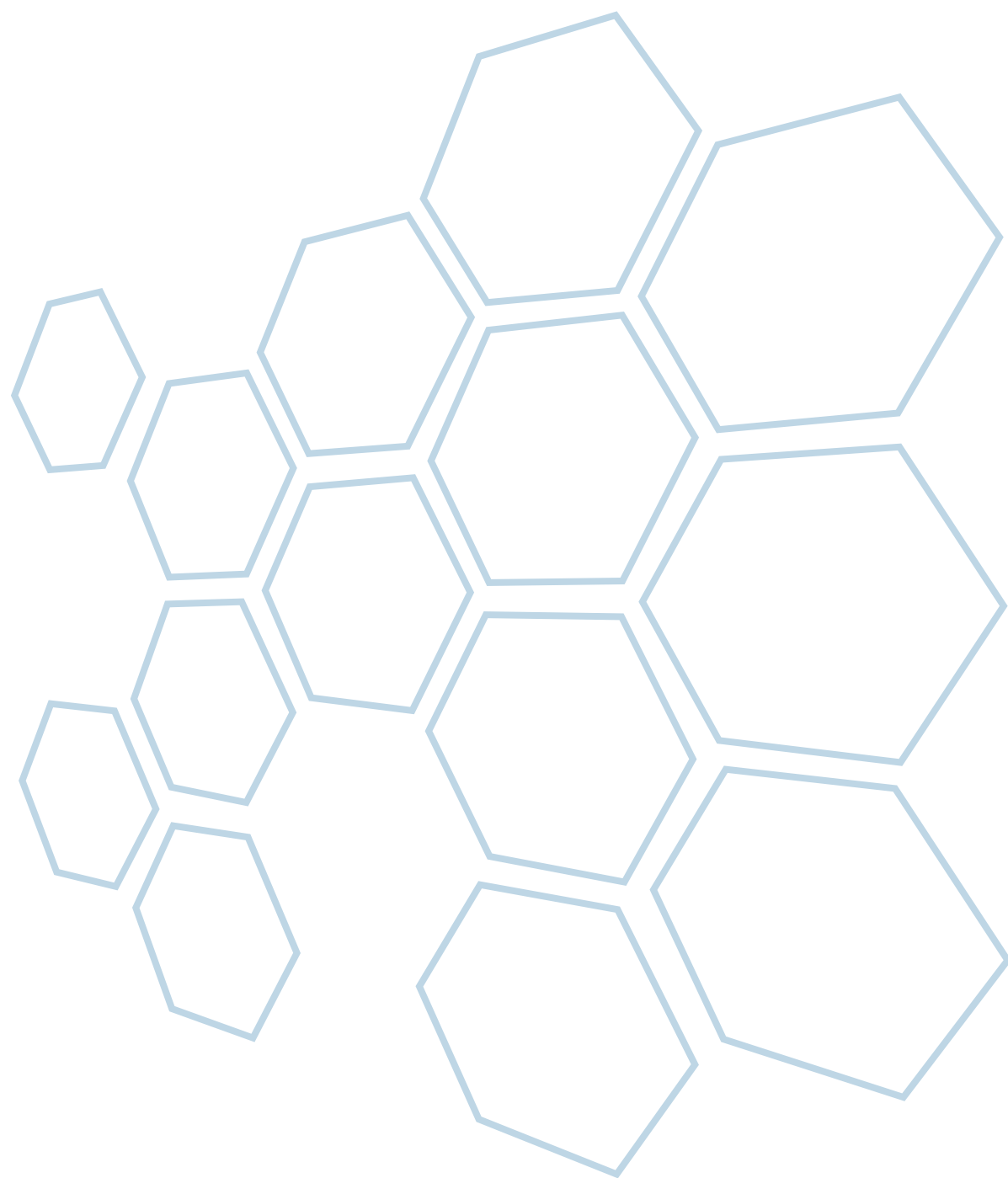




Shanghai IKEN Precision Tools Co., Ltd.

No.333, Xinke Road, Qingpu District,
Shanghai, China , PC 201707

Tel :+86-21-6922 0725

Fax :+86-21-6922 0726

E-mail: info@iken-tools.com

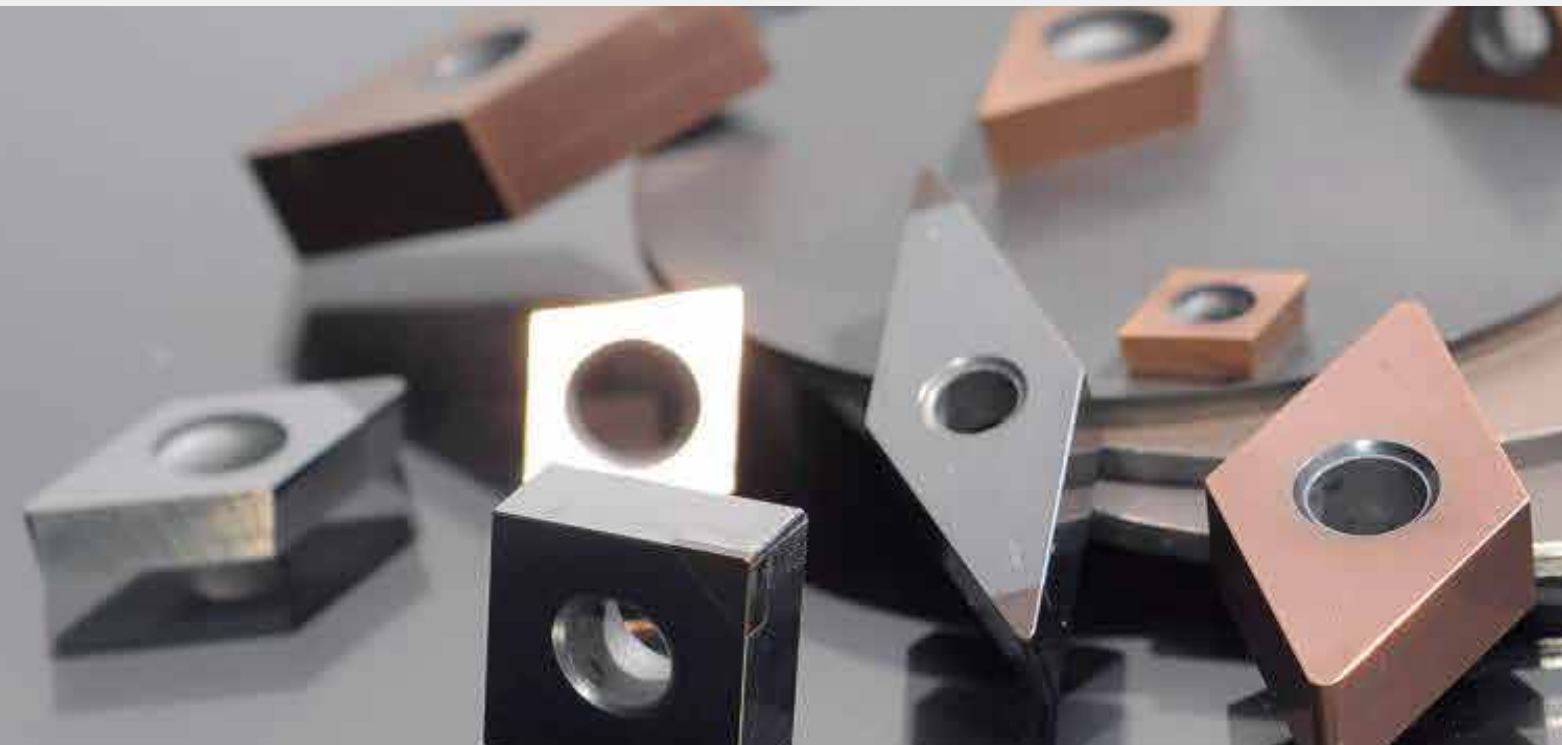
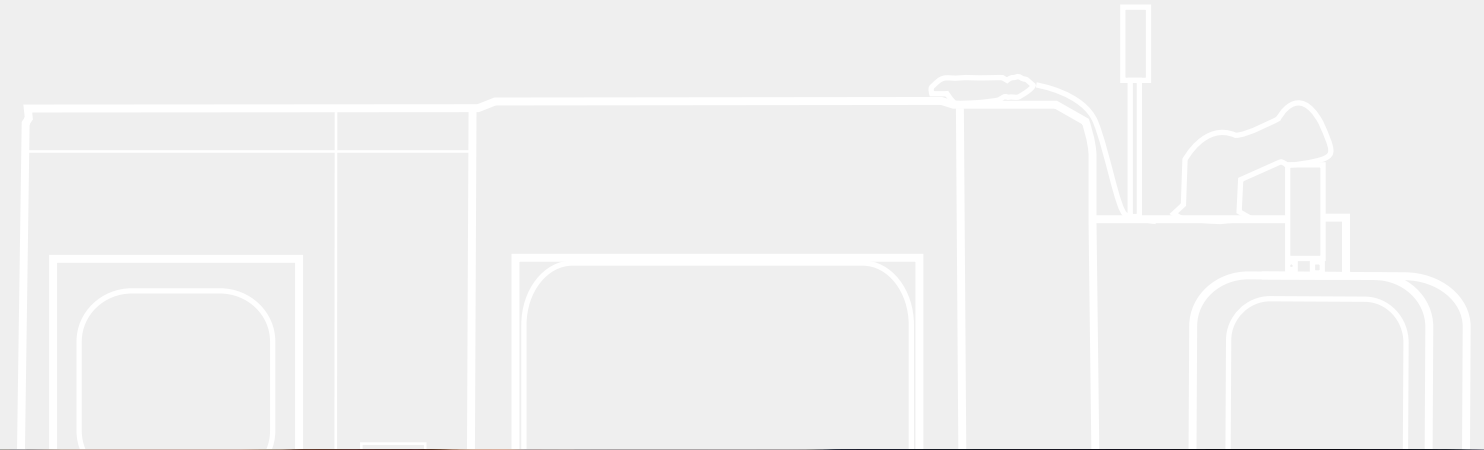
Website: www.iken-tools.com



IKEN

Shanghai IKEN Precision Tools Co.Ltd.





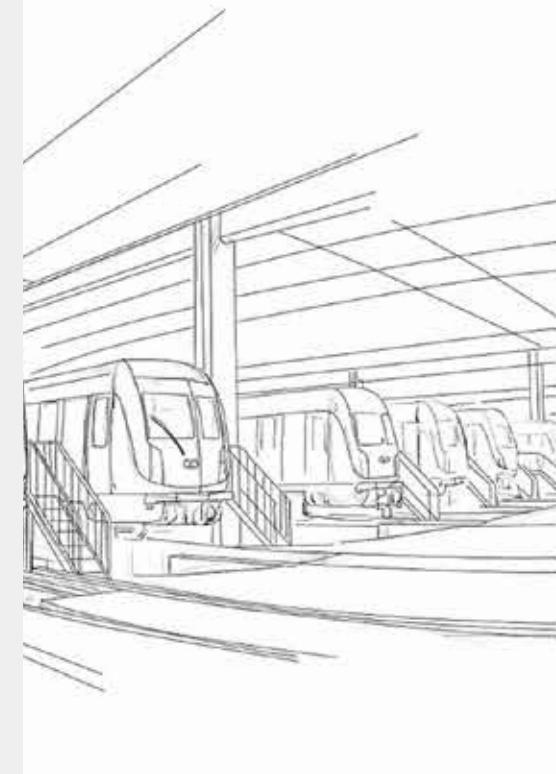
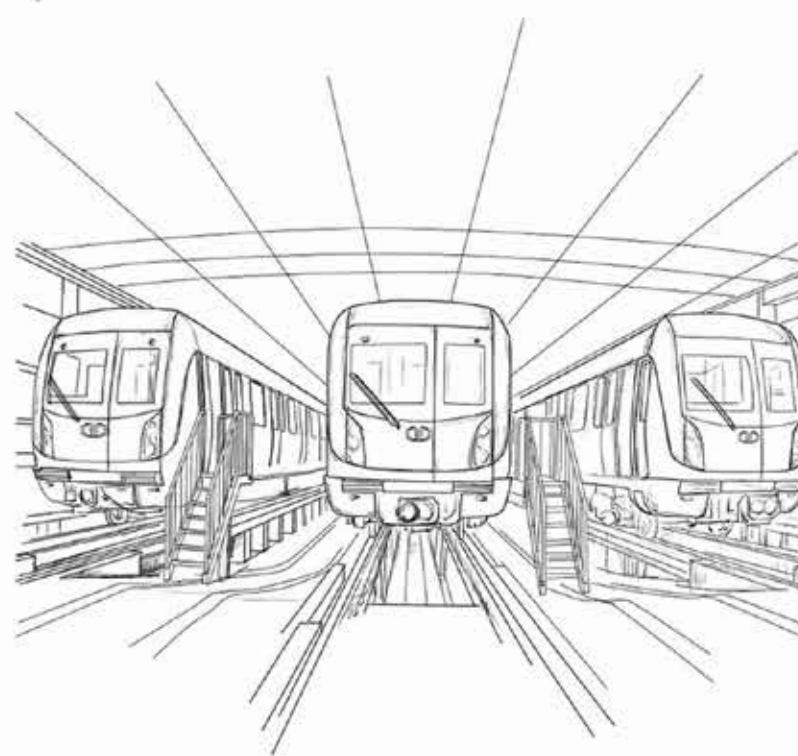
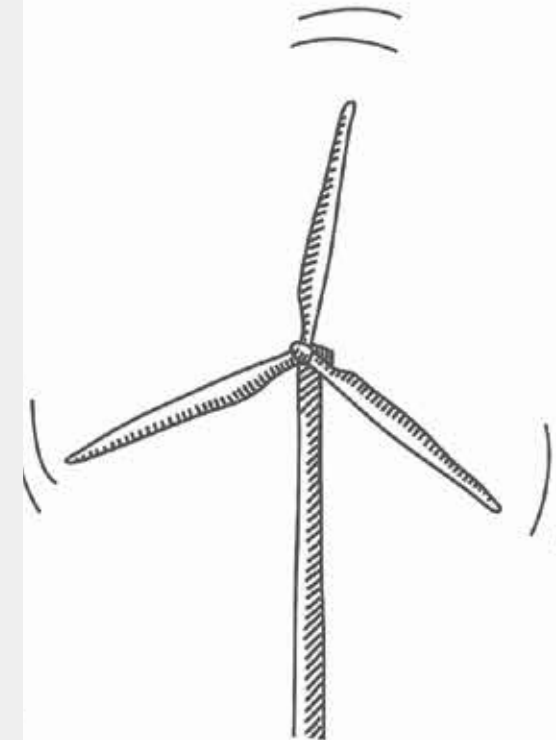
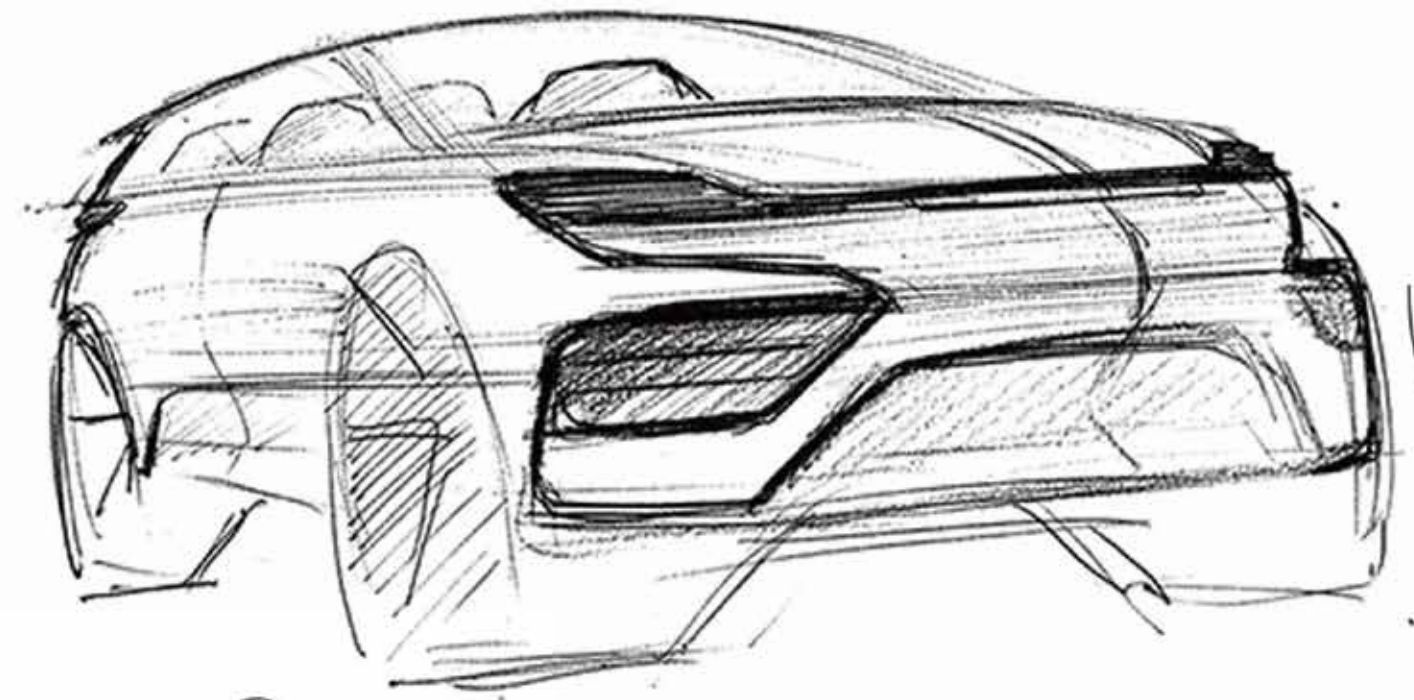
HIGHER EFFICIENCY , BETTER SERVICE

Shanghai IKEN Precision Tools Co.Ltd.

COMPANY INTRODUCTION

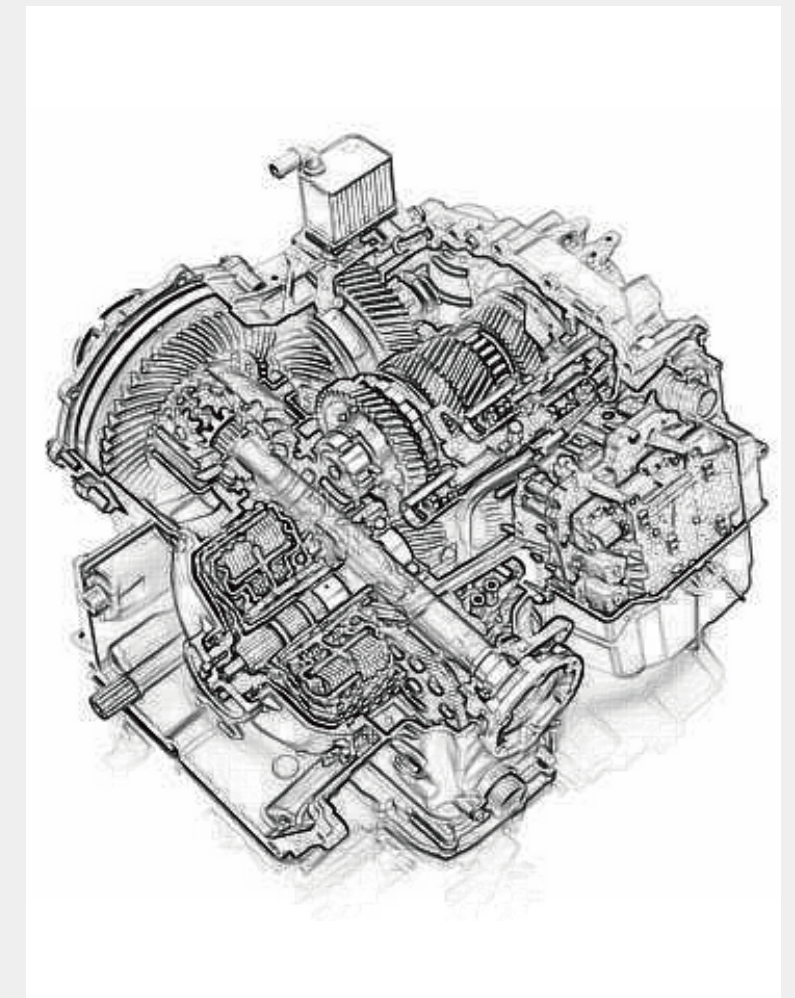
Shanghai IKEN Precision Tools Co., Ltd. established in 2011 is a professional tool manufacturer of CBN and PCD superhard metal cutting tools.

Our products are widely used in various industries such as automobile, railways, ship-building, aviation, medical, energy, etc. We are absorbing cutting tool industry talents, bringing in the most advanced technology and equipment to develop and produce high quality and high precision tools. our enterprise core values are integrity, opening-up and cooperation, innovation, creation of value. we are guided by clients' expectations and facilitated by innovations to actively exploit domestic and abroad markets and provide more efficient, more economic, greener metal cutting solutions.



iKEN
Shanghai IKEN Precision Tools CO.Ltd.

In various industries the component made of no matter high hardness material like hardened steel or abrasive material like cast iron or sintered powder can be machined accurately , stably and effciently by IKEN superhard tools.

