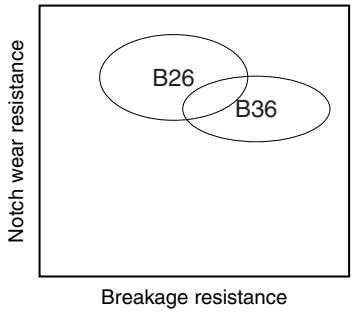
NTK

CBN / Diamond Coated Carbide

CBN B16·B26·B36

Grade	Style	Applications	Typical parts
B16	Solid	Rough & Finish turning gray iron	Brake disks & drums
			Cylinder liners
B26	Single or Multi tipped	Hardened steel (Continuous - Interruption)	Gears Shafts
B36	Multi tipped	Hardened steel (Interruption)	Gears Shafts

Turning hardened steel



■B16

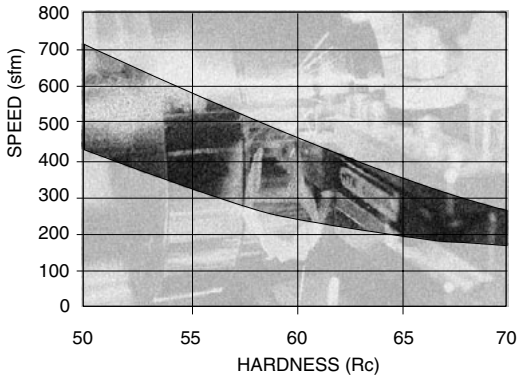
B16 is a solid PVD coated CBN grade with a high CBN content. An increased CBN content and a binder high in binding force, B16's main range application is cast iron machining.

General applications	Cutting speed (SFM)
Rough turning	500 - 3500
Finish turning	1000 - 5000

■B26

B26 is a CBN grade which has the combined toughness and wear resistance needed for high performance hard turning steel applications. B26 is available in petite (single use) sizes but with multi-tipped cutting edges.

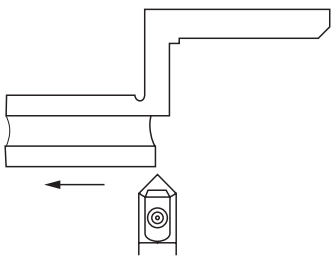
Recommended Speed Range for B26 & B36

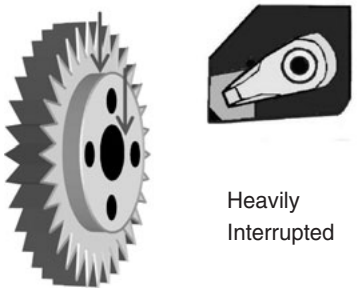


■B36

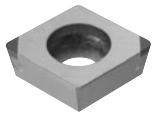
B36 is a special ceramic bonded CBN grade.
B36 has the combined toughness and thermal shock resistance needed for interrupted hard turning applications.

● Case Study

Brake disk (Rough)	Longer tool life
● Material Gray cast iron ● Insert SNM435 ● 3500 SFM ● .028 IPR ● .040" DOC ● With coolant	
NTK : B16	***800 pcs/edge***
CBN	650 pcs/edge

Gear (61-65RC)	Constant tool life
● Material 5120H ● Insert CNGA432 ● 430 SFM ● .006 IPR ● .004" DOC ● No coolant	 Heavily Interrupted
NTK : B36	***50 pcs/edge***
CBN	20 - 50 pcs/edge

● CCMW

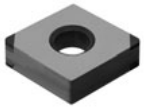


Insert Order Number	ISO Catalog Number	Grade			Dimensions (inch)			
		B16	B26	B36	# of edge	IC	T	R
CCMW 21.51 P	CCMW 060204 P		●		1	1/4	3/32	1/64
21.52 P	060208 P		●		1	1/4	3/32	1/32
32.51 PD	09T304 PD		●		2	3/8	5/32	1/64
32.52 PD	09T308 PD		●		2	3/8	5/32	1/32

For details of boring bars, see page 168.

