A-Drills | Drills Designed with A Brand Values in Mind

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The A Brand represents a new evolution in cutting tool technology. With a commitment to only the best, the A Brand emanates innovations essential for shaping the future of global manufacturing. The A Brand is not only a premium tooling brand, it also represents the quality assurance OSG guarantees to each and every customer. The A Brand is composed of OSG’s latest high performance threading, drilling and milling tool innovations. Developed with attention to the finest details, manufacturers will experience the level of quality, reliability and satisfaction that can only be delivered by the A Brand tooling master class.

Advanced tool qualities have been incorporated into the A Brand products, including a versatility that enables a wide range of processing in different work materials, an excellent capability to perform difficult processing tasks, and high efficiency that leads to shortened production time and cost savings. Expectations have risen that the A Brand will bring innovations into the manufacturing field, and pass on OSG’s technologies from today to the future. To better understand the concept of the A Brand, interviews were conducted with OSG experts who have devoted their manufacturing careers to the development of A Brand products. They spoke enthusiastically about how their passions underpinned the development process.
The Tooling Master Class
Innovations for shaping the future of global manufacturing
The A Brand is not only a premium tooling brand, it also represents the quality assurance OSG guarantees to each and every customer.

To better accommodate evolving manufacturing needs, the A Brand offering has been expanded. Whether you are looking for better tools or need assistance in choosing the right tool, give one of the A Brand products a try. You will experience a level of quality, reliability and satisfaction that can only be delivered by the A Brand tooling master class.

**A-DRILL**

- A Brand® ADO-TRS 3D & 5D
- A Brand® ADF • ADFO • ADFL
- A Brand® ADO 3-30D
- A Brand® AD 2D & 4D
- A Brand® ADO-SUS 3D & 5D
- A Brand® AD-LDS

**A-TAP**

- A Brand® AT-1
- A Brand® A-CSF
- A Brand® A-CHT
- A Brand® A-SFT • A-OIL-SFT • A-LT-SFT
- A Brand® A-POT • A-OIL-POT • A-LT-POT

**A-END MILL**

- A Brand® AE-VMS
3-Flutes vs 2-Flutes

3 Advantages of a 3-Flute Design

**High Feed Rate:**

OSG’s ADO-TRS drills have a specially shaped flute (PAT.P.) that breaks steel chips into small, manageable pieces for easy evacuation. This allows for increased feed rates up to 1.5 to 2 times faster than 2-fluted drills.

**High Precision:**

The 120° equal spacing margins of the 3-flute design allows for more stable, vibration-free hole processing, thereby increasing hole quality and tolerance.

**Reduced Work Hardening:**

The amount of work hardening and depth of work hardening have a tendency to be proportional to the feed per revolution. When compared to conventional 2-flute drills with the same feed per revolution, the 3-flute design has proven to decrease work hardening.
**Tool Life in Carbon Steel**

**1065 Carbon Steel**

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**Tool Life in Cast Iron**

**Gray Cast Iron**

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## List 6600

**ADO-TRS-3D, 3 Flute, Coolant-Through**

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<td>35-45 HRC 55-50 HRC 50-70 HRC</td>
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### Packed: 1 pc.
Available EgiAs Coating Only.

### Work Material

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Packed: 1 pc.
Available EgiAs Coating Only.

Cutting Diameter Tolerance (h8)

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**Additional Information**

- New Speed Feed CARBIDE
- EgiAs
- 30˚ R Thinning
- Size: mm inch
- Fractional Size: mm
- Wire Gage: Letter Size
- Diameter Tolerance (h8): +0 / -0.0009
- Cutting Diameter Tolerance (h8): mm inch
- Overall Length: mm
- Shank Diameter: mm
- Packed: 1 pc.

www.osgtool.com
List 6600 (Continued)
ADO-TRS-3D, 3 Flute, Coolant-Through

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Packed: 1 pc.
Available EgiAs Coating Only.

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- **P**: Good/Best
- **M**: Good/Best
- **K**: Good/Best
- **N**: Good/Best
- **S**: Good/Best
- **H**: Good/Best

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WWW.OSGTOOL.COM
### List 6610

**ADO-TRS-SD, 3 Flute, Coolant-Through**

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Available EgiAs Coating Only.
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Packed: 1 pc.
Available EglAs Coating Only.

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<td>8724000</td>
<td>-</td>
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<td>20.00</td>
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</table>

Packed: 1 pc.
Available EgiAs Coating Only.

**Work Material**

<table>
<thead>
<tr>
<th>List No.</th>
<th>Carbon Steels</th>
<th>Alloy Steels</th>
<th>Die Steels</th>
<th>Stainless Steels</th>
<th>Cast Iron</th>
<th>Aluminum</th>
<th>Nickel Alloy</th>
<th>Titanium</th>
<th>Hardened Steels</th>
</tr>
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<tbody>
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<table>
<thead>
<tr>
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<th>Low</th>
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<th>High</th>
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<td>1035</td>
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**Cutting Diameter Tolerance (h8)**

<table>
<thead>
<tr>
<th>Size</th>
<th>mm</th>
<th>inch</th>
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<tbody>
<tr>
<td>4≤D≤6</td>
<td>+0 / -0.018</td>
<td>+0 / 0.007</td>
</tr>
<tr>
<td>6&lt;D≤10</td>
<td>+0 / -0.027</td>
<td>+0 / 0.011</td>
</tr>
<tr>
<td>10&lt;D≤18</td>
<td>+0 / -0.033</td>
<td>+0 / 0.013</td>
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**Fluting Diameter**

- R Thinning

**NEW**

- Speed Feed
- Carbide
- 30°
- Shank
### General Drilling Operations

<table>
<thead>
<tr>
<th>Work Material</th>
<th>Carbon Steels, Mild Steels 1010, 1050, 12L14</th>
<th>Alloy Steels 4140, 4140</th>
<th>Stainless Steels 400SS, 17-4PH</th>
<th>Cast Iron</th>
<th>Ductile Cast Iron</th>
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<tbody>
<tr>
<td><strong>Drilling Speed</strong></td>
<td>260-395 SFM</td>
<td>260-395 SFM</td>
<td>130-200 SFM</td>
<td>260-395 SFM</td>
<td>195-330 SFM</td>
</tr>
<tr>
<td><strong>Drill Dia.</strong></td>
<td><strong>Speed RPM</strong></td>
<td><strong>Feed IPR</strong></td>
<td><strong>Speed RPM</strong></td>
<td><strong>Feed IPR</strong></td>
<td><strong>Speed RPM</strong></td>
</tr>
<tr>
<td><strong>mm</strong></td>
<td><strong>Inch</strong></td>
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<tr>
<td>4 –</td>
<td>8,000</td>
<td>0.005 - 0.009</td>
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<td>0.005 - 0.009</td>
<td>4,000</td>
</tr>
<tr>
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<td>5,300</td>
<td>0.007 - 0.013</td>
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<td>0.007 - 0.013</td>
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</tr>
<tr>
<td>8 –</td>
<td>4,000</td>
<td>0.009 - 0.017</td>
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<td>0.009 - 0.017</td>
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<tr>
<td>10 –</td>
<td>3,200</td>
<td>0.012 - 0.021</td>
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<td>0.012 - 0.021</td>
<td>1,700</td>
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<tr>
<td>12 –</td>
<td>7/16</td>
<td>2,900</td>
<td>0.014 - 0.023</td>
<td>2,900</td>
<td>0.013 - 0.023</td>
</tr>
<tr>
<td>14 –</td>
<td>1/2</td>
<td>2,700</td>
<td>0.014 - 0.024</td>
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<td>0.014 - 0.024</td>
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<tr>
<td>18 –</td>
<td>5/8</td>
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<td>0.015 - 0.025</td>
<td>2,500</td>
<td>0.015 - 0.025</td>
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<tr>
<td>20 –</td>
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### General Drilling Operations

