

# AEROSIL®

Specialized fumed silica to enhance coatings performance



## AEROSIL® at a glance

AEROSIL® fumed silica can be used in coatings to improve rheological performance as well as a variety of other attributes like improved corrosion resistance, reinforcement, and scratch resistance. The AEROSIL® product line offers a wide array of custom tailored products to meet your needs.

## AEROSIL® improving rheology

Both hydrophilic fumed silica and hydrophobically modified fumed silica can be used to improve rheology. Choosing the correct silica to build rheology depends on the coatings systems overall polarity. The relationship between the hydrophobicity of the silica and the polarity of the system is described in the diagram below indicating which product would be preferred for thickening.

### AEROSIL® Product Selector by Polarity

|   |                                |   |                      |   |       |
|---|--------------------------------|---|----------------------|---|-------|
|   | <b>Resin Type</b>              | Silicone<br>Alkyd   | Polyester<br>Acrylic | Polyurethane  | Epoxy |
| <p><b>When thickening and rheology are desired –</b> the more polar the coating system, the more hydrophobic the silica needs to be.</p> <p><b>When other attributes are desired –</b> the opposite principle applies to achieve the highest silica loading level with the least impact on viscosity.</p> | <b>AEROSIL® Hydrophobicity</b> | <p>High</p> <p>Toluene</p> <p>Aldehydes</p> <p><b>AEROSIL® R 812</b></p> <p><b>AEROSIL® R 805</b></p> <p><b>AEROSIL® R 972</b></p> <p><b>AEROSIL® R 974</b></p> <p>MEK</p> <p>Acetone</p> <p>Medium</p> |                      | <p>High</p> <p><b>AEROSIL® R 208</b></p> <p><b>AEROSIL® R 202</b></p> <p><b>AEROSIL® R 812 S</b></p> <p>Amines</p> <p>Alcohols</p> <p>Low</p> |       |
|   |                                | <b>System Polarity</b>  |                      |   |       |

## AEROSIL® – Fundamentals for enhancing other coatings attributes

AEROSIL® fumed silica can improve a variety of non-rheological attributes in coatings including improved mechanical reinforcement, scratch resistance, and increased hydrophobicity which assists in improving corrosion resistance. Typically the higher the loading level of AEROSIL® used, the more noticeable these attributes can be improved.



### For improving scratch resistance and mechanical reinforcement

A new generation of structure modified AEROSIL® fumed silica has been developed to improve scratch resistance in UV-curing, high-solid and conventional solvent-based two component paint systems. These grades typically require milling for adequate dispersion.

Structure modified fumed silica can be used to reinforce coating systems where structural rigidity is needed, such as exterior coatings where substrates have a tendency to expand and contract, or coatings that are faced with other mechanical stress.

- AEROSIL® R 8200** – Suggested for epoxy and silicone systems
- AEROSIL® R 7200** – Ideal compatibility in UV systems
- AEROSIL® R 9200** – Suggested for urethane and acrylic systems
- AERODISP® 1030** – A 30% dispersion of AEROSIL® R 9200 in MPA for easy incorporation



### For increasing hydrophobicity and corrosion resistance

Within the AEROSIL® product line are a variety of hydrophobically modified fumed silica products which can increase a coatings resistance to water and moisture, as well as improve corrosion resistance by enhancing the performance of corrosion inhibiting pigments.

- AEROSIL® R 972** – General purpose with wide compatibility
- AEROSIL® R 812** – More hydrophobic than AEROSIL® R 972 - can be used in pH sensitive systems
- AEROSIL® R 805** – Preferred in PDMS (silicone oil) sensitive systems
- AEROSIL® R 202** – Most hydrophobic for systems sensitive to moisture

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#### 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