



PCBN Face Milling

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BEIJING WORLDIA DIAMOND TOOLS CO.,LTD.



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Worldia PCBN Face Milling Cutter with Indexable Inserts used for end milling

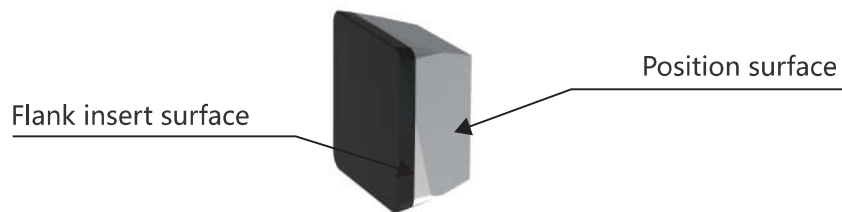
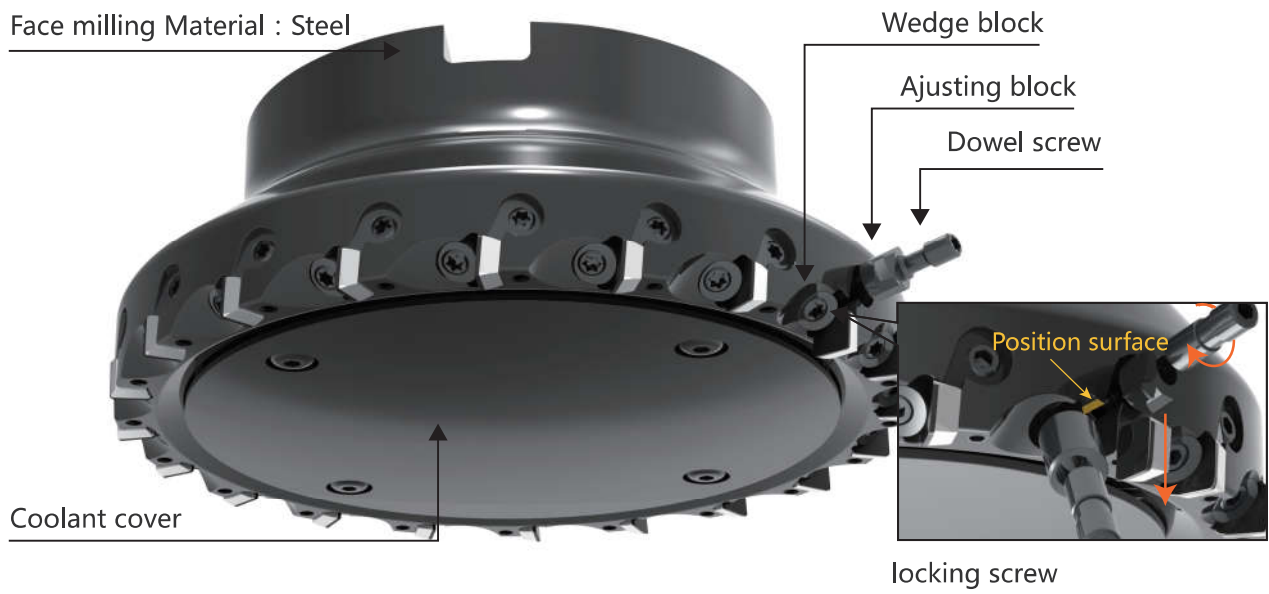
Worldia PCBN Face Milling Cutter with Indexable Inserts used for finishing on end milling of cast iron, it can satisfy the demand for surface roughness and geometric tolerances .

The features of Worldia PCBN Face Milling Cutter with Indexable Inserts

- Cutter body made by high-strength.
- High-precision pocket seat which can keep 0.01mm axial run out without insert adjustment, that can cover more users' requirements without pre-setting machine.
- The adjustment structure is simple and easy to use. The inserts can be easily adjusted to 5 micron axial run out within the 0.3mm range.
- Positive rake angle, low resistance cutting, larger processing coverage.
- The inserts are easily to install, it can install different wiper inserts.
- The positioning surface and Flank face separated design, keep the positioning surface stability and effectiveness.
- Mini-inserts and full face 4-tips design, supply regrinding service which can reduce the cost.
- Inserts are designed by variety of wipers, could meet different application of customers' requirements.

