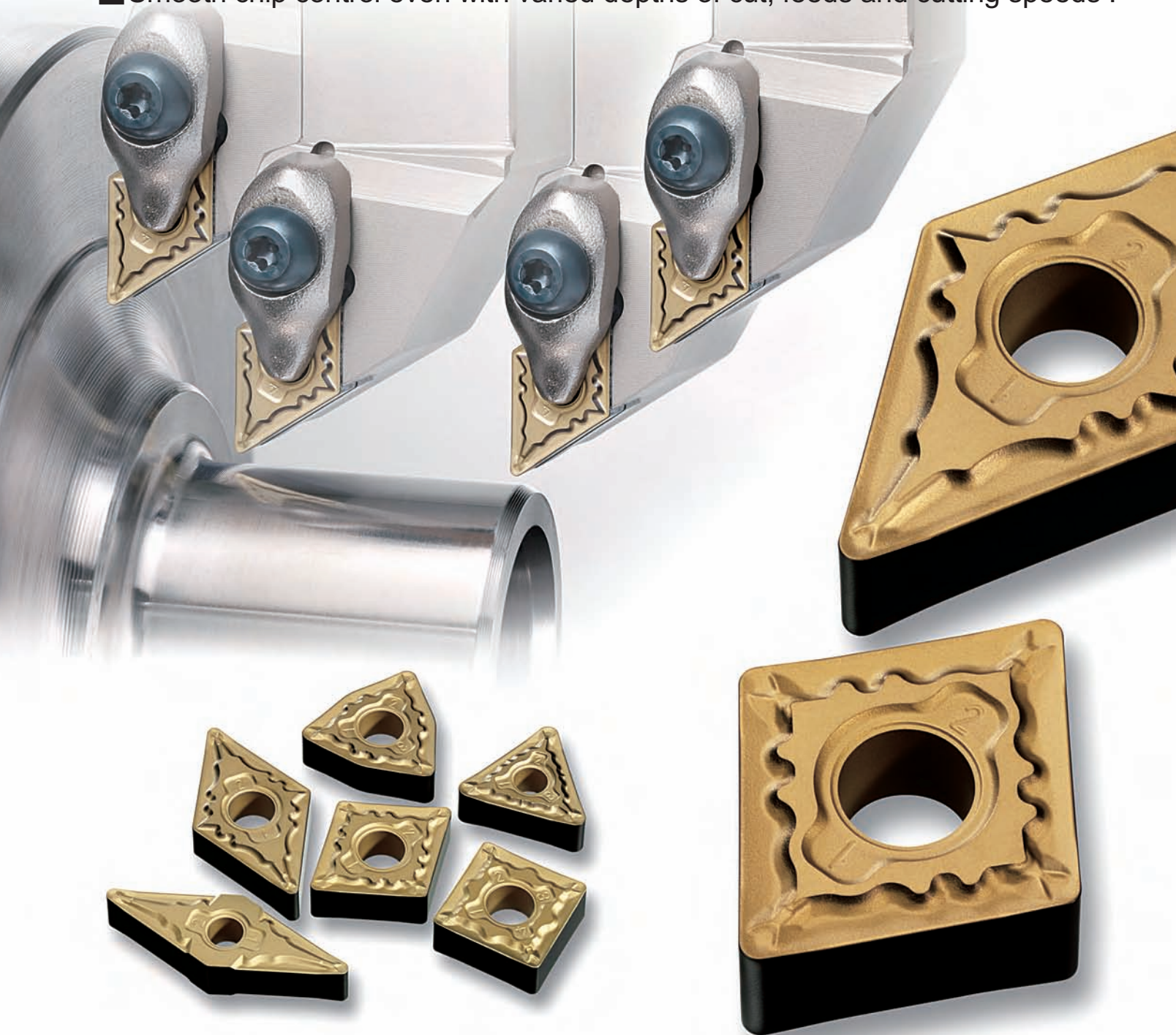


New Chip Breaker Inserts for Turning

MIP Breaker

Offers the best performance for automotive parts applications !

