

New AC4010K / *New* AC4015K / AC420K

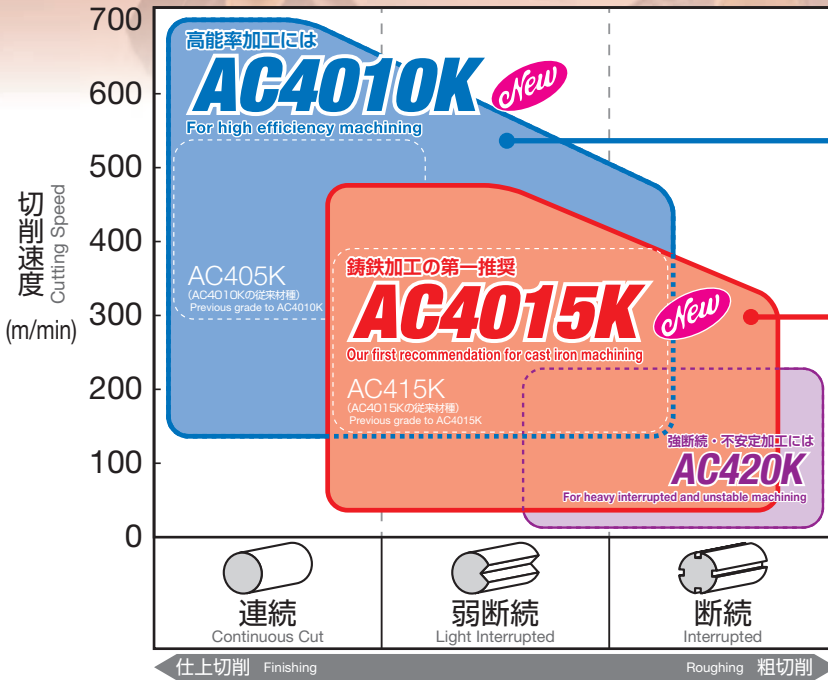
AC4010K / AC4015K / AC420K 第2版

ねずみ鑄鉄の超高速加工から、高強度ダクタイル鑄鉄の強断続加工まで
完全網羅する新材種シリーズ登場

From ultra-high speed machining of gray cast iron to heavy interrupted machining of high-strength ductile cast iron
Introducing a new grade series for more complete coverage

AC4010K/AC4015K/AC420K

■ 適用領域 Application Range



● **AC4010K** *New*

ねずみ鑄鉄加工の第一推奨材種。超厚膜コーティングにより、 $v_c=700\text{m/min}$ での超高速加工が可能。
Our first recommended grade for gray cast iron. Ultra-thick coating allows for ultra-high speed machining ($v_c = 700\text{m/min}$).

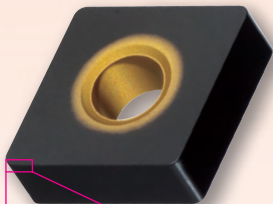
● **AC4015K** *New*

ダクタイル鑄鉄加工の第一推奨材種。高密着、高強度コーティングにより、安定長寿命が可能。
Our first recommended grade for ductile cast iron. High-adhesion, high-strength coating provides longer and stable tool life.

● **AC420K**

強断続、不安定加工において抜群の耐久損性を実現
Excellent fracture resistance in heavy interrupted and unstable machining.

■ AC4010K/AC4015Kの特長 Feature



新開発の高密着技術・結晶配向制御技術・残留応力制御技術により、ねずみ鑄鉄(FC)から高強度ダクタイル鑄鉄(FCD)まで、あらゆる鑄鉄で安定長寿命を実現

Newly developed high adhesion technology, crystal orientation control technology, and residual stress control technology for longer and stable tool life with various cast irons—from gray cast iron and ordinary cast iron (FC) to high-strength ductile cast iron (FCD).