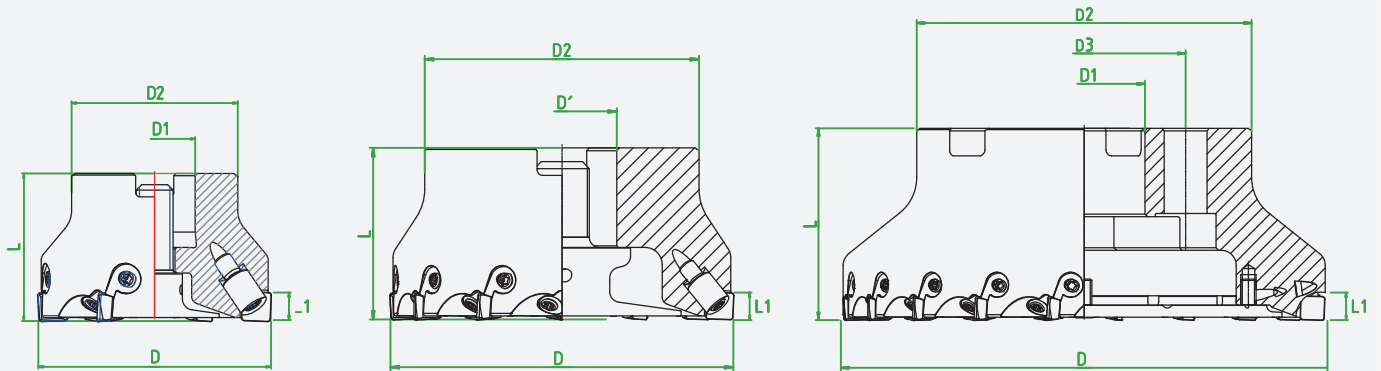


Structure Details of Worldia PCBN Face Milling



Face milling cutter specifications

Worldia PCBN Face Milling Cutter with Indexable Inserts used for end milling of cast iron



Specifications

Type	Inventory Code	D	D1	D2	D3	L	L1	Z	Kg	max RPM
FMP050SA22-SD07-05	040401060023	50	22	45	—	40	7.94	5	0.40	9500
FMP063SA22-SD07-08	040401060022	63	22	45	—	40	7.94	8	0.60	7500
FMP080SA27-SD07-10	040401060021	80	27	60	—	50	7.94	10	1.20	6000
FMP100SB32-SD07-12	040401060020	100	32	80	—	50	7.94	12	1.90	4700
FMP125SB40-SD07-16	040401060019	125	40	90	—	63	7.94	16	3.20	3800
FMP160SC40-SD07-20	040401060018	160	40	110	66.7	63	7.94	20	4.50	3000
FMP200SC60-SD07-24	040401060017	200	60	150	101.6	63	7.94	24	6.80	2300
FMP250SC60-SD07-32	040401060016	250	60	200	101.6	63	7.94	32	11.6	1900

Accessories

D	Wrench	Dowel screw	Wedge block	Coolant lock screw	Coolant lock screw	Coolant lock screw	Coolant shower plate
50	15IP	M5*20	FMPSD07.01	FMPSD07.02	FMP050SA22-SD07-05.02	—	—
63	15IP	M5*20	FMPSD07.01	FMPSD07.02	FMP063SA22-SD07-08.02	—	—
80	15IP	M5*20	FMPSD07.01	FMPSD07.02	FMP080SA27-SD07-10.02	—	—
100	15IP	M5*20	FMPSD07.01	FMPSD07.02	—	FMP100SB32-SD07-12.02	—
125	15IP	M5*20	FMPSD07.01	FMPSD07.02	—	FMP125SB40-SD07-16.02	—
160	15IP	M5*20	FMPSD07.01	FMPSD07.02	—	—	FMP160SC40-SD07-20.02
200	15IP	M5*20	FMPSD07.01	FMPSD07.02	—	—	FMP200SC60-SD07-24.02
250	15IP	M5*20	FMPSD07.01	FMPSD07.02	—	—	FMP250SC60-SD07-32.02

Rule of PCBN milling inserts



①

Shape		
Code	Shape	
O	Octagonal	
S	Square	
T	Triangle	
C	Diamond 80°	
M	Diamond 86°	
B	Diamond 82°	
R	Round	
X	Special	—
W	Wiper	—

