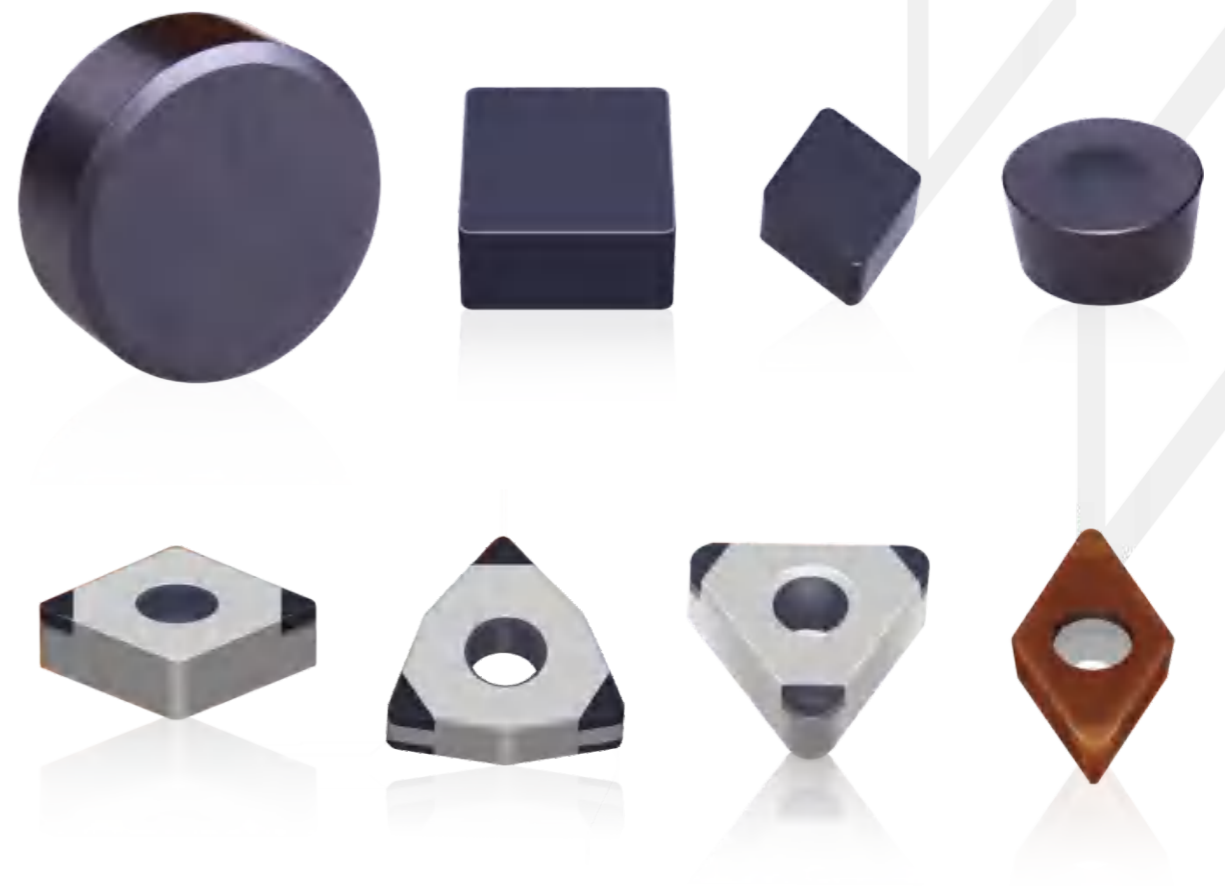


FUNIK

PCBN Insert

Substantially improve cutting efficiency and tool life



Funik Ultrahard Material Co., Ltd.

