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MITSUBISHI MATERIALS

MITSUBISHI CARBIDE

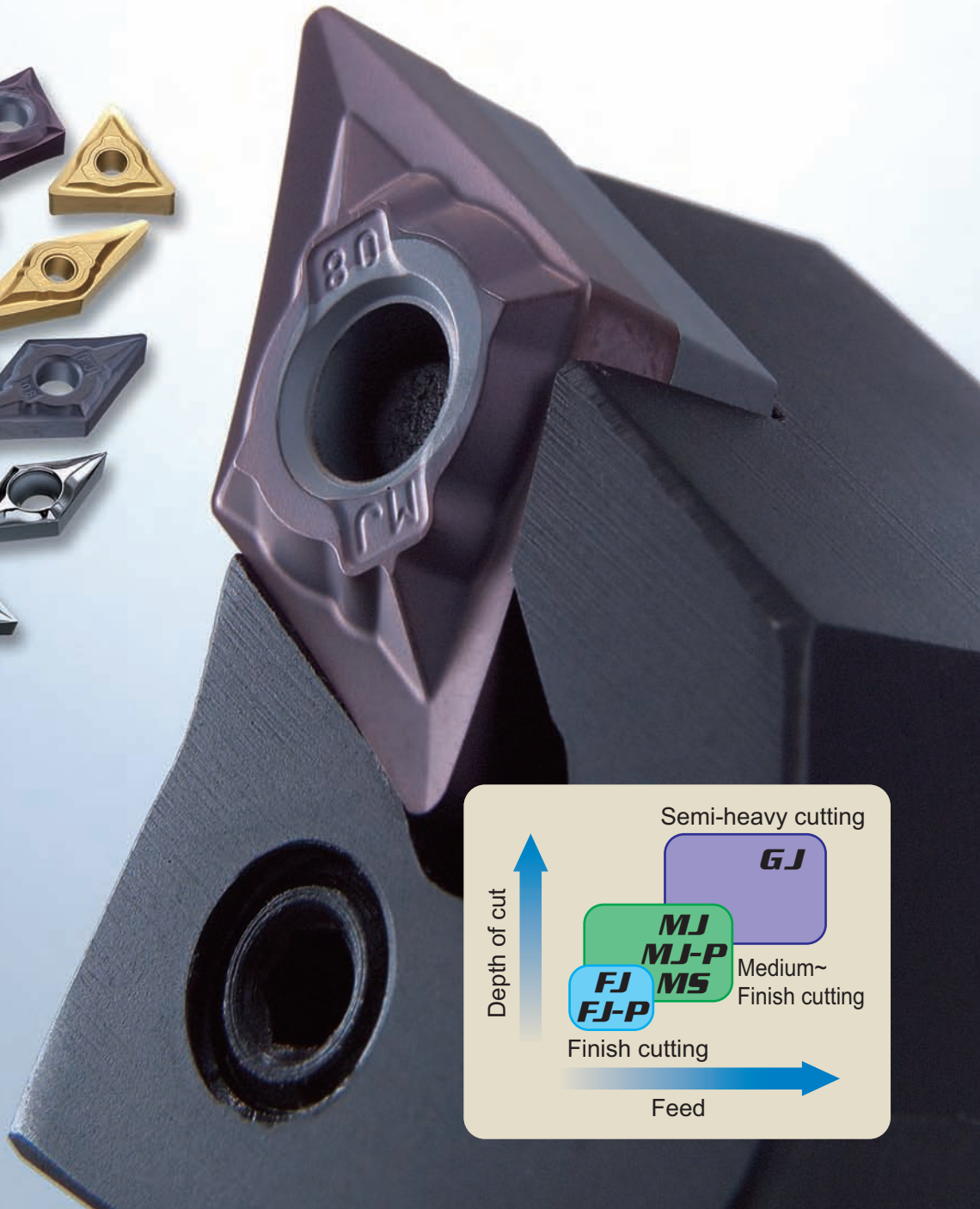
TOOL NEWS

2007.10 Update B036A

Special breakers for difficult-to-cut materials

FJ/MJ/GJ/MS breaker
FJ-P/MJ-P (P denotes polished, uncoated inserts)

Excellent for highly accurate machining of heat-resistant and titanium alloy.



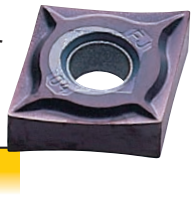
Special breakers for difficult-to-cut materials

FJ/MJ/GJ/MS
FJ-P/MJ-P breaker

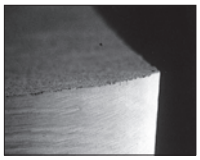
Features

FJ breaker — Finish cutting — G Class

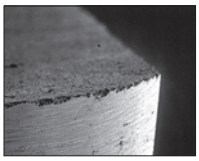
Optimum chip breaker for high accuracy finishing



- Reduced heat generation with the use of a sharp cutting edge.
- Superior chip control at very small depths of cut with a special dot type chip breaker.



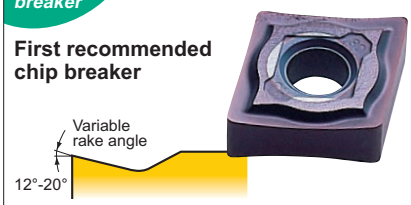
Cutting edge of *FJ breaker* (Extremely sharp cutting edge)



Cutting edge of a competitors breaker for difficult-to-cut materials.

MJ breaker — Medium-Finish cutting — M Class

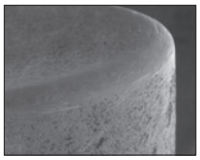
First recommended chip breaker



- M-class economy with a smooth micro honing for highest sharpness.
- A curved edge design suitable for copy turning.
- A wide variety of corner radii, .016—.063 available as standard.

