

 **MITSUBISHI MATERIALS**

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**COMPLETE
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MV9005

**COATED GRADE FOR HEAT
RESISTANT SUPER ALLOYS**



TOOL NEWS B271A

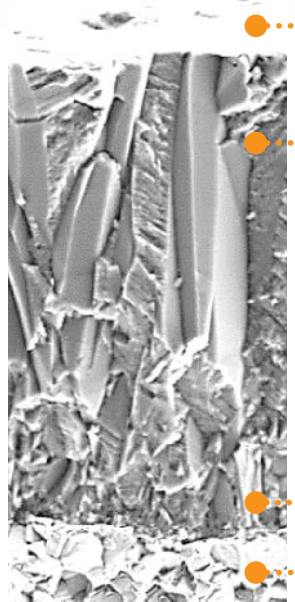
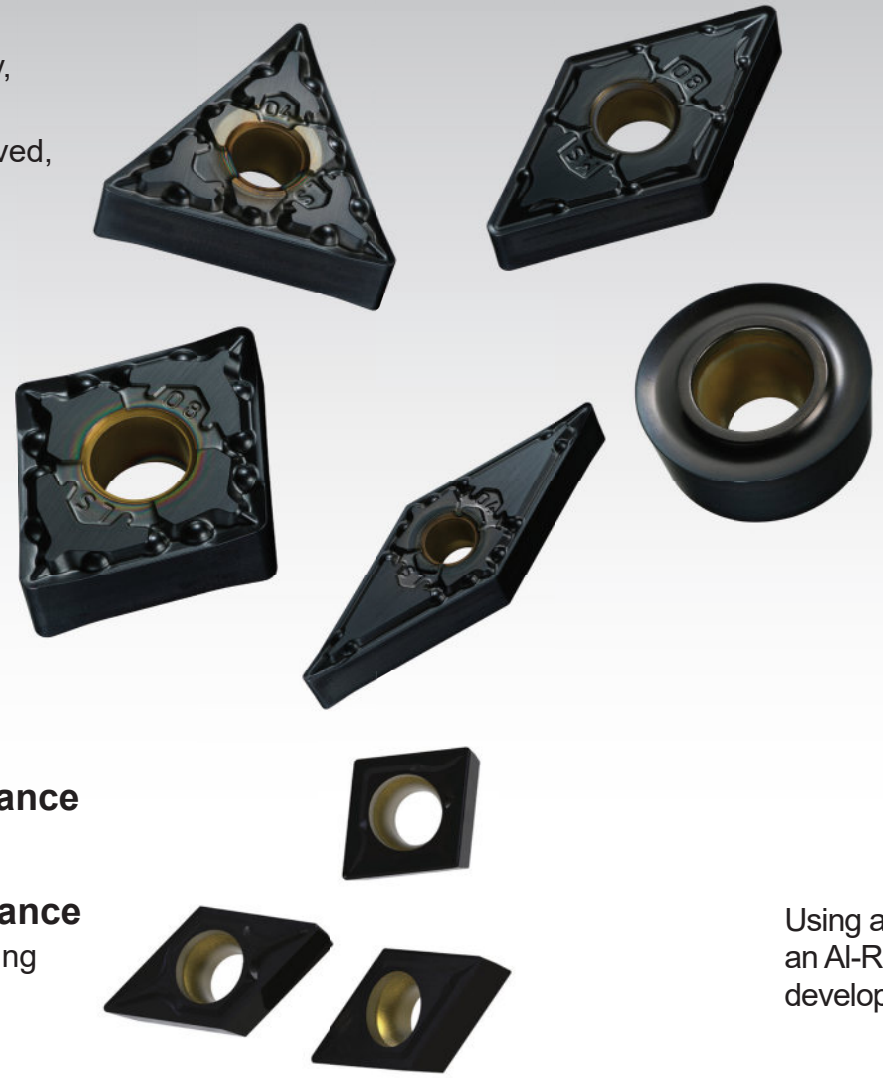
Coated Grade for Heat Resistant Super Alloys

MV9005

Complete Coating Technology that Topples Current Tool Life Standards

Advanced Wear Resistance

By adopting a newly developed Al-Rich coating technology, an (Al,Ti)N coating with a high Al content ratio for extreme hardness means that oxidation resistance is greatly improved, resulting in excellent wear resistance.

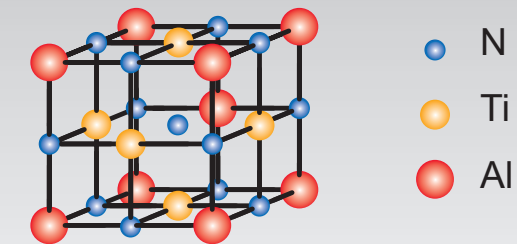


- Excellent welding resistance**
Smooth surface
- Outstanding wear resistance**
Newly developed Al-Rich coating
- Excellent chipping resistance for stable machining**
Newly developed bonding layer
- Excellent Resistance to Plastic Deformation**
Extremely hard dedicated cemented carbide substrate

*Graphical Representation.

