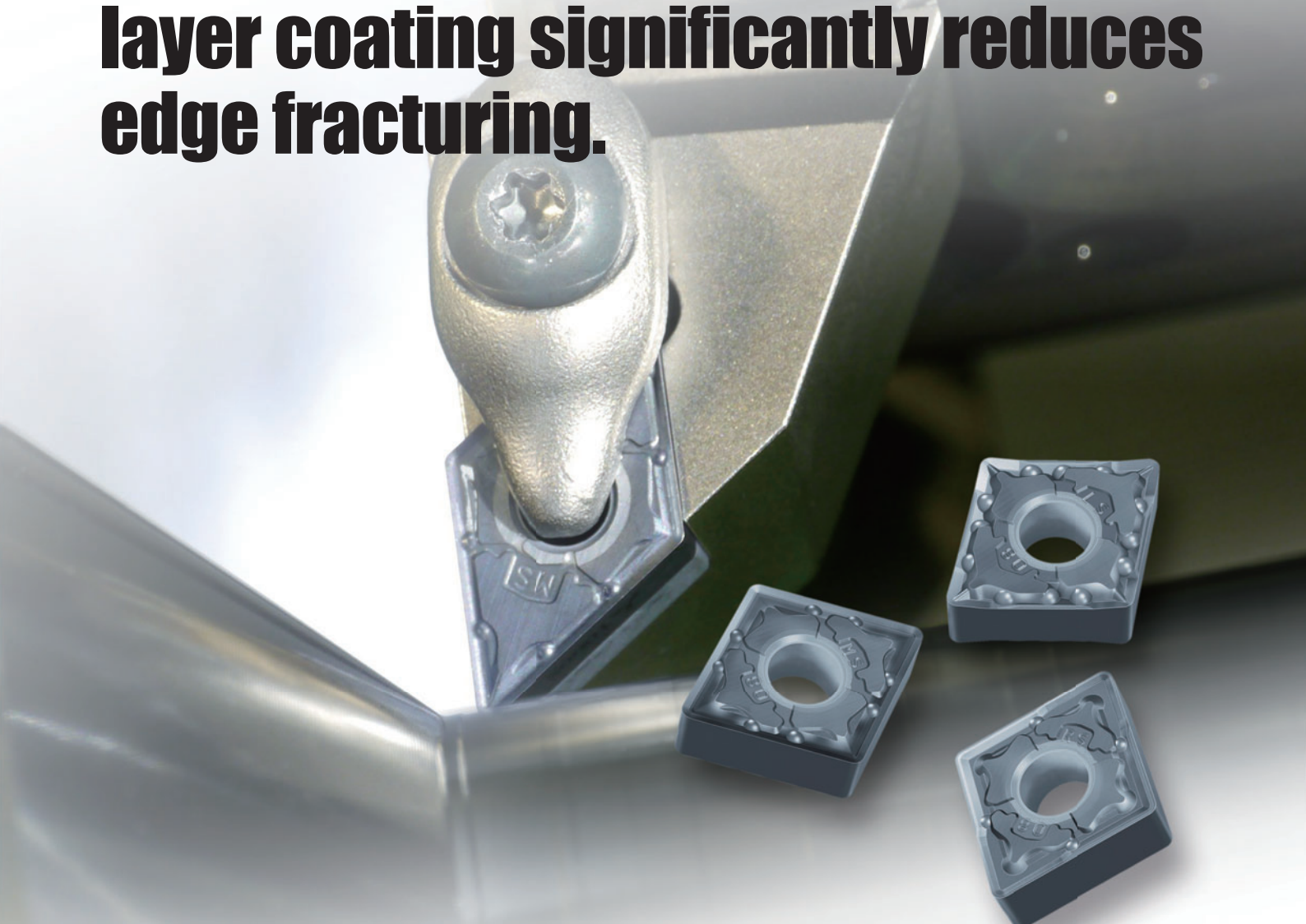


ISO Turning Inserts for Difficult-to-cut Materials



Item
Expansion

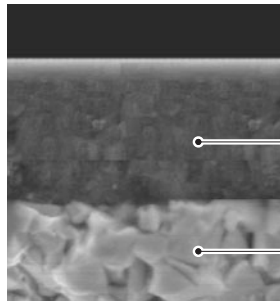
The new high Al-rich (Al,Ti)N single layer coating significantly reduces edge fracturing.



MP9005
MP9015
MT9005
MT9015 **+** ***FS/LS***
MS/RS

ISO Turning Inserts for Difficult-to-cut Materials

PVD Coated Grade *MP9005/MP9015*



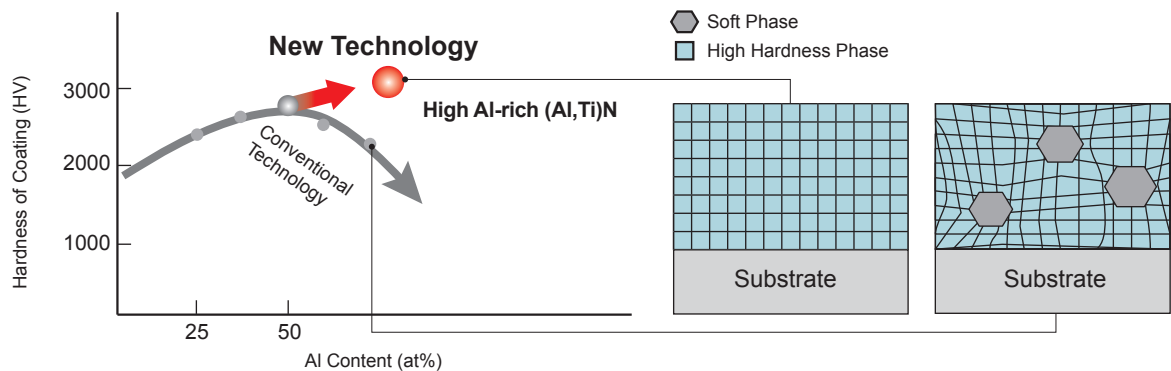
High Al-rich (Al,Ti)N Single Layer Coating Technology

Special Cemented Carbide Substrate

MP9005/MP9015

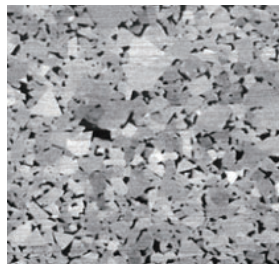
High Al and Conventional Coating Comparison

The new technology 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.



ISO Grade	Grade	Concept	Application
S01	<i>MP9005</i>	Top-quality grade focusing on wear resistance.	Heat Resistant Alloys Finish-Medium Cutting
S10	<i>MP9015</i>	First recommendation for general applications.	Heat Resistant Alloys Medium-Rough Cutting

Carbide Grade (Non Coated) *MT9005/MT9015*

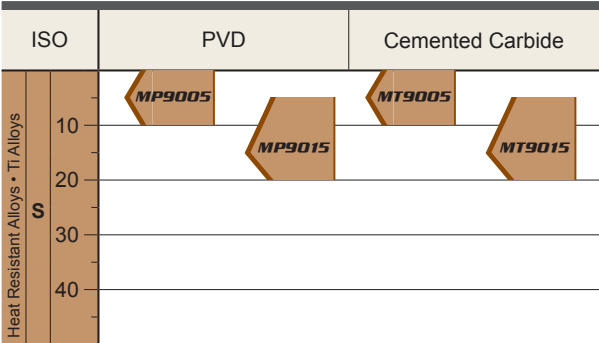


MT9005



MT9015

Application Range



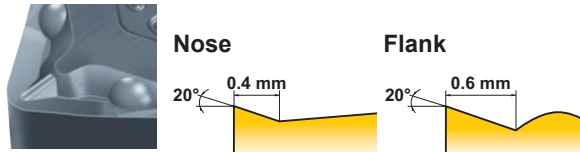
ISO Grade	Grade	Concept	Application
S01	<i>MT9005</i>	New cemented carbide with unmatched resistance to heat and plastic deformation.	Titanium Alloys High Speed Cutting
S10	<i>MT9015</i>	New cemented carbide with sharp cutting edge, excellent wear and fracture resistance.	Titanium Alloys General Cutting

