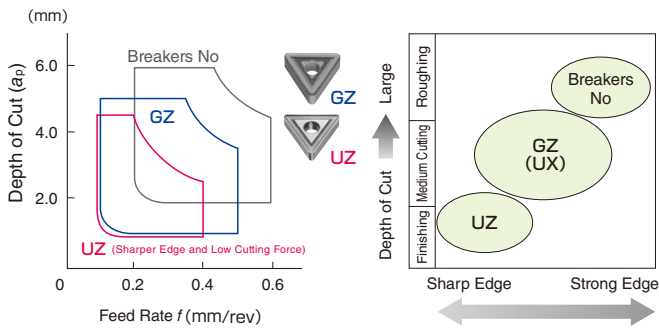
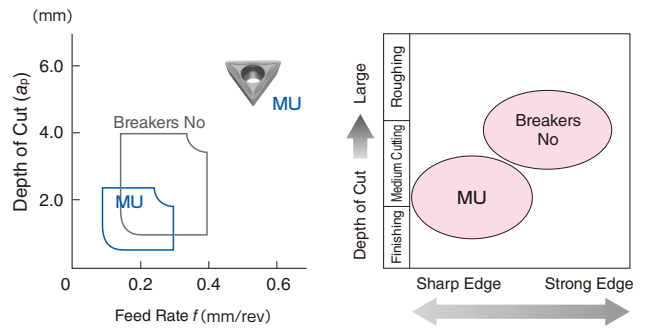


### Chipbreakers

#### Negative Type



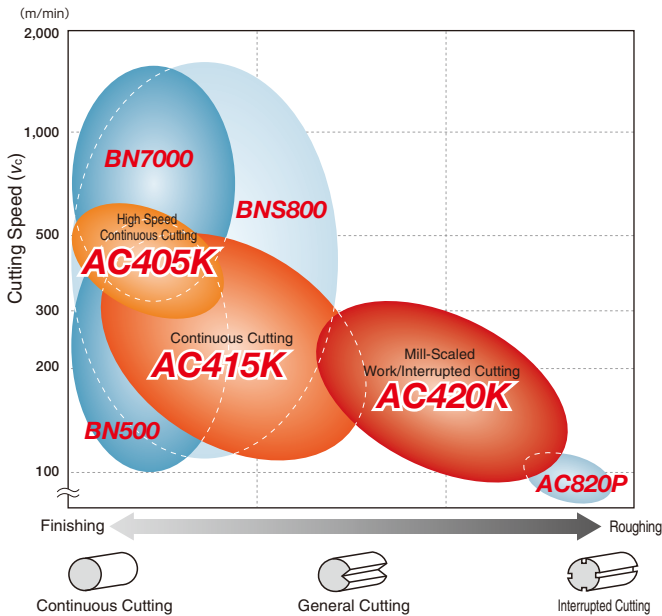
#### Positive Type



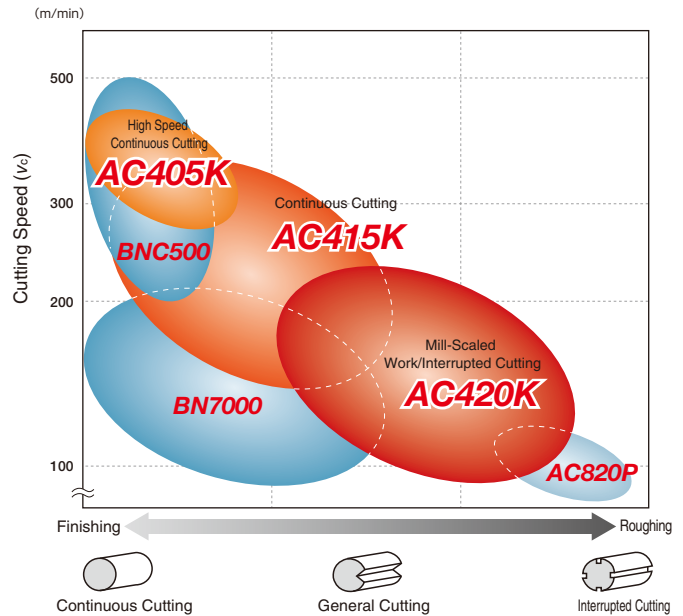
### Grades

CBN Coated SUMIBORON / SUMIBORON / SUMIBORON / SUMIBORON / SUMIBORON  
**BNC500 / BN500 / BN7000 / BN700 / BNS800** ... Page L18

#### ● FC (Grey Cast Iron)



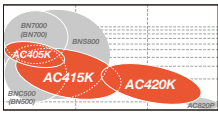
#### ● FCD (Ductile Cast Iron)



### Recommended Cutting Conditions

(Red text indicates 1st recommendation.)