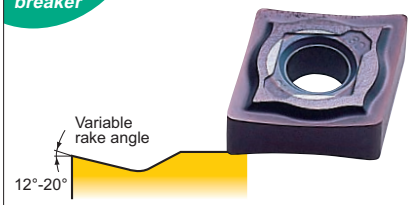
An industry first M-class type with micro honing.

Cutting edge of *MJ breaker* for class M (Extremely sharp cutting edge)



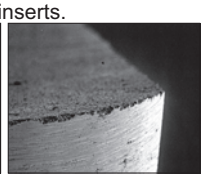
Cutting edge of a competitors breaker for class M

MJ breaker — Medium-Finish cutting — G Class



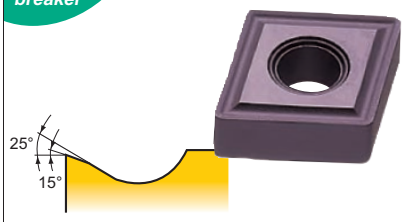
- G-class precision with a smooth micro honing for the highest sharpness.
- A curved edge design suitable for copy turning.
- When high accuracy and precise insert positioning are needed, we recommend the use of G-class inserts.

Cutting edge of *MJ breaker* for class G (Extremely sharp cutting edge)



Cutting edge of a competitors breaker for difficult-to-cut materials.

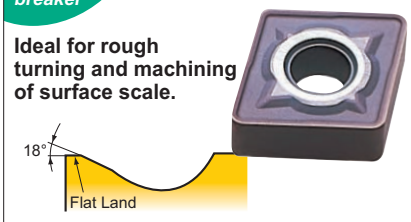
MS breaker — Medium cutting — M Class



- The high rake angle reduces cutting temperatures.
- Reduced contact area on the rake face.
- Suppresses heat generation.

GJ breaker — Semi-heavy cutting — M Class

Ideal for rough turning and machining of surface scale.



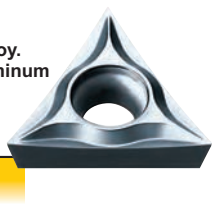
- Sharpness and high cutting edge strength with an optimum rake angle and flat land.
- Cutting edge geometry optimized for resistance to face wear when cutting titanium alloy.

RCMX Standard breaker — Medium cutting — M Class

- A smaller rake angle prevents notching.

FJ-P breaker — Finish cutting — G Class

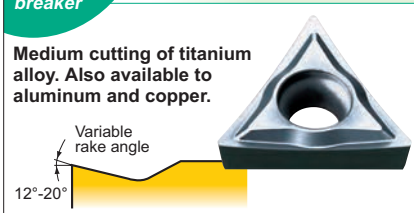
Finishing titanium alloy. Also available to aluminum and copper.



- The sharp edge produces good surface finish.
- The curved edge allows smooth chip discharge.
- A mirror finish insert surface offers high welding resistance.

MJ-P breaker — Medium-Finish cutting — G Class

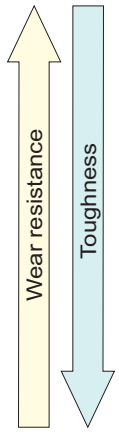
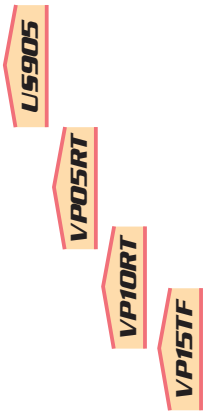
Medium cutting of titanium alloy. Also available to aluminum and copper.



- The sharp edge produces good surface finish.
- The curved edge allows smooth chip discharge.
- A mirror finish insert surface offers high welding resistance.

Grade Features

Application range for heat resistant alloy machining

Properties	Heat-resistant alloy
	

● CVD coated *US905*
Unequalled wear resistance enables machining at high speeds when compared to conventional products.

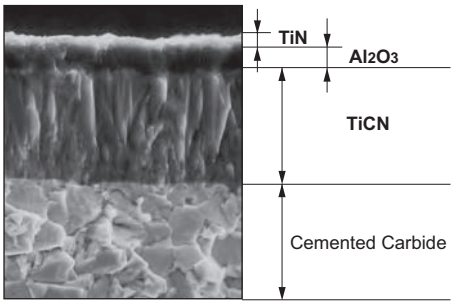
● Miracle Coated grade *VP05RT*
The combination of MIRACLE coating and a high-strength cemented carbide substrate increases wear resistance and exhibits high continous cut performance.

● Miracle Coated grade *VP10RT*
A good balance of wear and fracture resistance. First recommendation for turning heat-resistant alloys. Also suitable for stainless steels.

● Miracle Coated grade *VP15TF*
High-strength micro-grain cemented carbide substrate. Ideal for interrupted cutting that requires high fracture resistance.

Features of *US905*

CVD Coated *US905*



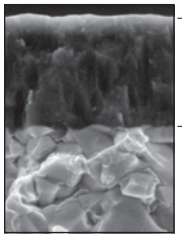
Coating

A CVD coating layer with a close micro structure to prevent flank and face wear of edges that are subject to very high temperatures.

Substrate

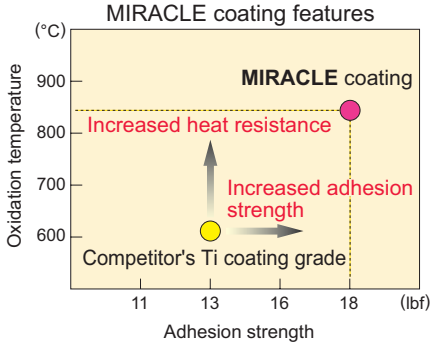
The highest hardness cemented carbide substrate suitable for CVD coating. For reduced plastic deformation and improved dimensional accuracy of components.