<table>
<thead>
<tr>
<th>Work Material</th>
<th>Cast Aluminum</th>
<th>Special Alloy Steels, Hardened Steels</th>
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<tr>
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<td>260-660 SFM</td>
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<td><strong>Drill Dia.</strong></td>
<td><strong>Speed RPM</strong></td>
<td><strong>Feed IPR</strong></td>
</tr>
<tr>
<td><strong>mm</strong></td>
<td><strong>Inch</strong></td>
<td></td>
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<tr>
<td>4 –</td>
<td>11,100</td>
<td>0.006 - 0.012</td>
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<tr>
<td>6 –</td>
<td>7,400</td>
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<td>8 –</td>
<td>5,600</td>
<td>0.013 - 0.025</td>
</tr>
<tr>
<td>10 –</td>
<td>4,700</td>
<td>0.015 - 0.030</td>
</tr>
<tr>
<td>12 –</td>
<td>7/16</td>
<td>4,000</td>
</tr>
<tr>
<td>14 –</td>
<td>1/2</td>
<td>3,700</td>
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<tr>
<td>18 –</td>
<td>5/8</td>
<td>3,500</td>
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<td>20 –</td>
<td>3/4</td>
<td>2,800</td>
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<tr>
<td>24 –</td>
<td>7/8</td>
<td>2,500</td>
</tr>
<tr>
<td>20 –</td>
<td>3/4</td>
<td>2,300</td>
</tr>
<tr>
<td>25 –</td>
<td>5/8</td>
<td>2,200</td>
</tr>
</tbody>
</table>
**ADFO & ADF**

**Features & Benefits**

- **Double Margin**
  - for high rigidity.

- **Sharp Gash Angle**
  - produces chips with fine curl.

- **20° Helix**
  - for high rigidity.

- **Improved Cutting Edge**
  - for reduced cutting forces and smaller chip size.

- **Balanced Point Form**
  - for stable hole entry.

- **Wide Flute Room**
  - facilitates stable chip evacuation.

- **EgiAs Coating**
  - for exceptional wear resistance and toughness.

---

**EgiAs Coating**

**Exceptional Wear Resistance & Toughness**

Constructed with extreme toughness, high wear and heat resistance characteristics to ensure stable and consistent tool life. Suppresses friction with the wear resistance layer; prevents breakage with the nano periodical layer.

<table>
<thead>
<tr>
<th>A Brand® ADF</th>
<th>Competitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>After drilling 1,620 holes (Still good)</td>
<td>After drilling 660 holes (Chipping)</td>
</tr>
</tbody>
</table>

- Material: Carbon Steel (1050)
- Cutting Speed: 246 SFM (3,981 RPM) • Feed Rate: 9.4 IPM (0.002 IPR)
Multi-Purpose Flat Drills

The ADFO and ADF are Suitable for a Wide Variety of Applications

The ADFO & ADF drills are capable of drilling in numerous applications such as inclined surfaces, curved surfaces, flat-bottom holes and more.

Application Guide

Exceptional Wear Resistance & Toughness

Constructed with extreme toughness, high wear and heat resistance characteristics to ensure stable and consistent tool life. Suppresses friction with the wear resistance layer; prevents breakage with the nano periodical layer.

<table>
<thead>
<tr>
<th>ADF 2D &amp; ADFLS 2D</th>
<th>ADFO 3D</th>
</tr>
</thead>
<tbody>
<tr>
<td>• General purpose</td>
<td>• Up to 3D Drilling</td>
</tr>
<tr>
<td>• Suitable up to 2D</td>
<td>• Suitable for stainless steel applications</td>
</tr>
<tr>
<td>• Suitable for a wide variety of applications</td>
<td></td>
</tr>
</tbody>
</table>

When machining stainless steel, the ADFO breaks chips into small, manageable pieces.

ADF 3D

Competitor
Superior Performance in Stainless Steel

304 Stainless Steel

The ADFO demonstrated exceptional results in stainless steel against its competitors, machining over 100 holes while the competitor tooling failed at just 5 holes.

Cutting Data

<table>
<thead>
<tr>
<th>Tool</th>
<th>ADFO 3D</th>
<th>Competitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drill Size</td>
<td>Ø10mm</td>
<td></td>
</tr>
<tr>
<td>Machined Surface</td>
<td>Flat Surface</td>
<td></td>
</tr>
<tr>
<td>Work Material</td>
<td>304 Stainless Steel</td>
<td></td>
</tr>
<tr>
<td>Cutting Speed</td>
<td>164 SFM (1,592 RPM)</td>
<td></td>
</tr>
<tr>
<td>Feed Rate</td>
<td>9.4 IPM (0.006 IPR)</td>
<td></td>
</tr>
<tr>
<td>Depth of Hole</td>
<td>30 mm (Through)</td>
<td></td>
</tr>
<tr>
<td>Coolant</td>
<td>Water Soluble</td>
<td></td>
</tr>
<tr>
<td>Machine</td>
<td>Horizontal Machining Center</td>
<td></td>
</tr>
</tbody>
</table>

Cutting Resistance Waveform

With its 20° helica grooves, the ADFO maintained stable thrust and torque throughout the machining process.

Hole Expansion Comparison

ADFO 3D has minimal hole expansion variation when compared to the competitors.

Durability

The ADFO showed minimal wear after 5 holes, while the competitors showed chipping and tangling of chips.
Stable Processing of Stainless in Small Diameter

304 Stainless Steel

Even at smaller diameters, the ADFO demonstrated controlled hole expansion and exceptional durability.

<table>
<thead>
<tr>
<th>Tool</th>
<th>ADFO 3D</th>
<th>Competitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drill Size</td>
<td>Ø3mm</td>
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<td>Machined Surface</td>
<td>Flat Surface</td>
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</tr>
<tr>
<td>Work Material</td>
<td>304 Stainless Steel</td>
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</tr>
<tr>
<td>Cutting Speed</td>
<td>164 SFM (5,305 RPM)</td>
<td></td>
</tr>
<tr>
<td>Feed Rate</td>
<td>9.4 IPM (0.002 IPR)</td>
<td></td>
</tr>
<tr>
<td>Depth of Hole</td>
<td>9 mm (Through)</td>
<td></td>
</tr>
<tr>
<td>Coolant</td>
<td>Water Soluble</td>
<td></td>
</tr>
<tr>
<td>Machine</td>
<td>Horizontal Machining Center</td>
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</tbody>
</table>

Hole Expansion Comparison

<table>
<thead>
<tr>
<th>Cutting Length (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>70” (200 Holes) Can Continue</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADFO 3D</th>
<th>1.41” (4 Holes)</th>
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<tbody>
<tr>
<td>Competitor A</td>
<td>Tangling of Chips</td>
</tr>
<tr>
<td>Competitor B</td>
<td>Tangling of Chips</td>
</tr>
</tbody>
</table>

Burrs Suppression

400 Stainless Steel

The ADFO’s proprietary cutting edge geometry suppresses burrs when machining through holes.