Application	Cutting Process	Chipbreakers	Grades	FC (Grey Cast Iron) Min. - Optimum - Max.		FCD (Ductile Cast Iron) Min. - Optimum - Max.	
				Feed Rate $f$ (mm/rev)	Cutting Speed $v_c$ (m/min)	Feed Rate $f$ (mm/rev)	Cutting Speed $v_c$ (m/min)
High Speed Cutting	Continuous to General	No	<b>BN7000</b>	0.1- <b>0.2</b> -0.5	500- <b>1,500</b> -2,000	0.1- <b>0.20</b> -0.4	80- <b>150</b> -200
	Continuous	No	<b>BNC500</b>	—	—	0.1- <b>0.20</b> -0.4	200- <b>350</b> -500
Finishing	Continuous	UZ	AC405K	0.1- <b>0.25</b> -0.4	230- <b>400</b> -570	0.1- <b>0.25</b> -0.4	170- <b>350</b> -500
	General	<b>UZ</b>	<b>AC415K</b>	0.1- <b>0.25</b> -0.4	200- <b>350</b> -500	0.1- <b>0.25</b> -0.4	150- <b>300</b> -450
	Interrupted	GZ	AC415K	0.1- <b>0.30</b> -0.5	150- <b>275</b> -400	0.1- <b>0.30</b> -0.5	150- <b>250</b> -350
Light Interrupted Medium	Continuous	GZ	AC405K	0.1- <b>0.30</b> -0.5	170- <b>315</b> -460	0.1- <b>0.30</b> -0.5	170- <b>285</b> -400
	General	<b>GZ</b>	<b>AC415K</b>	0.1- <b>0.30</b> -0.5	150- <b>275</b> -400	0.1- <b>0.30</b> -0.5	150- <b>250</b> -350
	Interrupted	GZ	AC420K	0.1- <b>0.30</b> -0.5	100- <b>200</b> -300	0.1- <b>0.30</b> -0.5	80- <b>150</b> -220
Roughing (Mill-Scaled Work)	Continuous	GZ	AC415K	0.1- <b>0.30</b> -0.5	150- <b>275</b> -400	0.1- <b>0.30</b> -0.5	150- <b>250</b> -350
	General	<b>GZ</b>	<b>AC420K</b>	0.1- <b>0.30</b> -0.5	100- <b>200</b> -300	0.1- <b>0.30</b> -0.5	80- <b>150</b> -220
	Interrupted	No	AC420K	0.2- <b>0.35</b> -0.6	100- <b>175</b> -250	0.2- <b>0.35</b> -0.6	80- <b>130</b> -180



# Representative Grades / Application Examples



# Cast Iron

Work Material

A

Grades

Steel

Stainless Steel

Cast Iron

Exotic Alloy

Hardened Steel

Non-Ferrous Metal

## Grades

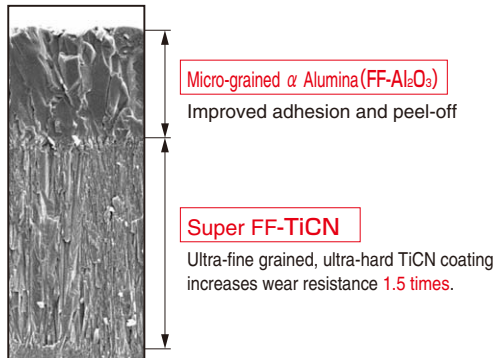
High Speed Continuous Cutting    General Purpose    Mill-Scaled Work/Interrupted Cutting  
**AC405K / AC415K / AC420K**

AC405K : Suitable for high-speed continuous cutting. Excellent resistance to wear and plastic deformation.  
 AC415K : First recommended grade for cast iron turning. Provides stability and long tool life in a wide range of processes.  
 AC420K : Superior fracture resistance provides excellent stability in interrupted unstable cutting and when cutting mill-scaled work.

