

PCBN Material Introduction S

Hardened steel / Cast iron / Powder metallurgy



Powder metallurgy Machining

Grade	Content (%)	Grain (μm)	Bond	Structure	Features
TQS0117	85-90	1-4	Metallic compound		Suitable for continuous processing in powder metallurgy with excellent anti-cracking resistance and outstanding chemical stability
TQS0126	60-65	0.5-3	TiN		Suitable for hardening of powder metallurgy with excellent high-temperature resistance
TQS2005	90-95	0.5-1.5	Metallic compound		Suitable for finishing and interrupted cutting of powder metallurgy with excellent toughness and sharpness
TQS2017	85-95	1-2	Metallic compound		A universal grade for machining powder metallurgy
TQS2019	85-90	1-3	Metallic compound		Suitable for interrupted cutting of powder metallurgy featuring excellent toughness and wear resistance

Application S

Sharp Cutting Edge: E0000005
Standard Cutting Edge: S0101505
Strong Cutting Edge: S0153510

PCBN Grade	Cutting Recommendation		
	Cutting Speed Vc(m/min)	Feed Rate f(mm/rev)	Cutting Depth ap(mm)
TQS0117	450-800	0.1-0.3	0.1-0.7
TQS0126	150-300	0.1-0.3	0.1-0.7
TQS2005	450-800	0.1-0.3	0.1-0.7
TQS2017	450-800	0.1-0.3	0.1-0.7
TQS2019	450-800	0.1-0.3	0.1-0.7

★ This mark indicates this material is the preferred material, depending on the actual working condition

Application Case Studies and Recommendations



Workpiece: Hollow input shaft Workpiece material: 20CrNiMo
Hardness: 80HRamin Machining part: Inner hole
Cooling type: Liquid coolant Machining condition: Continuous cutting
Surface finish: Ra1.2 Allowance: 0.15mm

	Previous	Tbeli
Insert	CCGW09T308	CCGW09T308
Grade	PCBN	0120
Cutting edge	-	SLWG22C3
Coating	Coated	C3
Ap(mm)	0.1	0.1
Vc(m/min)	160	160
Feed(mm/rev)	0.15	0.15

Workpiece: Bearing outer ring Workpiece material: G20CrNiMo
Hardness: HRC48-62 Machining part: End face& Outer diameter
Cooling type: Liquid coolant Machining condition: Continuous cutting
Surface finish: Ra1.6 Allowance: 1.1mm for outer circle/ 1.7mm for end face

	Previous	Tbeli
Insert	CNGA120408	CNGA120408
Grade	PCBN	1022
Cutting edge	—	SLST30CE
Coating	Coated	CE
Ap(mm)	0.3	0.3
Vc(m/min)	180	180
Feed(mm/rev)	0.25	0.25

Workpiece: Wheel bearing Workpiece material: Hardened steel
Hardness: HRC58~62 Machining part: Ball track
Cooling type: Liquid coolant Machining condition: Continuous finishing
Surface finish: Ra1.6 Allowance: 0.15mm

	Previous	Tbeli
Insert	VNGA160408	VNGA160408
Grade	PCBN	1024
Cutting edge	—	SLST22CE
Coating	Coated	CE
Ap(mm)	0.15	0.15
Vc(m/min)	250	250
Feed(mm/rev)	0.16	0.16

Application Case Studies and Recommendations

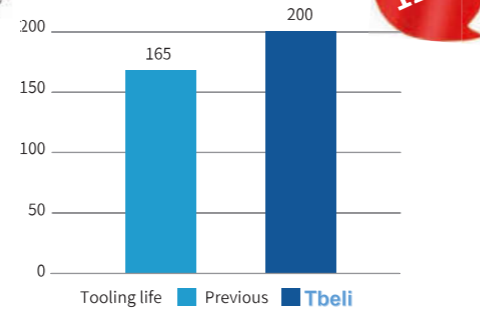


Workpiece: Pump drive wheel
 Hardness: 680HV1
 Cooling type: Liquid coolant
 Surface finish: Rz6.3

Workpiece material: 16MnCr5
 Machining part: End face& Inner hole & Chamfer
 Operation type: Continuous cutting
 Allowance: 0.15mm

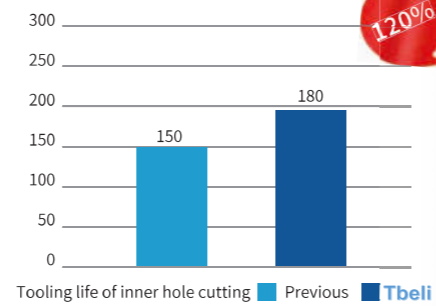
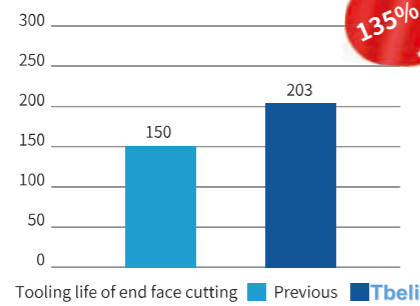


	Previous	Tbeli
Insert	VCGW110304	VCGW110304
Grade	PCBN	2016
Cutting edge	—	SLST22C3
Coating	Coated	C3
Ap(mm)	0.08	0.08
Vc(m/min)	120	120
Feed(mm/rev)	0.15	0.15



Workpiece: Reducer gear
 Hardness: HRC58~62
 Operation type: Continuous and heavy interrupted cutting
 Surface finish: Ra0.8
 Workpiece material: 20CrMoT1
 Machining part: End face/ Inner hole
 Cooling type: Liquid coolant
 Machining allowance: 0.15mm

