Specifications

Microsilica complies with the provisions and specifications of ASTM C-1240 and AASHTO M307.

Physical Properties

Microsilica is an amorphous silicon dioxide (silica) consisting of sub-micron spherical primary particles and agglomerates of these. The material is highly reactive in cementitious and ceramic bond systems.

The average diameter of a Microsilica sphere is about 0.15 micron. Although some of the spheres exist as single entities, most of them form primary agglomerates. The size of these may vary between 0.1 and 1 micron. This rather wide particle size distribution contributes to high packing efficiency.

Microsilica will also contain secondary agglomerates (typically 5 - 50 microns), often generated during filtration and collection. These are - unlike the primary agglomerates - easily broken down when the powder is dispersed in a liquid.

Microsilica has no internal porosity, and the specific gravity of Microsilica is about 2.3 g/cm³. The specific surface area may vary between 15 and 30 m²/g.

Benefits

- Dense impermeable concrete
- Improved strength, early and ultimate
- High Performance Concrete

Areas of Application

- Steel and foundry: Blast furnace troughs and runners, ladle linings, sliding gates, etc.
- Cement: Preheater linings, lining in the chain system and lining of in- and outlet zones of rotary kilns
- Glass and ceramics: Kiln furniture
- Parking Ramps
- Bridge Decks
Microsilica

Silica Fume

Storage

Microsilica is slightly hygroscopic. A slight increase in moisture content is to be expected from production through shipment and during storage. Normally an equilibrium value in the range of 0.8-1.2% is attained depending on the ambient conditions. Specific limit values for moisture content is restricted to material condition at the time of delivery, unless otherwise specified, and tested according to Standard Test Methods for Microsilica, Test M-1; Water Content.

Dosage

In order to give best results, Microsilica should be used in quantities of 3-8 wt% of the total dry mix. When optimum particle packing is applied, the water demand is normally 4 - 5% of the total dry weight, depending on the Microsilica quantity.

Deflocculants

For Microsilica to have the desired flow enhancing properties, it is vital that it is well-dispersed. It is generally advised to use a deflocculant. Among a variety of different additives available, the most commonly used in Microsilica containing castables are polyacrylates and different phosphates.