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Silico® SILICONES

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SILICO SILICONE
GLOBAL-ORIENTED CHEMICAL SUPPLIER

Silico® ORGANOSILICON

Shandong Silico® Silicone Materials Co., Ltd., established in 2007, is a leading high-tech enterprise specializing in the research, development, production, and sales of silicone materials. Our core products include silicone rubber, silicone oil, silicone resin, fumed silica, and silicone intermediates. We have a fully integrated production capacity, covering everything from silicon metal powder processing to silicone monomers, intermediates, and downstream products, ensuring a complete industrial chain.

Leading Manufacturer in China's Organosilicon Industry

With over 15 years of continuous growth, Shandong Silico® has become one of China's largest organosilicon enterprises. The company operates three organosilicon monomer production units, with a methyl chlorosilane monomer production capacity of 600,000 tons per year. As a key supplier of silicone deep-processing products, we offer more than 300 grades of silicone rubber, silicone oil, fumed silica, and other advanced materials.

Why select Silico® Organosilicon?

- Strong silane and silicone manufacturing capabilities built over 30+ years history.
- Flexible manufacturing facility able to handle kilograms to thousands of tons per years.
- Rapid and professional process development and scale-up capabilities.
- Offer tailored options while adhering to high quality and safety standards.

Silico® Hydrophilic Fumed Silica

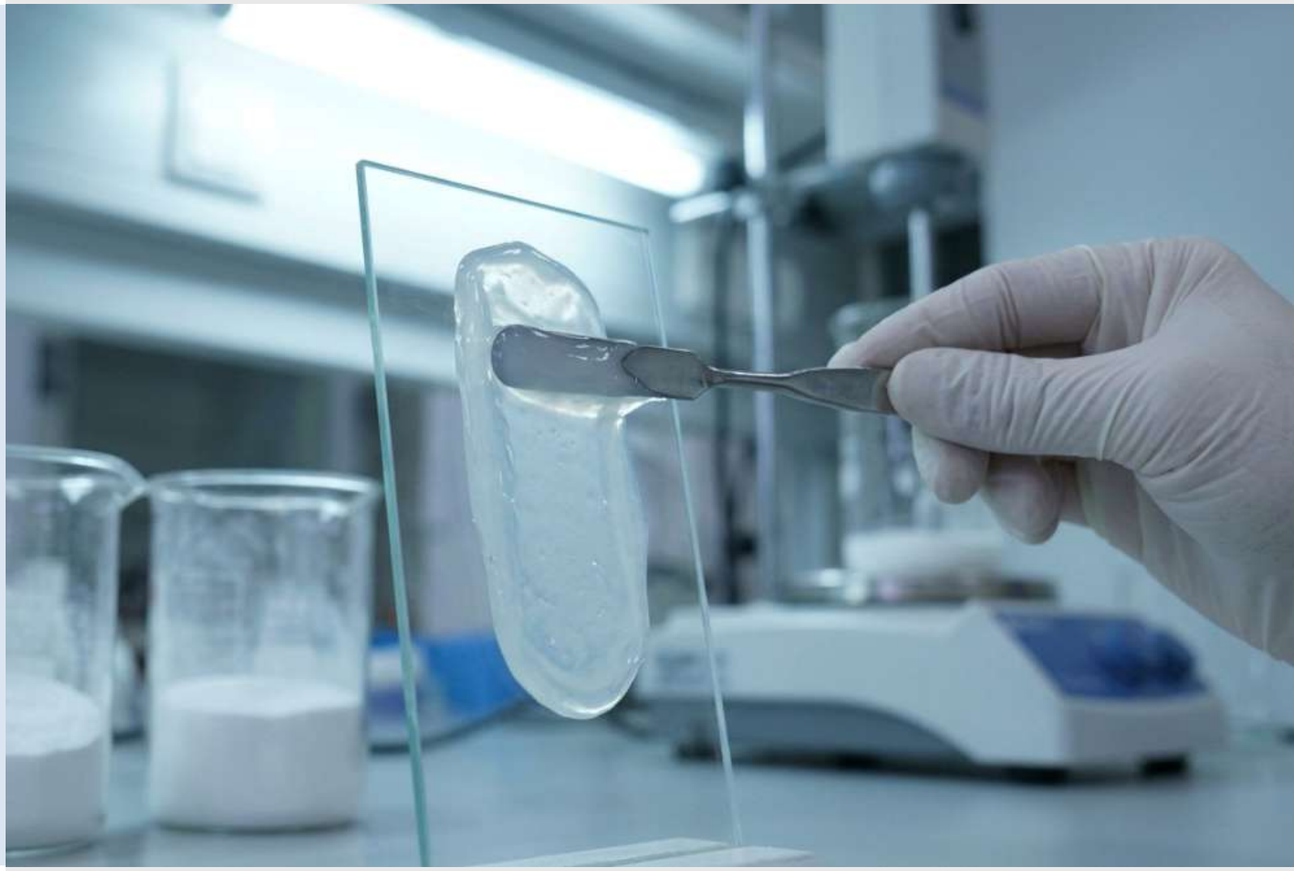
Fumed silicas are ultra-light, nano-scale amorphous silicon dioxide particles available in untreated and surface-treated grades. They are also known as pyrogenic silica or amorphous silica.