	Previous	Tbeli
Insert	CNGA120408	CNGA120408
Grade	PCBN	2024
Cutting edge	—	SLST22C3
Coating	Coated	C3
Ap(mm)	0.25	0.25
Vc(m/min)	150	150
Feed(mm/rev)	0.25	0.25

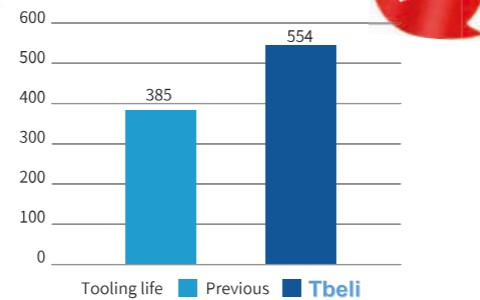


Workpiece: Outer star wheel
 Hardness: HRC58~62
 Cooling type: Air cooling
 Surface finish: Ra0.8

Workpiece material: UC1-Q
 Machining part: Ball surface
 Machining condition: Heavy interrupted cutting
 Allowance: 0.2mm



	Previous	Tbeli
Insert	TNGA160416	TNGA160416
Grade	PCBN	3019
Cutting edge	—	SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.2	0.2
Vc(m/min)	160	160
Feed(mm/rev)	0.12	0.12



Application Case Studies and Recommendations

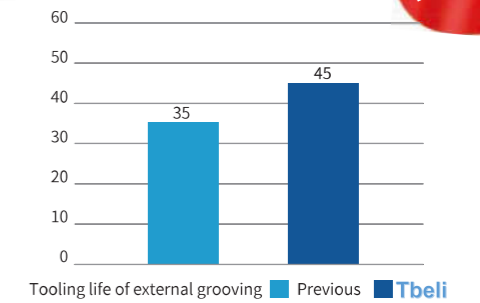


Workpiece: Spindle
 Hardness: HRC58~62
 Cooling type: Dry cutting
 Surface finish: Ra0.8

Workpiece material: ETN22-X
 Machining part: End face
 Machining condition: Heavy interrupted cutting
 Machining allowance: 0.2mm

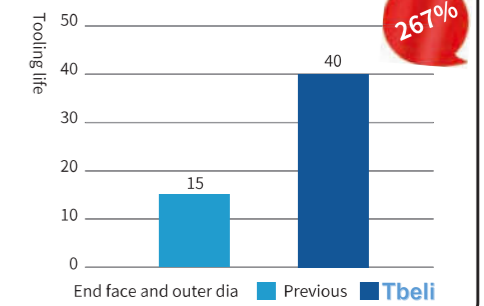
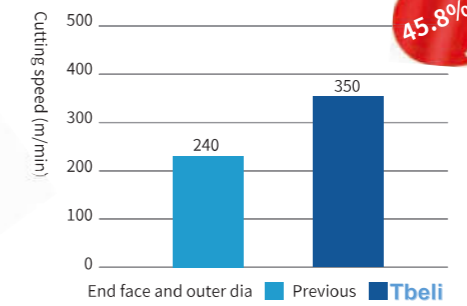


	Previous	Tbeli
Insert	VNGA160404	VNGA160404
Grade	PCBN	3023
Cutting edge	—	SLST22C3
Coating	Coated	C3
Ap(mm)	0.2	0.2
Vc(m/min)	90	90
Feed(mm/rev)	0.06	0.06



Workpiece: Differential
 Hardness: HB220~240
 Workpiece material: Ductile iron600-3
 Machining part: End face / Outer dia
 Machining condition: Continuous and interrupted cutting
 Surface finish: Ra3.2
 Cooling type: Liquid coolant
 Allowance: 0.6mm

	Previous	Tbeli
Insert	CNGA120412	CNGA120412
Grade	Carbide	0122
Cutting edge	—	SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.6	0.6
Vc(m/min)	240	350
Feed(mm/rev)	0.3	0.3

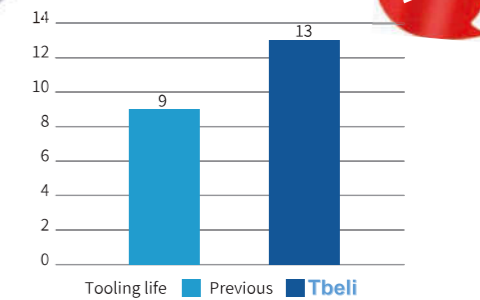


Workpiece: Scroll
 Hardness: HB190~220
 Cooling type: Liquid coolant
 Surface finish: Ra0.7

Workpiece material: QT500
 Machining part: End face
 Machining condition: Interrupted finishing
 Flatness: 0.02



	Previous	Tbeli
Insert	DCGW11T308	DCGW11T308
Grade	PCBN	0122
Cutting edge	—	SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.15	0.15
Vc(m/min)	550	550
Feed(mm/rev)	0.1	0.1



Application Case Studies and Recommendations

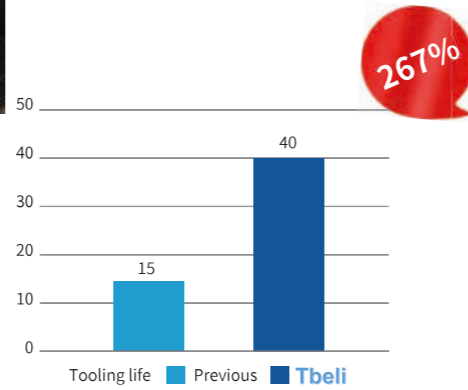


Workpiece: Bush bearing
 Hardness: HB217~269
 Cooling type: Liquid coolant
 Surface finish: Ra2.0