New Chip Breaker System

Negative Inserts

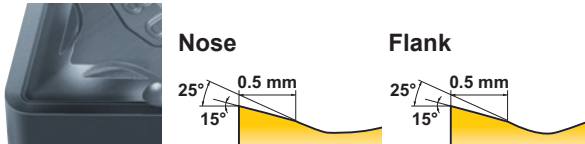
LS Breaker for Light Cutting

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



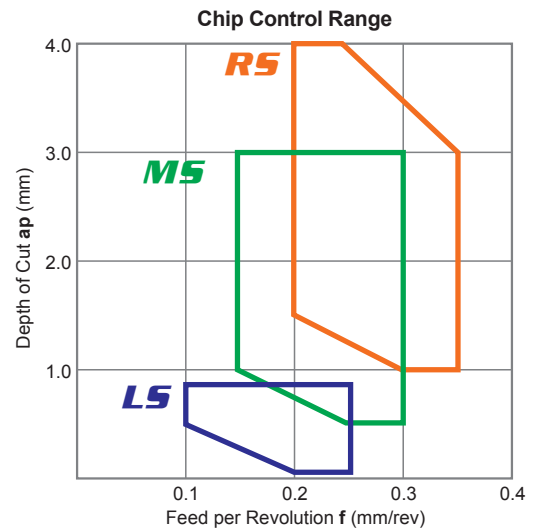
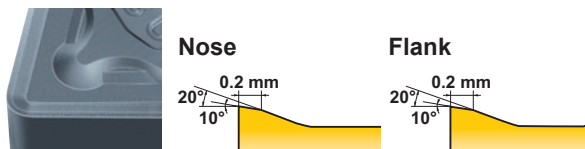
MS Breaker Newly Designed for Medium Cutting

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



RS Breaker for Rough Cutting

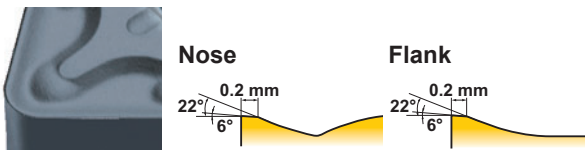
During low speed cutting the positive land controls chip welding and abrasion at the depth of cut line.



The chip breaker control range was tested for optimum chip evacuation when cutting Inconel718 with a CNMG120408 insert.

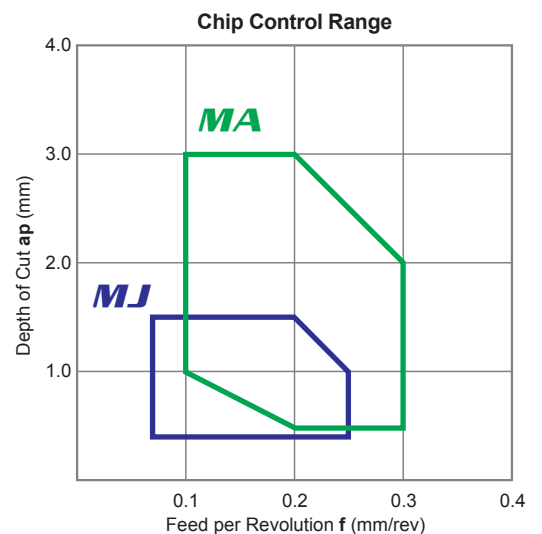
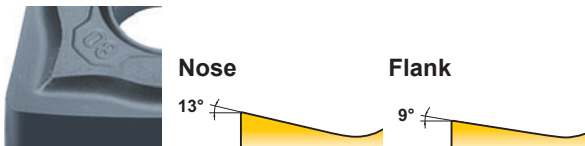
NEW MABreaker Multi-assist Breaker

Suitable for medium cutting range.



NEW MJBreaker Sub Breaker

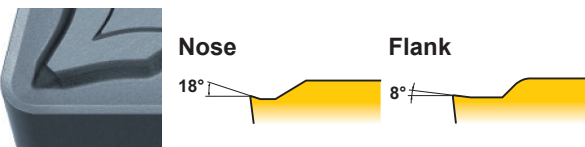
Alternative chip breaker of main chip breaker LS and MS. Excellent notch wear resistance for light to medium cutting.



Positive Inserts

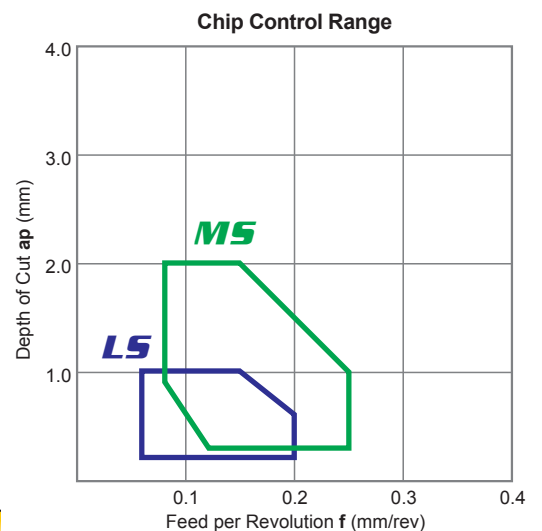
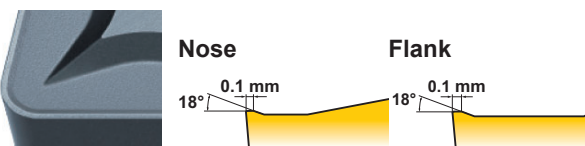
LS Breaker for Light Cutting

Prevents welding of the insert and controls white turbidity of the surface finish.



MS Breaker for Medium Cutting

A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depth of cut.



The chip breaker control range was tested for optimum chip evacuation when cutting Inconel718 with a DCMT11T304 insert.

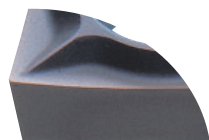
New Precision Chip Breaker System

Positive Inserts

FS/FS-P Breaker for Finish Cutting

NEW

FS



First Recommendation for Finish Cutting of Difficult-to-cut Materials

Ideal for heat resistant alloys, titanium alloys, and cobalt chromium alloys. Sharp cutting edges provide excellent surface precision and finish. Highly efficient chip discharge is possible due to curved cutting edges.

NEW

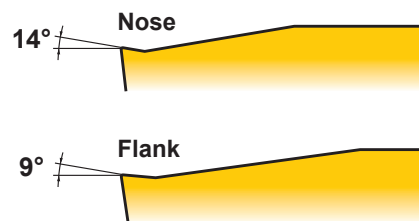
FS-P



Mirror Finish

First Recommendation for Finish Cutting of Titanium Alloys

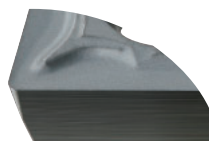
Ideal for titanium alloys and copper alloys. Sharp cutting edges provide excellent surface precision. Highly efficient chip discharge is possible due to curved cutting edges. Polished (mirror-surface) finish of insert surfaces drastically improves welding resistance extending tool life.



LS/LS-P Breaker for Light Cutting

NEW

LS



First Recommendation for Light Cutting of Difficult-to-cut Materials

Ideal for heat resistant alloys, titanium alloys, and cobalt chromium alloys. Designed with parallel cutting edges. Achieves stable chip control over a wide range from low to medium depths of cut.

NEW

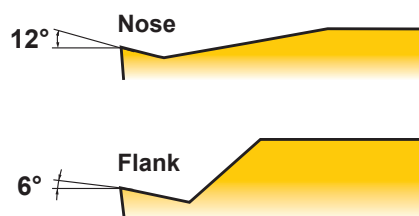
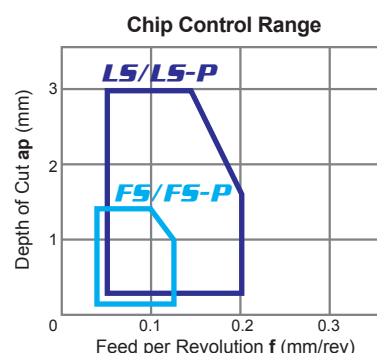
LS-P



Mirror Finish

First Recommendation for Light Cutting of Titanium Alloys

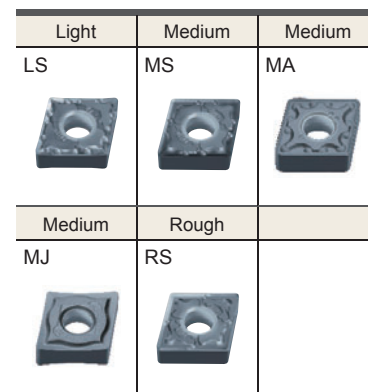
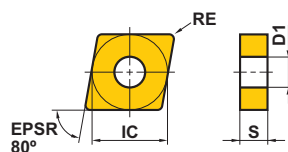
Ideal for titanium alloys and copper alloys. Designed with parallel cutting edges. Achieves stable chip control over a wide range from low to medium depths of cut. Polished (mirror-surface) finish of insert surfaces drastically improves welding resistance extending tool life.