Address: No. 9, Wutong West Street, High-tech Industrial Development Zone, Zhengzhou City, Henan Province, China 450001
Website: www.funik.com

Funik

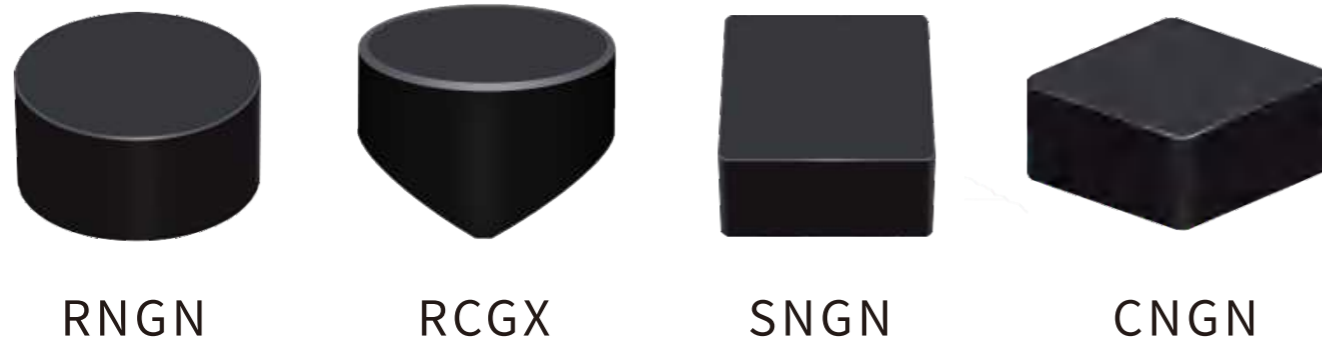
ISO9001/ISO14001/ISO45001 Certified

Advantages of Funik PCBN Insert:

- Excellent cost performance
- High machining efficiency
- Excellent surface quality
- Strong universality