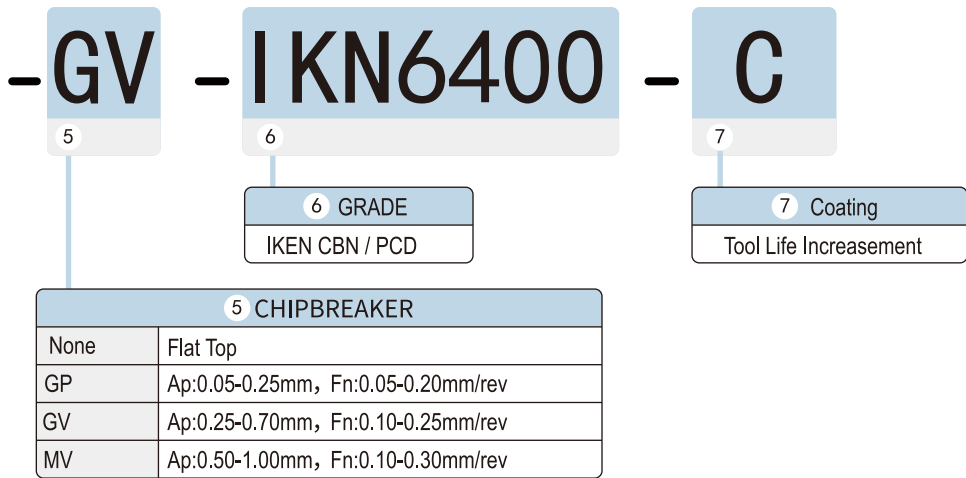
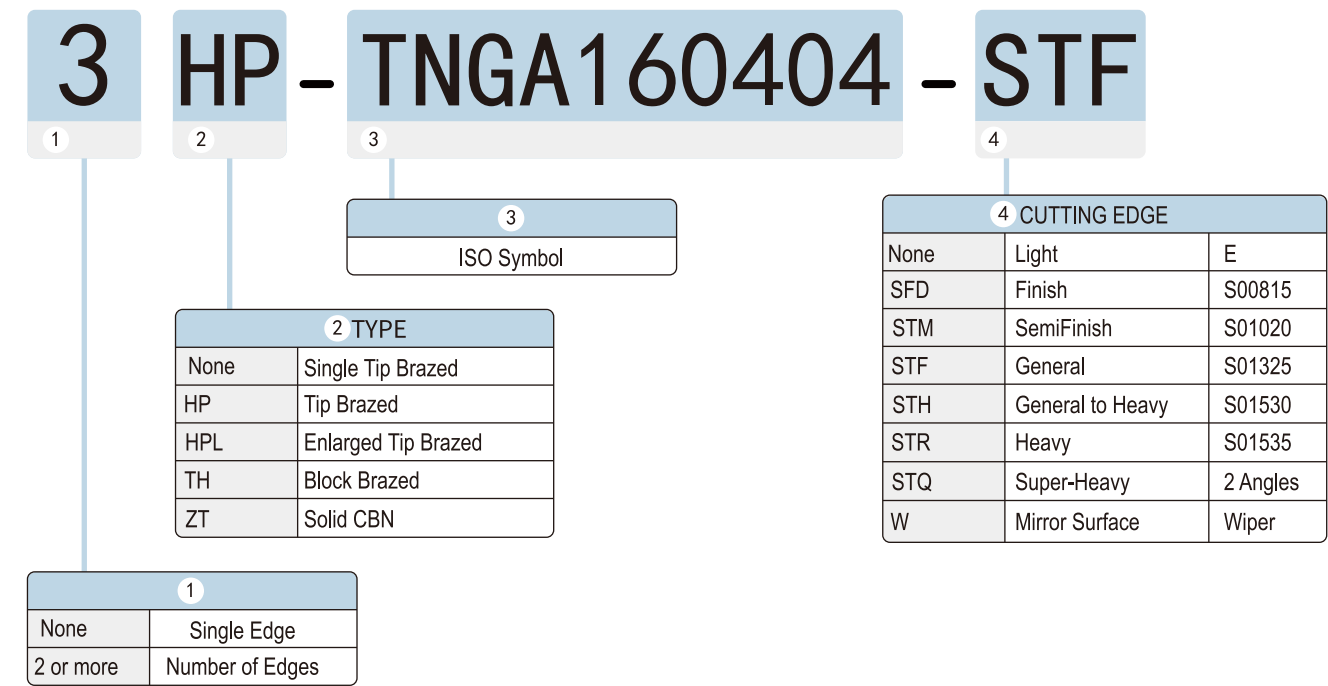


<u>Nomenclature</u>	01-02
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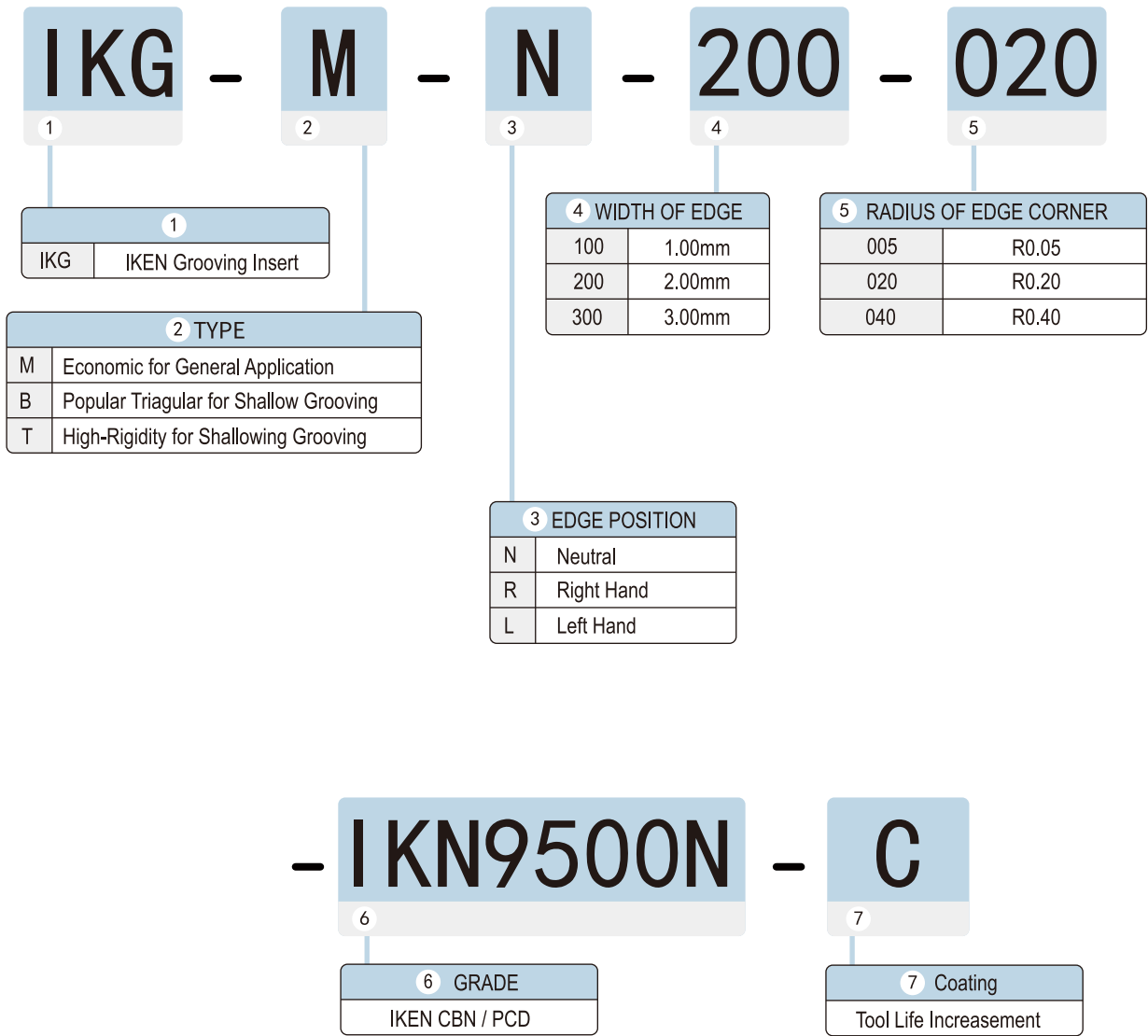
IKEN NOMENCLATURE FOR ISO INSERT

ISO INSERT



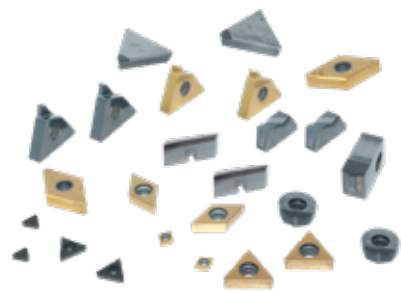
IKEN NOMENCLATURE FOR GROOVING INSERT

GROOVING INSERT



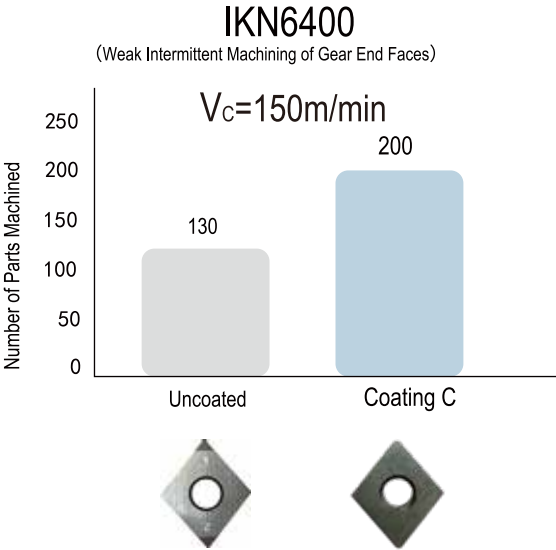
CBN INTRODUCTION

WHY CBN CHOSEN



- CBN
- ※ CBN (Cubic Boron Nitride) is the 2nd hardest materials on Earth just after diamond. This material is sintered under high-pressure and temperature with CBN particles and a special binder.
- Characteristics:
- ※ CBN hardness is more than twice that of cemented carbide, with the hardness at high temperature exceeding that of cemented carbide so that long tool life can be achieved.
 - ※ CBN has no tendency to react with ferrous materials. This makes it suitable for high speed cutting of hardened steel, cast iron and ferrous sintered metals so that high efficiency can be achieved.
 - ※ CBN has very good thermal conductivity so that the heat generated in cutting zone will be dispersed rapidly. All these makes stable tool life achieved.

IKEN CBN coating



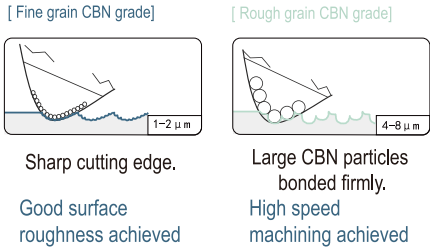
- Characteristics of Coating
- ※ High hardness and high thermal resistance enable long tool life and high-speed machining;
 - ※ Suppress crater wear and achieve stable machining;
 - ※ High-temperature stability and surface smoothness ensure the achievement of a perfect machined surface;
 - ※ The coating helps to block air, preventing CBN from oxidative wear.
 - ※ Coating C is general-purpose and focused on stability

Necessary for cutting

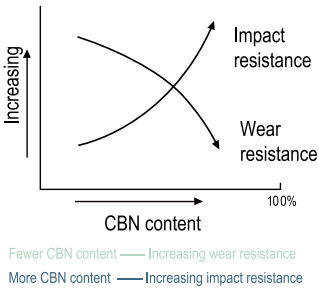
※ Hardness of tool ≥ Hardness of workpiece x 3

Name	Materials	Hardness
Workpiece	Hardened Steel (62HRC)	750 HV
Cutting Tool	Cemented Carbide	1600 HV
Cutting Tool	CBN (IKN6400)	3500 HV

Effects of grain size of CBN



※ Effects of CBN Content

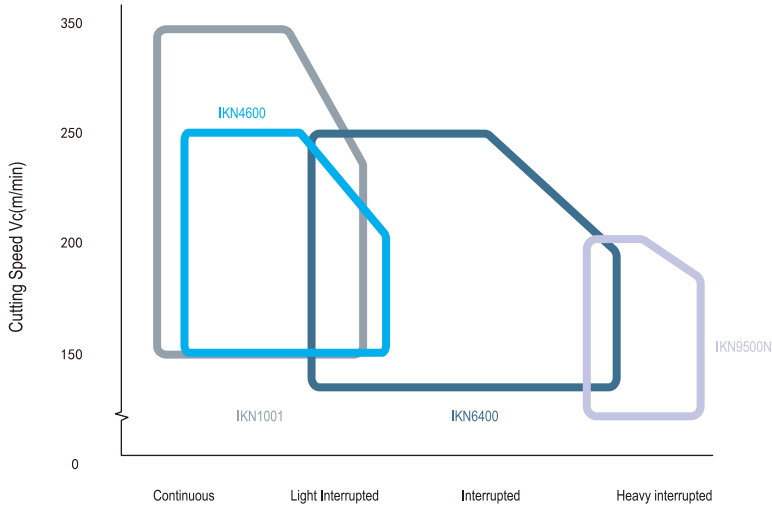


CBN grades for hardned steel

Grade	Cutting speed	Features
IKN1001	150-350	High Speed, Excellent Wear Resistance
IKN4600	150-250	Good Surface Quality, Good Wear Resistance
IKN6400	100-250	Versatile , Good Integrated Performance
IKN9500N	50-200	Excellent Impact Resistance

IKEN CBN Grades Introduction

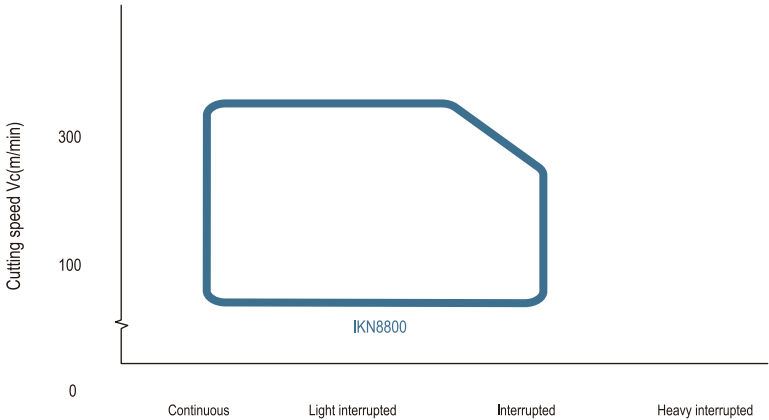
Application	Grade	Cutting Condition	Vc (mm/min)	Fn (mm/rev)	Ap (mm)
Hardened Steel	IKN1001	Continous - Light Interrupted	150- 200 -350	0.03- 0.10 -0.15	0.03- 0.10 -0.20
	IKN4600	Continous - Light Interrupted	150- 200 -250	0.05- 0.15 -0.25	0.03- 0.15 -0.30
	IKN6400	Continous - Interrupted	100- 150 -250	0.05- 0.15 -0.30	0.03- 0.20 -0.40
	IKN9500N	Interrupted	50- 100 -200	0.05- 0.15 -0.35	0.05- 0.15 -0.30
Sintered Metal	IKN8800	Continous - Interrupted	50- 150 -350	0.01- 0.10 -0.15	0.05- 0.10 -0.30
Ductile Cast Iron	IKN9500N	Continous - Interrupted	100-400	0.05- 0.15 -0.25	0.03- 0.20 -0.50
Gray Cast Iron	IKN8501	Continous - Interrupted	200-1500	0.05- 0.15 -0.30	0.05- 0.50 -1.00



CBN Grade for Sintered Metal

S

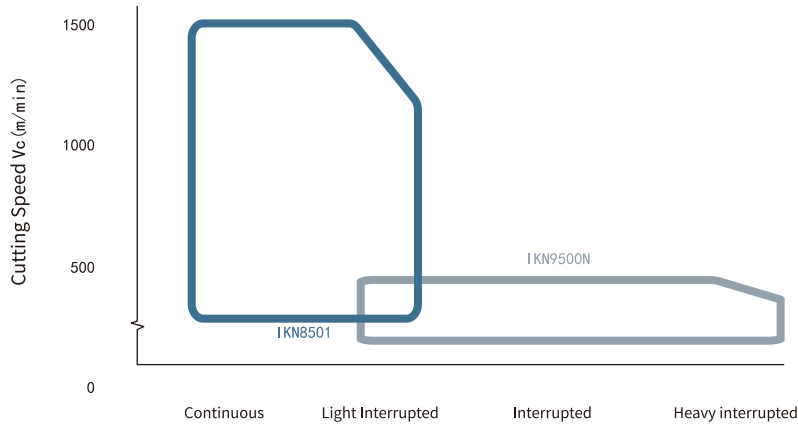
Grade	Cutting speed	Features
IKN8800	50-350	Versatile , Good Integrated Performance



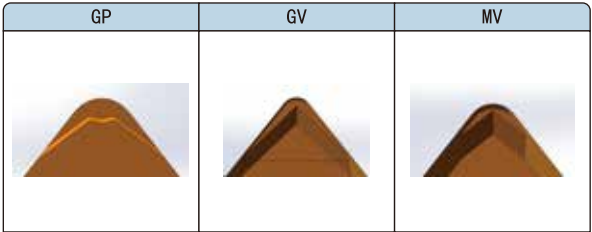
CBN Grades for Cast Iron

K

Grade	Cutting speed	Features
IKN9500N	100-400	Excellent Impact Resistance, 1st Recommendation for Ductile Cast Iron
IKN8501	200-1500	Excellent Wear Resistance, 1st Recommendation for Gray Cast Iron



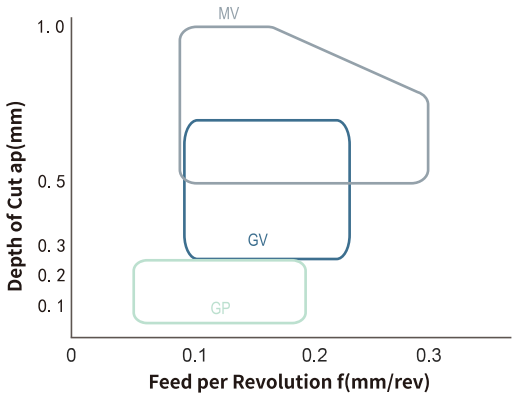
Chip Breaker



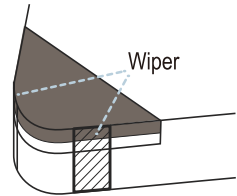
GP: Small Cutting Depth for Finishing

GV: iddle Cutting Depth for Semi-Finishing

MV: Large Cutting Depth for Roughing



Wiper



Improvement of Surface Roughness

※ Superior surface quality achieved by wiper edge at the same feed rate of conventional insert

Improvement of Productivity

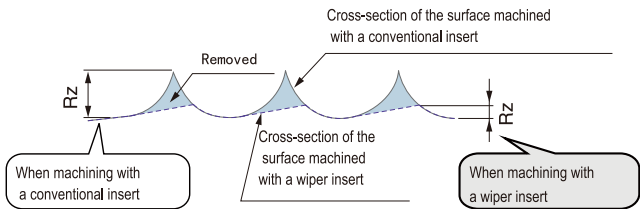
※ By integrating roughing and finishing into one process, productivity can be increased. The wiper edge can double the feed rate and moreover does not deteriorate the surface roughness.

Improvment of Tool Life

※ Higher feed rate by wiper insert contributes to less machining time and more machined parts per cutting edge

Improvement of Chip Control

※ Thicker chip by higher feed rate is easier to break and avoid entanglement.



Additional Notes:

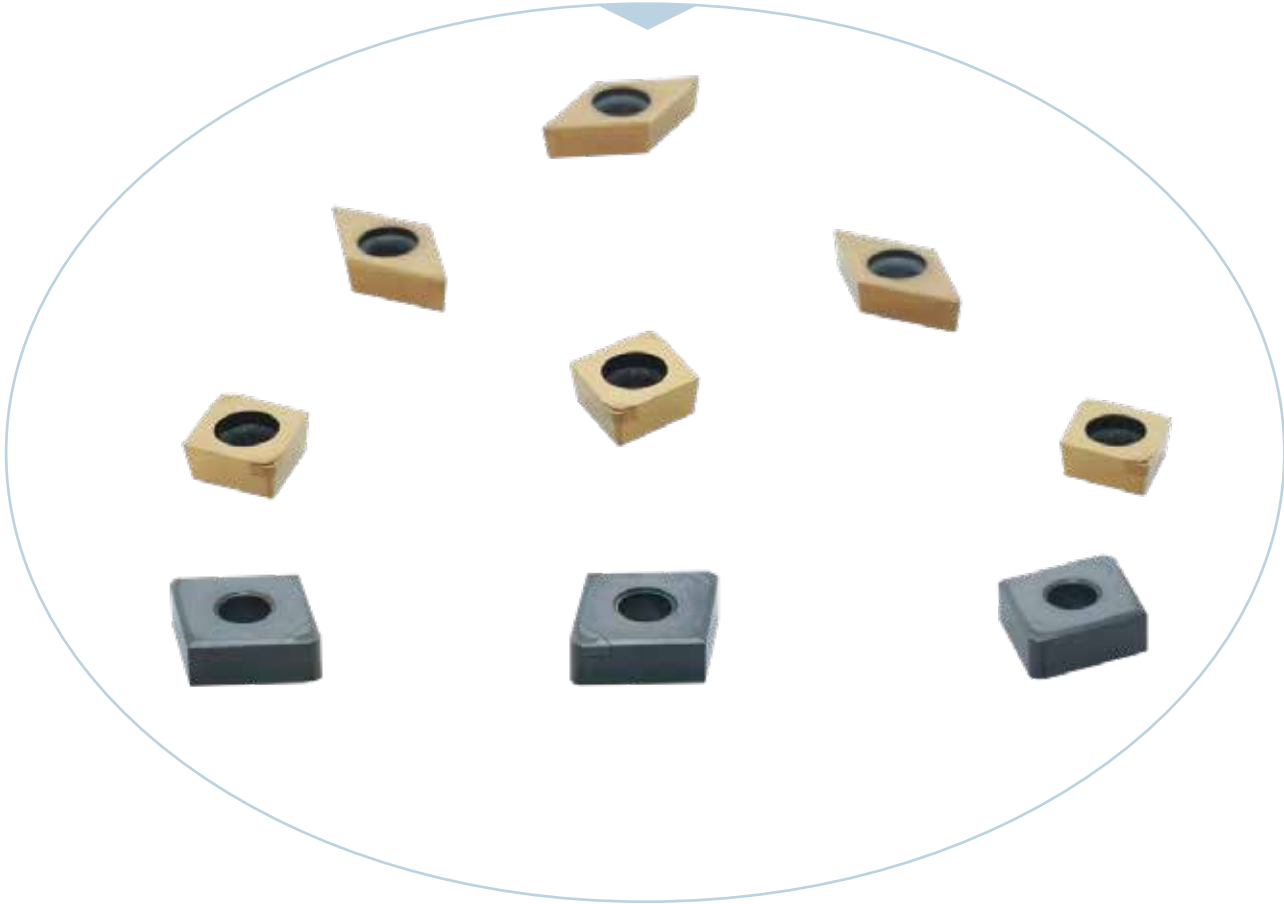
※ The supplementary code "W" at the end of the ISO insert code indicates wiper edge applied,