特殊表面処理

Special Surface Treatment

従来比2倍以上の圧縮応力を付与、耐チッピング性能 従来比2倍

More than twice the compressive stress and 2x chipping resistance compared with conventional products

結晶配向制御 アルミナ層

Crystal Orientation-Controlled Alumina Layer

高速加工時の耐クレーター摩耗性能 従来比2倍

2x crater wear resistance for high-speed machining compared with conventional products

C-rich微粒TiCN層

C-rich Fine TiCN Layer

耐逃げ面摩耗性能 従来比2倍

2x flank wear resistance compared with conventional products

高密着技術

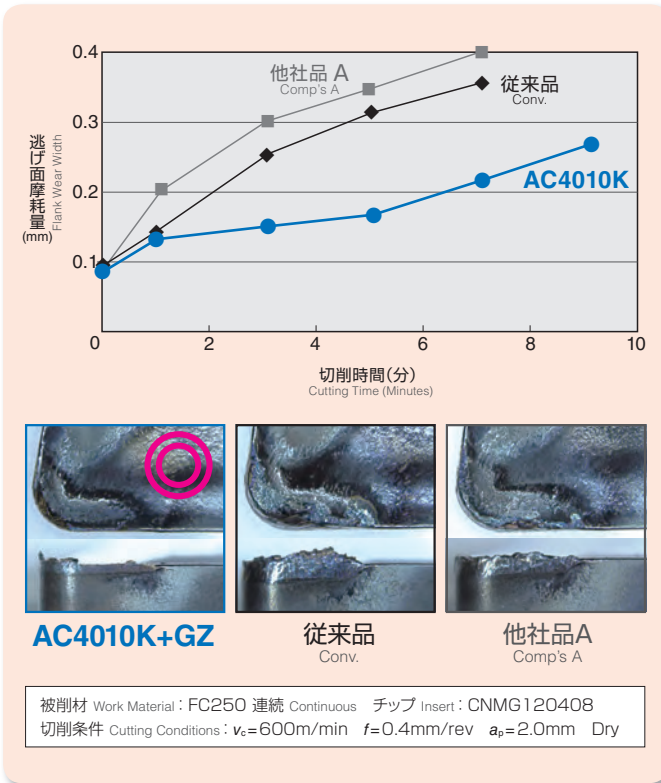
High Adhesion Technology

平滑刃先処理 ($R_z0.15\mu\text{m} \rightarrow 0.07\mu\text{m}$) により、耐剥離性能大幅向上

Smooth cutting edge treatment ($R_z 0.15\mu\text{m} \rightarrow 0.07\mu\text{m}$) for drastically improved peeling resistance

