

BUILDFUME

Microsilica / Silicafume admixture

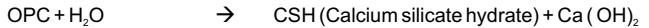
DESCRIPTION

SILICAFUME also known as **SILICAFUME**, is a fine amorphous silica. It is a filter powder generated from the reduction of high purity quartz - **ferrosilicon metals or silicon metals**. It consists primarily of very fine smooth spherical silicon oxide particles with an extremely high surface area. Added to concrete at around 30kg/m³, it changes the rheology and reacts with the cement hydration products to dramatically improve concrete strengths, durability and impermeability, allowing concrete to be used in ways never before possible.

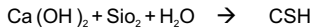
STANDARDS : Conforms to ASTM C - 1240

Effect of Silica fume in concrete

1. Pozzolanic effect : When water is added to OPC, hydration occurs forming two products, as shown below :



In the presence of **Silicafume**, the silicon dioxide from the **Silicafume** will react with the calcium hydroxide to produce more aggregate binding CSH as follows:



The reaction reduces the amount of calcium hydroxide in the concrete as shown in the graph. The weaker calcium hydroxide does not contribute to strength. When combined with carbon dioxide, it forms soluble salt which will leach through the concrete causing efflorescence, a familiar architectural problem. Concrete is also more vulnerable to sulphate attack, chemical attack and adverse alkali aggregate reactions when high amounts of calcium hydroxide is present in concrete.

MAIN FEATURES

High strength concrete : Silicafume in conjunction with Superplasticisers is used to produce very high strength concrete (50 - 120 Mpa). High strength concretes provide large economic benefits to developers e.g. reduced column and wall thickness in tall buildings and improved construction schedule. It is also much more easier to pump **Silicafume** concrete to high rise buildings during construction.

SHOTCRETE : SILICAFUME imparts the following properties:

BENEFITS WITH Silicafume

Low Rebound

High Build

Durable

High Quality finish

With Steel Fibres

- ★ eliminates mesh
- ★ low overspray
- ★ high toughness & impact

High cohesion and adhesion make **Silicafume** shotcrete a viable low cost construction method. In underground construction, **Silicafume** shotcrete can be shot in one pass, thus eliminating the possibilities of cold joints.

High durability and strength make **Silicafume** the ideal choice in severe exposure environments.

Shotcrete incorporated with **Steel Fibre** (glued and both ends hooked) imparts high toughness, enabling mesh to be excluded.

2. Microfiller effect : **Silicafume** is an extremely fine material, with an average diameter 100x finer than cement. At a typical dosage of 8% by weight of cement, approximately 100,000 particles for each grain of cement will fill the water spaces in fresh concrete. This eliminates bleed and the weak transition zone between aggregate and improve the past-to-aggregate bond of **Silicafume** concrete compared to conventional concrete.