Exit Hole Comparison

ADFO suppresses burrs on exit of the material.

<table>
<thead>
<tr>
<th>Tool</th>
<th>ADFO 3D</th>
<th>Competitor A</th>
<th>Competitor B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drill Size</td>
<td>Ø16mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machined Surface</td>
<td>Flat Surface</td>
<td>Angled Surface</td>
<td></td>
</tr>
<tr>
<td>Work Material</td>
<td>400 Stainless Steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cutting Speed</td>
<td>328 SFM (1,989 RPM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed Rate</td>
<td>25 IPM (0.013 IPR)</td>
<td>12.5 IPM (0.006 IPR)</td>
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</tr>
<tr>
<td>Depth of Hole</td>
<td>10 mm (Through)</td>
<td>16.5 mm (Through)</td>
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<tr>
<td>Coolant</td>
<td>Water Soluble</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine</td>
<td>Horizontal Machining Center</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: All tooling for this test was ran at the same parameters as the ADFO.
Counterboring

Grey Cast Iron

Both A Brand® ADF Drills and conventional drills show little to no positional inaccuracies when processed over the center of a pre-existing hole. However, when it is necessary to process the drill off-center over a pre-existing hole, the position and straightness of the hole made with the ADF is 5 times more accurate than the conventional drill.

<table>
<thead>
<tr>
<th>Tool</th>
<th>ADF-2D</th>
<th>Conventional Carbide Drill</th>
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</thead>
<tbody>
<tr>
<td>Drill Size</td>
<td>Ø18</td>
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<tr>
<td>Machined Surface</td>
<td>Flat Surface</td>
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</tr>
<tr>
<td>Work Material</td>
<td>Grey Cast Iron</td>
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</tr>
<tr>
<td>Cutting Speed</td>
<td>246 SFM (1,327 RPM)</td>
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</tr>
<tr>
<td>Feed Rate</td>
<td>5.2 IPM (0.004 IPR)</td>
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<td>Depth of Hole</td>
<td>34 mm (Blind)</td>
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</tr>
<tr>
<td>Coolant</td>
<td>Water Soluble</td>
<td></td>
</tr>
<tr>
<td>Machine</td>
<td>Horizontal Machining Center</td>
<td></td>
</tr>
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</table>

Half-Hole

Carbon Steel (1050)

The ADF minimized the amount of shift when drilling a half-hole as compared to both the conventional and competitor drills.

<table>
<thead>
<tr>
<th>Tool</th>
<th>ADF-2D</th>
<th>Conventional Carbide Drill</th>
<th>Competitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drill Size</td>
<td>Ø12</td>
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<tr>
<td>Machined Surface</td>
<td>Flat Surface</td>
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<td></td>
</tr>
<tr>
<td>Work Material</td>
<td>Carbon Steel (1050)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cutting Speed</td>
<td>121 SFM (979 RPM)</td>
<td></td>
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</tr>
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<td>Feed Rate</td>
<td>5.9 IPM (0.006 IPR)</td>
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<tr>
<td>Depth of Hole</td>
<td>24 mm (Blind)</td>
<td></td>
<td></td>
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<tr>
<td>Coolant</td>
<td>Water Soluble</td>
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</tr>
<tr>
<td>Machine</td>
<td>Horizontal Machining Center</td>
<td></td>
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</table>

Inclined Surface

Alloy Steel (4140)

The ADF maintained accurate hole position and resisted chipping while drilling on an inclined surface.

<table>
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<th>Tool</th>
<th>ADF-2D</th>
<th>Competitor</th>
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<tbody>
<tr>
<td>Drill Size</td>
<td>Ø10</td>
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</tr>
<tr>
<td>Machined Surface</td>
<td>Angled Surface (30°)</td>
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<tr>
<td>Work Material</td>
<td>Alloy Steel (4140)</td>
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<tr>
<td>Cutting Speed</td>
<td>200 SFM (1,944 RPM)</td>
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<td>7.7 IPM (0.004 IPR)</td>
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<td>Water Soluble</td>
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<tr>
<td>Machine</td>
<td>Horizontal Machining Center</td>
<td></td>
</tr>
</tbody>
</table>

Shift in Hole Position

ADF vs Competitor

Shift Amount in Hole Position

Centered vs Offset

Fallen Amount (Inch)

0.0000
0.0019
0.0039
0.0059
0.0078
0.0098
0.0118
0.0137
0.0157
0.0177

From Hole Entry

0.393" From Hole Entry

0.787" From Hole Entry

A Brand® ADF

Cutting Data
List 5720

ADFO-3D, Coolant-Through, Flat Drill

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<thead>
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<th>Wire Gage</th>
<th>Letter Size</th>
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<th>Ød</th>
<th>L</th>
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<th>L2</th>
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Packed: 1 pc.
Available EgiAs Coating Only.

Cutting Diameter Tolerance (h8)

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- good
- best
List 5720 (Continued)

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Packed: 1 pc. Available EgAs Coating Only.
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Packed: 1 pc.
Available EgiAs Coating Only.

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ADR
## List 5700

**ADF-2D, Flat Drill**

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Available EgiAs Coating Only.
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List 5700 (Continued)

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- **Available EgiAs Coating Only.**

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**Available EgiAs Coating Only.**
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Available EgiAs Coating Only.

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Packed: 1 pc.  
Available EgiAs Coating Only.
### List 5705 (Continued)

**ADFLS-2D, Long Shank, Flat Drill**

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Packed: 1 pc.
Available EgiAs Coating Only.

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### Work Material

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<th>Alloy Steels</th>
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- **P:** good
- **M:** best
### General Drilling Operations

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<thead>
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<th>Work Material</th>
<th>Carbon Steels, Mild Steels 1010, 1050, 12L14</th>
<th>Alloy Steels 4140, 4130</th>
<th>Stainless Steels 300SS, 400SS, 17-4PH</th>
<th>Cast Iron</th>
<th>Ductile Cast Iron</th>
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<th>1/8</th>
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### General Drilling Operations

**Note:**

1. Water-soluble coolant may be applied as noted in the above table only under the premise that the work surface has been flattened by milling.
2. Use a rigid and precise machine and holder.
3. Please minimize overhang length as much as possible during machining.
4. Adjust the rotational speed and feed in accordance with conditions such as the machining shape, machine rigidity, or work holding.
5. Please set up the drill so that the runout of the cutting edge is under 0.0008".
6. Please select a cutting fluid that is most suitable for the work material with minimal smoke formation.
7. In the case of dry machining, please use air blow to remove chips to prevent clogging.
8. Please do not machine stainless steel dry.
9. When machining an inclined plane, adjust the rotational speed and feed in accordance with the angle of the incline (β).
   - When the machining incline angle (β) is less than 30°, please reduce the feed to 40-60%.
   - When the machining incline angle (β) is over 30°, please reduce the speed to 60-80%, the feed to 20-40%.
10. Please use step drilling in pilot holes to improve cutting chip separation.
11. If it is necessary to ensure the locating precision of the hole to be machined, adjust the rotational speed and feed as indicated above (in accordance with the machining precision requirement).
12. Please always use the appropriate cutting fluid recommended by the cutting fluid manufacturer in the machining of magnesium alloys. Be cautious with the cutting chips as they are highly flammable and may pose a serious fire risk if not properly handled.
### General Drilling Operations

