

CVD coated grade for turning of cast iron

**UC5015/  
UC5005/UE6010**

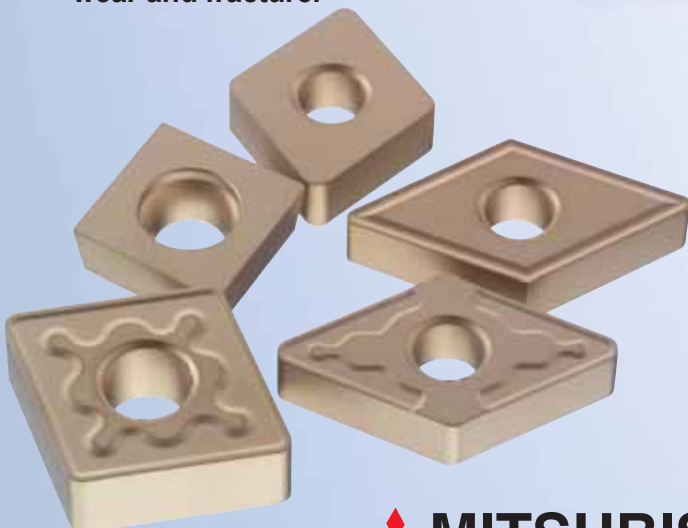
## Excellent wear resistance in machining ordinary cast iron and ductile cast iron, reducing cutting costs.

### Grey cast iron cutting

Due to the employment of a thickened smooth outer layer of fine-grained aluminium oxide (Al<sub>2</sub>O<sub>3</sub>), UC5015 achieves improved cutting edge strength under a raised temperature. It displays excellent wear resistance in high speed cutting of cast iron.

### Ductile cast iron cutting

Because of a thick, fibrous, crystalline inner layer of titanium carbonitride(TiCN), UC5015 exhibits superior resistance to wear and fracture.

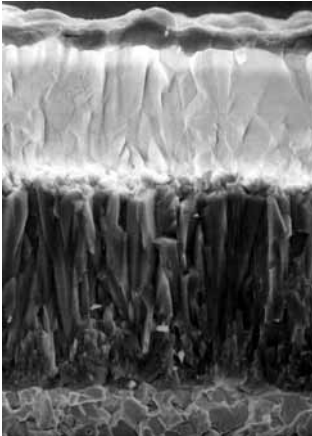


# CVD coated grade for turning of cast iron

# UC5015/UC5005/UE6010

## Features of UC5015

CVD coated carbide grade **UC5015**, which has a thickened smooth outer layer of fine-grained aluminium oxide (Al<sub>2</sub>O<sub>3</sub>) and a very thick, fibrous, crystalline inner layer of titanium carbonitride (TiCN), is the first recommendation for grey cast iron and ductile cast iron cutting.



Micro-structure of **UC5015**

○ **First recommendation for cutting of grey cast iron / ductile cast iron!**

■ **Grey cast iron cutting**

Due to the employment of a thickened smooth outer layer of fine-grained aluminium oxide (Al<sub>2</sub>O<sub>3</sub>), **UC5015** achieves improved cutting edge strength under a raised temperature. It displays excellent wear resistance in high speed cutting of cast iron.

■ **Ductile cast iron cutting**

Due to the employment of a very thick fibrous crystalline titanium carbonitride inner layer for the coating, **UC5015** displays excellent wear and fracture resistance in ductile cast iron cutting.

○ **Prevents welding**.....The surface of the coating layers is lamination of special titanium compound that is vapor deposited by Even Coating technology. This prevents welding that tends to occur in cast iron cutting, leading to significantly longer tool life when compared with conventional counterparts.

○ **Highly fracture resistant substrate**

.....**UC5015** employs highly fracture resistant special substrate.

○ **Responds to dry cutting**.....**UC5015** responds to dry cutting, and thus is environment-friendly; it reduces energy consumption and contributes to the protection of global environment.

