

THE NEW VALUE FRONTIER



新氮化硅陶瓷

# KS6050/CS7050

New Si<sub>3</sub>N<sub>4</sub> Ceramic Insert Grades

新開發 鑄鐵加工用氮化硅陶瓷  
鑄鐵加工時高品質化・高信賴性

New Si<sub>3</sub>N<sub>4</sub> ceramic insert grades for cutting cast iron  
High efficiency and high reliability at cast iron machining

●高縱橫比組織結構，提高抗崩損性

Fracture resistance improvement by high aspect ratio structure

抑制黑皮・斷續加工時的振刀

Prevents chipping at processing scale and interrupted cutting

●透過晶界相抑制實現高速加工鐵鑄（良好的耐磨損性）

High speed cutting of cast iron by controlling grain boundary phase (good wear resistance)

●非塗層（KS6050:通用・斷續加工・重視穩定性）

Non coated grade (KS6050: for general use and interrupted cut / stability oriented)

高塗層黏著（CS7050:精加工 連續加工、重視高速 高品質）

Coated grade (CS7050: for finishing and continuous cut / speed and efficiency oriented)

可同時適用2種材質

2 types of grades available

ADVANCING PRODUCTIVITY

生産性向上に貢献する京セラ

# 新開發 鑄鐵加工用氮化硅陶瓷

## KS6050&CS7050 誕生

New Si<sub>3</sub>N<sub>4</sub> Ceramic Insert Grades KS6050 & CS7050

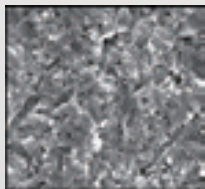
### KS6050

#### 優點 Features

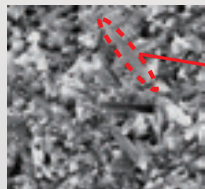
- 透過氮化硅的晶界相抑制及高縱橫比結構組織，抗崩損性及耐磨損性得到提高

High fracture resistance and wear resistance by controlling grain boundary phase and high aspect ratio structure of Si<sub>3</sub>N<sub>4</sub>

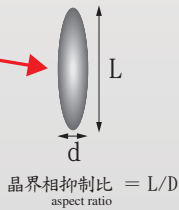
- 鑄鐵的粗、斷續加工、第一推薦材質 First recommendation for roughing and interrupted cut of cast iron



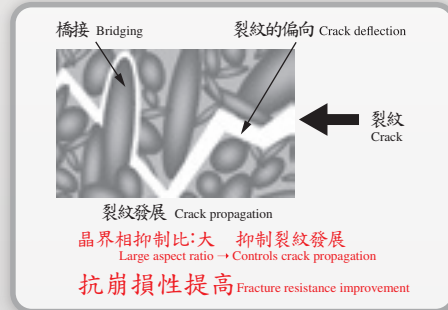
過去產品A  
Grade A (conventional)



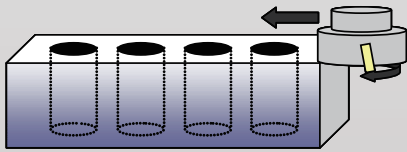
KS6050



KS6050與過去產品A相比，  
晶界相抑制比較大  
KS6050 has high aspect ratio  
compared with grade A



#### 抗崩損性比較 Comparison of fracture resistance

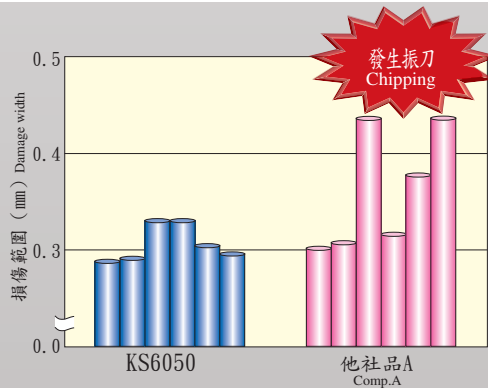


<切削條件 Cutting Condition>

Vc=500m/min, ap=2mm, fz=0.5mm/t, 乾式Dry

被切材質 Workpiece Material ; FCD450 (4孔斷續 4-hole block)

刀片 Insert ; SNGN120412T02025



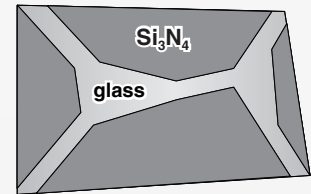
斷續加工時損傷範圍小  
Less damage at interrupted cutting  
良好的抗崩損性  
High fracture resistance

#### 晶界相的差異 Difference of the grain boundary phase

##### 過去材質 Conventional Grade

晶界相(glass)多，因此在切削熱的影響下，強度會降低

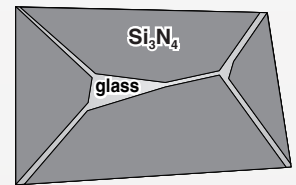
The grain boundary phase contained a high proportion of glass, therefore its toughness will be weakened by cutting heat.