● : Stock ★ : 2 weeks delivery

● CNGA / CNMA

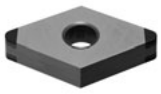


Insert Order Number	ISO Catalog Number	Grade			Dimensions (inch)			
		B16	B26	B36	# of edge	IC	T	R
CNGA 431 PQ	CNGA 120404 PQ			★	4	1/2	3/16	1/64
CNMA 431 PD	CNMA 120404 PD		●		2			
CNGA 432 PQ	CNGA 120408 PQ			★	4			1/32
CNMA 432 PD	CNMA 120408 PD		●		2			
433 PQ	120412 PQ			★	4			3/64
PD	PD		●		2			

For details of toolholders, see pages 121 and 128.

● : Stock ★ : 2 weeks delivery

● DNGA / DNMA



Insert Order Number	ISO Catalog Number	Grade			Dimensions (inch)			
		B16	B26	B36	# of edge	IC	T	R
DNGA 431 PQ	DNGA 150404 PQ			★	4	1/2	3/16	1/64
DNMA 431 PD	DNMA 150404 PD		●		2			
DNGA 432 PQ	DNGA 150408 PQ			★	4			1/32
DNMA 432 PD	DNMA 150408 PD		●		2			
433 PQ	150412 PQ			★	4			3/64
PD	PD		●		2			

For details of toolholders, see pages 122, 123 and 128.

● : Stock ★ : 2 weeks delivery

● RNM

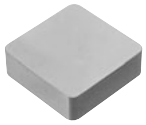
Insert Order Number	ISO Catalog Number	Grade			Dimensions (inch)			
		B16	B26	B36	# of edge	IC	T	R
RNM 42S TN	RNMN 42S TN	★			Solid	1/2	1/8	–
43S TN	43S TN	★			Solid		3/16	–

Edge prep: TN is T0425

For details of toolholders, see page 116.

● : Stock ★ : 2 weeks delivery

● SNM



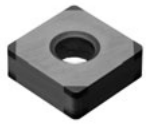
Insert Order Number	ISO Catalog Number	Grade			Dimensions (inch)			
		B16	B26	B36	# of edge	IC	T	R
SNM 322S TNB	SNMN 322S TNB	★			Solid	3/8	1/8	1/32
323S TN	323S TN	★			Solid			3/64
422S TN	422S TN	★			Solid	1/2	1/8	1/32
423S TN	423S TN	★			Solid			3/64
432S TN	432S TN	★			Solid		3/16	1/32
433S TNF	433S TNF	★			Solid			3/64
434S TNF	434S TNF	★			Solid			1/16

Edge prep: TNB is T0225, TN is T0425, TNF is T0825

● : Stock ★ : 2 weeks delivery

For details of toolholders, see pages 117, 118, 125 and 129.

● SNGA / SNMA

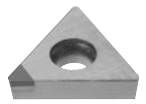


Insert Order Number	ISO Catalog Number	Grade			Dimensions (inch)			
		B16	B26	B36	# of edge	IC	T	R
SNGA 432 PE	SNGA 120408 PE			★	8	1/2	3/16	1/32
SNMA 432 PQ	SNMA 120408 PQ		●		4			
433 PE	120412 PE			★	8			3/64
PQ	PQ		●		4			

For details of toolholders, see pages 125 and 129.

● : Stock ★ : 2 weeks delivery

● TCMW



Insert Order Number	ISO Catalog Number	Grade			Dimensions (inch)			
		B16	B26	B36	# of edge	IC	T	R
TCMW 21.51 P	TCMW 110204 P		●		1	1/4	3/32	1/64

For details of boring bars, see page 169.