Negative Inserts (With Hole)

M Class

CNMG



(mm)

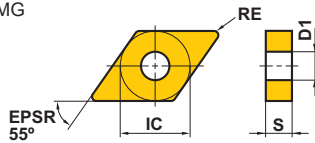
Order Number	Cutting Area	MP9005	MP9015	MT9015	IC	S	RE	D1
NEW CNMG090304-LS	L	●	●		9.525	3.18	0.4	3.81
NEW CNMG090308-LS	L	●	●		9.525	3.18	0.8	3.81
NEW CNMG120402-LS	L	●	●	●	12.7	4.76	0.2	5.16
CNMG120404-LS	L	●	●	●	12.7	4.76	0.4	5.16
CNMG120408-LS	L	●	●	●	12.7	4.76	0.8	5.16
NEW CNMG090304-MS	M	●	●		9.525	3.18	0.4	3.81
NEW CNMG090308-MS	M	●	●		9.525	3.18	0.8	3.81
CNMG120404-MS	M	●	●	●	12.7	4.76	0.4	5.16
CNMG120408-MS	M	●	●	●	12.7	4.76	0.8	5.16
CNMG120412-MS	M	●	●	●	12.7	4.76	1.2	5.16
CNMG160612-MS	M	●	●	●	15.875	6.35	1.2	6.35
CNMG160616-MS	M	●	●	●	15.875	6.35	1.6	6.35
NEW CNMG120404-MA	M		●		12.7	4.76	0.4	5.16
NEW CNMG120408-MA	M		●		12.7	4.76	0.8	5.16
NEW CNMG120412-MA	M		●		12.7	4.76	1.2	5.16
NEW CNMG120416-MA	M		●		12.7	4.76	1.6	5.16
NEW CNMG120404-MJ	M	●	●		12.7	4.76	0.4	5.16
NEW CNMG120408-MJ	M	●	●		12.7	4.76	0.8	5.16
NEW CNMG120412-MJ	M	●	●		12.7	4.76	1.2	5.16
NEW CNMG120416-MJ	M	●	●		12.7	4.76	1.6	5.16
CNMG120408-RS	R		●	●	12.7	4.76	0.8	5.16
CNMG120412-RS	R		●	●	12.7	4.76	1.2	5.16
CNMG120416-RS	R		●	●	12.7	4.76	1.6	5.16
CNMG160612-RS	R		●	●	15.875	6.35	1.2	6.35
CNMG160616-RS	R		●	●	15.875	6.35	1.6	6.35
CNMG190612-RS	R		●	●	19.05	6.35	1.2	7.93
CNMG190616-RS	R		●	●	19.05	6.35	1.6	7.93

ISO Turning Inserts for Difficult-to-cut Materials

Negative Inserts (With Hole)

M Class

DNMG



Light	Medium	Medium
LS	MS	MA
Medium	Rough	
MJ	RS	

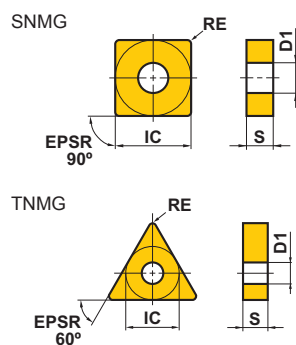
(mm)

Order Number	Cutting Area	MP9005	MP9015	MT9015	IC	S	RE	D1
NEW DNMG150402-LS	L	●	●	●	12.7	4.76	0.2	5.16
DNMG150404-LS	L	●	●	●	12.7	4.76	0.4	5.16
DNMG150408-LS	L	●	●	●	12.7	4.76	0.8	5.16
DNMG150604-LS	L	●	●	●	12.7	6.35	0.4	5.16
DNMG150608-LS	L	●	●	●	12.7	6.35	0.8	5.16
DNMG150404-MS	M	●	●	●	12.7	4.76	0.4	5.16
DNMG150408-MS	M	●	●	●	12.7	4.76	0.8	5.16
DNMG150412-MS	M	●	●	●	12.7	4.76	1.2	5.16
DNMG150604-MS	M	●	●	●	12.7	6.35	0.4	5.16
DNMG150608-MS	M	●	●	●	12.7	6.35	0.8	5.16
DNMG150612-MS	M	●	●	●	12.7	6.35	1.2	5.16
NEW DNMG150404-MA	M		●		12.7	4.76	0.4	5.16
NEW DNMG150408-MA	M		●		12.7	4.76	0.8	5.16
NEW DNMG150412-MA	M		●		12.7	4.76	1.2	5.16
NEW DNMG150604-MA	M		●		12.7	6.35	0.4	5.16
NEW DNMG150608-MA	M		●		12.7	6.35	0.8	5.16
NEW DNMG150612-MA	M		●		12.7	6.35	1.2	5.16
NEW DNMG150404-MJ	M	●	●		12.7	4.76	0.4	5.16
NEW DNMG150408-MJ	M	●	●		12.7	4.76	0.8	5.16
NEW DNMG150412-MJ	M	●	●		12.7	4.76	1.2	5.16
NEW DNMG150416-MJ	M	●	●		12.7	4.76	1.6	5.16
NEW DNMG150604-MJ	M	●	●		12.7	6.35	0.4	5.16
NEW DNMG150608-MJ	M	●	●		12.7	6.35	0.8	5.16
NEW DNMG150612-MJ	M	●	●		12.7	6.35	1.2	5.16
NEW DNMG150616-MJ	M	●	●		12.7	6.35	1.6	5.16
DNMG150408-RS	R		●	●	12.7	4.76	0.8	5.16
DNMG150412-RS	R		●	●	12.7	4.76	1.2	5.16
DNMG150416-RS	R		●	●	12.7	4.76	1.6	5.16
DNMG150608-RS	R		●	●	12.7	6.35	0.8	5.16
DNMG150612-RS	R		●	●	12.7	6.35	1.2	5.16
DNMG150616-RS	R		●	●	12.7	6.35	1.6	5.16

● : Inventory maintained in Japan.

Negative Inserts (With Hole)

M Class



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

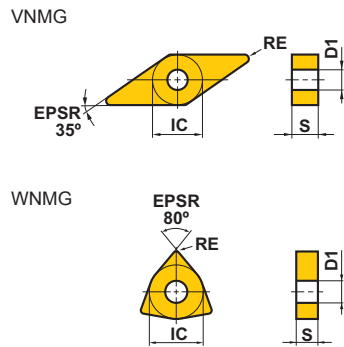
(mm)

Order Number	Cutting Area	MP9005	MP9015	MT9015	IC	S	RE	D1
SNMG120404-MS	M	●	●	●	12.7	4.76	0.4	5.16
SNMG120408-MS	M	●	●	●	12.7	4.76	0.8	5.16
SNMG120412-MS	M	●	●	●	12.7	4.76	1.2	5.16
SNMG150612-MS	M	●	●	●	15.875	6.35	1.2	6.35
SNMG150616-MS	M	●	●	●	15.875	6.35	1.6	6.35
NEW SNMG190612-MS	M	●	●	●	19.05	6.35	1.2	7.93
NEW SNMG120404-MA	M		●		12.7	4.76	0.4	5.16
NEW SNMG120408-MA	M		●		12.7	4.76	0.8	5.16
NEW SNMG120412-MA	M		●		12.7	4.76	1.2	5.16
NEW SNMG120416-MA	M		●		12.7	4.76	1.6	5.16
SNMG120408-RS	R		●	●	12.7	4.76	0.8	5.16
SNMG120412-RS	R		●	●	12.7	4.76	1.2	5.16
SNMG120416-RS	R		●	●	12.7	4.76	1.6	5.16
SNMG150616-RS	R		●	●	15.875	6.35	1.6	6.35
NEW SNMG190612-RS	R		●		19.05	6.35	1.2	7.93
SNMG190616-RS	R		●	●	19.05	6.35	1.6	7.93
NEW TNMG160402-LS	L	●	●	●	9.525	4.76	0.2	3.81
TNMG160404-LS	L	●	●	●	9.525	4.76	0.4	3.81
TNMG160408-LS	L	●	●	●	9.525	4.76	0.8	3.81
TNMG160404-MS	M	●	●	●	9.525	4.76	0.4	3.81
TNMG160408-MS	M	●	●	●	9.525	4.76	0.8	3.81
TNMG160412-MS	M	●	●	●	9.525	4.76	1.2	3.81
TNMG220408-MS	M	●	●	●	12.7	4.76	0.8	5.16
TNMG220412-MS	M	●	●	●	12.7	4.76	1.2	5.16
NEW TNMG160404-MA	M		●		9.525	4.76	0.4	3.81
NEW TNMG160408-MA	M		●		9.525	4.76	0.8	3.81
NEW TNMG160412-MA	M		●		9.525	4.76	1.2	3.81
NEW TNMG220408-MA	M		●		12.7	4.76	0.8	5.16
NEW TNMG220412-MA	M		●		12.7	4.76	1.2	5.16
NEW TNMG220416-MA	M		●		12.7	4.76	1.6	5.16
NEW TNMG270616-MA	M		●		15.875	6.35	1.6	6.35
NEW TNMG330924-MA	M		●		19.05	9.52	2.4	7.93
NEW TNMG160404-MJ	M	●	●		9.525	4.76	0.4	3.81
NEW TNMG160408-MJ	M	●	●		9.525	4.76	0.8	3.81
NEW TNMG160412-MJ	M	●	●		9.525	4.76	1.2	3.81
TNMG160408-RS	R		●	●	9.525	4.76	0.8	3.81
TNMG160412-RS	R		●	●	9.525	4.76	1.2	3.81
TNMG220408-RS	R		●	●	12.7	4.76	0.8	5.16
TNMG220412-RS	R		●	●	12.7	4.76	1.2	5.16

