Funik

Company honor

1988 Synthesis of Funik's first high-grade cubic boron nitride abrasive
1993 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
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 were 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”
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 q 63 large diameter compact 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
2020 Funik has accumulated more than 340 national patents

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PCD compact

Improve the comprehensive Competitiveness advantages of cutting tool manufacturer

Advantages of Funik PCD compact
• Excellent Wear-resistance
• Excellent impact-resistant
• The best cost efficiency to help customers improve efficiency

Subverting the tradition  Enlightening the future
ISO9001/ISO14001/ISO45001 Certified
PCD compact

Grade

<table>
<thead>
<tr>
<th>Grade</th>
<th>Grain size</th>
<th>Bond</th>
<th>Feature</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD510</td>
<td>8-10μm</td>
<td>Metal</td>
<td>Good wear resistance and higher impact resistance</td>
<td>Wood, plastic board, stone, graphite, etc</td>
</tr>
<tr>
<td>PCD510W</td>
<td>8-10μm</td>
<td>Metal</td>
<td>Excellent wire EDM cutting performance, wear resistance and impact resistance</td>
<td>Wood, plastic board, graphite, ceramic, etc</td>
</tr>
<tr>
<td>PCD610</td>
<td>10μm</td>
<td>Metal</td>
<td>High impact resistance and better wear resistance</td>
<td>Medium and high silicon aluminum alloy, metal matrix composite material, ceramic, organic glass, graphite, etc</td>
</tr>
<tr>
<td>PCD532</td>
<td>25μm</td>
<td>Metal</td>
<td>Very high impact resistance, thermal stability and good wear resistance</td>
<td>Graphite, wood, wear-resistant part, carbon, stone, etc</td>
</tr>
<tr>
<td>PCD632</td>
<td>2-30μm</td>
<td>Metal</td>
<td>Very high wear resistance, thermal stability and impact resistance through adopting mixed granulaties</td>
<td>High silicon aluminum alloy, composite plastic, duplex metal, metal matrix composite material, ceramic, etc</td>
</tr>
</tbody>
</table>

Application condition and machining performance

<table>
<thead>
<tr>
<th>Grade</th>
<th>Impact resistance</th>
<th>Wear resistance</th>
<th>Electric spark machining performance</th>
<th>Machinability</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD510</td>
<td>☐</td>
<td>☑</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>PCD510W</td>
<td>☐</td>
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<td>☐</td>
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<tr>
<td>PCD532</td>
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<tr>
<td>PCD632</td>
<td>☐</td>
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</tr>
</tbody>
</table>

Parameters for product specifications

<table>
<thead>
<tr>
<th>Grade</th>
<th>Outer diameter (mm)</th>
<th>PCD layer(mm)</th>
<th>Total Thickness (± 0.05mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1.2</td>
<td>1.6</td>
</tr>
<tr>
<td>PCD510</td>
<td>63</td>
<td>0.4-0.6</td>
<td>☑</td>
</tr>
<tr>
<td>PCD510W</td>
<td>63</td>
<td>0.4-0.6</td>
<td>☑</td>
</tr>
<tr>
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<td>0.4-0.6</td>
<td>☑</td>
</tr>
</tbody>
</table>

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 kind of PCD.
- **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 100μm 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 650°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.

1. Increase the radius of tool tip to prevent the tool tip from being worn away.
2. Reduce the clearance angle to reduce the friction between the tool and workpiece.
3. Reduce the feed to reduce the cutting force.
4. Reduce cutting velocity to reduce the heat generated.
5. Reduce cutting depth to reduce the load on the tool.
6. Increase the clearance angle to improve the tool's ability to remove chips.
7. Use the positive rake angle to improve the tool's ability to remove chips.
8. Add a small blunt circle to reduce the cutting force.
9. Negative rake angle to improve the tool's ability to remove chips.
10. Add the chamfer to improve the tool's ability to remove chips.
11. Choose PCD with better toughness to improve the tool's ability to remove chips.
12. Choose PCD with better wear resistance.