● : Stock ★ : 2 weeks delivery

● TNM

Insert Order Number	ISO Catalog Number	Grade			Dimensions (inch)			
		B16	B26	B36	# of edge	IC	T	R
TNM 223S TNC	TNMN 223S TNC	★			Solid	1/4	1/8	3/64
332S TN	332S TN	★			Solid	3/8	3/16	1/32
333S TNF	333S TNF	★			Solid			3/64

Edge prep: TN or TNC is T0425, TNF is T0825

● : Stock ★ : 2 weeks delivery

For details of toolholders, see pages 126 and 127.

● TNGA / TNMA

Insert Order Number	ISO Catalog Number	Grade			Dimensions (inch)			
		B16	B26	B36	# of edge	IC	T	R
TNGA 331 PH	TNGA 160404 PH			★	6	3/8	3/16	1/64
TNMA 331 PT	TNMA 160404 PT		●		3			
TNGA 332 PH	TNGA 160408 PH			★	6			1/32
TNMA 332 PT	TNMA 160408 PT		●		3			
333 PH	160412 PH			★	6			3/64
PT	PT		●		3			

For details of toolholders, see pages 126 and 127.

● : Stock ★ : 2 weeks delivery

● TPM

Insert Order Number	ISO Catalog Number	Grade			Dimensions (inch)			
		B16	B26	B36	# of edge	IC	T	R
TPM 321 PT	TPMN 160304 PT		●		3	3/8	1/8	1/64
322 PT	160308 PT		●		3			1/32

● : Stock ★ : 2 weeks delivery

● VNGA / VNMA

Insert Order Number	ISO Catalog Number	Grade			Dimensions (inch)			
		B16	B26	B36	# of edge	IC	T	R
VNGA 331 PQ	VNGA 160404 PQ			★	4	3/8	3/16	1/64
VNMA 331 PD	VNMA 160404 PD		●		2			
VNGA 332 PQ	VNGA 160408 PQ			★	4			1/32
VNMA 332 PD	VNMA 160408 PD		●		2			

For details of toolholders, see pages 123 and 124.

● : Stock ★ : 2 weeks delivery

Diamond Coated UC2

Best Performance for

Al alloy (High Si Al alloy), MMC(FRM)

Ceramics, Reinforced ceramics, Carbon

Features

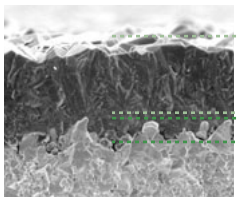
Improvement in Wear Resistance

Superior wear resistance designed for hard-to-cut aluminum material i.e. High Si Al alloy and MMC material.

Physical Performance

	UC2	Natural diamond	DLC	PCD
Crystal structure	Diamond	Diamond	Amorphous	Diamond
Bonded phase	None	None	None	Co, Ni, etc
Density(g/cm³)	3.5	3.5	1.7 - 2.2	4.1
Young's modulus(GPa)	1000	280 - 300	280 - 300	800
Hardness(GPa)	100	90 - 120	10 - 50	10 - 50

Composition of Diamond Coating



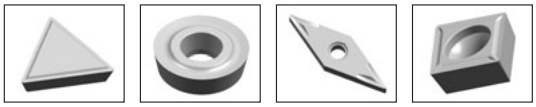
Fine and thick diamond layer has improved wear resistance performance.

Special surface treatment has improved spalling resistance performance.

Variety in Shapes

- Moulded chipbreakers ensure better chip control.
- UC2 inserts have a deeper cutting potential due to the coating covering the whole cutting edge.

Types of shapes

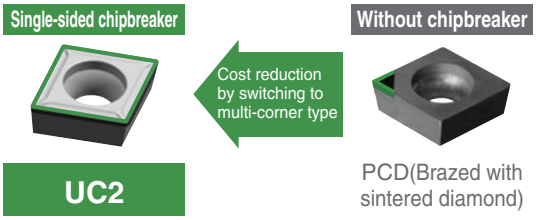


Lower Cost

Available in multi cornered geometries and no re-grinding cost.

