Tooling News No. 550

SUMITOMO

CARBIDE - CBN - DIAMOND

Global Support, Global Solutions.

Coated Grades for Cast Iron

AC4010K/AC4015K/AC4125K

New

Rev. 2

From Ultra-high-speed Machining of Gray Cast Iron to Heavy Interrupted Machining of High-strength Ductile Cast Iron

2017-019 JTA ECO PRODUCT (AC4010K/AC4015K)

New Grade for Interrupted Machining of Cast Iron

Introducing AC4125K

P M K N S H

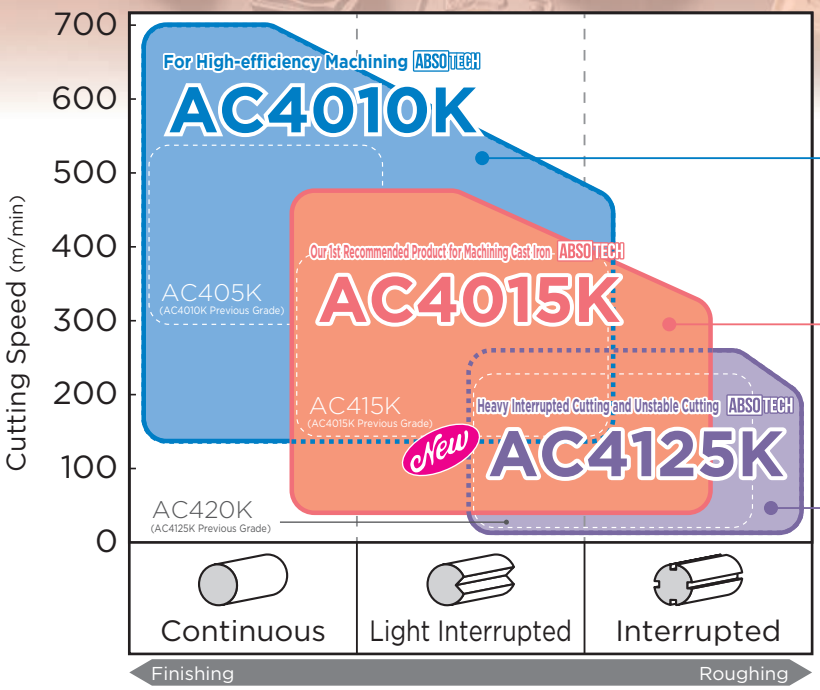
SUMITOMO ELECTRIC GROUP

VIDEO OF CUTTING

Coated Grades for Cast Iron

AC4010K / AC4015K / AC4125K (New)

■ Application Range



AC4010K ABSOTECH

Our 1st recommended grade for machining gray cast iron.
Ultra-thick film coating enables ultra-high-speed machining at vc=700m/min.

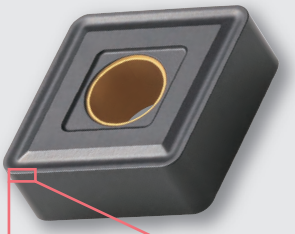
AC4015K ABSOTECH

Our 1st recommended grade for machining of ductile cast iron.
High-adhesion and high-strength coating enables stable and long tool life.

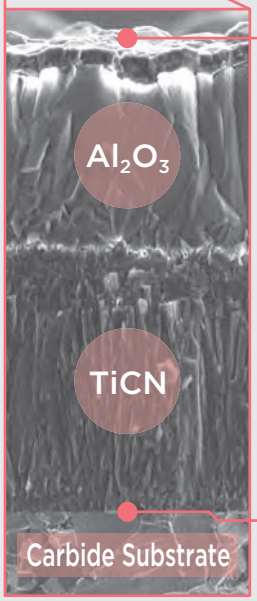
AC4125K New ABSOTECH

Our 1st recommended grade for interrupted machining of cast iron.
Especially effective for stable long life in roughing of parts like differential cases and carriers.

■ Features of AC4010K/AC4015K



Technologies for high-adhesion, crystal orientation control and residual stress control realise stable tool life for various types of cast iron, from grey cast iron (FC) to high-strength ductile cast iron (FCD).



Special Surface Treatment

Compressive stress more than twice as high as conventional stress
Chipping resistance: **Twice as much as conventional types**

Crystal Orientation Control Alumina Layer

Crater wear resistance in high-speed machining: **Twice as much as conventional types**

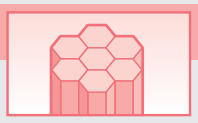


Image of Crystal Orientation

C-rich Ultra-fine TiCN Layer

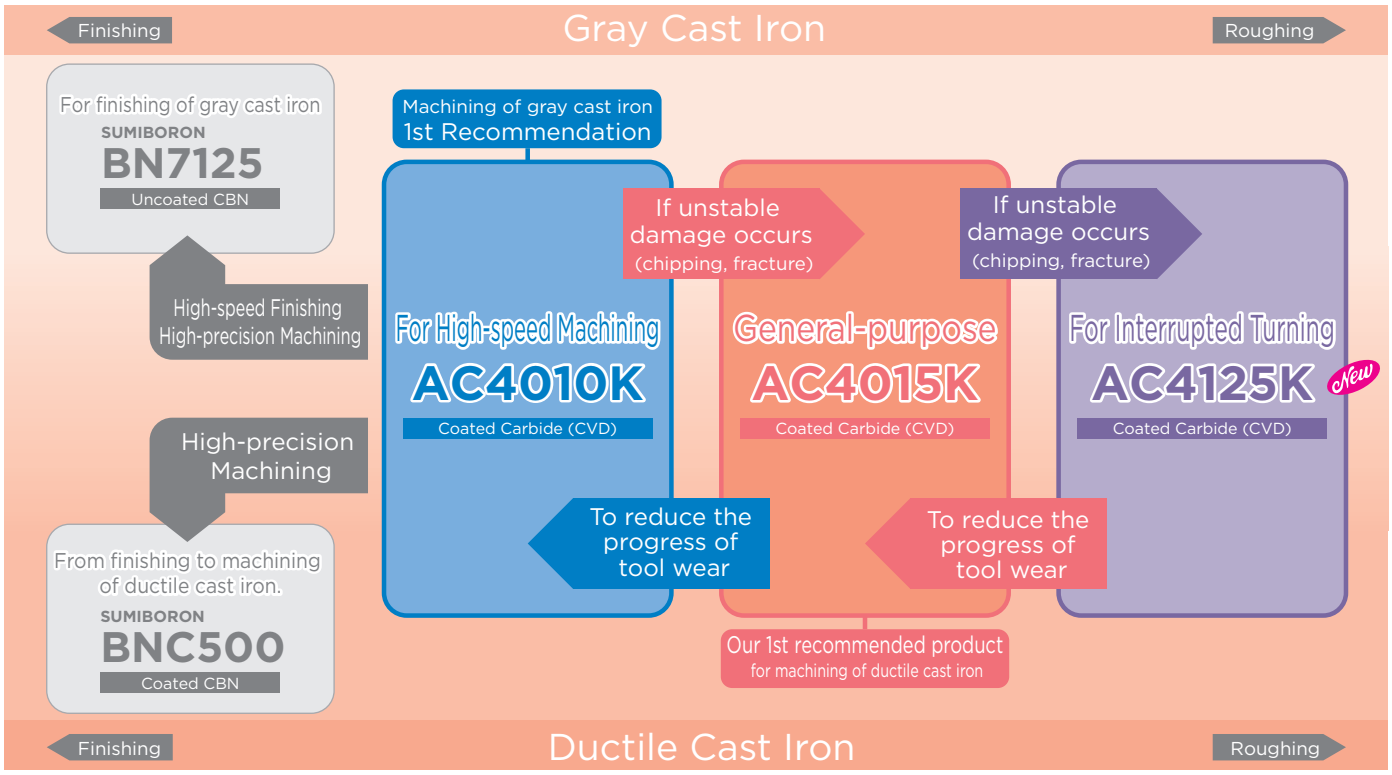
Flank wear resistance: **Twice as much as conventional types**