ISO Turning Inserts for Difficult-to-cut Materials

Negative Inserts (With Hole)

M Class



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

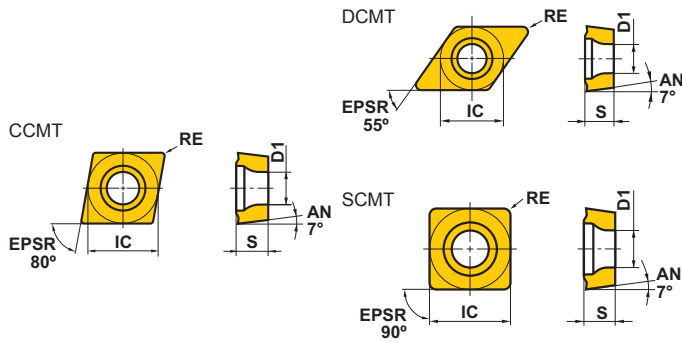
(mm)

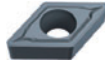
Order Number	Cutting Area	MP9005	MP9015	MT9015	IC	S	RE	D1
NEW VNMG160402-LS	L	●	●	●	9.525	4.76	0.2	3.81
VNMG160404-LS	L	●	●	●	9.525	4.76	0.4	3.81
VNMG160408-LS	L	●	●	●	9.525	4.76	0.8	3.81
VNMG160404-MS	M	●	●	●	9.525	4.76	0.4	3.81
VNMG160408-MS	M	●	●	●	9.525	4.76	0.8	3.81
NEW VNMG160404-MJ	M	●	●		9.525	4.76	0.4	3.81
NEW VNMG160408-MJ	M	●	●		9.525	4.76	0.8	3.81
NEW VNMG160412-MJ	M	●	●		9.525	4.76	1.2	3.81
NEW WNMG080402-LS	L	●	●	●	12.7	4.76	0.2	5.16
WNMG080404-LS	L	●	●	●	12.7	4.76	0.4	5.16
WNMG080408-LS	L	●	●	●	12.7	4.76	0.8	5.16
WNMG080404-MS	M	●	●	●	12.7	4.76	0.4	5.16
WNMG080408-MS	M	●	●	●	12.7	4.76	0.8	5.16
WNMG080412-MS	M	●	●	●	12.7	4.76	1.2	5.16
NEW WNMG080404-MA	M		●		12.7	4.76	0.4	5.16
NEW WNMG080408-MA	M		●		12.7	4.76	0.8	5.16
NEW WNMG080412-MA	M		●		12.7	4.76	1.2	5.16
NEW WNMG080416-MA	M		●		12.7	4.76	1.6	5.16
NEW WNMG080408-MJ	M	●	●		12.7	4.76	0.8	5.16
NEW WNMG080412-MJ	M	●	●		12.7	4.76	1.2	5.16
NEW WNMG080416-MJ	M	●	●		12.7	4.76	1.6	5.16
WNMG080408-RS	R		●	●	12.7	4.76	0.8	5.16
WNMG080412-RS	R		●	●	12.7	4.76	1.2	5.16
WNMG080416-RS	R		●	●	12.7	4.76	1.6	5.16
WNMG100612-RS	R		●	●	15.875	6.35	1.2	6.35

● : Inventory maintained in Japan.

7° Positive Inserts (With Hole)

M Class



Light	Medium	
LS	MS	
		
Light	Medium	Medium
LS	MS	MS
		

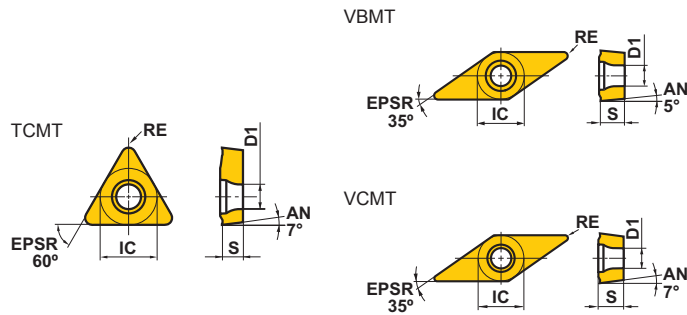
(mm)

Order Number	Cutting Area	MP9005	MP9015	MT9005	IC	S	RE	D1
CCMT060202-LS	L	●	●	●	6.35	2.38	0.2	2.8
CCMT060204-LS	L	●	●	●	6.35	2.38	0.4	2.8
CCMT09T302-LS	L	●	●	●	9.525	3.97	0.2	4.4
CCMT09T304-LS	L	●	●	●	9.525	3.97	0.4	4.4
CCMT09T308-LS	L	●	●	●	9.525	3.97	0.8	4.4
NEW CCMT060202-MS	M	●	●	●	6.35	2.38	0.2	2.8
NEW CCMT060204-MS	M	●	●	●	6.35	2.38	0.4	2.8
NEW CCMT060208-MS	M	●	●	●	6.35	2.38	0.8	2.8
NEW CCMT09T302-MS	M	●	●	●	9.525	3.97	0.2	4.4
CCMT09T304-MS	M	●	●	●	9.525	3.97	0.4	4.4
CCMT09T308-MS	M	●	●	●	9.525	3.97	0.8	4.4
NEW CCMT120404-MS	M	●	●	●	12.7	4.76	0.4	5.5
NEW CCMT120408-MS	M	●	●	●	12.7	4.76	0.8	5.5
NEW CCMT120412-MS	M	●	●	●	12.7	4.76	1.2	5.5
DCMT070202-LS	L	●	●	●	6.35	2.38	0.2	2.8
DCMT070204-LS	L	●	●	●	6.35	2.38	0.4	2.8
DCMT11T302-LS	L	●	●	●	9.525	3.97	0.2	4.4
DCMT11T304-LS	L	●	●	●	9.525	3.97	0.4	4.4
DCMT11T308-LS	L	●	●	●	9.525	3.97	0.8	4.4
DCMT070204-MS	M	●	●	●	6.35	2.38	0.4	2.8
DCMT070208-MS	M	●	●	●	6.35	2.38	0.8	2.8
DCMT11T304-MS	M	●	●	●	9.525	3.97	0.4	4.4
DCMT11T308-MS	M	●	●	●	9.525	3.97	0.8	4.4
NEW DCMT11T312-MS	M	●	●	●	9.525	3.97	1.2	4.4
NEW SCMT09T304-MS	M	●	●	●	9.525	3.97	0.4	4.4
NEW SCMT09T308-MS	M	●	●	●	9.525	3.97	0.8	4.4
NEW SCMT120404-MS	M	●	●	●	12.7	4.76	0.4	5.5
NEW SCMT120408-MS	M	●	●	●	12.7	4.76	0.8	5.5
NEW SCMT120412-MS	M	●	●	●	12.7	4.76	1.2	5.5

ISO Turning Inserts for Difficult-to-cut Materials

5° and 7° Positive Inserts (With Hole)

