



Performance Process Inc. - Mundelein, IL.

Nottingham Company (Div. of Performance Process, Inc.) - Atlanta, GA.

Hydrophobic Fumed and Precipitated Silica

Performance Process, Inc. (PPI) has been producing Treated Silica since 1991. Initially formed and producing out of our facility in Mundelein, IL.; in August 2000, PPI purchased the Nottingham plant in Atlanta, GA., where we installed a new "state-of-the-art" Treated Silica production facility. This new facility was built to give PPI a greater presence in the Southeast, better serve our customers, and more than doubled our production capacity.

Our Fumed and Precipitated Silicas are produced for a wide range of applications, including: Paints, Inks, Adhesives, Plastics, Coatings, Toners, Defoamers, Silicone rubber, Silicone sealants, Cosmetics, Agriculture, Fire extinguishers, Foods, Polyester resins, Cable gels, Greases, etc.

In the above applications, our Silicas perform some of the following functions: Rheology control, Suspension and Stability behavior, Adsorbent, Free-flow of powders, Anti-setting, Anti-sagging, Anti-blocking, Reinforcement, Pigment stabilization & dispersion, Print definition, Anti-setoff, Mechanical/Optical properties improvement, Thixotropy, Thickening, Hydrophobicity control, and Improved processability.

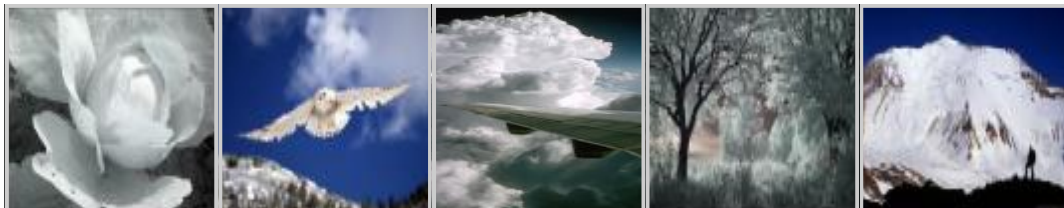
Quality - it's standard operating procedure

The foundation of every product we develop is its formulation. Our custom formulations lead the industry in accuracy, consistency and performance. Our full-equipped laboratory, on the premises, enables us to develop, analyze, test and regulate our formulations, from beginning to end, saving valuable time and money for our customers.

At the forefront of our commitment to quality is a policy we call "the informed customer". We make every effort to transform the customer into an active participant at each stage of the formulation process - right to their production line, through installation and performance evaluations. It is this close relationship to our customers and our commitment to providing consistent, reliable product that defines our standard operation procedure.

Our goal is to exceed our customers' expectations, not simply meet them.

THINK SILICA



Think PROFUSIL & PERFORM-O-SIL

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PERFORM-O-SIL Precipitated Hydrophobic Silica

Physical Characteristics of precipitated silica

Precipitated silica has both internal and external surface area, which allows for easy adsorption of liquids, among other qualities. Primary characteristics include:

Average Agglomerate Size (morphology)

The precipitated silica manufacturing process results in the formation of distinct agglomerates based on primary particles. These agglomerates range in size from 50 to 100 microns. They can be milled by various methods to reduce agglomerate size to the range of 2 to 15 microns. Particle size of the milled products can be measured by the Coulter Counter or laser diffraction.

pH

The pH of precipitated silica is normally slightly acidic (5.5-7.0). But for defoamer applications, the pH is adjusted to the alkaline range to ease the hydrophobizing process which most defoamer manufacturers employ.

Moisture or Ignition Loss

Precipitated silicas contain both physically and chemically bound moisture. The physically bound moisture is driven off by heating to 105 degrees centigrade for two hours to determine Loss on Drying (LOD), which is usually in the range of 5 percent. Chemically bound moisture, in the form of surface silanol groups, is removed by igniting the dried silica for two hours at 1000 degrees centigrade. Loss on Ignition is also in the range of 5 percent.

Tapped Density and Specific Gravity

The specific gravity of precipitated silicas is approximately 2.1. This is a chemical property of silicon dioxide manufactured by this type of process. The resulting solvated weight per gallon (bulking value) is about 17.5 pounds. The density of precipitated silicas can range from about 70 g/l to 300 g/l depending on the type of silica and at what point the material is sampled. Unmilled grades of precipitated silicas will have higher densities than milled products, since milling reduces both particle size and density.

Absorptivity/Porosity

Dibutylphthalate (DBP) absorption is a method used to determine the absorptive capability of precipitated silica. Another is DOP, which is the number of ml of dioctylphthalate that 100 g of precipitate can absorb before becoming pasty. Generally, a precipitated silica can adsorb two to three times its weight depending on the density of the liquid being absorbed. Particle size and surface characteristics determine how much DBP or DOP a silica can absorb. This characteristic is directly linked with morphology. In practice, it means the ability of the conglomerates to store appreciable quantities of liquids. Absorbency corresponds essentially to the filling of the micropores by liquids.

Purity

The purity of precipitated silica is greater than 98 percent silicon dioxide on an ignited basis. Normal impurities include Fe₂O₃ and water soluble Na₂O₃. Any foreign elements remaining, at acceptable levels, in the precipitates come either from the original sand or from the method of manufacture. These impurities can be determined by Atomic Absorption (AA) or Ion Chromatography (IC).