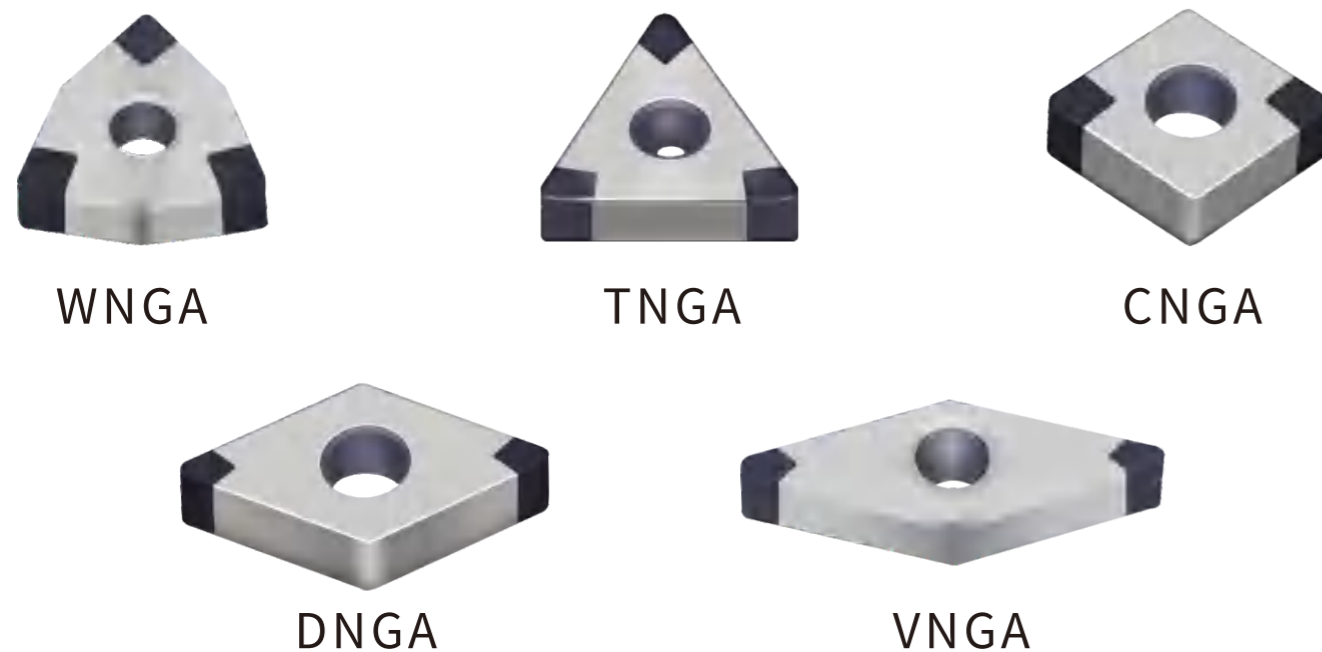
FBN Solid Insert

Heavy turning, high-efficiency milling



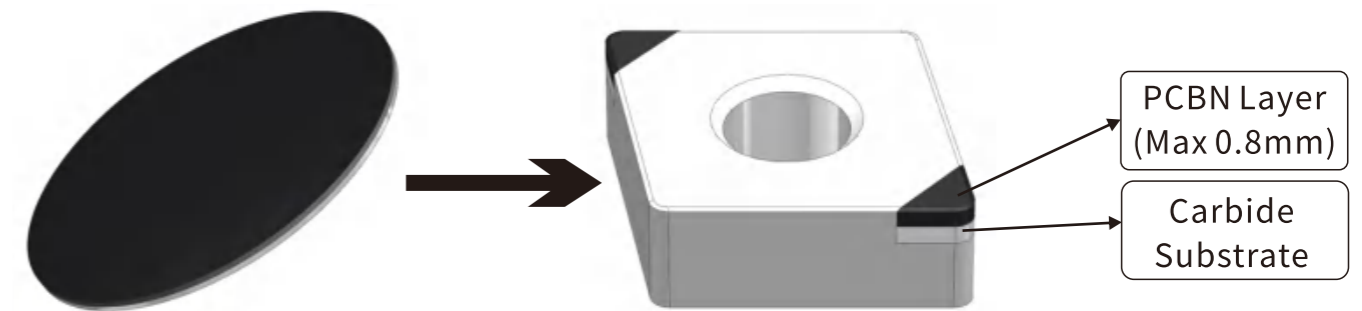
FBS Full Corner Brazed Insert

Double-sides multi-cutting edges, combined roughing and finishing, high universality



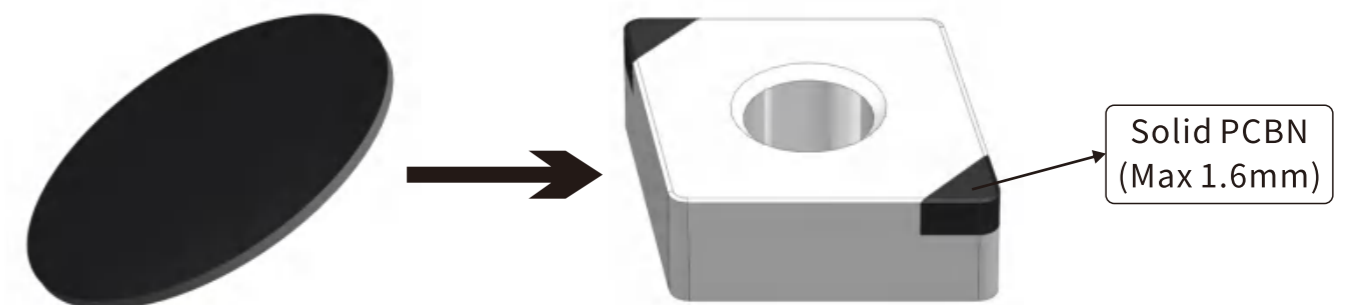
FBK Composite Tip Brazed Insert

Extremely high surface machining accuracy, ensuring automatic and continuous machining



