

Expanded  
Inserts

New Chip Breaker Inserts for Turning

## **MP Breaker**

# Offers the best performance for automotive parts applications !

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



## New Chip Breaker Inserts for Turning

# MP Breaker

## Outline

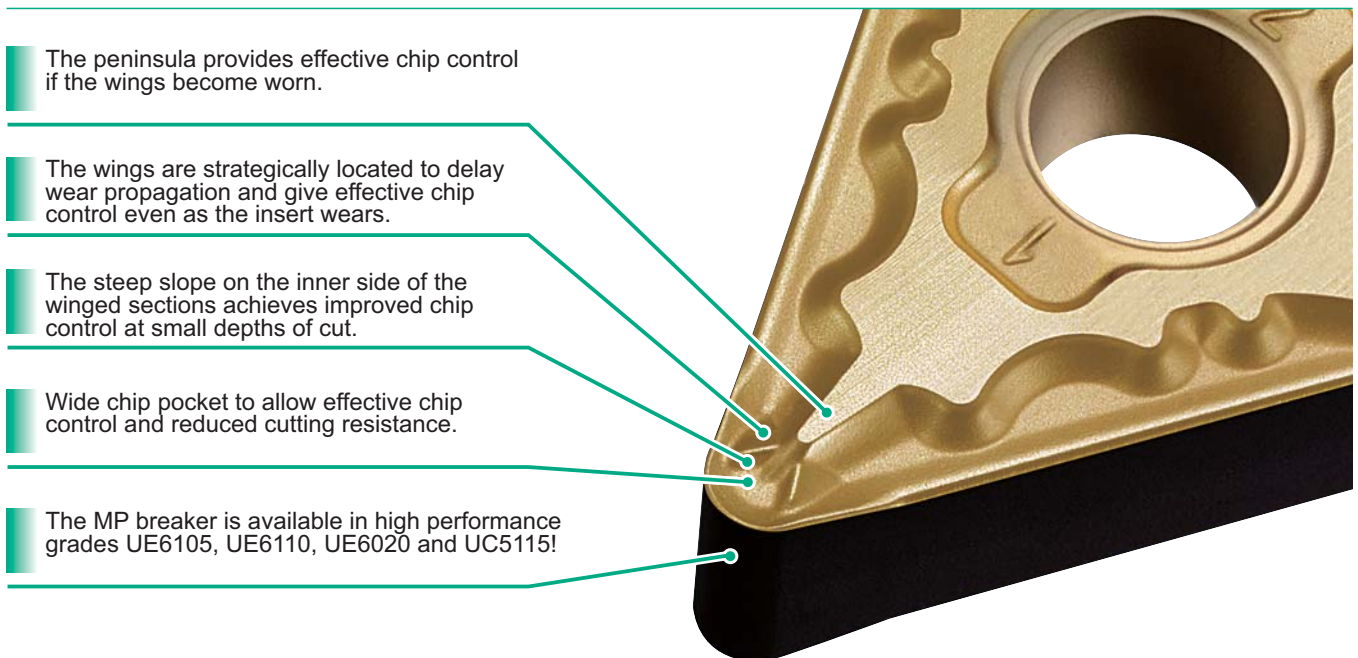
When copying, cutting conditions such as the depth of cut, feed rate and cutting speed can vary.

This can lead to a number of problems and reduce efficiency:

- 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.