Example : 2HP-CNGA120408W-STM

※ The Recommended Lead Angle of Toolholder for Different ISO Insert Shape

Shape of ISO Insert	Type C	Type T	Type D
Lead Angle of Toolholder	95°	91°	93°

CBN Tip Brazed Insert



Negative

Continuous ○ Light Interrupted ◐ Interrupted ◑ Heavy Interrupted ◒

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
1204	12.7	4.76	5.16	0.2-1.2	K				◑◒		◑◒
					S					◐◑	
					H	○◐	○◐	◑◒			◒

image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N
	Super-Finishing	2HP-CNGA120402	(Only Honing)	0.2			●	●	●	●
		2HP-CNGA120404	(Only Honing)	0.4			●	●	●	●
	Finishing	2HP-CNGA120402	-SFD	0.2	●	●	●			
		2HP-CNGA120404	-SFD	0.4	●	●	●	●	●	●
		2HP-CNGA120408	-SFD	0.8	●	●	●	●	●	●
		2HP-CNGA120412	-SFD	1.2	●	●	●	●	●	●
	Finishing - Semi-Finishing	2HP-CNGA120402	-STM	0.2	●	●	●			
		2HP-CNGA120404	-STM	0.4	●	●	●	●	●	●
		2HP-CNGA120408	-STM	0.8	●	●	●	●	●	●
		2HP-CNGA120412	-STM	1.2	●	●	●	●	●	●
	General Machining	2HP-CNGA120404	-STF	0.4	●	●	●	●	●	●
		2HP-CNGA120408	-STF	0.8	●	●	●	●	●	●
		2HP-CNGA120412	-STF	1.2	●	●	●	●	●	●
		2HP-CNGA120416	-STF	1.6	●	●	●	●	●	●
	Heavy Machining	2HP-CNGA120404	-STH	0.4	●	●	●	●	●	●
		2HP-CNGA120408	-STH	0.8	●	●	●	●	●	●
		2HP-CNGA120412	-STH	1.2	●	●	●	●	●	●
		2HP-CNGA120416	-STH	1.6	●	●	●	●	●	●
	Very Heavy Machining	2HP-CNGA120408	-STR	0.8			●	●	●	●
		2HP-CNGA120412	-STR	1.2			●	●	●	●
		2HP-CNGA120416	-STR	1.6			●	●	●	●
	Super Heavy Machining	2HP-CNGA120408	-STQ	0.8			●	●	●	●
		2HP-CNGA120412	-STQ	1.2			●	●	●	●
		2HP-CNGA120416	-STQ	1.6			●	●	●	●

Negative

Continuous○Light Interrupted⌢Interrupted⌢Heavy Interrupted⌢

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
1204	12.7	4.76	5.16	0.2-1.2	K				○⌢		○⌢
					S					○⌢	
					H	○⌢	○⌢	⌢⌢			⌢⌢

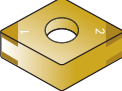
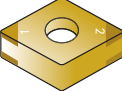


image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N
	Super-Finishing	4HP-CNGA120402	(Only Honing)	0.2			●	●	●	●
		4HP-CNGA120404	(Only Honing)	0.4			●	●	●	●
	Finishing	4HP-CNGA120402	-SFD	0.2	●	●	●			
		4HP-CNGA120404	-SFD	0.4	●	●	●	●	●	●
		4HP-CNGA120408	-SFD	0.8	●	●	●	●	●	●
		4HP-CNGA120412	-SFD	1.2	●	●	●	●	●	●
	Finishing - Semi-Finishing	4HP-CNGA120402	-STM	0.2	●	●	●			
		4HP-CNGA120404	-STM	0.4	●	●	●	●	●	●
		4HP-CNGA120408	-STM	0.8	●	●	●	●	●	●
		4HP-CNGA120412	-STM	1.2	●	●	●	●	●	●
	General Machining	4HP-CNGA120404	-STF	0.4	●	●	●	●	●	●
		4HP-CNGA120408	-STF	0.8	●	●	●	●	●	●
		4HP-CNGA120412	-STF	1.2	●	●	●	●	●	●
	Heavy Machining	4HP-CNGA120404	-STH	0.4	●	●	●	●	●	●
		4HP-CNGA120408	-STH	0.8	●	●	●	●	●	●
		4HP-CNGA120412	-STH	1.2	●	●	●	●	●	●
	Very Heavy Machining	4HP-CNGA120408	-STR	0.8			●	●	●	●
		4HP-CNGA120412	-STR	1.2			●	●	●	●
	Super Heavy Machining	4HP-CNGA120408	-STQ	0.8			●	●	●	●
		4HP-CNGA120412	-STQ	1.2			●	●	●	●

Negative

Continuous○Light Interrupted⌢Interrupted⌢Heavy Interrupted⌢

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
1104	9.525	4.76	3.81	0.2-1.2	K				○⌢		○⌢
1504	12.7	4.76	5.16	0.2-1.2	S					○⌢	
1506	12.7	6.35	5.16	0.2-1.2	H	○⌢	○⌢	○⌢			⌢⌢

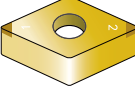
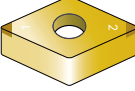
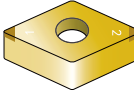


image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N
	Super-Finishing	2HP-DNGA110402	(Only Honing)	0.2			●	●	●	●
		2HP-DNGA110404	(Only Honing)	0.4			●	●	●	●
		2HP-DNGA150402	(Only Honing)	0.2			●	●	●	●
		2HP-DNGA150404	(Only Honing)	0.4			●	●	●	●
		2HP-DNGA150602	(Only Honing)	0.2			●	●	●	●
		2HP-DNGA150604	(Only Honing)	0.4			●	●	●	●
	Finishing	2HP-DNGA110402	-SFD	0.2	●	●	●			
		2HP-DNGA110404	-SFD	0.4	●	●	●	●	●	●
		2HP-DNGA110408	-SFD	0.8	●	●	●	●	●	●
		2HP-DNGA110412	-SFD	1.2	●	●	●	●	●	●
		2HP-DNGA150402	-SFD	0.2	●	●	●			
		2HP-DNGA150404	-SFD	0.4	●	●	●	●	●	●
		2HP-DNGA150408	-SFD	0.8	●	●	●	●	●	●
		2HP-DNGA150412	-SFD	1.2	●	●	●	●	●	●
		2HP-DNGA150602	-SFD	0.2	●	●	●			
		2HP-DNGA150604	-SFD	0.4	●	●	●	●	●	●
		2HP-DNGA150608	-SFD	0.8	●	●	●	●	●	●
		2HP-DNGA150612	-SFD	1.2	●	●	●	●	●	●
	Finishing - Semi-Finishing	2HP-DNGA110404	-STM	0.4	●	●	●	●	●	●
		2HP-DNGA110408	-STM	0.8	●	●	●	●	●	●
		2HP-DNGA110412	-STM	1.2	●	●	●	●	●	●
		2HP-DNGA150404	-STM	0.4	●	●	●	●	●	●
		2HP-DNGA150408	-STM	0.8	●	●	●	●	●	●
		2HP-DNGA150412	-STM	1.2	●	●	●	●	●	●
		2HP-DNGA150604	-STM	0.4	●	●	●	●	●	●
		2HP-DNGA150608	-STM	0.8	●	●	●	●	●	●
		2HP-DNGA150612	-STM	1.2	●	●	●	●	●	●

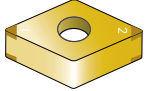
Negative

Continuous ○ Light Interrupted ◐ Interrupted ◑ Heavy Interrpted ◒

specs	incircleΦd	thickness	apertureΦd1	nose radius	Grade	Impacting Frequency					
1104	9.525	4.76	3.81	0.2-1.2	K				⊙⊗		⊙⊗
1504	12.7	4.76	5.16	0.2-1.2	S					⊙⊗	
1506	12.7	6.35	5.16	0.2-1.2	H	⊙⊗	⊙⊗	⊙⊗			⊗
image	application	Specification		edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N
	General Machining	2HP-DNGA110404		-STF	0. 4	●	●	●	●	●	●
		2HP-DNGA110408		-STF	0. 8	●	●	●	●	●	●
		2HP-DNGA110412		-STF	1. 2	●	●	●	●	●	●
		2HP-DNGA150404		-STF	0. 4	●	●	●	●	●	●
		2HP-DNGA150408		-STF	0. 8	●	●	●	●	●	●
		2HP-DNGA150412		-STF	1. 2	●	●	●	●	●	●
		2HP-DNGA150604		-STF	0. 4	●	●	●	●	●	●
		2HP-DNGA150608		-STF	0. 8	●	●	●	●	●	●
		2HP-DNGA150612		-STF	1. 2	●	●	●	●	●	●
	Heavy Machining	2HP-DNGA110404		-STH	0. 4	●	●	●	●	●	●
		2HP-DNGA110408		-STH	0. 8	●	●	●	●	●	●
		2HP-DNGA110412		-STH	1. 2	●	●	●	●	●	●
		2HP-DNGA150404		-STH	0. 4	●	●	●	●	●	●
		2HP-DNGA150408		-STH	0. 8	●	●	●	●	●	●
		2HP-DNGA150412		-STH	1. 2	●	●	●	●	●	●
		2HP-DNGA150604		-STH	0. 4	●	●	●	●	●	●
		2HP-DNGA150608		-STH	0. 8	●	●	●	●	●	●
		2HP-DNGA150612		-STH	1. 2	●	●	●	●	●	●
	Very Heavy Machining	2HP-DNGA110408		-STR	0. 8			●	●	●	●
		2HP-DNGA110412		-STR	1. 2			●	●	●	●
		2HP-DNGA150408		-STR	0. 8			●	●	●	●
		2HP-DNGA150412		-STR	1. 2			●	●	●	●
		2HP-DNGA150608		-STR	0. 8			●	●	●	●
		2HP-DNGA150612		-STR	1. 2			●	●	●	●

Negative

Continuous ○ Light Interrupted ◐ Interrupted ◑ Heavy Interrpted ◒

specs	incircleΦd	thickness	apertureΦd1	nose radius	Grade	Impacting Frequency					
1504	12.7	4.76	5.16	0.2-1.2	K				○⊕		○⊕
					S					○⊕	
					H	○⊕	○⊕	○⊕			⊕
image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N	
	Super-Finishing	4HP-DNGA150402	(Only Honing)	0.2			●	●	●	●	
		4HP-DNGA150404	(Only Honing)	0.4			●	●	●	●	
	Finishing	4HP-DNGA150402	-SFD	0.2	●	●	●				
		4HP-DNGA150404	-SFD	0.4	●	●	●	●	●	●	
		4HP-DNGA150408	-SFD	0.8	●	●	●	●	●	●	
		4HP-DNGA150412	-SFD	1.2	●	●	●	●	●	●	
	Finishing - Semi-Finishing	4HP-DNGA150404	-STM	0.4	●	●	●	●	●	●	
		4HP-DNGA150408	-STM	0.8	●	●	●	●	●	●	
		4HP-DNGA150412	-STM	1.2	●	●	●	●	●	●	
	General Machining	4HP-DNGA150404	-STF	0.4	●	●	●	●	●	●	
		4HP-DNGA150408	-STF	0.8	●	●	●	●	●	●	
		4HP-DNGA150412	-STF	1.2	●	●	●	●	●	●	
	Heavy Machining	4HP-DNGA150404	-STH	0.4	●	●	●	●	●	●	
		4HP-DNGA150408	-STH	0.8	●	●	●	●	●	●	
		4HP-DNGA150412	-STH	1.2	●	●	●	●	●	●	
Very Heavy Machining	4HP-DNGA150408	-STR	0.8			●	●	●	●		
	4HP-DNGA150412	-STR	1.2			●	●	●	●		

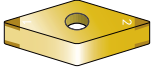
Negative

Continuous ○ Light Interrupted ◐ Interrupted ◑ Heavy Interrupted ◒

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
1604	9.525	4.76	3.81	0.2-1.2	K				○○⊗		○○⊗
					S					○○⊗	
					H	○○⊗	○○⊗	○○⊗			⊗
image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N	
	Super-Finishing	2HP-VNGA160402	(Only Honing)	0.2			●	●	●	●	
		2HP-VNGA160404	(Only Honing)	0.4			●	●	●	●	
		2HP-VNGA160408	(Only Honing)	0.8			●	●	●	●	
		2HP-VNGA160412	(Only Honing)	1.2			●	●	●	●	
	Finishing	2HP-VNGA160402	-SFD	0.2	●	●	●				
		2HP-VNGA160404	-SFD	0.4	●	●	●	●	●	●	
		2HP-VNGA160408	-SFD	0.8	●	●	●	●	●	●	
		2HP-VNGA160412	-SFD	1.2	●	●	●	●	●	●	
	Finishing - Semi-Finishing	2HP-VNGA160404	-STM	0.4	●	●	●	●	●	●	
		2HP-VNGA160408	-STM	0.8	●	●	●	●	●	●	
		2HP-VNGA160412	-STM	1.2	●	●	●	●	●	●	
	General Machining	2HP-VNGA160404	-STF	0.4	●	●	●	●	●	●	
		2HP-VNGA160408	-STF	0.8	●	●	●	●	●	●	
		2HP-VNGA160412	-STF	1.2	●	●	●	●	●	●	
	Heavy Machining	2HP-VNGA160404	-STH	0.4	●	●	●	●	●	●	
		2HP-VNGA160408	-STH	0.8	●	●	●	●	●	●	
2HP-VNGA160412		-STH	1.2	●	●	●	●	●	●		

Negative

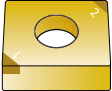
Continuous ○ Light Interrupted ◐ Interrupted ◑ Heavy Interrupted ◒

specs	incircleΦd	thickness	apertureΦd1	nose radius	Grade	Impacting Frequency					
1604	9.525	4.76	3.81	0.2-1.2	K				○○		○○
					S					○○○	
					H	○○○	○○○	○○○			○○○
image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N	
	Super-Finishing	4HP-VNGA160402	(Only Honing)	0.2			●	●	●	●	
		4HP-VNGA160404	(Only Honing)	0.4			●	●	●	●	
		4HP-VNGA160408	(Only Honing)	0.8			●	●	●	●	
		4HP-VNGA160412	(Only Honing)	1.2			●	●	●	●	
	Finishing	4HP-VNGA160402	-SFD	0.2	●	●	●				
		4HP-VNGA160404	-SFD	0.4	●	●	●	●	●	●	
		4HP-VNGA160408	-SFD	0.8	●	●	●	●	●	●	
		4HP-VNGA160412	-SFD	1.2	●	●	●	●	●	●	
	Finishing - Semi-Finishing	4HP-VNGA160404	-SFM	0.4	●	●	●	●	●	●	
		4HP-VNGA160408	-SFM	0.8	●	●	●	●	●	●	
		4HP-VNGA160412	-SFM	1.2	●	●	●	●	●	●	
	General Machining	4HP-VNGA160404	-STF	0.4	●	●	●	●	●	●	
		4HP-VNGA160408	-STF	0.8	●	●	●	●	●	●	
		4HP-VNGA160412	-STF	1.2	●	●	●	●	●	●	
	Heavy Machining	4HP-VNGA160404	-STH	0.4	●	●	●	●	●	●	
		4HP-VNGA160408	-STH	0.8	●	●	●	●	●	●	
		4HP-VNGA160412	-STH	1.2	●	●	●	●	●	●	

Negative

Continuous○Light Interrupted⦿Interrupted⦿Heavy Interrupted⦿

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
1204	12.7	4.76	5.16	0.2-1.2	K				○⦿		○⦿
					S					○⦿	
					H	○⦿	○⦿	○⦿			⦿

image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N
	Super-Finishing	2HP-SNGA120402	(Only Honing)	0.2			●	●	●	●
		2HP-SNGA120404	(Only Honing)	0.4			●	●	●	●
	Finishing	2HP-SNGA120402	-SFD	0.2	●	●	●			
		2HP-SNGA120404	-SFD	0.4	●	●	●	●	●	●
		2HP-SNGA120408	-SFD	0.8	●	●	●	●	●	●
		2HP-SNGA120412	-SFD	1.2	●	●	●	●	●	●
	Finishing - Semi-Finishing	2HP-SNGA120402	-STM	0.2	●	●	●			
		2HP-SNGA120404	-STM	0.4	●	●	●	●	●	●
		2HP-SNGA120408	-STM	0.8	●	●	●	●	●	●
		2HP-SNGA120412	-STM	1.2	●	●	●	●	●	●
	General Machining	2HP-SNGA120404	-STF	0.4	●	●	●	●	●	●
		2HP-SNGA120408	-STF	0.8	●	●	●	●	●	●
		2HP-SNGA120412	-STF	1.2	●	●	●	●	●	●
	Heavy Machining	2HP-SNGA120404	-STH	0.4	●	●	●	●	●	●
		2HP-SNGA120408	-STH	0.8	●	●	●	●	●	●
		2HP-SNGA120412	-STH	1.2	●	●	●	●	●	●
	Very Heavy Machining	2HP-SNGA120408	-STR	0.8			●	●	●	●
		2HP-SNGA120412	-STR	1.2			●	●	●	●
	Super Heavy Machining	2HP-SNGA120408	-STQ	0.8			●	●	●	●
		2HP-SNGA120412	-STQ	1.2			●	●	●	●

Negative

Continuous○Light Interrupted⦿Interrupted⦿Heavy Interrupted⦿

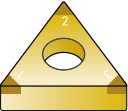
specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
1204	12.7	4.76	5.16	0.2-1.2	K				○⦿		○⦿
					S					○⦿	
					H	○⦿	○⦿	○⦿			⦿

image	application	Specification	edge preparation	corner radius	IKN1001	IKN1001	IKN6400	IKN8501	IKN8800	IKN9500N
	Super-Finishing	4HP-SNGA120402	(Only Honing)	0.2			●	●	●	●
		4HP-SNGA120404	(Only Honing)	0.4			●	●	●	●
	Finishing	4HP-SNGA120402	-SFD	0.2	●	●	●			
		4HP-SNGA120404	-SFD	0.4	●	●	●	●	●	●
		4HP-SNGA120408	-SFD	0.8	●	●	●	●	●	●
		4HP-SNGA120412	-SFD	1.2	●	●	●	●	●	●
	Finishing - Semi-Finishing	4HP-SNGA120402	-STM	0.2	●	●	●			
		4HP-SNGA120404	-STM	0.4	●	●	●	●	●	●
		4HP-SNGA120408	-STM	0.8	●	●	●	●	●	●
		4HP-SNGA120412	-STM	1.2	●	●	●	●	●	●
	General Machining	4HP-SNGA120404	-STF	0.4	●	●	●	●	●	●
		4HP-SNGA120408	-STF	0.8	●	●	●	●	●	●
		4HP-SNGA120412	-STF	1.2	●	●	●	●	●	●
	Heavy Machining	4HP-SNGA120404	-STH	0.4	●	●	●	●	●	●
		4HP-SNGA120408	-STH	0.8	●	●	●	●	●	●
		4HP-SNGA120412	-STH	1.2	●	●	●	●	●	●
	Very Heavy Machining	4HP-SNGA120408	-STR	0.8			●	●	●	●
		4HP-SNGA120412	-STR	1.2			●	●	●	●
	Super Heavy Machining	4HP-SNGA120408	-STQ	0.8			●	●	●	●
		4HP-SNGA120412	-STQ	1.2			●	●	●	●

Negative

Continuous ○ Light Interrupted ◐ Interrupted ◑ Heavy Interrupted ◒

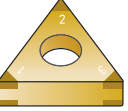
specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
1604	9.525	4.76	3.81	0.2-1.6	K				◑		◑
					S					◑	
					H	◐	◐	◑			◒

image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N
	Super-Finishing	3HP-TNGA160402	(Only Honing)	0.2			●	●	●	●
		3HP-TNGA160404	(Only Honing)	0.4			●	●	●	●
	Finishing	3HP-TNGA160402	-SFD	0.2	●	●	●			
		3HP-TNGA160404	-SFD	0.4	●	●	●	●	●	●
		3HP-TNGA160408	-SFD	0.8	●	●	●	●	●	●
		3HP-TNGA160412	-SFD	1.2	●	●	●	●	●	●
		3HP-TNGA160416	-SFD	1.6	●	●	●	●	●	●
		3HP-TNGA160402	-STM	0.2	●	●	●			
	Finishing - Semi-Finishing	3HP-TNGA160404	-STM	0.4	●	●	●	●	●	●
		3HP-TNGA160408	-STM	0.8	●	●	●	●	●	●
		3HP-TNGA160412	-STM	1.2	●	●	●	●	●	●
		3HP-TNGA160416	-STM	1.6	●	●	●	●	●	●
		3HP-TNGA160404	-STF	0.4	●	●	●	●	●	●
	General Machining	3HP-TNGA160408	-STF	0.8	●	●	●	●	●	●
		3HP-TNGA160412	-STF	1.2	●	●	●	●	●	●
		3HP-TNGA160416	-STF	1.6	●	●	●	●	●	●
		3HP-TNGA160404	-STH	0.4	●	●	●	●	●	●
	Heavy Machining	3HP-TNGA160408	-STH	0.8	●	●	●	●	●	●
		3HP-TNGA160412	-STH	1.2	●	●	●	●	●	●
		3HP-TNGA160416	-STH	1.6	●	●	●	●	●	●
		3HP-TNGA160408	-STR	0.8			●	●	●	●
	Very Heavy Machining	3HP-TNGA160412	-STR	1.2			●	●	●	●
		3HP-TNGA160416	-STR	1.6			●	●	●	●

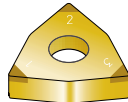
Negative

Continuous ○ Light Interrupted ◐ Interrupted ◑ Heavy Interrupted ◒

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
1604	9.525	4.76	3.81	0.2-1.6	K				◑		◑
					S					◑	
					H	◐	◐	◑			◒

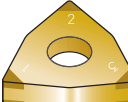
image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N
	Super-Finishing	6HP-TNGA160402	(Only Honing)	0.2			●	●	●	●
		6HP-TNGA160404	(Only Honing)	0.4			●	●	●	●
	Finishing	6HP-TNGA160402	-SFD	0.2	●	●	●			
		6HP-TNGA160404	-SFD	0.4	●	●	●	●	●	●
		6HP-TNGA160408	-SFD	0.8	●	●	●	●	●	●
		6HP-TNGA160412	-SFD	1.2	●	●	●	●	●	●
		6HP-TNGA160416	-SFD	1.6	●	●	●	●	●	●
		6HP-TNGA160402	-STM	0.2	●	●	●			
	Finishing - Semi-Finishing	6HP-TNGA160404	-STM	0.4	●	●	●	●	●	●
		6HP-TNGA160408	-STM	0.8	●	●	●	●	●	●
		6HP-TNGA160412	-STM	1.2	●	●	●	●	●	●
		6HP-TNGA160416	-STM	1.6	●	●	●	●	●	●
		6HP-TNGA160404	-STF	0.4	●	●	●	●	●	●
	General Machining	6HP-TNGA160408	-STF	0.8	●	●	●	●	●	●
		6HP-TNGA160412	-STF	1.2	●	●	●	●	●	●
		6HP-TNGA160416	-STF	1.6	●	●	●	●	●	●
		6HP-TNGA160404	-STH	0.4	●	●	●	●	●	●
	Heavy Machining	6HP-TNGA160408	-STH	0.8	●	●	●	●	●	●
		6HP-TNGA160412	-STH	1.2	●	●	●	●	●	●
		6HP-TNGA160416	-STH	1.6	●	●	●	●	●	●
		6HP-TNGA160408	-STR	0.8			●	●	●	●
	Very Heavy Machining	6HP-TNGA160412	-STR	1.2			●	●	●	●
		6HP-TNGA160416	-STR	1.6			●	●	●	●