Features of MIRACLE Coating

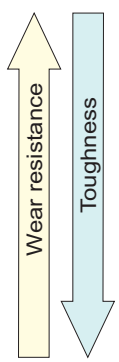
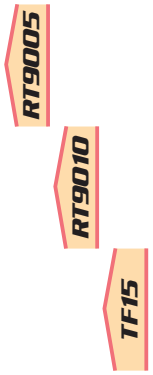


Micro-structure of ***VP10RT***

MIRACLE coating features



Application range for titanium alloys machining

Properties	Titanium Alloys
	

● Cemented carbide grade *RT9005*
Unmatched resistance to heat and plastic deformation.
Ideal for wear resistant high-speed machining.

● Cemented carbide grade *RT9010*
Good balance of wear and fracture resistance.
First choice for turning of titanium alloys.

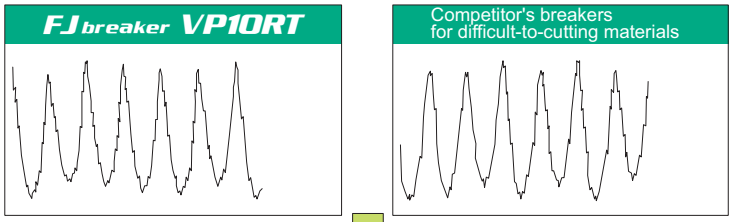
● Cemented carbide grade *TF15*
High-strength micro-grain cemented carbide grade.
Ideal for interrupted cutting that requires high fracture resistance.

FJ/MJ/GJ/MS
FJ-P/MJ-P breaker

Cutting performance of FJ breaker

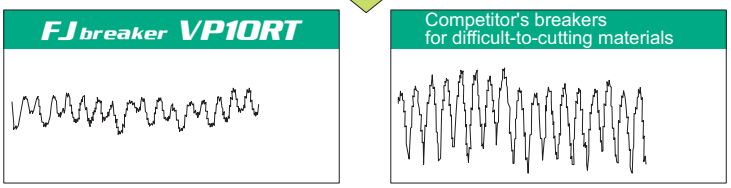
● Finished surface comparison on Inconel 718

Feed .006 IPR

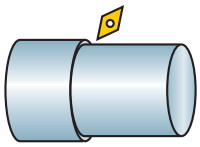


Rz=.236 μinch　　Rz=.295 μinch

Feed .002 IPR



Rz=.094 μinch　　Rz=.185 μinch



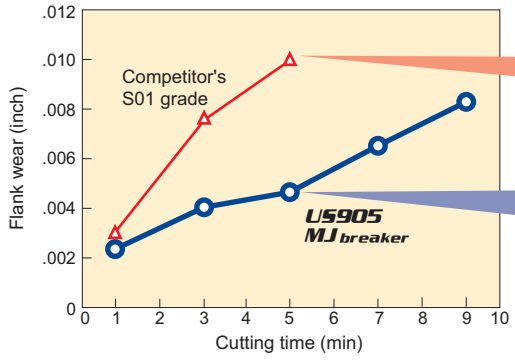
Inconel 718

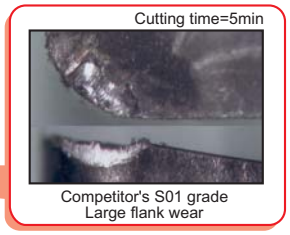
<Cutting conditions>
Holder : MDJNL-163
Insert : DNGG432FJ (VP10RT)
Cutting speed : 130 SFM
Depth of cut : .028 inch
Coolant : Wet (water soluble oil)

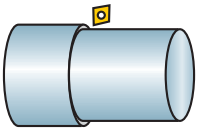
The sharp cutting edges of the FJ breaker in fine feed turning ensure high quality surface finishes.

Cutting performance of MJ breaker

● High speed turning of Inconel 718
US905 with unmatched wear resistance.







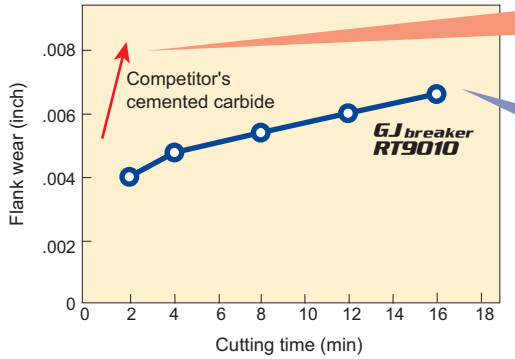
Inconel 718

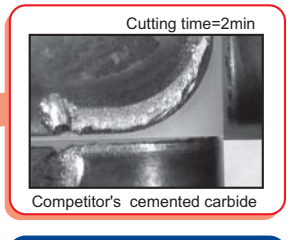
<Cutting conditions>
Insert : CNMG432MJ
Holder : MCLNL-163
Cutting speed : 295 SFM
Feed : .006 IPR
Depth of cut : .020 inch
Coolant : Wet (water soluble oil)

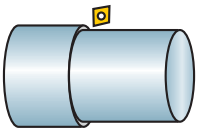
- Unequalled cutting edge sharpness for M class inserts. Provides excellent wear resistance due to a combination of M class accuracy and the coated carbide grade US905.
- Excellent for workpieces and machines lacking rigidity.
- Ideal for stainless steel turning with the combination of M class accuracy and the coated carbide grade VP10RT.

Cutting performance of GJ breaker

● Titanium alloy (Ti-6Al-4V)
GJ breaker for excellent wear & fracture resistance.







