AEROSIL® fumed silica

Lubricating grease applications

The use of AEROSIL® fumed silica is recommended for lubricating greases used in industrial applications, automotive, electrical as well as food grade.

### Electrical

**Hydrophilic AEROSIL®**
- High thixotropic effect
- High temperature stability
- Dielectric properties

**Hydrophobic AEROSIL®**
- Offers rheology control as well as water resistance

### Industrial

**Hydrophilic AEROSIL®**
- High thixotropic effect
- High temperature stability
- Wear resistance
- Extreme pressure resistance

**Hydrophobic AEROSIL®**
- Offers rheology control as well as oxidation resistance against water and chemicals

### Automotive

**Hydrophilic AEROSIL®**
- High thixotropic effect
- High temperature stability
- Wear resistance
- Reduced friction

**Hydrophobic AEROSIL®**
- Offers rheology control as well as oxidation resistance against water and chemicals

### Food

**Hydrophilic AEROSIL®** are generally recognized as safe (GRAS; direct food contact)
- High thixotropic effect
- High temperature stability
- Wear resistance

**Hydrophobic AEROSIL®** (indirect food contact)
- Offers rheology control as well as water resistance

---

**AEROSIL® fumed silica in lubricating greases**

AEROSIL® fumed silica helps to build a stable matrix to increase viscosity and suppress oil separation in lubricating greases. It can be used in the following systems:

- In non-soap greases, used in high-temperature applications up to 230° C as well as for extreme-pressure and multipurpose greases.
- In soap greases, thickened by fatty acid soaps of lithium, calcium, sodium or aluminum, AEROSIL® fumed silica can be used to further improve the performance of the lubricating grease.
- Hydrophilic fumed silica provides optimized thickening effects in non-polar oils.
- Hydrophobic fumed silica provides viscosity control and increased water repellency in semi-polar to polar oils.
- The surface area of the silica and the volume fraction of the silica in the final mass play a role in the long term storage and heat stability.

**AEROSIL® fumed silica for wire drawing & metal working fluids**

**AEROSIL® COK 84**

- This product is a mixture of AEROSIL® 200 and a highly dispersed fumed aluminum oxide especially designed for aqueous, highly polar liquids.
- It is used in metal working fluids and wire drawing lubricants for rheology control (thixotropic effect) but it can also stabilize lubricating solid particles (e.g. MoS$_2$, graphite) and improve the metal surface in some applications.

**AEROXIDE® Alu C**

- This product is a fine particulate, pure aluminum oxide with high specific surface area.
- It is used in metal working fluids and wire drawing lubricants: The AEROXIDE® Alu C particles can improve the metal surface in some applications.
### AEROSIL® fumed silica recommendation by base oil and required properties

<table>
<thead>
<tr>
<th>Base oil</th>
<th>Hydrophobicity</th>
<th>Viscosity</th>
<th>Oil separation</th>
<th>Cone penetration</th>
<th>Dropping point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral oil</td>
<td>Hydrophilic</td>
<td>Good</td>
<td>Best</td>
<td>Good</td>
<td>No DP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Best</td>
<td>No DP</td>
</tr>
<tr>
<td>Polya Alpha olefin (PAO)</td>
<td>Hydrophilic</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>No DP</td>
</tr>
<tr>
<td></td>
<td>Hydrophilic</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>No DP</td>
</tr>
<tr>
<td>Naphthenic oil</td>
<td>Hydrophilic</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>No DP</td>
</tr>
<tr>
<td>Animal fat</td>
<td>Hydrophilic</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>No DP</td>
</tr>
<tr>
<td>Silicone oil</td>
<td>Hydrophilic</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>No DP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Base oil</th>
<th>Hydrophobicity</th>
<th>Viscosity</th>
<th>Oil separation</th>
<th>Cone penetration</th>
<th>Dropping point</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Good</td>
<td>No DP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No DP</td>
<td>No DP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No DP</td>
<td>No DP</td>
</tr>
</tbody>
</table>

* = Low hydrophobicity  ++ = Medium hydrophobicity  +++ = High hydrophobicity

### Premium product recommendations

- **AEROSIL® R 876**: Provides overall the best effects in most base oil systems and gives outstanding stability.
- **AEROSIL® R 805**: Provides excellent performance in oil separation and cone penetration due to high hydrophobicity as well as giving outstanding stability.

Evonik supports you in selecting the best suited AEROSIL® product and optimizing current formulations through our Application Technology Group.

---

This information and any recommendations, technical or otherwise, are presented in good faith and believed to be correct as of the date prepared. Recipients of this information and recommendations must make their own determination as to its suitability for their purposes. In no event shall Evonik assume liability for damages or losses of any kind or nature that result from the use of or reliance upon this information and recommendations. EVONIK EXPRESSLY DISCLAIMS ANY REPRESENTATIONS AND WARRANTIES OF ANY KIND, WHETHER EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, NON-INFRINGEMENT, MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE (EVEN IF EVONIK IS AWARE OF SUCH PURPOSE) WITH RESPECT TO ANY INFORMATION AND RECOMMENDATIONS PROVIDED. Reference to any trade names used by other companies is neither a recommendation nor an endorsement of the corresponding product, and does not imply that similar products could not be used. Evonik reserves the right to make any changes to the information and/or recommendations at any time, without prior or subsequent notice. AEROSIL® is a registered trademark of Evonik Industries or one of its subsidiaries.

---

**Evonik Resource Efficiency GmbH**  
Business Line Silica  
Rodenbacher Chaussee 4  
63457 Hanau  
Germany

**PHONE** +49 6181 59-12532  
**FAX** +49 6181 59-712532  
ask-si@evonik.com

www.aerosil.com

Evonik. Power to create.