## Application range and recommended cutting conditions

### TOOL NAVI SYSTEM

**UC5015** is the most highly recommended grade for cast iron cutting. **UC5005** is recommended for stable cutting. **UC6010** is recommended for unstable, heavy-load cutting.

### NEGATIVE INSERTS FOR CAST IRON



#### Cutting conditions

● **Stable cutting**  
Continuous cutting  
Constant depth of cutting  
Pre-machined  
Securely clamped component cutting

○ **General cutting**

⊕ **Unstable cutting**  
Heavy interrupted cutting  
Irregular depth of cutting  
Low clamping rigidity cutting

#### Cutting area

**F** Finish cutting (ap≤0.5mm)

**M** Medium cutting (ap=1.5–4.0mm)

**G** Semi-heavy cutting (ap=4.0–7.0mm)

#### Application range

ISO	Grey cast iron Ductile cast iron
K01	UC5005
K10	UC5015
K20	UC5015
K30	UE6010

#### Recommended cutting conditions

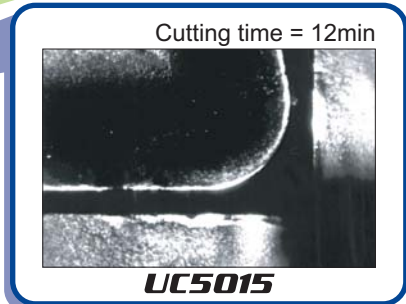
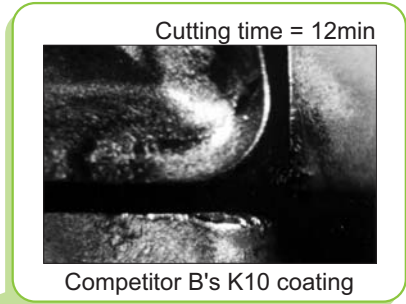
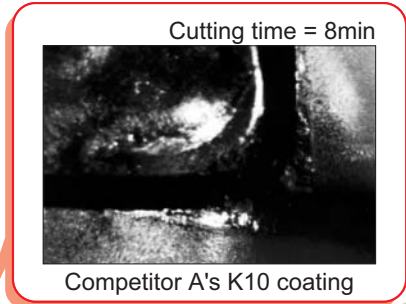
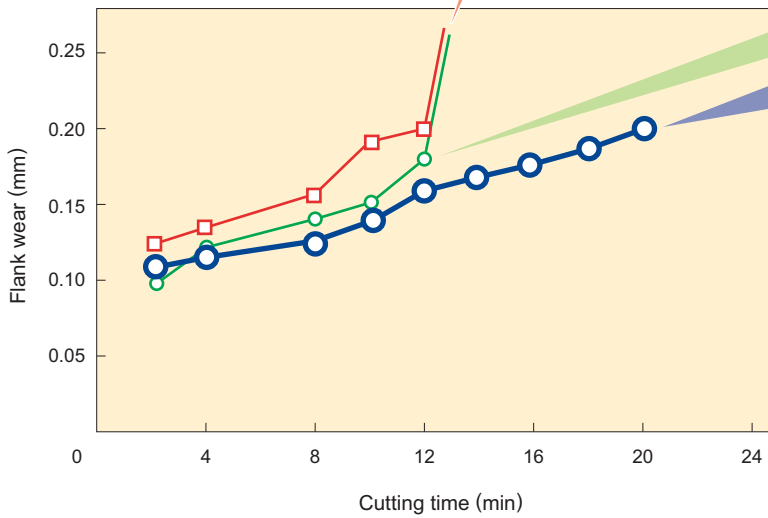
Workpiece	Tensile strength (N/mm <sup>2</sup> )	Recommended cutting speed (m/min)		
		UC5005	UC5015	UE6010
K Grey cast iron	≤300	250 (150–300)	200 (100–250)	
	≤450	250 (150–300)	200 (100–250)	
Ductile cast iron	500–800	200 (150–250)	150 (100–200)	

