CapcoGel FD

Supplementary Materials Containing Silica Fume and Water-Reducing Admixture and Polypropylene Fibers

CapcoGel FD is a supplementary material containing silica fume together with a strong pozzolan property and superplasticizer/water-reducing admixture and polypropylene fibers that is used to increase concrete/mortar consistency without changing the water-to-cement ratio or to reduce the water-to-cement consistency without reducing consistency. This product with its strong pozzolan property reacts with Calcium Hydroxide resulting from the hydration process and reduces secondary products from pozzolan reactions, and concrete permeability, and improves the mechanical and abrasion strengths of the concrete. Also, the fibers control probable cracks due to plastic shrinkage in concrete.

The silica fume in this product is based on the general requirements of the Iran National Standard No.13278 and the requirements of the ASTM C1240 and EN 13263-1 Standard. Moreover, the superplasticizers of this product are according to the performance requirements of tables 1-3 and 2-3 of the Iran National Standard No.2930-2 and the requirements of grade F of the ASTM C494 Standard and the requirements of tables 1-3 and 2-3 of the EN 934-2 Standard.

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

Physical State	Thixotropic Gel
Color	Dark Grey
The water of the Gel	50%
Silica Fume content in the gel	45%
Type of Fibers of the Gel	Polypropylene
Size of the Fibers of the Gel	12 mm
Chemical Base of the superplasticizer of the gel	Polycarboxylate Ether
Density	1/30 ± 0/02 g/cm3
Chloride Content	Little
The equivalent Alkaline Substance (Na_2O)	Little
pH	7 ± 1
Freezing Temperature	0°C

The usage and effect of the supplementary product on concrete

The usage of supplementary material on concrete

- Different types of concrete structures
- The production of ready-to-use high-strength concrete
- The production of pre-cast high-strength concrete
- The implementation of concrete in industrial high-strength floors
- The production and implementation of wet shotcrete
- The production of concrete with water-to-cement ratios between 0.35 and 0.45

The advantages of using the supplementary product in concrete

- Reducing the water-to-cement ratio in an equal consistency and increasing the 7-day and 28-day compressive strengths
- A better distribution of the cement, improving compaction in different conditions and increasing the compressive strength in an equal water-to-cement ratio
- Reducing the water penetration and permeability due to a reduction in the water-to-cement ratio and the silica fume in the supplementary material
- Controlling the crack due to plastic shrinkage
- Reducing the risk of corrosion of the bars in chloride environments
- Reducing the risk of developing alkali-silica reactions
- Reducing the risk of expansion due to sulfate ion
- Easy carrying and storing without making dust in the production site, as well as adhering to sanitation and protecting personnel's health.

The effect of the supplementary material on fresh concrete

- It improves the cohesion of concrete and reduces the excessive separation and bleeding in high consistency
- Using this product in concrete with an equal water-to-cement ratio leads to an increase in consistency.
- It does not change the initial setting time of the standard mortar for more than 30 minutes in a congruous dosage
- It does not change the final setting time of the standard mortar for more than 60 minutes in a congruous dosage
- The production of air bubbles in the fresh concrete is controlled in a way that the changes in the air percentage remain in the allowable standard range announced in the properties sheet.

The effect of the supplementary material on hardened concrete

- It increases the 1-day, 7-day, 28-day, and 90-day compressive strengths in equal water-to-cement ratio and air bubble percentage.
- It significantly increases the strength of hardened concrete in all ages in a consistency equal to the consistency of fresh concrete.
- It increases the strength and durability of concrete in Sulfate attack and alkali, chloride, acid, and sewage environments.
- It reduces concrete permeability and improves waterproofing properties.

The instruction to use the supplementary material in concrete

The allowable range of using supplementary material in concrete

The allowable range for using The CapcoGel FD is from 8% to 18% of the cement material weight (8 to 18 kg per 100 kg of cement content including cement, silica fume, slag, fly ash, and other similar pozzolans). 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. The excessive use of admixture may result in the separation of components and concrete bleeding as well as the excessive increase in the concrete setting time, especially for concrete containing slow-setting cement. It is necessary to obtain the minimum amount of using supplementary material in the laboratory in case of using reactive silica aggregates in concrete.

The instructions to add admixture to concrete

The CapcoGel FD must be added to the concrete while mixing other components in the batching plant. It is also necessary to take the following tips into consideration:

- Mix the concrete for 2 to 5 minutes after adding the admixture and assure the uniform distribution of the admixture in the concrete.
- Avoid the direct contact of the admixture with the dry cement and aggregates
- Subtract 50% of the supplementary material weight from the mixing water of the concrete.

Safety tips for using the admixture

This product is not categorized as a dangerous substance; however, it can be allergic to contact with the skin. Therefore, it is necessary to use a suitable gown, goggles, and mask while working and take the following tips into consideration:

- Avoid pouring this product into the workplace. This product contaminates the environment after drying and it is dangerous to breathe in this environment.
- 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 admixtures

Compatibility of admixture with other products

The simultaneous use of this product with other admixtures of Capco Company is allowed except for the products based on Naphthalene in a mix design. 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. No Calcium chloride or any other compounds containing chloride is used in producing the CapcoGel FD.

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 25 ˚C. It is also necessary to consider the following tips:

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

The admixture lifetime

If the containers of this product are conserved and stored in a standard condition, they will be usable for 6 months. The supplementary material has a Thixotropy property and hardens after a while and its consistency can be increased by mechanical stirring.

The admixture substance packaging

This product is supplied in 25 Kg buckets.

Complementary information

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