M Class



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

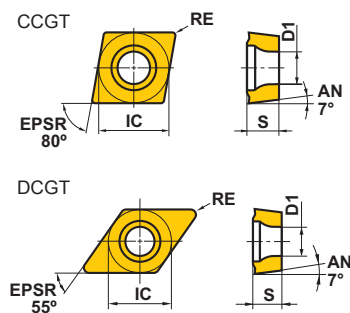
(mm)

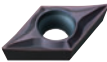
Order Number	Cutting Area	MP9005	MP9015	MT9005	IC	S	RE	D1
NEW TCMT090202-LS	L	●	●	●	5.56	2.38	0.2	2.5
NEW TCMT110202-LS	L	●	●	●	6.35	2.38	0.2	2.8
NEW TCMT090204-MS	M	●	●	●	5.56	2.38	0.4	2.5
NEW TCMT090208-MS	M	●	●	●	5.56	2.38	0.8	2.5
NEW TCMT110204-MS	M	●	●		6.35	2.38	0.4	2.8
NEW TCMT110208-MS	M	●	●		6.35	2.38	0.8	2.8
NEW TCMT16T304-MS	M	●	●	●	9.525	3.97	0.4	4.4
NEW TCMT16T308-MS	M	●	●	●	9.525	3.97	0.8	4.4
NEW TCMT16T312-MS	M	●	●	●	9.525	3.97	1.2	4.4
NEW VBMT110302-LS	L	●	●	●	6.35	3.18	0.2	2.9
NEW VBMT110304-LS	L	●	●	●	6.35	3.18	0.4	2.9
NEW VBMT110308-LS	L	●	●	●	6.35	3.18	0.8	2.9
VBMT160404-LS	L	●	●	●	9.525	4.76	0.4	4.4
VBMT160408-LS	L	●	●	●	9.525	4.76	0.8	4.4
NEW VBMT160402-MS	M	●	●	●	9.525	4.76	0.2	4.4
VBMT160404-MS	M	●	●	●	9.525	4.76	0.4	4.4
VBMT160408-MS	M	●	●	●	9.525	4.76	0.8	4.4
NEW VBMT160412-MS	M	●	●	●	9.525	4.76	1.2	4.4
VCMT110302-LS	L	●	●	●	6.35	3.18	0.2	2.8
VCMT110304-LS	L	●	●	●	6.35	3.18	0.4	2.8
VCMT160404-LS	L	●	●	●	9.525	4.76	0.4	4.4
VCMT160408-LS	L	●	●	●	9.525	4.76	0.8	4.4
NEW VCMT110302-MS	M	●	●		6.35	3.18	0.2	2.8
NEW VCMT110304-MS	M	●	●	●	6.35	3.18	0.4	2.8
NEW VCMT110308-MS	M	●	●	●	6.35	3.18	0.8	2.8
VCMT160404-MS	M	●	●	●	9.525	4.76	0.4	4.4
VCMT160408-MS	M	●	●	●	9.525	4.76	0.8	4.4

● : Inventory maintained in Japan.

7° Positive Inserts (With Hole)

G Class



Finish	Finish	Light	Light
FS	FS-P	LS	LS-P
			
Finish	Finish	Light	Light
FS	FS-P	LS	LS-P
			

(mm)

Order Number	Cutting Area	MP9005	MP9015	MT9005	IC	S	RE	D1
NEW CCGT060201M-FS	F	●	●		6.35	2.38	0.08	2.8
NEW CCGT060202M-FS	F	●	●		6.35	2.38	0.18	2.8
NEW CCGT09T301M-FS	F	●	●		9.525	3.97	0.08	4.4
NEW CCGT09T302M-FS	F	●	●		9.525	3.97	0.18	4.4
NEW CCGT09T304M-FS	F	●	●		9.525	3.97	0.38	4.4
NEW CCGT060201M-FS-P	F			●	6.35	2.38	0.08	2.8
NEW CCGT060202M-FS-P	F			●	6.35	2.38	0.18	2.8
NEW CCGT09T301M-FS-P	F			●	9.525	3.97	0.08	4.4
NEW CCGT09T302M-FS-P	F			●	9.525	3.97	0.18	4.4
NEW CCGT09T304M-FS-P	F			●	9.525	3.97	0.38	4.4
NEW CCGT060201M-LS	L	●	●		6.35	2.38	0.08	2.8
NEW CCGT060202M-LS	L	●	●		6.35	2.38	0.18	2.8
NEW CCGT09T301M-LS	L	●	●		9.525	3.97	0.08	4.4
NEW CCGT09T302M-LS	L	●	●		9.525	3.97	0.18	4.4
NEW CCGT09T304M-LS	L	●	●		9.525	3.97	0.38	4.4
NEW CCGT060201M-LS-P	L			●	6.35	2.38	0.08	2.8
NEW CCGT060202M-LS-P	L			●	6.35	2.38	0.18	2.8
NEW CCGT09T301M-LS-P	L			●	9.525	3.97	0.08	4.4
NEW CCGT09T302M-LS-P	L			●	9.525	3.97	0.18	4.4
NEW CCGT09T304M-LS-P	L			●	9.525	3.97	0.38	4.4
NEW DCGT070201M-FS	F	●	●		6.35	2.38	0.08	2.8
NEW DCGT070202M-FS	F	●	●		6.35	2.38	0.18	2.8
NEW DCGT11T301M-FS	F	●	●		9.525	3.97	0.08	4.4
NEW DCGT11T302M-FS	F	●	●		9.525	3.97	0.18	4.4
NEW DCGT070201M-FS-P	F			●	6.35	2.38	0.08	2.8
NEW DCGT070202M-FS-P	F			●	6.35	2.38	0.18	2.8
NEW DCGT11T301M-FS-P	F			●	9.525	3.97	0.08	4.4
NEW DCGT11T302M-FS-P	F			●	9.525	3.97	0.18	4.4
NEW DCGT070201M-LS	L	●	●		6.35	2.38	0.08	2.8
NEW DCGT070202M-LS	L	●	●		6.35	2.38	0.18	2.8
NEW DCGT070204M-LS	L	●	●		6.35	2.38	0.38	2.8
NEW DCGT11T301M-LS	L	●	●		9.525	3.97	0.08	4.4
NEW DCGT11T302M-LS	L	●	●		9.525	3.97	0.18	4.4
NEW DCGT11T304M-LS	L	●	●		9.525	3.97	0.38	4.4
NEW DCGT070201M-LS-P	L			●	6.35	2.38	0.08	2.8
NEW DCGT070202M-LS-P	L			●	6.35	2.38	0.18	2.8
NEW DCGT070204M-LS-P	L			●	6.35	2.38	0.38	2.8
NEW DCGT11T301M-LS-P	L			●	9.525	3.97	0.08	4.4
NEW DCGT11T302M-LS-P	L			●	9.525	3.97	0.18	4.4
NEW DCGT11T304M-LS-P	L			●	9.525	3.97	0.38	4.4

ISO Turning Inserts for Difficult-to-cut Materials

7° Positive Inserts (With Hole)

G Class

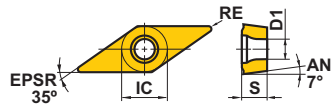
Light
LS



Light
LS-P



VCGT



(mm)

	Order Number	Cutting Area	MP9005	MP9015	MT9005	IC	S	RE	D1
NEW	VCGT110301M-LS	L	●	●		6.35	3.18	0.08	2.8
NEW	VCGT110302M-LS	L	●	●		6.35	3.18	0.18	2.8
NEW	VCGT110304M-LS	L	●	●		6.35	3.18	0.38	2.8
NEW	VCGT130301M-LS	L	●	●		7.94	3.18	0.08	3.4
NEW	VCGT130302M-LS	L	●	●		7.94	3.18	0.18	3.4
NEW	VCGT130304M-LS	L	●	●		7.94	3.18	0.38	3.4
NEW	VCGT110301M-LS-P	L			●	6.35	3.18	0.08	2.8
NEW	VCGT110302M-LS-P	L			●	6.35	3.18	0.18	2.8
NEW	VCGT110304M-LS-P	L			●	6.35	3.18	0.38	2.8
NEW	VCGT130301M-LS-P	L			●	7.94	3.18	0.08	3.4
NEW	VCGT130302M-LS-P	L			●	7.94	3.18	0.18	3.4
NEW	VCGT130304M-LS-P	L			●	7.94	3.18	0.38	3.4

● : Inventory maintained in Japan.