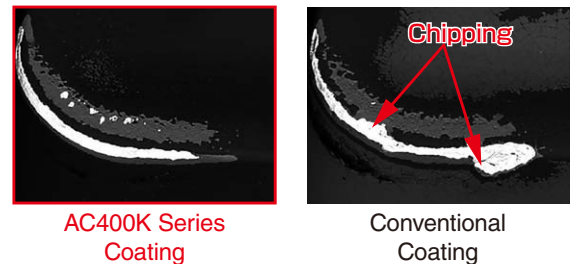


- Improvements to super FF-TiCN coating grain and hardness provide significantly improved wear resistance. Newly developed stress control technology enhances micro-grained  $\alpha$  Alumina (FF- $Al_2O_3$ ) coating for superior reliability.

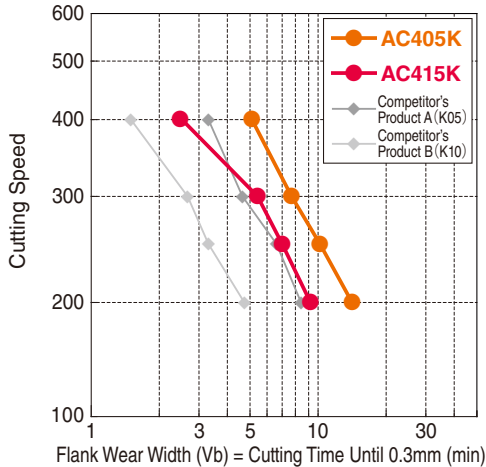
### ● Coating Structure



Coating stress control technology reduces abnormal damage caused by chipping.

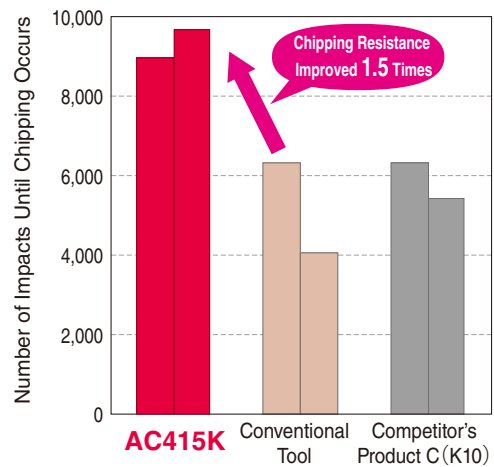


## AC405K/AC415K Wear Resistance



Work Material : FCD450(Round Bar)    Insert : CNMG120408N-GZ  
 Cutting Conditions :  $v_c=200$  to  $400$ m/min     $f=0.30$ mm/rev     $a_p=1.5$ mm    Wet

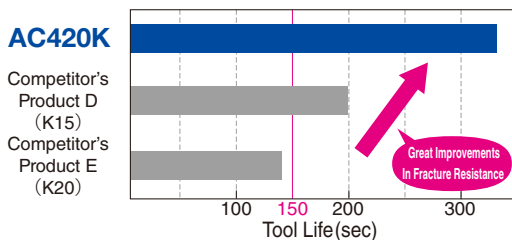
## AC415K Chipping Resistance



Work Material : FCD450    Insert : CNMG120408N-GZ  
 Cutting Conditions :  $v_c=300$ m/min     $f=0.25$ mm/rev     $a_p=1.5$ mm    Wet

## AC420K Fracture Resistance

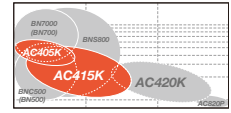
FCD450 Grooved (Heavy Interrupted Acceleration Test)



Edge Wear Comparison (After 150 s)



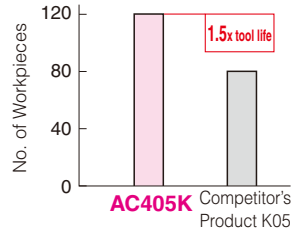
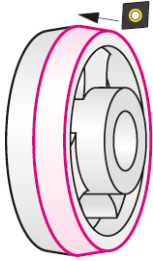
Work Material : FCD450    Toolholder : PCLNR2525-43    Insert : CNMG120408N-GZ  
 Cutting Conditions :  $v_c=350$ m/min     $f=0.25$ mm/rev     $a_p=1.5$ mm    Wet



## AC405K

## FC200 Compressor Component (Pulley)

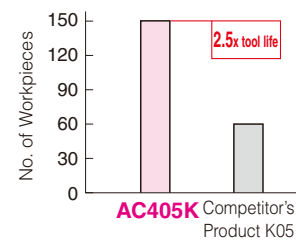
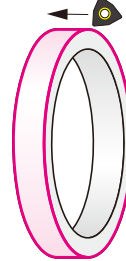
AC405K achieves 1.5 times longer tool life through improved wear resistance.



