

ORISIL® PRODUCTION

ORISIL – is amorphous fumed silica produced by vapor phase hydrolysis of silicon tetrachloride in flame of hydrogen and oxygen, the resulting products are pure, x-ray amorphous, silicon dioxide (SiO₂). The chemical reaction for this process is:



Silica particle morphology can be modified by variations in flame conditions.

The B.E.T. Surface Area is the quantitative characteristic that defines the different grades of Orisil.

Orisil is produced in accordance with TU U 24.1-31695418-002:2008.

ORISIL® PROPERTIES

ORISIL is a pure amorphous pyrogenic silica. The appearance of the material is a fine, bluish-white powder. This form of silica is non-toxic and is not flammable or combustible.

During production of hydrophilic ORISIL, silanol groups are formed on the surface. These groups have hydrogen bonding capability and provide hydrophilic nature to fumed silica.

In producing of surface treated ORISIL grades M130, M200 and M300, the organosilane treatment reacts with hydroxyl surface groups, resulting in hydrophobic characteristics of these grades.

Specifications

PROPERTY	Orisil 200	Orisil 300	Orisil 380	Orisil M130	Orisil M200	Orisil M300
	HYDROPHILIC			HYDROPHOBIC (Treated)		
Surface Area, m ² /g (BET method)	200±25	300±30	380±40	120±20	170±30	260±30
pH (4 % Suspension)	3,6 - 4,3	3,6 - 4,3	3,6 - 4,3	3,5 - 5,5	3,5 - 5,5	3,5 - 5,5
Loss on Heating (2hrs @ 105°C) wt.%, max.*	1,5	1,5	1,5	0,6	0,6	0,6

Typical properties

PROPERTY	Orisil 200	Orisil 300	Orisil 380	Orisil M130	Orisil M200	Orisil M300
	HYDROPHILIC			HYDROPHOBIC (Treated)		
Bulk density, gm/l* -Undensed -Densed	50 110	50 110	50 110	50 90	50 90	50 90
Loss on Ignition (1hr @ 1000°C), wt. %, max.*.	1,5	2,0	2,0	2,0	2,0	2,5
SiO ₂ content, wt. %, min.	99,9	99,9	99,9	99,8	99,8	99,8
Fe ₂ O ₃ content, wt. %, max.	0,003	0,003	0,003	0,01	0,01	0,01
Al ₂ O ₃ content, wt. %, max.	0,05	0,05	0,05	0,05	0,05	0,05
TiO ₂ content, wt. %, max.	0,03	0,02	0,02	0,03	0,03	0,03

All properties measured in accordance with TU U 24.1-31695418-002:2008.

*At time of loading

■ QUALITY, ISO 9001:2000

To insure quality and consistency of our products, ORISIL production facility has been certified to conform to international standard ISO 9001:2000 and to the Ukrainian quality standard DSTU ISO 9001-2001.

■ PRODUCTION

Production plant is located in Kalush, Ivano-Frankovsk region, Ukraine.

Applications of ORISIL®

ORISIL is widely used in variety of fields, which include both consumer and industrial products. Many common applications are listed here.

■ COATINGS AND PAINTS

ORISIL fumed silica functions as stabilizer, preventing settling of pigments, it acts as anti-sedimentation additive. ORISIL can also be used to modify the system thixotropy and regulate viscosity. This silica is colorless and transparent in clear lacquers. In powder coatings, ORISIL promotes free-flow, prevents caking and modifies electrostatic effects. Fumed silica is also used to control gloss in some coatings applications, such as urethane satin finishes.

■ SEALANTS AND ADHESIVES

In adhesives and sealants, ORISIL is used as a thixotropic agent, as a thickener and to control sag. Fumed silica in these products can also be used as reinforcing filler. ORISIL is especially useful in industrial adhesives for high-speed machine application. It allows automated systems to tolerate wide range of temperatures. RTV-1 and RTV-2 silicon rubber based sealants use ORISIL silicas for rheology control and reinforcing properties. Similarly, polyurethane-based sealants benefit from improved rheology and mechanical strength.