Titanium alloy (Ti-6Al-4V)

<Cutting conditions>
Insert : CNMG432GJ
Holder : MCLNL-163
Cutting speed : 165 SFM
Feed : .010 IPR
Depth of cut : .079 inch
Coolant : Wet (water soluble oil)

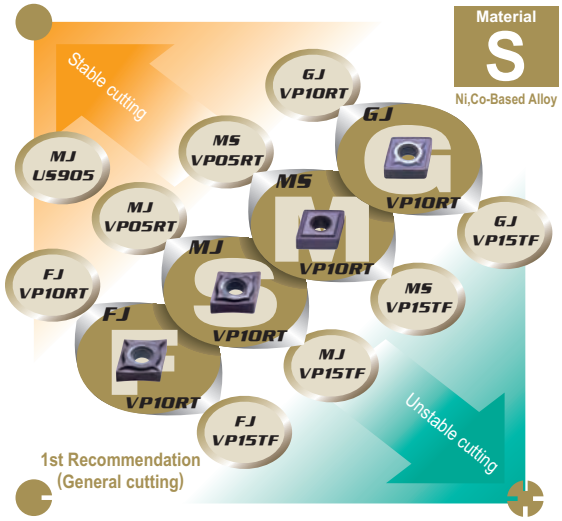
Recommended cutting conditions

Cutting conditions

Stable cutting	Continuous cutting Constant depth of cut machining Pre-machined Securely clamped component machining
General cutting	
Unstable cutting	Heavy interrupted cutting Irregular depth of cut machining Low clamping rigidity machining

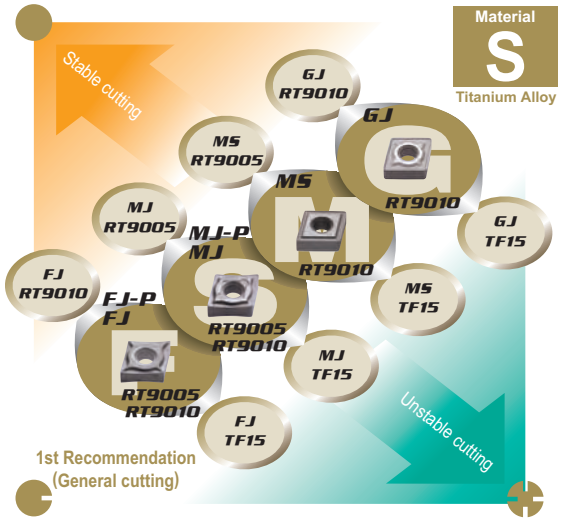
Cutting area

F	Finish cutting
S	Light cutting
M	Medium cutting
G	Semi-heavy cutting



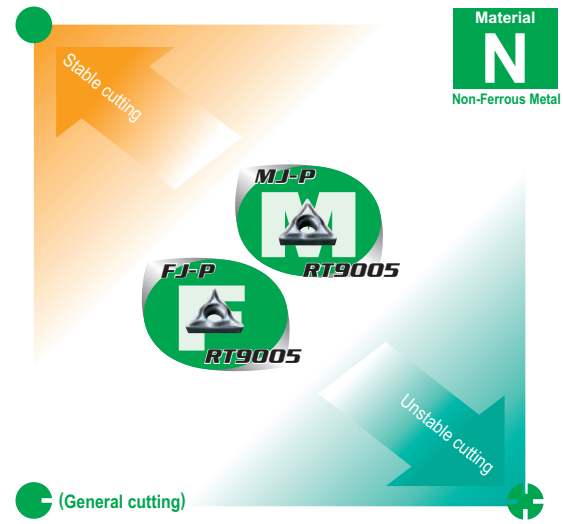
INSERTS FOR HEAT-RESISTANT ALLOY

Cutting area	Breaker	Cutting speed (SFM)	Feed (IPR)	Depth of cut (inch)
Finish cutting	FJ	65—250	—.008	—.032
Finish cutting I Medium cutting	MJ	65—200	—.008	.020—.070
Medium cutting	MS	65—200	.004—.010	.020—.100
Semi-heavy cutting	GJ	65—170	.006—.012	.040—.125



INSERTS FOR TITANIUM ALLOY

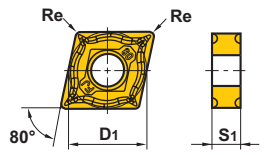
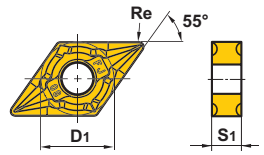
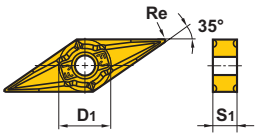
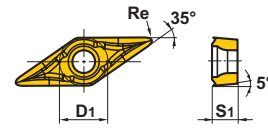
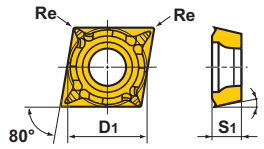
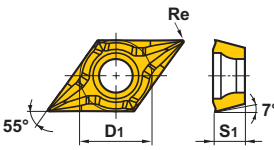
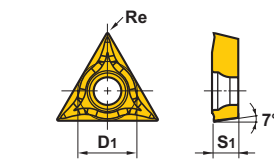
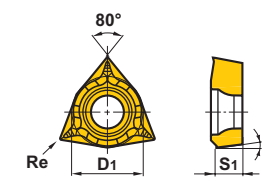
Cutting area	Breaker	Cutting speed (SFM)	Feed (IPR)	Depth of cut (inch)
Finish cutting	FJ-P FJ	65—250	—.008	—.032
Finish cutting I Medium cutting	MJ-P MJ	65—200	—.008	.020—.070
Medium cutting	MS	65—200	.004—.010	.020—.100
Semi-heavy cutting	GJ	65—170	.006—.012	.040—.125



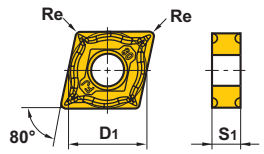
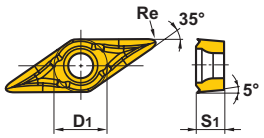
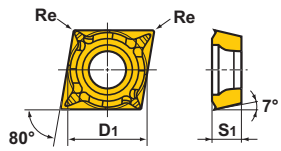
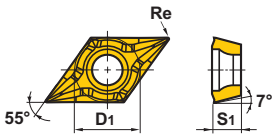
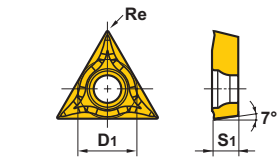
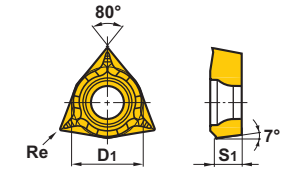
INSERTS FOR ALUMINUM ALLOY