High Adhesion Technology

Smooth cutting edge treatment (**Rz0.15μm→0.07μm**) greatly improves peel-off resistance

AC4010K/AC4015K/AC4125K

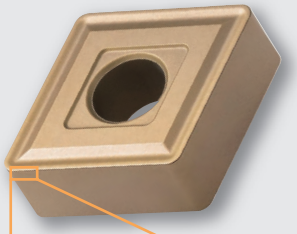
■ Applications of AC4000K Series (Example)



SUMIBORON BN7125 Tooling News

SUMIBORON BNC500 Tooling News

■ Features of AC4125K



Excellent chipping resistance is demonstrated by the evolution of high adhesion technology, fine crystal orientation control technology and residual stress control technology, and very stable machining is realized in heavy interrupted machining and unstable machining of cast iron. In addition, it adopts a gold color that makes used corners easily identifiable.

Special Surface Treatment

Significantly improves the compressive stress while maintaining the gold color

Chipping resistance: **Twice as much as conventional types**

Crystal Orientation Control Ultra-fine Alumina Layer

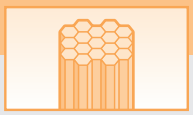


Image of Crystal Orientation

Fine grain structure greatly improves the coating strength

Chipping resistance: **Twice as much as conventional types**

C-rich Ultra-fine TiCN Layer

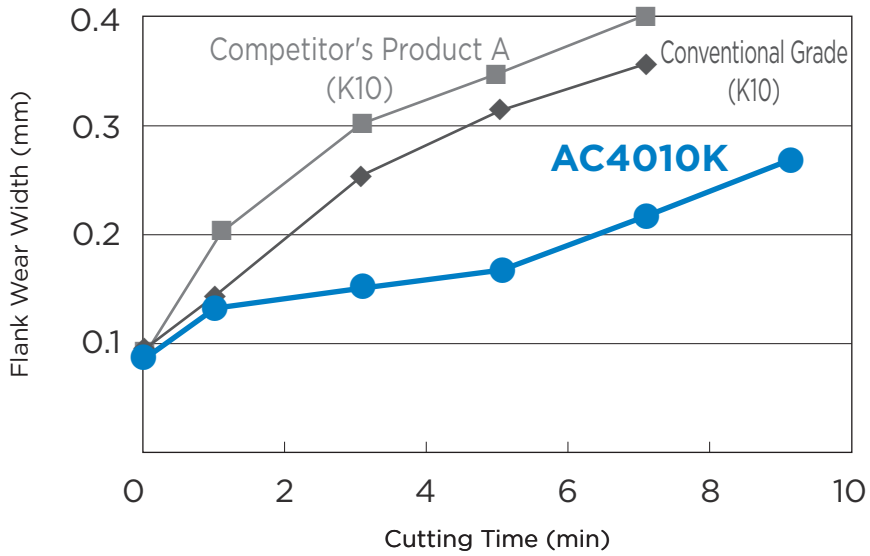
Flank wear resistance: **1.5x as much as conventional types**

High Adhesion Technology

Smooth cutting edge treatment (**Rz0.15µm→0.07µm**) greatly improves peel-off resistance

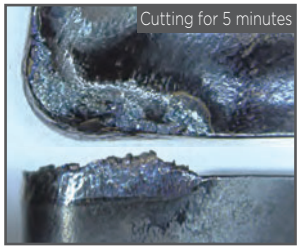
AC4010K/AC4015K/AC4125K

■ Wear Resistance of AC4010K (Continuous Cutting of Gray Cast Iron)

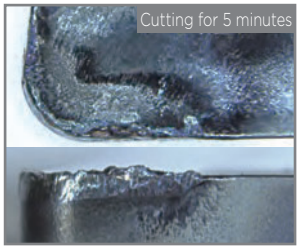


Work Material: FC250 Continuous
Insert : CNMG120408
Cutting Conditions: vc=600m/min
f=0.4mm/rev
ap=2.0mm
Dry

AC4010K+GZ



Conventional Grade (K10)



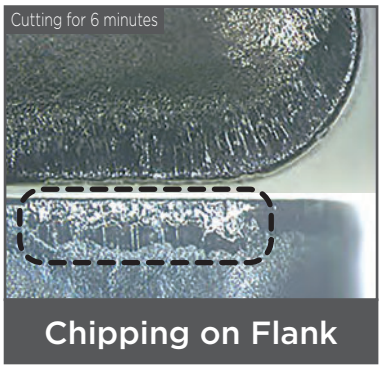
Comp's A (K10)

■ Chipping Resistance of AC4010K/AC4015K (Interrupted Cutting of Gray Cast Iron)

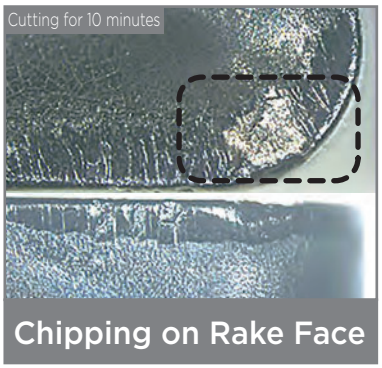
AC4010K+GZ

AC4015K+GZ

Work Material: FC250 Interrupted
Insert : CNMG120408
Cutting Conditions: vc=400m/min
f=0.3mm/rev
ap=2.0mm
Wet



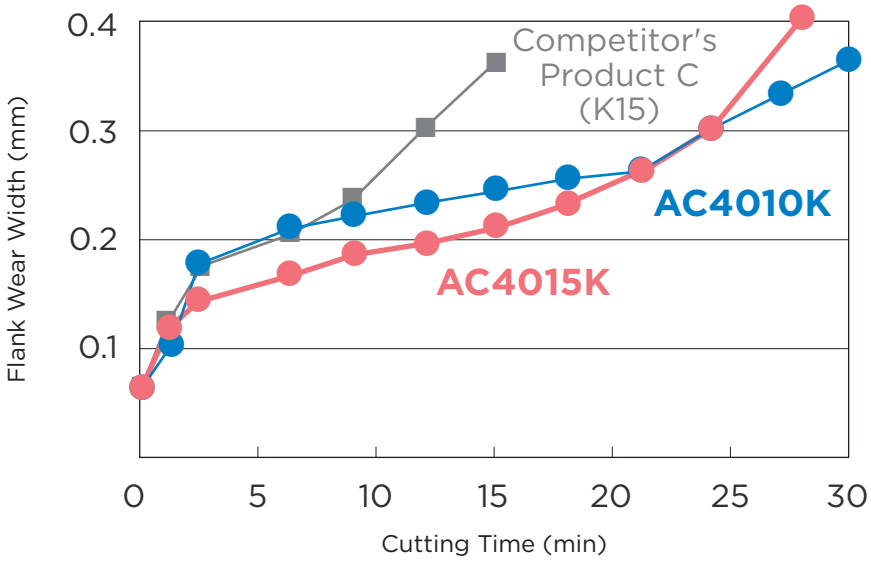
Conventional Grade (K10)



