superabrasive DRESSING TOOLS
Introduction - Diamonds & Dressing Tools

Natural diamonds are available in many shapes: octahedrons, dodecahedrons, flats, elongated shapes, triangles, irregular shapes and grits.

Diamond qualities vary from the finest pure crystals, free from flaws, cracks or impurities, to the lowest grade crystals which can be considerably flawed.

Abrasive Technology’s team of associates have the experience to help you choose the best diamond types and quality to match your tooling needs. We also have highly qualified design engineers to custom design a tool to fit your exacting requirements.

<table>
<thead>
<tr>
<th>Diamond Grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPLICATION</td>
</tr>
<tr>
<td>For hard wheels or when very fine finishes and close tolerances are required, such as thread, bearing and gear grinding</td>
</tr>
<tr>
<td>For demanding requirements and close tolerance work</td>
</tr>
<tr>
<td>For average grinding conditions</td>
</tr>
<tr>
<td>For general purpose work, still resettable</td>
</tr>
<tr>
<td>For general purpose work, non-resettable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Basic Dressing Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPLICATION</td>
</tr>
<tr>
<td>Dressing straight grinding wheels</td>
</tr>
<tr>
<td>Simple profiles, thread and gear grinding</td>
</tr>
<tr>
<td>Straight and profile dressing</td>
</tr>
<tr>
<td>Large OD wheels, surface and centerless wheels</td>
</tr>
<tr>
<td>Angle, radius and profile dressing</td>
</tr>
<tr>
<td>Custom designed to meet grinding profile requirements</td>
</tr>
</tbody>
</table>
Recommendations for Single-Point Dressers

1. Mounting the dressing tool
   • Mount the tool with minimum overhang to avoid vibration.
   • Never mount a dressing tool in an oversized hole.
   • Mount the diamond with a 10 to 15 degree drag angle pointing in the direction of wheel travel. When a straight dressing fixture is mounted on the table, position the diamond point past the center. A diamond pointing to the center of the wheel will cause vibration and shorten the tool life. (Figure 1)

2. Coolant
   • Dress dry when grinding dry. Dress with coolant if it is used during the grinding cycle.
   • Do not turn the coolant on if the dressing cycle was started dry. The thermal shock may fracture the diamond.
   • Direct a generous flow of coolant to the diamond at all times.

3. Operating parameters
   • Start the dressing cycle in the center of the wheel. (Figure 2)
   • Traverse rate: See chart below.
   • Infeed:
     - 36 - 60 grit whl     .001” (.025mm) to max .002” (.05mm)
     - 80 - 180 grit whl   .0005” (.013mm) to max .001” (.025mm)
     - 220 grit and finer .0002” (.005mm) to max .0005” (.013mm)
   • Index the diamond dresser frequently
     When the diamond wears, the increased contact area will generate more heat and shorten the tool life. Index the dresser 20 to 30 degrees when the wear flat reaches 1/16” (1.6mm). The diamond will then develop a conical wear pattern. (Figure 3)
   • Reset the diamond before a 3/32” (2.4mm) flat develops
     FOR “SG” WHEELS: Reduce infeed rate by 50% and increase the traverse rate. Use good quality diamonds with a sharp point.

4. Trueing time cycle
   • To calculate the trueing cycle, determine:
     - The grit size of the grinding wheel.
     - The speed of the grinding wheel.
     - The width of the grinding wheel.
   • To dress an open structure and aggressive grinding wheel, the diamond should not hit each abrasive grain more than once per revolution. Therefore, grit size and wheel speed will determine traverse rate.
   • To achieve a better finish, slow down the traverse rate to hit each grain a maximum of 2 times per revolution. If the traverse rate is too slow the diamond dulls the abrasive and the grinding wheel will burnish and cause heat checks.

Chart Of Trueing Time In Seconds Per Inch
(Lower figures for open wheel—Higher figures for finish)