②

Clearance angle		
Code	Clearance Angle	
C	7°	
D	15°	
E	20°	
F	25°	
G	30°	
N	0°	
P	11°	
O	Other clearance angle	
X	Other clearance angle	

③

Tolerance			
Code	Nose Height m (mm)	Inscribed Circle Diameter &D1(mm)	Tolerance S1(mm)
A	±0.005	±0.025	±0.025
C	±0.013	±0.025	±0.025
E	±0.025	±0.025	±0.025
H	±0.013	±0.013	±0.025
K*	±0.013	±0.05—±0.15	±0.025
M*	±0.08—±0.18	±0.05—±0.15	±0.13
N*	±0.08—±0.18	±0.05—±0.15	±0.025
*standard for no lapping on the side face.			

④

Chip breaker and Fixing type				
Code	Bore	Shape of Bore	Chip Breaker	Shape
W	With Bore	Cylindrical Bore + Single Side (40°—60°)	Without	
T	With Bore		Single	
B	With Bore	Cylindrical Bore + Single Side (70°—90°)	Without	
N	Without	—	Without	
R	Without	—	Single	
X	—	—	—	Special

Rule of PCD milling inserts



⑤

Inscribed circle Dia.				
Code				Inscribed Circle (mm)
	06	06	11	6.35
	08	07	13	7.94
	09	09	16	9.525
10				10.00
12				12.00
	12	12	22	12.70
	16	15	27	15.875
20				20.00

⑥

Tip radius			
Code	Mark	Code	Mark
00	0.0	08	0.8
02	0.2	12	1.2
04	0.4	16	1.6
Tool cutting edgeangle		Clearance angle of wiper	
Code	Mark	Code	Mark
A	45°	D	15°
E	75°	E	20°
P	90°	F	25°
Z	Other	G	30°
		Z	Other

⑦

Tool cutting edgeangle	
Code	Tool cutting edgeangle
A	45°
E	75°
P	90°
Z	Other Angle

⑨

Cutting edge design	
Code	Cutting Edge Design
E	Honed
F	Sharp Edge
T	Chamfered
S	Chamfered + Honed
Z	Chamfered

⑩

Cutting direction	
Code	Cutting Direction
L	Left Hand
N	Left& Right
R	Right Hand

⑪

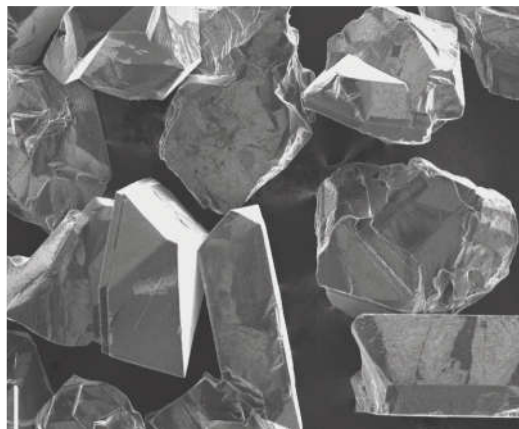
Edges	
Code	Edges
1	1 edge
2	2 edge
4	4 edge

⑫

Cutting edge design		
WG	UW	PT
Wiper	Universal Wiper	PT edge

Worldia Cutting Material Introduction

立方氮化硼 (CBN) 在1957年制造成功, 成为一种新型人造超硬材料, CBN的硬度仅次于金刚石, CBN单晶的显微硬度为 HV8000~9000, 是目前已知的第二高硬度的物质, PCBN的硬度一般为 HV2500~5000。因此用于加工高硬度材料时具有比硬质合金及陶瓷更高的耐磨性, CBN具有很高的抗氧化能力, 在 1000°C时也不产生氧化现象, 与铁系材料在1200~1300°C时也不发生化学反应, 所以使用CBN刀具时往往采用干切方式因此 CBN材料在加工黑色金属材料方面具有独到之处。现在已经成为难加工材料的首选材料, 其应用加工领域为: 淬火钢, 铸铁, 高温合金和粉末冶金。



Insert material code specification

PN	K10	20
PCBN	Application	Material Code

Material	使用分类代号	材料代号	Characteristic
PN	K01	20	Speed ↑ 耐磨性 ↑
	K10		↓ ↓
	K20		↓ ↓
	K30		↓ ↓
			Interruption ↓ 韧性 ↓