Competitor's Product B (K10)

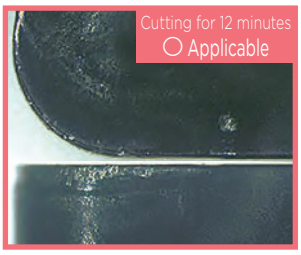
AC4010K/AC4015K/AC4125K

■ Wear Resistance of AC4010K/AC4015K (Continuous Cutting of Ductile Cast Iron)

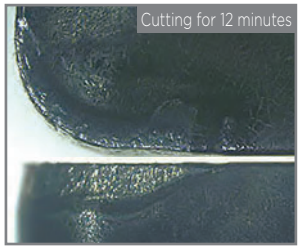


Work Material: FCD700 Continuous
Insert : CNMG120408
Cutting Conditions: vc=140m/min
f=0.3mm/rev
ap=1.5mm
Wet

AC4010K+GZ

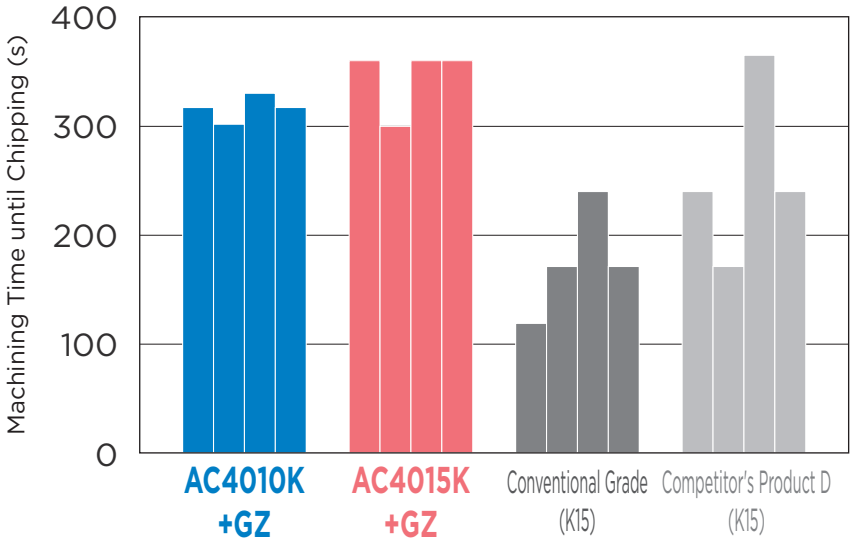


AC4015K+GZ

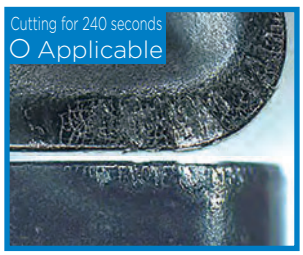


Comp's C (K15)

■ Chipping Resistance of AC4010K/AC4015K (Interrupted Cutting of Ductile Cast Iron)

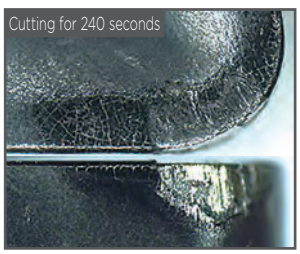


Work Material: FCD450 Interrupted
Insert : CNMG120408
Cutting Conditions: vc=450m/min
f=0.3mm/rev
ap=1.5mm
Wet

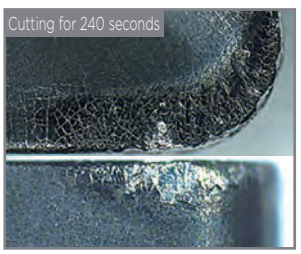


AC4010K

AC4015K



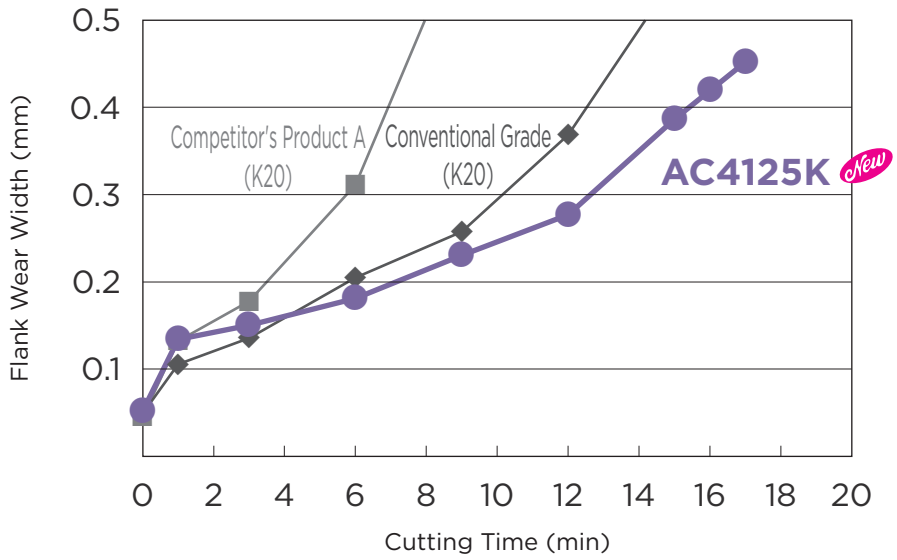
Conventional Grade (K15)



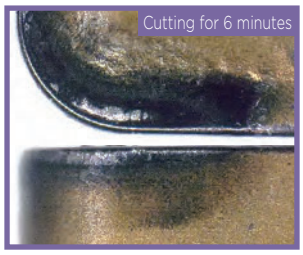
Competitor's Product D (K15)

AC4010K/AC4015K/AC4125K

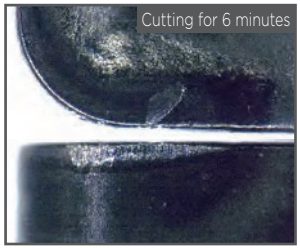
■ Wear Resistance of AC4125K (Continuous Cutting of Cast Iron)



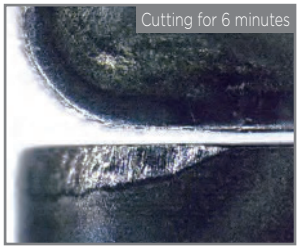
Work Material: FCD700
Continuous
Insert : CNMG120408
Cutting Conditions: vc=140m/min
f=0.3mm/rev
ap=1.5mm
Wet