# Cutting performance

## Wear resistance

**High wear resistance and long tool life**

Cast iron JIS FC300

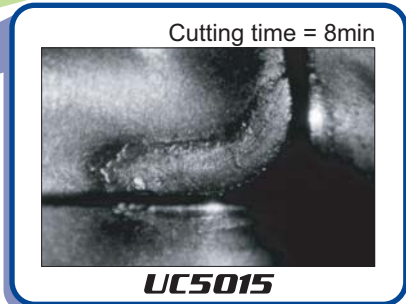
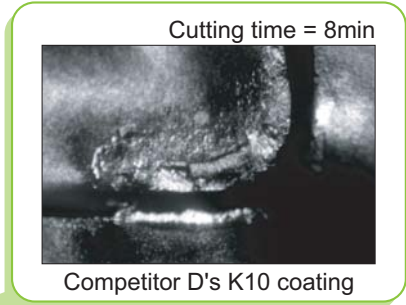
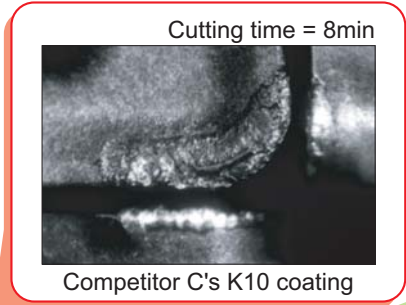
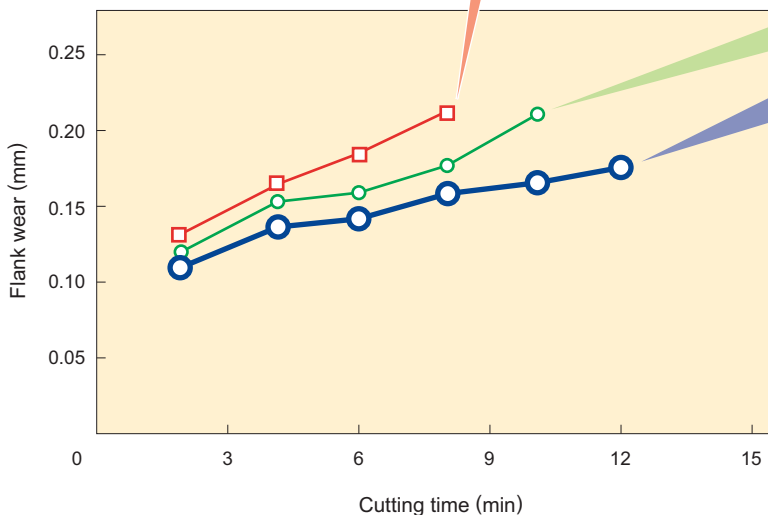


<Cutting conditions>  
 Insert : CNMG120408-○○○  
 Tool : PCLNL2525M12  
 Cutting speed : 300m/min  
 Feed : 0.3mm/rev  
 Depth of cut : 1.5mm  
 Dry cutting  
 ○○○ indicates chipbreaker types.

## Wear resistance

**High wear resistance and long tool life**

Ductile cast iron JIS FCD700



<Cutting conditions>  
 Insert : CNMG120408-○○○  
 Tool : PCLNL2525M12  
 Cutting speed : 200m/min  
 Feed : 0.3mm/rev  
 Depth of cut : 1.5mm  
 Wet cutting  
 ○○○ indicates chipbreaker types.