Hydrophilic fumed silica is produced by hydrolyzing volatile chlorosilanes in an oxyhydrogen flame, resulting in highly pure silicon dioxide with excellent dispersion properties and strong thickening performance.

Silico® supplies a wide range of hydrophilic fumed silica products with different surface areas for various industrial applications. These materials offer excellent thermal stability, chemical resistance, rheology control, and thixotropic properties.

In non-polar systems such as xylene, styrene, and mineral spirits, Silico® fumed silica forms a three-dimensional network through hydrogen bonding between particles, providing effective thickening, anti-sag, and anti-settling performance.

Silico® fumed silicas are widely used in adhesives and sealants, silicone elastomers, coatings and inks, composites, personal care products, and fire extinguishing powders. They are commonly used to improve rheology, reinforcement, scratch resistance, free-flow properties, absorbency, and overall formulation stability.



Silico® Hydrophilic Fumed Silica

- High purity.
- Highly aggregated nano-scale structure.
- Submicron particle size.
- Low bulk density.
- Hydrophilic surface.

- Untreated grade with strong affinity for water.
- Effective for thickening non-polar solvents such as xylene, styrene, and mineral spirits.
- Suitable for reinforcing and thickening silicone systems and elastomers.

Fumed Silica	CAS No.	pH Value * (1)	Silica Content (%)	Loss on Drying * (2)	BET Surface Area (m2/g)
Silico® FS0150	112945-52-5 ex.7631-86-9	3.7 - 4.5	> 99.8%	Max. 1.5%	135 -165
Silico® FS0200		3.7 - 4.5	> 99.8%	Max. 1.5%	175 - 225
Silico® FS0300		3.7 - 4.5	> 99.8%	Max. 1.5%	270 - 330
Silico® FS0380		3.7 - 4.5	> 99.8%	Max. 1.5%	350- 410

*(1) Measured as a 4 wt.% slurry in water, or as a 4 wt.% slurry in a 1:1 methanol-water mixture for hydrophobic fumed silica grades.
*(2) Loss on Drying measured at the time of packing under conditions of 105°C for 2 hours.
*(3) PDMS: Polydimethylsiloxane; DDS: Dimethyldichlorosilane; HMDS: Hexamethyldisilazane.

Silico® Hydrophobic Fumed Silica

Silico® provides both hydrophilic and hydrophobic fumed silica grades for a wide range of industrial applications.

Silico® hydrophobic fumed silicas are typically post-treated products produced by reacting hydrophilic silica with reactive silanes or silicone fluids, such as chlorosilanes, hexamethyldisilazane (HMDS), and polydimethylsiloxane (PDMS). These treated grades offer excellent water repellency and are no longer dispersible in water.

Silico® hydrophobic fumed silicas provide outstanding thixotropic performance in polar adhesive and sealant systems, including epoxy, polyurethane, isocyanate, and vinyl ester resins. They are also effective for reinforcing silicone Systems with minimal viscosity increase.

In addition, Silico® hydrophobic silica improves the water resistance of moisture-sensitive formulations, enhances powder flowability, and delivers excellent storage stability and processing performance. They are widely used as anti-settling and anti-sagging agents in coatings, sealants, cosmetics, and pigment systems.

Silico® Hydrophobic Fumed Silica

- Surface-treated with reactive silanes to provide excellent water-repellent properties.
- Effective for thickening polar solvents and resin systems such as alcohols, isocyanates, epoxies, and urethanes.
- Suitable for reinforcing silicone systems with minimal viscosity increase.

Fumed Silica	Treated by	CAS No.	pH Value *(1)	Silica Content	Loss on Drying *(2)	Carbon Content	BET Surface Area (m2/g)
Silico® FS2100	PDMS*(3)	67762-90-7	4.0 - 7.0	> 99.8%	Max. 0.7%	4.0 - 7.0 %	70 - 130
Silico® FS5120	DDS*(3)	68611-44-9 ex 60842-32-2	3.6 - 5.5	> 99.8%	Max. 0.7%	0.6 - 1.2%	90 - 150
Silico® FS5170	DDS*(3)		3.6 - 5.5	> 99.8%	Max. 0.7%	0.8 - 1.6%	140 - 200
Silico® FS9141	HMDS*(3)	68909-20-2	5.0 - 8.0	> 99.8%	Max. 0.7%	0.7 - 1.3%	120 - 160
Silico® FS9142	HMDS*(3)		5.0 - 8.0	> 99.8%	Max. 0.7%	1.0 - 1.7%	120 - 160
Silico® FS9143	HMDS*(3)		6.0 - 9.0	> 99.8%	Max. 0.7%	2.0 - 4.0%	120 - 160
Silico® FS9170	HMDS*(3)		6.0 - 9.0	> 99.8%	Max. 0.7%	1.5 - 2.5%	140 - 200
Silico® FS9330	HMDS*(3)		6.0 - 9.0	> 99.8%	Max. 0.7%	2.5 - 4.0%	300 - 360