New AC4125K+GZ

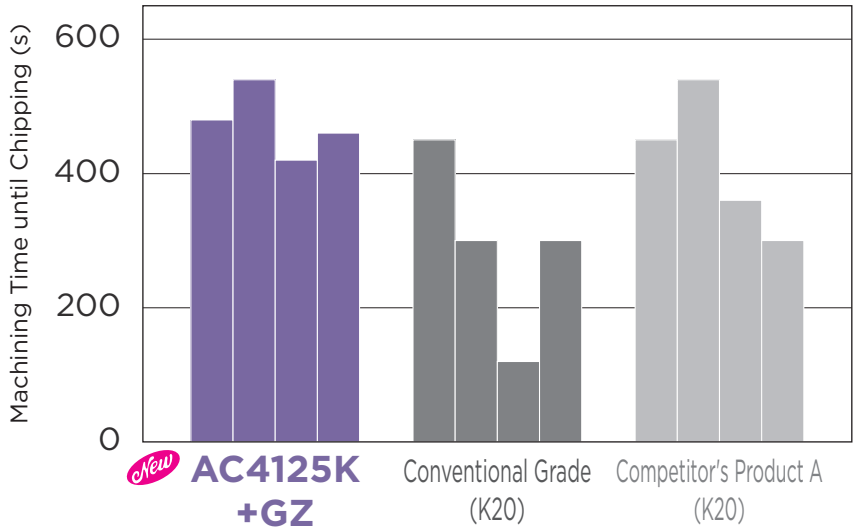


Conventional Grade (K20)

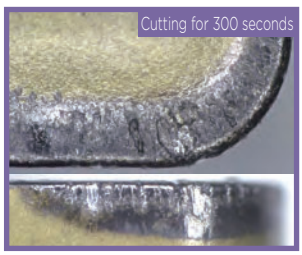


Comp's A (K20)

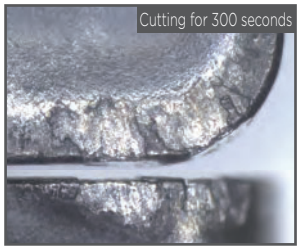
■ Chipping Resistance of AC4125K (Interrupted Cutting of Ductile Cast Iron)



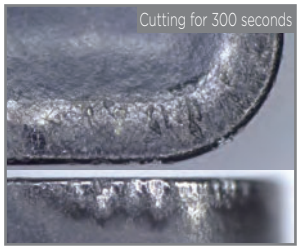
Work Material: FCD450
Interrupted
Insert : CNMG120408
Cutting Conditions: vc=450m/min
f=0.3mm/rev
ap=1.5mm
Wet



New AC4125K+GZ



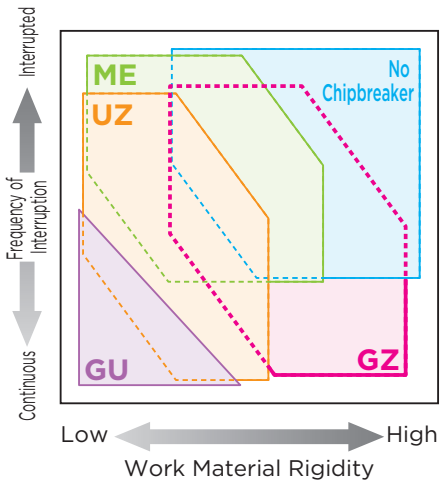
Conventional Grade (K20)



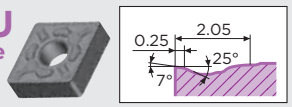
Comp's A (K20)

AC4010K/AC4015K/AC4125K

■ Chipbreaker Selection

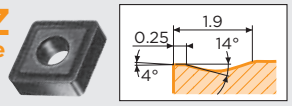


GU type



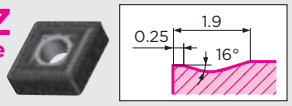
Low-resistance breaker suitable for machining workpieces with low rigidity such as ones that are slim and long

UZ type



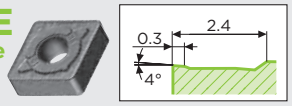
General finishing breaker that is both sharp and strong edged

GZ type



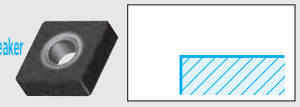
Our 1st recommended breaker with excellent cutting edge strength and high versatility

ME type



Roughing breaker that demonstrates both sharpness and strength in high-feed machining

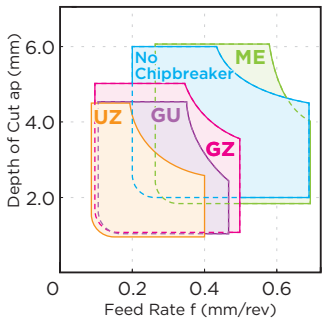
No Chipbreaker

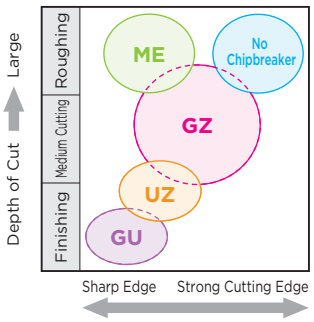


Excellent cutting edge strength, ideal for large depths of cut and interrupted machining

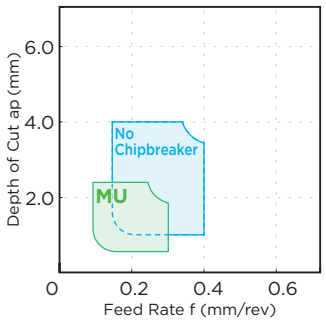
■ Chipbreaker Application Range

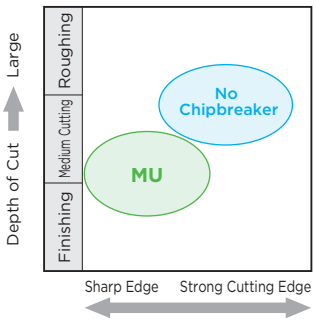
● Negative





● Positive





■ Recommended Cutting Conditions

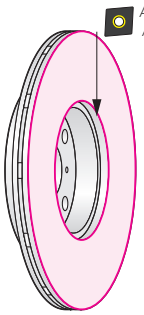
(Red text indicates 1st recommendation)

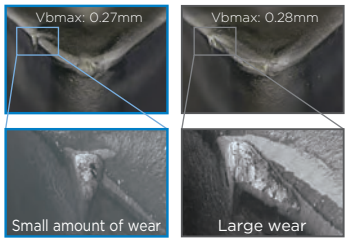
Work Material	Application	Grade	Cutting Conditions (Min. - **Optimum** - Max.)		
			Depth of Cut ap (mm)	Feed Rate f (mm/rev)	Cutting Speed (vc) (m/min)
Gray Cast Iron (example: FC250)	Continuous to General	**AC4010K**	0.5 - **2.0** - 6.0	0.10 - **0.25** - 0.40	200 - **400** - 700
	Interrupted	**AC4015K**	0.5 - **2.0** - 6.0	0.10 - **0.30** - 0.50	180 - **300** - 450
	Heavy Interrupted	**AC4125K**	0.5 - **2.0** - 6.0	0.10 - **0.30** - 0.60	150 - **200** - 300
Ductile Cast Iron (example: FCD450)	Continuous	**AC4010K**	0.5 - **2.0** - 6.0	0.10 - **0.25** - 0.40	180 - **300** - 450
	General to Interrupted	**AC4015K**	0.5 - **2.0** - 6.0	0.10 - **0.30** - 0.50	160 - **250** - 400
	Heavy Interrupted	**AC4125K**	0.5 - **2.0** - 6.0	0.10 - **0.30** - 0.60	120 - **170** - 250
High-strength Ductile Cast Iron (example: FCD700)	Continuous	**AC4010K**	0.5 - **2.0** - 6.0	0.10 - **0.25** - 0.40	160 - **250** - 400
	General to Interrupted	**AC4015K**	0.5 - **2.0** - 6.0	0.10 - **0.30** - 0.50	140 - **200** - 350
	Heavy Interrupted	**AC4125K**	0.5 - **2.0** - 6.0	0.10 - **0.30** - 0.60	80 - **150** - 220