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### Note:
1. The speeds and feeds in the table above apply when drilling on a flat surface with water-soluble coolant.
2. When using non-water soluble oil or water-emulsifiable (over 20 times dilution), reduce cutting speed by 30%.
3. Use a rigid and precise machine and holder.
4. Please minimize tool hang over as much as possible during machining.
5. Adjust the rotational speed and the feed rate in accordance with conditions such as the machining shape, machine rigidity, or work holding.
6. Please set up the drill so that the runout of the cutting edge is under 0.1 mm.
7. When machining an inclined plane, adjust the rotational speed and the feed rate in accordance with the angle of the incline (β).
   - When the machining incline angle(β) is less than 30°, please reduce the feed to 40-60%.
   - When the machining incline angle(β) is over 30°, please reduce the speed to 60-80%, the feed to 40-60%.
8. Please use step drilling in pilot holes to improve cutting chip separation.
9. If it is necessary to ensure the locating precision of the hole to be machined, adjust the rotational speed and the feed rate as indicated above (in accordance with the machining precision requirement).
## General Drilling Operations

### Work Material

<table>
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<tr>
<th>Hardness</th>
<th>Carbon Steels, Mild Steels 1010, 1050, 12L14</th>
<th>Alloy Steels 4140, 4130</th>
<th>Stainless Steel 300SS, 400SS, 17-4PH</th>
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<th>Ductile Cast Iron</th>
<th>Aluminum Alloy 5052, 7075</th>
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### Drilling Speed

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<th>200-400 SFM</th>
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<tbody>
<tr>
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<td>65-100 SFM</td>
<td>65-130 SFM</td>
<td>200-400 SFM</td>
<td>165-260 SFM</td>
<td>265-650 SFM</td>
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### General Drilling Operations

1. To process flat surfaces, prior center-drilling with a larger diameter is required.
2. The speeds and feeds in the table above apply when drilling on a flat surface with water-soluble coolant.
3. When using non-water soluble oil or water-eminisful (over 20 times dilution), reduce cutting speed by 30%. (Less than 5% oil)
4. Use a rigid and precise machine and holder.
5. Please minimize tool hang over as much as possible during machining.
6. Adjust the rotational speed and the feed rate in accordance with conditions such as the machining shape, machine rigidity, or work holding.
7. Please set up the drill so that the runout of the cutting edge is under 0.0004".
8. When machining an inclined plane, adjust the rotational speed and the feed rate in accordance with the angle of the incline (β).
   - When the machining incline angle (β) is less than 30°, please reduce the feed to 40-60%.
   - When the machining incline angle (β) is over 30°, please reduce the speed to 60-80%, the feed to 40-60%.
9. Please use step drilling in pilot holes to improve cutting chip separation for hard to break materials.
10. It is necessary to ensure the locating precision of the hole to be machined, adjust the rotational speed and the feed rate as indicated above (in accordance with the machining precision requirement).
Two Point Forms Based on Length

Wavy Point Form (3D-8D) or Straight Point Form (10D-30D)

Wavy point form improves the sharpness of the cutting edge at various areas where the cutting force fluctuates with the cutting speed, thereby achieving low thrust, stable torque, and longer tool life.

Straight point form offers superior point strength with low cutting forces for long drills even with long overhang length.

Middle Margin Design 8D & Up

More Stability than Conventional Double Margin Designs

Unlike the conventional double margin, the second margin has been placed in the center of the peripheral land. This has shortened the time from the start of engagement to the four-point restraint by the double margin. Furthermore, it has improved stability during intermittent cutting such as cross-drilling or when penetrating an angled surface.

EgiAs Coating

Exceptional Wear Resistance & Toughness

 Constructed with extreme toughness, high wear and heat resistance characteristics that ensures stable and consistent tool life. Suppresses friction with the wear resistance layer; prevents breakage with the nano periodical layer.

<table>
<thead>
<tr>
<th>Coating Color</th>
<th>Coating Structure</th>
<th>Hardness (Hv)</th>
<th>Oxidation Temperature (°C)</th>
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<th>Adhesion Strength</th>
<th>Wear Resistance</th>
<th>Welding Resistance</th>
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<tbody>
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Enhanced Durability

EgiAs Coating Provides Superior Durability

With the protection of OSG’s EgiAs coating, the A Brand® ADO outperforms against competitors and conventional drills.

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<td>Water Soluble (Internal)</td>
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After drilling 500 holes

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Longer Tool Life

Achieve Longer Tool Life at Faster Feeds

Long tool life can be achieved even at high feed rates with OSG’s EgiAs coating.
Efficient Deep-Hole Drilling

Wide Chip Room and Middle Margin Design Provide Efficient Drilling

With the A Brand® ADO’s unique design allowing for stable chip evacuation, a middle margin design that provides additional stability when drilling in deep-hole applications, and the EgiAs coating the ADO is able to achieve longer tool life than conventional drills.

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### Number of Holes

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Designed Based on Depth

Tool Features Designed for Each Drilling Depth

Improved hole accuracy can be achieved with the middle margin and hook tooth geometry.
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Packed: 1 pc.
Available EgiAs Coating Only.

**Cutting Diameter Tolerance (h8)**

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**R Thinning**

- **FL**
- **L**
- **d**
List 6500 (Continued)
ADO-3D, Coolant-Through

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Packed: 1 pc.  
Available EgiAs Coating Only.

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Available EgiAs Coating Only.
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- Carbon Steels
- Stainless Steels
- Cast Iron
- Aluminum
- Nickel Alloy
- Titanium
- Hardened Steels

- Low
- Med.
- High
- Stainless
- Die Steels
- 300
- 400
- 17-4 PH
- 6061
- 844
- 30 HRC
- 4340
- 43-45 HRC
- 45-50 HRC
- 60-65 HRC
- 50-70 HRC

- good
- best
## A Brand ADO

**Advanced Performance Coolant-Through Carbide Drill**

### List 6500 (Continued)

**ADO-3D, Coolant-Through**

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**ADR**

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List 6510
ADO-SD, Coolant-Through

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Packed: 1 pc.
Available EgiAs Coating Only.

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**Advanced Performance Coolant-Through Carbide Drill**
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Available EgiAs Coating Only.
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Packed: 1 pc.
Available EgiAs Coating Only.
### List 6510 (Continued)

**ADO-SD, Coolant-Through**

- **R Thinning**
- **NEW**
- **SPEED FEED**
- **CARBIDE**
- **EgiAs**
- **3°**
- **SHANK h6**

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**List No.**

| 6510 |

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Packed: 1 pc.
Available EgiAs Coating Only.
## List 6520

**ADO-8D, Coolant-Through**

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Available EgiAs Coating Only.