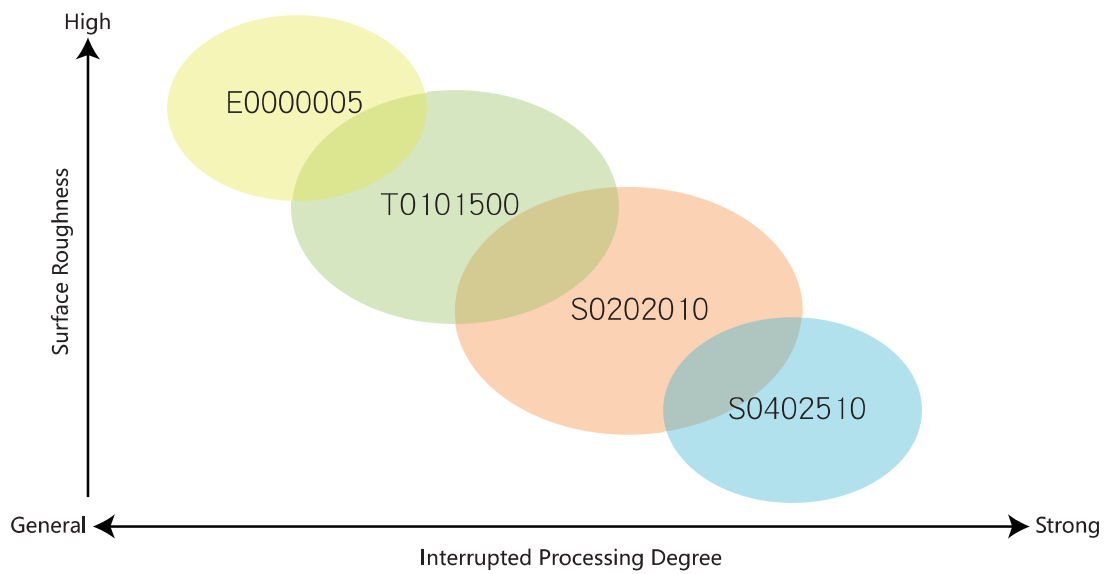
PCBN material Introduction (Focus on cast iron machining)

Workpiece Material	PCBN Grades	Content %	PCBN Grade size	Hardness	Characteristic
K	PNK0119	90~95	3	3700~3900	Excellent abrasive resistance
	PNK3019	90~95	1	3700~3900	Combination of wear resistance and impact resistance

Cutting Data Recommendations

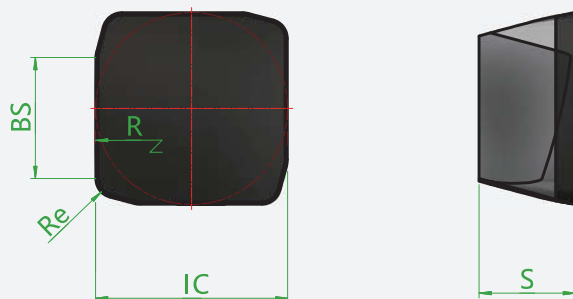
PCBN Grade	Cutting Data Recommendations		
	Cutting Speed,vc (m/min)	Feed Rate,fn (mm/r)	Cutting Depth,AP (mm)
PNK0119			
PNK3019			

Cutting edge recommendation

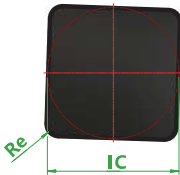
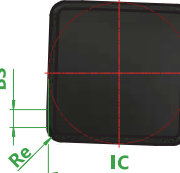
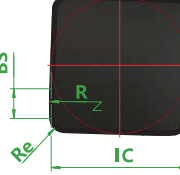
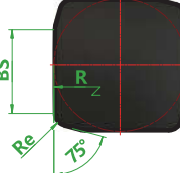


Worldia milling inserts specifications

Inserts are designed by variety of Kr, could meet different application of end milling and shoulder milling.