■ Application Examples of AC4010K / AC4015K

FC250 Brake Disc Black Scale Surface AC4010K K

AC4010K achieved 1.4x longer tool life with minimal wear



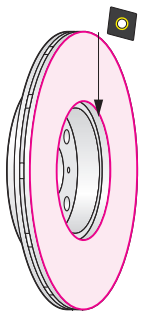


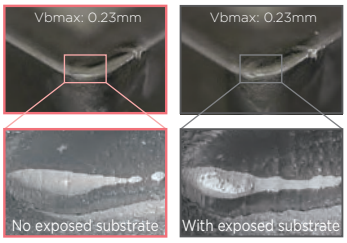
AC4010K+GZ (70 pcs/C) | Competitor's Product A (50 pcs/C)

Tool Used: CNMG120408N-GZ (AC4010K) Continuous Cutting
Cutting Conditions: vc=960m/min f=0.75mm/rev ap=2.0mm Wet

FC250 Brake Disc Black Scale Surface AC4015K K

AC4015K achieves 1.4x longer tool life than competitors' products
Minor damage even when machining 35 pieces



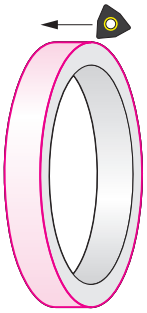


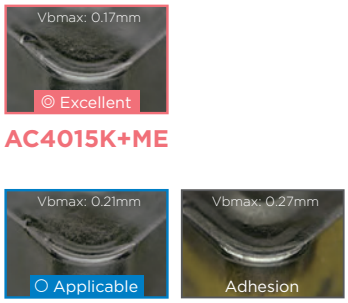
AC4015K+GZ (35 pcs/C) | Competitor's Product B (35 pcs/C)

Tool Used: CNMG120408N-GZ (AC4015K) Continuous Cutting
Cutting Conditions: vc=960m/min f=0.75mm/rev ap=2.0mm Wet

FCD800 Gear Ring External Turning AC4010K AC4015K K

Good wear resistance for machining high-strength ductile cast iron



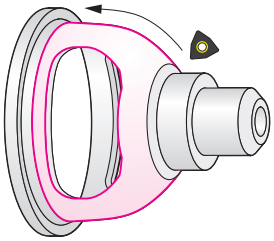


AC4015K+ME | **AC4010K+ME** | Competitor's Product C

Tool Used: WNMG080412N-ME (AC4010K/AC4015K) Continuous Cutting
Cutting Conditions: vc=120m/min f=0.25mm/rev ap=1.0-3.0mm Wet

FCD600 Differential Case External Turning AC4010K AC4015K K

Excellent chipping resistance and wear suppression in heavy interrupted machining of high-strength ductile cast iron

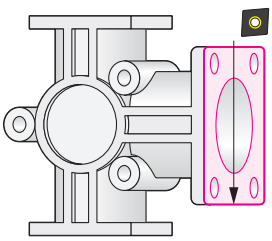


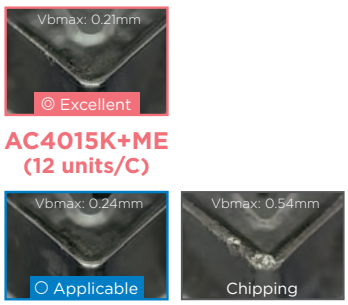
AC4015K+GZ (60 pcs/C) | **AC4010K+GZ (45 pcs/C)** | Competitor's Product D (45 pcs/C)

Tool Used: WNMG080412N-GZ (AC4010K/AC4015K) Interrupted Cutting
Cutting Conditions: vc=250m/min f=0.30-0.45mm/rev ap=2.0mm Wet

FCD500 Gear Case Facing AC4010K AC4015K K

Combined with ME type breaker for rough cutting for 1.2x longer tool life than competitor's products



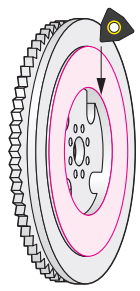


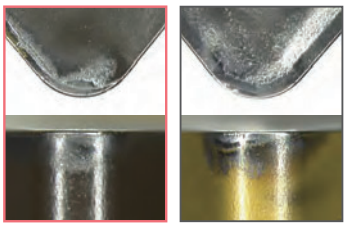
AC4015K+ME (12 units/C) | **AC4010K+ME (12 units/C)** | Competitor's Product E (10 units/C)

Tool Used: CNMG120408N-ME (AC4010K/AC4015K) Interrupted Cutting
Cutting Conditions: vc=220m/min f=0.35mm/rev ap=1.5mm Wet

FCD450 Flywheel Facing AC4015K K

AC4015K has excellent wear resistance, resulting in minimal wear even after machining double the number of parts





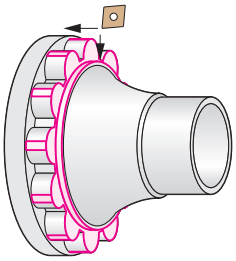
AC4015K (80 units/C) | Competitor's Product F (40 units/C)

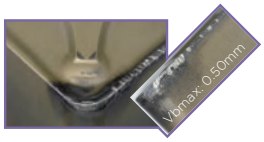
Tool Used: WNMA080408 (AC4015K) Continuous Cutting
Cutting Conditions: vc=230m/min f=0.3mm/rev ap=2.0mm Wet

■ Application Examples of AC4125K

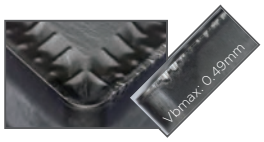
FCD600 Differential Case External Turning/Facing AC4125K K

AC4125K demonstrates excellent chipping resistance and 1.5x tool life in heavy interrupted machining of high-strength ductile cast iron.