Negative

specs	incircleΦd	thickness	apertureΦd1	nose radius	Grade	Impacting Frequency					
0804	12.7	4.76	5.16	0.2-1.2	K				○⊞		○⊞
					S					○⊞	
					H	○⊞	○⊞	○⊞			⊞
image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N	
	Super-Finishing	3HP-WNGA080402	(Only Honing)	0.2			●	●	●	●	
		3HP-WNGA080404	(Only Honing)	0.4			●	●	●	●	
	Finishing	3HP-WNGA080402	-SFD	0.2	●	●	●				
		3HP-WNGA080404	-SFD	0.4	●	●	●	●	●	●	
		3HP-WNGA080408	-SFD	0.8	●	●	●	●	●	●	
		3HP-WNGA080412	-SFD	1.2	●	●	●	●	●	●	
	Finishing - Semi-Finishing	3HP-WNGA080402	-STM	0.2	●	●	●				
		3HP-WNGA080404	-STM	0.4	●	●	●	●	●	●	
		3HP-WNGA080408	-STM	0.8	●	●	●	●	●	●	
		3HP-WNGA080412	-STM	1.2	●	●	●	●	●	●	
	General Machining	3HP-WNGA080404	-STF	0.4	●	●	●	●	●	●	
		3HP-WNGA080408	-STF	0.8	●	●	●	●	●	●	
		3HP-WNGA080412	-STF	1.2	●	●	●	●	●	●	
	Heavy Machining	3HP-WNGA080404	-STH	0.4	●	●	●	●	●	●	
		3HP-WNGA080408	-STH	0.8	●	●	●	●	●	●	
		3HP-WNGA080412	-STH	1.2	●	●	●	●	●	●	
	Very Heavy Machining	3HP-WNGA080404	-STR	0.4	●	●	●	●	●	●	
		3HP-WNGA080408	-STR	0.8	●	●	●	●	●	●	
		3HP-WNGA080412	-STR	1.2	●	●	●	●	●	●	
	Super Heavy Machining	3HP-WNGA080408	-STQ	0.8			●	●	●	●	
		3HP-WNGA080412	-STQ	1.2			●	●	●	●	

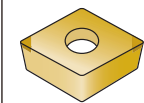
Negative

Continuous ○ Light Interrupted ⊞ Interrupted ⊞ Heavy Interrupted ⊞

specs	incircleΦd	thickness	apertureΦd1	nose radius	Grade	Impacting Frequency					
0804	12. 7	4. 76	5. 16	0. 2-1. 2	K				○⊞		○⊞
					S					○⊞	
					H	○⊞	○⊞	○⊞			⊞
image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N	
	Super-Finishing	6HP-WNGA080402	(Only Honing)	0.2			●	●	●	●	
		6HP-WNGA080404	(Only Honing)	0.4			●	●	●	●	
	Finishing	6HP-WNGA080402	-SFD	0.2	●	●	●				
		6HP-WNGA080404	-SFD	0.4	●	●	●	●	●	●	
		6HP-WNGA080408	-SFD	0.8	●	●	●	●	●	●	
		6HP-WNGA080412	-SFD	1.2	●	●	●	●	●	●	
	Finishing - Semi-Finishing	6HP-WNGA080402	-STM	0.2	●	●	●				
		6HP-WNGA080404	-STM	0.4	●	●	●	●	●	●	
		6HP-WNGA080408	-STM	0.8	●	●	●	●	●	●	
		6HP-WNGA080412	-STM	1.2	●	●	●	●	●	●	
	General Machining	6HP-WNGA080404	-STF	0.4	●	●	●	●	●	●	
		6HP-WNGA080408	-STF	0.8	●	●	●	●	●	●	
		6HP-WNGA080412	-STF	1.2	●	●	●	●	●	●	
	Heavy Machining	6HP-WNGA080404	-STH	0.4	●	●	●	●	●	●	
		6HP-WNGA080408	-STH	0.8	●	●	●	●	●	●	
		6HP-WNGA080412	-STH	1.2	●	●	●	●	●	●	
	Very Heavy Machining	6HP-WNGA080404	-STR	0.4	●	●	●	●	●	●	
		6HP-WNGA080408	-STR	0.8	●	●	●	●	●	●	
		6HP-WNGA080412	-STR	1.2	●	●	●	●	●	●	
	Super Heavy Machining	6HP-WNGA080408	-STQ	0.8			●	●	●	●	
		6HP-WNGA080412	-STQ	1.2			●	●	●	●	

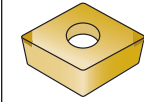
Positive

ContinuousLight InterruptedInterruptedHeavy Interrupted

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
0602	6.35	2.38	2.80	0.2-1.2	K						
09T3	9.525	3.97	4.40	0.2-1.2	S						
1204	12.7	4.76	5.50	0.2-1.2	H						
image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8510	IKN8800	IKN9500N	
	Super-Finishing	2HP-CCGW060202	(Only Honing)	0.2							
		2HP-CCGW060204	(Only Honing)	0.4							
		2HP-CCGW09T302	(Only Honing)	0.2							
		2HP-CCGW09T304	(Only Honing)	0.4							
	Finishing	2HP-CCGW060202	-SFD	0.2							
		2HP-CCGW060204	-SFD	0.4							
		2HP-CCGW060208	-SFD	0.8							
		2HP-CCGW060212	-SFD	1.2							
		2HP-CCGW09T302	-SFD	0.2							
		2HP-CCGW09T304	-SFD	0.4							
		2HP-CCGW09T308	-SFD	0.8							
		2HP-CCGW09T312	-SFD	1.2							
		2HP-CCGW120402	-SFD	0.2							
		2HP-CCGW120404	-SFD	0.4							
		2HP-CCGW120408	-SFD	0.8							
		2HP-CCGW120412	-SFD	1.2							
	Finishing - Semi-Finishing	2HP-CCGW060202	-STM	0.2							
		2HP-CCGW060204	-STM	0.4							
		2HP-CCGW060208	-STM	0.8							
		2HP-CCGW060212	-STM	1.2							
		2HP-CCGW09T302	-STM	0.2							
		2HP-CCGW09T304	-STM	0.4							
		2HP-CCGW09T308	-STM	0.8							
		2HP-CCGW09T312	-STM	1.2							
		2HP-CCGW120402	-STM	0.2							
		2HP-CCGW120404	-STM	0.4							
		2HP-CCGW120408	-STM	0.8							
		2HP-CCGW120412	-STM	1.2							

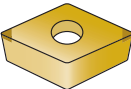
Positive

ContinuousLight InterruptedInterruptedHeavy Interrupted

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
0602	6.35	2.38	2.80	0.2-1.2	K						
09T3	9.525	3.97	4.40	0.2-1.2	S						
1204	12.7	4.76	5.50	0.2-1.2	H						
image	application	Specification	edge preparation	corner radius	IKN1001	IKN1001	IKN6400	IKN8510	IKN8800	IKN9500N	
	General Machining	2HP-CCGW060204	-STF	0.4							
		2HP-CCGW060208	-STF	0.8							
		2HP-CCGW060212	-STF	1.2							
		2HP-CCGW09T304	-STF	0.4							
		2HP-CCGW09T308	-STF	0.8							
		2HP-CCGW09T312	-STF	1.2							
		2HP-CCGW120404	-STF	0.4							
		2HP-CCGW120408	-STF	0.8							
		2HP-CCGW120412	-STF	1.2							
	Heavy Machining	2HP-CCGW060204	-STH	0.4							
		2HP-CCGW060208	-STH	0.8							
		2HP-CCGW060212	-STH	1.2							
		2HP-CCGW09T304	-STH	0.4							
		2HP-CCGW09T308	-STH	0.8							
		2HP-CCGW09T312	-STH	1.2							
		2HP-CCGW120404	-STH	0.4							
		2HP-CCGW120408	-STH	0.8							
		2HP-CCGW120412	-STH	1.2							
	Very Heavy Machining	2HP-CCGW09T308	-STR	0.8							
		2HP-CCGW09T312	-STR	1.2							
		2HP-CCGW120408	-STR	0.8							
		2HP-CCGW120412	-STR	1.2							

Positive

Continuous ○ Light Interrupted ◐ Interrupted ⊞ Heavy Interrupted ⊞

0702	6.35	2.38	2.80	0.2-1.2	K				○⊞		○⊞
11T3	9.525	3.97	4.40	0.2-1.2	S					○⊞	
					H	○◐	○◐	○⊞			⊞
image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N	
	Super-Finishing	2HP-DCGW070202	(Only Honing)	0.2			●	●	●	●	
		2HP-DCGW070204	(Only Honing)	0.4			●	●	●	●	
		2HP-DCGW11T302	(Only Honing)	0.2			●	●	●	●	
		2HP-DCGW11T304	(Only Honing)	0.4			●	●	●	●	
	Finishing	2HP-DCGW070202	-SFD	0.2	●	●	●				
		2HP-DCGW070204	-SFD	0.4	●	●	●	●	●	●	
		2HP-DCGW070208	-SFD	0.8	●	●	●	●	●	●	
		2HP-DCGW070212	-SFD	1.2	●	●	●	●	●	●	
		2HP-DCGW11T302	-SFD	0.2	●	●	●				
		2HP-DCGW11T304	-SFD	0.4	●	●	●	●	●	●	
		2HP-DCGW11T308	-SFD	0.8	●	●	●	●	●	●	
		2HP-DCGW11T312	-SFD	1.2	●	●	●	●	●	●	
	Finishing - Semi-Finishing	2HP-DCGW070204	-STM	0.4	●	●	●	●	●	●	
		2HP-DCGW070208	-STM	0.8	●	●	●	●	●	●	
		2HP-DCGW070212	-STM	1.2	●	●	●	●	●	●	
		2HP-DCGW11T304	-STM	0.4	●	●	●	●	●	●	
		2HP-DCGW11T308	-STM	0.8	●	●	●	●	●	●	
		2HP-DCGW11T312	-STM	1.2	●	●	●	●	●	●	
	General Machining	2HP-DCGW070204	-STF	0.4	●	●	●	●	●	●	
		2HP-DCGW070208	-STF	0.8	●	●	●	●	●	●	
		2HP-DCGW070212	-STF	1.2	●	●	●	●	●	●	
		2HP-DCGW11T304	-STF	0.4	●	●	●	●	●	●	
		2HP-DCGW11T308	-STF	0.8	●	●	●	●	●	●	
		2HP-DCGW11T312	-STF	1.2	●	●	●	●	●	●	
	Heavy Machining	2HP-DCGW070204	-STH	0.4	●	●	●	●	●	●	
		2HP-DCGW070208	-STH	0.8	●	●	●	●	●	●	
		2HP-DCGW070212	-STH	1.2	●	●	●	●	●	●	
		2HP-DCGW11T304	-STH	0.4	●	●	●	●	●	●	
		2HP-DCGW11T308	-STH	0.8	●	●	●	●	●	●	
		2HP-DCGW11T312	-STH	1.2	●	●	●	●	●	●	
	Very Heavy Machining	2HP-DCGW11T308	-STR	0.8			●	●	●	●	
		2HP-DCGW11T312	-STR	1.2			●	●	●	●	

Positive

Continuous ○ Light Interrupted ◐ Interrupted ⊞ Heavy Interrupted ⊞

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
0802	4. 76	2. 38	2. 30	0. 2-1. 2	K				○⊞		○⊞
1103	6. 35	3. 18	2. 80	0. 2-1. 2	S					○⊞	
1604	9. 525	4. 76	4. 40	0. 2-1. 2	H	○◐	○◐	○⊞			⊞
image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N	
	Super-Finishing	2HP-VCGW080202	(Only Honing)	0.2	●	●	●	●	●	●	
		2HP-VCGW080204	(Only Honing)	0.4	●	●	●	●	●	●	
		2HP-VCGW110302	(Only Honing)	0.2	●	●	●	●	●	●	
		2HP-VCGW110304	(Only Honing)	0.4	●	●	●	●	●	●	
		2HP-VCGW160402	(Only Honing)	0.2	●	●	●	●	●	●	
		2HP-VCGW160404	(Only Honing)	0.4	●	●	●	●	●	●	
	Finishing	2HP-VCGW080202	-SFD	0.2	●	●	●				
		2HP-VCGW080204	-SFD	0.4	●	●	●	●	●	●	
		2HP-VCGW080208	-SFD	0.8	●	●	●	●	●	●	
		2HP-VCGW080212	-SFD	1.2	●	●	●	●	●	●	
		2HP-VCGW110302	-SFD	0.2	●	●	●				
		2HP-VCGW110304	-SFD	0.4	●	●	●	●	●	●	
		2HP-VCGW110308	-SFD	0.8	●	●	●	●	●	●	
		2HP-VCGW110312	-SFD	1.2	●	●	●	●	●	●	
		2HP-VCGW160402	-SFD	0.2	●	●	●				
		2HP-VCGW160404	-SFD	0.4	●	●	●	●	●	●	
		2HP-VCGW160408	-SFD	0.8	●	●	●	●	●	●	
		2HP-VCGW160412	-SFD	1.2	●	●	●	●	●	●	
	Finishing - Semi-Finishing	2HP-VCGW080204	-STM	0.4	●	●	●	●	●	●	
		2HP-VCGW080208	-STM	0.8	●	●	●	●	●	●	
		2HP-VCGW080212	-STM	1.2	●	●	●	●	●	●	
		2HP-VCGW110304	-STM	0.4	●	●	●	●	●	●	
		2HP-VCGW110308	-STM	0.8	●	●	●	●	●	●	
		2HP-VCGW110312	-STM	1.2	●	●	●	●	●	●	
		2HP-VCGW160404	-STM	0.4	●	●	●	●	●	●	
		2HP-VCGW160408	-STM	0.8	●	●	●	●	●	●	
		2HP-VCGW160412	-STM	1.2	●	●	●	●	●	●	

Positive

Continuous○Light Interrupted⦿Interrupted⦿Heavy Interrupted⦿

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
0802	4.76	2.38	2.30	0.2-1.2	K				⦿⦿		⦿⦿
1103	6.35	3.18	2.80	0.2-1.2	S					⦿⦿	
1604	9.525	4.76	4.40	0.2-1.2	H	○○⦿	○○⦿	○○⦿			⦿
image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N	
	General Machining	2HP-VCGW080204	-STF	0.4	●	●	●	●	●	●	
		2HP-VCGW080208	-STF	0.8	●	●	●	●	●	●	
		2HP-VCGW080212	-STF	1.2	●	●	●	●	●	●	
		2HP-VCGW110304	-STF	0.4	●	●	●	●	●	●	
		2HP-VCGW110308	-STF	0.8	●	●	●	●	●	●	
		2HP-VCGW110312	-STF	1.2	●	●	●	●	●	●	
		2HP-VCGW160404	-STF	0.4	●	●	●	●	●	●	
		2HP-VCGW160408	-STF	0.8	●	●	●	●	●	●	
		2HP-VCGW160412	-STF	1.2	●	●	●	●	●	●	
	Heavy Machining	2HP-VCGW080204	-STH	0.4	●	●	●	●	●	●	
		2HP-VCGW080208	-STH	0.8	●	●	●	●	●	●	
		2HP-VCGW080212	-STH	1.2	●	●	●	●	●	●	
		2HP-VCGW110304	-STH	0.4	●	●	●	●	●	●	
		2HP-VCGW110308	-STH	0.8	●	●	●	●	●	●	
		2HP-VCGW110312	-STH	1.2	●	●	●	●	●	●	
		2HP-VCGW160404	-STH	0.4	●	●	●	●	●	●	
		2HP-VCGW160408	-STH	0.8	●	●	●	●	●	●	
		2HP-VCGW160412	-STH	1.2	●	●	●	●	●	●	

Positive

Continuous○Light Interrupted⦿Interrupted⦿Heavy Interrupted⦿

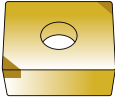
specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
1103	6.35	3.18	2.80	0.2-1.2	K				⦿⦿		⦿⦿
1604	9.525	4.76	4.40	0.2-1.2	S					⦿⦿	
					H	○⦿	⦿⦿	⦿⦿			⦿⦿
image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N	
	Super-Finishing	2HP-VBGW110302	(Only Honing)	0.2			●	●	●	●	
		2HP-VBGW110304	(Only Honing)	0.4			●	●	●	●	
		2HP-VBGW160402	(Only Honing)	0.2			●	●	●	●	
		2HP-VBGW160404	(Only Honing)	0.4			●	●	●	●	
	Finishing	2HP-VBGW110302	-SFD	0.2	●	●	●				
		2HP-VBGW110304	-SFD	0.4	●	●	●	●	●	●	
		2HP-VBGW110308	-SFD	0.8	●	●	●	●	●	●	
		2HP-VBGW110312	-SFD	1.2	●	●	●	●	●	●	
		2HP-VBGW160402	-SFD	0.2	●	●	●				
		2HP-VBGW160404	-SFD	0.4	●	●	●	●	●	●	
		2HP-VBGW160408	SFD	0.8	●	●	●	●	●	●	
		2HP-VBGW160412	SFD	1.2	●	●	●	●	●	●	
	Finishing - Semi-Finishing	2HP-VBGW110304	-STM	0.4	●	●	●	●	●	●	
		2HP-VBGW110308	-STM	0.8	●	●	●	●	●	●	
		2HP-VBGW110312	-STM	1.2	●	●	●	●	●	●	
		2HP-VBGW160404	-STM	0.4	●	●	●	●	●	●	
		2HP-VBGW160408	-STM	0.8	●	●	●	●	●	●	
		2HP-VBGW160412	-STM	1.2	●	●	●	●	●	●	
	General Machining	2HP-VBGW110304	-STF	0.4	●	●	●	●	●	●	
		2HP-VBGW110308	-STF	0.8	●	●	●	●	●	●	
		2HP-VBGW110312	-STF	1.2	●	●	●	●	●	●	
		2HP-VBGW160404	-STF	0.4	●	●	●	●	●	●	
		2HP-VBGW160408	-STF	0.8	●	●	●	●	●	●	
		2HP-VBGW160412	-STF	1.2	●	●	●	●	●	●	
	Heavy Machining	2HP-VBGW110304	-STH	0.4	●	●	●	●	●	●	
		2HP-VBGW110308	-STH	0.8	●	●	●	●	●	●	
		2HP-VBGW110312	-STH	1.2	●	●	●	●	●	●	
		2HP-VBGW160404	-STH	0.4	●	●	●	●	●	●	
		2HP-VBGW160408	-STH	0.8	●	●	●	●	●	●	
		2HP-VBGW160412	-STH	1.2	●	●	●	●	●	●	

Positive

Continuous ○ Light Interrupted ◐ Interrupted ◑ Heavy Interrupted ◒

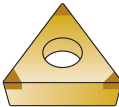
specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
09T3	9. 525	3. 97	4. 40	0. 2-1. 2	K				○◑		○◑
1204	12. 7	4. 76	5. 50	0. 2-1. 2	S					○◑	

				H	○◐	○◐	○◑				◒
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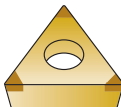
image	application	Specification	edge preparation	corner radius	IKN1001	IKN1001	IKN6400	IKN8501	IKN8800	IKN9500N
	Super-Finishing	2HP-SCGW09T302	(Only Honing)	0.2			●	●	●	●
		2HP-SCGW09T304	(Only Honing)	0.4			●	●	●	●
		2HP-SCGW120402	(Only Honing)	0.2			●	●	●	●
		2HP-SCGW120404	(Only Honing)	0.4			●	●	●	●
	Finishing	2HP-SCGW09T302	-SFD	0.2	●	●	●			
		2HP-SCGW09T304	-SFD	0.4	●	●	●	●	●	●
		2HP-SCGW09T308	-SFD	0.8	●	●	●	●	●	●
		2HP-SCGW09T312	-SFD	1.2	●	●	●	●	●	●
		2HP-SCGW120402	-SFD	0.2	●	●	●			
		2HP-SCGW120404	-SFD	0.4	●	●	●	●	●	●
		2HP-SCGW120408	-SFD	0.8	●	●	●	●	●	●
		2HP-SCGW120412	-SFD	1.2	●	●	●	●	●	●
	Finishing - Semi-Finishing	2HP-SCGW09T302	-STM	0.2	●	●	●			
		2HP-SCGW09T304	-STM	0.4	●	●	●	●	●	●
		2HP-SCGW09T308	-STM	0.8	●	●	●	●	●	●
		2HP-SCGW09T312	-STM	1.2	●	●	●	●	●	●
		2HP-SCGW120402	-STM	0.2	●	●	●	●	●	●
		2HP-SCGW120404	-STM	0.4	●	●	●	●	●	●
		2HP-SCGW120408	-STM	0.8	●	●	●	●	●	●
		2HP-SCGW120412	-STM	1.2	●	●	●	●	●	●
	General Machining	2HP-SCGW09T304	-STF	0.4	●	●	●	●	●	●
		2HP-SCGW09T308	-STF	0.8	●	●	●	●	●	●
		2HP-SCGW09T312	-STF	1.2	●	●	●	●	●	●
		2HP-SCGW120404	-STF	0.4	●	●	●	●	●	●
		2HP-SCGW120408	-STF	0.8	●	●	●	●	●	●
		2HP-SCGW120412	-STF	1.2	●	●	●	●	●	●
	Heavy Machining	2HP-SCGW09T304	-STH	0.4	●	●	●	●	●	●
		2HP-SCGW09T308	-STH	0.8	●	●	●	●	●	●
		2HP-SCGW09T312	-STH	1.2	●	●	●	●	●	●
		2HP-SCGW120404	-STH	0.4	●	●	●	●	●	●
		2HP-SCGW120408	-STH	0.8	●	●	●	●	●	●
		2HP-SCGW120412	-STH	1.2	●	●	●	●	●	●
	Very Heavy Machining	2HP-SCGW09T308	-STR	0.8			●	●	●	●
		2HP-SCGW09T312	-STR	1.2			●	●	●	●
		2HP-SCGW120408	-STR	0.8			●	●	●	●
		2HP-SCGW120412	-STR	1.2			●	●	●	●

Positive

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
0902	5.56	2.38	2.50	0.2-1.2	K				○◑		○◑
1102	6.35	2.38	2.80	0.2-1.2	S					○◑	
1103	6.35	3.18	2.80	0.2-1.2	H	○◐	○◐	○◑			◒
16T3	9.525	3.97	4.40	0.2-1.2							

