

# Funik

## PCBN insert

Substantially improve cutting efficiency and tool life



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Subverting the tradition Enlightening the future

ISO9001/ISO14001/ISO45001 Certified

## Advantages of Funik Innovative PCBN insert

Focusing on revolutionary technological innovation on CBN micro-nano materials, composites and cutting tool application, and advanced controlling and manufacturing process, Funik is able to develop and manufacture the most consistent high-quality PCBN solid inserts with high impact resistance, more economical double-layer inserts, super finishing single-layer inserts and inserts with cutting-edge coating techniques. It fully meets the requirements of wear resistance, impact resistance, thermal stability and chemical stability of metal machining.

Our PCBN inserts are widely used in processing pearlitic cast iron, high chromium and nickel alloy cast iron, hardened steel, powder metal, hard alloy and super alloy. In the mechanical machining application of the traditional system, not only it has greatly reduced the comprehensive production cost, but also significantly improved the production capacity and efficiency during the whole production operation, and the equipment investment is greatly decreased at the same time.

### ● Excellent cost performance

The service life of Funik PCBN insert can be more than 10 times that of carbide insert and reduce the cost of comprehensive cutting tool by 30%-50%. The interval time between the replacements of Funik PCBN insert is long and the insert replacement frequency is less, which can significantly reduce the cost on inserts.

### ● High machining efficiency

The machining efficiency of Funik PCBN insert is 5-10 times that of the carbide insert, which greatly improves the equipment capacity and reduces the fixed investment of equipment.

### ● Excellent surface quality

Surface finish and dimensional precision of machining workpiece of Funik PCBN insert can reach the grinding level, and make turning instead of grinding to reduce equipment investment.

### ● Strong universality

Funik PCBN insert can be used for both dry cutting and wet cutting and one grade normally is suitable for machining a variety of materials.

## FBN Impact-resistant Solid Insert

Grade	Machining Model	Applicable Industry	Workpiece Material	Feature
FBN3500	Rough machining	<ul style="list-style-type: none"> <li>Roll</li> <li>Slurry pump</li> <li>Rolling mortar wall</li> </ul>	<ul style="list-style-type: none"> <li>High nickel-chromium, high hardness alloy cast iron, cast high speed steel</li> <li>High manganese steel</li> </ul>	<ul style="list-style-type: none"> <li>High hardness with excellent impact resistance, good cutting edge stability</li> <li>Suitable for heavy loading rough machining from interrupted to continuous working conditions</li> </ul>
FBN7630	Rough machining / Semi-finishing	<ul style="list-style-type: none"> <li>Brake disc</li> <li>Brake drum</li> <li>Parts of compressor</li> </ul>	<ul style="list-style-type: none"> <li>gray cast iron</li> </ul>	<ul style="list-style-type: none"> <li>Excellent combination of toughness and wear resistance, good edge stability</li> <li>Good universality, suitable for high-speed roughing machining from interrupted to continuous working conditions</li> </ul>
FBN9500	Rough machining / Semi-finishing	<ul style="list-style-type: none"> <li>Gear</li> <li>Bearing</li> <li>Mining machinery</li> <li>Coal mine machinery</li> </ul>	<ul style="list-style-type: none"> <li>Hardened steel</li> <li>Surface overlaying material</li> </ul>	<ul style="list-style-type: none"> <li>Balanced impact toughness and good wear resistance</li> <li>Suitable for heavy interrupted to continuous machining under various working conditions</li> </ul>

## FBS Brazed Solid Tip Insert

Grade	Machining Model	Applicable Industry	Workpiece Material	Feature
FBS7630	Rough machining / Semi-finishing	<ul style="list-style-type: none"> <li>Brake disc</li> <li>Brake drum</li> <li>Parts of compressor</li> </ul>	<ul style="list-style-type: none"> <li>gray cast iron</li> </ul>	<ul style="list-style-type: none"> <li>Excellent combination of toughness and wear resistance, good edge stability</li> <li>Good universality, suitable for high-speed roughing machining from interrupted to continuous working conditions</li> </ul>
FBS9500	Rough machining / Semi-finishing	<ul style="list-style-type: none"> <li>Gear</li> <li>Bearing</li> <li>Mining machinery</li> <li>Coal mine machinery</li> </ul>	<ul style="list-style-type: none"> <li>Hardened steel</li> <li>Surface overlaying material</li> </ul>	<ul style="list-style-type: none"> <li>Balanced impact toughness and good wear resistance</li> <li>Suitable for heavy interrupted to continuous machining under various working conditions</li> </ul>

## FBK Single-layer brazed Coated Insert

Grade	Machining Model	Applicable Industry	Workpiece Material	Feature	Cutting speed Vc ( m/min )	Cutting fluid
FBK7510C07	Finishing	<ul style="list-style-type: none"> <li>Brake disc</li> </ul>	<ul style="list-style-type: none"> <li>Gray cast iron</li> </ul>	<ul style="list-style-type: none"> <li>Mainly used for gray cast iron workpieces processing</li> <li>From continuous to heavy interrupted high speed finishing</li> <li>Strong coating adhesion, effectively improving tool life</li> </ul>	600-1200	Dry cut or wet cut
			<ul style="list-style-type: none"> <li>Case hardened alloy</li> </ul>		100-300	
FBK7520C07	Finishing	<ul style="list-style-type: none"> <li>Brake disc</li> <li>Gear</li> </ul>	<ul style="list-style-type: none"> <li>Gray cast iron</li> </ul>	<ul style="list-style-type: none"> <li>Capable of the machining of various materials</li> <li>From interrupted to continuous high speed finishing</li> <li>Strong coating adhesion, effectively improving tool life</li> </ul>	600-1200	Dry cut or wet cut
			<ul style="list-style-type: none"> <li>Powder metallurgy</li> </ul>		90-200	
FBK9540C06	Finishing	<ul style="list-style-type: none"> <li>Gear</li> <li>Bearing</li> </ul>	<ul style="list-style-type: none"> <li>Hardened steel</li> </ul>	<ul style="list-style-type: none"> <li>Excellent thermal stability and red hardness for its excellent wear resistance</li> <li>High speed continuous finishing</li> <li>Excellent temperature resistance and wear resistance of the coating can significantly reduce the wear of the cutting edges</li> </ul>	180-300	Dry cut or wet cut
FBK9550C06	Finishing	<ul style="list-style-type: none"> <li>Gear</li> <li>Bearing</li> </ul>	<ul style="list-style-type: none"> <li>Bearing steel</li> <li>Cemented steel</li> </ul>	<ul style="list-style-type: none"> <li>Balanced wear resistance and chipping resistance</li> <li>Medium interrupted and continuous finishing</li> <li>The excellent high temperature and wear resistance of the coating can significantly reduce the wear of the cutting edges</li> </ul>	100-175	Dry cut or wet cut
FBK9560C06	Finishing	<ul style="list-style-type: none"> <li>Gear</li> <li>Bearing</li> </ul>	<ul style="list-style-type: none"> <li>Cemented steel</li> </ul>	<ul style="list-style-type: none"> <li>Strong chipping resistance and edge treatment</li> <li>Heavy interrupted finishing</li> <li>Excellent temperature resistance and wear resistance of the coating can significantly reduce the wear of the cutting edges</li> </ul>	100-200	Dry cut










