APPLICATION FOR CV JOINTS

Ball Track Milling Cutter
Hard Turning Insert
Vitrified CBN wheel
Rotary dresser

EHWA
CV joints (Constant-velocity joints) allow a drive shaft to transmit power through a variable angle, at constant rotational speed, without an appreciable increase in friction or play. CV joints are mainly composed of outer race, inner race, ball cage, and ball, which have been machined by grinding process, but recently PCBN hard machining process are replacing the grinding process.

PCBN tools are suitable for this kind of hard machining.

EHWA provides optimum designs and PCBN solutions with high technology in hard machining.
01 Ball Track Milling Cutter

■ EHWA CUTTER TYPES
EHWA offers two customized milling cutters with specific PCBN grades and edge preparations for each application.

<table>
<thead>
<tr>
<th>SPEC</th>
<th>EEBEB-HF</th>
<th>EEBEB-ST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Type (Steel)</td>
<td>HF10</td>
<td>HF12</td>
</tr>
<tr>
<td>Flute (Z)</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Material</td>
<td>PCBN</td>
<td>PCBN</td>
</tr>
</tbody>
</table>

■ PCBN GRADE FOR MILLING CUTTER

EB37X
Better Chemical Resistance & Higher Toughness

EB11
Better Wear Resistance & High Toughness

EB710
Good Chemical & Wear Resistance
■ PROFILE

CV joints have several types such as AC, UF, SX, GI, DO and etc, in which track geometries of Elliptic, Gothic and Circle are applicable for inner race and outer race.

EHWA offers an optimized cutter design for each component geometry with superior accuracy.

![Elliptic, Gothic, Circle](images/elliptic_gothic_circle.png)

■ Designing Of Optimized Tool For Each Track Geometry

![Optimized Tool Diagram](images/optimized_tool_diagram.png)
Questionnaire Form For
Ball Track Milling Cutter

### Workpiece

<table>
<thead>
<tr>
<th>Component</th>
<th>Inner Race</th>
<th>Outer Race</th>
<th>Circle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Track Geometry</td>
<td>Elliptic</td>
<td>Gothic</td>
<td>Circle</td>
</tr>
<tr>
<td>Gage Ball Diameter</td>
<td>[mm]</td>
<td>[mm]</td>
<td>[mm]</td>
</tr>
<tr>
<td>Ball Track Diameter (P.C.D)</td>
<td>[mm]</td>
<td>[mm]</td>
<td>[mm]</td>
</tr>
<tr>
<td>Contact Angle</td>
<td>[degree]</td>
<td>[degree]</td>
<td>[degree]</td>
</tr>
<tr>
<td>Vertex Clearance</td>
<td>[mm]</td>
<td>[mm]</td>
<td>[mm]</td>
</tr>
<tr>
<td>Conformity</td>
<td>[mm]</td>
<td>[mm]</td>
<td>[mm]</td>
</tr>
<tr>
<td>Contact Radius</td>
<td>[mm]</td>
<td>[mm]</td>
<td>[mm]</td>
</tr>
<tr>
<td>Wrapping Angle</td>
<td>[degree]</td>
<td>[degree]</td>
<td>[degree]</td>
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</tbody>
</table>

### Tool

<table>
<thead>
<tr>
<th>Tool</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool Length (L)</td>
<td>[mm]</td>
</tr>
<tr>
<td>Tool Setting Angle (V)</td>
<td>[degree]</td>
</tr>
</tbody>
</table>

### Machine

<table>
<thead>
<tr>
<th>Machine</th>
<th>HSK63</th>
<th>Special</th>
</tr>
</thead>
</table>
EHWA PCBN inserts show excellent performance in hard turning for outer race, inner race, cage and tripod with heavy interruption. In these applications, PCBN tools with high edge strength and thermal-chemical wear resistance are required. EHWA PCBN grades, EB73 & EB210 perform perfectly in the heavy interruption application. Also, they provide fine surface finish and longer tool life.

**PCBN INSERT SHAPE**

<table>
<thead>
<tr>
<th>SPEC</th>
<th>TNGA160412(16)</th>
<th>CNGA120408</th>
<th>DCGW11T308</th>
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<tbody>
<tr>
<td>Application</td>
<td>Outer &amp; Inner Race Cage (OD,ID)</td>
<td>Tripod Joint Shaft (OD)</td>
<td>Tripod (Spider)</td>
</tr>
</tbody>
</table>

**PCBN GRADE FOR TURNING**

- **EB73**
  Better Chemical Resistance & Good Toughness

- **EB210**
  Better Wear Resistance & High Toughness

![Diagram showing performance comparison between EB73 and competitor](image-url)
Advantages

- High stock removal for improved production capacity
- Outstanding surface quality with low heat and tight tolerance
- Longer dressing intervals & less wheel wear to reduce cost and improve consistency
- EHWA has specialized solution for cv joint part grinding

Cage Window Grinding

Standard specification
B126M180VBTM

Outer Race Grinding

Standard specification
B181M160VBTM
CV joints
Components that transmit the power of the engine delivered to the transmission to the wheels at constant speed.

Advantages
- Customized design
- Highly precise tolerance
- Outstanding grinding performance due to high diamond exposure
EHWA diamond tools serve as a promoter of globalization

Since 1975, EHWA DIAMOND has been growing by developing long-term partnerships with customers worldwide and across the industries. EHWA is tirelessly striving to provide the very best customer satisfaction through continuous product innovation and world class service.