Workpiece material: QT700
 Machining part: Outer diameter & End face
 Allowance: 0.2mm



	Previous	Tbeli
Insert	DNCA150408	DNCA150408
Grade	PCBN	0126
Cutting edge	—	SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.2	0.2
Vc(m/min)	130	130
Feed(mm/rev)	0.2	0.2

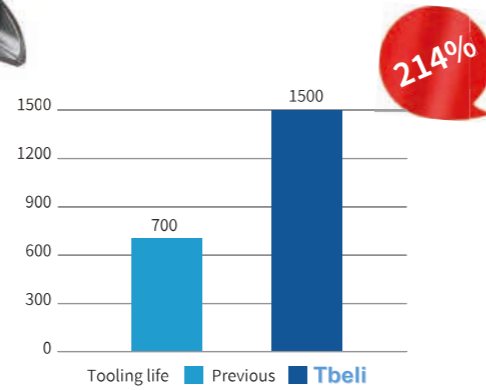


Workpiece: Cylinder block
 Hardness: HB190~220
 Cooling type: Dry cutting
 Surface finish: Rz10~20

Workpiece material: HT250
 Machining part: Inner hole
 Machining condition: Continuous cutting
 Allowance: 0.065/0.2mm

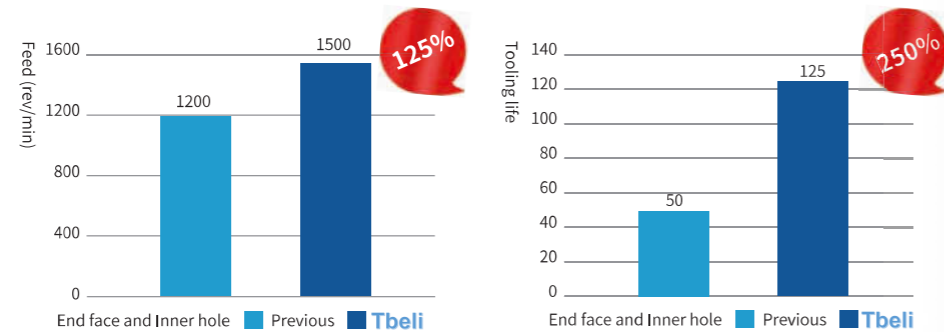


	Previous	Tbeli
Insert	CCGW09T308	CCGW09T308
Grade	PCBN	3003
Cutting edge	—	SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.065/0.2	0.065/0.2
Vc(m/min)	745	745
Feed(mm/rev)	0.15	0.15



Workpiece: Gear Hub
 Hardness: HB180~220
 Workpiece material: Powder metallurgy
 Machining part: End face / Inner hole
 Machining condition: Interrupted Cutting
 Surface finish: Ra6.3
 Cooling type: Dry Cutting
 Machining allowance: 0.15mm

	Previous	Tbeli
Insert	VCGW110306	VCGW110306
Grade	PCBN	2005
Cutting edge	—	SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.15	0.15
Vc(m/min)	1200	1500
Feed(mm/rev)	0.05	0.05



Application Case Studies and Recommendations

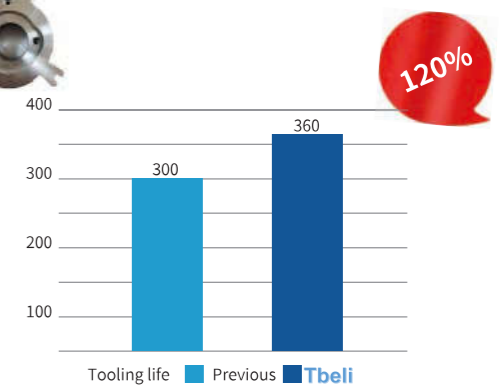


Workpiece: Rotor
 Hardness: HRC58~62
 Cooling type: Liquid coolant
 Surface finish: Rz6.3

Workpiece material: Powder metallurgy
 Machining part: End face and inner hole
 Machining condition: Continuous and interrupted cutting
 Machining allowance: 0.2mm



	Previous	Tbeli
Insert	DCGW11T302	DCGW11T302
Grade	PCBN	2007
Cutting edge	—	SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.2	0.2
Vc(m/min)	250	250
Feed(mm/rev)	0.06	0.06

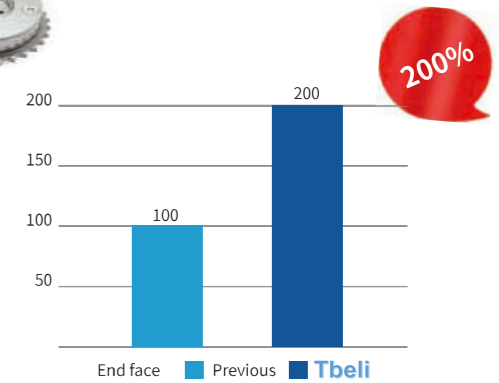


Workpiece: Timing camshaft sprocket
 Hardness: HB180~220
 Cooling type: Dry Cutting
 Surface finish: Ra1.2

Workpiece material: Powder metallurgy
 Machining part: End face
 Machining condition: Light interrupted cutting
 Flatness: 0.02



	Previous	Tbeli
Insert	DCGW11T308	DCGW11T308
Grade	PCBN	2019
Cutting edge	—	SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.1	0.1
Vc(m/min)	1900	2400
Feed(mm/rev)	0.09	0.07