Cutting area	Breaker	Cutting speed (SFM)	Feed (IPR)	Depth of cut (inch)
Finish cutting	FJ-P	200—3300	—.006	—.032
Finish cutting I Medium cutting	MJ-P	650—2000	—.012	.010—.175

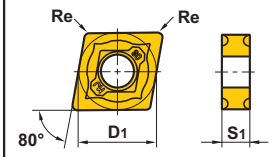
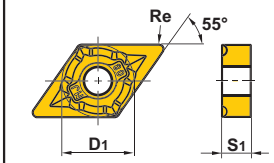
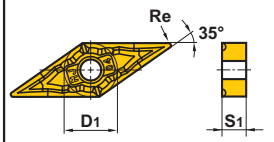
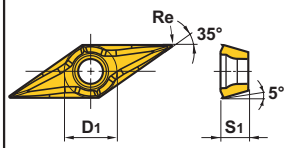
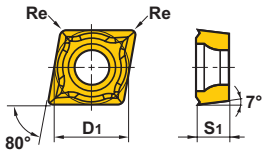
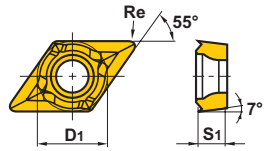
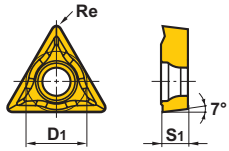
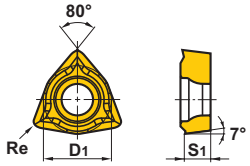
Special breakers for difficult-to-cut materials

Type	Geometry	Order Number	(ISO) Number	Class	Coating				Carbide				Dimensions (inch)		
					US905	VP05RT	VP10RT	VP15TF	RT9005	RT9010	TF15	HTi10	D1	S1	Re
FJ (Finish Cutting / G Class)		CNGG43V5FJ	CNGG1204V5-FJ	G			●			□			.500	.188	.002
		430.2FJ	120401-FJ	G			●			□			.500	.188	.004
		430.5FJ	120402-FJ	G			●			□			.500	.188	.008
		431FJ	120404-FJ	G			●	★		★	★	□	.500	.188	.016
		432FJ	120408-FJ	G			●	●		●	★	□	.500	.188	.031
		DNGG431FJ	DNGG150404-FJ	G			★	★		★	★	□	.500	.188	.016
		432FJ	150408-FJ	G			●	●		●	★	□	.500	.188	.031
		VNGG33V5FJ	VNGG1604V5-FJ	G			●			●			.375	.188	.002
		330.2FJ	160401-FJ	G			●			●			.375	.188	.004
		330.5FJ	160402-FJ	G			●			●			.375	.188	.008
		VBGT33V5FJ	VBGT1604V5-FJ	G			●						.375	.188	.002
		330.2FJ	160401-FJ	G			●						.375	.188	.004
		330.5FJ	160402-FJ	G			●						.375	.188	.008
		CCGT21.5V5FJ	CCGT0602V5-FJ	G			●						.250	.094	.002
		21.50.2FJ	060201-FJ	G			●						.250	.094	.004
		21.50.5FJ	060202-FJ	G			●						.250	.094	.008
		32.5V5FJ	09T3V5-FJ	G			●						.375	.156	.002
		32.50.2FJ	09T301-FJ	G			●			□			.375	.156	.004
		32.50.5FJ	09T302-FJ	G			●			□			.375	.156	.008
		32.51FJ	09T304-FJ	G			●			□			.375	.156	.016
		DCGT21.5V5FJ	DCGT0702V5-FJ	G			●						.250	.094	.002
		21.50.2FJ	070201-FJ	G			●						.250	.094	.004
		21.50.5FJ	070202-FJ	G			●						.250	.094	.008
		32.5V5FJ	11T3V5-FJ	G			●						.375	.156	.002
		32.50.2FJ	11T301-FJ	G			●						.375	.156	.004
		32.50.5FJ	11T302-FJ	G			●						.375	.156	.008
		TCGT21.5V5FJ	TCGT1102V5-FJ	G			●						.250	.094	.002
		21.50.2FJ	110201-FJ	G			●						.250	.094	.004
		21.50.5FJ	110202-FJ	G			●						.250	.094	.008
		32.5V5FJ	16T3V5-FJ	G			●						.375	.156	.002
		32.50.2FJ	16T301-FJ	G			●						.375	.156	.004
		32.50.5FJ	16T302-FJ	G			●						.375	.156	.008
		WCGT21.5V5FJ	WCGT0402V5-FJ	G			●						.250	.094	.002
		21.50.2FJ	040201-FJ	G			●						.250	.094	.004
		21.50.5FJ	040202-FJ	G			●						.250	.094	.008
		32.5V5FJ	06T3V5-FJ	G			●						.375	.156	.002
		32.50.2FJ	06T301-FJ	G			●						.375	.156	.004
		32.50.5FJ	06T302-FJ	G			●						.375	.156	.008

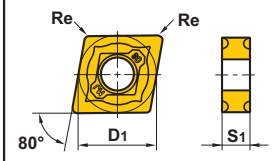
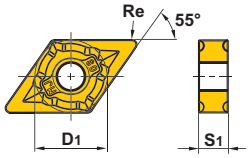
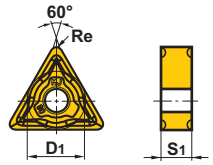
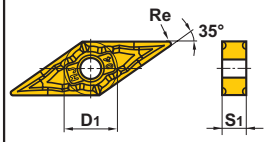
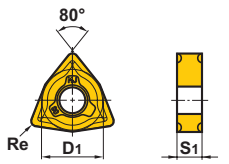
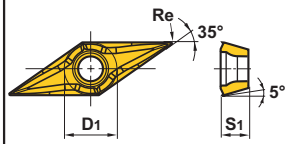
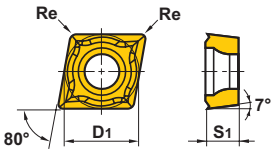
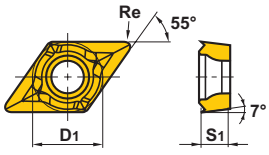
● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.