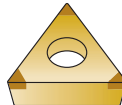
image	application	Specification	edge preparation	corner radius	IKN1001	IKN1001	IKN6400	IKN8501	IKN8800	IKN9500N
	Super-Finishing	3HP-TCGW090202	(Only Honing)	0.2			●	●	●	●
		3HP-TCGW090204	(Only Honing)	0.4			●	●	●	●
		3HP-TCGW110202	(Only Honing)	0.2			●	●	●	●
		3HP-TCGW110204	(Only Honing)	0.4			●	●	●	●
		3HP-TCGW110302	(Only Honing)	0.2			●	●	●	●
		3HP-TCGW110304	(Only Honing)	0.4			●	●	●	●
		3HP-TCGW16T302	(Only Honing)	0.2			●	●	●	●
		3HP-TCGW16T304	(Only Honing)	0.4			●	●	●	●
	Finishing	3HP-TCGW090202	-SFD	0.2	●	●	●			
		3HP-TCGW090204	-SFD	0.4	●	●	●	●	●	●
		3HP-TCGW090208	-SFD	0.8	●	●	●	●	●	●
		3HP-TCGW090212	-SFD	1.2	●	●	●	●	●	●
		3HP-TCGW110202	-SFD	0.2	●	●	●			
		3HP-TCGW110204	-SFD	0.4	●	●	●	●	●	●
		3HP-TCGW110208	-SFD	0.8	●	●	●	●	●	●
		3HP-TCGW110212	-SFD	1.2	●	●	●	●	●	●
		3HP-TCGW110302	-SFD	0.2	●	●	●			
		3HP-TCGW110304	-SFD	0.4	●	●	●	●	●	●
		3HP-TCGW110308	-SFD	0.8	●	●	●	●	●	●
		3HP-TCGW110312	-SFD	1.2	●	●	●	●	●	●
		3HP-TCGW16T302	-SFD	0.2	●	●	●			
		3HP-TCGW16T304	-SFD	0.4	●	●	●	●	●	●
		3HP-TCGW16T308	-SFD	0.8	●	●	●	●	●	●
		3HP-TCGW16T312	-SFD	1.2	●	●	●	●	●	●
	Finishing - Semi-Finishing	3HP-TCGW090202	-STM	0.2	●	●	●			
		3HP-TCGW090204	-STM	0.4	●	●	●	●	●	●
		3HP-TCGW090208	-STM	0.8	●	●	●	●	●	●
		3HP-TCGW090212	-STM	1.2	●	●	●	●	●	●
		3HP-TCGW110202	-STM	0.2	●	●	●			
		3HP-TCGW110204	-STM	0.4	●	●	●	●	●	●
		3HP-TCGW110208	-STM	0.8	●	●	●	●	●	●
		3HP-TCGW110212	-STM	1.2	●	●	●	●	●	●
		3HP-TCGW110302	-STM	0.2	●	●	●			
		3HP-TCGW110304	-STM	0.4	●	●	●	●	●	●
		3HP-TCGW110308	-STM	0.8	●	●	●	●	●	●
		3HP-TCGW110312	-STM	1.2	●	●	●	●	●	●

Positive

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
0902	5.56	2.38	2.50	0.2-1.2	K				⊕⊖		⊕⊖
1102	6.35	2.38	2.80	0.2-1.2	S					⊕⊖	
1103	6.35	3.18	2.80	0.2-1.2	H	⊕⊖	⊕⊖	⊕⊖			⊕⊖
16T3	9.525	3.97	4.40	0.2-1.2							
image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N	
	Finishing - Semi-Finishing	3HP-TCGW16T302	-STM	0.2	●	●	●				
		3HP-TCGW16T304	-STM	0.4	●	●	●	●	●	●	
		3HP-TCGW16T308	-STM	0.8	●	●	●	●	●	●	
		3HP-TCGW16T312	-STM	1.2	●	●	●	●	●	●	
	General Machining	3HP-TCGW090204	-STF	0.4	●	●	●	●	●	●	
		3HP-TCGW090208	-STF	0.8	●	●	●	●	●	●	
		3HP-TCGW090212	-STF	1.2	●	●	●	●	●	●	
		3HP-TCGW110204	-STF	0.4	●	●	●	●	●	●	
		3HP-TCGW110208	-STF	0.8	●	●	●	●	●	●	
		3HP-TCGW110212	-STF	1.2	●	●	●	●	●	●	
		3HP-TCGW110304	-STF	0.8	●	●	●	●	●	●	
		3HP-TCGW110308	-STF	1.2	●	●	●	●	●	●	
		3HP-TCGW110312	-STF	0.8	●	●	●	●	●	●	
		3HP-TCGW16T304	-STF	1.2	●	●	●	●	●	●	
		3HP-TCGW16T308	-STF	0.2	●	●	●	●	●	●	
		3HP-TCGW16T312	-STF	0.4	●	●	●	●	●	●	
		Heavy Machining	3HP-TCGW090204	-STH	0.4	●	●	●	●	●	●
	3HP-TCGW090208		-STH	0.8	●	●	●	●	●	●	
	3HP-TCGW090212		-STH	1.2	●	●	●	●	●	●	
	3HP-TCGW110204		-STH	0.4	●	●	●	●	●	●	
	3HP-TCGW110208		-STH	0.8	●	●	●	●	●	●	
	3HP-TCGW110212		-STH	1.2	●	●	●	●	●	●	
	3HP-TCGW110304		-STH	0.4	●	●	●	●	●	●	
	3HP-TCGW110308		-STH	0.8	●	●	●	●	●	●	
	3HP-TCGW110312		-STH	1.2	●	●	●	●	●	●	
	3HP-TCGW16T304		-STH	0.4	●	●	●	●	●	●	
	3HP-TCGW16T308		-STH	0.8	●	●	●	●	●	●	
	3HP-TCGW16T312		-STH	1.2	●	●	●	●	●	●	
	Very Heavy Machining		3HP-TCGW090208	-STR	0.8				●	●	●
		3HP-TCGW090212	-STR	1.2				●	●	●	●
		3HP-TCGW110208	-STR	0.8				●	●	●	●
		3HP-TCGW110212	-STR	1.2				●	●	●	●
		3HP-TCGW110308	-STR	0.8				●	●	●	●
		3HP-TCGW110312	-STR	1.2				●	●	●	●
		3HP-TCGW16T308	-STR	0.8				●	●	●	●
		3HP-TCGW16T312	-STR	1.2				●	●	●	●

Positive

Continuous ○ Light Interrupted ⊕ Interrupted ⊕ Heavy Interrupted ⊕

specs	incircleΦd	thickness	apertureΦd1	nose radius	Grade	Impacting Frequency					
0802	4. 76	2. 38	2. 30	0. 2-1. 2	K				○ ⊕		○ ⊕
0902	5. 56	2. 38	2. 50	0. 2-1. 2	S					○ ⊕	
1102	6. 35	2. 38	2. 80	0. 2-1. 2	H	○ ⊕	○ ⊕	○ ⊕			⊕
1103	6. 35	3. 18	3. 30	0. 2-1. 2							
image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N	
	Super-Finishing	3HP-TPGW110202	(Only Honing)	0.2			●	●	●	●	
		3HP-TPGW110204	(Only Honing)	0.4			●	●	●	●	
		3HP-TPGW110302	(Only Honing)	0.2			●	●	●	●	
		3HP-TPGW110304	(Only Honing)	0.4			●	●	●	●	
	Finishing	3HP-TPGW110202	-SFD	0.2	●	●	●				
		3HP-TPGW110204	-SFD	0.4	●	●	●	●	●	●	
		3HP-TPGW110208	-SFD	0.8	●	●	●	●	●	●	
		3HP-TPGW110212	-SFD	1.2	●	●	●	●	●	●	
		3HP-TPGW110302	-SFD	0.2	●	●	●				
		3HP-TPGW110304	-SFD	0.4	●	●	●	●	●	●	
		3HP-TPGW110308	-SFD	0.8	●	●	●	●	●	●	
		3HP-TPGW110312	-SFD	1.2	●	●	●	●	●	●	
	Finishing - Semi-Finishing	3HP-TPGW080202	-STM	0.2	●	●	●				
		3HP-TPGW080204	-STM	0.4	●	●	●	●	●	●	
		3HP-TPGW080208	-STM	0.8	●	●	●	●	●	●	
		3HP-TPGW080212	-STM	1.2	●	●	●	●	●	●	
		3HP-TPGW090202	-STM	0.2	●	●	●				
		3HP-TPGW090204	-STM	0.4	●	●	●	●	●	●	
		3HP-TPGW090208	-STM	0.8	●	●	●	●	●	●	
		3HP-TPGW090212	-STM	1.2	●	●	●	●	●	●	
		3HP-TPGW110202	-STM	0.2	●	●	●				
		3HP-TPGW110204	-STM	0.4	●	●	●	●	●	●	
		3HP-TPGW110208	-STM	0.8	●	●	●	●	●	●	
		3HP-TPGW110212	-STM	1.2	●	●	●	●	●	●	
		3HP-TPGW110302	-STM	0.2	●	●	●				
		3HP-TPGW110304	-STM	0.4	●	●	●	●	●	●	
		3HP-TPGW110308	-STM	0.8	●	●	●	●	●	●	
		3HP-TPGW110312	-STM	1.2	●	●	●	●	●	●	

Positive

Continuous Light Interrupted Interrupted Heavy Interrupted

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
0802	4.76	2.38	2.30	0.2-1.2	K						
0902	5.56	2.38	2.50	0.2-1.2	S						
1102	6.35	2.38	2.80	0.2-1.2	H						
1103	6.35	3.18	3.30	0.2-1.2							

image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N
	General Machining	3HP-TPGW110202	-STF	0.2	●	●	●	●	●	●
		3HP-TPGW110204	-STF	0.4	●	●	●	●	●	●
		3HP-TPGW110208	-STF	0.8	●	●	●	●	●	●
		3HP-TPGW110212	-STF	1.2	●	●	●	●	●	●
		3HP-TPGW110302	-STF	0.2	●	●	●	●	●	●
		3HP-TPGW110304	-STF	0.4	●	●	●	●	●	●
		3HP-TPGW110308	-STF	0.8	●	●	●	●	●	●
		3HP-TPGW110312	-STF	1.2	●	●	●	●	●	●
	Intermittent Machining	3HP-TPGW080204	-STH	0.4	●	●	●	●	●	●
		3HP-TPGW080208	-STH	0.8	●	●	●	●	●	●
		3HP-TPGW080212	-STH	1.2	●	●	●	●	●	●
		3HP-TPGW090202	-STH	0.2	●	●	●	●	●	●
		3HP-TPGW090204	-STH	0.4	●	●	●	●	●	●
		3HP-TPGW090208	-STH	0.8	●	●	●	●	●	●
		3HP-TPGW090212	-STH	1.2	●	●	●	●	●	●
		3HP-TPGW110202	-STH	0.2	●	●	●	●	●	●
		3HP-TPGW110204	-STH	0.4	●	●	●	●	●	●
		3HP-TPGW110208	-STH	0.8	●	●	●	●	●	●
		3HP-TPGW110212	-STH	1.2	●	●	●	●	●	●
		3HP-TPGW110302	-STH	0.2	●	●	●	●	●	●
		3HP-TPGW110304	-STH	0.4	●	●	●	●	●	●
		3HP-TPGW110308	-STH	0.8	●	●	●	●	●	●
		3HP-TPGW110312	-STH	1.2	●	●	●	●	●	●
	Heavy Intermittent Machining	3HP-TPGW080208	-STR	0.8			●	●	●	●
		3HP-TPGW080212	-STR	1.2			●	●	●	●
		3HP-TPGW090208	-STR	0.8			●	●	●	●
		3HP-TPGW090212	-STR	1.2			●	●	●	●
		3HP-TPGW110208	-STR	0.8			●	●	●	●
		3HP-TPGW110212	-STR	1.2			●	●	●	●
		3HP-TPGW110308	-STR	0.8			●	●	●	●
		3HP-TPGW110312	-STR	1.2			●	●	●	●

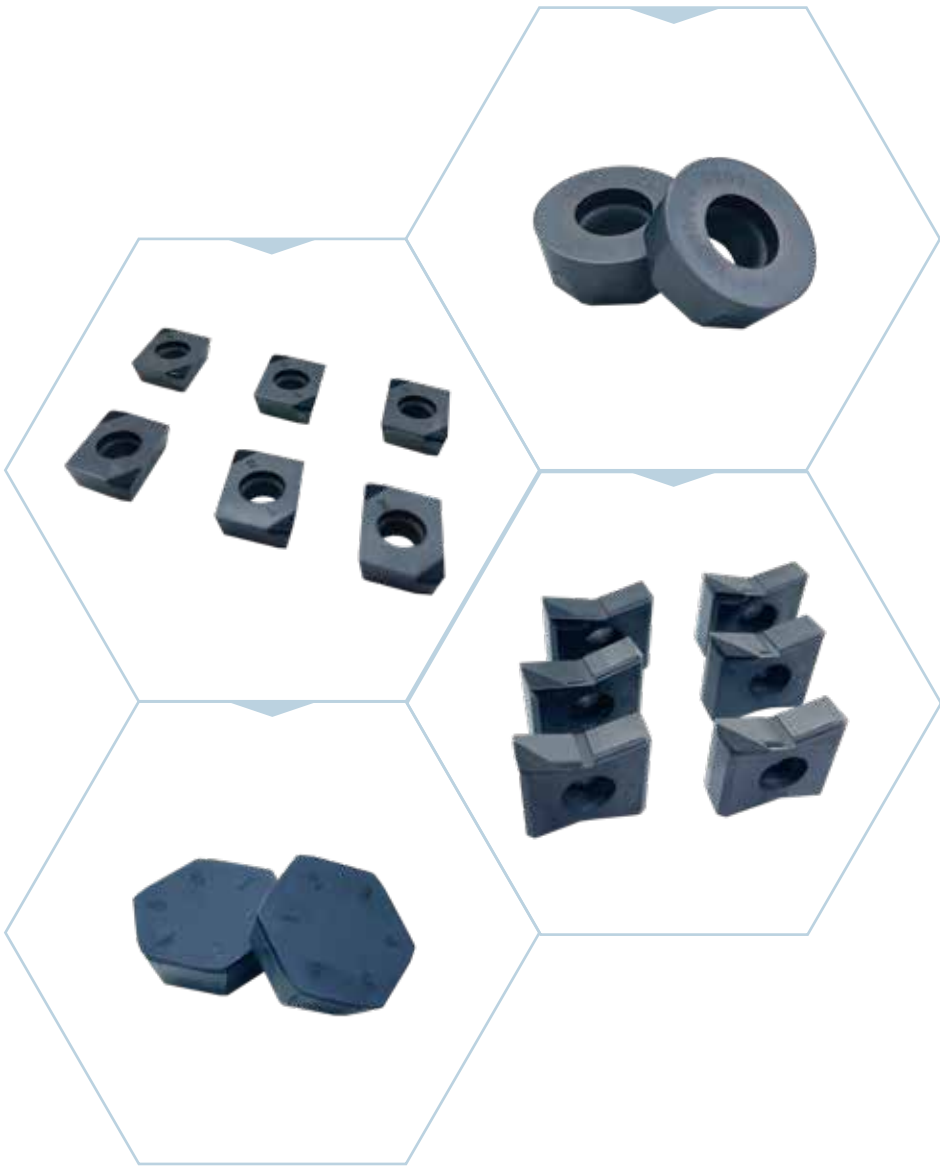
Mini CBN Insert

Continuous Light Interrupted Interrupted Heavy Interrupted

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency					
CCGW0301	3.5	1.40	1.90	0.2-0.4	K						
CCGW0401	4.3	1.80	2.30	0.2-0.4	S						
TBGW0601	3.97	1.59	2.30	0.2-0.4	H						
TPGW0802	4.76	2.38	2.30	0.2-0.4							

image	application	Specification	edge preparation	corner radius	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N
	SuperFinish	CCGW030102	Only Honing	0.2			●	●	●	●
		CCGW030104	Only Honing	0.4			●	●	●	●
		CCGW040102	Only Honing	0.2			●	●	●	●
		CCGW040104	Only Honing	0.4			●	●	●	●
	Finishing	CCGW030102	SFD	0.2	●	●	●	●	●	●
		CCGW030104	SFD	0.4	●	●	●	●	●	●
		CCGW040102	SFD	0.2	●	●	●	●	●	●
		CCGW040104	SFD	0.4	●	●	●	●	●	●
	Finshing-Semi-Finishing	CCGW030102	STM	0.2	●	●	●	●	●	●
		CCGW030104	STM	0.4	●	●	●	●	●	●
		CCGW040102	STM	0.2	●	●	●	●	●	●
		CCGW040104	STM	0.4	●	●	●	●	●	●
	General Machining	CCGW030102	STF	0.2	●	●	●	●	●	●
		CCGW030104	STF	0.4	●	●	●	●	●	●
		CCGW040102	STF	0.2	●	●	●	●	●	●
		CCGW040104	STF	0.4	●	●	●	●	●	●
	SuperFinish	TBGW060102	Only Honing	0.2			●	●	●	●
		TBGW060104	Only Honing	0.4			●	●	●	●
		TPGW080202	Only Honing	0.2			●	●	●	●
		TPGW080204	Only Honing	0.4			●	●	●	●
	Finishing	TBGW060102	SFD	0.2	●	●	●	●	●	●
		TBGW060104	SFD	0.4	●	●	●	●	●	●
		TPGW080202	SFD	0.2	●	●	●	●	●	●
		TPGW080204	SFD	0.4	●	●	●	●	●	●
	Finshing-Semi-Finishing	TBGW060102	STM	0.2	●	●	●	●	●	●
		TBGW060104	STM	0.4	●	●	●	●	●	●
		TPGW080202	STM	0.2	●	●	●	●	●	●
		TPGW080204	STM	0.4	●	●	●	●	●	●
	General Machining	TBGW060102	STF	0.2	●	●	●	●	●	●
		TBGW060104	STF	0.4	●	●	●	●	●	●
		TPGW080202	STF	0.2	●	●	●	●	●	●
		TPGW080204	STF	0.4	●	●	●	●	●	●

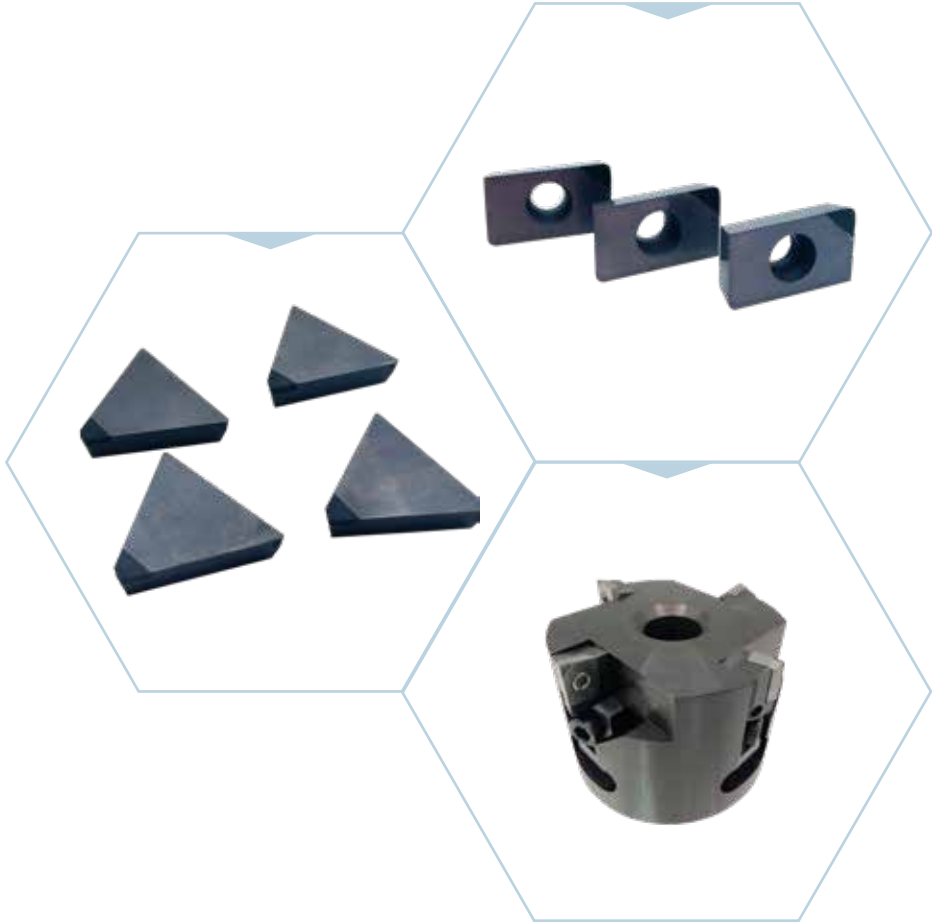
CBN Milling Insert



Indexable Milling Insert

Image	Specification	Depth of Cut	Feed per Tooth	Application	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N
	APGW160402-PDER	Depended on actual working conditions		Should Milling & Face Milling		●	●	●	●	●
	APGW160404-PDER					●	●	●	●	●
	APGW160408-PDER					●	●	●	●	●
	APGW160412-PDER					●	●	●	●	●
	APGW113502-PDER					●	●	●	●	●
	APGW113504-PDER					●	●	●	●	●
	APGW113508-PDER					●	●	●	●	●
	APGW113512-PDER					●	●	●	●	●
	TPGN1103PDER					●	●	●	●	●
	TPGN1603PDER					●	●	●	●	●
	TPGN2204PDER					●	●	●	●	●

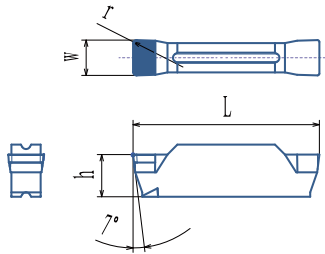
Notes:
※ PDER indicates wiper applied
※ Tailor-made solution available



Grooving Insert IKGMN

Image	Specification	W	r	L	h	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N
	IKGMN150 015	1.5	0.15	16.0	3.5	●	●	●	●	●	●
	IKGMN200 020	2.0	0.2	16.0	3.5	●	●	●	●	●	●
	IKGMN250 020	2.5	0.2	18.5	3.85	●	●	●	●	●	●
	IKGMN300 040	3.0	0.4	21.0	4.8	●	●	●	●	●	●
	IKGMN400 040	4.0	0.4	21.0	4.8	●	●	●	●	●	●
	IKGMN500 080	5.0	0.8	26.0	5.8	●	●	●	●	●	●
	IKGMN600 080	6.0	0.8	26.0	5.8	●	●	●	●	●	●

Note:
※ The standard edge preparation is honing
※ other options of edge preparation available (-STM, -STF, -STH, etc.)



W: Grooving Width
r: Corner Radius
L: Insert Length
h: Edge Height

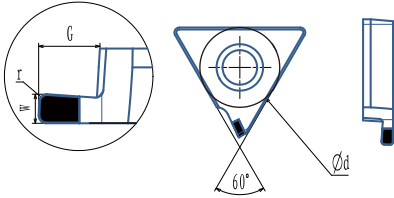


- ※ The most popular general-purpose grooving insert can be applied to external groove, internal groove and face groove.
- ※ The standard IKGMN grooving insert is single edged. The double edged insert is also available on request.
- ※ Tailor-made available for the different grooving width and corner radius.

Grooving Insert IKGBR/L

image	Specification	W	r	G	ød	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N
	IKGBR/L43150 020	1.5	0.2	3.5	12.7	●	●	●	●	●	●
	IKGBR/L43200 020	2.0	0.2	3.5	12.7	●	●	●	●	●	●
	IKGBR/L43250 030	2.5	0.3	3.5	12.7	●	●	●	●	●	●
	IKGBR/L43300 030	3.0	0.3	5.0	12.7	●	●	●	●	●	●
	IKGBR/L43350 030	3.5	0.3	5.0	12.7	●	●	●	●	●	●
	IKGBR/L43400 040	4.0	0.4	5.0	12.7	●	●	●	●	●	●
	IKGBR/L43450 040	4.5	0.4	5.0	12.7	●	●	●	●	●	●

Note:
※ The standard edge preparation is honing
※ other options of edge preparation available (-STM, -STF, -STH, etc.)