FBM Solid Tip Brazed Insert

Extremely high surface machining accuracy and stronger impact resistance



PCBN Insert

Grade and Applicable Industry

Funik

Series	Grade	Workpiece Material	Machining Condition	Machining Model	Wear Resistance	Impact Resistance	Applicable Industry
FBN Solid Insert	FBN7630	● Gray cast iron ● High-hard alloy cast iron	Continuous to interrupted	Roughing /Semi-finishing /Finishing	★★★★★	★★★★	Brake disc, Brake drum, Flywheel, Belt pulley, Roll
	FBN7600	● Gray cast iron ● High-hard alloy cast iron ● High manganese steel	Continuous to interrupted	Roughing /Semi-finishing	★★★★	★★★★★	Brake disc, Brake drum, Roll, Belt pulley, Rolling mortar wall
	FBN7200	● Gray cast iron	Continuous	Semi-finishing /Finishing	★★★★★	★★★	Brake disc, Brake drum, Flywheel, Belt pulley
	FBN7000	● Gray cast iron ● Alloy cast iron	Continuous to heavy interrupted	Roughing /Semi-finishing /Finishing	★★★★	★★★★	Cylinder block, Cylinder head, Cylinder liner, Air-conditioning compressors
	FBN3500	● Chilled cast iron ● High-nickel chromium ● High-chromium steel	Heavy interrupted	Heavy roughing	★★★	★★★★★	Roll, Slurry pump, Rolling mortar wall, Special for wind power bearing bainite, Mining machinery
	FBN2530	● Gray cast iron	Continuous	Roughing /Semi-finishing /Finishing	★★★★	★★★	Roll, Brake disc, Brake drum, Flywheel, Air-conditioning compressors
	FBN9500	● Hardened steel ● Laser cladding	Continuous to heavy interrupted	Roughing /Semi-finishing /Finishing	★★★	★★★★★	Slewing bearing, Wind power bearings, Gear, Coal mining machinery
	FBN5800	● Hardened steel	Continuous	Roughing /Semi-finishing /Finishing	★★★★★	★★★	Slewing bearing, Bearing gear
	FBN7620	● Cast high-speed steel	Continuous to heavy interrupted	Roughing /Semi-finishing /Finishing	★★★★	★★★★★	High-speed steel roll
FBS Full Corner Brazed Insert	FBS2530	● Gray cast iron	Continuous	Semi-finishing /Finishing	★★★★	★★★	Brake disc, Brake drum, Flywheel, Air-conditioning compressors
	FBS7000	● Gray cast iron	Continuous to heavy interrupted	Semi-finishing /Finishing	★★★★	★★★★	Air-conditioning compressors
	FBS3610	● Hardened steel	Continuous	Semi-finishing /Finishing	★★★★	★★★	Slewing bearing, Bearing gear
	FBS5800	● Hardened steel	High-speed continuous	Semi-finishing /Finishing	★★★★★	★★★	Slewing bearing, Bearing gear
	FBS9500	● Hardened steel	Continuous to interrupted	Semi-finishing /Finishing	★★★	★★★★★	Slewing bearing, Bearing gear, Hub unit

PCBN Insert

Grade and Applicable Industry

Funik

Series	Grade	Workpiece Material	Machining Condition	Machining Model	Wear Resistance	Impact Resistance	Applicable Industry
FBK Composite Tip Brazed Insert	FBK7400	● High-hard alloy cast iron ● Heat-treated powder metallurgy	Continuous to heavy interrupted	Finishing	★★★★	★★★★	Gear, Sprocket wheel
	FBK7500	● Gray cast iron ● Powder metallurgy	Continuous to interrupted	Finishing	★★★★★	★★★	Brake disc, Gear, Sprocket wheel
	FBK7510	● Gray cast iron ● Hardened steel	Continuous	Finishing	★★★★	★★★★★	Cylinder block, Cylinder liner, Brake disc, CV joint
	FBK7520	● Alloy cast iron ● Powder metallurgy	Continuous to medium interrupted	Finishing	★★★★	★★★★	Turbocharger, Gear, Crankshaft
	FBK7560	● Gray cast iron ● Powder metallurgy	Continuous	Super finishing	★★★★★	★★★★★	Gear, Sprocket wheel, Palm of roller-cone
	FBK7700	● Gray cast iron ● Powder metallurgy ● Hardened steel	Continuous to heavy interrupted	Super finishing	★★★★	★★★★★	Gear, Sprocket wheel
	FBK9300	● Hardened steel	High-speed continuous	Finishing	★★★★	★★★	Bearing gear
	FBK9400	● Hardened steel	Continuous	Finishing	★★★★	★★★	Bearing gear, Hub unit
	FBK9526	● Hardened steel	High-speed continuous	Super finishing	★★★★★	★★★	Bearing gear
	FBK9600	● Hardened steel	Heavy interrupted	Finishing	★★★	★★★★	Bearing gear
FBM Solid Tip Brazed Insert	FBM9400	● Hardened steel	Continuous to light interrupted	Semi-finishing /Finishing	★★★★	★★★★	Bearing gear, Motor shaft, Hub unit
	FBM9520	● Hardened steel	High-speed continuous	Finishing	★★★★★	★★★	Bearing gear
	FBM9550	● Hardened steel	Medium interrupted	Semi-finishing /Finishing	★★★★★	★★★★	Bearing gear
	FBM9560	● Hardened steel	Heavy interrupted	Semi-finishing /Finishing	★★★	★★★★★	Bearing gear, Motor shaft