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Packed: 1 pc. Available EgiAs Coating Only.

* Sizes ≤ 2.90 mm have a single margin. Sizes ≥ 3 mm have a double margin.

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A Brand® ADO | 47
## List 6520 (Continued)

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Packed: 1 pc.
Available EgiAs Coating Only.
* Sizes ≤ 2.90 mm have a single margin. Sizes ≥ 3 mm have a double margin.

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- Carbon Steels
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- Die Steels
- Stainless Steels
- Cast Iron
- Aluminum
- Nickel Alloy
- Titanium
- Hardened Steels

**Quality Index**
- good
- best

### Cutting Diameter Tolerance (HR)

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Packed: 1 pc.  
Available EgiAs Coating Only.

* Sizes ≤ 2.90 mm have a single margin. Sizes ≥ 3 mm have a double margin.

Cutting Diameter Tolerance (mm)

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Work Material

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Packed: 1 pc.
Available EgiAs Coating Only.
* Sizes ≤ 2.90 mm have a single margin. Sizes ≥ 3 mm have a double margin.
### List 6530 (Continued)

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* Packed: 1 pc.
Available EgiAs Coating Only.

Sizes ≤ 2.90 mm have a single margin. Sizes ≥ 3 mm have a double margin.
## A Brand® ADO
Advanced Performance Coolant-Through Carbide Drill

### List 6535
ADO-15D, Coolant-Through

**Cutting Diameter Tolerance (E8)**

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Available EgiAs Coating Only.
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Packed: 1 pc. Available EgiAs Coating Only.

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NEW SPEED FEED CARBIDE EgiAs 30° SHANK h6
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Packed: 1 pc.  
Available EgiAs Coating Only.
List 6540 (Continued)
ADO-20D, Coolant-Through

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Packed: 1 pc.
Available EgiAs Coating Only.

Work Material

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<th>Die Steels</th>
<th>Stainless Steels</th>
<th>Cast Iron</th>
<th>Aluminum</th>
<th>Nickel Alloy</th>
<th>Titanium</th>
<th>Hardened Steels</th>
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- good
- best
# A Brand® ADO

## Advanced Performance Coolant-Through Carbide Drill

### List 6550

**ADO-30D, Coolant-Through**

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Packed: 1 pc.
Available EgiAs Coating Only.

### Cutting Diameter Tolerance (in)

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List 6550 (Continued)

ADO-30D, Coolant-Through

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<th>Flute Length</th>
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Packed: 1 pc.
Available EgiAs Coating Only.

**Work Material**

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<tr>
<th>List No.</th>
<th>Carbon Steels</th>
<th>Alloy Steels</th>
<th>Die Steels</th>
<th>Stainless Steels</th>
<th>Cast Iron</th>
<th>Aluminum</th>
<th>Nickel Alloy</th>
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<td>1045 1065</td>
<td>4140 4540</td>
<td>300 400 17-4 PH</td>
<td>6061 7075</td>
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- good
- best
List 6500 - A Brand® ADO: 3D
List 6510 - A Brand® ADO: 5D
List 6520 - A Brand® ADO: 8D

General Drilling Operations

<table>
<thead>
<tr>
<th>Work Material</th>
<th>Carbon Steels, Mild Steels 1010, 1030, 12L14</th>
<th>Alloy Steels 4140, 4130</th>
<th>Stainless Steels 300SS, 4000SS, 17-4PH</th>
<th>High Heat Material</th>
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<td>RPM</td>
<td>Feed IPR</td>
<td>RPM</td>
<td>Feed IPR</td>
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Note:
1. The indicated speeds and feeds are for drilling with water-soluble oil or MQL.
2. Suitable cutting fluid is water-soluble high density oil (less than 20 times dilution).
3. When using non-water-soluble oil or water-soluble oil (over 20 times dilution), reduce cutting speed by 30%.
4. These conditions are for drilling depth under 8 times the drill diameter.
5. 1D-2D step feeding may be required for drilling high hardened steels and mid-range (8D) work.
### General Drilling Operations

#### Work Material

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<th>Feed IPR</th>
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<td>80 - 130 SFM</td>
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#### Work Material

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<th>Stainless Steels 300SS, 400SS, 17-4PH</th>
<th>Ti-Alloy, Ti-6Al-4V</th>
<th>Fe-Base Material, A286</th>
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### General Drilling Operations

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<td>195-330 SFM</td>
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<tr>
<td>Drill Dia.</td>
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<td>Feed IPR</td>
<td>Speed RPM</td>
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<td>1,800</td>
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</tbody>
</table>

### Note:

1. The indicated speeds and feeds are for drilling with water-soluble oil or MQL. (We do not recommend mist drilling with stainless steels.)
2. Water-soluble oil (20-30 times dilution) is recommended.
3. When using non-water-soluble oil, set the cutting speed between 70-100% of the lowest limit.
4. Make a pilot hole before using in accordance with recommended operation.
5. A clogged oil hole can lead to breakage. Make sure that a filter is attached to the oil feeder.
6. Peck drilling of 1D-2D is strongly recommended.
Deep Hole Operational Guidelines

1. Make a pilot hole.
   For a pilot hole, select 0.0008”-0.0031” (0.02-0.08mm) larger size drill than ADO 10D, ADO 15D, ADO 20D and ADO 30D. If the needed pilot drill size is not available, we recommend using the same diameter drill from ADO 3D.

2. Insert the extra long drill into a pilot hole with zero or low revolution (below 500rpm).

3. Increase the revolution to the designated speed and start drilling.

4. After drilling, move the drill away from the bottom of the hole, then reduce its speed while pulling it out of the hole.

Drilling a Curved Surface
When working on a curved surface, we recommend using A Brand® ADF flat drill.

Stable Drilling with Long Drills

The runout of a gripped cutting tool increases with the speed, as shown in the graph on the right. To ensure a higher level of work stability, OSG recommends "making +0.0008”-0.0031” (+0.02-0.08mm) pilot holes" and "inserting long drills stopped or at low speeds."

The reason for this is made evident in the graph on the right. Increasing the speed increases the dynamic runout, posing a higher risk of the drill not fitting properly in the pilot hole. Therefore, this is effective not only for inhibiting static runout, but is also the recommended drilling method for long drills.

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Wide Range of Carbide Applications

High Performance Carbide Drills for Ferrous and Non-Ferrous Materials

Superior point strength with low cutting force are achieved to accommodate a wide range of carbide drilling applications. EgiAs coating constructed with extreme toughness, high wear and heat resistance characteristics to ensure stable and consistent tool life.

EgiAs Coating

Exceptional Wear Resistance & Toughness

Constructed with extreme toughness, high wear and heat resistance characteristics to ensure stable and consistent tool life. Suppresses friction with the wear resistance layer; prevents breakage with the nano periodical layer.