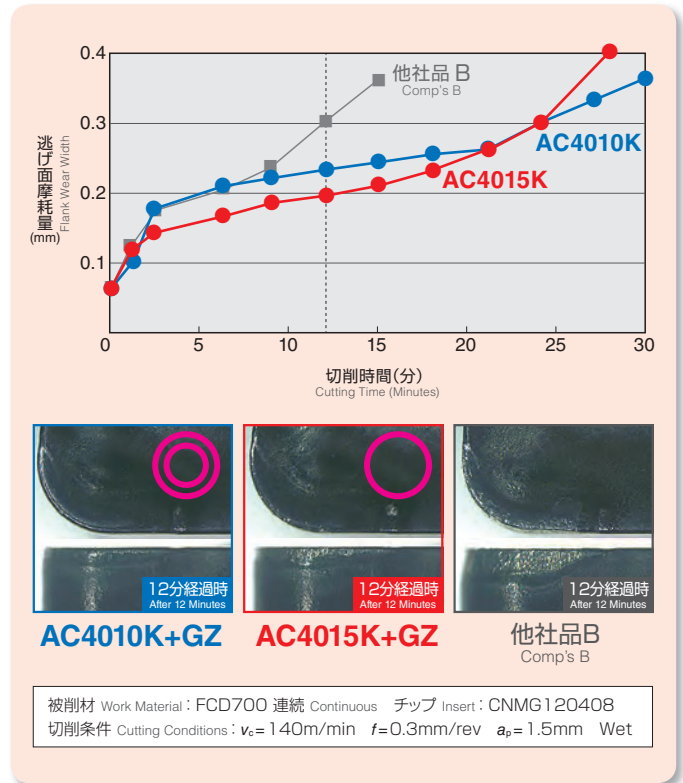
耐摩耗性 ねずみ鋳鉄

Wear Resistance Gray Cast Iron



耐摩耗性 ダクタイル鋳鉄

Wear Resistance Ductile Cast Iron



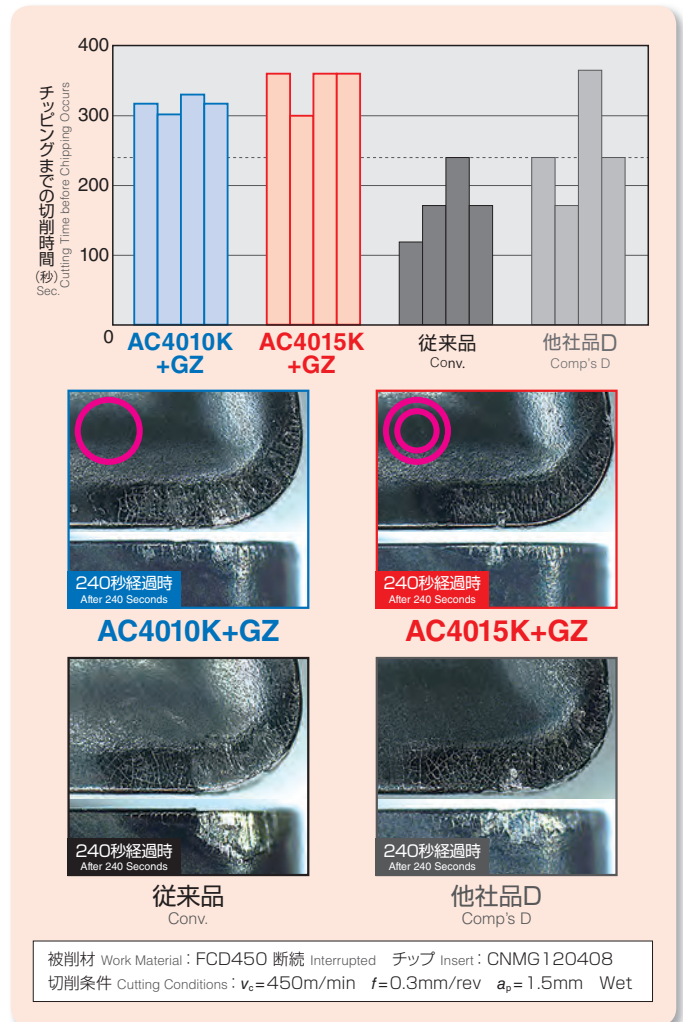
耐チッピング性能 ねずみ鋳鉄

Chipping Resistance Gray Cast Iron

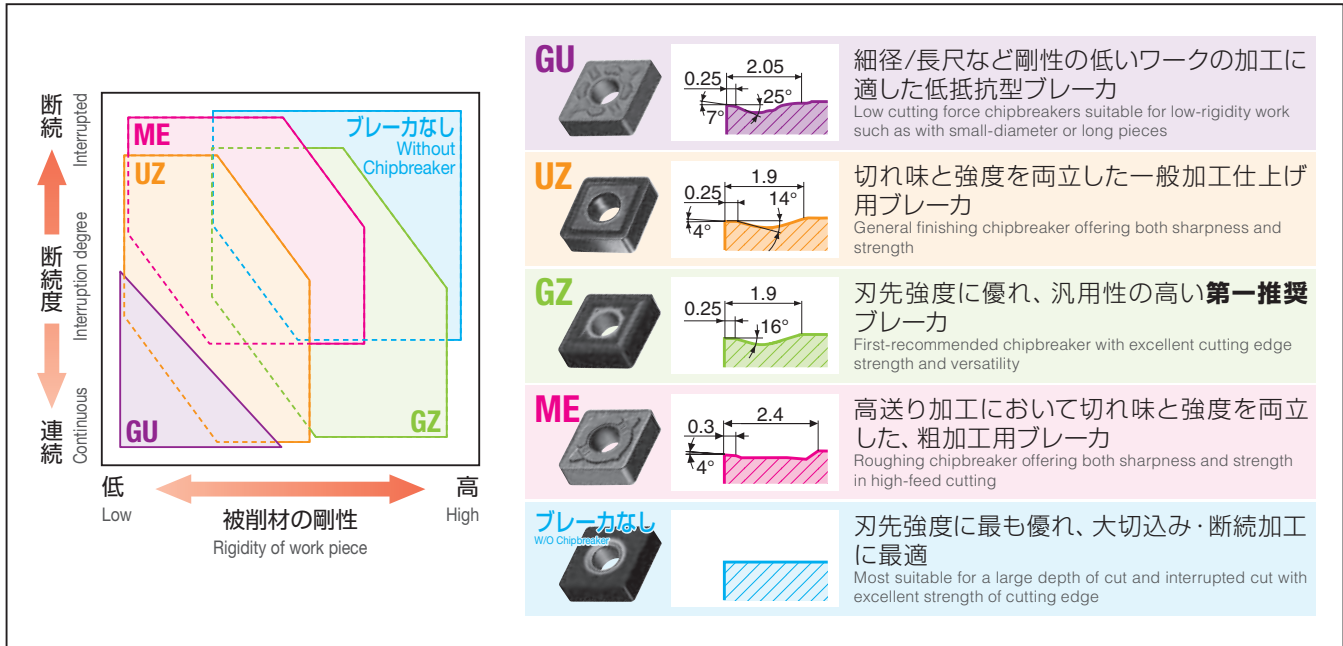


耐チッピング性能 ダクタイル鋳鉄

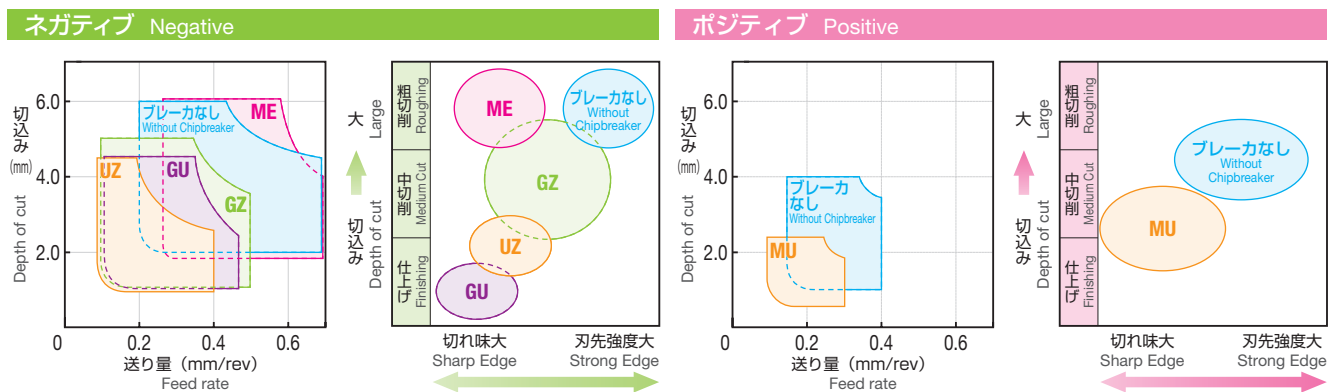
Chipping Resistance Ductile Cast Iron



■ チップブレイカ選択ガイド Chipbreaker Selection Guide



■ チップブレイカ適用領域 Chipbreaker Application Range



■ 推奨切削条件 Recommended Cutting Conditions

(赤字は第1推奨)
(Red text indicates first recommendations.)

被削材 Work Material	切削状態 Cutting Process	材種 Grades	切削条件 Cutting Conditions		
			切込み a_p (mm) Depth of Cut	送り量 f (mm/rev) Feed Rate	切削速度 v_c (m/min) Cutting Speed