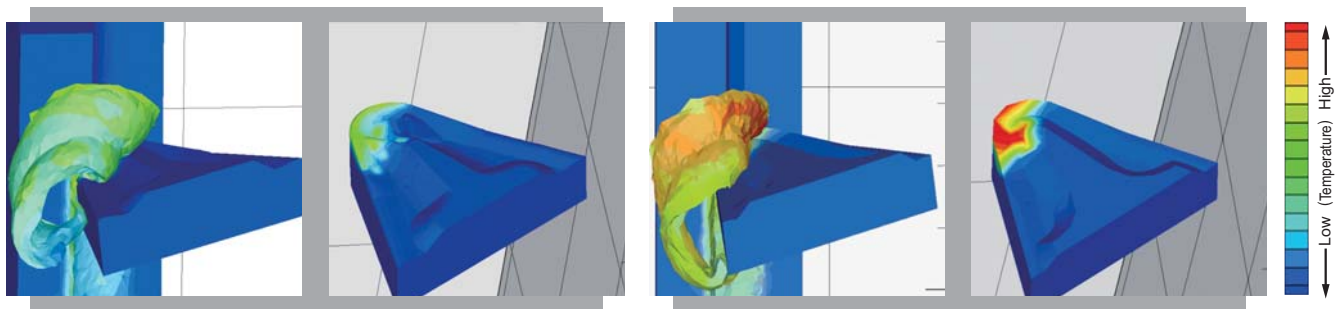
**MP** breaker uses a unique geometry that provides effective chip control over a wide application area. It also improves wear resistance because of lower heat generation during cutting, therefore contributing to a large increase in productivity.

## Features



## Analysis: Chip geometry and cutting edge temperatures

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



**MP Breaker**

**Conventional breaker**

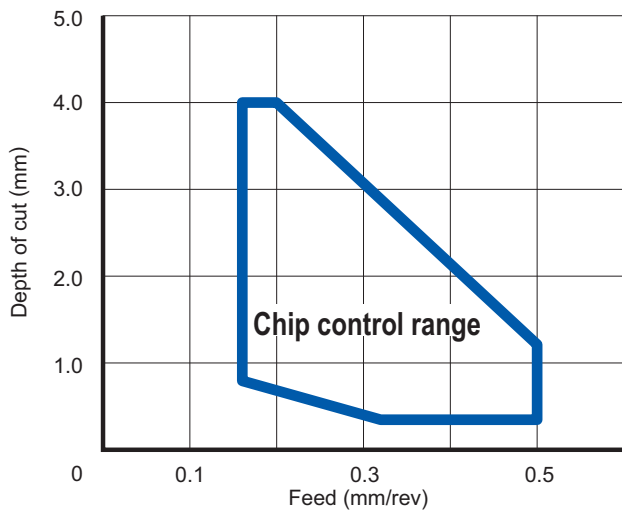
<Cutting Conditions>

Insert : DNMG150412-00 Feed : 0.4mm/rev  
Workpiece : JIS S45C Depth of cut: 2.0mm  
Cutting speed: 200m/min Dry cutting

# MP Breaker

## Cutting performance

### Effective chip control range



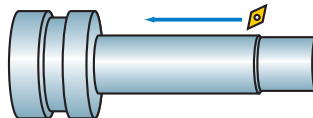
<Cutting conditions>

Insert : CNMG120408-MP  
 Workpiece : JIS SCr420H  
 Cutting speed: 200m/min  
 Wet cutting

### Chip control comparison

Cutting speed	MP Breaker	Conventional breaker
200m/min		
400m/min		

Carbon steel (JIS S45C)



<Cutting conditions>

Insert : DNMG150412-00  
 Feed : 0.45mm/rev  
 Depth of cut : 1.0mm  
 Wet cutting

### Cutting edge comparison

<Cutting Conditions>

Workpiece : JIS S45C Feed : 0.2–0.5mm/rev  
 Insert : DNMG150412-00 Depth of cut : 0.4–2.5mm  
 Cutting speed: 230m/min Wet cutting


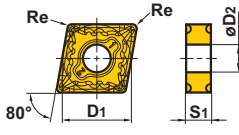

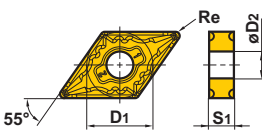

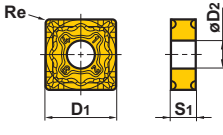

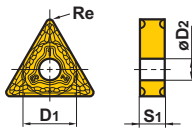

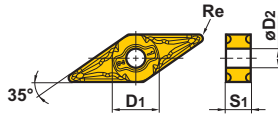

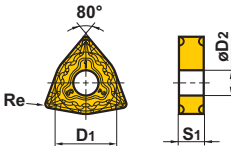
MP Breaker	Conventional breaker
 Breaker remains	 Breaker is worn away
Pieces: 100	Pieces: 70

