

### SILICA FUME TECHNICAL DATA SHEET

**SILICA FUME** is a very fine pozzolanic material, composed of amorphous silica produced by electric arc furnaces as a byproduct of the production of elemental silicon or ferro silicon alloys.

**SILICA FUME** can be used in a variety of applications such as concrete, grouts, mortars, fibre cement products, refractory oil/gas well cements, ceramics, elastomer, and polymer applications.

**SILICA FUME** is produced in conformance with the ASTM C1240 specifications. The quality is controlled and monitored throughout the entire production process to ensure that it meets or exceeds specification requirements.

PROPERTIES	
State	Amorphous- Sub-micron powder
Color	Gray powder
Specific Gravity	2.10 to 2.40
Solubility	Insoluble
Bulk Density - Densified	600 to 650 kg/m'
Bulk Density - Undensified"as produced"	300 to 350 kg/m'

SPECIFICATIONS		
Chemical Requirements	ASTM	Typical
Silicon Dioxide (SiO <sub>2</sub> ) %	85.0% Minimum	95.12%
Moisture Content%	3.0% Maximum	0.17 %
Loss on Ignition(LOI) %	6.0% Maximum	2.56%
Total alkalis ( %)	--	0.74%
Autoclave Expansion (%)	--	0.06%
Sulphur Trioxide (SO <sub>3</sub> ) (%)	--	0.16%
Carbon free ( C ) (%)	--	0.62%
Chloride (Cl-) (%)	--	0.02%
Aluminium Oxide (Al <sub>2</sub> O <sub>3</sub> ) (%)	--	0.31%
Calcium Oxide (CaO) (%)	--	0.76%
Ferric Oxide (Fe <sub>2</sub> O <sub>3</sub> ) (%)	--	0.10%
Magnesium Oxide (MgO) (%)	--	0.24%
PH Value(%)	--	3.00-8.00%
Phosphorus Pentoxide (P <sub>2</sub> O <sub>5</sub> ) (%)	--	0.04%
Potassium Oxide (K <sub>2</sub> O) (%)	--	0.94%
Sodium Oxide (Na <sub>2</sub> O) (%)	--	0.12%
Physical Requirements	ASTM	Typical
Oversize percent retained on 45 μm (325 sieve)	10.0% Maximum	1.78%
Accelerated Pozzolanic Strength Activity Index with Portland cement(7 day)	105.0% Minimum	119%

## **MECHANISM OF SILICA FUME'S POZZOLANIC REACTION IN A CEMENTITIOUS SYSTEM**

**SILICA FUME** in contact with water goes into solution within an hour. The silica in solution forms an amorphous silica rich, Ca poor, gel on the surface of the silica fume particles and agglomerates. After time the silica rich, Ca poor, coating dissolves and the agglomerates of silica fume reacts with free lime( $\text{CaOH}_2$ ) to form calcium silicate hydrates(CSH). This reaction is called the **pozzolanic reaction**.

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#### **STORAGE**

**SILICA FUME** should be kept dry out of weather and the elements.

#### **SAFETY AND HANDLING PRECAUTIONS**

**SILICA FUME** is generally considered a nuisance dust. Use and handling of silica fume does not represent a health risk when normal safety rules are observed. Direct contact may cause irritation of eyes. Prolonged contact may cause skin irritation. Inhalation may cause respiratory irritation resulting in coughing and shortness of breath. This product may be harmful if swallowed. Do not get in eyes and avoid prolonged skin contact. Do not take internally. Wash thoroughly with water after handling

The country of origin: China