W: Grooving Width
r: Corner Radius
G: Insert Length
ød: Edge Height

Grooving Insert IKGBR/L

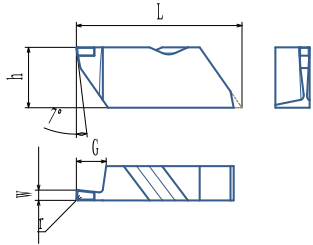


- ※ The excellent clamping rigidity enables precise grooving operation.
- ※ This popular type for shallow grooving is compatible with a majority of tool brands in market.
- ※ This popular type for shallow grooving is compatible with a majority of tool brands in market.

Grooving Insert IKGTR/L

image	Specification	W	r	G	h	IKN1001	IKN4600	IKN6400	IKN8501	IKN8800	IKN9500N
	IKGTR/L150-020	1.5	0.2	3.5	8.8	●	●	●	●	●	●
	IKGTR/L200-020	2.0	0.2	3.5	8.8	●	●	●	●	●	●
	IKGTR/L250-020	2.5	0.2	3.5	8.8	●	●	●	●	●	●
	IKGTR/L300-040	3.0	0.4	5.0	8.8	●	●	●	●	●	●
	IKGTR/L350-040	3.5	0.4	5.0	8.8	●	●	●	●	●	●
	IKGTR/L400-040	4.0	0.4	5.0	8.8	●	●	●	●	●	●

Note:
※ The standard edge preparation is honing
※ other options of edge preparation available
(-SFD, -STM, -STF, -STH, etc.)



W: Grooving Width
r: Corner Radius
G: Insert Length
h: Edge Height



- ※ The excellent clamping rigidity enables precise grooving operation.
- ※ The standard IKGTR/L grooving insert is used for external and internal shallow groove. The face grooving insert is also available on request.
- ※ Tailor-made available for the different grooving width, grooving depth, corner radius and relief angle.

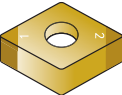
CBN Block Brazed Insert



- ※ The economical choice for roughing and semi-finishing operation.

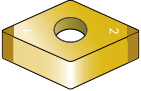
Negative

ContinuousLight InterruptedInterruptedHeavy Interrupted

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency		
0804	12.7	4.76	5.16	0.4-1.6	K		⌚⌚	
					S			
					H	⬤⬤⬤		⌚⌚
image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96	
	General Machining	4TH-CNGA120404	-STF	0.4	●	●	●	
		4TH-CNGA120408	-STF	0.8	●	●	●	
		4TH-CNGA120412	-STF	1.2	●	●	●	
		4TH-CNGA120416	-STF	1.6	●	●	●	
	Heavy Machining	4TH-CNGA120404	-STH	0.4	●	●	●	
		4TH-CNGA120408	-STH	0.8	●	●	●	
		4TH-CNGA120412	-STH	1.2	●	●	●	
		4TH-CNGA120416	-STH	1.6	●	●	●	
	Very Heavy Machining	4TH-CNGA120404	-STR	0.4	●	●	●	
		4TH-CNGA120408	-STR	0.8	●	●	●	
		4TH-CNGA120412	-STR	1.2	●	●	●	
		4TH-CNGA120416	-STR	1.6	●	●	●	

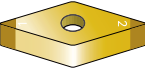
Negative

ContinuousLight InterruptedInterruptedHeavy Interrupted

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency		
1504	12.7	4.76	5.16	0.4-1.6	K		⌚⌚	
					S			
					H	⬤⬤⬤		⌚⌚
image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96	
	General Machining	4TH-DNGA150404	-STF	0.4	●	●	●	
		4TH-DNGA150408	-STF	0.8	●	●	●	
		4TH-DNGA150412	-STF	1.2	●	●	●	
		4TH-DNGA150416	-STF	1.6	●	●	●	
	Heavy Machining	4TH-DNGA150404	-STH	0.4	●	●	●	
		4TH-DNGA150408	-STH	0.8	●	●	●	
		4TH-DNGA150412	-STH	1.2	●	●	●	
		4TH-DNGA150416	-STH	1.6	●	●	●	
	Very Heavy Machining	4TH-DNGA150404	-STR	0.4	●	●	●	
		4TH-DNGA150408	-STR	0.8	●	●	●	
		4TH-DNGA150412	-STR	1.2	●	●	●	
		4TH-DNGA150416	-STR	1.6	●	●	●	

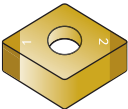
Negative

ContinuousLight InterruptedInterruptedHeavy Interrupted

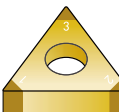
specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency		
1604	9.525	4.76	3.81	0.4-1.6	K		⌚⌚	
					S			
					H	⬤⬤⬤		⌚⌚
image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96	
	General Machining	4TH-VNGA160404	-STF	0.4	●	●	●	
		4TH-VNGA160408	-STF	0.8	●	●	●	
		4TH-VNGA160412	-STF	1.2	●	●	●	
		4TH-VNGA160416	-STF	1.6	●	●	●	
	Heavy Machining	4TH-VNGA160404	-STH	0.4	●	●	●	
		4TH-VNGA160408	-STH	0.8	●	●	●	
		4TH-VNGA160412	-STH	1.2	●	●	●	
		4TH-VNGA160416	-STH	1.6	●	●	●	
	Very Heavy Machining	4TH-VNGA160404	-STR	0.4	●	●	●	
		4TH-VNGA160408	-STR	0.8	●	●	●	
		4TH-VNGA160412	-STR	1.2	●	●	●	
		4TH-VNGA160416	-STR	1.6	●	●	●	

Negative

ContinuousLight InterruptedInterruptedHeavy Interrupted

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency		
1204	12.7	4.76	5.16	0.4-1.6	K		⌚⌚	
					S			
					H	⬤⬤⬤		⌚⌚
image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96	
	General Machining	4TH-SNGA120404	-STF	0.4	●	●	●	
		4TH-SNGA120408	-STF	0.8	●	●	●	
		4TH-SNGA120412	-STF	1.2	●	●	●	
		4TH-SNGA120416	-STF	1.6	●	●	●	
	Heavy Machining	4TH-SNGA120404	-STH	0.4	●	●	●	
		4TH-SNGA120408	-STH	0.8	●	●	●	
		4TH-SNGA120412	-STH	1.2	●	●	●	
		4TH-SNGA120416	-STH	1.6	●	●	●	
	Very Heavy Machining	4TH-SNGA120404	-STR	0.4	●	●	●	
		4TH-SNGA120408	-STR	0.8	●	●	●	
		4TH-SNGA120412	-STR	1.2	●	●	●	
		4TH-SNGA120416	-STR	1.6	●	●	●	

Negative

					Continuous  Light Interrupted  Interrupted  Heavy Interrupted 			
specs	incircleΦd	thickness	apertureΦd1	nose radius	Grade	Impacting Frequency		
1604	9.525	4.76	3.81	0.4-1.6	K		 	
					S			
					H	  		 
image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96	
	General Machining	6TH-TNGA160404	-STF	0.4				
		6TH-TNGA160408	-STF	0.8				
		6TH-TNGA160412	-STF	1.2				
		6TH-TNGA160416	-STF	1.6				
	Heavy Machining	6TH-TNGA160404	-STH	0.4				
		6TH-TNGA160408	-STH	0.8				
		6TH-TNGA160412	-STH	1.2				
		6TH-TNGA160416	-STH	1.6				
	Very Heavy Machining	6TH-TNGA160404	-STR	0.4				
		6TH-TNGA160408	-STR	0.8				
		6TH-TNGA160412	-STR	1.2				
		6TH-TNGA160416	-STR	1.6				

Negative

continuous

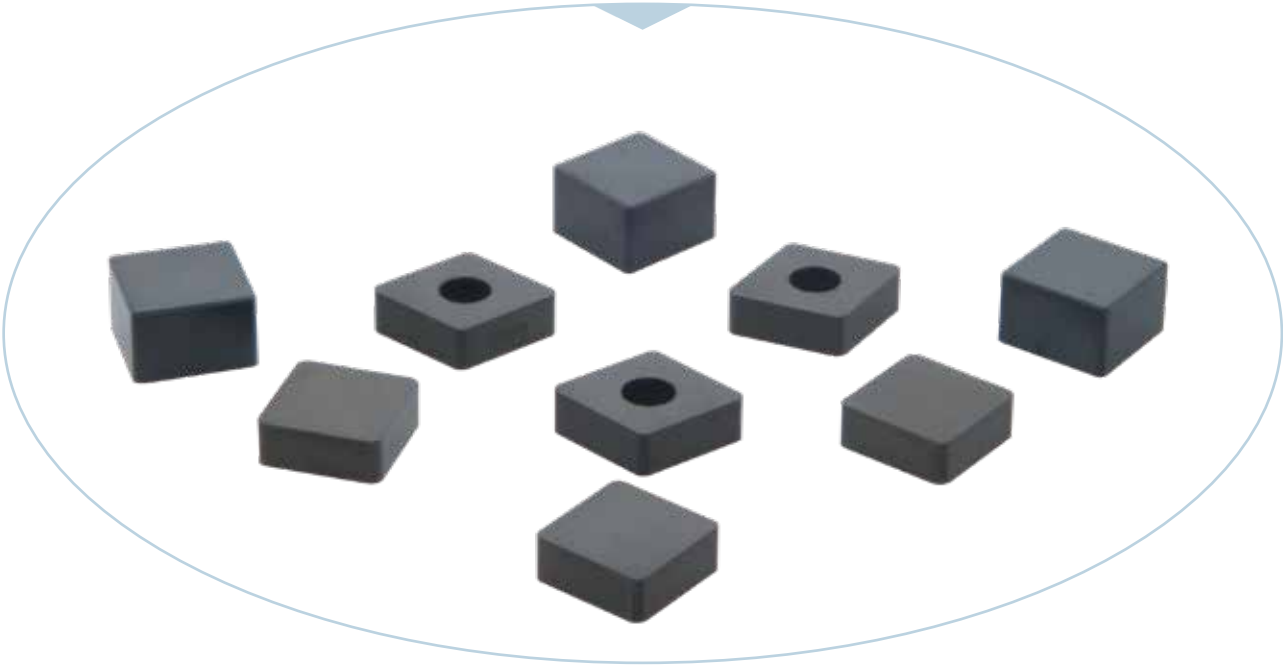
Weak interrupted

interrupted

heavy interrupted

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency		
0804	12.7	4.76	5.16	0.4-1.6	K		 	
					S			
					H	  		 
image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96	
	General Machining	6TH-WNGA080404	-STF	0.4				
		6TH-WNGA080408	-STF	0.8				
		6TH-WNGA080412	-STF	1.2				
		6TH-WNGA080416	-STF	1.6				
	Heavy Machining	6TH-WNGA080404	-STH	0.4				
		6TH-WNGA080408	-STH	0.8				
		6TH-WNGA080412	-STH	1.2				
		6TH-WNGA080416	-STH	1.6				
	Very Heavy Machining	6TH-WNGA080404	-STR	0.4				
		6TH-WNGA080408	-STR	0.8				
		6TH-WNGA080412	-STR	1.2				
		6TH-WNGA080416	-STR	1.6				

Solid CBN Insert



Negative

ContinuousLight InterruptedInterruptedHeavy Interrupted

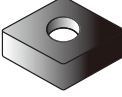
specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency		
1204	12.7	4.76	-	0.4-1.6	K			
1207	12.7	7.94	-	0.4-1.6	S			
					H			

image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96
	General Machining	ZTCNGN120404	-STF	0.4	●	●	●
		ZTCNGN120408	-STF	0.8	●	●	●
		ZTCNGN120412	-STF	1.2	●	●	●
		ZTCNGN120416	-STF	1.6	●	●	●
		ZTCNGN120704	-STF	0.4	●	●	●
		ZTCNGN120708	-STF	0.8	●	●	●
		ZTCNGN120712	-STF	1.2	●	●	●
		ZTCNGN120716	-STF	1.6	●	●	●
	Heavy Machining	ZTCNGN120404	-STH	0.4	●	●	●
		ZTCNGN120408	-STH	0.8	●	●	●
		ZTCNGN120412	-STH	1.2	●	●	●
		ZTCNGN120416	-STH	1.6	●	●	●
		ZTCNGN120704	-STH	0.4	●	●	●
		ZTCNGN120708	-STH	0.8	●	●	●
		ZTCNGN120712	-STH	1.2	●	●	●
		ZTCNGN120716	-STH	1.6	●	●	●
	Very Heavy Machining	ZTCNGN120404	-STR	0.4	●	●	●
		ZTCNGN120408	-STR	0.8	●	●	●
		ZTCNGN120412	-STR	1.2	●	●	●
		ZTCNGN120416	-STR	1.6	●	●	●
		ZTCNGN120704	-STR	0.4	●	●	●
		ZTCNGN120708	-STR	0.8	●	●	●
		ZTCNGN120712	-STR	1.2	●	●	●
		ZTCNGN120716	-STR	1.6	●	●	●

Negative

ContinuousLight InterruptedInterruptedHeavy Interrupted

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency		
1204	12.7	4.76	5.16	0.4-1.6	K			
					S			
					H			

image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96
	General Machining	ZT-CNGA120404	-STF	0.4	●	●	●
		ZT-CNGA120408	-STF	0.8	●	●	●
		ZT-CNGA120412	-STF	1.2	●	●	●
		ZT-CNGA120416	-STF	1.6	●	●	●
	Heavy Machining	ZT-CNGA120404	-STH	0.4	●	●	●
		ZT-CNGA120408	-STH	0.8	●	●	●
		ZT-CNGA120412	-STH	1.2	●	●	●
		ZT-CNGA120416	-STH	1.6	●	●	●
	Very Heavy Machining	ZT-CNGA120404	-STR	0.4	●	●	●
		ZT-CNGA120408	-STR	0.8	●	●	●
		ZT-CNGA120412	-STR	1.2	●	●	●
		ZT-CNGA120416	-STR	1.6	●	●	●

Negative

ContinuousLight InterruptedInterruptedHeavy Interrupted

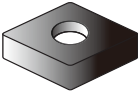
specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency		
1504	12.7	4.76	-	0.4-1.6	K			
1506	12.7	6.35	-	0.4-1.6	S			
					H			

image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96
	General Machining	ZT-DNGN150404	-STF	0.4	●	●	●
		ZT-DNGN150408	-STF	0.8	●	●	●
		ZT-DNGN150412	-STF	1.2	●	●	●
		ZT-DNGN150416	-STF	1.6	●	●	●
		ZT-DNGN150604	-STF	0.4	●	●	●
		ZT-DNGN150608	-STF	0.8	●	●	●
		ZT-DNGN150612	-STF	1.2	●	●	●
		ZT-DNGN150616	-STF	1.6	●	●	●
	Heavy Machining	ZT-DNGN150404	-STH	0.4	●	●	●
		ZT-DNGN150408	-STH	0.8	●	●	●
		ZT-DNGN150412	-STH	1.2	●	●	●
		ZT-DNGN150416	-STH	1.6	●	●	●
		ZT-DNGN150604	-STH	0.4	●	●	●
		ZT-DNGN150608	-STH	0.8	●	●	●
		ZT-DNGN150612	-STH	1.2	●	●	●
		ZT-DNGN150616	-STH	1.6	●	●	●
	Very Heavy Machining	ZT-DNGN150404	-STR	0.4	●	●	●
		ZT-DNGN150408	-STR	0.8	●	●	●
		ZT-DNGN150412	-STR	1.2	●	●	●
		ZT-DNGN150416	-STR	1.6	●	●	●
		ZT-DNGN150604	-STR	0.4	●	●	●
		ZT-DNGN150608	-STR	0.8	●	●	●
		ZT-DNGN150612	-STR	1.2	●	●	●
		ZT-DNGN150616	-STR	1.6	●	●	●

Negative

ContinuousLight InterruptedInterruptedHeavy Interrupted

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency		
1504	12.7	4.76	5.16	0.4-1.6	K			
					S			
					H			

image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96
	General Machining	ZT-DNGA150404	-STF	0.4	●	●	●
		ZT-DNGA150408	-STF	0.8	●	●	●
		ZT-DNGA150412	-STF	1.2	●	●	●
		ZT-DNGA150416	-STF	1.6	●	●	●
	Heavy Machining	ZT-DNGA150404	-STH	0.4	●	●	●
		ZT-DNGA150408	-STH	0.8	●	●	●
		ZT-DNGA150412	-STH	1.2	●	●	●
		ZT-DNGA150416	-STH	1.6	●	●	●
	Very Heavy Machining	ZT-DNGA150404	-STR	0.4	●	●	●
		ZT-DNGA150408	-STR	0.8	●	●	●
		ZT-DNGA150412	-STR	1.2	●	●	●
		ZT-DNGA150416	-STR	1.6	●	●	●

Negative

ContinuousLight InterruptedInterruptedHeavy Interrupted

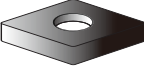
specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency		
1604	9.525	4.76	-	0.4-1.6	K			
1606	9.525	6.35	-	0.4-1.6	S			
					H			

image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96
	General Machining	ZT-VNGN160404	-STF	0.4	●	●	●
		ZT-VNGN160408	-STF	0.8	●	●	●
		ZT-VNGN160412	-STF	1.2	●	●	●
		ZT-VNGN160416	-STF	1.6	●	●	●
		ZT-VNGN160604	-STF	0.4	●	●	●
		ZT-VNGN160608	-STF	0.8	●	●	●
		ZT-VNGN160612	-STF	1.2	●	●	●
		ZT-VNGN160616	-STF	1.6	●	●	●
	Heavy Machining	ZT-VNGN160404	-STH	0.4	●	●	●
		ZT-VNGN160408	-STH	0.8	●	●	●
		ZT-VNGN160412	-STH	1.2	●	●	●
		ZT-VNGN160416	-STH	1.6	●	●	●
		ZT-VNGN160604	-STH	0.4	●	●	●
		ZT-VNGN160608	-STH	0.8	●	●	●
		ZT-VNGN160612	-STH	1.2	●	●	●
		ZT-VNGN160616	-STH	1.6	●	●	●
	Very Heavy Machining	ZT-VNGN160404	-STR	0.4	●	●	●
		ZT-VNGN160408	-STR	0.8	●	●	●
		ZT-VNGN160412	-STR	1.2	●	●	●
		ZT-VNGN160416	-STR	1.6	●	●	●
		ZT-VNGN160604	-STR	0.4	●	●	●
		ZT-VNGN160608	-STR	0.8	●	●	●
		ZT-VNGN160612	-STR	1.2	●	●	●
		ZT-VNGN160616	-STR	1.6	●	●	●

Negative

ContinuousLight InterruptedInterruptedHeavy Interrupted

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency		
1604	9.525	4.76	3.81	0.4-1.6	K			
					S			
					H			

image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96
	General Machining	ZT-VNGA160404	-STF	0.4	●	●	●
		ZT-VNGA160408	-STF	0.8	●	●	●
		ZT-VNGA160412	-STF	1.2	●	●	●
		ZT-VNGA160416	-STF	1.6	●	●	●
	Heavy Machining	ZT-VNGA160404	-STH	0.4	●	●	●
		ZT-VNGA160408	-STH	0.8	●	●	●
		ZT-VNGA160412	-STH	1.2	●	●	●
		ZT-VNGA160416	-STH	1.6	●	●	●
	Very Heavy Machining	ZT-VNGA160404	-STR	0.4	●	●	●
		ZT-VNGA160408	-STR	0.8	●	●	●
		ZT-VNGA160412	-STR	1.2	●	●	●
		ZT-VNGA160416	-STR	1.6	●	●	●

Negative

Continuous

Light Interrupted

Interrupted

Heavy Interrupted

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency		
1204	12. 7	4. 76	–	0. 4–1. 6	K			
1207	12. 7	7. 94	–	0. 4–1. 6	S			
					H			

image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96
	General Machining	ZT-SNGN120404	-STF	0.4	●	●	●
		ZT-SNGN120408	-STF	0.8	●	●	●
		ZT-SNGN120412	-STF	1.2	●	●	●
		ZT-SNGN120416	-STF	1.6	●	●	●
		ZT-SNGN120704	-STF	0.4	●	●	●
		ZT-SNGN120708	-STF	0.8	●	●	●
		ZT-SNGN120712	-STF	1.2	●	●	●
		ZT-SNGN120716	-STF	1.6	●	●	●
	Heavy Machining	ZT-SNGN120404	-STH	0.4	●	●	●
		ZT-SNGN120408	-STH	0.8	●	●	●
		ZT-SNGN120412	-STH	1.2	●	●	●
		ZT-SNGN120416	-STH	1.6	●	●	●
		ZT-SNGN120704	-STH	0.4	●	●	●
		ZT-SNGN120708	-STH	0.8	●	●	●
		ZT-SNGN120712	-STH	1.2	●	●	●
		ZT-SNGN120716	-STH	1.6	●	●	●
	Very Heavy Machining	ZT-SNGN120404	-STR	0.4	●	●	●
		ZT-SNGN120408	-STR	0.8	●	●	●
		ZT-SNGN120412	-STR	1.2	●	●	●
		ZT-SNGN120416	-STR	1.6	●	●	●
		ZT-SNGN120704	-STR	0.4	●	●	●
		ZT-SNGN120708	-STR	0.8	●	●	●
		ZT-SNGN120712	-STR	1.2	●	●	●
		ZT-SNGN120716	-STR	1.6	●	●	●

Negative

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency		
1204	12. 7	4. 76	5. 16	0. 4–1. 6	K			
					S			
					H			

image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96
	General Machining	ZT-SNGA120404	-STF	0.4	●	●	●
		ZT-SNGA120408	-STF	0.8	●	●	●
		ZT-SNGA120412	-STF	1.2	●	●	●
		ZT-SNGA120416	-STF	1.6	●	●	●
	Heavy Machining	ZT-SNGA120404	-STH	0.4	●	●	●
		ZT-SNGA120408	-STH	0.8	●	●	●
		ZT-SNGA120412	-STH	1.2	●	●	●
		ZT-SNGA120416	-STH	1.6	●	●	●
	Very Heavy Machining	ZT-SNGA120404	-STR	0.4	●	●	●
		ZT-SNGA120408	-STR	0.8	●	●	●
		ZT-SNGA120412	-STR	1.2	●	●	●
		ZT-SNGA120416	-STR	1.6	●	●	●

Negative

specs	incircleΦd	thickness	apertureΦd1	nose radiusr	Grade	Impacting Frequency		
0804	12.7	4.76	-	0.4-1.6	K		 	
					S			
					H			

image	application	Specification	edge preparation	corner radius	IKN60	IKN80	IKN96
	General Machining	ZT-WNGN080404	-STF	0.4	●	●	●
		ZT-WNGN080408	-STF	0.8	●	●	●
		ZT-WNGN080412	-STF	1.2	●	●	●
		ZT-WNGN080416	-STF	1.6	●	●	●
	Heavy Machining	ZT-WNGN080404	-STH	0.4	●	●	●
		ZT-WNGN080408	-STH	0.8	●	●	●
		ZT-WNGN080412	-STH	1.2	●	●	●
		ZT-WNGN080416	-STH	1.6	●	●	●
	Very Heavy Machining	ZT-WNGN080404	-STR	0.4	●	●	●
		ZT-WNGN080408	-STR	0.8	●	●	●
		ZT-WNGN080412	-STR	1.2	●	●	●
		ZT-WNGN080416	-STR	1.6	●	●	●

Negative

Continuous  Light Interrupted  Interrupted  Heavy Interrupted 

specs	incircleΦd	thickness	apertureΦd1	—	Grade	Impacting Frequency		
0603	6.35	3.18	—	—	—			
0903	9.525	3.18	—	—	K		 	
1204	12.7	4.76	—	—	S			
1207	12.7	7.94	—	—	H	  		 

image	application	Specification	edge preparation	—	IKN60	IKN80	IKN96
	Finishing	ZT-RNGN0603	-STM	—	●	●	●
		ZT-RNGN0903	-STM	—	●	●	●
		ZT-RNGN1204	-STM	—	●	●	●
	General Machining	ZT-RNGN0603	-STF	—	●	●	●
		ZT-RNGN0903	-STF	—	●	●	●
		ZT-RNGN1204	-STF	—	●	●	●
		ZT-RNGN1207	-STF	—	●	●	●
	Heavy Machining	ZT-RNGN0903	-STH	—	●	●	●
		ZT-RNGN1204	-STH	—	●	●	●
		ZT-RNGN1207	-STH	—	●	●	●
	Very Heavy Machining	ZT-RNGN0903	-STR	—	●	●	●
		ZT-RNGN1204	-STR	—	●	●	●
		ZT-RNGN1207	-STR	—	●	●	●

Material Properties

PCD (Polycrystalline Diamond)

Positive Rake Angle PCD Insert

Why is it necessary to use PCD cutting tools?