## Recommended cutting conditions

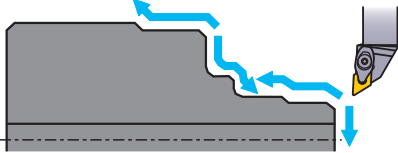
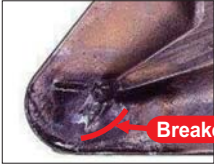
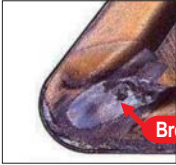
Work Material	Hardness	Grade	Recommended Cutting Speed (m/min)	Work Material	Hardness	Grade	Recommended Cutting Speed (m/min)		
P Mild Steel	?180HB	UE6105	400 (270–500)	K Cast Iron	Tensile Strength ≤300MPa	UC5115	230 (160–300)		
		UE6110	340 (250–420)			Tensile Strength ≤450MPa	UC5115	230 (160–300)	
		UE6020	310 (240–380)		Ductile Cast Iron		Tensile Strength 500–800MPa	UC5115	200 (150–250)
	Carbon Steel Alloy Steel	180–280HB	UE6105			300 (200–380)			
			UE6110			260 (190–330)			
			UE6020		240 (180–300)				






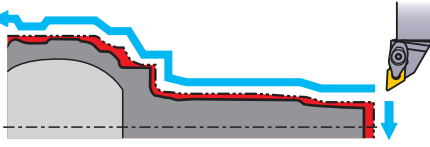
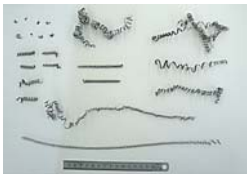
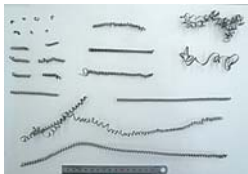
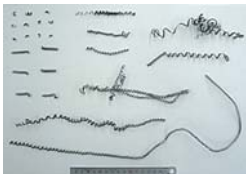
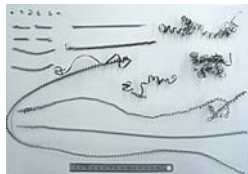
## Inserts

Shape	Order Number	Coated				Dimensions (mm)				Geometry
		NEW UE6105	UE6110	UE6020	UC5115	D1	S1	Re	D2	
<b>MP Breaker</b>  Medium Cutting	NEW CNMG120404-MP	●	●	●	●	12.7	4.76	0.4	5.16	
	120408-MP	●	●	●	●	12.7	4.76	0.8	5.16	
	120412-MP	●	●	●	●	12.7	4.76	1.2	5.16	
	NEW 120416-MP	●	●	●	●	12.7	4.76	1.6	5.16	
	NEW 160608-MP	●	●	●	●	15.875	6.35	0.8	6.35	
	160612-MP	●	●	●	●	15.875	6.35	1.2	6.35	
	160616-MP	●	●	●	●	15.875	6.35	1.6	6.35	
<b>MP Breaker</b>  Medium Cutting	NEW DNMG150404-MP	●	●	●	●	12.7	4.76	0.4	5.16	
	150408-MP	●	●	●	●	12.7	4.76	0.8	5.16	
	150412-MP	●	●	●	●	12.7	4.76	1.2	5.16	
	NEW 150416-MP	●	●	●	●	12.7	4.76	1.6	5.16	
	NEW 150604-MP	●	●	●	●	12.7	6.35	0.4	5.16	
	150608-MP	●	●	●	●	12.7	6.35	0.8	5.16	
	NEW 150612-MP	●	●	●	●	12.7	6.35	1.2	5.16	
NEW 150616-MP	●	●	●	●	12.7	6.35	1.6	5.16		
<b>MP Breaker</b>  Medium Cutting	NEW SNMG120404-MP	●	●	●	●	12.7	4.76	0.4	5.16	
	120408-MP	●	●	●	●	12.7	4.76	0.8	5.16	
	120412-MP	●	●	●	●	12.7	4.76	1.2	5.16	
<b>MP Breaker</b>  Medium Cutting	NEW TNMG160404-MP	●	●	●	●	9.525	4.76	0.4	3.81	
	160408-MP	●	●	●	●	9.525	4.76	0.8	3.81	
	160412-MP	●	●	●	●	9.525	4.76	1.2	3.81	
	NEW 220408-MP	●	●	●	●	12.7	4.76	0.8	5.16	
	NEW 220412-MP	●	●	●	●	12.7	4.76	1.2	5.16	
<b>MP Breaker</b>  Medium Cutting	NEW VNMG160404-MP	●	●	●	●	9.525	4.76	0.4	3.81	
	160408-MP	●	●	●	●	9.525	4.76	0.8	3.81	
	NEW 160412-MP	●	●	●	●	9.525	4.76	1.2	3.81	
<b>MP Breaker</b>  Medium Cutting	NEW WNMG06T304-MP	●	●	●	●	9.525	3.97	0.4	3.81	
	NEW 06T308-MP	●	●	●	●	9.525	3.97	0.8	3.81	
	NEW 06T312-MP	●	●	●	●	9.525	3.97	1.2	3.81	
	NEW 060404-MP	●	●	●	●	9.525	4.76	0.4	3.81	
	NEW 060408-MP	●	●	●	●	9.525	4.76	0.8	3.81	
	NEW 060412-MP	●	●	●	●	9.525	4.76	1.2	3.81	
	NEW 080404-MP	●	●	●	●	12.7	4.76	0.4	5.16	
	080408-MP	●	●	●	●	12.7	4.76	0.8	5.16	
	080412-MP	●	●	●	●	12.7	4.76	1.2	5.16	
NEW 080416-MP	●	●	●	●	12.7	4.76	1.6	5.16		