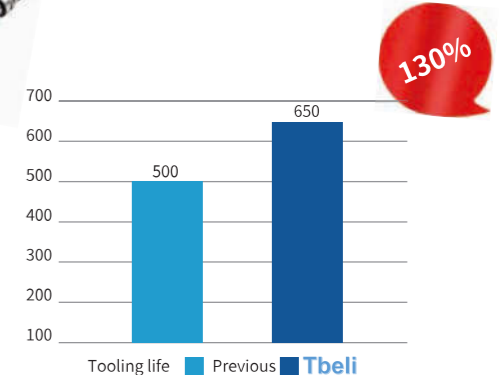


Workpiece: Camshaft
 Hardness: HB180~220
 Cooling type: Liquid coolant
 Surface finish: Ra0.8

Workpiece material: Powder metallurgy
 Machining part: End face
 Machining condition: Continuous finishing
 Flatness: 0.3



	Previous	Tbeli
Insert	VBGW160408	VBGW160408
Grade	PCBN	2019
Cutting edge	—	SLST22S
Coating	Uncoated	Uncoated
Ap(mm)	0.3	0.3
Vc(m/min)	210	210
Feed(mm/rev)	0.1	0.1



New Energy Vehicle Components

Figure	Processing conditions	Processing parameters		
	Workpiece: Motor end cover Material: Aluminum alloy Spindle: Single spindle Maximum speed: 16000RPM Adaptor: BT40 Surface finish: Ra1.25		Previous	Tbeli
		Cutter	—	
		Insert	—	
		Grade	—	PD10E
		Cutter diameter (mm)	φ100	φ100
		Number of teeth	6	16
		Cutting length (mm)	580	580
		Cutting speed (m/min)	2200	3140
		Feed per tooth (mm/z)	0.1	0.063
		Depth of cut (mm)	4.2	4.2
		Milling time roughing (s)	7.73	0
		Milling time finishing (s)	8.70	3.48
		Total (s)	16.43	3.48
		Productivity	—	4.7 X

Figure	Processing conditions	Processing parameters		
	Workpiece: Gearbox housing for commercial vehicles Material: Aluminum alloy Spindle: Single spindle Maximum speed: 16000RPM Adaptor: BT50 Surface finish: Ra1.25		Previous	Tbeli
		Cutter	Integral PCD Milling Cutter	
		Insert	—	
		Grade	—	PD10E
		Cutter diameter (mm)	φ80	φ80
		Number of teeth	8	12
		Cutting length (mm)	960	960
		Cutting speed (m/min)	2010	3016
		Feed per tooth (mm/z)	0.1	0.07
		Depth of cut (mm)	4.5	4.5
		Milling time roughing (s)	7.63	0
		Milling time finishing (s)	9.60	5.76
		Total (s)	17.23	5.76
		Productivity	—	3 X

Figure	Processing conditions	Processing parameters		
	Workpiece: Integrate valve of heat pump Material: Aluminum alloy Spindle: Single spindle Maximum speed: 16000RPM Adaptor: BT40 Surface finish: Ra0.8		Previous	Tbeli
		Cutter	—	
		Insert	—	
		Grade	—	PD10E
		Cutter diameter (mm)	φ60	φ125
		Number of teeth	6	20
		Cutting length (mm)	440	220
		Cutting speed (m/min)	1320	3927
		Feed per tooth (mm/z)	0.1	0.04
		Depth of cut (mm)	Ap1=2 AP2=0.2	2.2
		Milling time roughing (s)	6.60	0
		Milling time finishing (s)	6.60	1.65
		Total (s)	13.20	1.65
		Productivity	—	8 X

Figure	Processing conditions	Processing parameters		
	Workpiece: Battery compartment Material: Aluminum alloy Spindle: Single spindle Maximum speed: 16000RPM Adaptor: HSK63A Surface finish: Ra2.5		Previous	Tbeli
		Cutter	—	
		Insert	—	
		Grade	—	PD10E
		Cutter diameter (mm)	φ80	φ80
		Number of teeth	8	12
		Cutting length (mm)	960	960
		Cutting speed (m/min)	2011	3016
		Feed per tooth (mm/z)	0.1	0.07
		Depth of cut (mm)	4.5	4.5
		Milling time roughing (s)	7.63	0
		Milling time finishing (s)	9.60	5.76
		Total (s)	17.23	5.76
		Productivity	—	3 X

New Energy Vehicle Components

Figure	Processing conditions	Processing parameters		
	Workpiece: ESC Material: ADC12 Spindle: Single spindle Maximum speed: 12000RPM Adaptors: BT40 Surface finish: Ra0.8		Previous	Tbeli
		Cutter	—	
		Insert	—	
		Grade	PCD	PD10E
		Cutter diameter (mm)	φ100	φ100
		Number of teeth	6	16
		Cutting length (mm)	580	580
		Cutting speed (m/min)	2042 (rough) 2199 (finish)	3142
		Feed per tooth (mm/z)	0.12 (rough) 0.10 (finish)	0.063
		Depth of cut (mm)	AP1=4 AP2=0.2	4.2
		Milling time roughing (s)	7.73	0
		Milling time finishing (s)	8.70	3.48
		Total (s)	16.43	3.48
		Productivity	—	4.7 X

Combustion Engine Components

Figure	Processing conditions	Processing parameters		
	Workpiece: Cylinder head Material: ALSi10MgCu Spindle: Single spindle Maximum speed: 12000RPM Adaptor: HSK63 Processing type: Surface milling Processing time: 1 Surface finish: Ra3.2		Previous	Tbeli
		Cutter	100B08RP90BG15C2WPM	
		Cutter diameter (mm)	φ100	φ100
		Number of teeth	10	16
		Inserts	BGHX1 5L1 5PCTRHET	
		Grade	PCD	PD10E
		Cutting speed (m/min)	2513	2513
		Feed per tooth (mm/z)	0.088	0.055
		Depth of cut (mm)	4	4
		Tool life		1.6 X