AC4125K+GU (17 pcs/C)

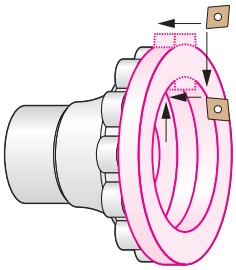


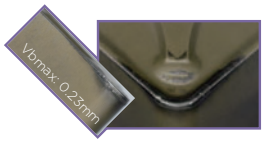
Competitor's Product G (11 pcs/C)

Tool Used: CNMG160412N-GU (AC4125K) Interrupted Cutting
Cutting Conditions: vc=160m/min f=0.20-0.45mm/rev ap=2.5-3.0mm Wet

FCD600 Differential Case External/Internal Turning/Facing AC4125K K

AC4125K demonstrates excellent chipping resistance in heavy interrupted machining of high-strength ductile cast iron





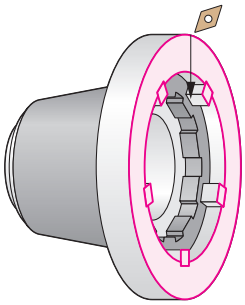
AC4125K+GU (11 pcs/C)

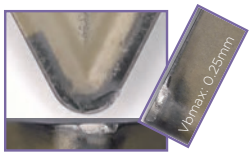
Competitor's Product H (11 pcs/C)

Tool Used: CNMG160412N-GU (AC4125K) Interrupted Cutting
Cutting Conditions: vc=130-170m/min f=0.20-0.45mm/rev ap=2.5-3.0mm Wet

FCD500 Wheel Hub Facing AC4125K K

AC4125K achieves 1.3x longer tool life than competitors' products





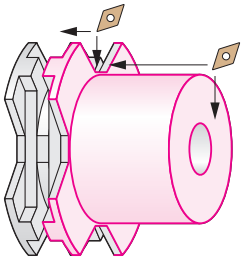
AC4125K+GZ (10 pcs/C)

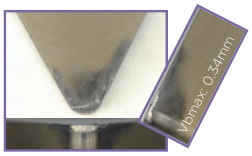
Competitor's Product I (8 pcs/C)

Tool Used: DNMG150608N-GZ (AC4125K) Interrupted Cutting
Cutting Conditions: vc=200-300m/min f=0.15mm/rev ap=0.5mm Wet

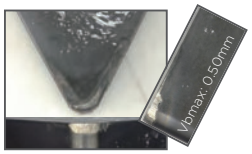
FCD450 Load Sheave External Turning/Roughing AC4125K K

AC4125K achieves 1.2x longer tool life than competitors' products





AC4125K (240 pcs/C)

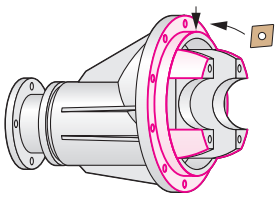


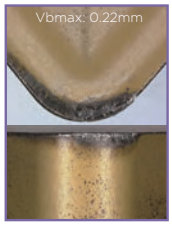
Competitor's Product J (200 pcs/C)

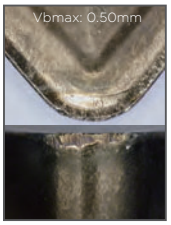
Tool Used: DNMA150408 (AC4125K) Interrupted Cutting
Cutting Conditions: vc=200m/min f=0.15mm/rev ap=1.0mm Wet

FCD450 Carrier Case External Turning/Facing AC4125K K

AC4125K achieves 2x longer tool life than competitors' products
Minor damage even after machining 50 pieces





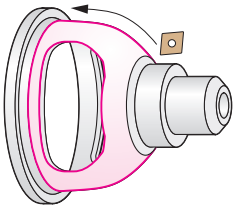


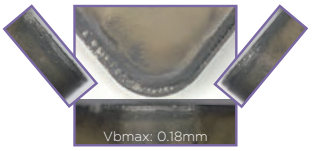
AC4125K+GZ (50 units/C) Conventional Grade (50 units/C)

Tool Used: CNMG120412N-GZ (AC4125K) Interrupted Cutting
Cutting Conditions: vc=200m/min f=0.3mm/rev ap=2.5mm Wet

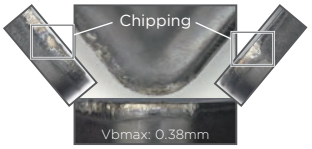
FCD450 Differential Case External Interrupted Turning AC4125K K

AC4125K achieves 1.3x longer tool life than competitors' products
Minor damage even after machining 30 pieces





AC4125K+ME (30 units/C)



Competitor's Product K (30 units/C)

Tool Used: CNMG120412N-ME (AC4125K) Interrupted Cutting
Cutting Conditions: vc=150m/min f=0.2-0.3mm/rev ap=2.0mm Wet

AC4010K/AC4015K/AC4125K

Negative 80° Diamond type

Shape	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 GU	CNMG 090304N-GU	●	●	●	9.525	3.18	3.81	0.4
	090308N-GU	●	●	●				0.8
	CNMG 090412N-GU	●	●	●	9.525	4.76	3.81	1.2
	CNMG 120404N-GU	●	●	●	12.7	4.76	5.16	0.4
	120408N-GU	●	●	●				0.8
	120412N-GU	●	●	●				1.2
	120416N-GU	●	●	●				1.6
	CNMG 160608N-GU	●	●	●	15.875	6.35	6.35	0.8
	160612N-GU	●	●	●				1.2
	160616N-GU	●	●	●				1.6
 ME	CNMG 120408N-ME	●	●	●	12.7	4.76	5.16	0.8
	120412N-ME	●	●	●				1.2
	120416N-ME	●	●	●				1.6
	CNMG 160608N-ME	●	●	●	15.875	6.35	6.35	0.8
	160612N-ME	●	●	●				1.2
	160616N-ME	●	●	●				1.6
	CNMG 190612N-ME	●	●	●	19.05	6.35	7.94	1.2
	190616N-ME	●	●	●				1.6
	190624N-ME	●	●	●				2.4
	CNMG 250924N-ME	●	●	●	25.4	9.52	9.12	2.4
 UZ	CNMG 120404N-UZ	●	●	●	12.7	4.76	5.16	0.4
	120408N-UZ	●	●	●				0.8
	120412N-UZ	●	●	●				1.2
	120416N-UZ	●	●	●				1.6
	CNMG 160612N-UZ	●	●	●	15.875	6.35	6.35	1.2
	160616N-UZ	●	●	●				1.6
	CNMG 190612N-UZ	●	●	●	19.05	6.35	7.94	1.2
	190616N-UZ	●	●	●				1.6
 GZ	CNMG 090408N-GZ	●	●	●	9.525	4.76	3.81	0.8
	090412N-GZ	●	●	●				1.2
	CNMG 120404N-GZ	●	●	●	12.7	4.76	5.16	0.4
	120408N-GZ	●	●	●				0.8
	120412N-GZ	●	●	●				1.2
	120416N-GZ	●	●	●				1.6
	CNMG 160608N-GZ	●	●	●	15.875	6.35	6.35	0.8
	160612N-GZ	●	●	●				1.2
	160616N-GZ	●	●	●				1.6
	CNMG 190612N-GZ	●	●	●	19.05	6.35	7.94	1.2
	190616N-GZ	●	●	●				1.6
	CNMA 120404	●	●	●	12.7	4.76	5.16	0.4
	120408	●	●	●				0.8
	120412	●	●	●				1.2
	120416	●	●	●				1.6
	CNMA 160608	●	●	●	15.875	6.35	6.35	0.8
	160612	●	●	●				1.2
	160616	●	●	●				1.6
	CNMA 190612	●	●	●	19.05	6.35	7.94	1.2
	190616	●	●	●				1.6