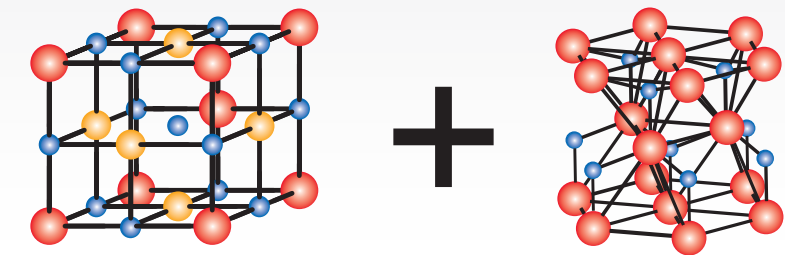
Due to The Newly Developed Al-Rich Coating

Aluminum titanium nitride (Al,Ti)N is a compound of aluminum and titanium that is widely used as a coating for cutting tools due to its extremely hard and heat-resistant properties.



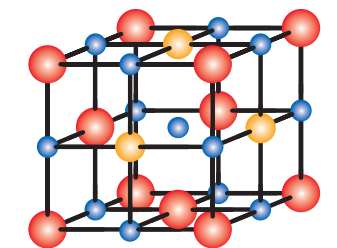
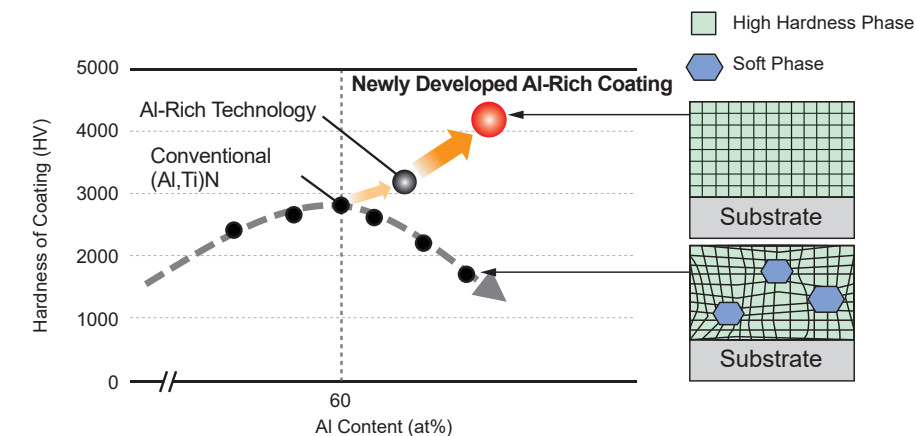
The combination of atoms with different sizes creates an exceptionally hard crystal structure.

The hardness of (Al,Ti)N increases as the Al content ratio increases, but with conventional technology, when the Al content ratio exceeds 60%, the crystal structure changes and the hardness of (Al,Ti)N decreases.



When the Al ratio is over 60%, a softer crystal phase is formed.

Using a new coating process based on Mitsubishi Materials' own original technology, a way in which an Al-Rich coating does not change its crystal structure even when the Al content is increased was developed. This also achieves a higher Al content and higher the hardness of (Al,Ti)N.



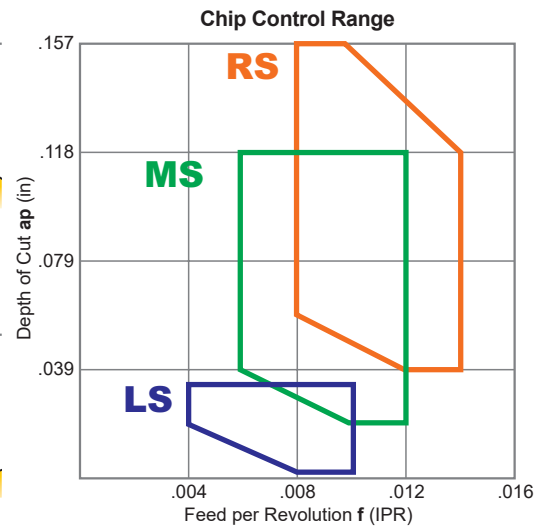
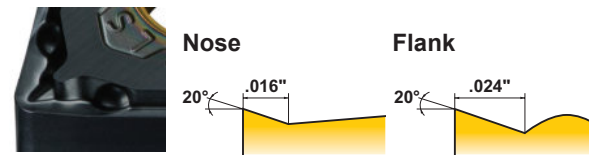
Crystal image of **MV9005**