##### KS6050

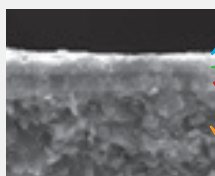
透過抑制晶界相，能提高機械性能以及熱性能

Mechanical and thermal property will be improved by controlling grain boundary phase.



#### CS7050 (塗層硬質合金Si<sub>3</sub>N<sub>4</sub>) CS7050 (coated Si<sub>3</sub>N<sub>4</sub> ceramic)

鑄鐵高速精加工用的塗層硬質合金系列 Coated type for high speed finishing of cast iron



耐磨損性強化層(TiC基座) High wear resistant phase (TiC base)

特殊Al<sub>2</sub>O<sub>3</sub>層 Special Al<sub>2</sub>O<sub>3</sub> phase

黏著力強化層(TiN基座) High adhesion phase (TiN base)

Si<sub>3</sub>N<sub>4</sub>主材料 Si<sub>3</sub>N<sub>4</sub> substrate

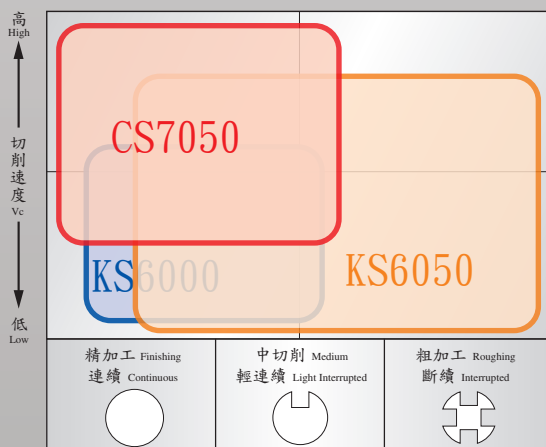
高度塗層硬質合金黏著力，提高耐磨損性、適合高速度加工

Wear resistance improvement due to high coating adhesion. Suitable for high speed cutting.

# 標準庫存型號 Stock Items

刀尖規格 Edge Preparation				使用分類標準 Classification of usage		K	球墨鐵鑄 (高速) Nodular Cast Iron (high speed)		☒	●		
符號 Symbol	刀尖規格記號狀況 Cutting edge condition	示例 Indication		☒: 斷續加工/第1推薦 Interrupted/1st. choice ☒: 斷續加工/第2推薦 Interrupted/2nd. choice ●: 連續加工/第1推薦 Continuous/1st. choice ○: 連續加工/第2推薦 Continuous/2nd. choice			球墨鐵鑄 (低速) Nodular Cast Iron (low speed)		☒	○		
T	導角 Chamfer Cutting Edge	T02025	0.20mm X 25° 導角 Chamfered Cutting Edge				灰口鐵鑄 (高速) Gray Cast Iron (high speed)		☒	●		
							灰口鐵鑄 (低速) Gray Cast Iron (low speed)		☒	○		
形狀 Shape		型號 Description		(舊型號) Previous Description		刀尖規格 Edge Preparation	尺寸 (mm) Dimension(mm)				KS6050	CS7050
							rε	A	T	ød		
		CNGA	120408T02025	CNGA	120408	T02025	0.8	12.70	4.76	5.16	●	●
			120412T02025		120412		1.2				●	●
		CNGN	120408T02025	CNGN	120408	T02025	0.8	12.70	4.76	-	●	●
			120412T02025		120412		1.2				●	●
		CNGX	120712T02025	-	-	T02025	1.2	12.70	7.94	-	●	●
			120716T02025	-	-		1.6				●	●
		RNGN	120400T02025	RNGN	120400	T02025	-	12.70	4.76	-	●	●
		SNGA	120412T02025	SNGA	120412	T02025	1.2	12.70	4.76	5.16	●	●
			120416T02025		120416		1.6				●	●
		SNGN	120412T02025	SNGN	120412	T02025	1.2	12.70	4.76	-	●	●
			120416T02025		120416		1.6				●	●
			120420T02025		120420		2.0				●	●
		SNGN	120716T02025	SNGN	120716	T02025	1.6	7.94	-	-	●	●
		SNGX	120712T02025	-	-	T02025	1.2	12.70	7.94	-	●	●
			120716T02025	-	-		1.6				●	●