Insert: CNMG120412N-GZ (AC405K)  
Cutting Conditions:  $v_c=500\text{m/min}$ ,  $f=0.25\text{mm/rev}$ , Up to  $a_p=2.0\text{mm}$ , Dry

## FCD650 Ring

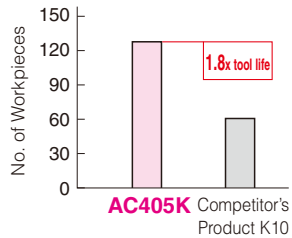
Thanks to reduced chipping and improved wear resistance, AC405K eliminates problems with unstable tool life and achieves 2.5 times longer stable tool life.



Insert: WNMG080408N-UZ (AC405K)  
Cutting Conditions:  $v_c=340\text{m/min}$ ,  $f=0.3\text{mm/rev}$ ,  $a_p=0.2\text{mm}$ , Wet

## FCD700 Input Shaft

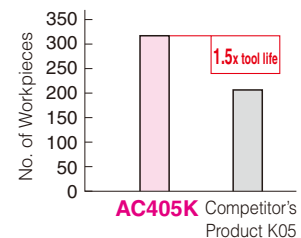
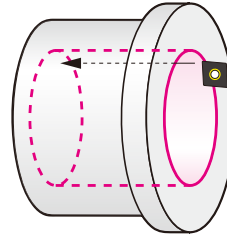
Thanks to reduced chipping and improved wear resistance, AC405K achieves 1.8 times longer tool life.



Insert: DNMG150408N-UZ (AC405K)  
Cutting Conditions:  $v_c=200\text{m/min}$ ,  $f=0.45\text{mm/rev}$ ,  $a_p=0.25$  to  $0.40\text{mm}$ , Wet

## FCD450 Sleeve

Excellent wear resistance achieves 1.5 times longer tool life in continuous hole finishing applications. The number of tool compensations required has also been halved.

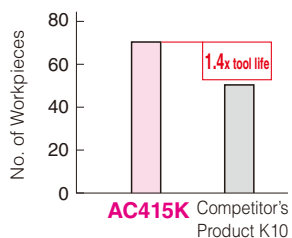
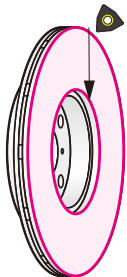


Insert: CNMG120408N-UZ (AC405K)  
Cutting Conditions:  $v_c=300\text{m/min}$ ,  $f=0.20\text{mm/rev}$ ,  $a_p=0.5\text{mm}$ , Wet

## AC415K

## FC200 Brake Disc

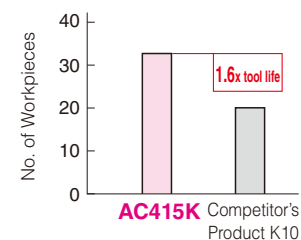
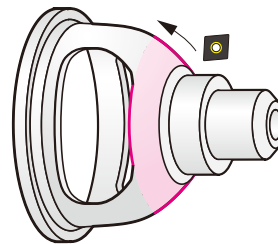
AC415K achieves 1.4 times longer tool life through improved wear resistance.



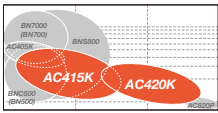
Insert: WNMA080412 (AC415K)  
Cutting Conditions:  $v_c=450\text{m/min}$ ,  $f=0.25\text{mm/rev}$ ,  $a_p=$  Up to  $1.5\text{mm}$ , Dry

## FCD450 Differential Case

Thanks to reduced chipping and improved wear resistance, AC415K eliminates problems with unstable tool life and achieves 1.6 times longer tool life.