■ Smooth chip control even with varied depths of cut, feeds and cutting speeds !



New Chip Breaker Inserts for Turning

MP Breaker

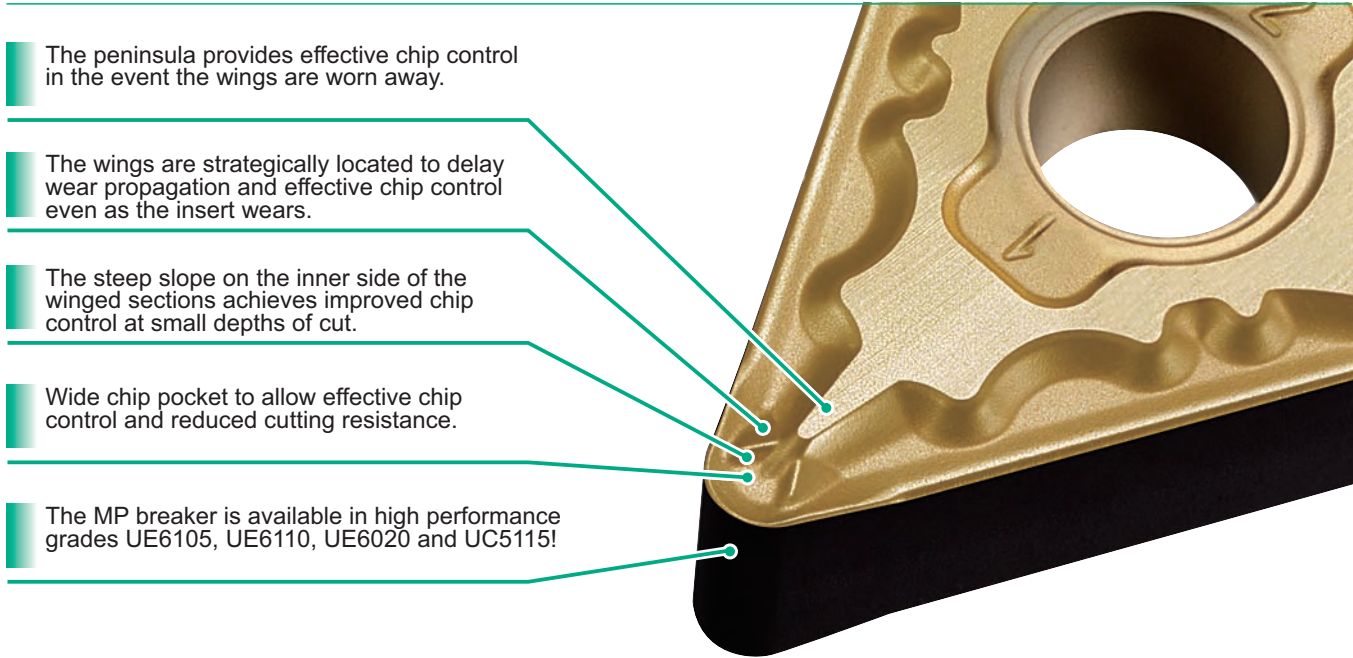
Outline

For copying, cutting conditions such as the depth of cut, feed rate and cutting speed can vary. When carrying out such machining operations, a number of problems occur that can lead to reducing overall machining productivity, such as:

- Ineffective chip control due to the use of one breaker style.
- Machine down time due to chip jamming.
- Poor tool management due to the use of numerous insert geometries.