ねずみ鋳鉄 (FC250など) Gray cast iron (FCD250 etc.)	連続 ~ 一般 Continuous to General	AC4010K	0.5-2.0-6.0	0.10-0.25-0.40	200-400-700
	断続 Interrupted	AC4015K	0.5-2.0-6.0	0.10-0.30-0.50	180-300-450
	強断続 Heavy Interrupted	AC420K	0.5-2.0-6.0	0.10-0.30-0.60	150-200-300
ダクタイル鋳鉄 (FCD450など) Ductile cast iron (FCD450 etc.)	連続 Continuous	AC4010K	0.5-2.0-6.0	0.10-0.25-0.40	180-300-450
	一般 ~ 断続 General to Interrupted	AC4015K	0.5-2.0-6.0	0.10-0.30-0.50	160-250-400
	強断続 Heavy Interrupted	AC420K	0.5-2.0-6.0	0.10-0.30-0.60	120-170-250
高強度ダクタイル鋳鉄 (FCD700など) High strength ductile cast iron (FCD700 etc.)	連続 Continuous	AC4010K	0.5-2.0-6.0	0.10-0.25-0.40	160-250-400
	一般 ~ 断続 General to Interrupted	AC4015K	0.5-2.0-6.0	0.10-0.30-0.50	140-200-350
	強断続 Heavy Interrupted	AC420K	0.5-2.0-6.0	0.10-0.30-0.60	80-150-220