Figure	Processing conditions	Processing parameters		
	Workpiece: Cylinder block Material: Aluminum alloy + gray cast iron Spindle: Single spindle Maximum speed: 12000RPM Adaptor: HSK63 Processing type: Surface milling Processing time: 1 Surface finish: Rt10		Previous	Tbeli
		Cutter	EcoFeed 7-06200-01	
		Cutter diameter (mm)	φ200	φ200
		Number of teeth	28	30
		Inserts	—	
		Grade	PCD	PD32E
		Cutting speed (m/min)	785	785
		Feed per tooth (mm/z)	0.051	0.048
		Depth of cut (mm)	0.5	0.5
		Tool life		2.35 X

Other Vehicle Components

Figure	Processing conditions	Processing parameters		
	Workpiece: Cylinder head cover Material: AISi9Cu3 Spindle: Single spindle Maximum speed: 10000RPM Adaptor: BT40 Processing type: Surface milling Surface finish: Ra3.2		Tbeli	
		Cutter	FTP063R050A	
		Cutter diameter (mm)	φ63	φ63
		Number of teeth	5	10
		Inserts	TMCPA01RRB5	
		Grade	Alloy (rough) PCD (finish)	PD10E
		Cutting tips	2	
		Cutting speed (m/min)	1484	1682
		Feed per tooth (mm/z)	0.125	0.071
		Depth of cut (mm)	Ap1=5 (alloy) AP2=1 (PCD)	6
Tools life		1.2 X		

Figure	Processing conditions	Processing parameters		
	Workpiece: Timing chain housing cover Material: ADC12 Spindle: Single spindle Maximum speed: 12000 RPM Adaptor: BT40 Surface finish: RZ 8-20(gridline)		Tbeli	
		Cutter		
		Inserts		
		Grade	PD10E	
		Cutter diameter (mm)	63	
		Number of teeth	10	
		Cutting speed (m/min)	1188	
		Feed per tooth (mm/z)	0.1	
		Depth of cut (mm)	0.2	

Figure	Processing conditions	Processing parameters		
	Workpiece: Cylinder head Material: ALSi10MgCu Spindle: Single spindle Maximum speed: 16000RPM Machining process: Deck face rough milling Surface finish: Ra3.2 Small chips due to lasered chipbreaker, easy chip removal.		Tbeli	
		Cutter		
		Inserts		
		Grade	D10E	
		Cutter diameter (mm)	125	
		Number of teeth	24	
		Cutting speed (m/min)	1963 / 1571	
		Feed per tooth (mm/z)	0.058 / 0.072	
		Depth of cut (mm)	3.5	

Cast Iron Components

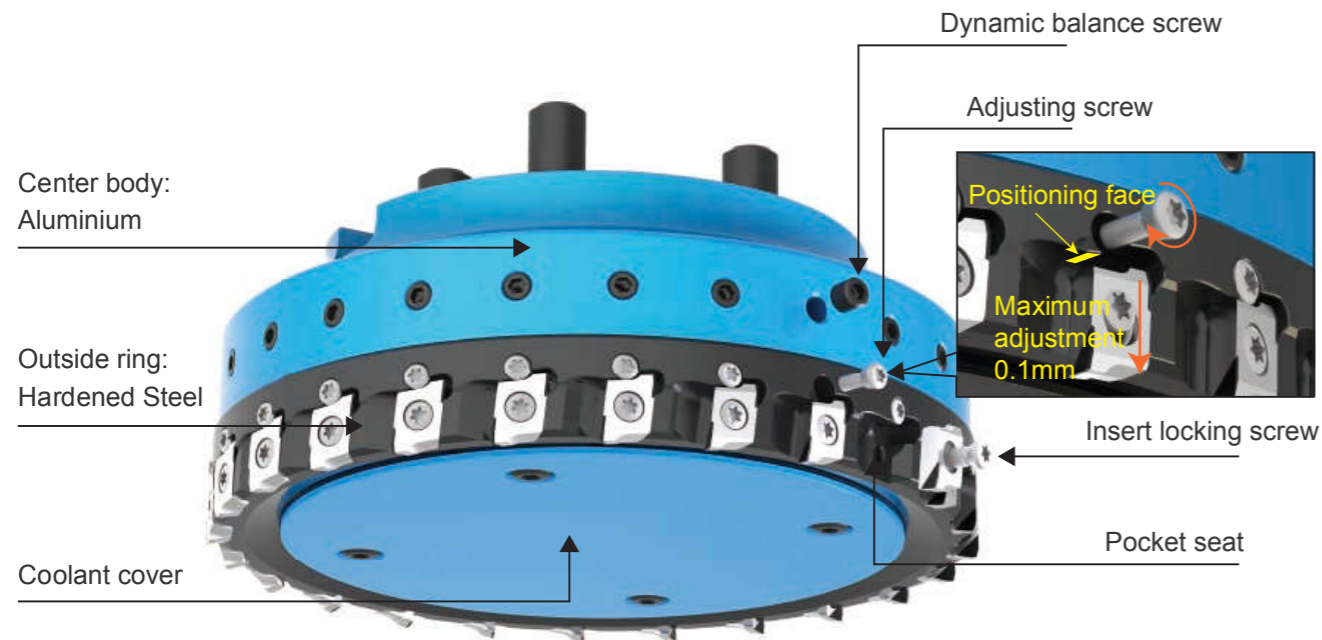
Figure	Processing conditions	Processing parameters		
	Workpiece: Guideways Material: HT250 Spindle: Single spindle Maximum speed: 8000RPM Surface finish: Ra0.4 Hardness: HB180 Surface finish: Ra0.4 Processing time: 1		Tbeli	
		Cutter	CBN Milling cutter	
		Cutter diameter (mm)	φ63	φ63
		Number of teeth	1	4
		Inserts	CBN cartridge	
		Grade	CBN	3003
		Cutting speed (m/min)	158	499
		Feed per tooth (mm/z)	0.25	0.08
		Depth of cut (mm)	0.2	0.2
		Tool life		2.6 X