## FBK Single-layer brazed Insert with High Cost Performance

Grade	Machining Model	Applicable Industry	Workpiece Material	Feature	Cutting speed Vc ( m/min )	Cutting fluid
FBK7500	Finishing	<ul style="list-style-type: none"> <li>Brake disc</li> <li>Gear</li> </ul>	<ul style="list-style-type: none"> <li>Gray cast iron</li> </ul>	<ul style="list-style-type: none"> <li>High CBN content, ultra-fine grain CBN material, excellent impact resistance and high wear resistance</li> <li>Excellent surface finish and cost Performance</li> </ul>	600-1200	Dry cut or wet cut
			<ul style="list-style-type: none"> <li>Powder metallurgy</li> </ul>		90-200	
FBK9400	Finishing	<ul style="list-style-type: none"> <li>Gear</li> <li>Bearing</li> </ul>	<ul style="list-style-type: none"> <li>Hardened steel</li> </ul>	<ul style="list-style-type: none"> <li>Specialized wear-resistant CBN material to achieve high precision and dimensional stability for continuous processing of high hardness materials</li> <li>The good thermal stability and chemical inertness of the base material can effectively prevent crater wear, and can be processed stably under high temperatures for a long time</li> </ul>	180-300	Dry cut or wet cut
FBK9600	Finishing	<ul style="list-style-type: none"> <li>Gear</li> <li>Bearing</li> </ul>	<ul style="list-style-type: none"> <li>Hardened steel</li> </ul>	<ul style="list-style-type: none"> <li>Balanced toughness and wear resistance make it extremely stable in interrupted machining of hard steel, the higher the steel hardness, the better the performance</li> <li>Strong chipping resistance and various cutting edge treatments, ideal for interrupted machining of high hardness materials</li> </ul>	100-175	Dry cut











## Multi-layer composite nano-coating for PCBN

Coating	Feature	Application	Workpiece Material	Applicable Industry	Cutting speed Vc ( m/min )
C06	<ul style="list-style-type: none"> <li>Bronze color, high hardness, good coating adhesion; small friction coefficient, suitable for hard turning quenched steel. Optimum coating for high-speed, high-temperature machining.</li> </ul>	<ul style="list-style-type: none"> <li>High-speed continuous machining</li> </ul>	<ul style="list-style-type: none"> <li>Hardened steel</li> </ul>	<ul style="list-style-type: none"> <li>Bearing gear</li> <li>Hardened steel</li> </ul>	120-300
C07	<ul style="list-style-type: none"> <li>Black color, good toughness, suitable for interrupted turning of gray cast iron and hardened steel, good versatility.</li> </ul>	<ul style="list-style-type: none"> <li>General machining</li> </ul>	<ul style="list-style-type: none"> <li>Gray cast iron</li> <li>Hardened steel</li> </ul>	<ul style="list-style-type: none"> <li>Bearing gear</li> <li>Hardened steel</li> </ul>	80-150

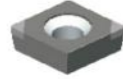
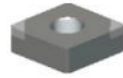
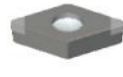
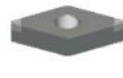
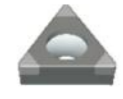


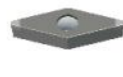
**FBN Impact-resistant Solid Insert**

Grade	Insert shape	Insert model	Radius	Chamfer							
				02020	02030	02530	03020	05020	10020	20020	
FBN3500 FBN7630		RN*N0904	00	●							
		RN*N1204	00	●					●		
		RN*N1207	00	●				●			
		RN*N1507	00	●							
		RN*N2007	00					●			
		RN*N2010	00					●		●	
		RC*X0907Y	00	●				●			
		RC*X1207Y	00					●	●		
		RC*X0907V	00	●				●			
		RC*X1207V	00					●	●		
		SN*N1207	12	●			●				
		SN*N1507	16				●	●			
SN*N2010		20					●				
	CN*N1207	12	●			●					
		16	●		●						
FBN9500		RN*N0904	00	●							
		RN*N1204	00	●							
		RN*N1207	00	●				●			
		RC*X0907Y	00	●				●			
		RC*X1207Y	00		●		●				
		RC*X0907V	00	●				●			
		RC*X1207V	00		●		●				
		SN*N1207	12	●							
		SN*N1507	16					●			
		CN*N1207	08	●							
12			●								


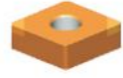
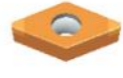
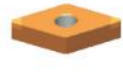

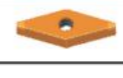


**FBS Brazed Solid Tip Insert**

Grade	Insert shape	Insert model	Radius	Chamfer						
				E	01010	01015	01520	02020	02025	02530
FBS7630		CNGA1204	08		●					
		DNGA1504	12					●		
		TNGA1604	08				●			
		VNGA1604	08	●	●					
			12		●					
	WNGA0804	08			●					
		12					●			
FBS9500		CNGA1204	08				●	●		
			16						●	
		DNGA1504	08				●			
		TNGA1604	08							●
		VNGA1604	08	●	●					
	WNGA0804	08				●				
		12				●				

**FBK Single-layer brazed Coated Insert**




Grade	Insert shape	Insert model	Radius	Chamfer							
				01015	01020	01225	01520	01530	02020		
FBK7510C07 FBK7520C07 FBK7500		CCGW0602	04		•						
		CCGW09T3	04	•							
		CCGW1204	12				•				
		CNGA1204	08				•				
			16		•						
		DCGW11T3	04			•					
		DNGA1504	08			•					
		TCGW1102	TCGW0902	04		•					
			04		•						
			08		•						
		TNGA1604	16							•	
		VNGA1604	04					•			
		VCGW1604	04			•					

**FBK Single-layer brazed Coated Insert**

Grade	Insert shape	Insert model	Radius	Chamfer							
				01010	01020	01225	01525	01535	02035	03035	
FBK9540C06 FBK9550C06 FBK9560C06 FBK9400 FBK9600		CCGW0602	04		•						
		CCGW09T3	04		•		•				
			08			•	•				
	CCGW1204	04		•							
		CNGA1204	08			•					
			12			•					
		DCGW11T3	DCGW0702	04		•					
			04			•					
			08				•			•	
		DNGA1504	04			•				•	
			08			•					
		TCGW1102	TCGW0902	04		•					
			04		•		•				
			04		•						
	TCGW1103	08					•				
TNGA1604		08			•			•			
	VNGA1604	08		•				•			
	VBGW1604	04			•						
		08		•	•						
	WNGA0804	08			•			•			

### Presentation Rule for Model of Funik Insert

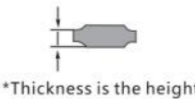
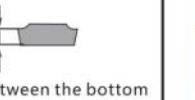
Shape code	Insert	Insert shape	Angle
S		Square	90°
T		Regular triangle	60°
C		Rhombus (Diamond frame)	80°
D			55°
E			75°
M			86°
V			35°
W		Raised triangle	80°
H		Regular hexagon	120°
O		Regular octagon	135°
P		Regular pentagon	108°
L		Rectangle	90°
A		Parallelogram	85°
B			82°
N/K			55°
R		Roundness	-