<table>
<thead>
<tr>
<th>Grit size</th>
<th>36</th>
<th>46</th>
<th>60</th>
<th>80</th>
<th>100</th>
<th>120</th>
<th>150</th>
<th>180</th>
<th>220</th>
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<tr>
<td>500</td>
<td>6-10</td>
<td>8-15</td>
<td>12-20</td>
<td>18-30</td>
<td>24-40</td>
<td>30-50</td>
<td>35-56</td>
<td>40-60</td>
<td>50-80</td>
</tr>
<tr>
<td>750</td>
<td>4-7</td>
<td>6-10</td>
<td>8-13</td>
<td>12-20</td>
<td>16-26</td>
<td>20-33</td>
<td>27-42</td>
<td>30-45</td>
<td>38-60</td>
</tr>
<tr>
<td>1,000</td>
<td>3-5</td>
<td>4-8</td>
<td>6-10</td>
<td>9-15</td>
<td>12-20</td>
<td>15-25</td>
<td>18-28</td>
<td>20-30</td>
<td>25-40</td>
</tr>
<tr>
<td>1,250</td>
<td>2-4</td>
<td>3-6</td>
<td>5-8</td>
<td>7-12</td>
<td>10-16</td>
<td>12-20</td>
<td>14-22</td>
<td>16-24</td>
<td>20-32</td>
</tr>
<tr>
<td>1,500</td>
<td>2-3</td>
<td>3-5</td>
<td>4-7</td>
<td>6-10</td>
<td>8-14</td>
<td>10-17</td>
<td>12-19</td>
<td>13-20</td>
<td>17-27</td>
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<tr>
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<td>3-6</td>
<td>5-9</td>
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<td>9-14</td>
<td>10-16</td>
<td>11-17</td>
<td>14-23</td>
</tr>
<tr>
<td>2,000</td>
<td>1-3</td>
<td>2-4</td>
<td>3-5</td>
<td>4-8</td>
<td>6-10</td>
<td>8-12</td>
<td>9-14</td>
<td>10-16</td>
<td>11-17</td>
</tr>
<tr>
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<td>1-2</td>
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<td>2-5</td>
<td>3-5</td>
<td>5-8</td>
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<td>8-12</td>
<td>10-16</td>
</tr>
<tr>
<td>2,500</td>
<td>1-2</td>
<td>1-5</td>
<td>2-5</td>
<td>3-5</td>
<td>5-8</td>
<td>6-10</td>
<td>7-11</td>
<td>8-12</td>
<td>10-16</td>
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<tr>
<td>2,750</td>
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<td>1-5</td>
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<td>8-12</td>
<td>10-16</td>
</tr>
<tr>
<td>3,000</td>
<td>1-2</td>
<td>1-5</td>
<td>2-5</td>
<td>3-5</td>
<td>5-8</td>
<td>6-10</td>
<td>7-11</td>
<td>8-12</td>
<td>10-16</td>
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<tr>
<td>3,200</td>
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<td>1-5</td>
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<td>5-8</td>
<td>6-10</td>
<td>7-11</td>
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<td>1-5</td>
<td>2-5</td>
<td>3-5</td>
<td>5-8</td>
<td>6-10</td>
<td>7-11</td>
<td>8-12</td>
<td>10-16</td>
</tr>
</tbody>
</table>

Instructions
1. Check the spindle speed.
2. Go to the corresponding grit size column.
3. Multiply the indicated seconds by the width of the wheel.
4. The lower figure applies to dress an open wheel.
5. The higher figure results in a finer finish.

EXAMPLE: For a 36” x 4” (91.44cm x 10.16cm) 46 grit wheel running at 500 RPM, the dressing time will be 8 seconds x 4 = 32 seconds to dress an open wheel, 15 x 4 = 60 seconds to dress for finer finish.

These calculations assume that a relatively sharp diamond is used.
Shank Designs

- Straight Shank
- Hand Dresser
- Plain Headed Shank
- Hexagon Headed Shank
- Taper Shank
- Plain Headed Taper Shank
- Hexagon Headed Taper Shank
- Threaded Shank
- Chisel Shank

- Taper Headed Shank
- Magazine Dresser (Non-Resettable)
- Turnable Head Dresser
- Location Flat
- Recess for Location
- Recess for Point Location
- Partially Threaded
- Totally Threaded
- Internal Thread

- Double Ended
- Extraction Hole
- Cranked Head
- Screw Driver Slot
- Tapered Head for Coolant
- Coolant Slots

All the above shank designs are available in Resettable and Non-Resettable formats.
Resettable & Non-Resettable Single-Point Dressers

Recommended Non-Resettable Applications
- Toolroom grinders
- O.D. and surface grinding wheels up to 18” x 3” (4500 x 750mm)
- Burr grinding wheels
- Centerless regulating wheels
- General purpose work

Recommended Resettable Applications
- Very hard wheels
- SG wheels
- Thread or gear grinders
- Profile grinders
- To dress small internal grinding wheels

Diameters of 1/4” (6.3mm) to 3/4” (19mm), up to 6” (150mm) long.

Precision Dressing Tools

FOR THREAD GRINDERS
Dressing tools for thread grinders require very sharp crystals. They are center set to .003” (.076mm) T.I.R.

To Dress Concave Radii

JONES & LAMSON Style

Heald Style

Dimensions
A  B  C
Inch mm Inch mm Inch mm
1/4 6.35     1 25.40

Bryant Style

Doodekahedron diamonds are center set to within .004” (.1mm) T.I.R.