FC250 ブレーキディスク Break disc AC4010K	FC250 ブレーキディスク Break disc AC4015K
<p>AC4010Kは摩耗軽微で1.4倍寿命達成 1.4x tool life thanks to minimal wear with the AC4010K</p>  <p>チップ: CNMG120408(AC4010K 鋭角) 黒皮端面加工 Insert Acute Angle Facing of Mill-Scaled Work 切削条件: $v_c=960\text{m/min}$ $f=0.75\text{mm/rev}$ $a_p=2.0\text{mm}$ Wet Cutting Conditions</p>	<p>AC4015Kは1.4倍寿命達成 35個加工時の比較でも損傷軽微 1.4x tool life with minimal damage even after 35 uses in AC4015K products</p>  <p>チップ: CNMG120408(AC4015K 鈍角) 黒皮端面加工 Insert Obtuse Angle Facing of Mill-Scaled Work 切削条件: $v_c=960\text{m/min}$ $f=0.75\text{mm/rev}$ $a_p=2.0\text{mm}$ Wet Cutting Conditions</p>

FCD800 ギアリング Gear ring AC4010K AC4015K	FCD600 デフケース Differential gear case AC4010K AC4015K
<p>高強度ダクタイル鋳鉄加工で耐摩耗性良好 Improved wear resistance in high-strength ductile cast iron machining</p>  <p>チップ: WNMG080412 連続加工 Insert Continuous 切削条件: $v_c=120\text{m/min}$ $f=0.25\text{mm/rev}$ $a_p=1.0-3.0\text{mm}$ Wet Cutting Conditions</p>	<p>高強度ダクタイル鋳鉄強断続加工で耐チッピング性良好、摩耗乱れ抑制 Improved chipping resistance and suppressed wear variation during heavy interrupted machining of high-strength ductile cast iron</p>  <p>チップ: WNMG080412 強断続加工 Insert Heavy Interrupted 切削条件: $v_c=250\text{m/min}$ $f=0.30-0.45\text{mm/rev}$ $a_p=2.0\text{mm}$ Wet Cutting Conditions</p>

FCD500 ギアケース Gear case AC4010K AC4015K	FCD450 フライホイール Flywheel AC4015K
<p>粗切削用ME型ブレーカとの組み合わせで寿命1.2倍達成 1.2x tool life when combined with ME type chipbreakers for roughing</p>  <p>チップ: CNMG120408 断続加工 Insert Interrupted 切削条件: $v_c=220\text{m/min}$ $f=0.35\text{mm/rev}$ $a_p=1.5\text{mm}$ Wet Cutting Conditions</p>	<p>優れた耐摩耗性により、2倍の加工数でも摩耗軽微 Minimal wear even after twice the cutting processes thanks to excellent wear resistance</p>  <p>チップ: WNMA080408 連続加工 Insert Continuous 切削条件: $v_c=230\text{m/min}$ $f=0.3\text{mm/rev}$ $a_p=2.0\text{mm}$ Wet Cutting Conditions</p>

△ ネガティブ三角形 (つづき) Negative Triangular Type (Con't)

形状 Appearance	型番 Cat. No.	在庫 Stock			寸法 Dimensions (mm)						
		AC4010K	AC4015K	AC420K	内接円 Inscribed circle	厚さ Thickness	穴径 Hole	ノーズ半径 Nose radius			
	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			
UZ	TNMG 220408N-UZ	●	●	●	12.7	4.76	5.16	0.8			
	220412N-UZ	●	●	●				1.2			
	220416N-UZ	●	●	●				1.6			
	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
GZ	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			

□ ネガティブ正方形 (穴なし) Negative Square Type (Without Insert Hole)

形状 Appearance	型番 Cat. No.	在庫 Stock			寸法 Dimensions (mm)			
		AC4010K	AC4015K	AC420K	内接円 Inscribed circle	厚さ Thickness	穴径 Hole	ノーズ半径 Nose radius
	SNMN 120408	●	●	●	12.7	4.76	-	0.8
	120412	●	●	●				1.2
	120416	●	●	●				1.6

△ ネガティブ三角形 (穴なし) Negative Triangular Type (Without Insert Hole)

形状 Appearance	型番 Cat. No.	在庫 Stock			寸法 Dimensions (mm)			
		AC4010K	AC4015K	AC420K	内接円 Inscribed circle	厚さ Thickness	穴径 Hole	ノーズ半径 Nose radius
	TNMA 160408	●	●	●	9.525	4.76	-	0.8
	160412	●	●	●				1.2
	160416	●	●	●				1.6

◇ ネガティブ 35° 菱形 Negative 35° Diamond Type

形状 Appearance	型番 Cat. No.	在庫 Stock			寸法 Dimensions (mm)			
		AC4010K	AC4015K	AC420K	内接円 Inscribed circle	厚さ Thickness	穴径 Hole	ノーズ半径 Nose radius
	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