TYPICAL PROPERTIES



PERFORM-O-SIL Precipitated Hydrophobic Silica

Typical Properties

Products	Hydrophobicity Level	Avg. Particle Size (micron)	Bulk Density lbs/ft ³	Density , 25 °C (g/ml)	pH (5%)	Surface Area, BET (m ² /g)
Perform-O-Sil 35	+	5-6	8-9	2	9	70
Perform-O-Sil 355	+++	5-6	8-9	2	9	70
Perform-O-Sil 358	+++++	5-6	8-9	2	9	70
Perform-O-Sil 35 FGK	+	5-6	8-9	2	9	70
Perform-O-Sil 66	+	3-4	8-9	2	10.5 max	80
Perform-O-Sil 665	+++	3-4	8-9	2	10.5 max	80
Perform-O-Sil 668	+++++	3-4	8-9	2	10.5 max	80
Perform-O-Sil 66 FGK	+	3-4	8-9	2	10.5 max	80
Perform-O-Sil 70	+	7-8	8-9.5	2	9-10	70-80
Perform-O-Sil 705	+++	7-8	8-9.5	2	9-10	70-80
Perform-O-Sil 708	+++++	7-8	8-9.5	2	9-10	70-80
Perform-O-Sil 70 FGK	+	7-8	8-9.5	2	9-10	70-80
Perform-O-Sil 80	+	10-11	8-10	2	9	50-60
Perform-O-Sil 805	+++	10-11	8-10	2	9	50-60
Perform-O-Sil 80 FGK	+	10-11	8-10	2	9	50-60

+ standard +++ med high +++++ highest

APPLICATIONS



PERFORM-O-SIL Precipitated Hydrophobic Silica

Typical Applications

Silica Product	Defoamers Anti-foams	Anti-Caking Active Filler	Food Industry	Rheology	Agricultural	Fire Extinguishers
Perform-O-Sil 35	▲	▲ 3		▲ 5		▲ 2a
Perform-O-Sil 355	▲					
Perform-O-Sil 358	▲					
Perform-O-Sil 35 FGK	▲		▲			
Perform-O-Sil 66	▲	▲ 3		▲ 5		▲ 2a
Perform-O-Sil 665	▲					
Perform-O-Sil 668	▲				▲ 4	
Perform-O-Sil 66 FGK	▲		▲			
Perform-O-Sil 70	▲	▲ 3		▲		
Perform-O-Sil 705	▲					
Perform-O-Sil 708	▲	▲ 1		▲ 5	▲ 4	▲ 2b
Perform-O-Sil 70 FGK	▲		▲			
Perform-O-Sil 80	▲	▲ 3		▲		
Perform-O-Sil 805	▲					
Perform-O-Sil 80 FGK	▲		▲			

1 Polystyrol: Anticaking of prefoamed foam polystyrol granule product. HTV silicon rubber: Active filler. Phenol and melamine resin: Anticaking during storage and improved dosing for press compounds. Polysulfide sealants: Active filler.

2a Ensures extremely good humidity protection, so that extinguishers remain fully operational even after extended storage.

2b Improved storage stability and pouring characteristics of powders

3 Free-flow and Anti-caking agent for powders

4 Carrier for light hydrolyzing active ingredients in the plant protection and pest control industry. Plant protection and pest control industry Carrier for slightly hydrolyzing active ingredients.

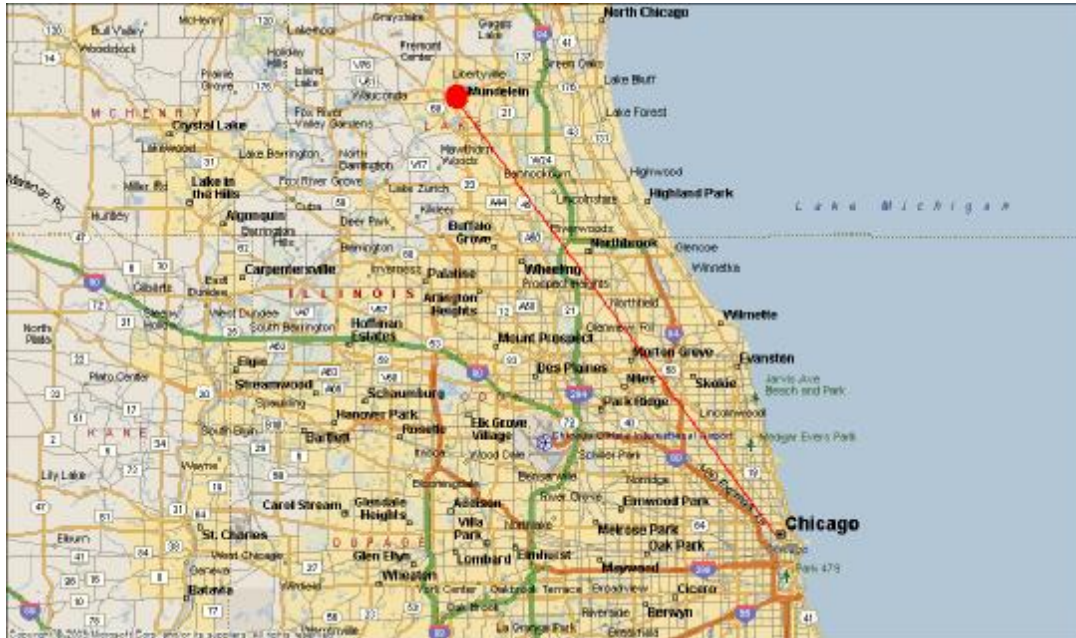
5 Also for rheology control in Cosmetics

LOCATIONS



Performance Process, Inc. Locations

PPI - Mundelein facility is located about 40 miles Northwest of Chicago



Nottingham facility is located just minutes Northwest of Downtown Atlanta