Type	Geometry	Order Number	(ISO) Number	Class	Coating				Carbide				Dimensions (inch)		
					US905	VP05RT	VP10RT	VP15TF	RT9005	RT9010	TF15	HTi10	D1	S1	Re
FJ-P (Finish Cutting / G Class)		**CNGG43V5FJ-P**	**CNGG1204V5-FJ-P**	G					●				.500	.188	.002
		430.2FJ-P	**120401-FJ-P**	G					●				.500	.188	.004
		430.5FJ-P	**120402-FJ-P**	G					●				.500	.188	.008
		**VBGT33V5-FJ-P**	**VBGT1604V5-FJ-P**	G					●				.375	.188	.002
		330.2FJ-P	**160401-FJ-P**	G					●				.375	.188	.004
		330.5FJ-P	**160402-FJ-P**	G					●				.375	.188	.008
		**CCGT21.5V5FJ-P**	**CCGT0602V5-FJ-P**	G					●				.250	.094	.002
		21.50.2FJ-P	**060201-FJ-P**	G					●				.250	.094	.004
		21.50.5FJ-P	**060202-FJ-P**	G					●				.250	.094	.008
		32.5V5FJ-P	**09T3V5-FJ-P**	G					●				.375	.156	.002
		32.50.2FJ-P	**09T301-FJ-P**	G					●				.375	.156	.004
		32.50.5FJ-P	**09T302-FJ-P**	G					●				.375	.156	.008
		32.51FJ-P	**09T304-FJ-P**	G					●				.375	.156	.016
		**DCGT21.5V5FJ-P**	**DCGT0702V5-FJ-P**	G					●				.250	.094	.002
		21.50.2FJ-P	**070201-FJ-P**	G					●				.250	.094	.004
		21.50.5FJ-P	**070202-FJ-P**	G					●				.250	.094	.008
		32.5V5FJ-P	**11T3V5-FJ-P**	G					●				.375	.156	.002
		32.50.2FJ-P	**11T301-FJ-P**	G					●				.375	.156	.004
		32.50.5FJ-P	**11T302-FJ-P**	G					●				.375	.156	.008
		**TCGT21.5V5FJ-P**	**TCGT1102V5-FJ-P**	G					●				.250	.094	.002
		21.50.2FJ-P	**110201-FJ-P**	G					●				.250	.094	.004
		21.50.5FJ-P	**110202-FJ-P**	G					●				.250	.094	.008
		32.5V5FJ-P	**16T3V5-FJ-P**	G					●				.375	.156	.002
		32.50.2FJ-P	**16T301-FJ-P**	G					●				.375	.156	.004
		32.50.5FJ-P	**16T302-FJ-P**	G					●				.375	.156	.008
		**WCGT21.5V5FJ-P**	**WCGT0402V5-FJ-P**	G					●				.250	.094	.002
		21.50.2FJ-P	**040201-FJ-P**	G					●				.250	.094	.004
		21.50.5FJ-P	**040202-FJ-P**	G					●				.250	.094	.008
		32.5V5FJ-P	**06T3V5-FJ-P**	G					●				.375	.156	.002
		32.50.2FJ-P	**06T301-FJ-P**	G					●				.375	.156	.004
		32.50.5FJ-P	**06T302-FJ-P**	G					●				.375	.156	.008

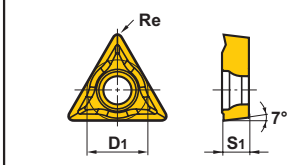
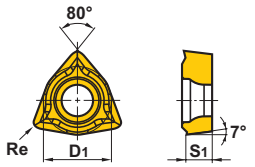
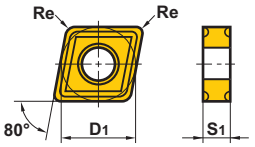
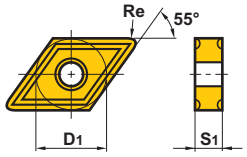
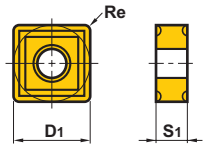
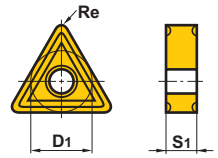
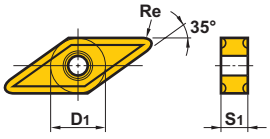
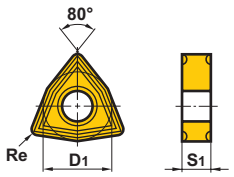
Special breakers for difficult-to-cut materials

Type	Geometry	Order Number	(ISO) Number	Class	Coating				Carbide				Dimensions (inch)		
					US905	VP05RT	VP10RT	VP15TF	RT9005	RT9010	TF15	HTi10	D1	S1	Re
MJ (Finish - Medium Cutting / G Class)		**CNGG431MJ**	**CNGG120404-MJ**	G			●	●		●	★	●	.500	.188	.016
		432MJ	**120408-FJ**	G			●	●		●	★	●	.500	.188	.031
		**DNGM431MJ**	**DNGM150404-MJ**	G			●	★		●	★	●	.500	.188	.016
		432MJ	**150408-MJ**	G			●	★		●	★	●	.500	.188	.031
		**VNGM331MJ**	**VNGM160404-MJ**	G			●			●			.375	.188	.016
		332MJ	**160408-MJ**	G			●			●			.375	.188	.031
		431MJ	**220404-MJ**	G			●			●			.500	.188	.016
		432MJ	**220408-MJ**	G			●			●			.500	.188	.031
		**VBGT331MJ**	**VBGT160404-MJ**	G			●						.375	.188	.016
		332MJ	**160408-MJ**	G			●						.375	.188	.031
		**CCGT21.51MJ**	**CCGT060204-MJ**	G			●						.250	.094	.016
		32.52MJ	**09T308-MJ**	G			●						.375	.156	.031
		**DCGT21.51MJ**	**DCGT070204-MJ**	G			●						.250	.094	.016
		32.51MJ	**11T304-MJ**	G			●						.375	.156	.016
		32.52MJ	**11T308-MJ**	G			●						.375	.156	.031
		**TCGT21.51MJ**	**TCGT110204-MJ**	G			●						.250	.094	.016
		32.51MJ	**16T304-MJ**	G			●						.375	.156	.016
		32.52MJ	**16T308-MJ**	G			●						.375	.156	.031
		**WCGT21.51MJ**	**WCGT040204-MJ**	G			●						.250	.094	.016
		32.51MJ	**06T304-MJ**	G			●						.375	.156	.016
		32.52MJ	**06T308-MJ**	G			●						.375	.156	.031