<table>
<thead>
<tr>
<th>Coating Color</th>
<th>Coating Structure</th>
<th>Hardness (Hv)</th>
<th>Oxidation Temperature (°C)</th>
<th>Heat Resistance</th>
<th>Adhesion Strength</th>
<th>Wear Resistance</th>
<th>Welding Resistance</th>
<th>Toughness</th>
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<td>Iridescent Color</td>
<td>Periodic Nano-layer and wear resistance layer</td>
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<td>1,100</td>
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## Wavy Point Form

**Low Thrust and Stable Torque in 4140**

Low thrust resistance and stable torque are possible by the new wavy point form and low web thickness.

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<th>Tool</th>
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<th>Competitor</th>
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</thead>
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<td>Ø10</td>
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<td>Work Material</td>
<td>4140 Alloy Steel</td>
<td>4140 Alloy Steel</td>
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<td>Cutting Speed</td>
<td>230 SFM (2,235 RPM)</td>
<td>230 SFM (7,445 RPM)</td>
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<tr>
<td>Feed Rate</td>
<td>26.3 IPM (0.0118 IPR)</td>
<td>29 IPM (0.0039 IPR)</td>
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<tr>
<td>Depth of Hole</td>
<td>34 mm (Blind)</td>
<td>12 mm (Blind)</td>
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<td>Coolant</td>
<td>Water Soluble (External)</td>
<td>Water Soluble (External)</td>
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<tr>
<td>Machine</td>
<td>Vertical Machining Center</td>
<td>Vertical Machining Center</td>
</tr>
</tbody>
</table>

![Graph showing torque and thrust comparison between AD 4D and Competitor](chart_1.png)

## High Hardness Coating

**Minimized wear at cutting edge**

3,200HV high hardness coating prevents margin area friction wear and minimizes damage at the cutting edge.

<table>
<thead>
<tr>
<th>Tool</th>
<th>AD 4D</th>
<th>Competitor</th>
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<tr>
<td>Cutting Speed</td>
<td>230 SFM (7,445 RPM)</td>
<td>328 SFM (2,654 RPM)</td>
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<tr>
<td>Feed Rate</td>
<td>29 IPM (0.0039 IPR)</td>
<td>25 IPM (0.0094 IPR)</td>
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<tr>
<td>Depth of Hole</td>
<td>12 mm (Blind)</td>
<td>47 mm (Blind)</td>
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<td>Coolant</td>
<td>Water Soluble (External)</td>
<td>Water Soluble (External)</td>
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<td>Machine</td>
<td>Vertical Machining Center</td>
<td>Vertical Machining Center</td>
</tr>
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</table>

![Number of holes comparison between AD 4D and Competitor](chart_2.png)

## Margin Protection

**EgiAs Coating Provides Protection at the Margin**

In carbon steel, EgiAs coating protects against chipping and friction at the margin.

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<th>Competitor</th>
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<td>328 SFM (2,654 RPM)</td>
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<td>Feed Rate</td>
<td>25 IPM (0.0094 IPR)</td>
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<td>Depth of Hole</td>
<td>47 mm (Blind)</td>
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<td>Machine</td>
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<td>Vertical Machining Center</td>
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</tbody>
</table>

![Number of holes comparison between AD 4D and Competitor](chart_3.png)
### Extreme Toughness

**An All-Purpose Tool Upgraded with Even Greater Capabilities**

EgiAs coating is constructed with extreme toughness, high wear and heat resistance characteristics to ensure stable and consistent tool life.

<table>
<thead>
<tr>
<th>Tool</th>
<th>AD 4D</th>
<th>Conventional</th>
<th>Competitor</th>
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<td>Drill Size</td>
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<td>Work Material</td>
<td>4140 Alloy Steel</td>
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<tr>
<td>Cutting Speed</td>
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<td>Feed Rate</td>
<td>26 IPM (0.007 IPR)</td>
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<td>Depth of Hole</td>
<td>18 mm (Blind)</td>
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<td>Coolant</td>
<td>Water Soluble (External)</td>
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<tr>
<td>Machine</td>
<td>Vertical Machining Center</td>
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</table>

### Durability

**Durability and Tool Life in 1050 Steel**

EgiAs coating provides superior protection against friction, resulting in longer tool life and more holes per tool.

<table>
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<tr>
<th>Tool</th>
<th>AD 4D</th>
<th>Conventional</th>
<th>Competitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drill Size</td>
<td>Ø6</td>
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<td>Work Material</td>
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<tr>
<td>Cutting Speed</td>
<td>328 SFM (5,285 RPM)</td>
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<td>Machine</td>
<td>Vertical Machining Center</td>
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**Tool Wear**

![AD 4D Tool Wear](image1)

![Conventional Tool Wear](image2)
### A Brand® AD

**Advanced Performance Carbide Drill**

#### List 6300

**AD-2D**

**NEW**

**SPEED FEED**

**CARBIDE**

**EgiAs**

**30°**

**SHANK**

**h6**

---

#### Cutting Diameter Tolerance (h6)

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<th>Size mm</th>
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<tr>
<td>3&lt;D≤6</td>
<td>+0.018</td>
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<tr>
<td>6&lt;D≤10</td>
<td>+0.022</td>
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<tr>
<td>10&lt;D≤18</td>
<td>+0.027</td>
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<tr>
<td>18&lt;D≤20</td>
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#### Diameter

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*Available EgiAs Coating Only.*
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Packed: 1 pc. 
Available EgiAs Coating Only.

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Packed: 1 pc.
Available EgiAs Coating Only.
### Work Material

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Packed: 1 pc.
Available EgiAs Coating Only.

**Cutting Diameter Tolerance (h6)**

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AADR

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continued on next page
## List 6310 (Continued)

### Advanced Performance Carbide Drill

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Available EgiAs Coating Only.
**Advanced Performance Carbide Drill**

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Packed: 1 pc.
Available EgiAs Coating Only.

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- **Packed:** 1 pc.
- **Available EgiAs Coating Only.**
List 6300 - A Brand® AD: 2D
List 6310 - A Brand® AD: 4D

General Drilling Operations

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Drill Dia. (Inch)                          | Speed RPM 0.002-0.004                       | Speed RPM 0.002-0.004    | Speed RPM 0.002-0.004                    | Speed RPM 0.002-0.003                        |
| 2 – 3                                      | 8,680                                      | 8,680                   | 5,360                                   | 4,190                                       |
| 3 – 4                                      | 8,480                                      | 8,480                   | 5,120                                   | 3,840                                       |
| 4 – 5                                      | 7,700                                      | 8,100                   | 4,830                                   | 3,640                                       |
| 5 – 6                                      | 7,000                                      | 6,400                   | 4,480                                   | 3,240                                       |
| 6 – 8                                      | 6,300                                      | 5,200                   | 4,120                                   | 2,900                                       |
| 8 – 10                                     | 5,600                                      | 4,200                   | 3,860                                   | 2,700                                       |
| 10 – 12                                    | 5,000                                      | 3,600                   | 3,600                                   | 2,550                                       |
| 12 – 14                                    | 4,400                                      | 2,900                   | 3,440                                   | 2,350                                       |
| 14 – 16                                    | 3,800                                      | 2,400                   | 3,240                                   | 2,150                                       |
| 16 – 18                                    | 3,200                                      | 1,900                   | 3,050                                   | 1,950                                       |
| 18 – 20                                    | 2,600                                      | 1,500                   | 2,860                                   | 1,750                                       |