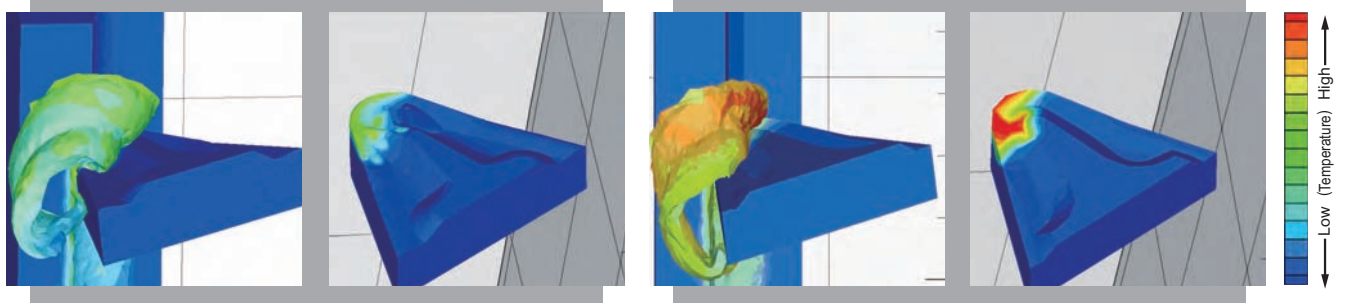
MP breaker employs a unique geometry that provides effective chip control over a wide application area, it also offers improved wear resistance due to lower cutting heat generation. Therefore contributing to a great increase in productivity.

Features



Analysis: Chip geometry and cutting edge temperatures

Low cutting heat reduces crater wear! Lower workpiece temperatures lead to higher dimensional accuracies!



MP Breaker

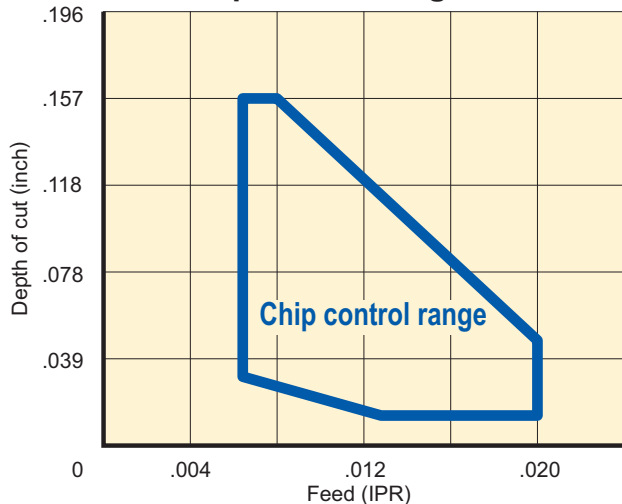
Conventional breaker

<Cutting Conditions>
Insert : DNMG43300
Workpiece : AISI 1045
Cutting speed: 655 SFM
Feed : .016 IPR
Depth of cut: .079 inch
Dry cutting

MP Breaker

Cutting Performance

Effective chip control range



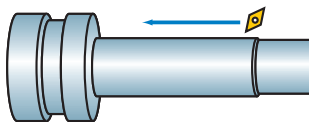
<Cutting Conditions>

Insert : CNMG432MP
 Workpiece : AISI 5020
 Cutting speed : 655 SFM
 Wet cutting

Chip control comparison

Cutting speed	MP Breaker	Conventional breaker
655 SFM		
1310 SFM		

AISI 1045



<Cutting Conditions>

Insert : DNMG43300
 Feed : .018 IPR
 Depth of cut : .039 inch
 Wet cutting

Cutting edge comparison

<Cutting Conditions>


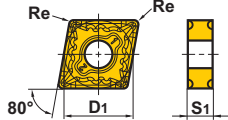

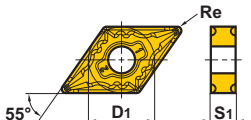

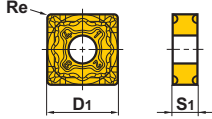

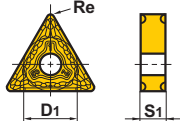

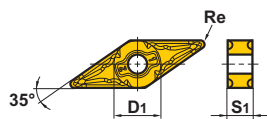

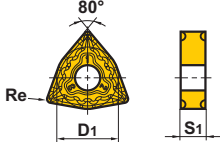
Workpiece : AISI 1055 Feed : .018-.020 IPR
 Insert : DNMG43300 Depth of cut : .016-.098 inch
 Cutting speed : 755 SFM Wet cutting