Effective cutting-edge area

Note: The line indicates an effective cutting-edge area.



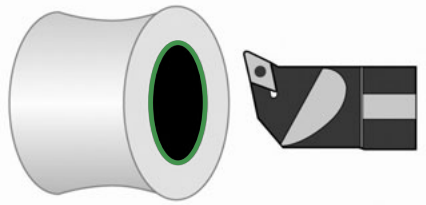
Characteristics of Material

UC2 has well-balanced durability against spalling and abrasion.

Boring of Al Alloy

Material	Competitor's PCD (Sintered diamond)	UC2
Part number	Brazed cutter	SPMW090312 (4-corner type)
Cutting speed	600m/min	←
Feed rate	0.4mm/rev	←
Cutting depth	4.0 mm (Total)	←
Coolant	WET	←
Tool life	3,000 pcs/cornerr	6,000 pcs/corner

Part name	Hub of Motor-bike
Material	Aluminum alloy



・**UC2** with a molded chipbreaker breaks up the chips to a manageable size. The operator has to stop the machine in remove the chips when using the PCD insert.

Chips by PCD

Scale: 0.4"

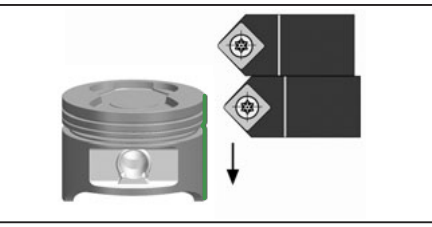
Chips by UC2

Scale: 0.4"

Outer Roughing of Al Alloys

Material	Competitor's PCD (Sintered diamond)	UC2
Part number	Brazed cutter	SPMW090312 (4-corner type)
Cutting speed	600m/min	←
Feed rate	0.4mm/rev	←
Cutting depth	4.0 mm (Total)	←
Coolant	WET	←
Tool life	3,000 pcs/corner	6,000 pcs/corner

Part name	Piston
Material	Aluminum alloy(Al+13vol%Si)

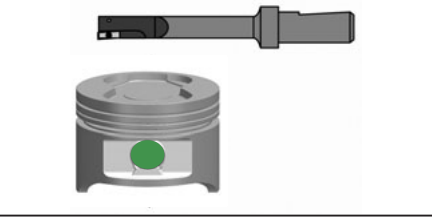


・**UC2** doubled tool life over the PCD. Productivity was improved.
・Although the PCD can be re-ground eight times, **UC2** allowed a cost reduction by extending the life of the tool and using a four-cornered insert.

Rough Boring of Al Alloys

Material	Competitor's PCD (Sintered diamond)	UC2
Part number	TPGW110304 (1 cutting edge)	Special shape (2 cutting edges)
Cutting speed	8000m/min^{-1}	←
Feed rate	0.15mm/rev	←
Cutting depth	3.0mm	←
Coolant	WET	←
Tool life	1 pc/corner	8,000 pcs/corner

Part name	Piston
Material	Aluminum alloy(Al+13vol%Si)

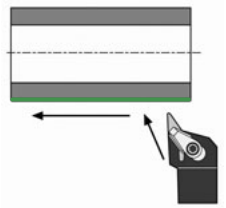


・The competitor's PCD insert cannot machine a single part because of chatter and the brazed tip coming off.
・The long effective cutting-edge on the **UC2** inserts can take deeper cuts, and its chipbreaker eliminated chatter.

Ceramics Outer Diameter Finishing

Material	Competitor's PCD (Sintered diamond)	UC2
Part number	Brazed cutter (w/out chipbreaker)	VNMM160404-ZP (2-corner, w/molded chipbreaker)
Cutting speed	150m/min	←
Feed rate	0.2mm/rev	←
Cutting depth	8.0mm	←
Coolant	DRY	←
Tool life	300 pcs/corner	400 pcs/corner

Part name	Vacuum switch parts
Material	Ceramic calcined body



- The life of **UC2** can be extended to 1.3 times that of a competitor's PCD tool, thus allowing productivity to be correspondingly improved.
- **UC2** insert can cut to greater depths than conventional PCD tools. This features requires less insert changes.