## 適用種類圖 Application Map



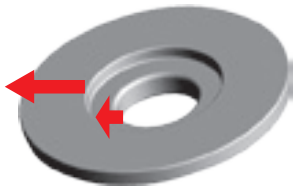
高速  
精加工  
High Speed / Finishing

通用  
斷續加工  
General Cutting / Interrupted

CS7050

KS6050

FC250 (有黑皮) (with scale)	
驅動板 Drive Plate •端面(斷續加工) Facing (interrupted) •Vc=330 m/min •ap=0.3 mm •f=0.1mm/rev •WET CNGN120408T02025	
<b>KS6050</b>	平均740個/C Avg.740pcs/edge
過去產品B Conv.B	120個/C 120 pcs/edge <b>6.2倍</b> 6.2 times
結果 •因加工件外圍突起處強斷續加工，造成過去產品B的壽命縮短 •KS6050與過去產品B相較，刀刃的磨損較為減少。 結論而言，壽命平均每740個/C延長。 =>壽命不僅延長6.2倍，亦實現了穩定加工。降低了工具成本。 Results •Tool life of conv. B was reduced due to interrupted cutting by workpiece's external boss. •KS6050 reduced the fracture at the cutting edge compared with conv. B. KS6050 increased the tool life to avg.740pcs/edge. =>Tool life become 6.2 times and machining stabilized. Tool cost also reduced.	(根據使用者評價) Evaluation by the user

FC250 (有黑皮) (with scale)	
碟煞盤 Brake Disk •端面 Facing •Vc=600 m/min •f=0.4mm/rev •WET CNGX120716T02025	
<b>CS7050</b>	360個/C 360 pcs/edge
過去產品C Conv.C	100個/C 100 pcs/edge <b>3.6倍</b> 3.6 times
結果 •CS7050與過去產品C相較壽命延長3.6倍 =>加工效率提高，降低工具成本 Results •CS7050 extended the tool life to 3.6 times of that of conv. C.	(根據使用者評價) Evaluation by the user

FC250 (有黑皮) (with scale)	
汽缸 Cylinder •缸徑加工 Boring •Vc=300~500 m/min •ap=1.5 mm •f=0.07mm/rev •WET SNGN120408T01015 3枚 刀盤 Cutter (3 edges)	
<b>KS6050</b>	0% <b>無振刀</b> No chipping
他社品C Competitor C	17% 振刀發生頻率 Chipping rate
結果 因工件的肉厚較薄，故刀刀式樣為特注 •比較一定數量完成加工時的刀刀狀態。 =>他社品有17%(5個/30個)發生振刀。 相較之下，KS6050無發生振刀。 實現穩定加工 Results Edge preparation was custom order for thin work material. •Compared the cutting edge condition after processing fixed number of workpieces. =>Comp. C's chipping ratio was 17%. (5 out of 30pcs) KS6050 caused no chipping. Stable machining.	(根據使用者評價) Evaluation by the user

FC250 (有黑皮) (with scale)	
軸承零件 Bearing Parts •外徑/端面 External / Facing •Vc=250 m/min •f=0.3~0.45mm/rev •WET CNGA120412T02025	
<b>CS7050</b>	磨損量:0.18mm Wear:0.18mm
他社品D Competitor D	磨損量:0.23mm Wear:0.23mm <b>-22%</b>
結果 比較各300個/C加工後的磨損量 •CS7050與他社品D相較，磨損量減少22% Results Compared wear condition after machining 300pcs/edge •CS7050 reduced wear by 22% compared with comp. D.	(根據使用者評價) Evaluation by the user

**"KYOCERA Cutting Tools" 已在 App Store 與 Google Play 發行**



- \* 下載高解析度京瓷切削工具型錄
- \* 切削產品影片
- \* 車削、銑削與鑽孔之條件計算
- \* KYOCERA 全球據點聯絡方式



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