*(1) Measured as a 4 wt.% slurry in water, or as a 4 wt.% slurry in a 1:1 methanol-water mixture for hydrophobic fumed silica grades.
*(2) Loss on Drying measured at the time of packing under conditions of 105°C for 2 hours.
* (3) PDMS: Polydimethylsiloxane; DDS: Dimethyldichlorosilane; HMDS: Hexamethyldisilazane.

Fumed Silica Technical Application Characteristics

Silico® Fumed Silica as Thickener and Thixotrope in Liquids

When Silico® fumed silica is incorporated into non-polar liquid systems, surface silanol groups on adjacent particles interact through hydrogen bonding, forming a three-dimensional particle network. This structure significantly increases viscosity and provides efficient thickening performance.

Under applied mechanical shear (e.g., stirring or shaking), the network structure is temporarily disrupted, resulting in a reduction in viscosity and improved flowability. The extent of structural breakdown depends on the intensity and duration of shear. Once the mechanical stress is removed, the particle network progressively rebuilds, and the system recovers its original viscosity. This reversible behavior is defined as thixotropy.

Systems formulated with Silico® fumed silica typically exhibit a yield stress, requiring a minimum force to initiate flow, which makes it highly effective for precise rheology control and anti-sag performance.

In polar and semi-polar media, hydrophilic grades may show reduced thickening efficiency due to weaker particle interactions. Therefore, performance is strongly dependent on formulation polarity and surface treatment selection.

The rheological efficiency of Silico® fumed silica is highly influenced by dispersion quality. Effective deagglomeration enhances network formation and improves viscosity build-up. In general, decreasing primary particle size increases thickening efficiency, although it may require higher shear energy to achieve optimal dispersion.

Silico® fumed silica is widely used for advanced rheology modification in coatings, plastics, printing inks, adhesives, lubricants, and personal care formulations such as creams, ointments, and toothpaste, where controlled flow behavior and stability are critical.

Silico® Fumed Silica as Anti-sagging Agent, Anti-settling Agent of Solids

Silico® fumed silica forms a fine submicron particle network within liquid systems, occupying the space between larger solid particles and creating a structured matrix that improves stability.

In pigmented coatings, resins, and filler-containing systems, it increases viscosity and restricts particle movement, effectively reducing or delaying sedimentation during storage.

If settling does occur, the formed sediment remains loose and easily redispersible due to the weakly structured silica network, ensuring simple and uniform remixing.

By preventing tight packing of solids, Silico® fumed silica enhances anti-sagging performance and long-term storage stability. It is widely used in zinc-rich primers, coatings, and lotion formulations where suspension stability is critical.

Silico® Fumed Silica as Dispersion and Grinding Aid

Silico® fumed silica is widely used as a grinding aid in both dry and liquid dispersion systems. During milling or high-shear processing, solid particles are reduced into finer fragments. When Silico® fumed silica is present, these newly formed particles are effectively coated and separated, preventing re-agglomeration.

This stabilizing effect enables finer particle size distribution in dry grinding processes and promotes more uniform dispersion in liquid media.

In coating formulations, the incorporation of hydrophobic Silico® fumed silica during the dispersion stage significantly improves pigment wetting, stability, and overall color performance.

Silico® Fumed Silica as Reinforcer in Elastomers

Silico® fumed silica is an effective reinforcing filler used to enhance the mechanical performance of elastomers. It significantly improves key properties such as tensile strength, elongation at break, and tear resistance.

In addition, Silico® fumed silica helps stabilize mechanical performance across a wide temperature range, reducing property variation under thermal stress and improving overall material reliability.

It is widely used in high-temperature vulcanized (HTV) silicone rubber, room-temperature vulcanized (RTV) silicone rubber, liquid silicone rubber (LSR), and various synthetic rubber systems.

Increases the Free Flow and Storage Stability of Powders

Silico® fumed silica effectively improves the flowability and storage stability of powders that are prone to caking or agglomeration.

By forming a fine coating on particle surfaces, it reduces interparticle adhesion and minimizes moisture-related bridging.