Insert: CNMG120408N-GZ (AC415K)  
Cutting Conditions:  $v_c=240\text{m/min}$ ,  $f=0.3\text{mm/rev}$ ,  $a_p=2.0$  to  $3.0\text{mm}$ , Wet



## Application Examples (2)



# Cast Iron

Work  
Material

A

Grades

Steel

Stainless  
Steel

Cast Iron

Exotic  
Alloy

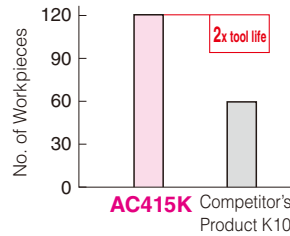
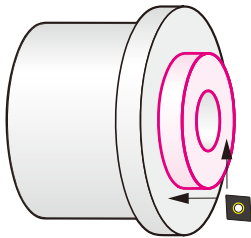
Hardened  
Steel

Non-Ferrous  
Metal

### AC415K

#### FCD500 Hub

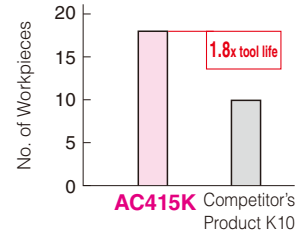
AC415K delivers 2 times longer tool life in light interrupted cutting of mill-scaled work thanks to improved chipping and wear resistance.



Insert: CNMA120408 (AC415K)  
Cutting Conditions:  $v_c=230\text{m/min}$ ,  $f=0.2$  to  $0.3\text{mm/rev}$ ,  $a_p=1.5$  to  $2.0\text{mm}$ , Wet

#### FC250 Pressure Plate

Reduces occurrence of sudden breakages and achieves 1.8 times longer stable tool life in heavy interrupted cutting.

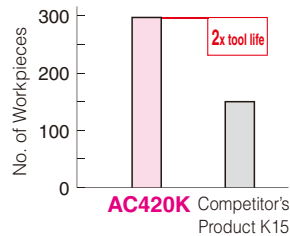
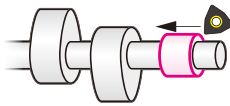


Insert: WNMA080412 (AC415K)  
Cutting Conditions:  $v_c=230\text{m/min}$ ,  $f=0.30\text{mm/rev}$ ,  $a_p=1.5$  to  $2.5\text{mm}$ , Dry

### AC420K

#### FCD700 Cam Shaft

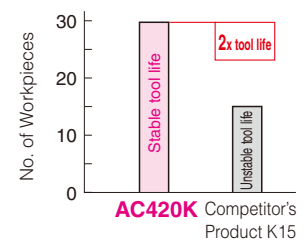
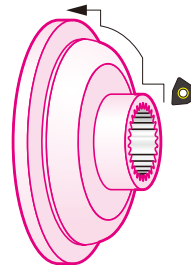
AC420K delivers 2 times longer tool life when cutting hardened steel and mill-scaled work.



Insert: WNMA080408 (AC420K)  
Cutting Conditions:  $v_c=100$  to  $250\text{m/min}$ ,  $f=0.15$  to  $0.30\text{mm/rev}$ ,  $a_p=1.0\text{mm}$ , Wet

#### FCD450 Drive Sprocket

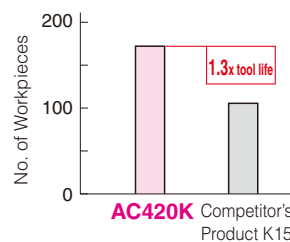
AC420K delivers 2 times longer stable tool life in unstable machining of mill-scaled work.



Insert: WNMA080412 (AC420K)  
Cutting Conditions:  $v_c=200\text{m/min}$ ,  $f=0.32\text{mm/rev}$ ,  $a_p=3.0\text{mm}$ , Wet

#### FCD500 Shaft

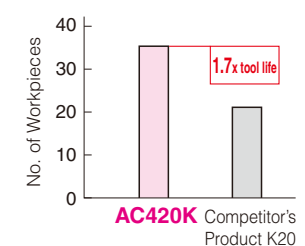
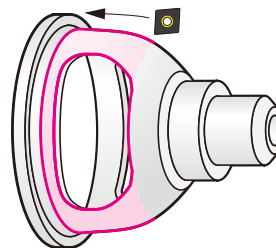
AC420K delivers 1.3 times longer stable tool life in heavy interrupted cutting.



Insert: DNMG150412N-GZ (AC420K)  
Cutting Conditions:  $v_c=100$  to  $270\text{m/min}$ ,  $f=0.15$  to  $0.40\text{mm/rev}$ ,  $a_p=1.5\text{mm}$ , Wet

#### FCD450 Differential Case

Reduces occurrence of sudden breakages and achieves 1.7 times longer stable tool life in heavy interrupted cutting.



Insert: CNMA120408 (AC420K)  
Cutting Conditions:  $v_c=250\text{m/min}$ ,  $f=0.30\text{mm/rev}$ ,  $a_p=2.0$  to  $3.0\text{mm}$ , Wet