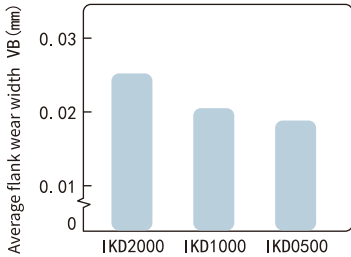
※ Diamond is the hardest known material on the earth by now. This is an advanced diamond based tool material where tiny diamond crystals are tightly sintered on the cemented carbide alloy base by means of a super high pressure and temperature process. PCD is therefore the optimum choice for cutting non-ferrous and non-metal materials.

IKEN PCD GRADES

※ N

Grade	IKD0200A	IKD1000	IKD2100
Material			
Characteristic	Focused on surface quality	General-purpose	Focused on wear resistance
Particle size(um)	< 2	10	4/25
Hardness (Hv)			
Wear resistance			
Smoothness of edge			

※ cutting performance · wear resistance



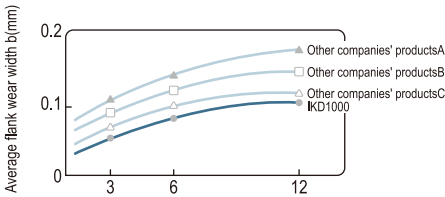
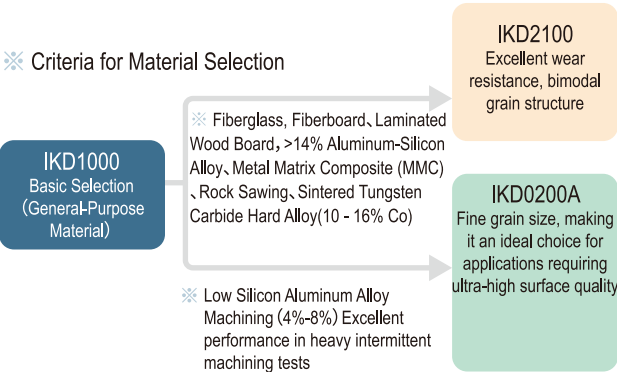
Continuous longitudinal turning of the outer circle
※ workpiece material : 10%Si-Ai Alloy
※ use the cutting tool : SPGN120308-IKD1000
※ use the tool body : CSBPR2525M4
※ cutting speed : Vc=500m/min
※ feed rate : f=0.1mm/rev
※ cutting depth : ap=0.5mm
※ cutting fluid : dry cutting
※ cutting time : 30min

※ Standard cutting conditions

Workpiece material	Cutting speed Vc(m/min)	Cutting depth ap(mm)	Feed rate f(mm/rev)	Grade		
				IKD0200A	IKD1000	IKD2100
Al alloy(Si<12%)	1500(1000-2500)	0.5(0.05-2.0)	0.1(0.05-0.2)	○	○	
Al alloy(Si<12%)	600(400-800)	0.5(0.05-2.0)	0.1(0.05-0.2)		○	○
Copper , Brass	800(500-1500)	0.5(0.05-2.0)	0.1(0.05-0.2)	○	○	
Phosphor Bronze	400(300-500)	0.5(0.05-2.0)	0.1(0.05-0.2)	○	○	
Carbon , Graphite	400(300-500)	0.5(0.05-2.0)	0.1(0.05-0.2)		○	○
FRP	700(500-1000)	0.2(0.05-0.5)	0.05(0.03-0.1)		○	○
Plastic	700(500-1000)	0.2(0.05-0.5)	0.03(0.01-0.05)	○	○	
Cemented Carbide(HRc40-60)	15(10-20)	0.1(0.05-0.2)	0.03(0.01-0.05)			○
Ceramic (Pre-sintered)	130(100-150)	0.5(0.05-2.0)	0.05(0.03-0.1)			○

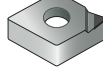
※ PCD tool life is 10 times more than carbide tool because of high hardness, high compressive strength, good thermal conductivity and excellent wear resistance.
※ Superior surface roughness and very high productivity can be achieved by PCD tool because of sharp cutting edge and ultra high cutting speed.

※ Criteria for Material Selection

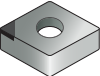
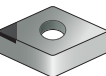


Face Milling

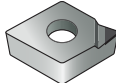
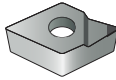
※ Workpiece material : Fiberglass(FRP)
※ Using cutting tools : SPCN42ZFR-IKD1000
※ use the tool body : TPG4208R-A
※ cutting speed : Vc=942m/min
※ Feed rate : f=0.1mm/rev
※ cutting depth : ap=1.5mm
※ cutting fluid : dry cutting

Image	Advantage	Specification	nose radius (r)	IKD0200A	IKD1000	IKD2100
	Low cutting force and good chip control	CNGT120402	0.2	●	●	●
		CNGT120404	0.4	●	●	●
		CNGT120408	0.8	●	●	●
		DNGT150402	0.2	●	●	●
		DNGT150404	0.4	●	●	●
		DNGT150408	0.8	●	●	●
		TNGT160402	0.2	●	●	●
		TNGT160404	0.4	●	●	●
		TNGT160408	0.8	●	●	●
		VNGT160402	0.2	●	●	●
		VNGT160404	0.4	●	●	●
		VNGT160408	0.8	●	●	●

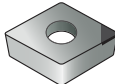
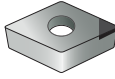
Flat-Topped PCD Insert

Image	Advantage	Specification	nose radius (r)	IKD0200A	IKD1000	IKD2100
	Good impacting resistance	CNGA120402	0.2	●	●	●
		CNGA120404	0.4	●	●	●
		CNGA120408	0.8	●	●	●
		DNGA150402	0.2	●	●	●
		DNGA150404	0.4	●	●	●
		DNGA150408	0.8	●	●	●
		TNGA160402	0.2	●	●	●
		TNGA160404	0.4	●	●	●
		TNGA160408	0.8	●	●	●
		SNGA120402	0.2	●	●	●
		SNGA120404	0.4	●	●	●
		SNGA120408	0.8	●	●	●
		SNGN090302	0.2	●	●	●
		SNGN090304	0.4	●	●	●
		SNGN090308	0.8	●	●	●
		SNGN120402	0.2	●	●	●
		SNGN120404	0.4	●	●	●
		SNGN120408	0.8	●	●	●

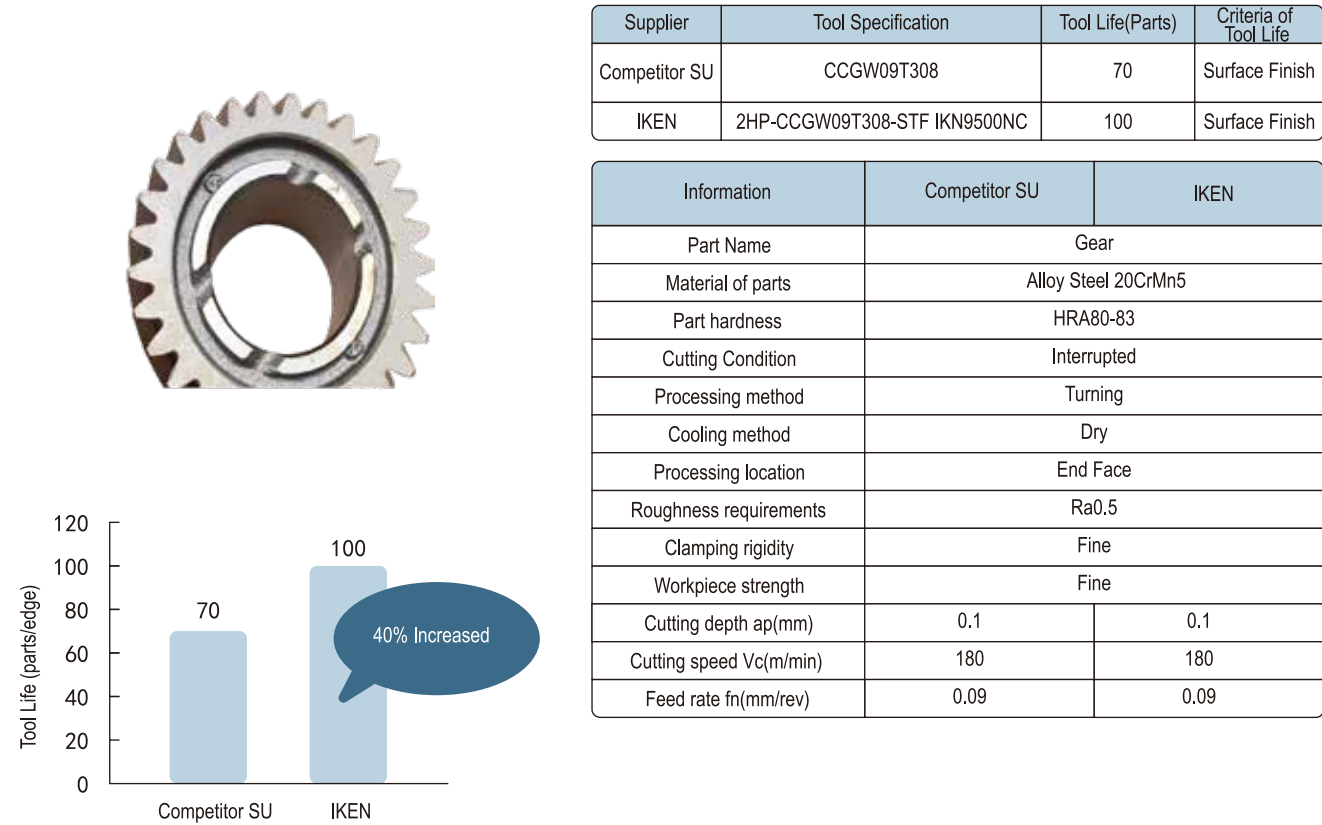
Positive Rake Angle Insert With Relief Angle

Image	Advantage	Specification	nose radius (r)	IKD200A	IKD1000	IKD2100
	Low cutting force and good chip control	CCGT09T302	0.2	●	●	●
		CCGT09T304	0.4	●	●	●
		CCGT09T308	0.8	●	●	●
		CCGT120402	0.2	●	●	●
		CCGT120404	0.4	●	●	●
		CCGT120408	0.8	●	●	●
		DCGT070202	0.2	●	●	●
		DCGT070204	0.4	●	●	●
		DCGT070208	0.8	●	●	●
		DCGT11T302	0.2	●	●	●
		DCGT11T304	0.4	●	●	●
		DCGT11T308	0.8	●	●	●
		VCGT160402	0.2	●	●	●
		VCGT160404	0.4	●	●	●
		VCGT160408	0.8	●	●	●
		TCGT090202	0.2	●	●	●
		TCGT090204	0.4	●	●	●
		TCGT090208	0.8	●	●	●
		TCGT110202	0.2	●	●	●
		TCGT110204	0.4	●	●	●
		TCGT110208	0.8	●	●	●
		TCGT110302	0.2	●	●	●
		TCGT110304	0.4	●	●	●
		TCGT110308	0.8	●	●	●

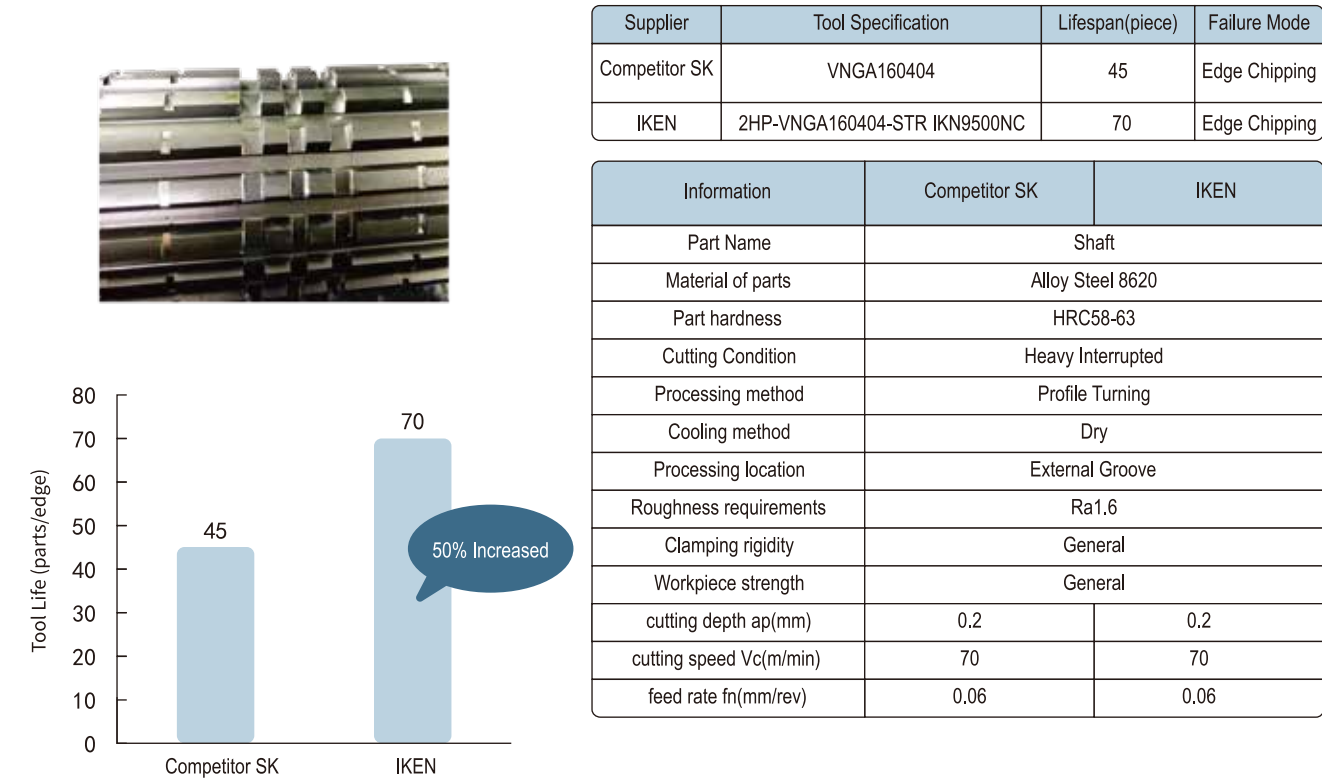
Flat-Topped PCD Insert With Relief Angle

Image	Advantage	Specification	nose radius (r)	IKD0200A	IKD1000	IKD2000
	Good impacting resistance	CCGW060202	0.2	●	●	●
		CCGW060204	0.4	●	●	●
		CCGW09T302	0.2	●	●	●
		CCGW09T304	0.4	●	●	●
		CCGW09T308	0.8	●	●	●
		DCGW070202	0.2	●	●	●
		DCGW070204	0.4	●	●	●
		DCGW070208	0.8	●	●	●
		DCGW11T302	0.2	●	●	●
		DCGW11T304	0.4	●	●	●
		DCGW11T308	0.8	●	●	●
		TPGW080202	0.2	●	●	●
		TPGW080204	0.4	●	●	●
		TPGW080208	0.8	●	●	●
		TPGW090202	0.2	●	●	●
		TPGW090204	0.4	●	●	●
		TPGW090208	0.8	●	●	●
		TPGW110202	0.2	●	●	●
		TPGW110204	0.4	●	●	●
		TPGW110208	0.8	●	●	●

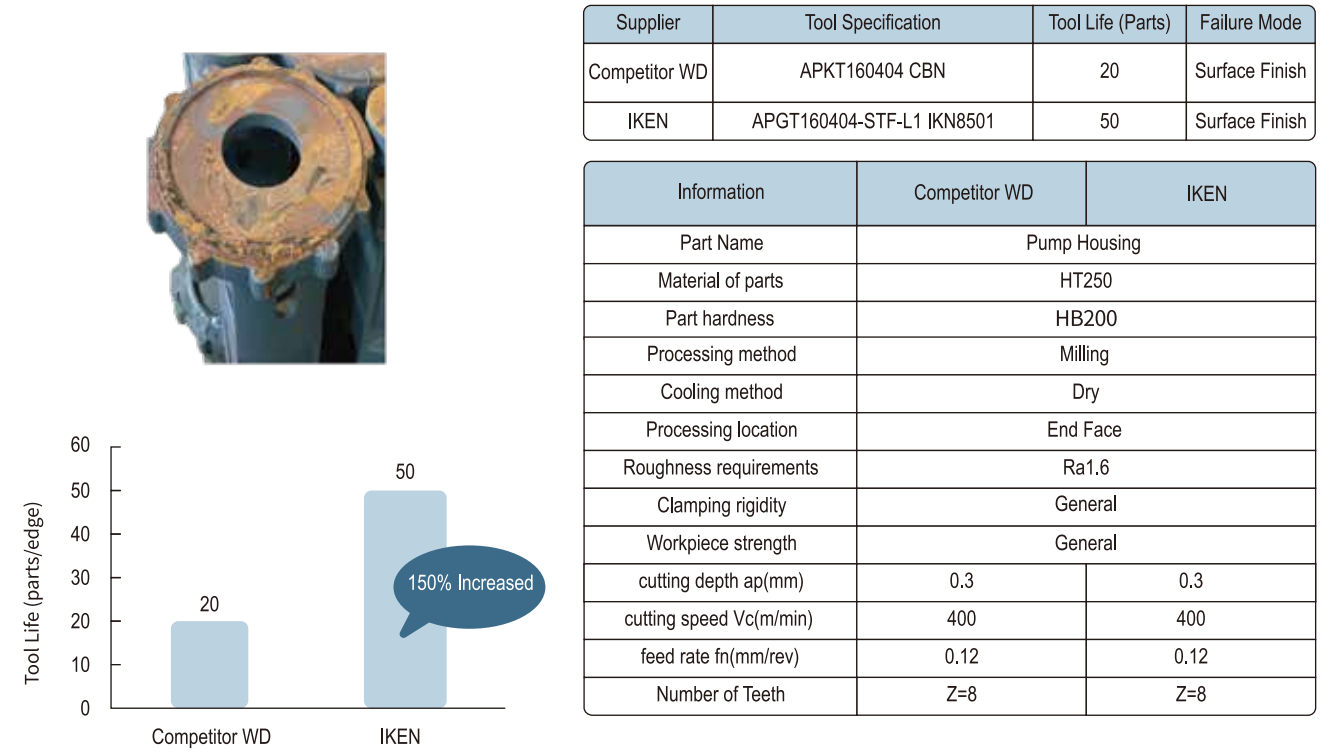
Case 1



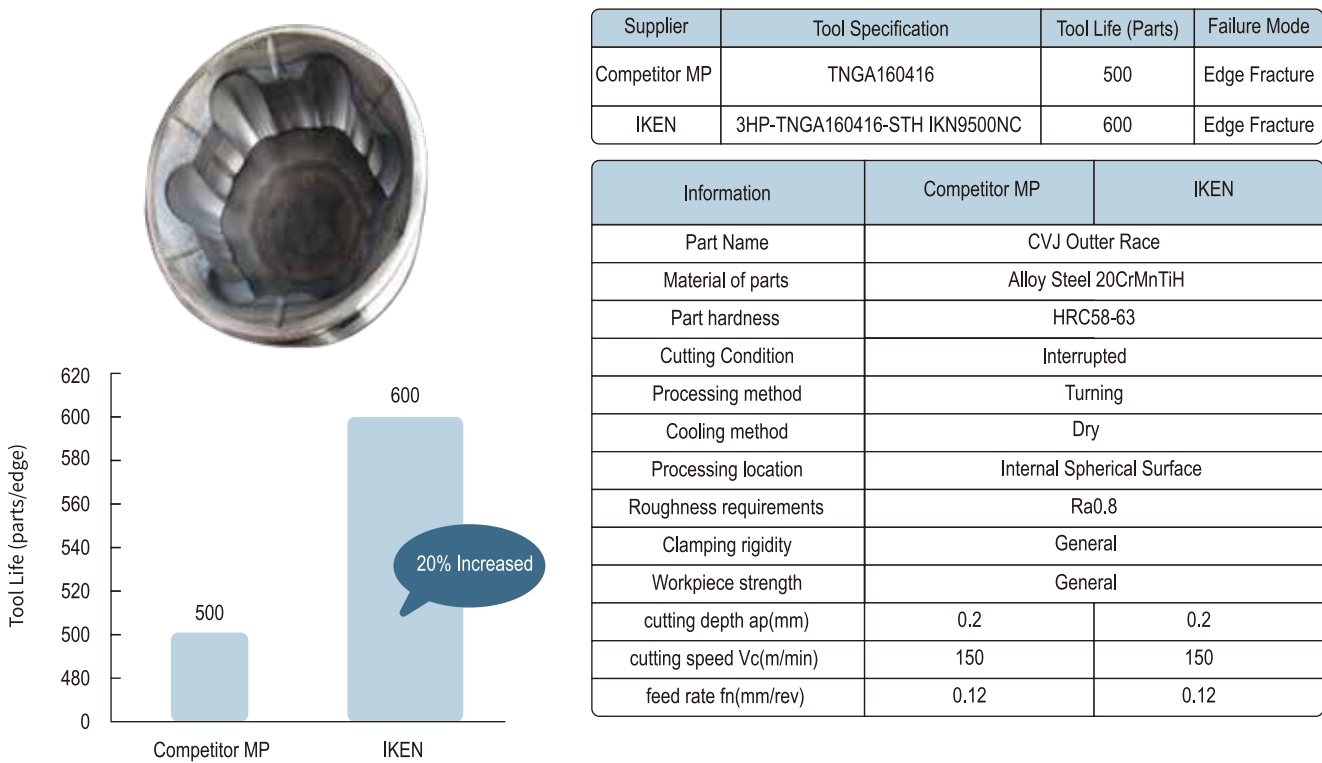
Case 2



Case 3



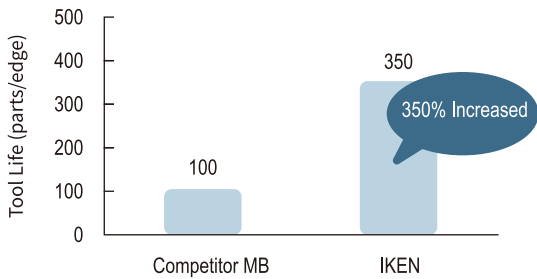
Case 4



Case 5

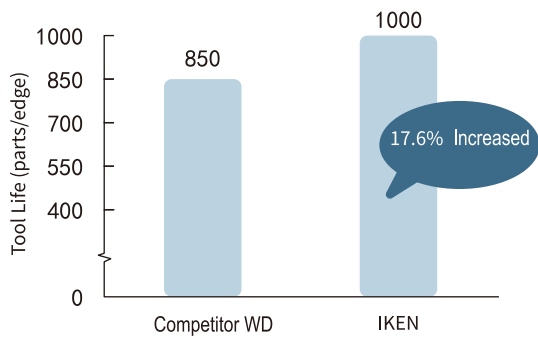


Supplier	Tool Specification	Failure Mode
Competitor MB	Special Grooving Insert, Width1.9mm, Corner RO.5	Edge Fracture
IKEN	GBR43190-050 IKN9500NC	Edge Fracture



