Safe, reliable wind turbines depend on strong threaded connections

Frequent problems with threaded connections:

- Tightening difficulties and thread damage
- Inconsistent or loose clamping force
- Broken bolts and base parts, such as flanges or plates
- Difficult disassembly and destroyed threads

Good lubricants for bolts and fasteners can help solve problems and increase reliability by reducing the effects of root causes, including:

- Seizure and abrasive wear
- Uneven coefficient of friction
- Fretting corrosion
- Embrittlement failures of substrates due to use of low-melting-point metals, such as lead, tin and copper
- Stress corrosion cracking

Investigate our solutions for threaded connections

**Molykote® 1000 and Molykote® G-Rapid Plus pastes**

**Tighten all assembly bolts to required tension with correct torque:** Thread roughness creates uneven friction and incorrect bolt tightening during installation. Lubricate threads with Molykote brand pastes to achieve a low and consistent coefficient of friction, thus helping to ensure proper tightening and tension on all wind turbine assembly bolts.

**Protect threaded connections for longer service life:** Bolts and fasteners on equipment joints must stay invulnerable in heat, cold, pollution, rain, snow and even salt fog. Apply Molykote brand pastes to help provide threaded bolts with increased, long-lasting protection from corrosion and seizure.

**Help to allow easier disassembly of threaded connections:** Corrosion, adhesion and seizure make disassembly difficult after long outdoor service. Use Molykote brand pastes for bolt lubrication, protection from fretting corrosion and easy disassembly without damage.
**Typical Properties**

*Specification Writers: Please contact your local Dow Corning Sales Application Engineer or Dow Corning Customer Service before writing specifications on these products.*

<table>
<thead>
<tr>
<th>Standard*</th>
<th>Test</th>
<th>Unit</th>
<th><strong>Molykote® brand pastes</strong></th>
<th><strong>Molykote® brand pastes</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1000</td>
<td>G-Rapid Plus</td>
</tr>
<tr>
<td>Color</td>
<td></td>
<td>Brown</td>
<td>Black</td>
<td></td>
</tr>
<tr>
<td>Composition</td>
<td></td>
<td>Solid lubricants, powdered metal in mineral oil</td>
<td>Solid lubricants in mineral oil</td>
<td></td>
</tr>
<tr>
<td>ISO 2137</td>
<td>Unworked penetration</td>
<td>mm/10</td>
<td>280-310</td>
<td>255-275</td>
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<tr>
<td>ISO 2811</td>
<td>Density at 20°C (68°F)</td>
<td>g/mL</td>
<td>1.26</td>
<td>1.40</td>
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<tr>
<td>Service temperature¹</td>
<td>°C</td>
<td>-30 to +650</td>
<td>-35 to +450</td>
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<tr>
<td>DIN 51 350 pt. 4</td>
<td>Four-ball welding load</td>
<td>N</td>
<td>4,800</td>
<td>5,300</td>
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<tr>
<td>Almen-Weiland machine OK load</td>
<td>N</td>
<td>20,000</td>
<td>&gt;20,000</td>
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<tr>
<td>Screw test – μ head²</td>
<td>Coefficient of friction</td>
<td>0.13</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>Screw test – μ head²</td>
<td>Coefficient of friction</td>
<td>0.08</td>
<td>0.06</td>
<td></td>
</tr>
</tbody>
</table>

*ISO: International Standardization Organization; DIN: Deutsche Industrie Norm
¹Temperature resistance of solid lubricants.
²Coefficient of friction in bolted connection, M12, 8.8, on blackened surface.

### Proper Lubricant Use

*Molykote® 1000 and Molykote® G-Rapid Plus pastes are easy to use:*

1. Clean the thread and bolt with a brush, if needed.
2. Stir the paste before applying.
3. Spread an adequate amount of paste on the thread and up to its root to obtain a good seal. Cover all surfaces, including washers, without waste.
4. Do not mix with other greases or oils; this can alter the paste’s properties.

### Product Packaging

*Molykote® 1000 and Molykote® G-Rapid Plus pastes are available in different standard container sizes. Contact Dow Corning for details.*

### Learn More: Contact Us

For expert advice on how to use *Molykote®* brand pastes on threaded connections for wind energy equipment, contact your Dow Corning Representative or e-mail us at **wind.energy@dowcorning.com**.

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