Code	Height m of cutting tip Tolerance (mm)	Inscribed circle Tolerance (mm)	Thickness S Tolerance (mm)	Code	Height m of cutting tip Tolerance (mm)	Inscribed circle Tolerance (mm)	Thickness S Tolerance (mm)
A	±0.005	±0.025	±0.025	J	±0.005	±0.05- ±0.13	±0.025
F	±0.005	±0.013	±0.025	K	±0.013	±0.05- ±0.13	±0.025
C	±0.013	±0.025	±0.025	L	±0.025	±0.05- ±0.13	±0.025
H	±0.013	±0.013	±0.025	M	±0.08 - ±0.18	±0.05- ±0.13	±0.13
E	±0.025	±0.025	±0.025	N	±0.08 - ±0.18	±0.05- ±0.13	±0.025
G	±0.025	±0.025	±0.13	U	±0.13- ±0.38	±0.08- ±0.25	±0.13

### Presentation Rule for Model of Funik Insert

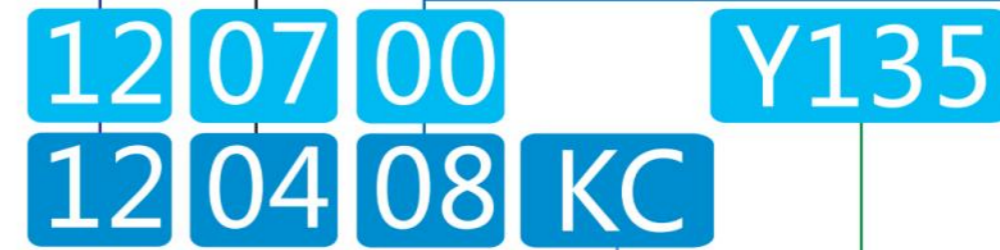
Inscribed circle (mm)	Length of cutting edge						
	C	D	S	T	V	W	R
3.97				06			03
4.76				08			04
5.0							05
5.56				09	09		05
6.0							06
6.35	06	07	06	11	11	04	06
7.94	08	09					07
8.0							08
9.525	09	11	09	16	16	06	09
10.0							10
12.0							12
12.7	12	15	12	22	22	08	12
15.875	16		15	27			15
16.0		19					16
19.05	19		19	33			19
20.0							20
25.0	25	25					25
25.4			25				25
31.75							31
32							32

\*Thickness is the height between the bottom of the insert and the top part of the cutting edge.

Code	Thickness of insert (mm)	Code	Thickness of insert (mm)
01	1.59	06	6.35
T1	1.98	07	7.94
02	2.38	08	8.0
T2	2.78	09	9.52
03	3.18	10	10.0
T3	3.97	12	12.0
04	4.76		
05	5.56		

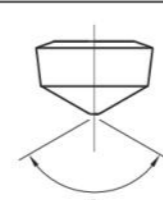
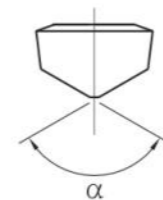
Code	Corner radius (mm)
00	No radius or circular insert
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
32	3.2
X	Others



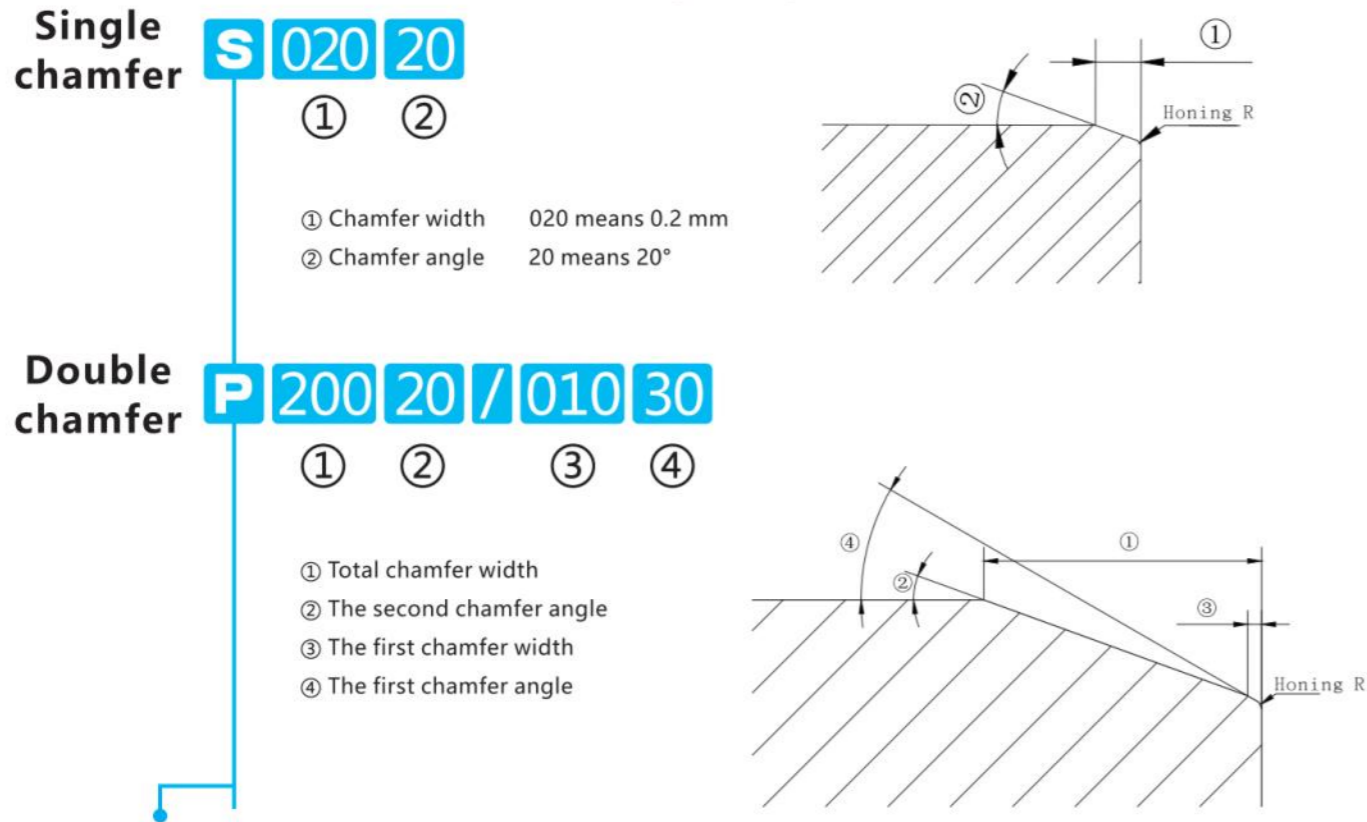
Code	Clearance angle
N	0°
A	3°
B	5°
C	7°
P	11°
D	15°
E	20°
F	25°
G	30°
O	Other clearance angles

Chip breaker and clamping form							
Code	With or without hole and hole shape	Chip breaker	Sketch map	Code	With or without hole and hole shape	Chip breaker	Sketch map
N	Non	Non chip breaker		B	Single side with 70°-90° counter bore	Non chip breaker	
R		Single side with chip breaker		H		Single side with chip breaker	
F		Double sides with chip breaker		C	Double sides with 70°-90° counter bore	Non chip breaker	
A	Non chip breaker		J	Double sides with chip breaker			
M	Round and straight hole	Single side with chip breaker		O	Fastening dimple	Roundness	
G		Double sides with chip breaker		S		Roundness	
W	Single side with 40°-60° counter bore	Non chip breaker		L		Long strip	Roundness
T		Single side with chip breaker			Long strip		
Q	Double sides with 40°-60° counter bore	Non chip breaker					
U		Double sides with chip breaker					
X	Other forms of fixing and chip breaker shall be illustrated by drawings						