Chipbreaker System

Negative Inserts

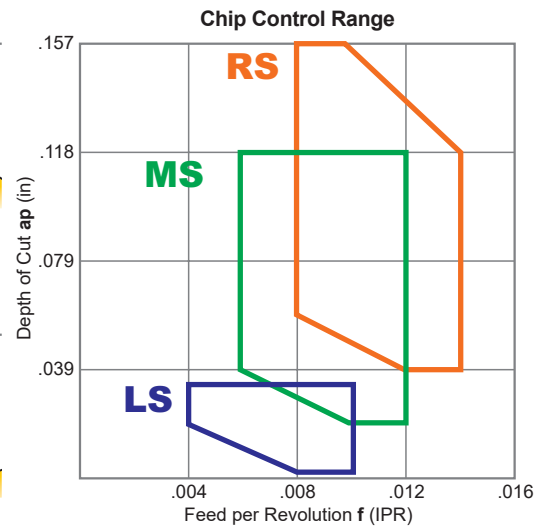
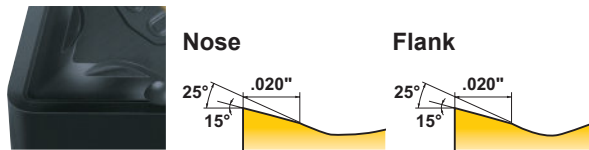
LS Chipbreaker for Light Cutting

Enhanced chip disposal for depths of cut smaller than the corner R.



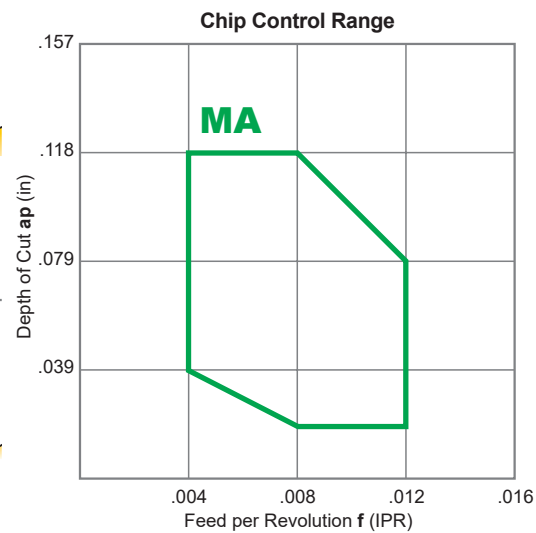
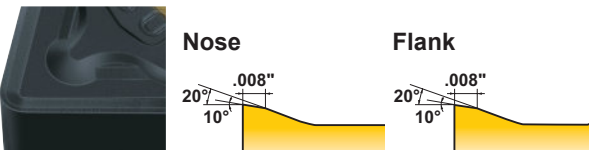
MS Chipbreaker Newly Designed for Medium Cutting

The large 2-step rake angle generates chips smoothly and without tangling during low feed cutting.



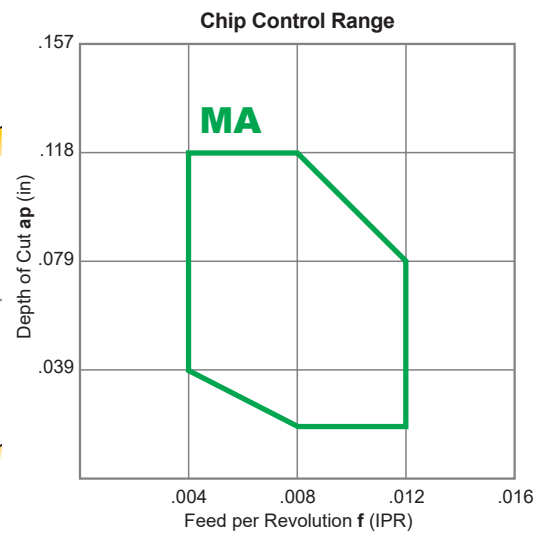
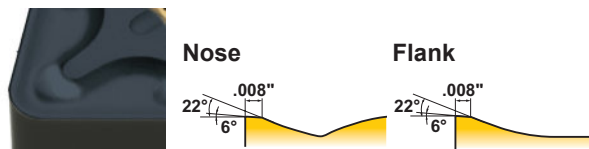
RS Chipbreaker for Rough Cutting

During low speed cutting, the positive land controls chip welding and abrasion at the depth of cut line.



MA Chipbreaker Multi-assist Chipbreaker

Suitable for medium cutting range.