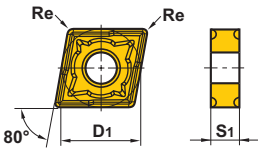
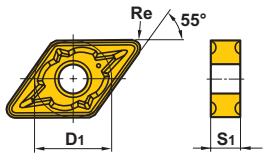
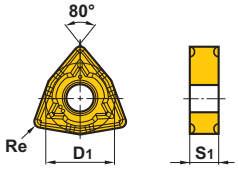
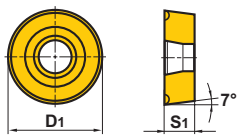
● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.

Type	Geometry	Order Number	(ISO) Number	Class	Coating				Carbide				Dimensions (inch)		
					US905	VP05RT	VP10RT	VP15TF	RT9005	RT9010	TF15	HTi10	D1	S1	Re
MJ (Finish - Medium Cutting / M Class)		**CNMG431MJ**	**CNMG120404-MJ**	M	★	●	●		□	●			.500	.188	.016
		432MJ	**120408-MJ**	M	★	●	●		□	●			.500	.188	.031
		433MJ	**120412-MJ**	M	★	★	★						.500	.188	.047
		434MJ	**120416-MJ**	M	★	★	★						.500	.188	.063
		**DNMG431MJ**	**DNMG150404-MJ**	M	★	●	●		□	●			.500	.188	.016
		432MJ	**150408-MJ**	M	★	●	●		□	●			.500	.188	.031
		433MJ	**150412-MJ**	M	★	★	★						.500	.188	.047
		434MJ	**150416-MJ**	M	★	★	★						.500	.188	.063
		441MJ	**150604-MJ**	M	★	★	★						.500	.250	.016
		442MJ	**150608-MJ**	M	★	★	★						.500	.250	.031
		443MJ	**150612-MJ**	M	★	★	★						.500	.250	.047
		444MJ	**150616-MJ**	M	★	★	★						.500	.250	.063
		**TNMG331MJ**	**TNMG160404-MJ**	M	★	●	●		□	●			.375	.188	.016
		332MJ	**160408-MJ**	M	★	●	●		●	●			.375	.188	.031
		333MJ	**160412-MJ**	M	★	★	★						.375	.188	.047
		**VNMG331MJ**	**VNMG160404-MJ**	M	★	●	●		□	●			.375	.188	.016
		332MJ	**160408-MJ**	M	★	●	●		□	●			.375	.188	.031
		333MJ	**160412-MJ**	M	★	★	★						.375	.188	.047
		**WNMG432MJ**	**WNMG080408-MJ**	M	★	★	★						.500	.188	.031
		433MJ	**080412-MJ**	M	★	★	★						.500	.188	.047
		434MJ	**080416-MJ**	M	★	★	★						.500	.188	.063
MJ-P (Finish - Medium Cutting / G Class)		**VBGT331MJ-P**	**VBGT160404-MJ-P**	G					●				.375	.188	.016
		332MJ-P	**160408-MJ-P**	G					●				.375	.188	.031
		**CCGT21.51MJ-P**	**CCGT060204-MJ-P**	G					●				.250	.094	.016
		32.52MJ-P	**09T308-MJ-P**	G					●				.375	.156	.031
		**DCGT21.51MJ-P**	**DCGT070204-MJ-P**	G					●				.250	.094	.016
		32.51MJ-P	**11T304-MJ-P**	G					●				.375	.156	.016
		32.52MJ-P	**11T308-MJ-P**	G					●				.375	.156	.031