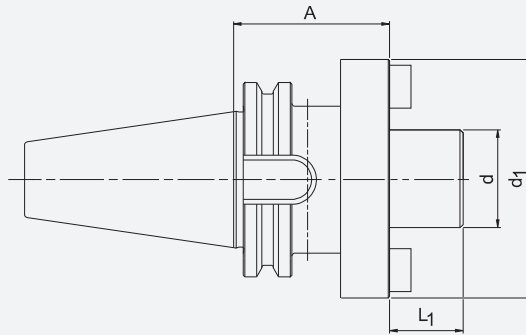
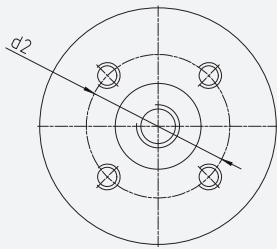


Specification

Diagram	Type Code	Z	IC	S	BS	Re	K	
							PNK0119	PNK3019
Drift angle 	SDHN07T308	4	7.94	3.97	—	0.8	●	●
Standard 	SDHN07T3PPSR4	4	7.94	3.97	1.5	0.8	●	●
Universal 	SDHN07T3PPSR4-UW	4	7.94	3.97	1.5	0.8	●	●
Wiper 	SDHN07T3EPSR4-WG	4	7.94	3.97	5	0.8	●	●

Face milling holder

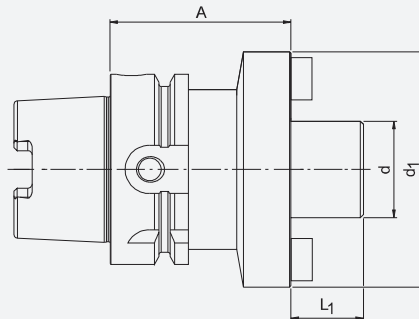
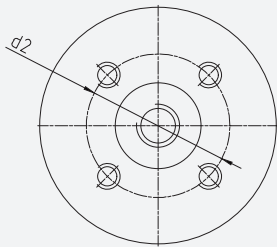
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Type	Inventory code	d	d1	d2	L1	A	Kg
BT30-FMC22-045	040401070007	22	45	—	18	45	0.70
BT30-FMC27-045	040401070008	27	70	—	20	45	1.10
BT40-FMC22-060	040401070009	22	45	—	18	60	1.50
BT40-FMC27-060	040401070010	27	70	—	20	60	2.00
BT40-FMC32-060	040401070011	32	85	—	22	60	2.40
BT40-FMB40-060	040401070002	40	85	—	26	60	2.60
BT40-XMC40-060	040401070021	40	108	66.7	26	60	3.01
BT50-FMB40F-075	040401070013	40	110	66.7	26	75	6.70
BT50-FMB60-075	040401070014	60	140	101.6	25	75	8.50

HSK

JIS B
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Type	Inventory code	D	D1	D2	L1	A	Kg
HSK63A-FMC22-060	040401070015	22	45	—	18	60	1.10
HSK63A-FMC27-060	040401070016	27	70	—	20	60	1.50
HSK63A-FMC32-060	040401070017	32	85	—	22	60	1.80
HSK63A-FMB40-060	040401070018	40	85	—	26	60	1.80
HSK63A-XMC40-060	040401070022	40	108	66.7	26	60	2.10
HSK100A-FMB40F-075	040401070019	40	110	66.7	26	75	4.80
HSK100A-FMB60-075	040401070020	60	140	101.6	25	75	6.80

Case of Study



Material : HT250

Tool : Face Milling Cutter with Indexable Inserts D=200 Z=24

Cutting Continue : $V_c=800\text{m/min}$ $n=1270$ $f=6.00\text{mm/r}$ $f_z=0.25\text{mm/Z}$



Material : HT250

Tool : Face Milling Cutter with Indexable Inserts D=200 Z=24

Cutting Continue : $V_c=500\text{m/min}$ $n=800$ $f=6.00\text{mm/r}$ $f_z=0.25\text{mm/Z}$



Material : QT450

Tool : Face Milling Cutter with Indexable Inserts D=125 Z=16

Cutting Continue : $V_c=400\text{m/min}$ $n=1000$ $f=1.28\text{mm/r}$ $f_z=0.08\text{mm/Z}$

Worldia After-sale Service

For contemporary cutting, many parameters must be considered, especially for mass production, even reasonable and scientific technological procedure or tool design, various processing procedure are available. Worldia can satisfy every customer with reasonable proposal depending on the rich experience.

New product delivery



As required, end milling insert can be installed dynamic balance and adjusted before delivery;

PCBN insert relap



Supply regrinding service.







COMPETE FOR THE TOP CREATE GLOBAL BRAND



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