Natural diamonds center set to .003” (.076mm) T.I.R.

To Dress Radius

<table>
<thead>
<tr>
<th>Inch</th>
<th>mm</th>
<th>Inch</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>.010</td>
<td>.254</td>
<td>.032</td>
<td>.813</td>
</tr>
<tr>
<td>.015</td>
<td>.381</td>
<td>.062</td>
<td>1.574</td>
</tr>
<tr>
<td>.020</td>
<td>.508</td>
<td>.125</td>
<td>3.174</td>
</tr>
<tr>
<td>.025</td>
<td>.635</td>
<td></td>
<td></td>
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</tbody>
</table>

FOR INTERNAL GRINDERS

Diamond is center set to .002” (.051mm) T.I.R.

Heald Style

Dimensions
A  B  C
Inch mm Inch mm Inch mm
1/4 6.35 11/16 17.46 3/8 9.52
7/16 11.10 1 25.40 – –

Bryant Style

Dimensions
A  B  C
Inch mm Inch mm Inch mm
1/16 1.59 1/2 12.70 1/8 3.17
1/4 6.35 1 25.40 3/8 9.52
1/4 6.35 1 3/16 30.15 3/8 9.52
7/16 11.10 1 3/32 27.79 – –
7/16 11.10 1 1/8 28.57 – –
7/16 11.10 1 5/8 41.27 – –

Dodekahedron diamonds are center set to within .004” (1mm) T.I.R.
This specialized dressing tool features indexable action promoting sharp diamond exposure to achieve optimum conditions on grinding wheels, resulting in ideal surface finish and material removal rates.

**Improved throughput and reduced cost**
- Designed for ease of use - Operators turn the dresser quickly with a spanner.
- Easy access to even the most confined areas of grinding machines.
- No re-referencing of dressing position is required after indexing.
Blade Dressers are available in fixed and swivel formats

- Precision Profile tools are a cost effective alternative to expensive shaped single-point diamond tools.
- Achieve close tolerance profile and finish.
- Available in high quality graded natural diamond grits or hand set needle shaped diamonds.

**Fixed Blade Dressers**

**RANGE:** Small carat weight (0.4 - 2 carat).

**DIMENSIONS:** Between 10mm (0.379”) and 20mm (0.787”) width.

**APPLICATION:**
- High wear applications.
- Dressing large wheels.

**PLEASE STATE WHEN ORDERING:**
- Shank dimensions.
- Wheel type.
- Wheel size (diameter and width).
- Grit size and type.

All purpose forming tool suitable for all but very fine forms. These blades contain 2 or 3 layers of selected long diamonds.

**Standard Replacement Blade Dressers**

<table>
<thead>
<tr>
<th>Types</th>
<th>Side Set Blades</th>
<th>Center Set Blades</th>
</tr>
</thead>
</table>
| FA    | Dimensions of the diamond plate  
PC2 X = 10mm (.379")  
PC4 X = 15mm (.590") |
|      | **Inch** | **mm** | **Inch** | **mm** |
| A     | 13/16     | 20.5  | D       | 3/16   | 5     |
| B     | 25/32     | 20    | E       | 9/32   | 7     |
| C     | 1/4       | 6.1   |

| FB    | Dimensions of the diamond plate  
PC1 X = 10mm (.379")  
PCS X = 15mm (.590") |
|      | **Inch** | **mm** | **Inch** | **mm** |
| A     | 13/32     | 10.5  | D       | 3/16   | 5     |
| B     | 13/32     | 10    | E       | 9/32   | 7     |
| C     | 1/4       | 6.1   |

*Shown above are standard sizes. Contact customer service for full range. This product is also available in synthetic diamond.*
**Impregnated Dressers**

Small diamonds are carefully screened and are randomly spaced in an abrasion resistant matrix.

**Why they save money:**

- Diamonds can be completely consumed, nothing is wasted.
- Longer tool life. Tool wear is shared by many small diamonds.
- Less downtime because of shorter dressing cycle.
- Fewer dressing passes saves wheel wear.

**Recommendations:**

- Traverse rate: 25 IPM (.06M/min.) and faster.
- Infeed: .002” (.05mm).
- Start the dress in the center of the wheel.
- Use flood coolant.

**Specifications:**

<table>
<thead>
<tr>
<th>Crown Dresser</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crown - 1” x 5/8” x 1/8”</td>
<td>(25.4mm x 15.9mm x 3.2mm)</td>
</tr>
<tr>
<td>Shank - 7/16” x 1 5/8” OAL</td>
<td>(11.1mm x 41.3mm)</td>
</tr>
</tbody>
</table>
Indexable Disc Type Dresser

Small elongated whole diamonds are carefully selected for quality and uniformity of shape.