Negative 55° Diamond type

Shape	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 GU	DNMG 110404N-GU	●	●	●	9.525	4.76	3.81	0.4
	110408N-GU	●	●	●				0.8
	110412N-GU	●	●	●				1.2
	DNMG 150404N-GU	●	●	●	12.7	4.76	5.16	0.4
	150408N-GU	●	●	●				0.8
	150412N-GU	●	●	●				1.2
	150416N-GU	●	●	●				1.6
	DNMG 150604N-GU	●	●	●	12.7	6.35	5.16	0.4
	150608N-GU	●	●	●				0.8
	150612N-GU	●	●	●				1.2
	150616N-GU	●	●	●				1.6
 ME	DNMG 150408N-ME	●	●	●	12.7	4.76	5.16	0.8
	150412N-ME	●	●	●				1.2
	150416N-ME	●	●	●				1.6
	DNMG 150608N-ME	●	●	●	12.7	6.35	5.16	0.8
	150612N-ME	●	●	●				1.2
	150616N-ME	●	●	●				1.6
 UZ	DNMG 150404N-UZ	●	●	●	12.7	4.76	5.16	0.4
	150408N-UZ	●	●	●				0.8
	150412N-UZ	●	●	●				1.2
	DNMG 150608N-UZ	●	●	●	12.7	6.35	5.16	0.8
	150612N-UZ	●	●	●				1.2

Negative 55° Diamond type

Shape	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 GZ	DNMG 110408N-GZ	●	●	●	9.525	4.76	3.81	0.8
	110412N-GZ	●	●	●				1.2
	DNMG 150404N-GZ	●	●	●	12.7	4.76	5.16	0.4
	150408N-GZ	●	●	●				0.8
	150412N-GZ	●	●	●				1.2
	DNMG 150608N-GZ	●	●	●	12.7	6.35	5.16	0.8
	150612N-GZ	●	●	●				1.2
	DNMA 150404	●	●	●	12.7	4.76	5.16	0.4
	150408	●	●	●				0.8
	150412	●	●	●				1.2
	DNMA 150608	●	●	●	12.7	6.35	5.16	0.8
	150612	●	●	●				1.2

Negative Square type

Shape	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 GU	SNMG 090304N-GU	●	●	●	9.525	3.18	3.81	0.4
	090308N-GU	●	●	●				0.8
	SNMG 120404N-GU	●	●	●	12.7	4.76	5.16	0.4
	120408N-GU	●	●	●				0.8
	120412N-GU	●	●	●				1.2
	120416N-GU	●	●	●				1.6
	SNMG 150608N-GU	●	●	●	15.875	6.35	6.35	0.8
	150612N-GU	●	●	●				1.2
	150616N-GU	●	●	●				1.6
 ME	SNMG 120408N-ME	●	●	●	12.7	4.76	5.16	0.8
	120412N-ME	●	●	●				1.2
	120416N-ME	●	●	●				1.6
	SNMG 150608N-ME	●	●	●	15.875	6.35	6.35	0.8
	150612N-ME	●	●	●				1.2
	150616N-ME	●	●	●				1.6
	SNMG 190612N-ME	●	●	●	19.05	6.35	7.94	1.2
	190616N-ME	●	●	●				1.6
	190624N-ME	●	●	●				2.4
	SNMG 250924N-ME	●	●	●	25.4	9.52	9.12	2.4
 UZ	SNMG 120408N-UZ	●	●	●	12.7	4.76	5.16	0.8
	120412N-UZ	●	●	●				1.2
	120416N-UZ	●	●	●				1.6
	SNMG 190612N-UZ	●	●	●	19.05	6.35	7.94	1.2
	190616N-UZ	●	●	●				1.6
 GZ	SNMG 120408N-GZ	●	●	●	12.7	4.76	5.16	0.8
	120412N-GZ	●	●	●				1.2
	120416N-GZ	●	●	●				1.6
	SNMG 150612N-GZ	●	●	●	15.875	6.35	6.35	1.2
	150616N-GZ	●	●	●				1.6
	SNMG 190612N-GZ	●	●	●	19.05	6.35	7.94	1.2
	190616N-GZ	●	●	●				1.6
	SNMA 120404	●	●	●	12.7	4.76	5.16	0.4
	120408	●	●	●				0.8
	120412	●	●	●				1.2
	120416	●	●	●				1.6
	120420	●	●	●				2.0
	SNMA 150612	●	●	●	15.875	6.35	6.35	1.2
	150616	●	●	●				1.6
	SNMA 190612	●	●	●	19.05	6.35	7.94	1.2
	190616	●	●	●				1.6

● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item)

AC4010K/AC4015K/AC4125K

Negative Triangular type

Shape	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 GU	**TNMG 160404N-GU**	●	●	●	9.525	4.76	3.81	0.4
	160408N-GU	●	●	●				0.8
	160412N-GU	●	●	●				1.2
	160416N-GU	●	●	●				1.6
	TNMG 220404N-GU	●	●	●	12.7	4.76	5.16	0.4
	220408N-GU	●	●	●				0.8
	220412N-GU	●	●	●				1.2
 ME	**TNMG 160408N-ME**	●	●	●	9.525	4.76	3.81	0.8
	160412N-ME	●	●	●				1.2
	TNMG 220408N-ME	●	●	●	12.7	4.76	5.16	0.8
	220412N-ME	●	●	●				1.2
	220416N-ME	●	●	●				1.6
 UZ	**TNMG 160404N-UZ**	●	●	●	9.525	4.76	3.81	0.4
	160408N-UZ	●	●	●				0.8
	160412N-UZ	●	●	●				1.2
	160416N-UZ	●	●	●				1.6
	160420N-UZ	●	●	●				2.0
	TNMG 220408N-UZ	●	●	●	12.7	4.76	5.16	0.8
	220412N-UZ	●	●	●				1.2
	220416N-UZ	●	●	●				1.6
 GZ	**TNMG 160404N-GZ**	●	●	●	9.525	4.76	3.81	0.4
	160408N-GZ	●	●	●				0.8
	160412N-GZ	●	●	●				1.2
	TNMG 220408N-GZ	●	●	●	12.7	4.76	5.16	0.8
	220412N-GZ	●	●	●				1.2
	220416N-GZ	●	●	●				1.6
	**TNMA 160404**	●	●	●	9.525	4.76	3.81	0.4
	160408	●	●	●				0.8
	160412	●	●	●				1.2
	160416	●	●	●				1.6
	160420	●	●	●				2.0
	TNMA 220408	●	●	●	12.7	4.76	5.16	0.8
	220412	●	●	●				1.2
	220416	●	●	●				1.6

Negative 35° Diamond type

Shape	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 GU	**VNMG 160404N-GU**	●	●	●	9.525	4.76	3.81	0.4
	160408N-GU	●	●	●				0.8
	160412N-GU	●	●	●				1.2
 UZ	**VNMG 160404N-UZ**	●	●	●	9.525	4.76	3.81	0.4
	160408N-UZ	●	●	●				0.8
	160412N-UZ	●	●	●				1.2
 GZ	**VNMG 160404N-GZ**	●	●	●	9.525	4.76	3.81	0.4
	160408N-GZ	●	●	●				0.8
	160412N-GZ	●	●	●				1.2
	**VNMA 160404**	●	●	●	9.525	4.76	3.81	0.4
	160408	●	●	●				0.8
	160412	●	●	●				1.2

