



Silicomix

Adding Strength to Strength

MICRO Silica

Overview:

Micro silica has been used extensively around the world to produce high performance concrete. Finer than fly ash, this pozzolan increases strength and density, reduces concrete permeability.

How Micro Silica Works in Concrete:

Increases strength: As a pozzolan, micro silica provides a more uniform distribution and a greater volume of hydration products.

Increases Durability: As filler, micro silica decreases the average size of pores in the cement paste.

Application Areas:

SILICOMIX micro silica can be used in a variety of cementitious products such as concrete, grouts and mortars as well as elastomer, polymer, refractory, ceramic and rubber applications.

- > Ready mixed concrete and grout
- > High rise buildings
- > Refractory industry
- > Offshore and marine structures
- > Dams, tunnels, bridges and motor ways
- > Oil Well Drilling
- > Shotcrete applications
- > Pre cast products

Technical Description:

SILICOMIX Micro Silica is a super pozzolan – a finely powdered material composed of amorphous silica produced by electric arc furnaces as a by product of the production of elemental silicon or ferro silicon alloys.

SILICOMIX Micro Silica is produced in conformance with the ASTM C 1240 specifications and the quality is controlled and monitored throughout the entire production process to ensure that it meets or exceeds specification requirements.

PROPERTIES

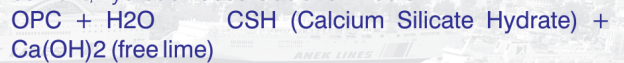
State	Amorphous - Sub-micron powder
Colour	Gray to medium gray powder
Specific gravity	2.10 - 2.40
Solubility	Insoluble
Bulk density - densified	650 - 700 Kgs / m ³

SPECIFICATIONS

	ASTM C1240	IS 15388	Typical
SiO ₂ (%)	>85	>85	92
Moisture (%)	<3.0	<3.0	0.8
Loss on Ignition (LOI) (%)	<6.0	<6.0	2.5
Retained on 45 micron sieve(%)	<10	<10	2.0
7days Pozzolanic activity index(%)	>105	>85	115
Specific surface area m ² /gram	>15	>15	20

How it Works

1. POZZOLANIC EFFECT: When water is added to cement, hydration occurs as shown below.



The free lime does not contribute to strength. When combined with Carbon dioxide, it forms a soluble salt, which leaches through the concrete causing efflorescence, a familiar architectural problem. On the other hand, concrete is also more vulnerable to chemical attack and deterioration. When micro silica is added, the following reaction takes place:



The reaction reduces the amount of calcium hydroxide in the concrete.

2. MICRO FILLER EFFECT: It is an extremely fine powder material with an average diameter much finer than cement. It gets well distributed in the paste, thus blocking the bleed – water channels.

BENEFITS

- > **Compressive Strength:** Micro Silica is very effective in improving compressive strength since one part of micro silica will give an increase similar to three or four parts of cement.
- > **Creep:** Usually less than that of conventional concrete at the same strength level.
- > **Bond:** Improved bond strength between cement paste and aggregates, cement and steel reinforcement and new / old concrete.
- > **Chemical Resistance:** Greatly improves resistance to chlorides and sulphates.
- > **Corrosion Resistance:** By reduction of the permeability and of the electrical conductivity through the combination of calcium hydroxide, micro silica improves the rust resistance of steel in concrete.
- > **Abrasion Resistance:** The abrasion resistance of concrete can be greatly improved by the use of micro silica.

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