Both hydrophilic and hydrophobic grades can be used to enhance free-flow performance, with hydrophobic Silico® fumed silica showing particularly strong effectiveness in hygroscopic powder systems.

It is widely applied in fire extinguisher powders, table salt, food powders (e.g., tomato powder), pharmaceutical tableting blends, plastic powders, and toner formulations, where consistent flow and long-term storage stability are essential.

Silico® Fumed Silica in Defoamers

Defoamers are typically formulated as suspensions of hydrophobic precipitated silica in mineral or vegetable oils, or as dispersions of hydrophobic/hydrophilic silica in silicone oil.

Due to the relatively large agglomerate size, precipitated silica tends to settle during storage. The incorporation of Silico® hydrophobic fumed silica effectively reduces this sedimentation tendency by improving suspension stability and preventing hard packing of particles.

A finely dispersed silica structure enhances both the speed and longevity of defoaming performance, even at low dosage levels.

To achieve optimal performance, Silico® fumed silica must be thoroughly dispersed within the system using high-shear equipment such as rotor–stator mixers or dissolver discs, ensuring uniform distribution and stable rheology.

Silico® Fumed Silica as an Adsorbent and Carrier

Due to its extremely high specific surface area and porous network structure, Silico® fumed silica is capable of adsorbing gases, liquids, and fine solid substances. This property is widely utilized in the pharmaceutical industry for the adsorption and stabilization of active ingredients.

In addition, Silico® fumed silica serves as an effective carrier for liquids and pastes, converting them into free-flowing powders that are easier to handle, transport, and dose.

This combination of adsorption capacity and flowability control makes Silico® fumed silica a versatile functional additive across pharmaceutical, chemical, and formulation systems.

Silico® Fumed Silica

Typical Application of Fumed Silica

Adhesives and Sealants - Rheology Control and Reinforcement

Silico® fumed silica is widely used in sealants, adhesives, and caulks to increase viscosity, reinforce the polymer matrix, and enhance bond strength.
In adhesive formulations, it improves rheology control and mechanical performance, contributing to better stability, application properties, and overall adhesion performance.
For moisture-cure RTV silicone systems, treated Silico® fumed silica absorbs less moisture, helping improve shelf life and Formulation stability during storage.
Hydrophobic surface-treated grades also offer excellent compatibility with silicone systems, enabling easier wet-out, faster incorporation, and reduced compounding time during processing.

Silicone Elastomer - Reinforcement

Silico® fumed silica is widely used as a reinforcing filler in silicone rubber to significantly improve mechanical properties such as tensile strength, tear resistance, and overall durability. Compared with carbon black, it provides effective reinforcement while maintaining the inherent characteristics of silicone materials.
Due to the similar refractive indices of fumed silica and silicone rubber, transparent or translucent silicone compounds can retain excellent optical clarity even after silica incorporation.
In general, higher surface area Silico® fumed silica provides stronger thickening and reinforcing effects. However, high surface area grades typically require high-shear dispersion equipment to achieve optimal dispersion and performance.

Typical Application of Fumed Silica

Paint, Coatings & Inks - Rheology Control and Free Flow in Powder Coatings

Silico® fumed silica is used in printing inks to increase viscosity and provide thixotropic rheology control for improved application performance.
It helps reduce ink penetration on porous substrates, prevents sagging during application, and improves storage stability by minimizing pigment settling in heavily loaded formulations.
By enhancing suspension stability and flow control, Silico® fumed silica supports consistent print quality and improved surface appearance.

Composites - Rheology Control

Silico® fumed silica is used in polyester and gel coat resin systems to increase viscosity and provide thixotropic rheology control.
It effectively prevents sagging during application on vertical surfaces and improves formulation stability by reducing sedimentation of heavy fillers and highly loaded components.
These properties help ensure uniform application, improved storage stability, and consistent surface finish performance.

Personal Care - Free Flow in Powders, Rheology Control Reinforcement

Silico® fumed silica is widely used in cosmetics and personal care products, including hair care products, antiperspirants, nail polishes, make-up, face creams, lotions, and lipsticks.
Thanks to its high purity and amorphous structure, it delivers excellent rheology control, texture improvement, and stability in both liquid and powder formulations.
Silico® fumed silica helps enhance product consistency, suspension performance, and overall sensory properties across a wide range of personal care applications.

Fire Extinguisher - Anti-Caking

Silico® fumed silica improves the flowability of fire extinguisher powders by effectively preventing caking and agglomeration, even after long-term storage.
Its anti-caking performance helps maintain consistent powder discharge and reliable equipment operation under demanding storage conditions.

Food - Free Flow and Anti-Caking

Silico® fumed silica improves the flowability and storage stability of powdered food products, including formulations with inherently poor flow characteristics.
By reducing caking and particle agglomeration, it helps maintain consistent handling, processing, and product quality during storage and transportation.