# UC5015/UC5005/UE6010

## Standard inserts

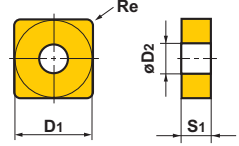
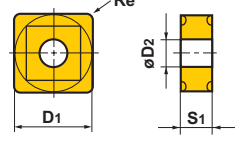
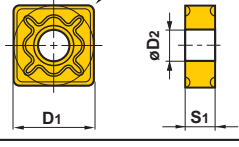
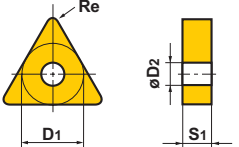
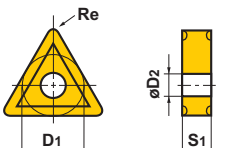
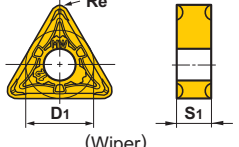
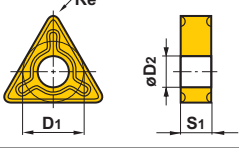
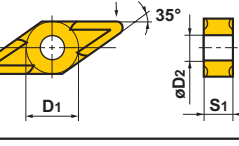
### ● Negative Insert

Geometry	Order number	Stock			Dimensions (mm)			
		UC5005	UC5015	UE6010	D1	S1	Re	D2
	<b>CNMA120404</b>	●	●	□	12.7	4.76	0.4	5.16
	<b>120408</b>	●	●	□	12.7	4.76	0.8	5.16
	<b>120412</b>	●	●	□	12.7	4.76	1.2	5.16
	<b>120416</b>	●	●	□	12.7	4.76	1.6	5.16
	<b>160612</b>	●	●	□	15.875	6.35	1.2	6.35
	<b>160616</b>	□	●		15.875	6.35	1.6	6.35
	<b>190612</b>	□	●	□	19.05	6.35	1.2	7.93
	<b>190616</b>	□	□	□	19.05	6.35	1.6	7.93
	<b>CNMG120404</b>	●	●	●	12.7	4.76	0.4	5.16
	<b>120408</b>	●	●	●	12.7	4.76	0.8	5.16
	<b>120412</b>	●	●	●	12.7	4.76	1.2	5.16
	<b>160612</b>	●	●	●	15.875	6.35	1.2	6.35
	<b>190612</b>	□	□	●	19.05	6.35	1.2	7.93
<p>(Wiper)</p>	<b>CNMG120408-MW</b>	●		●	12.7	4.76	0.8	5.16
	<b>120412-MW</b>	●		●	12.7	4.76	1.2	5.16
	<b>CNMG120408-GH</b>	●	●	●	12.7	4.76	0.8	5.16
	<b>120412-GH</b>	●	●	●	12.7	4.76	1.2	5.16
	<b>160612-GH</b>		●	●	15.875	6.35	1.2	6.35
	<b>DNMA150408</b>	●	●	□	12.7	4.76	0.8	5.16
	<b>150412</b>	●	●	□	12.7	4.76	1.2	5.16
	<b>150416</b>		●		12.7	4.76	1.6	5.16
	<b>150608</b>		●		12.7	6.35	0.8	5.16
	<b>DNMG150404</b>	●	●	●	12.7	4.76	0.4	5.16
	<b>150408</b>	●	●	●	12.7	4.76	0.8	5.16
	<b>150412</b>	●	●	●	12.7	4.76	1.2	5.16
	<b>150604</b>	□	□	●	12.7	6.35	0.4	5.16
	<b>150608</b>	●	●	●	12.7	6.35	0.8	5.16
	<b>150612</b>	●	●	●	12.7	6.35	1.2	5.16
<p>(Wiper)</p>	<b>DNMX150408-MW</b>	□	□	●	12.7	4.76	0.8	5.16
	<b>150412-MW</b>	□	□	●	12.7	4.76	1.2	5.16
	<b>150608-MW</b>	□	□	●	12.7	6.35	0.8	5.16
	<b>150612-MW</b>	□	□	●	12.7	6.35	1.2	5.16
	<b>DNMG150408-GH</b>	●	●	●	12.7	4.76	0.8	5.16
	<b>150412-GH</b>	●	●	●	12.7	4.76	1.2	5.16
	<b>150608-GH</b>	●	●	●	12.7	6.35	0.8	5.16
	<b>150612-GH</b>	●	●	●	12.7	6.35	1.2	5.16

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

No mark : Not manufactured.