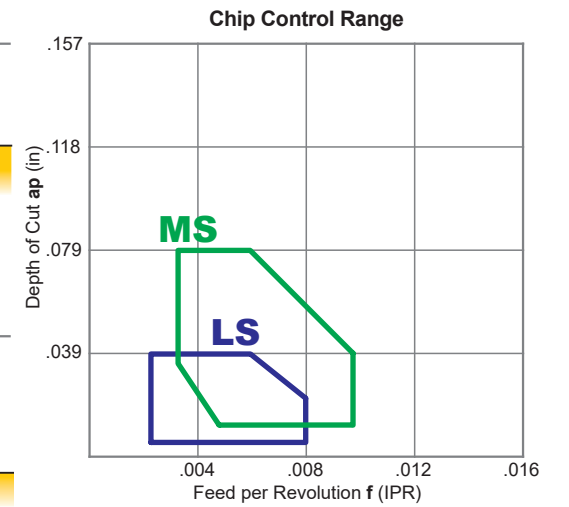
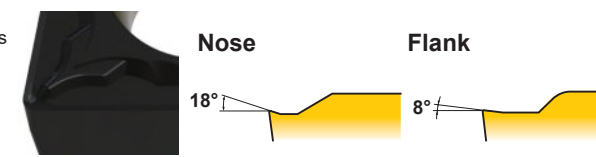


The chipbreaker control range was tested for optimum chip evacuation when cutting Inconel718 with a CNMG43200 insert.

Positive Inserts

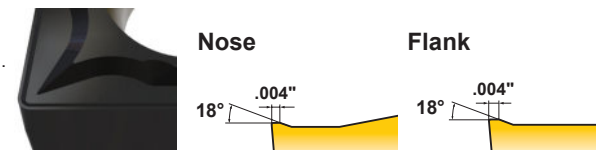
LS Chipbreaker for Light Cutting

Prevents insert welding and reduces the cloudiness of the finished surface.



MS Chipbreaker for Medium Cutting

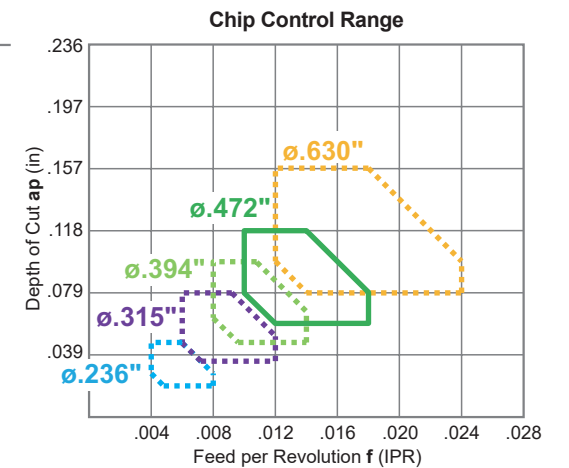
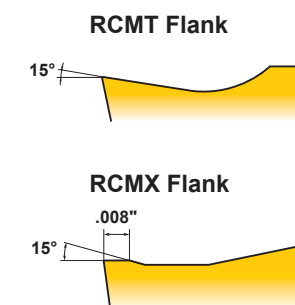
It reduces cutting resistance, chatter and vibration and chip clogging.



Positive Inserts

RCMT, RCMX for Medium Cutting

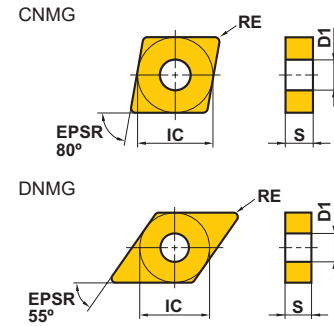
Balance of strength and sharpness due to a combination of a flat land and high rake angle.



MV9005

Negative Inserts (With Hole)

M Class



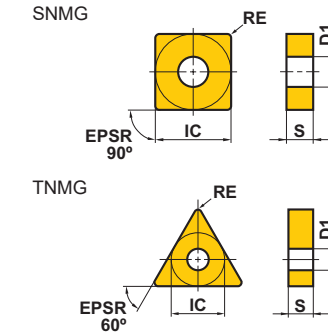
Light LS	Medium MS	Medium MA	Rough RS
Light LS	Medium MS	Medium MA	

(in)