Drill Dia. (Inch)                          | Speed RPM 0.002-0.004                       | Speed RPM 0.002-0.004    | Speed RPM 0.002-0.004                    | Speed RPM 0.002-0.003                        |
| 2 – 3                                      | 8,680                                      | 8,680                   | 5,360                                   | 4,190                                       |
| 3 – 4                                      | 8,480                                      | 8,480                   | 5,120                                   | 3,840                                       |
| 4 – 5                                      | 7,700                                      | 8,100                   | 4,830                                   | 3,640                                       |
| 5 – 6                                      | 7,000                                      | 6,400                   | 4,480                                   | 3,240                                       |
| 6 – 8                                      | 6,300                                      | 5,200                   | 4,120                                   | 2,900                                       |
| 8 – 10                                     | 5,600                                      | 4,200                   | 3,860                                   | 2,700                                       |
| 10 – 12                                    | 5,000                                      | 3,600                   | 3,600                                   | 2,550                                       |
| 12 – 14                                    | 4,400                                      | 2,900                   | 3,440                                   | 2,350                                       |
| 14 – 16                                    | 3,800                                      | 2,400                   | 3,240                                   | 2,150                                       |
| 16 – 18                                    | 3,200                                      | 1,900                   | 3,050                                   | 1,950                                       |
| 18 – 20                                    | 2,600                                      | 1,500                   | 2,860                                   | 1,750                                       |

General Drilling Operations

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Note:
1. The indicated speeds and feeds are for drilling with water-soluble oil.
2. Suitable cutting fluid is water-soluble high density oil (less than 20 times dilution).
3. When using non-water-soluble oil or water-soluble oil (over 20 times dilution), reduce cutting speed by 30%.
4. These conditions are for drilling depth under 3 times the drill diameter.
5. For machines that cannot achieve the speeds indicated in the table please set rotation as high as possible. Tool life may be reduced.
A Brand® ADO-SUS

Why Use A Brand® ADO-SUS?

OSG’s A Brand® ADO-SUS has specifically addressed many common issues that occur when machining stainless steels and titanium alloys such as work hardening, elongated chips, low thermal conductivity and welding on the tool.

With a patent pending cutting edge, new flute geometry, WXL® coating and the newly designed MEGA COOLER™ coolant hole, the ADO-SUS has a solution for all of your stainless steel and titanium troubles.

Mega Cooler™ Coolant Hole

Exceptional Coolant Delivery

Improved coolant delivery at the cutting edge suppresses heat buildup and improves chip evacuation, thereby increasing tool life and enabling faster drilling speeds. The Mega Cooler™ coolant hole is only available on sizes 6mm and over.

New Flute Geometry (PAT.P)

Producing Manageable Chips

The A Brand® ADO-SUS features a cutting geometry specifically designed for producing compact cutting chips.
Reduced Work Hardening

Sharp Cutting Edge Reduces Work Hardening Near Hole Entry

With a specially designed cutting edge, the ADO-SUS reduces work hardening around the hole entry; resulting in longer tool life and easier secondary processing.

![Work Hardness Near Hole Entry Graph]

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<tr>
<th>Tool</th>
<th>ADO-SUS 3D</th>
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<td>Drill Size</td>
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<td>Feed Rate</td>
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<td>217 PSI - Water Soluble (Internal)</td>
<td>217 PSI - Water Soluble (Internal)</td>
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<tr>
<td>Machine</td>
<td>Horizontal Machining Center</td>
<td>Horizontal Machining Center</td>
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</table>

Exceptional Tool Life in Titanium Alloy

More than 16 Times the Tool Life Compared to Competitor

The A Brand® ADO-SUS outperformed both the competitor and conventional tools when machining titanium alloy that had been age treated to a hardness of 34-36 HRC. The ADO-SUS machined over 2,000 holes before chipping, more than 16 times the number of holes made by the competitor.

![Number of Holes Graph]

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<th>Competitor</th>
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*After aging treatment
## List 5200
### ADO-SUS-3D, Coolant-Through

**R Thinning**

### Cutting Diameter Tolerance (h8)

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<th>Inch</th>
<th>Overall</th>
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### EDP Number

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**Notes:**
- Packed: 1 pc.
- Available WXL® coating only.
- MEGA COOLER™ applies only to diameter sizes over 6 mm.
### List 5200 (Continued)

**ADO-SUS-3D, Coolant-Through**

- **RC Thinning**
- **30°**
- **h6**

#### Cutting Diameter Tolerance (h8)

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Packed: 1 pc.
Available WXL® coating only.
MEGA COOLER™ applies only to diameter sizes over 6 mm.
## List 5200 (Continued)

**ADO-SUS-3D, Coolant-Through**

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Packed: 1 pc.
Available WXL® coating only.
MEGA COOLER™ applies only to diameter sizes over 6 mm.
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MEGA COOLER™ applies only to diameter sizes over 6 mm.
List 5200 (Continued)

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**ADO-SUS-3D, Coolant-Through**

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**Notes:**
- Packed: 1 pc.
- Available WXL® coating only.
- MEGA COOLER™ applies only to diameter sizes over 6 mm.
List 5200 (Continued)
ADO-SUS-3D, Coolant-Through

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Packed: 1 pc.
Available WXL® coating only.
MEGA COOLER™ applies only to diameter sizes over 6 mm.

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- good
- best
## A Brand® ADO-SUS
Advanced Performance Carbide Drills for Stainless Steels & Titanium Alloys

### List 5210
ADO-SUS-SD, Coolant-Through

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Packed: 1 pc.
Available WXL® coating only.
MEGA COOLER® applies only to diameter sizes over 6 mm.

Cutting Diameter Tolerance (h8)

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Packed: 1 pc.
Available WXL® coating only.
MEGA COOLER™ applies only to diameter sizes over 6 mm.
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Packed: 1 pc.
Available WXL® coating only.
MEGA COOLER™ applies only to diameter sizes over 6 mm.
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ADO-SUS-SD, Coolant-Through

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**Packed:** 1 pc.

Available WXL® coating only.

MEGA COOLER™ applies only to diameter sizes over 6 mm.

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## List 5210 (Continued)

**ADO-SUS-SD, Coolant-Through**

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### Table of Cutting Data

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**NOTES:**
- Packed: 1 pc.
- Available WXL® coating only.
- MEGA COOLER™ applies only to diameter sizes over 6 mm.
List 5210 (Continued)
ADO-SUS-5D, Coolant-Through

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Packed: 1 pc.
Available WXL® coating only.
MEGA COOLER™ applies only to diameter sizes over 6 mm.
## List 5220

ADO-SUS-8D, Coolant-Through

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Packed: 1 pc.
Available WXL coating only.
MEGA COOLER applies only to diameter sizes over 6 mm.

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**Drills**

- **ADO-SUS-8D**: Coolant-Through
- **Cutting Diameter Tolerance (H8)**
- **MEGA COOLER**: Applies only to diameter sizes over 6 mm.
- **List 5220**

**Specifications**

- **ADO-SUS-8D, Coolant-Through**
- **Cutting Diameter Tolerance (H8)**
- **MEGA COOLER**: Applies only to diameter sizes over 6 mm.
List 5220 (Continued)
ADO-SUS-8D, Coolant-Through

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Packed: 1 pc.
Available WXL® coating only.
MEGA COOLER™ applies only to diameter sizes over 6 mm.