Application Cases of FBN Solid Insert

Industry – Automobile – Brake Disc



Workpiece: 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/edge)
European and American ceramics	700	7	200
Funik FBN7630	800	5	1000

Funik CBN cutting tool:
The life is increased by **400%**
The efficiency is promoted by **29%**

Industry – Automobile – Engine Cylinder Block



Workpiece: Engine cylinder block
Workpiece material: HT250
Workpiece hardness: HB190-210
Machining position: Top face of cylinder block
Machining type: Interrupted finishing
Insert grade: FBN7000
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/edge)
European and American carbide	180	84	80
Funik FBN7000	470	12	500

Funik CBN cutting tool:
The life is increased by **460%**
The efficiency is promoted by **86%**

Application Cases of FBK Composite Tip Brazed Insert

Industry – Automobile – Belt Pulley



Workpiece: 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/edge)
Japan and South Korea CBN	301	19	250
Funik FBK7520 C07	427	13	300

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

Industry – Automobile – Planetary gear



Workpiece: Planetary gear
Workpiece material: 20CrMnTi
Workpiece hardness: HRC58-65
Machining position: Spherical end face
Machining type: Continuous finishing
Insert grade: FBK9526 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/edge)
Japanese CBN	190	5	450
Funik FBK9526 C06	200	4	500

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

Industry – Roll – Screw Thread Steel Roll



Workpiece: 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: FBN7620
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/edge)
Domestic brand	68	90	1
Funik FBN7620	103	60	2

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

Industry – Wind turbine – Slewing Ring



Workpiece: Slewing ring
Workpiece material: 42CrMo
Workpiece hardness: HRC47-55
Machining position: Raceway
Machining type: Interrupted finishing
Insert grade: FBN9500
Insert specification: CNGA120408
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 (s/pcs)	Life (pcs/edge)
Domestic CBN	70	60	1
Funik FBN9500	90	50	2

Funik CBN cutting tool:
The life is increased by **100%**
The efficiency is promoted by **16%**

Industry – Powder Metallurgy – Synchronising Meshing Gear



Workpiece: Synchronising meshing gear
Workpiece material: Powder metallurgy
Workpiece hardness: HRC38 (Grain hardness HRC57)
Machining position: End face
Machining type: Finishing
Insert grade: FBK7560 C07
Insert specification: CNGA120408
Cutting type: Dry cutting
Cutting parameters: Vc=180m/min ap=0.2mm
f=0.2mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s/pcs)	Life (pcs/edge)
European CBN	120	40	150
Funik FBK7560 C07	180	20	200

Funik CBN cutting tool:
The life is increased by **33%**
The efficiency is promoted by **50%**

Industry – Automobile – CV Joint



Workpiece: CV joint
Workpiece material: S55C (No.55 steel)
Workpiece hardness: HRC58-62
Machining position: Inner diameter
Machining type: Interrupted 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/edge)
Japanese brand	160	30	400
Funik FBK7510	180	25	500