Order Number	Cutting Area	MV9005	IC	S	RE	D1
CNMG430.5LS	L	●	.500	.187	.008	.203
CNMG431LS	L	●	.500	.187	.016	.203
CNMG432LS	L	●	.500	.187	.031	.203
CNMG431MS	M	●	.500	.187	.016	.203
CNMG432MS	M	●	.500	.187	.031	.203
CNMG433MS	M	●	.500	.187	.047	.203
CNMG432MA	M	●	.500	.187	.031	.203
CNMG433MA	M	●	.500	.187	.047	.203
CNMG434MA	M	●	.500	.187	.063	.203
CNMG432RS	R	●	.500	.187	.031	.203
CNMG433RS	R	●	.500	.187	.047	.203
CNMG434RS	R	●	.500	.187	.063	.203
CNMG644RS	R	●	.750	.250	.063	.312
DNMG430.5LS	L	●	.500	.187	.008	.203
DNMG431LS	L	●	.500	.187	.016	.203
DNMG432LS	L	●	.500	.187	.031	.203
DNMG441LS	L	●	.500	.250	.016	.203
DNMG442LS	L	●	.500	.250	.031	.203
DNMG443LS	L	●	.500	.250	.047	.203
DNMG431MS	M	●	.500	.187	.016	.203
DNMG432MS	M	●	.500	.187	.031	.203
DNMG433MS	M	●	.500	.187	.047	.203
DNMG441MS	M	●	.500	.250	.016	.203
DNMG442MS	M	●	.500	.250	.031	.203
DNMG443MS	M	●	.500	.250	.047	.203
DNMG431MA	M	●	.500	.187	.016	.203
DNMG432MA	M	●	.500	.187	.031	.203
DNMG433MA	M	●	.500	.187	.047	.203
DNMG441MA	M	●	.500	.250	.016	.203
DNMG442MA	M	●	.500	.250	.031	.203
DNMG443MA	M	●	.500	.250	.047	.203

● = NEW

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



Medium MS	Medium MA	Rough RS
Light LS	Medium MS	

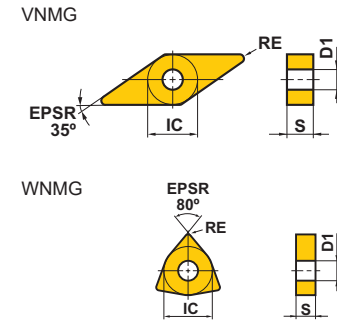
(in)

Order Number	Cutting Area	MV9005	IC	S	RE	D1
SNMG431MS	M	●	.500	.187	.016	.203
SNMG432MS	M	●	.500	.187	.031	.203
SNMG433MS	M	●	.500	.187	.047	.203
SNMG431MA	M	●	.500	.187	.016	.203
SNMG432MA	M	●	.500	.187	.031	.203
SNMG433MA	M	●	.500	.187	.047	.203
SNMG432RS	R	●	.500	.187	.031	.203
SNMG433RS	R	●	.500	.187	.047	.203
SNMG434RS	R	●	.500	.187	.063	.203
TNMG330.5LS	L	●	.375	.187	.008	.150
TNMG331LS	L	●	.375	.187	.016	.150
TNMG332LS	L	●	.375	.187	.031	.150
TNMG331MS	M	●	.375	.187	.016	.150
TNMG332MS	M	●	.375	.187	.031	.150
TNMG333MS	M	●	.375	.187	.047	.150

MV9005

Negative Inserts (With Hole)

M Class



Light LS	Medium MS	Medium MA
Light LS	Medium MS	Medium MA

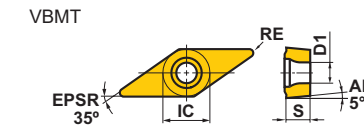
(in)

Order Number	Cutting Area	MV9005	IC	S	RE	D1
VNMG330.5LS	L	●	.375	.187	.008	.150
VNMG331LS	L	●	.375	.187	.016	.150
VNMG332LS	L	●	.375	.187	.031	.150
VNMG331MS	M	●	.375	.187	.016	.150
VNMG332MS	M	●	.375	.187	.031	.150
VNMG331MA	M	●	.375	.187	.016	.150
VNMG332MA	M	●	.375	.187	.031	.150
WNMG431LS	L	●	.500	.187	.016	.203
WNMG432LS	L	●	.500	.187	.031	.203
WNMG431MS	M	●	.500	.187	.016	.203
WNMG432MS	M	●	.500	.187	.031	.203
WNMG431MA	M	●	.500	.187	.016	.203
WNMG432MA	M	●	.500	.187	.031	.203

● = NEW

5° Positive Inserts (With Hole)

M Class



Light LS
Medium MS

(in)

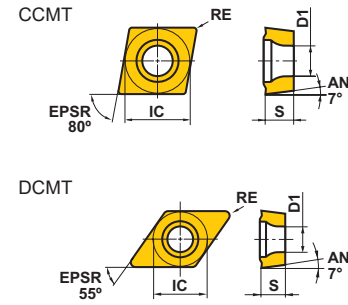
Order Number	Cutting Area	MV9005	IC	S	RE	D1
VBMT221LS	L	●	.250	.125	.016	.114
VBMT331LS	L	●	.375	.187	.016	.173
VBMT332LS	L	●	.375	.187	.031	.173
VBMT333LS	L	●	.375	.187	.047	.173
VBMT221MS	M	●	.250	.125	.016	.114
VBMT331MS	M	●	.375	.187	.016	.173
VBMT332MS	M	●	.375	.187	.031	.173
VBMT333MS	M	●	.375	.187	.047	.173