Special breakers for difficult-to-cut materials

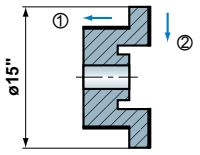
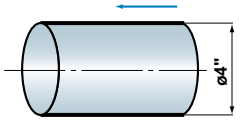
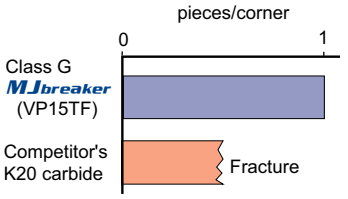
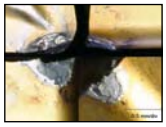
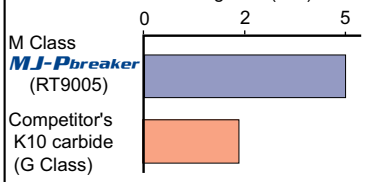
Type	Geometry	Order Number	(ISO) Number	Class	Coating				Carbide				Dimensions (inch)		
					US905	VP05RT	VP10RT	VP15TF	RT9005	RT9010	TF15	HTi10	D1	S1	Re
MJ-P (Finish - Medium Cutting / G Class)		TCGT21.51MJ-P	TCGT110204-MJ-P	G					●				.250	.094	.016
		32.51MJ-P	16T304-MJ-P	G					●				.375	.156	.016
		32.52MJ-P	16T308-MJ-P	G					●				.375	.156	.031
		WCGT21.51MJ-P	WCGT040204-MJ-P	G					●				.250	.094	.016
		32.51MJ-P	06T304-MJ-P	G					●				.375	.156	.016
		32.52MJ-P	06T308-MJ-P	G					●				.375	.156	.031
MS (Medium Cutting / M Class)		CNMG431MS	CNMG120404-MS	M		●	●	●	□	●	★	★	.500	.188	.016
		432MS	120408-MS	M		●	●	●	□	●	★	★	.500	.188	.031
		433MS	120412-MS	M		★	●	●	□	★	★		.500	.188	.047
		DNMG431MS	DNMG150404-MS	M		●	●	●	□	●	★		.500	.188	.016
		432MS	150408-MS	M		●	●	●	□	●	★		.500	.188	.031
		433MS	150412-MS	M		★	★	★	□	★	★		.500	.188	.047
		SNMG431MS	SNMG150404-MS	M						●			.500	.188	.016
		432MS	150408-MS	M		★	★	★	□	●	□	□	.500	.188	.031
		433MS	150412-MS	M		★	★	★	□	★	□		.500	.188	.047
		TNMG331MS	TNMG160404-MS	M		●	●	★	□	★	□		.375	.188	.016
		332MS	160408-MS	M		●	●	★	□	●	□	★	.375	.188	.031
		432MS	220408-MS	M		●	●	□	□	●	□		.500	.188	.031
		VNMG331MS	VNMG160404-MS	M		●	●		□	●			.375	.188	.016
		332MS	160408-MS	M		★	●		□	●			.375	.188	.031
		WNMG431MS	WNMG080404-MS	M		●	●	●		●		□	.500	.188	.016
		432MS	080408-MS	M		●	●	●	□	●	□		.500	.188	.031

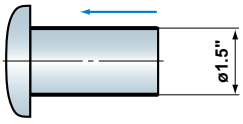
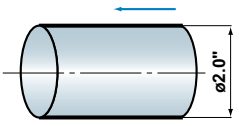
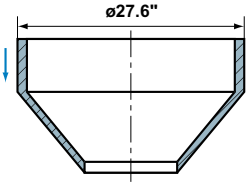
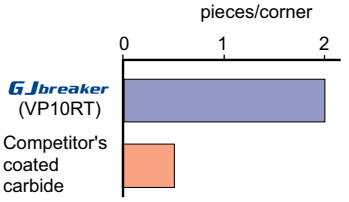
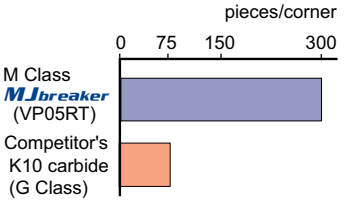
● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.

Type	Geometry	Order Number	(ISO) Number	Class	Coating				Carbide				Dimensions (inch)		
					US905	VP05RT	VP10RT	VP15TF	RT9005	RT9010	TF15	HTi10	D1	S1	Re
GJ (Semi-heavy Cutting / M Class)		**CNMG432GJ**	**CNMG120408-GJ**	M			●	●		●	★		.500	.188	.031
		433GJ	**120412-GJ**	M			●	●		●	★		.500	.188	.047
		434GJ	**120416-GJ**	M			★	★		★	★		.500	.188	.063
		543GJ	**160612-GJ**	M			●			●			.625	.250	.047
		643GJ	**190612-GJ**	M			●			●			.750	.250	.047
		644GJ	**190616-GJ**	M			●			●			.750	.250	.063
		**DNMG432GJ**	**DNMG150408-GJ**	M			●	●		●	★		.500	.188	.031
		433GJ	**150412-GJ**	M			●	●		●	★		.500	.188	.047
		434GJ	**150416-GJ**	M			★	★		★	★		.500	.188	.063
		**WNMG432GJ**	**WNMG080408-GJ**	M			●			●			.500	.188	.031
		433GJ	**080412-GJ**	M			●			●			.500	.188	.047
		434GJ	**080416-GJ**	M			●			●			.500	.188	.063
		543GJ	**100612-GJ**	M			●			●			.625	.250	.047
RCMX-Standard (Medium Cutting / M Class)		**RCMM1003**	**RCMX1003M0**	M	★	★	★						.394	.125	–
		1204	**1204M0**	M	★	★	★						.472	.188	–
		1606	**1606M0**	M	★	★	★						.630	.250	–

Special breakers for difficult-to-cut materials

Application Examples

Insert (Grade)		CNGG432MJ(VP15TF)	CNMG432MJ(US905)	DCGT32.52MJ-P(RT9005)
Work Material		Ring (Inconel 718) 	Inconel 718 	Titanium alloy 
Cutting Conditions	Cutting Speed (SFM)	①160(Continuous) ②100(Interrupted)	295	230
	Feed (IPR)	.004	.010	.008
	Depth of Cut (inch)	.012	.012	.039
	Coolant	Wet	WSO	Wet
Result		pieces/corner  MJ breaker did not suffer from fracture. Stable machining was possible with the MJ breaker.	M Class MJbreaker (US905) Cutting length :39.4 inch  Competitor's S01 coating Cutting length :26.8inch 	Cutting time (min)  MJ-P breaker displayed double the tool life.

Insert (Grade)		CNMG432GJ(VP10RT)	TNMG332MJ(VP05RT)	RCMM1204(VP05RT)
Work Material		Pin (Inconel 718) 	Sintered iron components 	Case (Inconel 718) 
Cutting Conditions	Cutting Speed (SFM)	100	395	150
	Feed (IPR)	.008	.002	.008
	Depth of Cut (inch)	.091	.020	.031
	Coolant	WSO	Wet	Wet
Result		pieces/corner  GJ breaker achieved four times longer tool life. GJ breaker also exhibited excellent chip disposal properties.	pieces/corner  MJ breaker achieved four times longer tool life.	Standard breaker RCMX insert (VP05RT) Cutting time:11min  Competitor's S01 coating Cutting time:9min  Normal wear, further use of the insert is possible.

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.

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