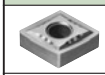
Aluminum Alloy Plunge Cutting

Material	Carbide	UC2
Part number	Special shape	BSMN3207Z24 (Formed insert)
Cutting speed	148m/min	←
Feed rate	0.06mm/rev	←
Cutting depth	3.0mm	←
Coolant	WET	←
Tool life	5,000 pcs/corner	50,000 pcs/cornerr

Part name	Two-wheel cylinder, mouth-chamfered
Material	Aluminum alloy(Al+12vol%Si)

- Carbide inserts caused too much build-up edge which resulted in insert failure.
- **UC2** has excellent build-up edge resistance. **UC2** comes in a variety of shapes and can extend tool life 10 times vs. carbide inserts.

Standard Stock

Shape	Insert Order Number	ISO Catalog Number	UC2	Screw	Wrench
 Single-sided chipbreaker	CNMM 431 ZP	CNMM 120404 ZP	★	–	–
 Single-sided chipbreaker	TNMM 331 ZP	TNMM 160404 ZP	★	–	–
 Single-sided chipbreaker	VNMM 331 ZP	VNMM 160404 ZP	★	–	–
 Single-sided chipbreaker	CCMT 21.51 AM3	CCMT 060204 AM3	★	LRIS - 2.5×7	RLR - 15S
	CCMT 32.51 AM3	CCMT 09T304 AM3	★	LRIS - 4×6 LRIS - 4×8	LLR - 25S
 Single-sided chipbreaker	CCMT 32.52 AF1	CCMT 090308 AF1	★		
 Single-sided chipbreaker	DCMT 32.51 AM3	DCMT 11T304 AM3	★		
 Without chipbreaker	SPM 421	SPPN 120304	★	–	–
 Single-sided chipbreaker	SPMR 421 AF1	SPMR 120304 AF1	★	–	–
 Single-sided chipbreaker for left-handed use	TCMT 21.51L AP	TCMT 110204L AP	★	LRIS - 2.5×7	RLR - 15S
	TCMT 21.52L AP	TCMT 110208L AP	★		
 Wiper Single-sided chipbreaker for left-handed use	TCMT 21.51 WL AP	TCMT 110204 WL AP	★		
 Single-sided chipbreaker for left-handed use	TPMT 221L AP	TPMT 110304L AP	★		
	TPMT 222L AP	TPMT 110308L AP	★		
 Single-sided chipbreaker for left-handed use	TPMR 221L AP	TPMR 110304L AP	★	–	–
 Single-sided chipbreaker for left-handed use	TPMR 321 AF1	TPMR 160304 AF1	★	–	–
 Single-sided chipbreaker for left-handed use	TPMP 631L AP	TPMH 080204L AP	★	LR - S - 2×4.4 LR - S - 2×5.5	RLR-13S
	TPMT 631L AP	TPMT 080204L AP	★	–	
	TPMP 731L AP	TPMH 090204L AP	★	LR - S - 2.5×4.8 LR - S - 2.5×6	RLR - 15S
	TPMH 221L AP	TPMH 110304L AP	★	LR - S - 3×6.2 LR - S - 3×7.8	RLR - 20S
	TPMH 321L AP	TPMH 160304L AP	★	LR - S - 4×5.8 LR - S - 4×9	RLR - 20S
 Wiper Single-sided chipbreaker for left-handed use	TPMT 631 WL AP	TPMT 080204 WL AP	★	–	–
 Single-sided chipbreaker	RPMX 42 MO GB	RPMX 1203 MO GB	★	–	–
 Single-sided chipbreaker	VCMT 221 AM3	VCMT 110304 AM3	★	LRIS - 2.5×7	RLR - 15S

★ : 2 weeks delivery