## Application Examples

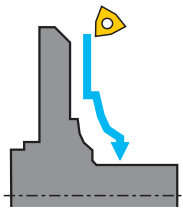



Insert	<b>DNMG150612-00</b>		
Workpiece	Carbon steel (JIS S45C)		
Component	Automotive part		
Cutting Conditions	Cutting speed (m/min)	280	
	Feed (mm/rev)	0.2–0.4	
	Depth of cut (mm)	0.4–1.0	
Coolant	Wet cutting		
Results	<p><b>MP Breaker (UE6110)</b></p>  <p><b>Breaker remains</b></p>	<p><b>Conventional breaker</b></p>  <p><b>Breaker is worn away</b></p>	<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	<b>CNMG120412-00</b>		
Workpiece	Carbon steel (JIS S45C)		
Component	Automotive part		
Cutting Conditions	Cutting speed (m/min)	240	
	Feed (mm/rev)	0.25–0.35	
	Depth of cut (mm)	1.0–1.5	
Coolant	Wet cutting		
Results	<p><b>MP Breaker (UC5115)</b></p>  <p><b>Normal wear</b></p>	<p><b>Conventional breaker</b></p>  <p><b>Chipping</b></p>	<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	<b>DNMG150412-00</b>	
Workpiece	Carbon steel (JIS S55C)	
Component	Automotive part	
Cutting Conditions	Cutting speed (m/min)	230
	Feed (mm/rev)	0.2–0.5
	Depth of cut (mm)	0.4–2.5
Coolant	Wet cutting	
Results	<p><b>MP Breaker (UC5115)</b></p>  <p>Initial stage of machining</p>  <p>After machining 100 parts</p> <p><b>No damage</b></p>	<p><b>Conventional breaker</b></p>  <p>Initial stage of machining</p>  <p>After machining 70 parts</p> <p><b>Chips are tangled</b></p>

# MP Breaker

## Application Examples

Insert	WNMG080412-00	
Workpiece	Carbon steel (JIS S45C)	
Component	Automotive part	
Cutting Conditions	Cutting speed (m/min)	225
	Feed (mm/rev)	0.4
	Depth of cut (mm)	1.0–1.5
Coolant	Wet cutting	
Results	<p>Chip geometry</p> <p><b>MP Breaker</b> (UE6020)</p>  <p>Conventional breaker</p> 	<p><b>MP Breaker</b> Wear condition</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

- 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 spanner.

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