● = NEW

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

MV9005

7° Positive Inserts (With Hole) M Class

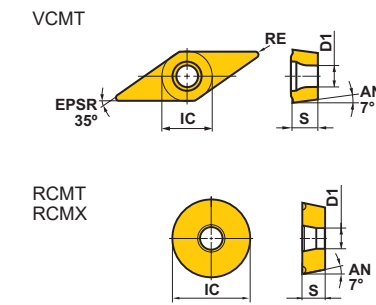


(in)

Order Number	Cutting Area	MV9005	IC	S	RE	D1
CCMT32.52LS	L	●	.375	.156	.031	.173
CCMT32.51MS	M	●	.375	.156	.016	.173
CCMT32.52MS	M	●	.375	.156	.031	.173
DCMT32.52LS	L	●	.375	.156	.031	.173
DCMT32.51MS	M	●	.375	.156	.016	.173
DCMT32.52MS	M	●	.375	.156	.031	.173

● = NEW

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



(in)

Order Number	Cutting Area	MV9005	IC	S	RE	D1
VCMT221LS	L	●	.250	.125	.016	.110
VCMT331LS	L	●	.375	.187	.016	.173
VCMT332LS	L	●	.375	.187	.031	.173
VCMT221MS	M	●	.250	.125	.016	.110
VCMT331MS	M	●	.375	.187	.016	.173
VCMT332MS	M	●	.375	.187	.031	.173
VCMT333MS	M	●	.375	.187	.047	.173
RCMT0602M0	M	●	.236	.094	—	.110
RCMT0803M0	M	●	.315	.125	—	.134
RCMT10T3M0	M	●	.394	.156	—	.173
RCMT1204M0	M	●	.472	.187	—	.173
RCMT1606M0	M	●	.630	.250	—	.217
RCMX1003M0	M	●	.394	.125	—	.142
RCMX1204M0	M	●	.472	.187	—	.165
RCMX1606M0	M	●	.630	.250	—	.205

● = NEW

Recommended Cutting Conditions

Negative Inserts

Material	Cutting Conditions	Cutting Area	Chipbreaker	Grade	vc (SFM)	f (IPR)	ap
S Ni Based Heat Resistant Alloys (Inconel718, Hastelloy, WSPALLOY)	Stable Cutting	Light Cutting	LS	MV9005	245-460	.004-.010	.008-.031
		Medium Cutting	MS	MV9005	230-425	.006-.012	.020-.118

Note 1) Verify the recommended conditions for each boring bar as cutting conditions for internal machining can differ.

Positive Inserts

CCMT, DCMT, VBMT, VCMT

Material	Cutting Conditions	Cutting Area	Chipbreaker	Grade	vc (SFM)	f (IPR)	ap
S Ni Based Heat Resistant Alloys (Inconel718, Hastelloy, WSPALLOY)	Stable Cutting	Light Cutting	LS	MV9005	210-395	.004-.010	.008-.031
		Medium Cutting	MS	MV9005	180-330	.006-.012	.020-.118

Note 1) Verify the recommended conditions for each boring bar as cutting conditions for internal machining can differ.

RCMT, RCMX

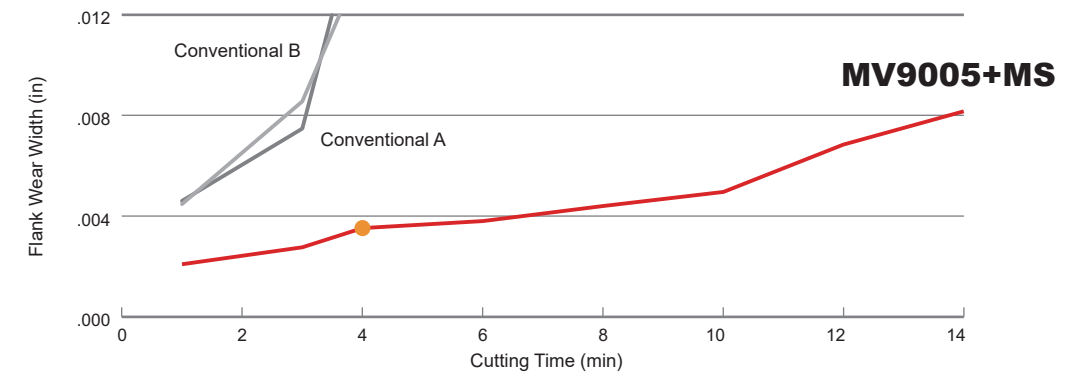
Material	Cutting Conditions	Cutting Area	Grade	vc (SFM)	f (IPR)	ap
S Ni Based Heat Resistant Alloys (Inconel718, Hastelloy, WSPALLOY)	Stable Cutting	Medium Cutting	MV9005	180-330	.010-.018	.059-.118

Note 1) Verify the recommended conditions for each boring bar as cutting conditions for internal machining can differ.

