## Application Guide

### Rotary Tool Grinding

#### Grinding Wheels

<table>
<thead>
<tr>
<th>Type Information</th>
<th>Grit Size</th>
<th>Bond</th>
<th>Grinding Method</th>
<th>Resin</th>
<th>Metal/Hybrid</th>
<th>NEW</th>
<th>Note:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15C320</td>
<td>G6V030W</td>
<td>&lt;= D40</td>
<td>Resin</td>
<td>Metal/Hybrid</td>
<td></td>
<td>All High-Performance Fluting and NF/NFM bond specifications are dedicated also to EDM-dressing!</td>
</tr>
<tr>
<td></td>
<td>15C500</td>
<td>F15VPMF030W</td>
<td>&lt;= D15</td>
<td>Resin</td>
<td>Metal/Hybrid</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Application Guide

**Grinding**

- **Tungsten Carbide**
- **Carbide**
- **Diamond**
- **Ceramic**
- **Silicon Carbide**

**Dressing**

- **Resin Bond**
- **Diamond Wheel**
- **Resin Bond Diamond Wheel**

**Polishing**

- **Resin Bond Diamond Wheel**

**Drill Bits**

- **Tungsten Carbide**
- **Carbide**

**Endwork**

- **Tungsten Carbide**
- **Carbide**

**Gashing**

- **Tungsten Carbide**
- **Carbide**

**Relief**

- **Micro Tools**

**Fluting**

- **Micro Tools**

**Taps**

- **High-Speed Steel (HSS)**

**Rollomatic**

- **Cutters**
- **Endwork**
- **Gashing**
- **Relief**

**Normac**

- **Endwork**

**ANCA, Walter**

- **Milling Cutters**
- **Gashing**
- **Relief**

**Haas, SAACKE**

- **Drill Bits**
- **Endwork**
- **Gashing**
- **Relief**

**Schütte, Rollomatic**

- **Drill Bits**
- **Endwork**
- **Gashing**
- **Relief**

**3M Science. Applied to Life.**
Grinding wheels for rotary cutting tools.

For the development of grinding wheels used to manufacture cutting tools.

Modern cutting tools like drills and milling machines often have complicated geometries with very tight tolerances and high requirements on the surface finish quality. To meet these requirements and be in the position to grind with high quality at low cost, the demands on the grinding machine and especially on the grinding wheels have risen dramatically.

To meet these demands, CNC tool grinding machines must have significantly higher performance and be more stable, flexible and equipped with an efficient cooling system. At the same time, though, this also increases the demands placed on the grinding wheels used.

Our products and services
■ Complete product portfolio of high quality tool grinding wheels in Diamond and CBN
■ New development of resin bonded 3M™ Cubitron™ II tool grinding wheels for HSS
■ Competent application consultants at your production site
■ Technical cooperation in order to increase productivity
■ Calculation of the total cost
■ Grinding seminars

Typical grinding operations: Tungsten carbide and HSS drills & mills production*

Peel grinding
Produces the final diameter.

Flute grinding
Flute grinding is the most critical, time consuming and cost intensive operation in manufacturing rotary tools.

Gashing
Creation of a taper along the cutting face to reduce the feed forces.

Clearance angle
Clearance angle reduces the contact area between the rotary tool and the workpiece. The clearance angles provide the tool with a free-cutting property and simultaneously reduce the feed forces when drilling and milling.

Relief grinding
Material is removed directly behind the cutting edge.

Profile roughing/finishing

Flute/Clearance angle polishing
Polishing is made to increase tool life and quality of the end product, the drill bit or milling cutters.

3M Grinding technologies for drills & mills for your special needs

1. Fluting
Shapes: 1A1, 1V1, 12V9
3M Product Codes: 6PHU, 6PHE, 6CHN, 6CHE

2. Gashing
Shapes: 1A1, 1V1, 1B1
3M Product Codes: 6PHU, 6PHE, 6PHN

3. Clearance angle
Shapes: 6A2, 11V9
3M Product Codes: 6CHN, 6CHE

4. Flute polishing
Shapes: 1A1, 1V1
3M Product Code: 6PBB

5. Clearance angle polishing
Shapes: 6A2, 11V9
3M Product Codes: 6CHN, 6CHE

6. Peel grinding
Shape: 4M9
3M Product Code: 6PHN

* All recommendations are examples and may have multiple options of wheel geometries and specifications depending on the specific application. Please contact your local 3M dealer for technical recommendations for your specific requirements.

NEW!

Typical grinding operations:

Tungsten carbide and HSS drills & mills production*

Flute/Clearance angle polishing

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Tungsten carbide and HSS drills & mills production*