting Steel (JIS SUM24L) 
Cutting Conditions	Cutting Speed **vc** (m/min)	197 (4500min-1)	125 (5000min-1)
	Feed per Rev. **f** (mm/rev)	0.1	0.05
	Depth of Cut **ap** (mm)	0.1	0.3
Cutting Mode		Wet Cutting (Water-insoluble)	Wet Cutting (Water-insoluble)
Machine		CNC Automatic Lathes	CNC Automatic 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)		DCGT11T302MR-SN (MS6015)	DCGT11T302M-SMG (MS6015)
Workpiece		Carbon Steel（AISI 1045） 	Mild Steel (AISI 1015) 
Cutting Conditions	Cutting Speed **vc** (m/min)	113 (3000min-1)	100 (1300min-1)
	Feed per Rev. **f** (mm/rev)	0.03	0.12
	Depth of Cut **ap** (mm)	1.0	1.3
Cutting Mode		Wet Cutting (Water-insoluble)	Wet Cutting (Water-insoluble)
Machine		CNC Automatic Lathes	CNC Automatic 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.

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

MS6015/MS7025/MS9025

Environmentally Friendly Product

This product has been certified as an environmentally friendly product in the machine tool industry by the Japan Cutting & Wear-resistant Tool Association. This is a product unique to the industry, in harmony with the environment, and with the aim of fulfilling the social responsibilities of the machine tool industry.

The Japan Cutting & Wear-resistant Tool Association evaluates the product's environmental impact during the manufacturing and usage stages and issues a certification according to the evaluation score.

MS6015 MS7025 MS9025

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For People, Society and the Earth

More information about MITSUBISHI MATERIALS' efforts to address social and environmental issues can be found in the website below or by scanning the QR code.

https://mmc.disclosure.site/en/

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.

MITSUBISHI MATERIALS CORPORATION

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http://www.mmc-carbide.com/
(Tools specifications subject to change without notice.)

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