

Silicamorf 90

Supplementary Cementitious Materials/ Silica Fume Powder

Silicamorf 90 is a fine powder and more than 85% of it contains Silicon dioxide (SiO_2) in the form of amorphous (formless). This product, with its strong pozzolanic properties, reacts with the Calcium hydroxide resulting from the hydration, and produces secondary products resulting from the pozzolanic reaction, reduces concrete permeability, and increases its mechanical and abrasion strength.

This product is produced based on the general Iran National Standard No. 13278, and the requirements mentioned in the ASTM C1240 and EN 13263-1 Standards.

The physical and chemical properties of Silicamorf 90 are according to the following table and produced in the allowable changing range.

Physical State	Powder
Color	Light Grey
Structure	Amorphous and formless
Average Size of Particles	0.15 Micron
Bulk Density	300-200 kg/m^3
Packing Density	600-400 kg/m^3
Specific Surface Area	20-14 m^2/g

The usage and effect of Silicamorf on concrete

The usage of Silicamorf on concrete

- Different types of concrete structures
- The production of high-strength ready-to-use concrete
- The production of high-strength pre-cast sections

- The production of concrete for industrial and high-strength flooring
- The production of concrete to build pools, water reservoirs, and sewage-treatment plant
- The production of concrete to build marine structures
- The production of concrete to build retaining walls, and foundations in excavations having moderate to severe water seepage

The advantages of using Silicamorf in concrete

- Improving compaction in different conditions and increasing the compressive strength in an equal water-to-cement ratio
- Improving concrete pump
- Reducing the penetration of the water under pressure in concrete
- Reducing the risk of rebar corrosion in chloride environments
- Reducing the risk of developing Alkali-Silica reactions
- Reducing the intensity of sulfate attack in concrete

The effect of Silica Fume on fresh concrete

- It improves concrete consistency and reduces the risk of separation and excessive bleeding in high consistencies.
- Using this production in concrete with an equal water-to-cement ratio leads to a reduction in consistency.
- It does not change the initial setting time of the standard mortar to more than 30 minutes in a congruous dosage.
- It does not change the final setting time of the standard mortar to more than 60 minutes in a congruous dosage.

The effect of Silica Fume on hardened concrete

- It increases the 1-day, 7-day, 28-day, and 90-day strength of concrete in an equal water-to-cement ratio.
- It increases the strength and durability of concrete in sulfate attack, and alkali, acidic and sewage environments.
- It reduces concrete permeability and improves its waterproofing properties.

The instruction to use the Silica Fume in the concrete

The allowable range of using the admixture in the concrete

The allowable range for using the Silicamorf 90 is from 5% to 10% of the cement weight (5 to 10 kg per 100 kg of cement). Specifying the optimum amount of the admixture should be accomplished with respect to the properties of the mix design and the implementation and weather conditions, and finally making the test mixes. It is necessary to determine the minimum amount of using the product in the laboratory in case of having silica reactive aggregates in concrete.

The instructions to add the silica fume to the concrete

Silicamorf 90 should be added to concrete in the batching plant while mixing other components. It is also necessary to take the following tips into consideration:

- Mix the concrete for 2 to 5 minutes after adding the admixture and ensure the uniform distribution of the admixture in the concrete.
- Avoid adding the silica fume to a ready-to-use truck mixer
- It is recommended to mix Silicamorf 90 with mixed water and dispersion silica fume, Zetanul SF of Capco Company, and develop a uniform grout before adding it to concrete so that maximum efficiency is obtained in concrete.

Safety tips while using the admixture

This product is categorized as a dangerous substance; it can be allergic to contact with skin. Therefore, it is necessary to use a suitable gown, goggles, and mask while working and take the following tips into consideration:

- Blink in water for at least 15 minutes in case of eye contact
- Wash your skin with clean water for 15 minutes in case of any contact with the skin
- The contaminated clothes must be washed with suitable detergents to be usable for further work.
- It is necessary to visit a doctor if the injured individual still feels uncomfortable

Other necessary notes in using the Silica Fume

Compatibility of Silica Fume with other products

The simultaneous use of this product with other admixtures of Capco Company is allowed. However, it is necessary to batch each admixture separately and then add it to the concrete mix.

The corrosion of admixture

This product does not start or extend corrosion in the buried bars in concrete, the pre-stressed steel, floor systems, and the roof made of galvanized steel.

Transportation and storage of the admixture substance

The conditions and maintenance temperature of transportation

The allowable transportation and maintenance temperature of this product is between 5 and 35 °C. It is also necessary to consider the following tips:

- Avoid putting the container having the admixture in direct exposure to sunlight

The admixture lifetime

In the first packaging away from moisture, long-term sunlight, and high temperature will be usable for 12 months.

The admixture substance packaging

This product is supplied in small 30 to 50-kg bags and big 400 to 600-kg bags.

Complementary information

Contact the technical section of Capco Company for complementary information. You can also refer to the performance form of (Silicamorf 90-PPI) Silicamorf 90 for more information on the performance of this product and its efficiency in the characteristics of fresh and hardened concrete.