Figure	Processing conditions	Processing parameters		
	Workpiece: Cylinder block Material: HT280 Adaptor: HSK100 Hardness: HB200-275 Processing : Bottom surface Processing type: Milling Processing time: 1 Surface finish: Ra3.2		Tbeli	
		Cutter		
		Cutter diameter (mm)	φ160	φ160
		Number of teeth	17	16
		Inserts	Ceramic 14 pcs + PCBN wiper 3 pcs	
		Grade	CBN	3003
		Cutting speed (m/min)	452	754
		Feed per tooth (mm/z)	0.099	0.063
		Depth of cut (mm)	0.5	0.5
		Tool life		4.5 X

Figure	Processing conditions	Processing parameters		
	Workpiece: Cylinder block Material: HT300 Spindle: Single spindle Maximum speed: 6000RPM Adaptor: HSK100 Processing part: Front and rear Processing type: Milling Processing time: 2 Surface finish: Ra3.2		Tbeli	
		Cutter		
		Cutter diameter (mm)	φ200	φ200
		Number of teeth	16	16
		Inserts	Ceramic 14 pcs + PCBN wiper 2 pcs	
		Grade	CBN	3003
		Cutting speed (m/min)	628	754
		Feed per tooth (mm/z)	0.15 (rear) 0.144 (front)	0.167 (rear) 0.16 (front)
		Depth of cut (mm)	0.35/0.15 (rear) 0.25/0.25 (front)	0.35/0.15 (rear) 0.25/0.25 (front)
		Tool life		2.5 X

Figure	Processing conditions	Processing parameters		
	Workpiece: Pump body Material: QT500 Spindle: Single spindle Maximum speed: 8000RPM Adaptors: BT40 Processing type: Milling Processing time: 2 Surface finish: Ra1.6		Tbeli	
		Cutter		
		Cutter diameter (mm)	φ125	φ125
		Number of teeth	1	5
		Inserts	APKT160408-1N (CBN)	
		Grade	CBN	3003
		Cutting speed (m/min)	236	785
		Feed per tooth (mm/z)	0.083	0.038
		Depth of cut (mm)	0.5	0.5
		Tool life		5 X

Assembly and Setting Instructions Indexable Milling Cutters



Assembly and Setting Instructions of PCD Milling Cutter

1. Fully unscrew (left-hand) the insert locking screw, and turn the adjusting screw to the left until the head stands out from the steel ring
2. Clean the insert and steel ring, then install the insert into the steel ring and confirm that the positioning face of the insert fits the pre-positioning face
3. Screw in (right-hand) locking screw and tighten to 2.5 Nm
4. Determine which insert is at the highest axial position, and the axial drop of all inserts is ≤ 0.04 mm
5. Turn (right-hand) the adjustment screw, adjust other inserts to move smoothly in the axial direction, and the maximum allowable axial runout error is 2 μ m
6. Tighten the insert locking screw to 3.5 Nm, check again whether the axial runout of the insert is less than 2 μ m, if not, fine adjustment is necessary
7. If there is a combined insert, install the insert according to steps 1-5, adjust the position of the entire set to the required size, and the maximum allowable axial runout error of the insert is 2 μ m

Safety attention:

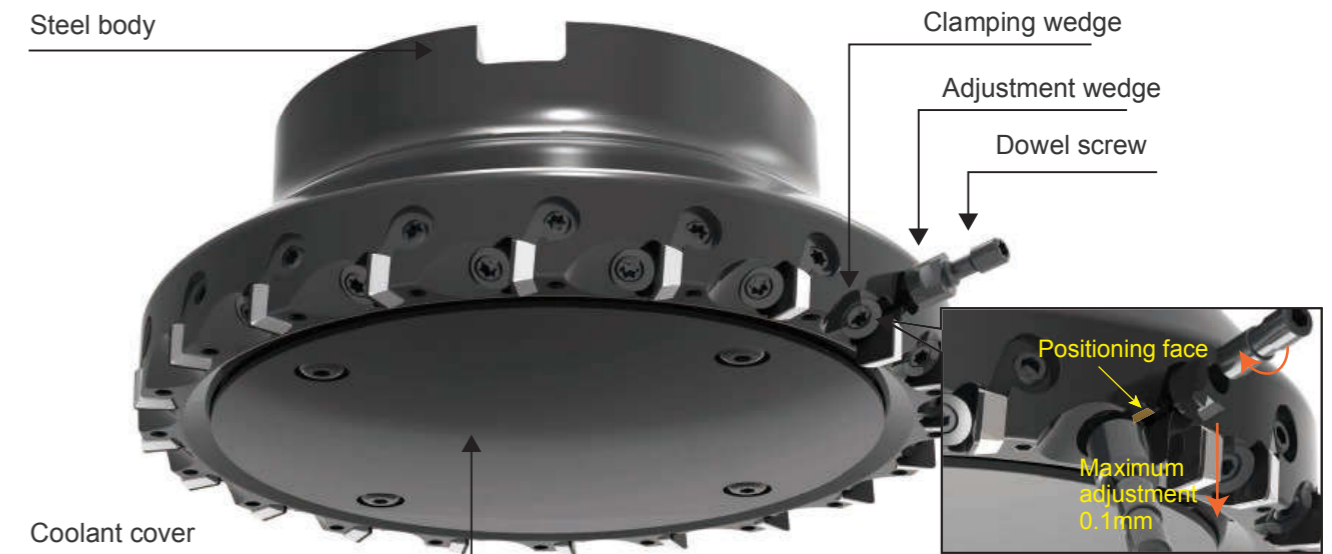
The cutter has been dynamically balanced before leaving the factory, thus the dynamic balance screw does not need to be adjusted. If you need to adjust the dynamic balance precisely after insert assembly, it is necessary to apply thread lock adhesives for protection!