Arbitrary sign
Main cutting edge style Cutting direction or chip breaker form It is blank if there is none

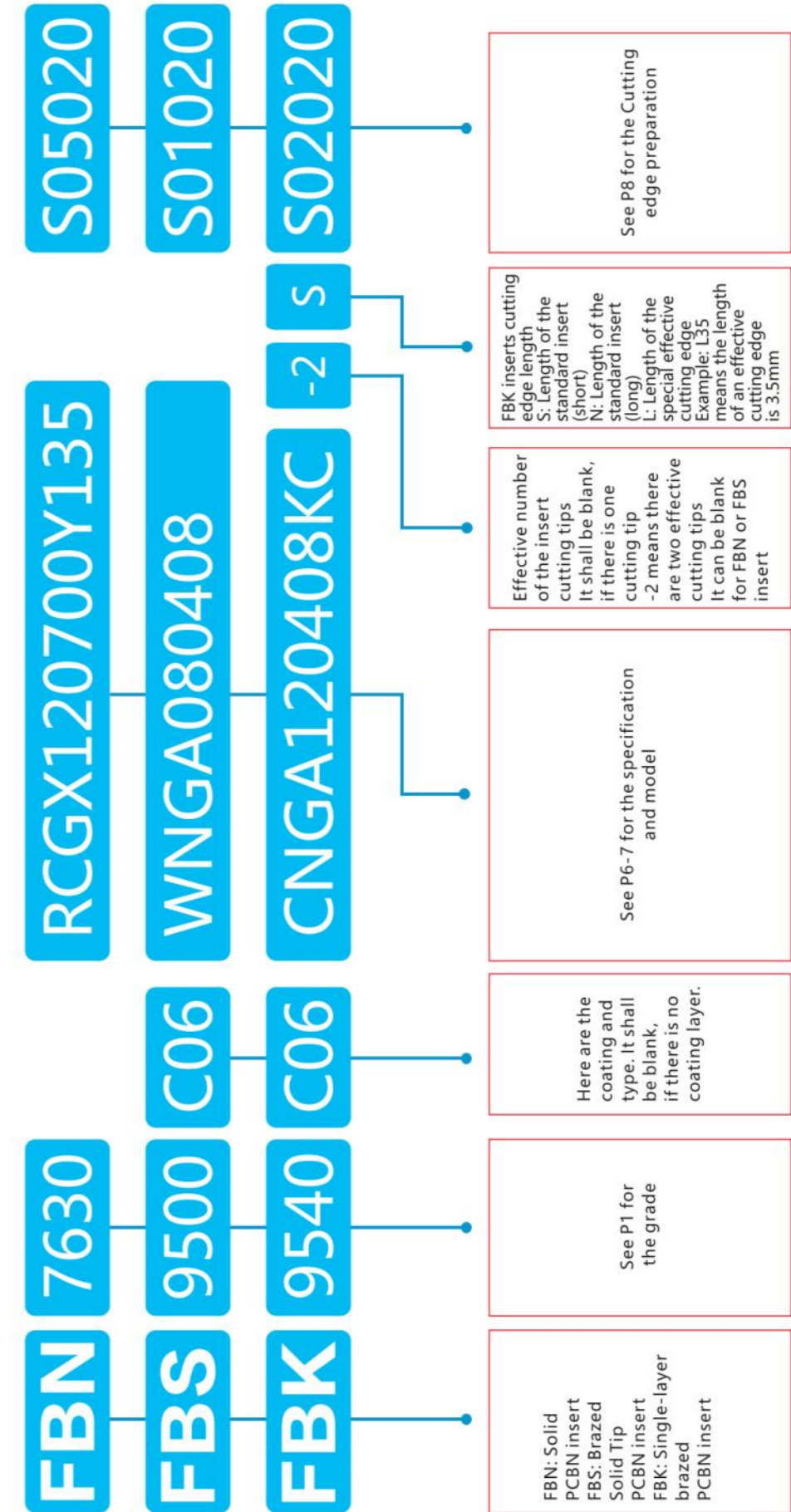
Pyramid or cone bottom	
<b>Y: Cone bottom</b> 	Y means the cone bottom, and 135 means the 135° of cone angle, If the cone angle is 120°, it can be blank. Example: The model No. of 120° cone bottom insert is RCMX120700Y. It also can be RCMX120700Y120. Non-120° cone angle must be marked Example: The model No. of 135° cone bottom insert is RCMX120700Y135
<b>V: Pyramid bottom</b> 	V means the pyramid bottom, and 135 means the 135° of pyramid angle, If the pyramid angle is 120°, it can be blank Example: The model No. of the 120° pyramid bottom insert is RCMX120700V It also can be RCMX120700V120 Non-120° pyramid angle must be marked Example: The model No. of 135° pyramid bottom insert is RCMX120700V135
Note: If there is no V or Y in the model No., for example: RCMX120700, it is shown as the V-shaped base.	

# Naming Standard of Funik Innovative PCBN Insert Cutting Edge



Cutting edge preparation			Main Function
Code	Cutting edge preparation	Drawing	
F	Sharp cutting edge		Sharp cutting edge is helpful to improve the machined surface roughness, and it is difficult to produce vibration marks. But being too sharp will cause slightly worse durability, so it is only applicable in the machining of general cast iron and higher roughness requirements.
E	Honing		Honing can reduce the micro chipping, improve the integrity of cutting edge and prolong life of cutting tool. The heavier the honing, the more intact the Cutting edge preparation, and the better the strength, but the cutting resistance and cutting heat will also be increased. When the system rigidity and machine power are enough or the cutting is interrupted, the heavy Honing can be chosen.
T	Chamfer		Chamfer can improve the impact resistance of cutting edge. Compared with the S cutting edge, it is beneficial to improve the machined surface quality and ensure the stability of dimension.
S	Chamfer + Honing		The strength and comprehensive performance of cutting edge are the best, and the cutting edge is the most widely used in CBN cutting tool. S05020 is more applicable for turning alloy hard cast iron, S02020 is more applicable for gray cast iron, and S01020 is more applicable for hardened steel.
K	Double chamfer		It is recommended in large allowance and interrupted turning to obtain better impact resistance.
P	Double chamfer + Honing		It is recommended in large allowance and interrupted turning to obtain better impact resistance and better strength than K cutting edge.