● Negative Insert

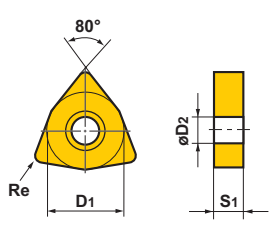
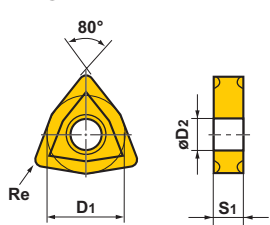
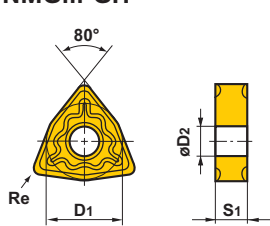
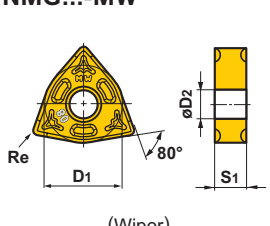
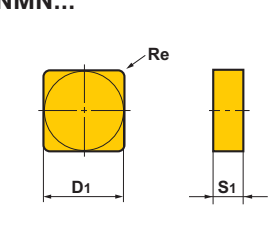
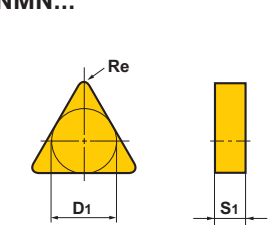
Geometry	Order number	Stock			Dimensions (mm)			
		UC5005	UC5015	UE6010	D1	S1	Re	D2
<b>SNMA...</b> 	<b>SNMA090308</b>	●	●		9.525	3.18	0.8	3.81
	<b>120408</b>	●	●		12.7	4.76	0.8	5.16
	<b>120412</b>	●	●		12.7	4.76	1.2	5.16
	<b>120416</b>	●	□		12.7	4.76	1.6	5.16
	<b>190612</b>	●	□		19.05	6.35	1.2	7.93
	<b>190616</b>	●	□	□	19.05	6.35	1.6	7.93
<b>SNMG...</b> 	<b>SNMG120408</b>	●	●	●	12.7	4.76	0.8	5.16
	<b>120412</b>	●	●	●	12.7	4.76	1.2	5.16
	<b>120416</b>	●	●	●	12.7	4.76	1.6	5.16
<b>SNMG...-GH</b> 	<b>SNMG120408-GH</b>	●	●	●	12.7	4.76	0.8	5.16
	<b>120412-GH</b>	●	●	●	12.7	4.76	1.2	5.16
<b>TNMA...</b> 	<b>TNMA160404</b>	●	●		9.525	4.76	0.4	3.81
	<b>160408</b>	●	●	□	9.525	4.76	0.8	3.81
	<b>160412</b>	●	●		9.525	4.76	1.2	3.81
	<b>160416</b>	●	●		9.525	4.76	1.6	3.81
	<b>160420</b>	●	●		9.525	4.76	2.0	3.81
	<b>220408</b>	●	●	□	12.7	4.76	0.8	5.16
	<b>220412</b>	●	●	□	12.7	4.76	1.2	5.16
	<b>220416</b>	●	●		12.7	4.76	1.6	5.16
<b>TNMG...</b> 	<b>TNMG160404</b>	●	●	●	9.525	4.76	0.4	3.81
	<b>160408</b>	●	●	●	9.525	4.76	0.8	3.81
	<b>160412</b>	●	●	●	9.525	4.76	1.2	3.81
	<b>160416</b>	□		●	9.525	4.76	1.6	3.81
	<b>220408</b>	●	●	●	12.7	4.76	0.8	5.16
	<b>220416</b>	●	□	●	12.7	4.76	1.6	5.16
<b>TNMX...-MW</b>  <p>(Wiper)</p>	<b>TNMX160408-MW</b>	□	□	●	9.525	4.76	0.8	3.81
	<b>160412-MW</b>	□	□	●	9.525	4.76	1.2	3.81
<b>TNMG...-GH</b> 	<b>TNMG160408-GH</b>	●	●	●	9.525	4.76	0.8	3.81
	<b>160412-GH</b>	●	●	●	9.525	4.76	1.2	3.81
	<b>220408-GH</b>	●	□	●	12.7	4.76	0.8	5.16
<b>VNMG...</b> 	<b>VNMG160404</b>		□	●	9.525	4.76	0.4	3.81
	<b>160408</b>	●	●	●	9.525	4.76	0.8	3.81