Workpiece Name	Gear Shaft
Workpiece Material	20CrMnTi
Workpiece Hardness	HRC58-63
Clamping rigidity	Fine
Cooling method	Dry
cutting speed Vc(m/min)	75
Feed f(m/rev)	0.04
Cutting Depth Ap(mm)	3.2
Operation	Grooving
Machining Position	External Groove

Case 7



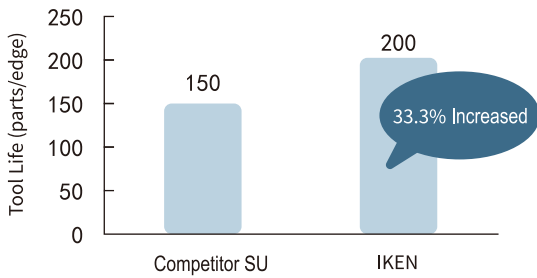
Supplier	Tool Specification	Tool Life (Parts)	Failure Mode
Competitor WD	CNGA120408	850	Surface Finish
IKEN	2HP-CNGA120408W-GP IKN1001C	1000	Surface Finish

Information	Competitor WD	IKEN
Part Name	CVJ Outter Race	
Material of parts	Alloy Steel20CrMnTi	
Cutting Condition	Continuous	
Processing method	Turning	
Cooling method	Dry	
Processing location	End Face	
Roughness requirements	Ra0.8	
Clamping rigidity	Fine	
Workpiece strength	Fine	
cutting depth ap(mm)	0.15	0.2
cutting speed Vc(m/min)	150	170
feed rate fn(mm/rev)	0.15	0.10
Rotation Speed N(rev/min)	850	960

Case 6

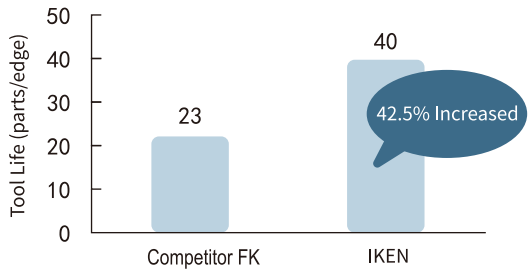
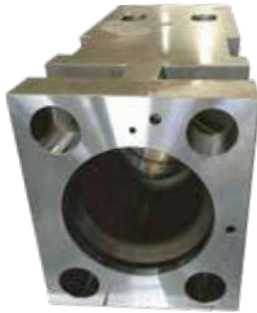


Supplier	Tool Specification	Failure Mode
Competitor SU	3T-TNGA160408 CBN Blade	Surface Finish
IKEN	3HP-TNGA160408-STF IKN4600C	Surface Finish



Workpiece Name	Transmission Gear Shaft
Workpiece Material	42CrMo
Workpiece Hardness	HRC58-62
Clamping rigidity	Fine
Cooling method	Wet Cutting
cutting speed Vc(m/min)	220
Feed Rate Fn(mm/rev)	0.11
Cutting Depth Ap(mm)	0.12
Machining Type	Turning
Machining Position	Externa Diameter

Case 8



Supplier	Tool Specification	Tool Life (Parts)	Failure Mode
Competitor FK	CNGA120408	23	Wear
IKEN	CNGA120412 IKN60C	40	Wear

Information	Competitor FK	IKEN
Part Name	Cylinder of Hydraulic Impactor	
Material of parts	Alloy Steel 42CrMo	
Cutting Condition	Heavy Interrupted	
Processing method	Turning	
Cooling method	Dry	
Processing location	End Face	
Clamping rigidity	Fine	
Workpiece strength	Fine	
cutting depth ap(mm)	0.5	0.5
cutting speed Vc(m/min)	110	110
feed rate fn(mm/rev)	0.15	0.15
Rotation Speed N(rev/min)	600	600

IKEN PRODUCTS EXPANSION



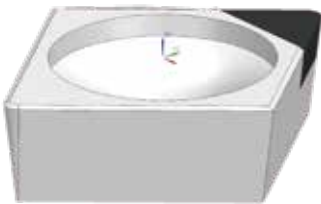
Insert for Turning

Negative / CN, DN, VN, TN, WN, etc

- ※ CBN Block Brazed Type Added
- Application: Large Cutting Depth
- High Feed Rate
- Interrupted Cutting



↑
Block



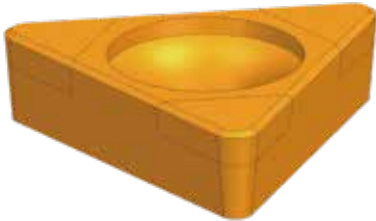
IC: 3.97mm

Positive / CC, CP, TC, TP, DC, VB, etc.

- ※ Very Small Size Insert Available, For Instance , CCGW030102

Positive / CC, CP, TC, TP, DC, VB, etc.

- ※ Small Inserts with Multy-Edges Available for Cost Advantage
- For Instance , 3HP-TBGW060104 , 2HP-CCGW040101 , etc.



IC: 3.97mm



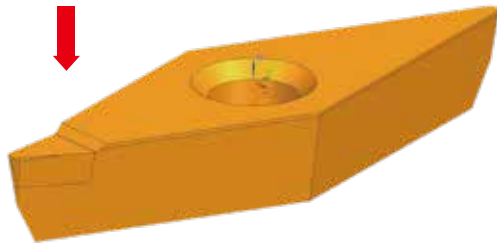
IC: 4.76mm

Insert for Turning

Positive / CC, CP, TC, TP, DC, VB, etc.

- ※ Very Small Nose Radius

R0.05 Available



Negative / Positive

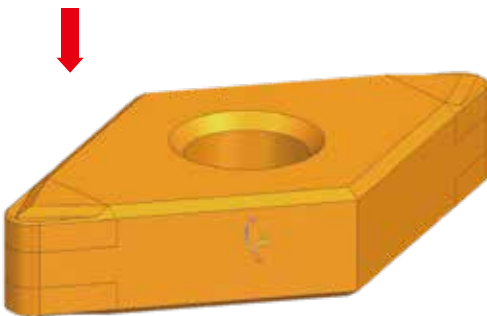
Wiper Available for the Following Application:

- ※ Better Surface Quality Achieved with Same Feed Rate
- ※ High Feed Rate Achieved with Same Surface Quality
- ※ Specific Surface Quality like Rmr , Rpk , etc. Achieved by Tailor-Made Solution



Wiper

Chip-Breaker

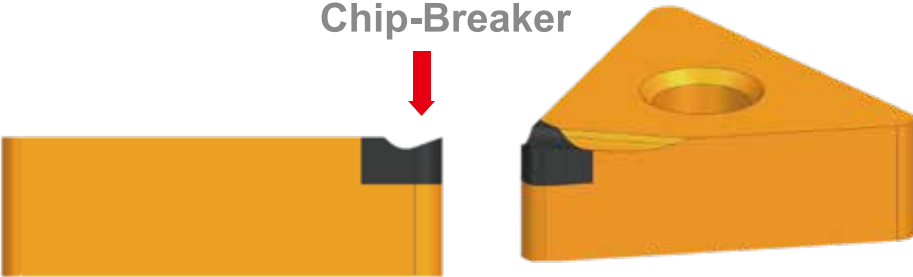


Insert for Turning

Negative / Positive

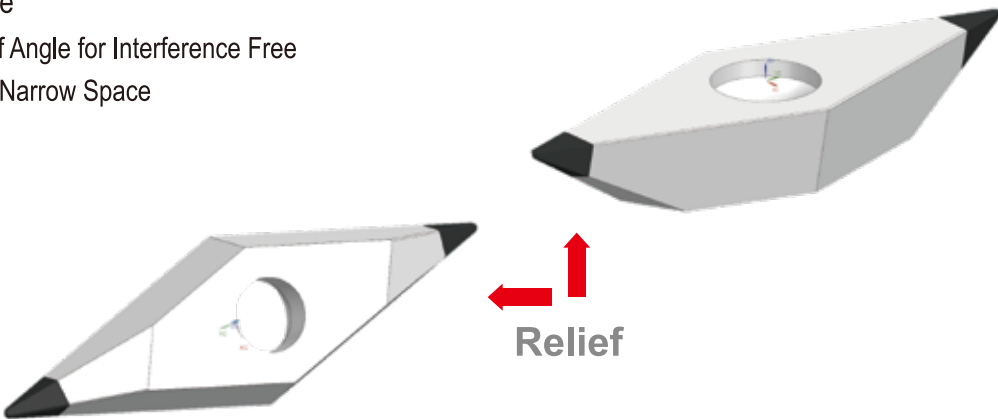
- ※ Chip-breaker Available for the Following Application:
Better Chip Control
Carburized Layer removal
Large Cutting Depth

Chip-Breaker



Negative / Positive

- ※ Special Relief Angle for Interference Free
Machining in Narrow Space



Insert for Milling

Negative / Positive

- ※ Shape , Size , Function , etc. Tailor-Made Solution



Should Milling / Face Milling

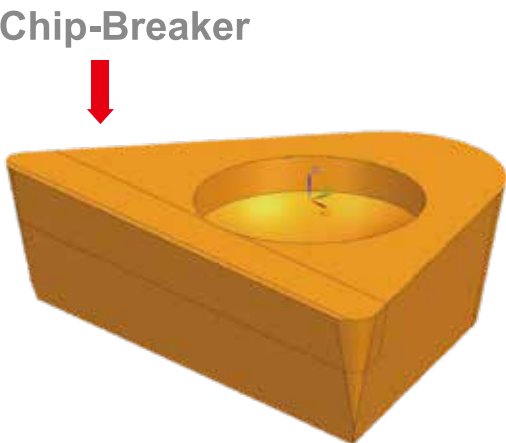
Insert for Milling



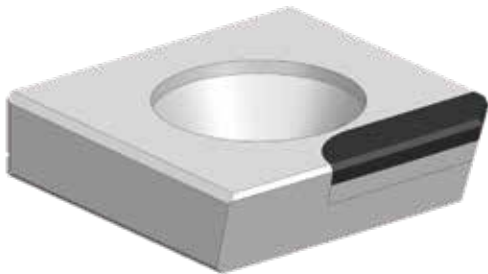
Tangentially Installed
※ Shape , Size , Function , etc. Tailor-Made Solution

Should Milling / Face Milling

Negative / Positive
※ Long Cutting Edge Available for Specific Application



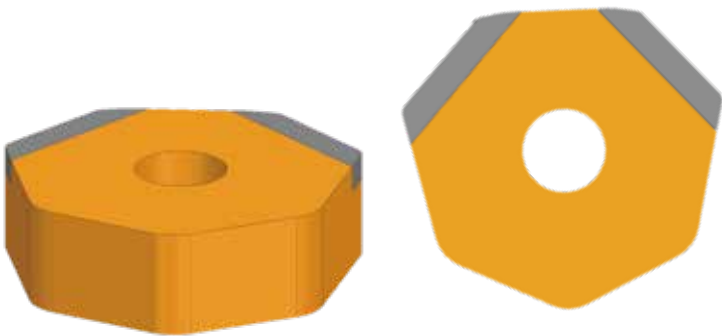
Chip-Breaker



Negative / Positive
※ Shape , Size , Function , etc. Tailor-Made Solution

Wiper for Superfinishing

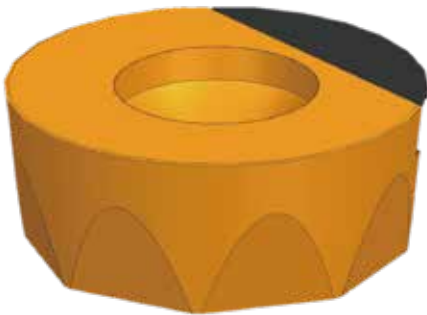
Insert for Milling



Negative / Positive
※ Shape , Size , Function , etc. Tailor-Made Solution

Wiper for Better Surface Finish

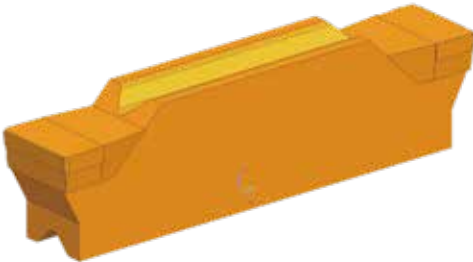
Negative / Positive
※ Shape , Size , Function , etc. Tailor-Made Solution



Face Milling

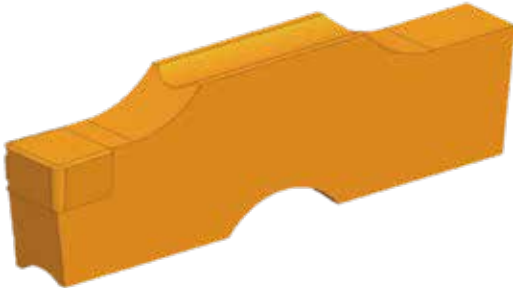
Insert for Grooving

IKGMN(L\R)150、 200、 250、 300、 400、 500、 600
※ Economic Universal Series



2 Cutting Edges Available

Insert for Grooving

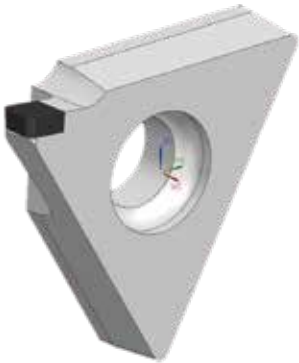


IKGSN (L\R) 200、300、400、500
※ High-Performance Universal Series

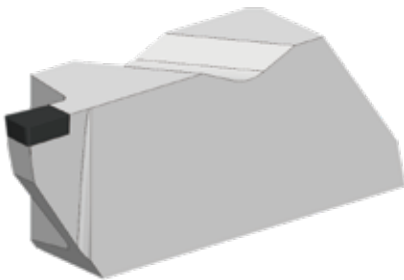
High Rigidity Clamping System

IKGB (L\R)

- ※ Popular Series for Narrow and Shallow Groove
- Specific Width and Radius Available



Normal Width 1.0 – 4.0mm



IGBT (L\R)

- ※ Top Clamping Series for Narrow and Shallow Groove
- Specific Width and Radius Available

High Rigidity

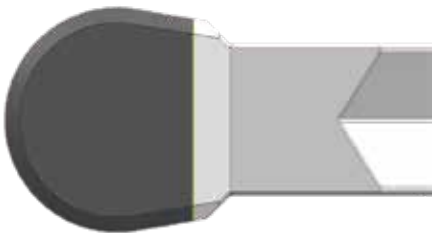
Tailor-Made Solution Available

- ※ External Groove
- ※ Internal Groove
- ※ Face Groove

Insert for Grooving

Tailor-Made

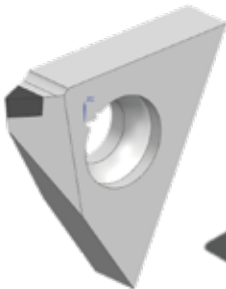
- ※ Full Radius Edge available for Copying



Economic Series

Insert for Threading

60°Metric



Tailor-Made

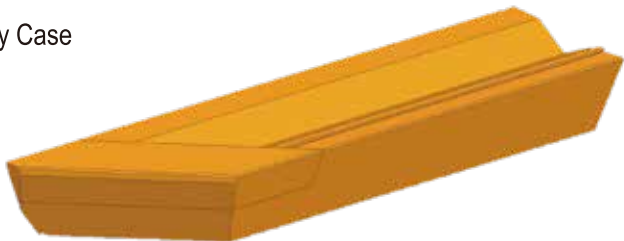
- ※ Varied Thread Type available
- 60° , 55° , 90° , etc.
- Partial Profile or Full Profile



Insert for Chamfering

Negative / Positive

- ※ Tailor-made Solution Provided Case by Case

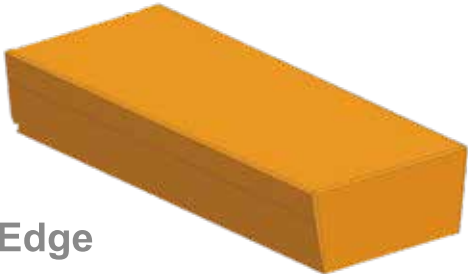


Valve Seat Ring
On Automobile Engine Cylinder Head

Insert for Shaving

Tailor-Made

- ※ Surface Without Tiny Helical Line Achieved
- Very High Efficiency
- Very Long Tool Life



Straight Cutting Edge
Y-axis Feeding

Boring Bar

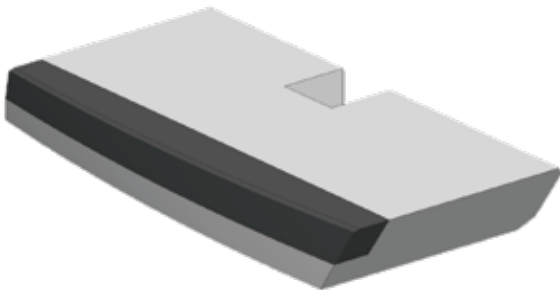
Tailor-Made



Fully Automated Mass Production

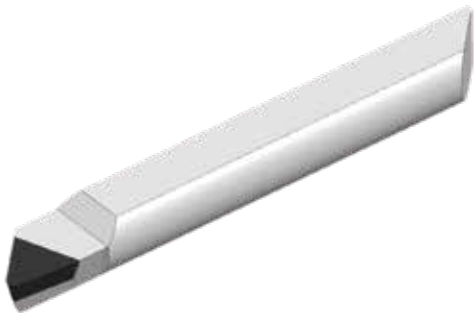
Tailor-Made

- ※ Surface Without Tiny Helical Line Achieved
- Very High Efficiency
- Very Long Tool Life



Curve Cutting Edge
Tool Rotating

Tailor-Made

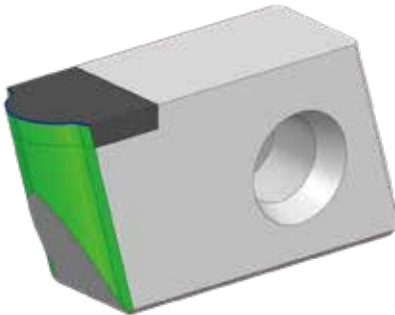


Fully Automated Mass Production

Insert for Whirling

Tailor-Made

- ※ High Accurate Screw Groove Profile
- High Quality Surface
- High Efficiency
- Long Tool Life



High Accurate Profile

Trouble Shooting

The failure mode of cutting tool is determined by the workpiece material, the CBN grade and the machining conditions. The following trouble shooting recommendation according to different failure mode is provided for your better use of CBN tools to achieve a longer tool life.

Excessive Flank Wear 	※ Increase Cutting Speed ※ Increase Feed Rate ※ Check Tool Center ※ Check Ferrite Content of the Workpiece
Excessive Crater Wear 	※ Reduce Cutting Speed ※ Reduce Feed Rate ※ Reduce Chamfer Angle ※ Use Coated Inserts ※ Use Coolant (Limited to Continuous Cutting)
Notch 	※ Increase Cutting Speed ※ Reduce Feed Rate ※ Reduce Chamfer Angle (Preferably Round Inserts) ※ Adjust Depth of Cut ※ Use Negative Chamfer Inserts
Chipping 	※ Use Inserts with Negative Chamfer and Edge Preparation ※ Enhance System Rigidity ※ In intermittent cutting, chamfer the grooves or holes on the workpiece where the tool enters and exits to prevent impact damage ※ Adjust Cutting Speed to Eliminate Vibration
Flaking on the Rake Face (Continuous Cutting) 	※ Increase Cutting Speed ※ Reduce Feed Rate ※ Adopt Negative Chamfer and Edge Preparation ※ Check Tool Center ※ Reduce the Approach Angle of the Insert
Flaking on the Rake Face (Interrupted Cutting) 	※ Do Not Use Coolant ※ Adopt Negative Chamfer and Edge Preparation ※ Reduce Feed Rate ※ Increase Cutting Speed ※ Check Tool Center ※ Reduce the Approach Angle of the Insert
Catastrophic Fracture 	※ Reduce Depth of Cut (Reduce Cutting Load) ※ Reduce Cutting Speed ※ Increase Tool Tip Radius (If permitted, use round inserts) ※ Increase Cutting Speed ※ Check Tool Center
Insert Breakage (Solid CBN Inserts) 	※ Check if the Tool Holder is Clean ※ Check if the Insert Shim is Secure ※ Do Not Use Damaged Shims ※ Do Not Use Damaged Clamp Plates ※ Check Tool Center

Note: The cutting parameter adjustment within the recommended range is preferred