■ RUBBERS AND RUBBER COMPOUNDS

Pyrogenic silica serves as reinforcing filler, enhancing all mechanical properties, including rigidity, tensile strength, and tear strength. One of the most important fields of ORISIL application is compounding of silicon rubber. Fumed silica greatly enhances properties in heat cured silicone rubber-compounds that far exceed its cost. As such, silicon rubber, with its superior heat and chemical resistance is found in a wide variety of consumer products.

■ POLYESTER RESINS AND GEL COATS

ORISIL is extensively used in polyester resins for production of boats, tubs, truck tops, and other applications employing laminated layers. In laminating resins, ORISIL products function as a thickener, preventing resin drainage during cure. In gel coats, the thickening effect prevents sag, enhancing the film thickness and appearance. In putties and repair compounds, ORISIL controls thickening, flow and thixotropy to achieve necessary results.

■ PVC BASED PLASTICS

Many areas of use of ORISIL include vinyl plastisols in soft and hard forms, films, flexible compounds, and extruded cable sheathing. Fumed silica provides rheology control, prevents sticking, and improves dielectric properties. In vinyl fabrics it modifies properties of vinyl so it does not penetrate the cloth, but stays on the surface. ORISIL also reduces gloss of vinyl surface. In dry blends, ORISIL enhances the flowability of powder materials.

■ PRINTING INKS

ORISIL fumed silica finds many uses in print inks, such as letterpress, gravure and flexographic printing. It helps to control flow, prevents smudging by increasing rate of gelling, and improves image definition.

■ CABLE GELS

Fumed Silica is used as a thickener and thixotropic agent in production of insulation materials for copper and fiber-optic cables.

■ GREASES

ORISIL provides excellent thickening effect in mineral and synthetic oils, silicon oils and blends.

■ PHARMACEUTICALS AND COSMETICS

ORISIL fumed silica, at the time of manufacture, complies with all the requirements of USP29/NF24 monograph specifications for Colloidal Silicon Dioxide. In pharmaceuticals it functions as carrier, stabilizer, anti-settling agent, and is inert to active ingredients. In cosmetics ORISIL is used as rheological agent and anti-caking aid. Applications include tablets, creams, powders, gels, ointments, toothpastes and nail polish. ORISIL prevents phase separation in emulsion systems.

■ OTHER ORISIL APPLICATIONS

Batteries - used in gelling of electrolyte acid.

Thermal Insulation - used as direct insulator for fuel cells, turbines and liquid gas vessels and in production of insulating materials such as ceramic tile.

Food - controls flow, used as carrier and defoaming agent. At the time of manufacture, ORISIL meets all the requirements of FCC V monograph specification for Silicon Dioxide (Synthetic Amorphous Silica) of Food Chemical Codex of United States.

■ PACKAGING, SHIPPING AND STORAGE

ORISIL is packed in valve, moisture resistant multi-ply bags of 10kg(in densed form – 20kg). Designation of grade, net weight, lot number and date of production are indicated on each bag. Pallet dimensions are 1140x1140mm for 10 kg bags.

Type of Bag	boxcar, bulk, ton	40' container, total pallets	pallet, total weight	vehicle, 84-96m ³ , bulk ton	vehicle, 13,6m, kg, total pallets	big bag, net wt.
Undensed 10 kg	6 -	20 pallets 24 pallets	180- 220 kg	4,8-5,2 -	3960- 4840 kg on 22 pallet	200 kg
Densed 20 kg	15	20 (24)	360kg	10	7920 kg on 22 pallets	-

ORISIL is fine white powder. Use dust mask and adequate ventilation to avoid excessive inhalation. May build electrostatic charge. Take safety measures, such as grounding and others, when handling near flammable or explosive area. For additional information: see Material Safety Data Sheet. **Storage:** Store in dry place away from volatile chemicals.



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