# UC5015/UC5005/UE6010

## Standard inserts

### ● Negative Insert

Geometry	Order number	Stock			Dimensions (mm)			
		UC5005	UC5015	UE6010	D1	S1	Re	D2
<b>WNMA...</b> 	<b>WNMA080404</b>		□		12.7	4.76	0.4	5.16
	<b>080408</b>	●	●	□	12.7	4.76	0.8	5.16
	<b>080412</b>	●	●	□	12.7	4.76	1.2	5.16
<b>WNMG...</b> 	<b>WNMG080408</b>	●	●	●	12.7	4.76	0.8	5.16
	<b>080412</b>	●	●	●	12.7	4.76	1.2	5.16
<b>WNMG...-GH</b> 	<b>WNMG080408-GH</b>	●	●	●	12.7	4.76	0.8	5.16
	<b>080412-GH</b>	●	●	●	12.7	4.76	1.2	5.16
<b>WNMG...-MW</b>  (Wiper)	<b>WNMG060408-MW</b>	□	□	●	9.525	4.76	0.8	3.81
	<b>060412-MW</b>	□	□	●	9.525	4.76	1.2	3.81
	<b>080408-MW</b>	●		●	12.7	4.76	0.8	5.16
	<b>080412-MW</b>	●		●	12.7	4.76	1.2	5.16
<b>SNMN...</b> 	<b>SNMN120408</b>	●	●		12.7	4.76	0.8	—
	<b>120412</b>	●	●	□	12.7	4.76	1.2	—
	<b>120416</b>	●	●		12.7	4.76	1.6	—
<b>TNMN...</b> 	<b>TNMN160408</b>	●	●		9.525	4.76	0.8	—
	<b>160412</b>	●	●		9.525	4.76	1.2	—
	<b>160416</b>	●	●		9.525	4.76	1.6	—
	<b>160420</b>	●	●		9.525	4.76	2.0	—

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

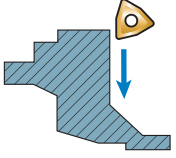
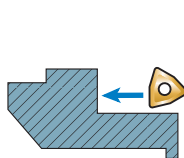
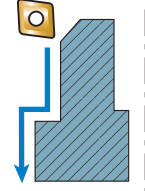
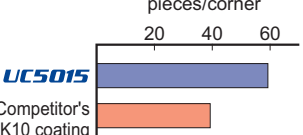
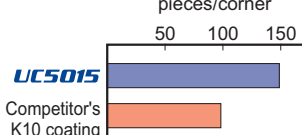
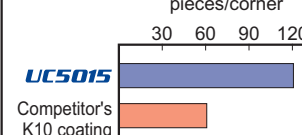
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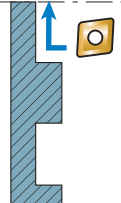
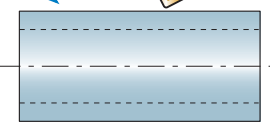
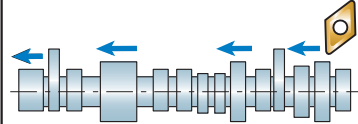
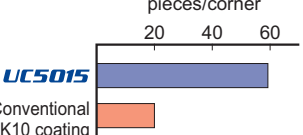
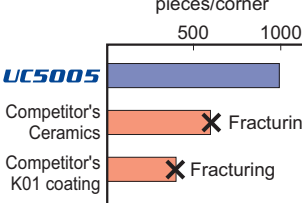
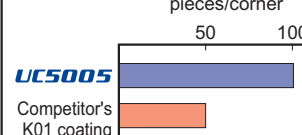
● Positive Insert