## Example and Instruction for the Order of Funik Innovative PCBN insert

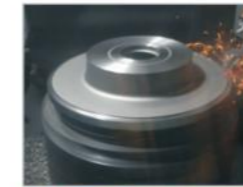


## Industrial application of Funik innovative PCBN insert



## Application case of Funik innovative PCBN insert in auto parts

Industry - Auto parts - Brake disc

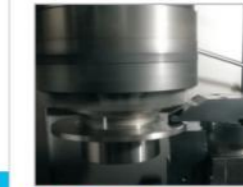


Funik CBN cutting tool:  
The life is increased by **400%**  
The efficiency is promoted by **23%**

Workpiece name: Brake disc  
Workpiece material: HT250  
Workpiece hardness: HB190-210  
Machining position: Brake surface  
Machining type: Continuous, rough machining  
Insert grade: FBN7630  
Insert specification: CNMN120712  
Cutting type: Dry cutting  
Cutting parameters: Vc=800m/min ap=2-3mm  
f = 0.45mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some Japanese and American brands	700	7	200
Funik FBN7630	800	5	1000

Industry - Auto parts - Brake disc



Funik CBN cutting tool:  
The life is increased by **300%**  
The efficiency is promoted by **10%**

Workpiece name: Brake disc  
Workpiece material: HT250  
Workpiece hardness: HB190-210  
Machining position: Brake surface  
Machining type: Continuous, finishing  
Insert grade: FBN7630  
Insert specification: SCGN090408FC  
Cutting type: Dry cutting  
Cutting parameters: Vc=600m/min ap=0.25mm  
f = 0.3mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some domestic CBN	450	30	30
Funik FBN7630	600	20	120

Industry - Auto parts - Brake drum



Funik CBN cutting tool:  
The life is increased by **300%**  
The efficiency is promoted by **43%**

Workpiece name: Brake drum  
Workpiece material: HT250  
Workpiece hardness: HB190-210  
Machining position: Outer circle, inner diameter  
Machining type: Continuous, rough machining  
Insert grade: FBN7630  
Insert specification: CNMN120716  
Cutting type: Wet cutting  
Cutting parameters: Vc=1130m/min ap=2-3mm  
f = 0.5mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some domestic CBN	920	3.5	15
Funik FBN7630	1130	2	60

Industry - Auto parts - Belt pulley



Funik CBN cutting tool:  
The life is increased by **20%**  
The efficiency is promoted by **32%**

Workpiece name: Belt pulley  
Workpiece material: Gray cast iron  
Workpiece hardness: HB220  
Machining position: Outer circle, end face  
Machining type: Continuous finishing  
Insert grade: FBK7520 C07  
Insert specification: DNGA150408  
Cutting type: Wet cutting  
Cutting parameters: Vc=427m/min ap=0.2mm  
f = 0.1mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some Japanese and Korean CBN	301	19	250
Funik FBK7520 C07	427	13	300

Industry - Auto parts - Cylinder liner



Funik CBN cutting tool:  
The life is increased by **600%**  
The efficiency is promoted by **13%**

Workpiece name: Cylinder liner  
Workpiece material: Alloy cast iron  
Workpiece hardness: HB230-260  
Machining position: Inner hole  
Machining type: Continuous finishing  
Insert grade: FBK7500  
Insert specification: CCGW09T304  
Cutting type: Wet cutting  
Cutting parameters: Vc=300m/min ap=0.6mm  
f = 0.25mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some Japanese and Korean inserts	250	80	100
Funik FBK7500	300	70	700

Industry - Auto parts - CV joint



Funik CBN cutting tool:  
The life is increased by **25%**  
The efficiency is promoted by **17%**

Workpiece name: CV joint  
Workpiece material: S55C (No. 55 steel)  
Workpiece hardness: HRC58-62  
Machining position: Inner diameter  
Machining type: Finishing  
Insert grade: FBK7510  
Insert specification: TNGA160416  
Cutting type: Dry cutting  
Cutting parameters: Vc=180m/min ap=0.2mm  
f = 0.08mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some Japanese brand	160	30	400
Funik FBK7510	180	25	500

Industry - Auto parts - Flywheel



Funik CBN cutting tool:  
The life is increased by **54%**  
The efficiency is promoted by **25%**

Workpiece name: Flywheel  
Workpiece material: HT250  
Workpiece hardness: HB190  
Machining position: Plane and inner diameter  
Machining type: Finishing  
Insert grade: FBN7630  
Insert specification: RCMX090700Y  
Cutting type: Dry cutting  
Cutting parameters: Vc=247m/min ap=0.5mm  
f = 0.2mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some domestic brand	178	24	63
Funik FBN7630	247	18	100

Industry - Auto parts - Turbocharger



Funik CBN cutting tool:  
The life is increased by **30%**  
The efficiency is promoted by **35%**

Workpiece name: Turbocharger  
Workpiece material: Alloy cast iron  
Workpiece hardness: HRC55-60  
Machining position: Inner hole  
Machining type: Finishing  
Insert grade: FBK7520 C07  
Insert specification: VCGW160404  
Cutting type: Dry cutting  
Cutting parameters: Vc=120m/min ap=0.2mm  
f = 0.1mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some domestic brand	80	75	70
Funik FBK7520 C07	120	50	90

## Application case of Funik innovative PCBN insert in roll

### Industry - Roll - Strip roll



Funik CBN cutting tool:  
The life is increased by **100%**  
The efficiency is promoted by **25%**

Workpiece name: Strip roll  
Workpiece material: High NiCr  
Workpiece hardness: HSD75-85  
Machining position: Shoulder, roll body  
Machining type: Rough machining  
Insert grade: FBN3500  
Insert specification: RNMN201000  
Cutting type: Dry cutting  
Cutting parameters: Vc=40m/min ap=10mm  
f = 0.5mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some domestic brand	30	200	1
Funik FBN3500	40	150	2

### Industry - Roll - H-shaped steel roll



Funik CBN cutting tool:  
The life is increased by **100%**  
The efficiency is promoted by **40%**

Workpiece name: H-shaped steel roll  
Workpiece material: High carbon semi-steel  
Workpiece hardness: HSD55-65  
Machining position: Roll body, end face  
Machining type: Rough machining  
Insert grade: FBN3500  
Insert specification: RNMN201000  
Cutting type: Dry cutting  
Cutting parameters: Vc=94m/min ap=10mm  
f = 0.4mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some domestic brand	56	85	0.5
Funik FBN3500	94	50	1

### Industry - Roll - Screw thread steel roll



Funik CBN cutting tool:  
The life is increased by **300%**  
The efficiency is promoted by **33%**

Workpiece name: Screw thread steel roll  
Workpiece material: High speed steel  
Workpiece hardness: HSD80-85  
Machining position: Outer circle of roll body, groove  
Machining type: Rough machining  
Insert grade: FBN7630  
Insert specification: RCMX120700Y  
Cutting type: Dry cutting  
Cutting parameters: Vc=72m/min ap=2mm f = 0.4mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some domestic brand	48	60	1
Funik FBN7630	72	40	3

### Industry - Roll - Screw thread steel roll



Funik CBN cutting tool:  
The life is increased by **100%**  
The efficiency is promoted by **33%**

Workpiece name: Screw thread steel roll  
Workpiece material: High speed steel  
Workpiece hardness: HSD80-85  
Machining position: Outer circle of roll body, groove  
Machining type: Finishing  
Insert grade: FBN7630  
Insert specification: RCMX090700Y  
Cutting type: Dry cutting  
Cutting parameters: Vc=103m/min ap=0.3mm  
f = 0.2mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some domestic brand	68	90	1
Funik FBN7630	103	60	2

## Application case of Funik innovative PCBN insert in gear

### Industry - Auto parts - Driven gear

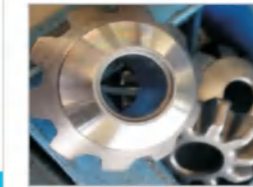


Funik CBN cutting tool:  
The life is increased by **570%**  
The efficiency is promoted by **8%**