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

Application Cases of FBS Full Corner Brazed Insert

Industry – Automobile – Wheel Hub Bearing Unit



Workpiece: Wheel hub bearing unit
Workpiece material: 65Mn
Workpiece hardness: HRC58-63
Machining position: Raceway
Machining type: Continuous finishing
Insert grade: FBS9500 C06
Insert specification: VNGA160408
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/edge)
Domestic CBN	120	1.5	90
Funik FBS9500 C06	185	1	110

Funik CBN cutting tool:
The life is increased by **22%**
The efficiency is promoted by **50%**

Industry – Automobile – Brake Drum



Workpiece: Brake drum
Workpiece material: HT250
Workpiece hardness: HB190-210
Machining position: Inner diameter of brake surface
Machining type: Finishing
Insert grade: FBS2530
Insert specification: WNGA080412
Cutting type: Wet cutting
Cutting parameters: Vc=550m/min ap=0.5mm
f=0.2mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (min/pcs)	Life (pcs/edge)
Coated alloy	280	3	20
Funik FBS2530	550	2	90

Funik CBN cutting tool:
The life is increased by **350%**
The efficiency is promoted by **33%**

Industry – Automobile – CV Joint



Workpiece: CV joint
Workpiece material: S55C (No.55 steel)
Workpiece hardness: HRC58-62(No quenching in the chuck)
Machining position: Outer circle
Machining type: Finishing
Insert grade: FBM9550 C06
Insert specification: DNGM150408FV
Cutting type: Dry cutting
Cutting parameters: Vc=120m/min ap=0.2-0.3mm
f=0.2mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s/pcs)	Life (pcs/edge)
Japanese brand	100	30	250
Funik FBM9550 C06	120	25	300

Funik CBN cutting tool:
The life is increased by **20%**
The efficiency is promoted by **17%**

Industry – Automobile – Main Reduction Gear



Workpiece: Main reduction gear
Workpiece material: SCM420H
Workpiece hardness: HRC45-48
Machining position: Inner end face
Machining type: Finishing
Insert grade: FBM9560 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 (s/pcs)	Life (pcs/edge)
Domestic brand	120	40	80
Funik FBM9560 C06	140	35	100

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

Industry – Automobile – Brake Disc



Workpiece: Brake disc
Workpiece material: HT250
Workpiece hardness: HB190-210
Machining position: Inner diameter
Machining type: Finishing
Insert grade: FBS2530
Insert specification: CNGA120408F
Cutting type: Dry cutting
Cutting parameters: Vc=650m/min ap=0.5mm
f=0.2mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s/pcs)	Life (pcs/edge)
European and American ceramics	600	20	100
Funik FBS2530	650	18	350

Funik CBN cutting tool:
The life is increased by **250%**
The efficiency is promoted by **10%**

Industry – Air Conditioning Compressor – Upper Bearing



Workpiece: Upper bearing
Workpiece material: HT250
Workpiece hardness: HB190-210
Machining position: Outer circle of shank, end face
Machining type: Finishing
Insert grade: FBS7000
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/edge)
Domestic brand	350	50	1000
Funik FBS7000	450	39	1300

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

Industry – Automobile – Driven Gear



Workpiece: Driven gear
Workpiece material: 20CrMnTiH
Workpiece hardness: HRC55-58
Machining position: End face, outer circle
Machining type: Continuous finishing
Insert grade: FBM9520 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/edge)
European CBN	130	12	100
Funik FBM9520 C06	140	11	120

Funik CBN cutting tool:
The life is increased by **20%**
The efficiency is promoted by **8%**

Industry – Automobile – Electric Vehicle Motor Shaft



Workpiece: Electric vehicle motor shaft
Workpiece material: 20CrMnTiH
Workpiece hardness: HRC55-58
Machining position: End face, outer circle
Machining type: Interrupted finishing
Insert grade: FBM9560 C07
Insert specification: DNGA110404
Cutting type: Dry cutting
Cutting parameters: Vc=90m/min ap=0.2mm
f=0.12mm/r

Cutting tool contrast	Cutting speed Vc(m/min)	Efficiency (s/pcs)	Life (pcs/edge)
Domestic CBN	90	18	60
Funik FBM9560 C07	90	22	100

Funik CBN cutting tool:
The life is increased by **67%**
Equivalent efficiency