FUMED METAL OXIDES

in silicone roof coatings

Application description

Roof coatings can impart important performance features to new and existing roof structures including ultraviolet (UV) absorption, aesthetic improvement, water resistance, useful life extension and energy consumption reduction. Silicone roof coatings are gaining in prominence in the roof coatings industry due to the longevity they impart to roof surfaces. They are especially suited for industrial and commercial roof coatings, including ponded water area and low slope roofs, as they are designed to perform well in high moisture environments. These coatings are available in both low and high solids formulations that contain silicone polymers. These silicone polymers are extremely water resistant and light stable, helping to preserve existing roof surfaces and preventing the need for replacement and subsequent waste.

CAB-O-SIL® fumed silica

Fumed silica is one of the most efficient reinforcement and rheology control additives available for silicone elastomers. The addition of fumed silica in a silicone roof coating can help prevent settling of fillers and pigments.

CAB-O-SIL® fumed silica additives can enable key functionalities in silicones for roof coatings including:

- Reduced viscosity
- Inhibits filler settling
- Increased mechanical reinforcement
- Improved hydrophobicity

CAB-O-SIL® products for silicone roof coatings

CAB-O-SIL product	Hydrophobicity	Reinforcement	Viscosity	Processability
LM-150	○	◕	◕	◐
M-5	○	●	●	○
TS-610	◕	◕	◐	◕
TS-622	◕	●	◐	◕
TS-530	◕	●	○	●
TS-720	●	●	○	●

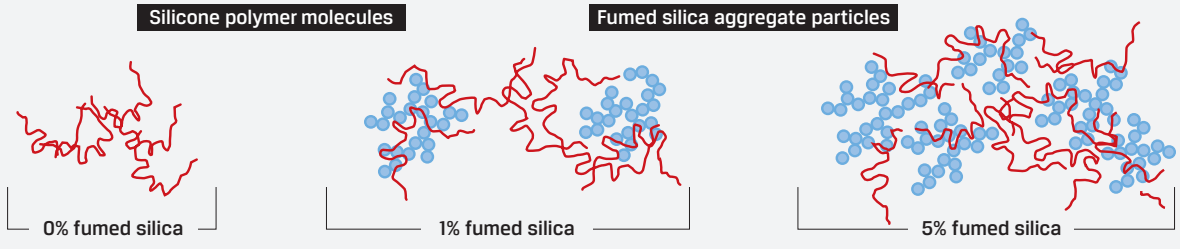
○ → ● Lower Higher

Comparison is for constant silica loading

CAB-O-SIL fumed silica loading level effect on mechanical reinforcement

As seen in **Figure 1**, polymer entanglement with the fumed silica particles enables greater composite material strength. Higher loadings of fumed silica and more subsequent polymer-silica entanglement in the elastomer provide greater tensile properties and hardness.

Figure 1: Higher loadings of fumed silica results in greater polymer-silica entanglement, which increases mechanical reinforcement



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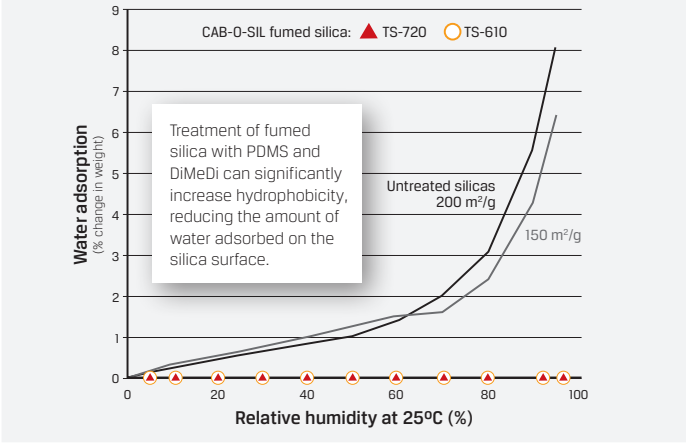
CAB-O-SIL fumed silica surface chemistry effect on viscosity and processability

Untreated fumed silicas impart high viscosity in silicone systems which is undesirable during application of a roof coating. The hydrophilic surface of an untreated silica is not compatible with silicone fluids resulting in more difficult incorporation and dispersion. Further the hydrophilic surface of untreated fumed silica can absorb moisture during storage; introduction of water via moisture absorbed on untreated fumed silica can result in viscosity instability of a silicone roof coating.

Surface treated fumed silicas are more compatible with silicone fluids resulting in lower viscosity and easier processability. Surface treated fumed silica are hydrophobic, absorbing little to no moisture, with good viscosity stability in silicone roof coatings.

Water adsorption of fumed silicas at a range of relative humidities



Consistency, quality, sustainability

Superior performance in silicone elastomers is not only driven by the physical properties of the particles but also the consistency of the given formulation. Cabot continuously invests in state-of-the art manufacturing, processing and monitoring technology to ensure that we deliver consistently reliable products that end users can have confidence in.

We produce fumed silica under our strict Safety, Health & Environment standards. Our commitment to responsible operations and sustainability is well regarded in the industry; Cabot has received a Gold rating from EcoVadis for the past four years. This rating provides confidence to our customers that they are working with a responsible, sustainable and transparent supply chain partner. Our global fumed silica operations are certified to ISO 9001 quality standards and our production facilities are individually certified to either ISO 14001 or RC 14001 environmental standards.

Our sustainability mission not only drives the way we conduct our operations, but also the products we create. We're proud to offer a product that can help extend the usable life of roof structures, preserve resources and prevent waste.

For more information about CAB-O-SIL® fumed silica for silicone roof coatings, please contact your Cabot representative or visit cabotcorp.com/coatings.

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