Recommended Cutting Conditions

Negative Inserts

(mm)

	Work Material	Cutting Conditions	Cutting Area	Chip Breaker	Grade	vc (m/min)	f (mm/rev)	ap
M	Precipitation Hardening Stainless Steels (AISI 630)	Stable Cutting	Light Cutting	LS	MP9005	125—175	0.10—0.25	0.2—0.8
			Medium Cutting	MS	MP9005	115—160	0.10—0.25	0.5—4.0
			Rough Cutting	RS	MP9015	105—150	0.20—0.35	1.0—4.0
		General Cutting	Light Cutting	LS	MP9015	120—165	0.10—0.25	0.2—0.8
			Medium Cutting	MS	MP9015	110—150	0.10—0.25	0.5—4.0
			Rough Cutting	RS	MP9015	100—40	0.20—0.35	1.0—4.0
S	Titanium Alloys (Ti-6Al-4V)	Stable Cutting	Light Cutting	LS	MT9015	40—85	0.10—0.25	0.2—0.8
			Medium Cutting	MS	MT9015	40—80	0.10—0.25	0.5—4.0
			Rough Cutting	RS	MT9015	35—75	0.20—0.35	1.0—4.0
		General Cutting	Light Cutting	LS	MT9015	40—85	0.10—0.25	0.2—0.8
			Medium Cutting	MS	MT9015	40—80	0.10—0.25	0.5—4.0
			Rough Cutting	RS	MT9015	35—75	0.20—0.35	1.0—4.0
	Ni Based Heat Resistant Alloys (Inconel718, Hastelloy, Waspaloy) Co Based Heat Resistant Alloys (Tribaloy, Stellite)	Stable Cutting	Light Cutting	LS	MP9005	30—110	0.10—0.25	0.2—0.8
			Medium Cutting	MS	MP9005	30—100	0.10—0.25	0.5—4.0
			Rough Cutting	RS	MP9015	20—75	0.20—0.35	1.0—4.0
		General Cutting	Light Cutting	LS	MP9015	25—85	0.10—0.25	0.2—0.8
			Medium Cutting	MS	MP9015	25—80	0.10—0.25	0.5—4.0
			Rough Cutting	RS	MP9015	20—75	0.20—0.35	1.0—4.0

(Note 1) When cutting conditions are unstable, please refer to page 2 for recommended chip breaker and grade.

(Note 2) Verify the recommended conditions for each boring bar as cutting conditions for internal machining will vary depending on the length of overhang.

Positive Inserts

(mm)

	Work Material	Cutting Conditions	Cutting Area	Chip Breaker	Grade	vc (m/min)	f (mm/rev)	ap
M	Precipitation Hardening Stainless Steels (AISI 630)	Stable Cutting	Light Cutting	LS	MP9015	105—140	0.06—0.20	0.2—1.0
			Medium Cutting	MS	MP9015	85—120	0.08—0.25	0.3—2.0
		General Cutting	Light Cutting	LS	MP9015	105—140	0.06—0.20	0.2—1.0
			Medium Cutting	MS	MP9015	85—120	0.08—0.25	0.3—2.0
S	Titanium Alloys (Ti-6Al-4V)	Stable Cutting	Finish and Light	LS	MT9005	40—80	0.06—0.20	0.2—1.0
			Medium Cutting	MS	MT9005	35—65	0.08—0.25	0.3—2.0
		General Cutting	Finish and Light	LS	MT9005	40—80	0.06—0.20	0.2—1.0
			Medium Cutting	MS	MT9005	35—65	0.08—0.25	0.3—2.0
		Unstable Cutting	Finish and Light	LS	MT9005	40—80	0.06—0.20	0.2—1.0
			Medium Cutting	MS	MT9005	35—65	0.08—0.25	0.3—2.0
	Ni Based Heat Resistant Alloys (Inconel718, Hastelloy, Waspaloy)	Stable Cutting	Finish and Light	LS	MP9005	25—95	0.06—0.20	0.2—1.0
			Medium Cutting	MS	MP9005	20—80	0.08—0.25	0.3—2.0
		General Cutting	Finish and Light	LS	MP9015	20—75	0.06—0.20	0.2—1.0
			Medium Cutting	MS	MP9015	20—60	0.08—0.25	0.3—2.0
		Unstable Cutting	Finish and Light	LS	MP9015	20—75	0.06—0.20	0.2—1.0
			Medium Cutting	MS	MP9015	20—60	0.08—0.25	0.3—2.0

vc = Cutting Speed f = Feed per Revolution
ap = Depth of Cut

Recommended Cutting Conditions

Precision Positive Inserts

(mm)						
Work Material	Cutting Conditions	Chip Breaker	Grade	vc (m/min)	f (mm/rev)	ap
M	Stable Cutting	FS	MP9005	40—80	0.04—0.10	0.20—1.40
		LS	MP9005	40—80	0.04—0.15	0.30—2.00
	General Cutting	FS	MP9015	40—80	0.04—0.10	0.20—1.40
		LS	MP9015	40—80	0.04—0.15	0.30—2.00
	Unstable Cutting	LS	MP9015	30—60	0.04—0.10	0.30—1.00
S	Stable Cutting	FS-P	MT9005	40—80	0.04—0.12	0.20—1.40
		LS-P	MT9005	40—80	0.04—0.20	0.30—3.00
	General Cutting	FS-P	MT9005	40—80	0.04—0.12	0.20—1.40
		LS-P	MT9005	40—80	0.04—0.12	0.30—2.00
	Unstable Cutting	FS-P	MT9005	30—60	0.04—0.10	0.20—1.40
	Stable Cutting	FS	MP9005	40—80	0.04—0.10	0.20—1.40
		LS	MP9005	40—80	0.04—0.15	0.30—2.00
	General Cutting	FS	MP9015	40—80	0.04—0.10	0.20—1.40
		LS	MP9015	40—80	0.04—0.15	0.30—2.00
	Unstable Cutting	LS	MP9015	30—60	0.04—0.10	0.30—1.00
	Stable Cutting	FS	MP9005	25—95	0.04—0.12	0.20—1.40
		LS	MP9005	25—95	0.04—0.12	0.30—2.00
	General Cutting	FS	MP9015	20—75	0.04—0.12	0.20—1.40
		LS	MP9015	20—75	0.04—0.12	0.30—2.00
	Unstable Cutting	FS	MP9015	20—75	0.04—0.12	0.20—1.40

vc = Cutting Speed f = Feed per Revolution
ap = Depth of Cut

For Effective Use of Large Corner Radius

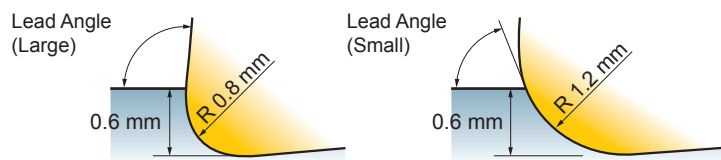
By setting the depth of cut smaller than the corner radius value, notching during cutting of heat resistant alloys can be greatly reduced.

Corner Radius > 1.5 x Depth of Cut

Depth of cut : 0.6mm. Corner radius over 0.9mm is recommended.

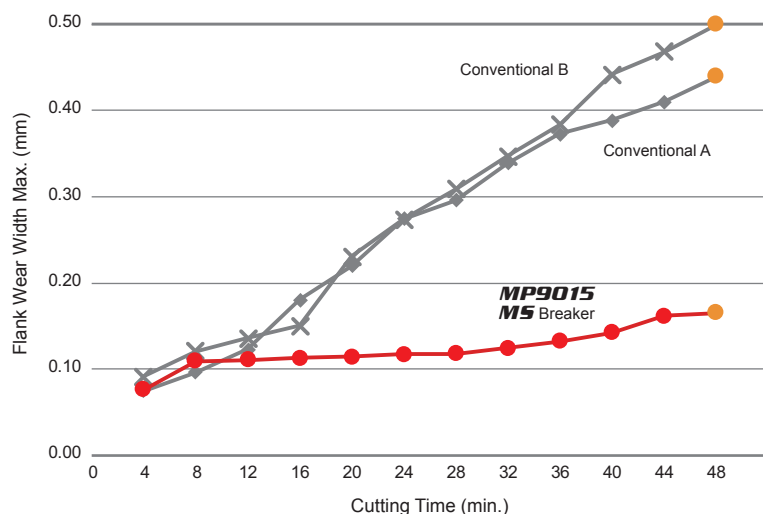
Point

A smaller lead angle is the key to reduced notching.