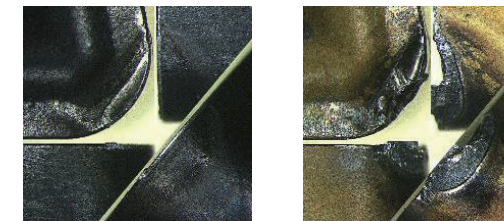
Cutting Performance

Comparison of wear resistance when machining Inconel718

Exhibits excellent wear resistance and extended tool life.



Taken after machining 4 minutes



MV9005

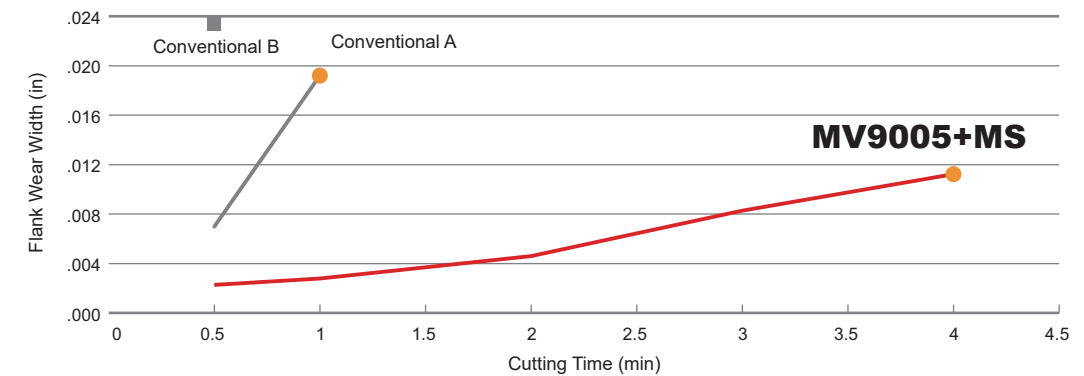
Conventional A

<Cutting Conditions>

Material : Inconel718
 Inserts : CNMG433
 Cutting Speed : vc=330 SFM
 Feed per Rev. : f=.012 IPR
 Depth of Cut : ap=.030"
 Cutting Mode : Wet Cutting

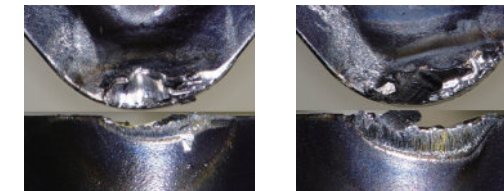
Comparison of wear resistance when machining Inconel718

Demonstrates excellent wear resistance even during high-speed cutting of heat resistant alloys, thus improving machining efficiency.



4 minutes machining

1 minute machining



MV9005

Conventional A

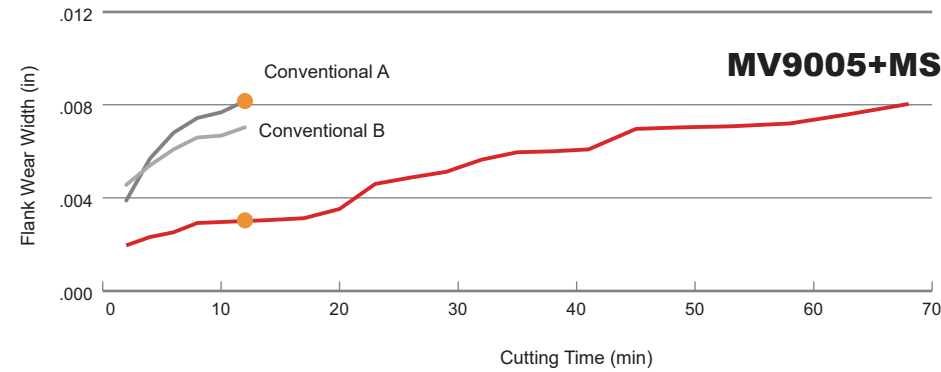
<Cutting Conditions>

Material : Inconel718
 Inserts : CNMG433
 Cutting Speed : vc=460 SFM
 Feed per Rev. : f=.012 IPR
 Depth of Cut : ap=.030"
 Cutting Mode : Wet Cutting

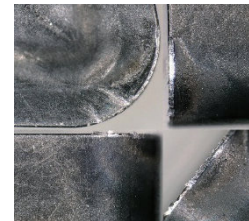
Cutting Performance

Comparison of wear resistance when machining Rene41

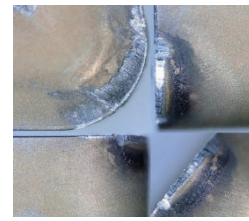
Exhibits excellent wear resistance even when machining heat resistant alloy components that are used in high temperature environments of 1472°F or higher.



