Funik

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 Φ63mm 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 Φ75mm PCD Blank was successfully put on the market

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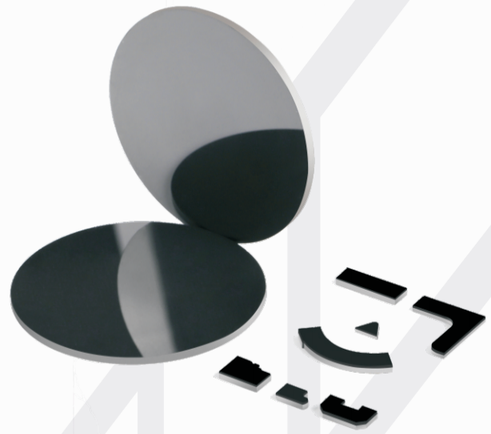
Funik

PCD blank

Improve the comprehensive Competitiveness advantages of cutting tool manufacturer



Advantages of Funik **PCD** blank

- Excellent wear-resistance
- Excellent impact-resistance
- The best cost efficiency to help customers improve efficiency

Subverting the tradition Enlightening the future

ISO9001/ISO14001/ISO45001 Certified

New: Bigger diameter (75mm) Life improved by 30%

PCD blank

Grade

	Grade	Grain size	Bond	Feature	Application
	PCD510	10μm	Metal	General PCD grade, with high impact resistance and high wear resistance	Wood, graphite, stone, metal, etc.
NEW	PCD512W	10μm	Metal	General PCD grade, with good EDM cutting performance, high wear resistance and high impact resistance	Wood, plastic board, graphite, ceramic, metal, etc.
	PCD605	5μm	Metal	Excellent wire EDM and mechanical cutting performance with high impact resistance and high wear resistance	Low silicon aluminum alloy, wood, plastic, metal, etc.
NEW	PCD612	10μm	Metal	General PCD grade, with high impact resistance and very high wear resistance	Middle silicon aluminum alloy, metal composite materials, ceramic, plexiglass, graphite, metal, etc.
	PCD632	2-30μm	Metal	Excellent wear resistance, high thermal stability and high impact resistance through adopting mixed grains	High silicon aluminum alloy, composite plastics, bimetal, metal composite materials, ceramic, etc.

Application condition and machining performance

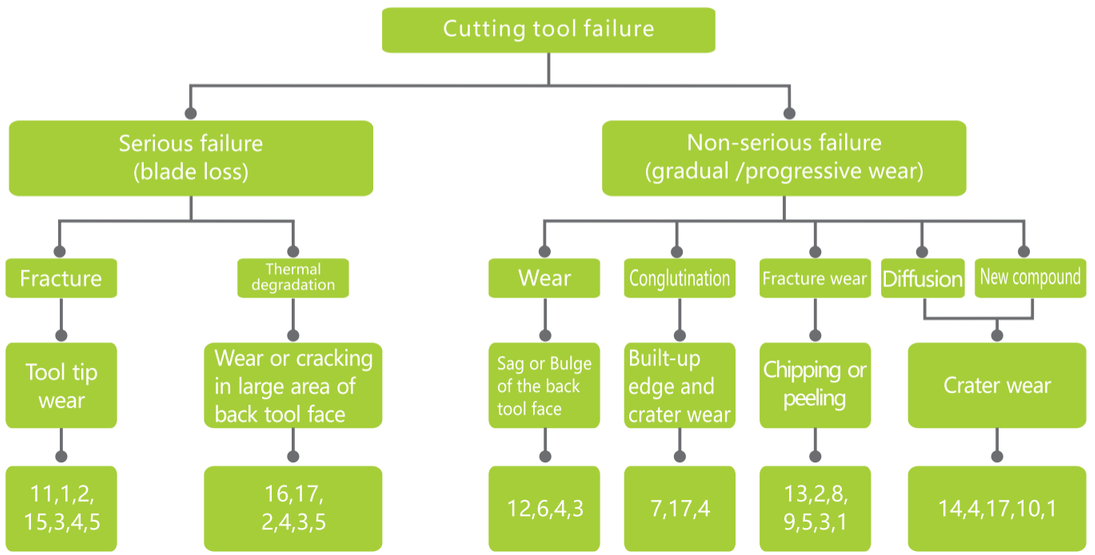
Grade	Impact resistance	Wear resistance	Electric spark machining performance	Machinability
PCD510				
PCD512W				
PCD605				
PCD612				
PCD632				

Parameters for product specifications

Grade	Outer diameter (mm)	PCD layer(mm)	Total Thickness (+/-0.05mm)		
			1.6	2.0	3.2
PCD605	63	0.5	√	√	
PCD510 / PCD512W / PCD612	63 / 75	0.5	√	√	√
PCD632	63	0.5	√	√	√

Note: 1. In the selection of PCD grade, it is necessary to consider four main factors including impact resistance, wear resistance, electric spark machining performance and machinability.
2. Other dimensions and styles are available upon request

PCD Cutting Tool Failure and Solution



1. Increase the radius of tool tip
2. Reduce the clearance angle
3. Reduce the feed
4. Reduce cutting velocity
5. Reduce cutting depth
6. Increase the clearance angle
7. Use the positive rake angle
8. Add a small blunt circle
9. Negative rake angle
10. Add the chamfer
11. Choose PCD with better toughness
12. Choose PCD with better wear resistance
13. Choose PCD with lager transverse fracture strength
14. Choose PCD with better chemical inertness
15. Increase the thickness
16. Choose PCD with better thermal stability
17. Use coolant, compressed air or high pressure cooling

Notes for PCD Brazing Process

- **Thermal stability:** The critical brazing temperature of PCD is around 750°C, and the exact critical brazing temperature depends on the PCD types.
- **Coefficient of thermal expansion:** The mismatch between the thermal expansion coefficient of PCD material layer and that of cutter body material will produce internal stress, which may lead to the generation of brazing defects.
- **Slot design:** If the tool head of PCD is to be hung out of the tool body, it is suggested that the length of the hanging out part should be equal to or more than 100um to avoid the crack of the tool head in the brazing process.
- Brazing area: For brazing cutting tool, the recommended brazing area (unit is mm2) should be more than 100 * f * ap to ensure that the insert can withstand the cutting load.
- **Solder:** It is recommended to choose the silver-based welding flux with low-melting point, the melting temperature is 680-710°C, the operating temperature is 690°C, and the shearing strength is about 280MPa.
- **Flux:** It is recommended that the working temperature of the scaling powder should be similar to that of the welding flux, and the initial working temperature of the scaling powder should be lower than that of the welding flux. For example, the melting point of the welding flux is 680-710°C, and the working temperature of the scaling powder should be 650-750°C.