<table>
<thead>
<tr>
<th>Shank Style</th>
<th>Dimensions</th>
<th>Recommended Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inch</td>
<td>mm</td>
</tr>
<tr>
<td>1</td>
<td>1/2</td>
<td>12.70</td>
</tr>
<tr>
<td>1</td>
<td>1/2</td>
<td>12.70</td>
</tr>
<tr>
<td>3</td>
<td>11/16</td>
<td>17.46</td>
</tr>
</tbody>
</table>

Cluster Type Dresser

Designed for straight pass grinding, these tools are of a robust construction and available in diameters from 1/4" (6.35mm) to 3/4" (19.05mm) as standard. Finest natural diamond grits are used for rapid stock removal and fine finish applications.

Single-Layer Dressing Block

Designed to dress straight wheels on tool room surface grinders. Quickly removes all previous forms or shapes.

Off-Hand Dresser

For hand trueing and dressing of abrasive grinding wheels.
Profile Tools

**Cone Lapped Dressing Tool**

Fine quality elongated diamonds are used in our cone shaped dressing tools. They are lapped to .003” (.076mm) T.I.R.

<table>
<thead>
<tr>
<th>Radius</th>
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</thead>
<tbody>
<tr>
<td>Inch</td>
</tr>
<tr>
<td>.005</td>
</tr>
<tr>
<td>.010</td>
</tr>
<tr>
<td>.015</td>
</tr>
<tr>
<td>.020</td>
</tr>
</tbody>
</table>

Specify “A” angle, “D” diameter, “L” length, “R” radius

**Polished Chisel Dressing Tool**

The finest quality flat elongated diamonds are used in our chisel edge dressing tools. They are lapped to .005” (.127mm) chisel width within .003” (.076mm) of center.

<table>
<thead>
<tr>
<th>Radius</th>
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<tbody>
<tr>
<td>Inch</td>
</tr>
<tr>
<td>.005</td>
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<tr>
<td>.010</td>
</tr>
<tr>
<td>.015</td>
</tr>
<tr>
<td>.020</td>
</tr>
</tbody>
</table>

Specify “A” angle, “D” diameter, “L” length, “R” radius

**Phono Points**

For dressing small radii fine grit wheels

<table>
<thead>
<tr>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inch</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>L</td>
</tr>
</tbody>
</table>

**Diaform Style**

Diaform and Pantocrush style dressers are made with the finest quality triangular shaped diamonds.

The grain is oriented to expose the hardest direction of the diamond to the abrasive forces of the grinding wheel. This yields longer tool life.

Polycrystalline diamond (PCD) tool blanks can be used on very selective applications.

Specify “A” angle, “D” diameter, “L” length, “R” radius
**PCD Form Dressers**

- A cost effective alternative to roll dressing and Diaform style dressing.
- Can impart complex and highly accurate forms to grinding wheels.
- Long lasting.
- Less machine downtime.

**Range:** Custom designed to meet customers’ grinding profile requirements.

**Dimensions:** .05” - 4” (1mm - 100mm) wide.

**Application:**
- Highly accurate form dressing applications.
- Alternative to roll dressing.
- Alternative to profile dressing.

**Please state when ordering:**
- Wheel type.
- Wheel size (diameter & width).
- Grit size and type.
- A tool or component drawing will also be required.

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**Rotatrim Devices for Dressing and Trueing**

For a fast, easy and cost effective way to restore, dress and true Diamond and CBN wheels.

<table>
<thead>
<tr>
<th>Item</th>
<th>Stock No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centrifugal Braking - For general purpose use</td>
<td>C4710001</td>
</tr>
<tr>
<td>Air Driven - For large and very small diameter wheels</td>
<td>C4720001</td>
</tr>
<tr>
<td>Replacement Wheels 60 SIC (5 pack)</td>
<td>C4730001</td>
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</tbody>
</table>

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**Natural Dressing Tool Service**

**Single Point Dressers**

We can reset all our resettable diamonds into a completely new shank.

**Polished Diamond Tools**

Both Chisel tools and Cone tools can be relapped and regenerated.

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**PCD Dressing Tools for CNC Profile Grinders**

Our polycrystalline diamond dressers are ideal for Voumard & Studer CNC Profile Grinders. The carbide post allows for secure mounting. Random diamond grain orientation on the dresser’s points provide consistent results.

<table>
<thead>
<tr>
<th></th>
<th>Inch</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>.217</td>
<td>5.51</td>
</tr>
<tr>
<td>B</td>
<td>.125</td>
<td>3.20</td>
</tr>
</tbody>
</table>
Go to www.abrasive-tech.com to order online or find a distributor near you.

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