Taken after machining 12 minutes



MV9005

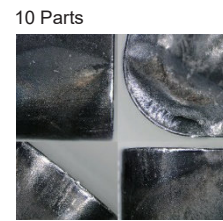
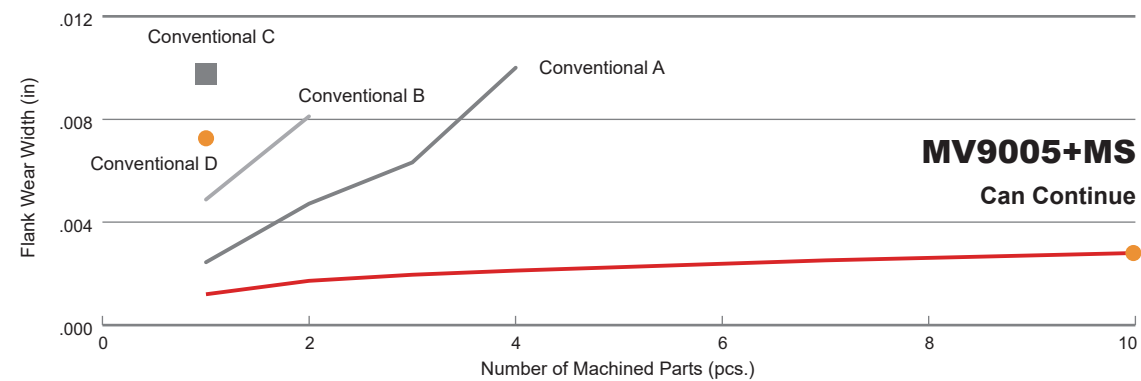


Conventional A

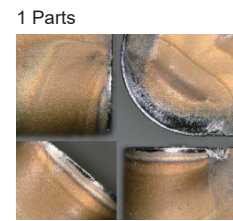
<Cutting Conditions>
 Material : Rene41
 (Ni Based Heat Resistant Alloys)
 Inserts : CNMG433
 Cutting Speed : vc=100 SFM
 Feed per Rev. : f=.004 IPR
 Depth of Cut : ap=.020"
 Cutting Mode : Wet Cutting

Comparison when machining a nickel-based super alloy containing cobalt

Exhibits excellent wear resistance across a wide range of nickel-based heat resistant alloys.



MV9005



Conventional D

<Cutting Conditions>
 Material : Nickel-base super alloy containing cobalt
 Inserts : CNMG433
 Cutting Speed : vc=130 SFM
 Feed per Rev. : f=.006 IPR
 Depth of Cut : ap=.059"
 Cutting Mode : Wet Cutting

Examples of Usage

Insert	CNMG433MS	CNMG433MS
Workpiece	Nickel-base super alloy containing cobalt 	Inconel718
Component	Aerospace Component	Aerospace Component
Application	Face	Turning
Cutting Conditions	Cutting Speed vc (SFM)	Conventional 260, MV9005 330
	Feed per Rev. f (IPR)	Conventional .010, MV9005 .012
	Depth of Cut ap (in)	.006-.014
Cutting Mode	Wet Cutting	Wet Cutting
Results	<p>Cutting Length (ft) 1640 3281 4921 6562</p> <p>MV9005 Conventional</p>	Cutting conditions improve machining efficiency by 50% compared to conventional products. Wear is also suppressed and stable machining is achieved.
		Notch wear is suppressed, and it is possible to significantly extend the tool life.

Insert	CNMG433MS	
Workpiece	Inconel718 	
Component	Aerospace Component	
Application	Internal	
Cutting Conditions	Cutting Speed vc (SFM)	Conventional 260, MV9005 330
	Feed per Rev. f (IPR)	Conventional .006, MV9005 .007
	Depth of Cut ap (in)	.006-.014
Cutting Mode	Wet Cutting	
Results	Machining efficiency is 50% higher than conventional products. Wear is suppressed even under increased cutting conditions, enabling stable machining.	

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



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2001 Orndorf Drive
Brighton, MI 48116
Main: 248.308.2620
Fax: 248.308.2627

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.

www.mmc-carbide.com/us

Tools specifications subject to change without notice.

B271A-US-2026.4



**COMPLETE
METALWORKING
SOLUTIONS**

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