Cutting Performance

Comparison in Continuous Machining of Precipitation Hardening Stainless Steels AISI 630



<Cutting Conditions>
 Work Material : AISI 630
 Inserts : CNMG120408-
 Machining Methods : External Continuous Cutting
 Cutting Speed : $v_c = 120$ m/min
 Feed per Rev. : $f = 0.2$ mm/rev
 Depth of Cut : $a_p = 1.5$ mm
 Cutting Mode : Wet Cutting

Cutting Time : 48min (Wear Photo)

MP9015
MS Breaker

Conventional A

Conventional B

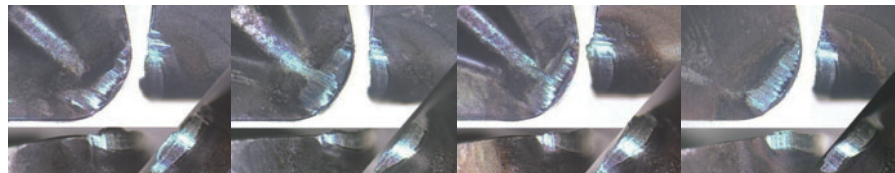
Achieved double tool life when machining Inconel718 during continuous machining

MP9005+LS

Conventional A (S10)

Conventional B (S10)

Conventional C (S10)



Wear - 0.24 mm Wear - 0.22 mm Wear - 0.23 mm Wear - 0.25 mm
 Cutting Time 66 min Cutting Time 22 min Cutting Time 36 min Cutting Time 16 min

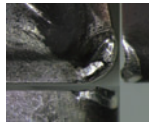
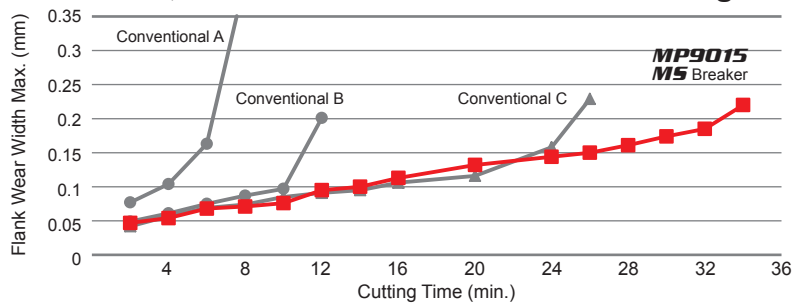
<Cutting Conditions>
 Work Material : Inconel718
 Inserts : CNMG120408-
 Cutting Speed : $v_c = 50$ m/min
 Feed per Rev. : $f = 0.15$ mm/rev
 Depth of Cut : $a_p = 0.5$ mm
 Cutting Mode : Wet Cutting

Comparison of Wear Resistance by Work Material

Materials and Cutting Conditions	New Chip Breaker	Conventional A	Conventional B
Work Material : Co-Cr-Mo Alloy Inserts : DCGT11T304M-LS Grade : MP9005 Cutting Speed : $v_c = 40$ m/min Feed per Rev. : $f = 0.05$ mm/rev Depth of Cut : $a_p = 0.2$ mm Cutting Mode : Wet Cutting (Water-soluble) Machine : CNC Automatic Lathes Cutting Time : 12 min.			
Work Material : Inconel718 Inserts : DCGT11T304M-LS Grade : MP9015 Cutting Speed : $v_c = 60$ m/min Feed per Rev. : $f = 0.05$ mm/rev Depth of Cut : $a_p = 0.5$ mm Cutting Mode : Wet Cutting (Water-soluble) Machine : CNC Automatic Lathes Cutting Time : 20 min.			
Work Material : Ti-6Al-4V ELI Inserts : DCGT11T304M-LS-P Grade : MT9005 Cutting Speed : $v_c = 80$ m/min Feed per Rev. : $f = 0.05$ mm/rev Depth of Cut : $a_p = 3.0$ mm Cutting Mode : Wet Cutting (Water-insoluble) Machine : Automatic Lathes			
	35 Pieces (Non-coat)	35 Pieces (PVD)	15 Pieces (PVD)

Cutting Performance

Inconel718, $vc=60$ m/min Continuous Machining



Conventional A
8 min



Conventional B
12 min



Conventional C
26 min



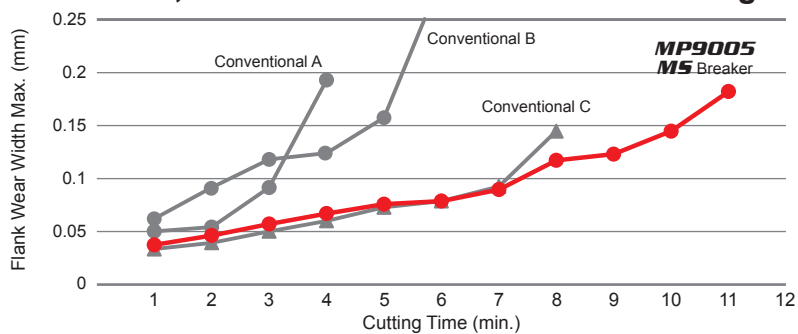
MP9015
MS Breaker
34 min

<Cutting Conditions>

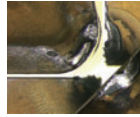
Work Material : Inconel718
Insert : CNMG120408-
Cutting Speed : $vc=60$ m/min
Feed per Rev. : $f=0.15$ mm/rev
Depth of Cut : $ap=0.75$ mm
Cutting Mode : Wet Cutting

Increased
28 %
Tool Life

Inconel718, $vc=100$ m/min Continuous Machining



Conventional A
4 min



Conventional B
6 min



Conventional C
8 min



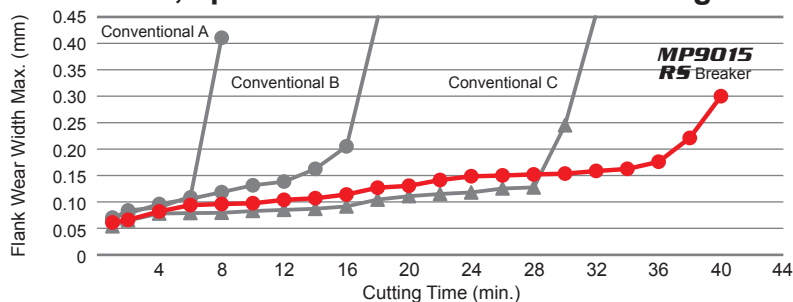
MP9005
MS Breaker
11 min

<Cutting Conditions>

Work Material : Inconel718
Insert : CNMG120408-
Cutting Speed : $vc=100$ m/min
Feed per Rev. : $f=0.15$ mm/rev
Depth of Cut : $ap=0.5$ mm
Cutting Mode : Wet Cutting

Increased
37 %
Tool Life

Inconel718, $ap=2.0$ mm Continuous Machining



Conventional A
8 min



Conventional B
18 min



Conventional C
32 min



MP9015
RS Breaker
40 min

<Cutting Conditions>

Work Material : Inconel718
Insert : CNMG120408-
Cutting Speed : $vc=40$ m/min
Feed per Rev. : $f=0.2$ mm/rev
Depth of Cut : $ap=2.0$ mm
Cutting Mode : Wet Cutting

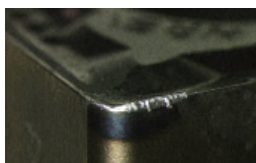
Increased
33 %
Tool Life

WASPALLOY Continuous Machining

MP9015 with RS breaker was smallest damage.