MP Breaker	Conventional breaker
Pieces: 100	Pieces: 70

Recommended Cutting Conditions



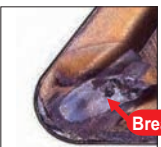
Work Material	Hardness	Grade	Recommended Cutting Speed (SFM)	Work Material	Hardness	Grade	Recommended Cutting Speed (SFM)		
P Mild Steel	≤180HB	UE6105	1215 (850-1540)	K Cast Iron	Tensile Strength ≤300MPa	UC5115	755 (525-985)		
		UE6110	1115 (820-1375)			Ductile Cast Iron	Tensile Strength ≤450MPa	UC5115	755 (525-985)
		UE6020	1015 (785-1245)				Tensile Strength 500-800MPa	UC5115	655 (490-820)
Carbon Steel Alloy Steel	180-280HB	UE6105	950 (655-1215)						
		UE6110	850 (620-1080)						
		UE6020	785 (590-985)						


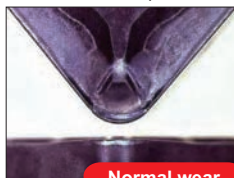

Inserts

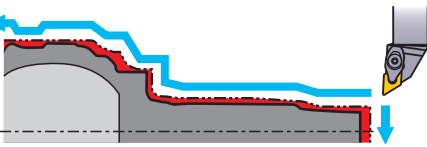


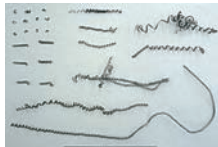
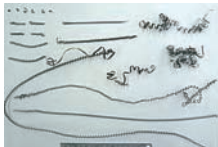
Shape	Order Number	(ISO) Number	Coated				Dimensions (inch)			Geometry
			UE6105	UE6110	UE6020	UC5115	D1	S1	Re	
	CNMG431MP	CNMG120404-MP	○	○	○	○	.500	.187	.016	
	432MP	120408-MP	●	●	●	●	.500	.187	.031	
	433MP	120412-MP	●	●	●	●	.500	.187	.047	
	434MP	120416-MP	○	○	○	○	.500	.187	.063	
	542MP	160608-MP	○	○	○	○	.625	.250	.031	
	543MP	160612-MP	●	●	●	●	.625	.250	.047	
	544MP	160616-MP	●	●	●	●	.625	.250	.063	
	DNMG431MP	DNMG150404-MP	○	○	○	○	.500	.187	.016	
	432MP	150408-MP	●	●	●	●	.500	.187	.031	
	433MP	150412-MP	●	●	●	●	.500	.187	.047	
	434MP	150416-MP	○	○	○	○	.500	.187	.063	
	441MP	150604-MP	○	○	○	○	.500	.250	.016	
	442MP	150608-MP	☆	★	★	★	.500	.250	.031	
	443MP	150612-MP	☆	★	★	★	.500	.250	.047	
444MP	150616-MP	○	○	○	○	.500	.250	.063		
	SNMG431MP	SNMG120404-MP	○	○	○	○	.500	.187	.016	
	432MP	120408-MP	●	●	●	★	.500	.187	.031	
	433MP	120412-MP	●	●	●	★	.500	.187	.047	
	TNMG331MP	TNMG160404-MP	○	○	○	○	.375	.187	.016	
	332MP	160408-MP	●	●	●	●	.375	.187	.031	
	333MP	160412-MP	●	●	●	●	.375	.187	.047	
	432MP	220408-MP	○	○	○	○	.500	.187	.031	
	433MP	220412-MP	○	○	○	○	.500	.187	.047	
	VNMG331MP	VNMG160404-MP	○	○	○	○	.375	.187	.016	
	332MP	160408-MP	●	●	●	●	.375	.187	.031	
	333MP	160412-MP	○	○	○	○	.375	.187	.047	
	WNMG32.51MP	WNMG06T304-MP	○	○	○	○	.375	.156	.016	
	32.52MP	06T308-MP	○	○	○	○	.375	.156	.031	
	32.53MP	06T312-MP	○	○	○	○	.375	.156	.047	
	331MP	060404-MP	○	○	○	○	.375	.187	.016	
	332MP	060408-MP	○	○	○	○	.375	.187	.031	
	333MP	060412-MP	○	○	○	○	.375	.187	.047	
	431MP	080404-MP	○	○	○	○	.500	.187	.016	
	432MP	080408-MP	●	●	●	●	.500	.187	.031	
	433MP	080412-MP	●	●	●	●	.500	.187	.047	
434MP	080416-MP	○	○	○	○	.500	.187	.063		