Roughing: The screw should be replaced every fifth insert change

Finishing: The screw should be replaced every tenth insert change



Assembly and Setting Instructions Indexable Milling Cutters



Assembly and Setting Instructions of PCBN Milling Cutter

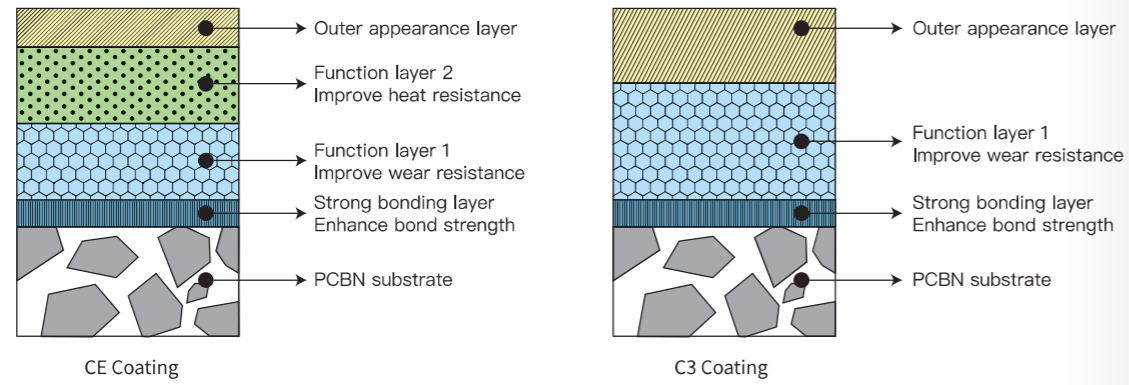
1. Left turn the screw to loosen the clamping wedge, then turn the dowel screw to the left to loosen the adjustment wedge
2. Install the insert into the cutter body, and confirm that the positioning face of the insert fits the pre-positioning face of the cutter body
3. (Pre-adjustment) Turn the screw to the right to drive the clamping wedge and tighten it to 0.5 Nm
4. (Pre-adjustment) Determine which insert is at the highest position in the insert axial direction
5. (Pre-adjustment) Drive the adjustment wedge to adjust the insert to move smoothly (observe the insert during the process, observe the axial, dimension, lead angle, step 3, 5), the maximum allowable axial runout error is 5 μ m, lead angle error is 15'
6. (Fine adjustment) Turn the screw to the right to drive the clamping wedge and tighten it to 2.5 Nm
7. (Fine adjustment) Determine which blade is at the highest position in axial direction
8. (Fine adjustment) Turn the screw to the right to drive the whole block to adjust the blade to move smoothly in axial direction, and the maximum allowable axial runout error is 5 μ m
9. If there is a combined insert, install the insert according to steps 1-8, adjust the position of the entire set to the required size, and the maximum allowable axial runout error of the insert is 2 μ m



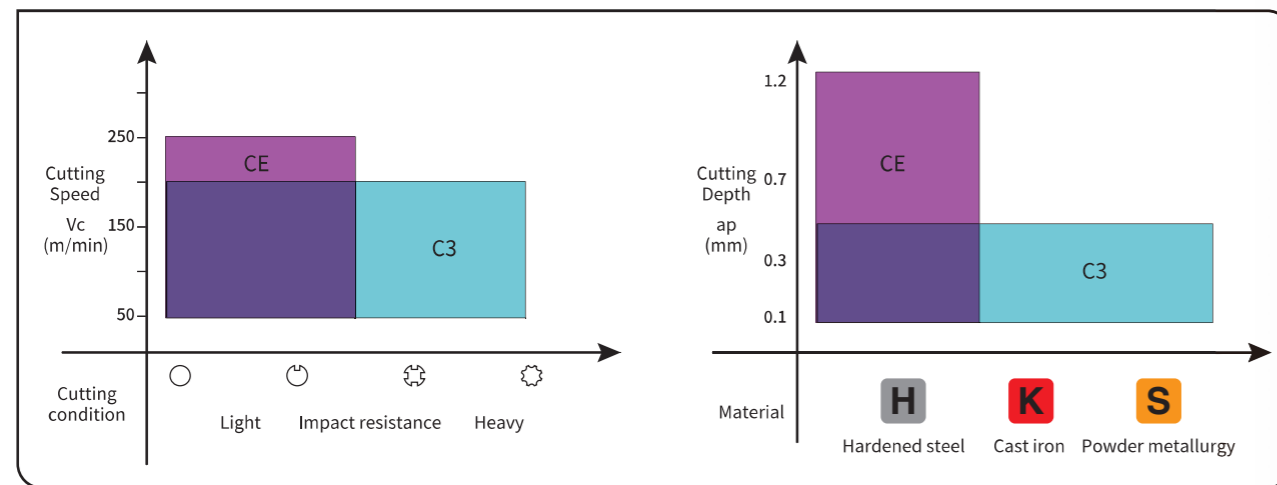
Coating Introduction

CE Coating/ C3 Coating

Applying a PVD coating on the CBN surface can extend the lifespan of tools and enhance precision, particularly in the case of hardened steel machining.