Conventional A



Conventional B

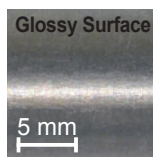
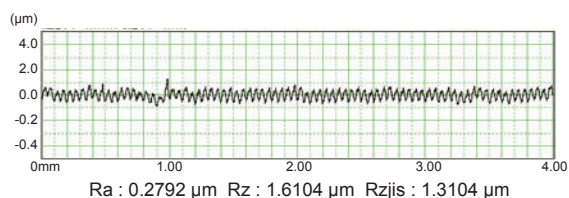
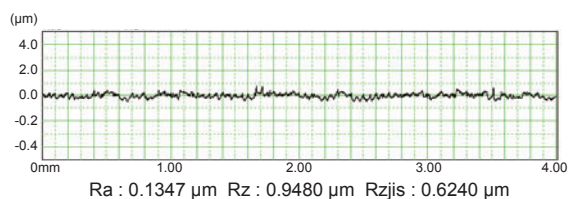


MP9015
RS Breaker

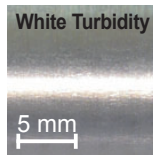
<Cutting Conditions>

Work Material : WASPALLOY
Insert : CNMG120408-
Cutting Speed : $vc=29$ m/min
Feed per Rev. : $f=0.22$ mm/rev
Depth of Cut : $ap=4.0$ mm
Cutting Time : 7 min
Cutting Mode : Wet Cutting

Titanium Alloy, Comparison of Surface Finish (Depth of Cut : 0.25 mm)



MT9015
LS Breaker



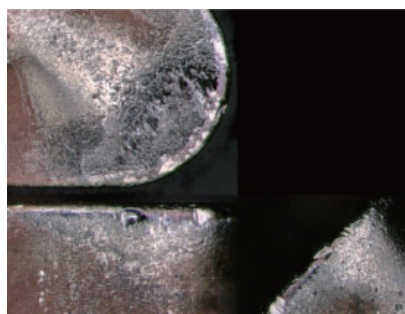
Conventional

**Excellent
Finish**

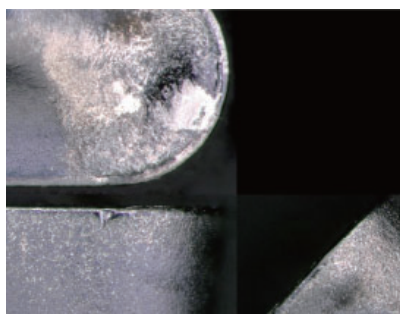
<Cutting Conditions>

Work Material : Ti-6Al-6V(325HB)
Insert : CNMG120408-
Cutting Speed : $v_c = 70$ m/min
Feed per Rev. : $f = 0.05$ mm/rev
Depth of Cut : $a_p = 0.25$ mm
Cutting Mode : Wet Cutting

MP9015 with LS breaker was smallest damage.



Conventional



MP9015 LS Breaker



<Cutting Conditions>

Work Material : Heat Resistant Cast Steel
Insert : DCMT11T304-
Cutting Speed : $v_c = 100$ m/min
Feed per Rev. : $f = 0.1$ mm/rev
Depth of Cut : $a_p = 0.25$ mm
Cutting Mode : Wet Cutting

Chip Control when Back Turning

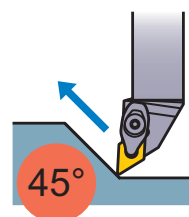
Non-tangling of chips when back turning Inconel718.



MS Breaker
New Design



Conventional



<Cutting Conditions>

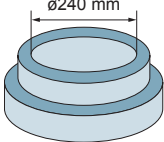
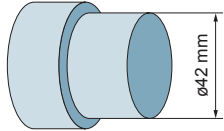
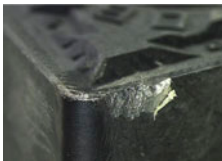
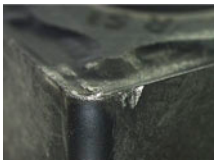
Work Material : Inconel718
Insert : DNMG150408-
Cutting Speed : $v_c = 40$ m/min
Feed per Rev. : $f = 0.2$ mm/rev
Depth of Cut : $a_p = 1.0$ mm
Cutting Mode : Wet Cutting

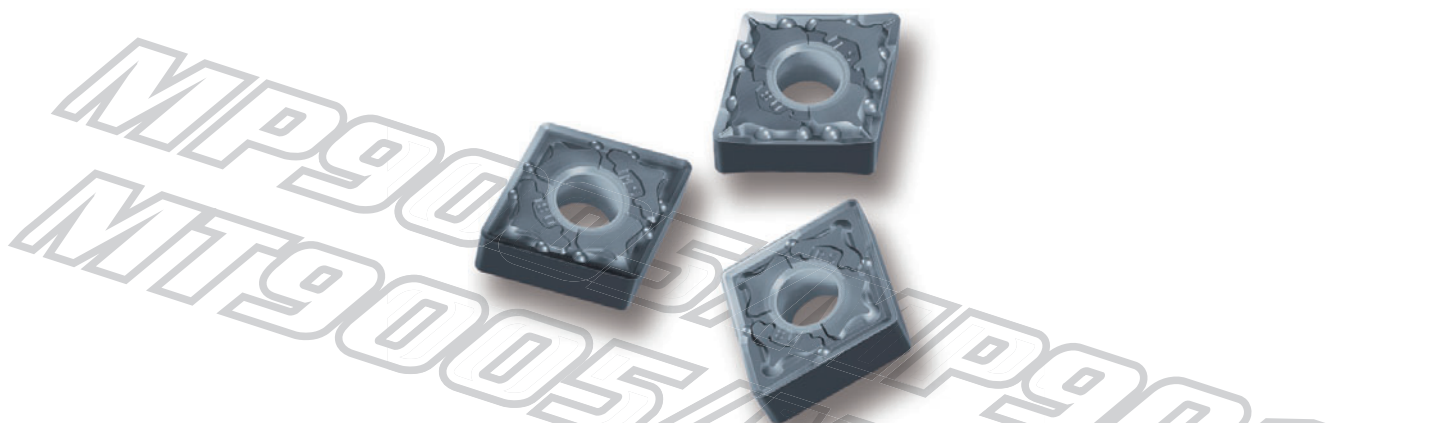
ISO Turning Inserts for Difficult-to-cut Materials

Application Examples

Insert (Grade)		DCGT11T304M-LS (MP9015)	DCGT11T302M-LS (MP9015)
Workpiece		AISI 430 (Forgings)	AISI 630 (17-4PH)
Cutting Conditions	Cutting Speed vc (m/min)	80	60
	Feed per Rev. f (mm/rev)	0.08	0.04
	Depth of Cut ap (mm)	0.3	0.3
Cutting Mode		Wet Cutting (Water-insoluble Coolants)	Wet Cutting (Water-insoluble Coolants)
Machine		CNC Automatic Lathes	CNC Automatic Lathes
Results		Compared to conventional products with inconsistent tool life, whose unstable chip evacuation can cause entanglement of chips in workpieces, the LS breaker provided stable chip evacuation allowing machining to be performed up to machining constants. It also exhibited excellent wear conditions after turning.	Even when machining at 1.5 times the machining constants of conventional products, there were no variations in turning surface dimensions. The amount of wear was also extremely small, making machining extension and cost reduction possible.

Insert (Grade)		DCGT11T302M-FS-P (MT9005)	DCGT070201M-FS (MP9015)
Workpiece		Ti-6Al-4V ELI	AISI 304
Cutting Conditions	Cutting Speed vc (m/min)	65	80
	Feed per Rev. f (mm/rev)	0.06	0.05
	Depth of Cut ap (mm)	0.75	0.3
Cutting Mode		Wet Cutting (Water-insoluble Coolants)	Wet Cutting (Water-insoluble Coolants)
Machine		CNC Automatic Lathes	CNC Automatic Lathes
Results		Compared to conventional PVD coated products, the cemented carbide MT 9005 (uncoated) provided exceptional machined surface roughness even at double the number of cuts. The extremely small amount of wear and stable dimensional precision allowed further machining extension.	Compared to conventional products, the amount of wear was small and chip evacuation was excellent, making it possible to perform machining at 1.5 times the machining constant.

Insert (Grade)		DNMG150408-MS (MP9005)	CNMG120408-RS (MP9015)
Workpiece		Inconel718 (Ni Based Heat Resistant Alloy)  45HRC Aging Treatment	HAYNES Alloy 25 (Co Based Heat Resistant Alloy) 
Component		Disk - Aerospace Component	Cover Plate - Aerospace Component
Application		Internal Turning	External Turning
Cutting Conditions	Cutting Speed vc (m/min)	60	34
	Feed per Rev. f (mm/rev)	0.15	0.20
	Depth of Cut ap × ae (mm)	0.25 × 15	1.5 × 42 (3 Pass)
Cutting Mode		Wet Cutting	Wet Cutting
Results		Conventional (S10)  MP9005+MS  MP9005 - Stable machining and less wear with long tool life without chip tangling.	Conventional (S10)  MP9015+RS  Both conventional and MP9015 display notch wear but the conventional grade wear was greater and exposed the substrate.



ISO Turning Inserts for Difficult-to cut Materials

MP9005/MP9015

MT9005/MT9015

For Your Safety

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

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(Tools specifications subject to change without notice.)

EXP-13-E025
2018.6.T(-)