Workpiece name: Driven gear  
Workpiece material: 20CrMnTiH  
Workpiece hardness: HRC58-62  
Machining position: End face, outer circle  
Machining type: Continuous, finishing  
Insert grade: FBK9560 C06  
Insert specification: CNGA120408  
Cutting type: Dry cutting  
Cutting parameters: Vc=140m/min ap=0.07mm  
f = 0.08mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some European and American CBN	130	12	150
Funik FBK9560 C06	140	11	1000

### Industry - Auto parts - Gear



Funik CBN cutting tool:  
The life is increased by **11%**  
The efficiency is promoted by **20%**

Workpiece name: Gear  
Workpiece material: 20CrMnTi  
Workpiece hardness: HRC58-65  
Machining position: Spherical end face  
Machining type: Continuous, finishing  
Insert grade: FBK9540 C06  
Insert specification: TNGA160408  
Cutting type: Dry cutting  
Cutting parameters: Vc=200m/min ap=0.15mm  
f = 0.08mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some Japanese CBN	190	5	450
Funik FBK9540 C06	200	4	500

### Industry - Auto parts - Rear axle gear



Funik CBN cutting tool:  
The life is increased by **25%**  
The efficiency is promoted by **20%**

Workpiece name: Rear axle gear  
Workpiece material: 20CrMnTiH  
Workpiece hardness: HRC58-62  
Machining position: Outer circle + end face  
Machining type: Finishing  
Insert grade: FBS9500 C06  
Insert specification: CNGA120412  
Cutting type: Dry cutting  
Cutting parameters: Vc=160m/min ap=0.15mm  
f = 0.12mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some domestic brand	140	1.5	120
Funik FBS9500 C06	160	1.2	150

### Industry - Auto parts - Gear ring



Funik CBN cutting tool:  
The life is increased by **25%**  
The efficiency is promoted by **13%**

Workpiece name: Gear ring  
Workpiece material: SCM420H  
Workpiece hardness: HRC45-48  
Machining position: Inner end face  
Machining type: Finishing  
Insert grade: FBK9560 C06  
Insert specification: CNGA120412  
Cutting type: Dry cutting  
Cutting parameters: Vc=140m/min ap=0.13mm  
f = 0.12mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some domestic brand	120	40%	80
Funik FBK9560 C06	140	35%	100

## Application case of Funik innovative PCBN insert in air conditioning compressor

### Industry - Air conditioning compressor - Air cylinder



Funik CBN cutting tool:  
The life is increased by **25%**  
The efficiency is promoted by **20%**

Workpiece name: Air cylinder  
Workpiece material: HT250  
Workpiece hardness: HB190-210  
Machining position: End face, outer circle  
Machining type: Rough machining  
Insert grade: FBN7630  
Insert specification: SNGN120712  
Cutting type: Dry cutting  
Cutting parameters: Vc=760m/min ap=1mm  
f = 0.4mm/r

Cutting tool contrast	Rotational speed n(r/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some domestic brand	1800	37	1200
Funik FBN7630	2200	30	1500

### Industry - Air conditioning compressor - Upper bearing



Funik CBN cutting tool:  
The life is increased by **30%**  
The efficiency is promoted by **20%**

Workpiece name: Upper bearing  
Workpiece material: HT250  
Workpiece hardness: HB190-210  
Machining position: Outer circle of shank, end face  
Machining type: Finishing  
Insert grade: FBN7630  
Insert specification: DNGA150408  
Cutting type: Dry cutting  
Cutting parameters: Vc=450m/min ap=0.3-0.5mm  
f = 0.3mm/r

Cutting tool contrast	Rotational speed n(r/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some domestic brand	1800	50	1000
Funik FBN7630	2300	39	1300

### Industry - Air conditioning compressor - Lower bearing



Funik CBN cutting tool:  
The life is increased by **20%**  
The efficiency is promoted by **21%**

Workpiece name: Lower bearing  
Workpiece material: HT250  
Workpiece hardness: HB190-210  
Machining position: Outer circle, end face  
Machining type: Rough machining  
Insert grade: FBN7630  
Insert specification: WNGA080412  
Cutting type: Dry cutting  
Cutting parameters: Vc=510m/min ap=0.8-1mm  
f = 0.4mm/r

Cutting tool contrast	Rotational speed n(r/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some domestic brand	1800	26	1900
Funik FBN7630	2300	20	2300

### Industry - Air conditioning compressor - Flange



Funik CBN cutting tool:  
The life is increased by **400%**  
The efficiency is promoted by **43%**

Workpiece name: Flange  
Workpiece material: Gray cast iron  
Workpiece hardness: HB220  
Machining position: Outer circle, end face  
Machining type: Continuous finishing  
Insert grade: FBN7630  
Insert specification: WNGA080408  
Cutting type: Dry cutting  
Cutting parameters: Vc=534m/min ap=0.4mm  
f = 0.26mm/r

Cutting tool contrast	Rotational speed n(r/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some domestic brand	1850	40	80
Funik FBN7630	2200	23	400

## Application case of Funik innovative PCBN insert in gear shaft

### Industry - Auto parts - Driven belt pulley shaft



Funik CBN cutting tool:  
The life is increased by **50%**  
The efficiency is promoted by **5%**

Workpiece name: Driven belt pulley shaft  
Workpiece material: 20CrMnTiH  
Workpiece hardness: HRC58-62  
Machining position: Outer circle  
Machining type: Semi-finishing  
Insert grade: FBK9560 C06  
Insert specification: CNGA120412  
Cutting type: Dry cutting  
Cutting parameters: Vc=140m/min ap=0.15mm  
f = 0.25mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some domestic brand	100	2	80
Funik FBK9560 C06	140	1.9	120

### Industry - Auto parts - Gear shaft



Funik CBN cutting tool:  
The life is increased by **11%**  
The efficiency is promoted by **10%**

Workpiece name: Intermediate shaft  
Workpiece material: 20CrMnTiH  
Workpiece hardness: HRC58-62  
Machining position: Cylindrical surface at both ends  
Machining type: Continuous, finishing  
Insert grade: FBK9540 C06  
Insert specification: DNGA150408  
Cutting type: Dry cutting  
Cutting parameters: Vc=180m/min ap=0.25mm  
f = 0.08mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some Japanese CBN	150	10	120
Funik FBK9540 C06	180	9	600

### Industry - Auto parts - Transmission shaft



Funik CBN cutting tool:  
The life is increased by **200%**  
The efficiency is promoted by **14%**

Workpiece name: Transmission shaft  
Workpiece material: 20CrMo  
Workpiece hardness: HRC58-65  
Machining position: Cylindrical surface at both ends  
Machining type: Light intermittent, finishing  
Insert grade: FBK9560 C06  
Insert specification: WNGA160408  
Cutting type: Wet cutting  
Cutting parameters: Vc=180m/min ap=0.1mm  
f = 0.15mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some domestic brand	132	7	100
Funik FBK9560 C06	132	6	300

### Industry - Auto parts - Wheel hub bearing



Funik CBN cutting tool:  
The life is increased by **22%**  
The efficiency is promoted by **30%**