Negative Trigon type

Shape	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 GU	**WNMG 060404N-GU**	●	●	●	9.525	4.76	3.81	0.4
	060408N-GU	●	●	●				0.8
	060412N-GU	●	●	●				1.2
	WNMG 080404N-GU	●	●	●	12.7	4.76	5.16	0.4
	080408N-GU	●	●	●				0.8
	080412N-GU	●	●	●				1.2
 ME	**WNMG 060408N-ME**	●	●	●	9.525	4.76	3.81	0.8
	060412N-ME	●	●	●				1.2
	WNMG 080408N-ME	●	●	●	12.7	4.76	5.16	0.8
	080412N-ME	●	●	●				1.2
	080416N-ME	●	●	●				1.6
 UZ	**WNMG 080404N-UZ**	●	●	●	12.7	4.76	5.16	0.4
	080408N-UZ	●	●	●				0.8
	080412N-UZ	●	●	●				1.2
 GZ	**WNMG 060408N-GZ**	●	●	●	9.525	4.76	3.81	0.8
	060412N-GZ	●	●	●				1.2
	WNMG 080404N-GZ	●	●	●	12.7	4.76	5.16	0.4
	080408N-GZ	●	●	●				0.8
	080412N-GZ	●	●	●				1.2
	**WNMA 080408**	●	●	●	12.7	4.76	5.16	0.8
	080412	●	●	●				1.2
	080416	●	●	●				1.6

Negative Square type (Without Hole)

Shape	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
	**SNMN 120408**	●	●	●	12.7	4.76	–	0.8
	120412	●	●	●				1.2
	120416	●	●	●				1.6

Negative Triangular type (Without Hole)

Shape	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
	**TNMN 160408**	●	●	●	9.525	4.76	–	0.8
	160412	●	●	●				1.2
	160416	●	●	●				1.6

● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item)

Positive 80° Diamond type

Shape	Relief Angle	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 SU	7°	CCMT 09T304N-SU (New)		●		9.525	3.97	4.4	0.4
		09T308N-SU (New)		●					0.8
 MU	7°	CCMT 09T304N-MU	●	●	●	9.525	3.97	4.4	0.4
		09T308N-MU	●	●	●				0.8
	7°	CCMW 060204	●	●	●	6.35	2.38	2.8	0.4
		CCMW 09T304	●	●	●	9.525	3.97	4.4	0.4
		09T308	●	●	●				0.8
 MU	11°	CPMT 080204N-MU	●	●	●	7.94	2.38	3.4	0.4
		080208N-MU	●	●	●				0.8
		CPMT 090304N-MU	●	●	●	9.525	3.18	4.4	0.4
		090308N-MU	●	●	●				0.8
	11°	CPMW 080204	●	●	●	7.94	2.38	3.4	0.4
		080208	●	●	●				0.8
		CPMW 090304	●	●	●	9.525	3.18	4.4	0.4
		090308	●	●	●				0.8

Positive 55° Diamond type

Shape	Relief Angle	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 SU	7°	DCMT 070204N-SU (New)		●		6.35	2.38	2.8	0.4
		070208N-SU (New)		●					0.8
 MU	7°	DCMT 11T304N-MU	●	●	●	9.525	3.97	4.4	0.4
		11T308N-MU	●	●	●				0.8
	7°	DCMW 070204	●	●	●	6.35	2.38	2.8	0.4
		070208	●	●	●				0.8
		DCMW 11T304	●	●	●	9.525	3.97	4.4	0.4
		11T308	●	●	●				0.8

Positive Round type

Shape	Relief Angle	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 RP	7°	RCMX 1003M0N-RP	●	●	●	10.0	3.18	3.6	–
		RCMX 1204M0N-RP	●	●	●	12.0	4.76	4.2	–
		RCMX 1606M0N-RP	●	●	●	16.0	6.35	5.2	–

Positive Square type

Shape	Relief Angle	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 MU	7°	SCMT 09T308N-MU	●	●	●	9.525	3.97	4.4	0.8
		SCMT 120408N-MU	●	●	●	12.7	4.76	5.5	0.8
	7°	SCMW 09T308	●	●	●	9.525	3.97	4.4	0.8
		SCMW 120408	●	●	●	12.7	4.76	5.5	0.8
		120412	●	●	●				1.2
 LB	11°	SPMT 090304N-LB (New)		●		9.525	3.18	3.4	0.4
		090308N-LB (New)		●					0.8
 SS	11°	SPMT 070208N-SS (New)		●		7.94	2.38	3.4	0.8
 US	11°	SPMT 070308N-US (New)		●		7.94	3.18	3.4	0.8
	11°	SPGW 070304 (New)		●		7.94	3.18	3.4	0.4
		070308 (New)		●					0.8
		SPGW 090304 (New)		●		9.525	3.18	3.4	0.4
		090308 (New)		●					0.8

Positive Triangular type

Shape	Relief Angle	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
	7°	TCMW 110204	●	●	●	6.35	2.38	2.8	0.4
		110208	●	●	●				0.8
		TCMW 16T304	●	●	●	9.525	3.97	4.3	0.4
		16T308	●	●	●				0.8
		16T312	●	●	●				1.2
 LU	11°	TPMT 080204N-LU (New)		●		4.76	2.38	2.4	0.4
 LB	11°	TPMT 090204N-LB (New)		●		5.56	2.38	2.8	0.4
 SU	11°	TPMT 080204N-SU (New)		●		4.76	2.38	2.4	0.4
		TPMT 110304N-SU (New)		●		6.35	3.18	3.4	0.4
 SU	11°	TPMT 160404N-SU (New)		●		9.525	4.76	4.4	0.4
		160408N-SU (New)		●					0.8
 MU	11°	TPMT 110304N-MU	●	●	●	6.35	3.18	3.4	0.4
		110308N-MU	●	●	●				0.8
 MU	11°	TPMT 160404N-MU	●	●	●	9.525	4.76	4.4	0.4
		160408N-MU	●	●	●				0.8
	11°	TPGW 080204 (New)		●		4.76	2.38	2.4	0.4
		080208 (New)		●					0.8
		TPGW 090204 (New)		●		5.56	2.38	2.8	0.4
		090208 (New)		●					0.8
		TPGW 110304 (New)		●		6.35	3.18	3.4	0.4
		110308 (New)		●					0.8
		TPGW 160404 (New)		●		9.525	4.76	4.4	0.4
		160408 (New)		●					0.8

Positive 35° Diamond type

Shape	Relief Angle	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
	5°	VBMW 160404	●	●	●	9.525	4.76	4.4	0.4
		160408	●	●	●				0.8

Positive Square type (Without Hole)

Shape	Relief Angle	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
	11°	SPMN 090304	●	●	●	9.525	3.18	–	0.4
		090308	●	●	●				0.8
		SPMN 120304	●	●	●	12.7	3.18	–	0.4
		120308	●	●	●				0.8
		120312	●	●	●				1.2

Positive Triangular type (Without Hole)

Shape	Relief Angle	Cat. No.	Stock AC4010K	Stock AC4015K	Stock AC4125K	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
	11°	TPMN 110304	●	●	●	6.35	3.18	–	0.4
		110308	●	●	●				0.8
		TPMN 160304	●	●	●	9.525	3.18	–	0.4
		160308	●	●	●				0.8
		160312	●	●	●				1.2

● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item) Blank: Made-to-order item

< SAFETY NOTES >

- Very hot or lengthy chips may be discharged while the machine is in operation. Therefore, machine guards, safety goggles or other protective covers must be used. Fire safety precautions must also be considered.
- Please handle with care as this product has sharp edges.
- Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.
- When using non-water soluble cutting oil, precautions against fire must be taken and please ensure that a fire extinguisher is placed near the machine.

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