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### List 5220 (Continued)

**ADO-SUS-8D, Coolant-Through**

#### Cutting Diameter Tolerance (h8)

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*Packed: 1 pc.*

*Available WXL® coating only.*

*MEGA COOLER™ applies only to diameter sizes over 6 mm.*
## List 5220 (Continued)

ADO-SUS-8D, Coolant-Through

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Packed: 1 pc.
Available WXL® coating only.
MEGA COOLER™ applies only to diameter sizes over 6 mm.

## Work Material

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List 5200 - A Brand® ADO-SUS: 3D
List 5210 - A Brand® ADO-SUS: 5D
List 5220 - A Brand® ADO-SUS: 8D

General Drilling Operations

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<th>Alloy Steels 4140, 4130</th>
<th>300 Series Austenitic Stainless Steels</th>
<th>400 Series Ferritic Stainless Steels Martensitic Stainless Steels</th>
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Note: Drilling speeds are in SFM (feet per minute) and feeds are in IPR (inches per revolution) or IPM (inches per minute).
## General Drilling Operations

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<td>14</td>
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<td>15</td>
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<td>0.015 - 0.020</td>
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<td>17</td>
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<td>0.016 - 0.021</td>
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<tr>
<td>18</td>
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<td>0.017 - 0.022</td>
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<tr>
<td>19</td>
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<td>0.018 - 0.023</td>
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<tr>
<td>20</td>
<td>-</td>
<td>1,000</td>
<td>0.019 - 0.024</td>
<td>600</td>
</tr>
</tbody>
</table>
EgiAs Coating* for improved wear resistance and toughness.
*EgiAs coating only applies to diameters above 2mm.

Unique Cutting Geometry for superior sharpness and high chipping resistance.

EgiAs Coating
Provides Exceptional Wear Resistance and Toughness

Constructed with extreme toughness, high wear resistance characteristics to ensure stable and consistent tool life.

<table>
<thead>
<tr>
<th>Tool</th>
<th>AD-LDS</th>
<th>Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drill Size</td>
<td>Ø12 x 90°</td>
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</tr>
<tr>
<td>Work Material</td>
<td>Carbon Steel</td>
<td></td>
</tr>
<tr>
<td>Cutting Speed</td>
<td>164 SFM (1,326 RPM)</td>
<td></td>
</tr>
<tr>
<td>Feed Rate</td>
<td>9.4 IPM (0.007 IPR)</td>
<td></td>
</tr>
<tr>
<td>Coolant</td>
<td>Water-Soluble</td>
<td></td>
</tr>
<tr>
<td>Machine</td>
<td>Horizontal Machining Center</td>
<td></td>
</tr>
</tbody>
</table>

Coating Structure

- Wear Resistance
- Periodic Nano-Layered Coating
Spot drills can perform both centering and chamfering. Centering improves drilling precision. Chamfering prevents burrs on the end face during tapping and removes burrs that may occur during drilling.

**Point Angle 90°**
for 45° chamfering, for both centering and chamfering.

**Point Angle 120° & 130°**
for centering before drilling.

**Point Angle 60°**
for chamfering when tapping with form tap. When a form tap is used, and the entrance to the hole is not chamfered, burring is likely to occur. It is recommended to use a spot drill with a 60° chamfer to prevent burring.
# List 5190

## AD-LDS

![Image of drill bit with dimensions](image)

### EDP Number

<table>
<thead>
<tr>
<th>List No.</th>
<th>Fractional Size</th>
<th>Wire Gage</th>
<th>Letter Size</th>
<th>mm</th>
<th>Inch</th>
<th>Min. Drill Hole Size</th>
<th>Flute Length</th>
<th>Overall Length</th>
<th>Shank Diameter</th>
<th>Point Angle</th>
<th>Helix</th>
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<tbody>
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<td>8688933</td>
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<td>0.4724</td>
<td>2.5</td>
<td>28</td>
<td>108</td>
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<td>25°</td>
</tr>
<tr>
<td>86889017</td>
<td>1/4</td>
<td>E</td>
<td>-</td>
<td>6.35</td>
<td>0.2500</td>
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<td>25°</td>
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<td>0.3750</td>
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<td>108</td>
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<td>25°</td>
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<td>86890317</td>
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<td>-</td>
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<td>25°</td>
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<td>-</td>
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<td>25°</td>
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<td>46</td>
<td>132</td>
<td>20</td>
<td>120°</td>
<td>25°</td>
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</tbody>
</table>

### Work Material

<table>
<thead>
<tr>
<th>List No.</th>
<th>Carbon Steels</th>
<th>Die Steels</th>
<th>Stainless Steels</th>
<th>Cast Iron</th>
<th>Aluminum</th>
<th>Nickel Alloy</th>
<th>Titanium</th>
<th>Hardened Steels</th>
</tr>
</thead>
<tbody>
<tr>
<td>5190</td>
<td>P 300 400 17-4 PH</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Packed: 1 pc.
Available EgiAs coating only.
Minimum drill hole size is recommended for chamfering operations.

ADR
# List 5190 - A Brand® AD-LDS

## General Drilling Operations

<table>
<thead>
<tr>
<th>Work Material</th>
<th>Carbon Steels, Mild Steels 1010, 1050, 12L14</th>
<th>Alloy Steels 4140, 4130</th>
<th>Cast Iron</th>
<th>Cast Aluminum</th>
<th>Special Alloy Steels, Hardened Steels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness</td>
<td>26-30 HRC</td>
<td>30-34 HRC</td>
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</tr>
<tr>
<td>Drilling Speed</td>
<td>200-260 SFM</td>
<td>100-165 SFM</td>
<td>200-325 SFM</td>
<td>260-525 SFM</td>
<td>65-90 SFM</td>
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<tr>
<td>Drill Dia., mm</td>
<td>Speed RPM</td>
<td>Feed IPR</td>
<td>Speed RPM</td>
<td>Feed IPR</td>
<td>Speed RPM</td>
</tr>
<tr>
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<td>0.0002-0.0008</td>
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<tr>
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<td>4,300</td>
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<tr>
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<td>12</td>
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<tr>
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<td>25</td>
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<td>560</td>
<td>0.010-0.018</td>
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</tr>
</tbody>
</table>

1. The indicated speeds and feeds are for drilling with water soluble oil.
2. When using non-water soluble oil, reduce the drilling speed by 20%.
3. When centering on a curved or inclined surface, reduce the feed rate accordingly.
4. For machines that cannot achieve the speeds indicated in the table, please set rotation as high as possible.
Safe use of cutting tools

- Use safety cover, safety glasses and safety shoes during operation.
- Do not touch cutting edges with bare hands.
- Do not touch cutting chips with bare hands. Chips will be hot after cutting.
- Stop cutting when the tool becomes dull.
- Stop cutting operation immediately if you hear any abnormal cutting sounds.
- Do not modify tools.
- Please use appropriate tools for the operation. Check dimensions to ensure proper selection.