Workpiece name: Wheel hub bearing  
Workpiece material: 65Mn  
Workpiece hardness: HRC58-63  
Machining position: Raceway  
Machining type: Continuous, finishing  
Insert grade: FBK9400 C06  
Insert specification: WNGA160408  
Cutting type: Dry cutting  
Cutting parameters: Vc=185m/min ap=0.15mm  
f = 0.1mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some domestic CBN	120	1.5	90
Funik FBK9400 C06	185	1	110



## Application case of Funik innovative PCBN insert in other industries

### Industry - Wind power - Slewing ring



Funik CBN cutting tool:  
The life is increased by 300%  
The efficiency is promoted by 15%

Workpiece name: Slewing ring  
Workpiece material: 42CrMo  
Workpiece hardness: HRC47-55  
Machining position: Raceway  
Machining type: Intermittent, finishing  
Insert grade: FBN9500  
Insert specification: RCMX090700  
Cutting type: Dry cutting  
Cutting parameters: Vc=90m/min ap=0.3mm  
f = 0.3mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some European and American CBN	70	60	1
Funik FBN9500	90	50	4

### Industry - Wind power - Large gear



Funik CBN cutting tool:  
The life is increased by 700%  
The efficiency is promoted by 80%

Workpiece name: Gear  
Workpiece material: 42CrMo  
Workpiece hardness: HRC45-55  
Machining position: Gear tip circle  
Machining type: Heavy intermittent, rough machining  
Insert grade: FBN9500  
Insert specification: SNMN150716  
Cutting type: Dry cutting  
Cutting parameters: Vc=97m/min ap=4mm  
f = 0.7mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (hour / pcs)	Life(pcs / cutting edge)
Some European and American alloy	20	20	0.25
Funik FBN9500	97	2	2

### Industry - Engineering machinery - Rolling mortar wall



Funik CBN cutting tool:  
The life is increased by 200%  
The efficiency is promoted by 14%

Workpiece name: Rolling mortar wall  
Workpiece material: High manganese steel  
Workpiece hardness: HB240  
Machining position: Inner conical surface  
Machining type: Continuous, rough machining  
Insert grade: FBN3500  
Insert specification: SNMN150716  
Cutting type: Dry cutting  
Cutting parameters: Vc=60m/min ap=6mm  
f = 0.4mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some European and American CBN	60	70	1
Funik FBN3500	75	60	3

### Industry - Automobile - Engine cylinder block



Funik CBN cutting tool:  
The life is increased by 440%  
The efficiency is promoted by 85%

Workpiece name: Engine cylinder block  
Workpiece material: HT250  
Workpiece hardness: HB190-210  
Machining position: Top face of cylinder block  
Machining type: Intermittent, finishing  
Insert grade: FBN7630  
Insert specification: SNEN090412  
Cutting type: Dry cutting  
Cutting parameters: Vc=470m/min ap=0.5mm  
f = 2000mm/min

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some domestic alloy	180	84	90
Funik FBN7630	470	12	500

### Industry - Mining machinery - Piston rod



Funik CBN cutting tool:  
The life is increased by 700%  
The efficiency is promoted by 60%

Workpiece name: Piston rod  
Workpiece material: 20Cr2Ni4A  
Workpiece hardness: HRC58-60  
Machining position: Outer circle  
Machining type: Continuous, finishing  
Insert grade: FBN9500  
Insert specification: RNGN090400  
Cutting type: Dry cutting  
Cutting parameters: Vc=120m/min ap=0.4-0.5mm  
f = 0.25mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some European and American alloy	48	75	0.5
Funik FBN9500	120	30	4

### Industry - Powder metallurgy - Planet carrier



Funik CBN cutting tool:  
The life is increased by 200%  
The fineness is increased

Workpiece name: Planet carrier  
Workpiece material: Powder metallurgy  
Workpiece hardness: HB190-210  
Machining position: Inner hole  
Machining type: Finishing  
Insert grade: FBK7500  
Insert specification: VCGW160404  
Cutting type: Dry cutting  
Cutting parameters: Vc=200m/min ap=0.2mm  
f = 0.15mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some domestic alloy	200	30	100
Funik FBK7500	200	30	300

### Industry - Automobile - Combined gear



Funik CBN cutting tool:  
The life is increased by 400%  
The efficiency is promoted by 25%

Workpiece name: Combined gear of gearbox  
Workpiece material: 16MnCr5  
Workpiece hardness: HRC58-62  
Machining position: Inner hole, end face  
Machining type: Continuous, finishing  
Insert grade: FBK9550 C06  
Insert specification: VBGW160404  
Cutting type: Dry cutting  
Cutting parameters: Vc=160m/min ap=0.1mm  
f = 0.01mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s / pcs)	Life(pcs / cutting edge)
Some Japanese and Korean CBN	140	4	50
Funik FBK9550 C06	160	3	250

### Industry - Engineering machinery - Slurry pump



Funik CBN cutting tool:  
The life is increased by 100%  
The efficiency is promoted by 40%

Workpiece name: Impeller  
Workpiece material: Wear resistant white cast iron  
Workpiece hardness: HRC50  
Machining position: Chamfer  
Machining type: Heavy intermittent, rough machining  
Insert grade: FBN3500  
Insert specification: SNGN120712  
Cutting type: Dry cutting  
Cutting parameters: Vc=55m/min ap=2-3mm  
f = 0.3mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min / pcs)	Life(pcs / cutting edge)
Some domestic CBN	40	15	1
Funik FBN3500	55	9	2

## Common cutting parameters for Funik innovative PCBN insert

Common cutting parameters for Funik PCBN turning insert						
Workpiece	Common material	Hardness	Cutting speed Vc (m/min)	Cutting depth ap (mm)	Feed rate (mm/rev)	Recommended structural form
Gear	20CrMnTi	58-65HRC	80-220	0.05-0.5	0.05-0.2	FBK
Bearing	GCr15	55-65HRC	80-220	0.05-0.5	0.05-0.2	FBK\FBS\FBN
Large gear	40CrMo	310-360HB	80-120	0.5-5.0	0.2-1.0	FBN
	18CrNiMo	58-62HRC	80-120	0.3-1.0	0.1-0.3	FBN
Slewing ring	42CrMo	55-62HRC	80-150	0.2-2.0	0.1-0.5	FBN
Brake disc			500-1000	0.2-0.5	0.1-0.3	FBN\FBS
			400-1200	0.5-3	0.1-0.5	FBN\FBS
Brake drum	HT250	220-260HB	350-1000	0.2-0.5	0.1-0.3	FBN\FBS
			280-1000	0.5-3	0.1-0.5	FBN\FBS
Air Conditioning Compressor			400-1000	0.3-2.5	0.2-0.5	FBN\FBS
Cylinder liner	Boron copper cast iron	180-260HB	500-800	0.1-0.3	0.1-0.2	FBN\FBS\FBK
		180-260HB	150-500	0.3-1.0	0.1-0.3	FBN\FBS\FBK
Roll	High nickel-chromium	78HSD	50-100	1.0-10.0	0.5-1.5	FBN
	High ferrochrome	75HSD	50-100	1.0-10.0		FBN
	High chromium steel	75HSD	40-100	1.0-10.0		FBN
	High speed steel	88HSD	40-80	0.3-3.0		FBN
	High carbon semi-steel	70HSD	50-80	1.0-10.0		FBN
	Chilled cast iron	67HSD	50-80	1.0-10.0		FBN
Slurry pump	Wear resistant white cast iron	50-60HRC	50-100	0.5-4.0	0.2-0.5	FBN
Rolling mortar wall	High manganese steel	300-500HB	30-100	0.5-8.0	0.2-0.5	FBN

Common cutting parameters for Funik PCBN milling insert						
Material	Hardness of workpiece	Cutting edge angle Kr	Cutting speed Vc (m/min)	Cutting depth ap (mm)	Feed rate (mm/rev)	Cutting fluid
Gray cast iron	200HB	75°	500-2000	0.5-2.0	0.1-0.2	Dry cut
Gray cast iron	55HRC	75°	150-300	0.5-2.0	0.05-0.2	Dry cut
Hardened steel	60HRC	75°	80-200	0.2-0.5	0.05-0.1	Dry cut

Description: The rigidity and power of machine tool, size and thickness of insert, the material, hardness and shape of workpiece, machining allowance, insert durability and other factors need to be comprehensively considered to make appropriate adjustments in the selection of specific cutting parameters.