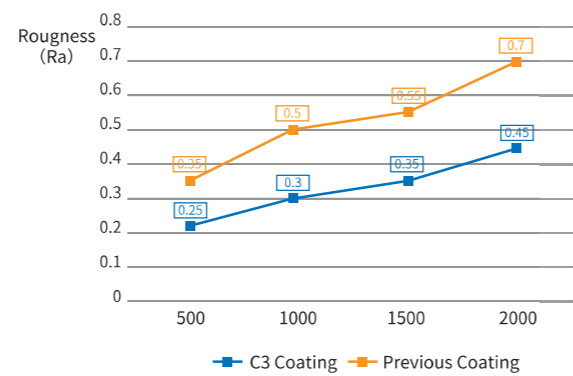
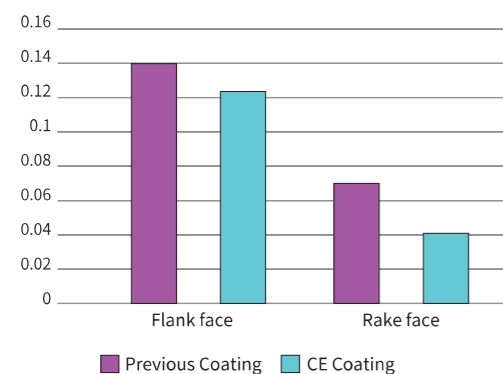
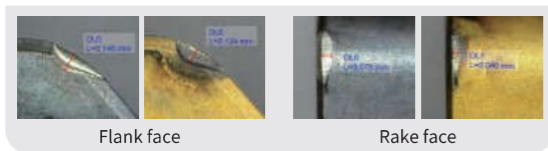


Application of CE/ C3 Coating



Cutting Performance of CE/ C3 Coating

Material: GCr15 Hardness: HRC58-62
 Cutting speed: 220m/min Cutting depth: 0.1mm Feed: 0.12mm/rev Dry cutting
 Material: GCr15 Hardness: HRC58-62
 Cutting speed: 150m/min Cutting depth: 0.15mm Feed: 0.1mm/rev Dry cutting

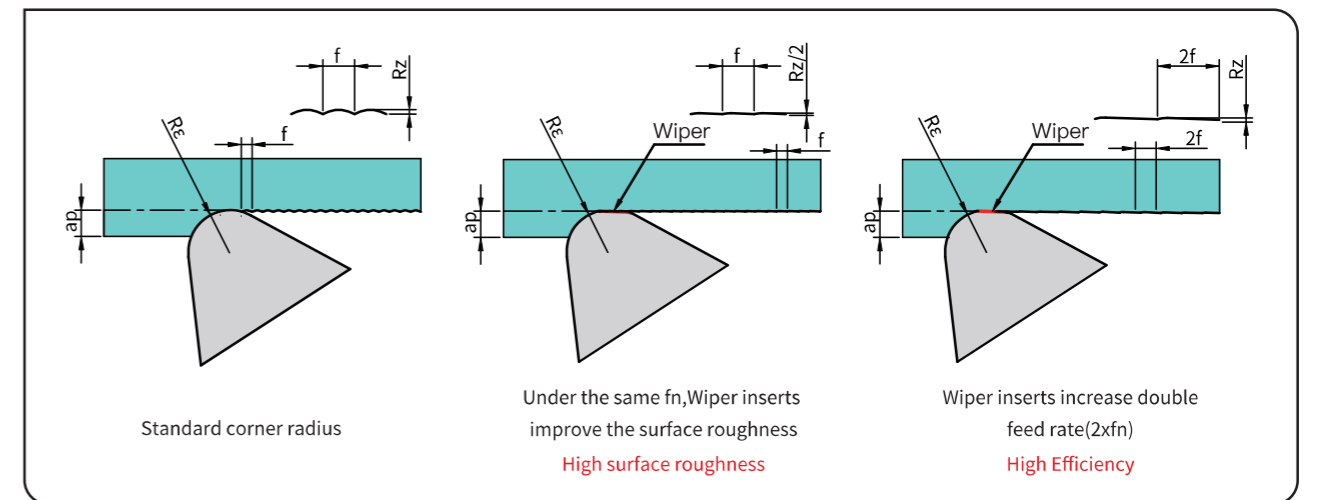


Wiper Introduction

Hardened steel, cast iron, powder metallurgy

Wiper Insert

- Good surface roughness: Surface roughness can be significantly improved under the same machining conditions, resulting in higher machining quality.
- High efficiency: The feed rate can be significantly increased to meet the same surface roughness requirements, resulting in improved machining efficiency.



Calculation of theoretical value of machined surface roughness for standard corner inserts

$$R_z = \frac{f^2}{8r_\epsilon} * 1000$$

$R_z(\mu\text{m})$: Theoretical surface roughness
 $f(\text{mm/rev})$: Feed per revolution
 $r_\epsilon(\text{mm})$: Radius of the tip circle

Tip radius r (mm)	Roughness requirements Ra(μm)				
	0.2	0.4	0.8	1.6	3.2
	Feed f (mm/rev)				
02	0.036	0.05	0.072	0.101	0.143
04	0.05	0.072	0.101	0.143	0.202
08	0.072	0.101	0.143	0.202	0.286
12	0.088	0.124	0.175	0.248	0.351
16	0.101	0.143	0.202	0.286	0.405
0.4/0.8/1.2Wiper	0.16	0.226	0.315	0.426	0.575

Note

- Wiper inserts are suitable for highly rigid machines and workpieces with high cutting resistance.
- It is important to use the appropriate type of holder with wiper inserts.
- Using the reverse cutting direction with wiper inserts is not recommended.