Geometry	Order number	Stock			Dimensions (mm)			
		UC5005	UC5015	UE6010	D1	S1	Re	D2
	<b>CCMW060204</b>	●	●		6.35	2.38	0.4	2.8
	<b>09T304</b>	●	●		9.525	3.97	0.4	4.4
	<b>09T308</b>	●	●		9.525	3.97	0.8	4.4
	<b>120404</b>	●	●		12.7	4.76	0.4	5.5
	<b>120408</b>	□	●		12.7	4.76	0.8	5.5
	<b>120412</b>	●	●		12.7	4.76	1.2	5.5
	<b>DCMW11T304</b>	●	●		9.525	3.97	0.4	4.4
	<b>11T308</b>	●	●		9.525	3.97	0.8	4.4
	<b>SCMW09T308</b>	●	●		9.525	3.97	0.8	4.4
	<b>120404</b>	●	●		12.7	4.76	0.4	5.5
	<b>120408</b>	●	●		12.7	4.76	0.8	5.5
	<b>TCMW110204</b>	□	□		6.35	2.38	0.4	2.8
	<b>16T304</b>	●	●		9.525	3.97	0.4	4.4
	<b>16T308</b>	●	●		9.525	3.97	0.8	4.4
	<b>VCMW160404</b>	□	●	□	9.525	4.76	0.4	4.4
	<b>160408</b>		●	□	9.525	4.76	0.8	4.4
	<b>TPMN110304</b>	●	●	●	6.35	3.18	0.4	—
	<b>110308</b>	●	●	●	6.35	3.18	0.8	—
	<b>160304</b>	●	●	●	9.525	3.18	0.4	—
	<b>160308</b>	●	●	●	9.525	3.18	0.8	—
	<b>160312</b>		□	□	9.525	3.18	1.2	—
	<b>220408</b>	□		●	12.7	4.76	0.8	—

**UC5015/UC5005/UE6010**

## Application examples

Insert / grade	WNMG080412(UC5015)	WNMG080408(UC5015)	CNMA120412(UC5015)	
Workpiece	Break drum (JIS FC250) 	Oil pump housing (JIS FC250) 	Interaction carrier (JIS FCD) 	
Cutting conditions	Cutting speed (m/min)	250	150	240
	Feed (mm/rev)	Max. 0.32	Max. 0.35	Max. 0.45
	Depth of cut (mm)	2	Max. 2.5	Max. 3
Coolant	Wet cutting			
Results	 The competitor grade reached tool life due to chipping. UC5015 achieved longer tool life only with normal wear.	 The competitor grade reached tool life due to excessive wear. UC5015 suffered from little wear and achieved longer tool life.	 The competitor grade showed unstable results for the number of machined pieces/corner. UC5015 achieved stable tool life.	

Insert / grade	CNMG120404(UC5015)	SNMG120412(UC5005)	DNMA150408(UC5005)	
Workpiece	Flywheel (JIS FC350) 	Sleeve (JIS FC300) Cutting length 50mm 	Cam shaft (FCD700) 	
Cutting conditions	Cutting speed (m/min)	180	110	170
	Feed (mm/rev)	0.08	0.95	0.4 – 0.5
	Depth of cut (mm)	0.5	1	1.0 – 1.5
Coolant	Dry cutting	Wet cutting		
Results	 UC5015 achieved 3 times as long tool life as the conventional grade.	 Competitor's Ceramics ✗ Fracturing Competitor's K01 coating ✗ Fracturing	 UC5005 achieved 2 times as long tool life as the competitor grade.	

## For your safety

●Do not touch cutting 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 spanner, and ensure the inserts and spare parts are damped securely.

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(Tools specifications subject to change without notice.)