CAC®-VMA

Viscosity Modifying Admixture (VMA) for Self Compacting Concrete

Description

CAC®-VMA is a premier ready-to-use, liquid, organic, viscosity-modifying admixture (VMA) specially developed for producing concrete with enhanced viscosity and controlled rheological properties. Concrete containing CAC®-VMA exhibits superior stability and controlled bleeding characteristics, thus increasing resistance to segregation and facilitating placement.

The new technology of Self Compacting Concrete (SCC) allows concretes to be obtained that can become compact without vibration, even with strongly reinforced structures.

A self-compacting mix should have a high workability and high viscosity.

The fluidity of the mix is guaranteed provided there is no friction between the internal particles and the concrete can flow freely; segregation occurs when the components of the concrete separate out into mortar and large aggregates.

Reaching the right balance between fluidity and resistance to segregation – apparently opposing properties – is essential for this type of mix. This balance is lacking when the fluidity of the concrete is obtained by adding water. Although a superplasticiser admixture gives high fluidity, alone it does not guarantee the necessary properties to ensure a good degree of self-compacting. That is why CAC®-VMA is a essential admixture when making SCC.

Uses

- Self Compacting Concrete
- Concrete containing gap-graded aggregates
- Lean concrete mixtures
- Concrete containing manufactured sand

Advantages

- Increased viscosity & thixotropic properties
- Improved stability during transport & placing
- Controlled bleeding
- Reduced segregation, even with highly fluid mix
- Enhanced pumping and finishing
- Reduced sagging – dimensional stability
- Enables flexibility in mixture proportioning

Mechanism of action

CAC®-VMA consists of a mixture of water soluble copolymers which is adsorbed onto the of the cement granules, thereby changing the viscosity of the water and influencing the rheological properties of the mix.

CAC®-VMA is chloride-free and compatible with all cements. It is incompatible for use with naphthalene sulphonate based admixtures.

It is possible with CAC®-VMA to:

- Refine the rheology of the mixes by increasing cohesiveness and eliminating bleeding
- Produce concretes distinguished by their great stability and strong capacity to retain water
- Make the mixture less sensitive to variations in sand grading, to the shape and moisture content of the aggregates and to the characteristics of the binders
- Obtain greater flexibility of choice and type of casts because of a low risk of segregation, greater pumping speeds and distances.

Typical Properties

Aspect	: Colourless free flowing liquid
Relative Density	: 1.015 ± 0.02 at 30°C
pH	: Minimum 6
Chloride ion content	: < 0.2%

Standards compliance

- EFNARC - VMA Guidelines 2006

Specification Clause:

The viscosity modifying agent (VMA) shall be CAC®-VMA, an organic, ready-to-use, liquid admixture specially formulated for applications in SCC. The product shall comply with the EFNARC VMA guidelines 2006.

Self Compacting Concrete (SCC):

Self Compacting Concrete, a very flowable concrete mixture that is able to fill every part and corner of formwork, even in the presence of dense reinforcement, due to its high fluidity and stability. SCC is produced using a **CAC-Hyperfluid** series, high range, water reducing admixture and, typically an organic viscosity modifying admixture such as **CAC®-VMA**, that gives properties-

- Slump flow of 550 – 800 mm
- Controlled rheology
- Mixture proportioning flexibility
- Reduced sensitivity to normal variations in aggregate gradation
- Increased resistance to segregation
- Enhanced surface appearance
- Predictable engineering properties and improved structural integrity and durability.

Methodology

CAC®-VMA is a ready-to-use liquid admixture, which should be added to the concrete after all the other components of the mix. This is particularly important in order to obtain maximum efficacy.

For best performance it is advisable to continue mixing until the mix is completely homogeneous. To produce SCC, CAC®-VMA should be used in combination with the other superplasticizer admixtures of the CAC-Hyperfluid range in order to guarantee maximum efficacy.

A slight decrease in slump or slump flow may be noted after the addition of CAC®-VMA admixture due to the increase in concrete viscosity. If necessary, the slight decrease in slump or slump flow can be offset easily by a minor increase in superplasticiser dosage. Also, because of its thixotropic properties, concrete containing CAC®-VMA admixture may stiffen if left in a mixing vessel or truck without agitation. Workability can be restored by simply remixing the concrete mixture.

CAC®-VMA admixture has little to no effect on concrete setting time, sump retention, air content and compressive strength within the recommended dosage.

Dosage

CAC®-VMA is dosed at the rate of 50 to 500gm/100 kg of cementitious material. Other dosages may be recommended in special cases according to specific job site conditions.

Packaging

CAC®-VMA is available in 200 kg drums.

Storage and Shelf life

CAC®-VMA must be stored where temperatures do not drop below +5°C. If product has frozen, thaw at +5°C or above and reconstitute using mild mechanical agitation. Do not use pressurized air for agitation. Store under cover, out of direct sunlight and protect from extremes of temperature.

Shelf life is at 12 months when stored as above.

Failure to comply with the recommended storage conditions may result in premature deterioration of the product or packaging.

Safety precautions

As with all chemical products, care should be taken during use and storage to avoid contact with eyes, mouth, skin and foodstuffs (which can also be tainted with vapour until product fully cured or dried). Treat splashes to eyes and skin immediately. If accidentally ingested, seek immediate medical attention. Keep away from children and animals. Reseal containers after use. Do not reuse containers for storage of consumable item.

Note

All CAC Technical Data Sheets are updated on regular basis; it is the user's responsibility, to obtain the most recent issue.

Field services where provided, does not constitute supervisory responsibility, for additional information contact your local CAC representative.