△ ネガティブ六角形 Negative Trigon Type

形状 Appearance	型番 Cat. No.	在庫 Stock			寸法 Dimensions (mm)				
		AC4010K	AC4015K	AC420K	内接円 Inscribed circle	厚さ Thickness	穴径 Hole	ノーズ半径 Nose radius	
	WNMG 060404N-GU	●	●	●	9.525	4.76	3.81	0.4	
	060408N-GU	●	●	●				0.8	
	060412N-GU	●	●	●				1.2	
	GU	WNMG 080404N-GU	●	●	●	12.7	4.76	5.16	0.4
		080408N-GU	●	●	●				0.8
080412N-GU		●	●	●	1.2				
	WNMG 060408N-ME	●	●	●	9.525	4.76	3.81	0.8	
	060412N-ME	●	●	●				1.2	
	WNMG 080408N-ME	●	●	●				12.7	4.76
	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	
	WNMG 060408N-GZ	●	●	●	9.525	4.76	3.81	0.8	
	060412N-GZ	●	●	●				1.2	
	WNMG 080404N-GZ	●	●	●				12.7	4.76
	080408N-GZ	●	●	●	0.8				
	080412N-GZ	●	●	●	1.2				
VNMA	080408	●	●	●	12.7	4.76	5.16	0.8	
	080412	●	●	●				1.2	
	080416	●	●	●				1.6	

◆ ポジティブ 80° 菱形 Positive 80° Diamond Type

Table with 8 columns: Shape, Relief angle, Cat. No., Stock (AC4010K, AC4015K, AC420K), Dimensions (mm) (Inscribed circle, Thickness, Hole, Nose radius).

◇ ポジティブ 55° 菱形 Positive 55° Diamond Type

Table with 8 columns: Shape, Relief angle, Cat. No., Stock (AC4010K, AC4015K, AC420K), Dimensions (mm) (Inscribed circle, Thickness, Hole, Nose radius).

○ ポジティブ円形 Positive Round Type

Table with 8 columns: Shape, Relief angle, Cat. No., Stock (AC4010K, AC4015K, AC420K), Dimensions (mm) (Inscribed circle, Thickness, Hole, Nose radius).

□ ポジティブ正方形 Positive Square Type

Table with 8 columns: Shape, Relief angle, Cat. No., Stock (AC4010K, AC4015K, AC420K), Dimensions (mm) (Inscribed circle, Thickness, Hole, Nose radius).

△ ポジティブ三角形 Positive Triangular Type

Table with 8 columns: Shape, Relief angle, Cat. No., Stock (AC4010K, AC4015K, AC420K), Dimensions (mm) (Inscribed circle, Thickness, Hole, Nose radius).

◇ ポジティブ 35° 菱形 Positive 35° Diamond Type

Table with 8 columns: Shape, Relief angle, Cat. No., Stock (AC4010K, AC4015K, AC420K), Dimensions (mm) (Inscribed circle, Thickness, Hole, Nose radius).

□ ポジティブ正方形 (穴なし) Square Type (Without Insert Hole)

Table with 8 columns: Shape, Relief angle, Cat. No., Stock (AC4010K, AC4015K, AC420K), Dimensions (mm) (Inscribed circle, Thickness, Hole, Nose radius).

△ ポジティブ三角形 (穴なし) Triangular Type (Without Insert Hole)

Table with 8 columns: Shape, Relief angle, Cat. No., Stock (AC4010K, AC4015K, AC420K), Dimensions (mm) (Inscribed circle, Thickness, Hole, Nose radius).

●印: 標準在庫品、無印: 受注生産品、**ワ**: ワイパーチップ
●mark: Standard stock item, Blank: Made to order item, **W**: Wiper insert

◆安全にお使いいただくために◆



- 高温の切りくずが飛散したり長く伸びた切りくずが排出されることがありますので、安全カバーや保護メガネ等の保護具を使用し、防災・防火に十分ご配慮ください。
●鋭い切れ刃を持っているため取扱いにご注意ください。
●使用方法を誤ったり、使用条件が不適切な場合、工具破損、飛散を招きますので推奨条件の範囲内でご使用ください。
●不水溶性の切削液をご使用になる場合は、自動消火装置を設置するなどの対策を講じて頂き、火災にくれぐれもご注意ください。
●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.

住友電気工業株式会社

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