- : Inventory maintained.
- : Inventory maintained. (Available Spring 2009)
- ★ : Inventory maintained in Japan.
- ☆ : Inventory maintained in Japan. (Available Spring 2009)

Application Examples





Insert	DNMG433	
Workpiece	Carbon steel (AISI 1045)	
Component	Automotive part	
Cutting Conditions	Cutting speed (SFM)	920
	Feed (IPR)	.008 – .016
	Depth of cut (Inch)	.016 – .039
	Coolant	Wet cutting
Results	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>MP Breaker (UE6110)</p>  <p>Breaker remains</p> </div> <div style="text-align: center;"> <p>Conventional breaker</p>  <p>Breaker is worn away</p> </div> </div>	<p>With conventional inserts, tool life was limited by rapidly deteriorating chip disposal conditions as the chip breaker eroded. The MP breaker precluded chip disposal problems extending tool life from 300 to 400 parts.</p>

Insert	CNMG433	
Workpiece	Carbon steel (AISI 1045)	
Component	Automotive part	
Cutting Conditions	Cutting speed (SFM)	785
	Feed (IPR)	.010 – .014
	Depth of cut (Inch)	.039 – .059
	Coolant	Wet cutting
Results	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>MP Breaker (UC5115)</p>  <p>Normal wear</p> </div> <div style="text-align: center;"> <p>Conventional breaker</p>  <p>Chipping</p> </div> </div>	<p>Edge chipping limited tool life with a conventional insert. The MP breaker delivered stable performance. Smooth edge wear without chipping reduces the risk of sudden fracturing.</p>

Insert	DNMG433			
Workpiece	Carbon steel (AISI 1055)			
Component	Automotive part			
Cutting Conditions	Cutting speed (SFM)	755		
	Feed (IPR)	.008 – .020		
	Depth of cut (Inch)	.016 – .098		
	Coolant	Wet cutting		
Results	<p style="text-align: center;">MP Breaker</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Initial stage of machining</p> </div> <div style="text-align: center;">  <p>After machining 100 parts</p> </div> </div> <p style="text-align: center;">No damage</p>		<p style="text-align: center;">Conventional breaker</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Initial stage of machining</p> </div> <div style="text-align: center;">  <p>After machining 70 parts</p> </div> </div> <p style="text-align: center;">Chips are tangled</p>	

MP Breaker

Application Examples

Insert	WNMG432MP	
Workpiece	Carbon steel (AISI 1045)	
Component	Automotive part (Constant-velocity joint)	
Cutting Conditions	Cutting speed (SFM)	740
	Feed (IPR)	.016
	Depth of cut (Inch)	.039 – .059
	Coolant	Wet cutting
Results	<p>Chip geometry</p> <p>MP breaker (UE6020)</p>  <p>Conventional breaker</p> 	<p>MP Breaker</p> 
	<p>The conventional insert failed through sudden fracturing due to jamming of continuous chips. The MP breaker produced freely broken chips and delivered stable machining performance.</p>	

For your safety

● Do not touch sharp parts or chips without wearing gloves. ● Use tools under recommended cutting conditions, and exchange tools before excessive wear occurs. ● Chips become extremely hot, scattered over and may be stretched. Ensure safety guards and goggles are used. ● In case of using non-water soluble oil, make sure to have a fire prevention countermeasure. ● Use the provided wrench, and ensure the inserts and spare parts are damped securely.

MITSUBISHI MATERIALS CORPORATION



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ISO 9001:2000
Registration No. JSAQ 080
Osaka Plant
ISO 9001:2000
Registration No. JSAQ 094



Tokai Plant
ISO 14001:1996
Registration No. JSAE 036



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(Tools specifications subject to change without notice.)