### Factors that may affect the insert life when PCBN insert is used in machining gray cast iron

- Casting blank should be properly done through aging treatment, and the general natural aging time should be more than 10 days.
- The ferrite content in casting blank should be equal to or less than 10%.
- The sulfur content should be equal to or more than 0.05%.

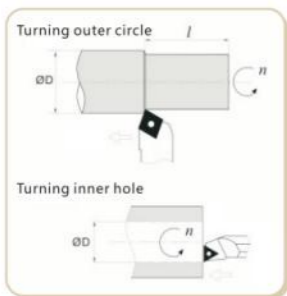
Failure to meet the above factors may result in a significant decrease in insert life

## Precautions for the Use of Funik Innovative PCBN Insert



## Calculation formula of common cutting parameter

Turning

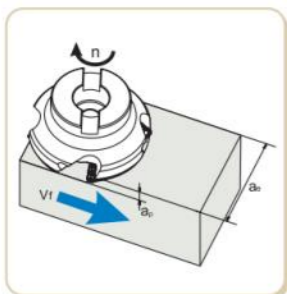


$$V_c = \frac{\pi * D * n}{1000} \text{ (m/min)}$$

$$f = \frac{V_f}{n} \text{ (mm/rev)}$$

In formula:  $V_c$ : cutting speed (m/min)  
 $n$ : Spindle speed (rev/min)  
 $D$ : workpiece diameter (mm)  
 $V_f$ : feed speed (mm/min)  
 $f$ : feed rate of every rotation (mm/rev)

Milling



$$V_c = \frac{\pi * D_c * n}{1000} \text{ (m/min)}$$

$$f_z = \frac{V_f}{n * Z} \text{ (mm/z)}$$

In formula:  $V_c$ : cutting speed (m/min)  
 $n$ : Spindle speed (rev/min)  
 $D_c$ : Nominal diameter of milling cutter (mm)  
 $V_f$ : feed speed (mm/min)  
 $Z$ : Tooth number of insert  
 $f_z$ : feed rate of every tooth (mm/rev)

## Notes for insert installation

- Thoroughly clean the insert and insert slot
- Check the completeness and wear of the shim
- Check whether the fastening of the shim is reliable
- Check whether the seal face of pressing plate is flat
- Ensure the insert and the positioning slot are closely fit
- Regularly replace the shim, pressing plate and all locking screws
- Avoid using the tool body with worn insert slot
- Keep the minimum overhanging of the tool holder
- Do not stop suddenly before the cutting tip dose not run out in the machining

## Company honor

- 1988 Synthesis of Funik's first high-grade cubic boron nitride abrasive
- 1991 Amber cubic boron nitride has been successfully developed
- 1997 High strength black cubic boron nitride has been successfully developed
- 1998 Won the title of "High-tech Enterprise" of Henan Science and Technology Commission
- 2002 National standard formulation unit of Super Abrasive, Cubic Boron Nitride
- 2003 Introduced high wear-resistant and impact-resistant polycrystalline cubic boron nitride inserts
- 2003 Undertook the "National Torch Plan" project of the Ministry of Science and Technology of the People's Republic of China
- 2005 Funik brand won the title of "Famous Brand Products of Henan Province"
- 2006 Won the "50 High-Tech and High-growth Enterprises" named by Henan Provincial Government
- 2006 The first one in the industry was certified by the "three-standard" management system of ISO9001, ISO14001, OHSAS18001
- 2007 Won the title of "Top Ten Enterprises with Comprehensive Economic Benefits in 2006" by China Machine Tool Industry Association
- 2008 Super wear-resistant high-speed finishing polycrystalline cubic boron nitride inserts were successfully put on the market
- 2009 Undertook and implemented the high-tech industrialization project of high-grade cubic boron nitride and high-speed cutting superhard cutting tools of the National Development and Reform Commission
- 2009 Won the title of "Henan Innovative Enterprise" in Henan Province
- 2010 Super brazed cubic boron nitride cutting tools was successfully put on the market
- 2011 Establishment of academician workstation of cubic boron nitride and its products
- 2012 Ultra-precision cubic boron nitride polycrystalline cutting tools was successfully put on the market
- 2014 Won the title of "Innovative Enterprise" of China Materials Research Society
- 2014 The company's shares are listed on the New Three Board, and the securities are referred to as "Funik". The stock code is 831378
- 2015 Won the national standard-setting unit of Polycrystalline Cubic Boron Nitride for Metal Processing
- 2015 Won the title of "Demonstration Enterprise of Technological Innovation in Henan Province in 2015"
- 2015 Won the title of "Top Ten Innovative Enterprises of Henan Economy (2015)"
- 2016 Won the title of "Intellectual Property Advantage Enterprise in Henan Province"
- 2016 Won the title of "Top Ten Product Quality" of cubic boron nitride awarded by China Machine Tool Industry Association
- 2016 Won the title of "Best Service Brand" of the third China Metal Cutting Tool
- 2017 Won the "Excellence Award of China Patent Award"
- 2017 Won the "First Prize for Scientific and Technological Progress in Henan Province"
- 2017 Won the "Top Ten Brands Made in Henan Province in 2017"
- 2018 Obtained the first batch of demonstration items of robot "Ten Hundred Thousand" demonstration application multiplication project in Henan Province in 2018
- 2018 Won the "First Prize for Scientific and Technological Progress in Henan Province"
- 2018 Funik innovative PCD cutting tool was sold more than 200,000 pieces in 3C electronics industry
- 2018 The  $\Phi 63$ mm PCD blank was successfully put on the market
- 2018 Won the title of "Henan Intelligent Factory"
- 2019 Won the title of the first batch of special new "Little Giant" enterprises of the Ministry of Industry and Information Technology of the People's Republic of China
- 2019 Won the "Henan Science and Technology Progress Award"
- 2019 Won the "National Intellectual Property Advantage Enterprise"
- 2020 Passed the evaluation of the "Management System for Integration of Informatization and Industrialization"
- 2020 Won the recognition of Henan Research Center of Cubic Boron Nitride Micro-nano Materials and Applied Engineering Technology
- 2021 Funik holds 370 national patents
- 2021 Premium quality Lab-grown diamond was successfully put on the market
- 2021 High performance  $\Phi 75$ mm PCD Blank was successfully put on the market