CBS Chemicals
Facilitators of Stability

TECHNICAL DATA GUIDE- CONCRETE ADMIXTURE

CFLOW™ 319

High Range PCE based Superplasticizer for Precast Concrete

DESCRIPTION

CFLOW™ 319 is a PCE (Poly Carboxylic Ether) based high range super plasticizer formulated to reduce the water content of a concrete mixture while attaining very high early compressive & flexural strengths.

These unique polymers accelerate the hydration process of cement & promotes early strength gain without steam curing. This helps in reducing the cycle time, improves the formwork repetition & productivity thus making it an ideal product for precast applications.

The set hardening properties of the product helps attain higher early strengths without increase in cement contents.

CFLOW™ 319 confirms to performance requirements of BIS 9103, ASTM C 494 (Type 'F'), BS 5075 & EN934 part2.

TYPICAL APPLICATIONS

- For use in precast concrete elements such as bridge girders, tunnel segments, kerb stones, interlock pavers, etc.
- For ultra-high strength concrete grades up to M100 & high-performance concrete
- Mixes needing water reduction up to 40% & low W/C ratios up to 0.21
- OPC/double/triple/ternary blend mixes with SCMs such as GGBS/ Fly ash/ Silica fume/ Metakaolin & other performance enhancers.
- Works effectively in extreme climatic conditions such as cold weather, hot weather & arid conditions.

FEATURES & BENEFITS

- Accelerates set times & early hardening of concrete. Higher early strength, ultimate strength & enhanced durability.
- Ideal product for hauling concrete in skip buckets/ gantry cranes with very good control on bleeding
- Facilitates early stripping & increases formwork repetitions.
- Reduces pre & final vibration of formwork Aids cohesion, enhances concrete rheology, & eases pumping of concrete
- Reduced water permeability in concrete due to low w/c ratio.
- Reduces stickiness due to higher binder contents
- Reduced incidence of plastic shrinkage cracks with low permeability in hot climates

MECHANISM OF ACTION

CFLOW™ 319 works as a dispersant by preventing the flocculation of fine particles of cement. It consists of a carboxylic ether polymer with long side chains & short lateral chains.

Rapid adsorption of the molecule onto the cement particles; combined with an efficient dispersion & increases the surface of the cement grains to react with water. These dispersants are basically surface-active chemicals consisting of molecules having hydrophilic group attached to a hydrophobic organic chain.

The hydrophilic tip is able to reduce the surface tension of water & the adsorbed polymer keeps the cement particles apart by electrostatic repulsion. The lateral side chains linked to the polymer backbone generates steric hindrance enhancing slump retention.

With the progress of hydration, the electrostatic charge diminishes & flocculation of hydrating product occurs eventually contributing for very high early strength.

PERFORMANCE TEST DATA

Appearance	Light Brown Free Liquid
Relative density	1.093 ± 0.02 @25°C
pH	≥6
Chloride ion content	<0.2%

DOSAGE

Optimum dosage rates of CFLOW™ 310 vary between 0.4% - 1.2 % by weight of cementitious materials.

Exact dosage rate depends on:

- Quality & quantity of binders &W/C ratio
- Gradation of fine aggregates
- Ambient temperature & site conditions
- Performance requirements.

The correct quantity of CFLOW™ 319 should be measured by means of a recommended dispenser & should preferably be dispensed after pre-wetting of aggregates.

The mix shall be thoroughly mixed/agitated at a speed of 12 rpm for at least 5 minutes before unloading.

RE-DOSING OF ADMIXTURE

Considering the challenges at sites CBS has formulated a high dispersing admixture which is compatible & can be used for re-dosing on unavoidable circumstances.

Depending on the slump required & time elapsed for concrete premixed with CFLOW™ 319, an additional dose of (say up to 0.4%) by W/C may be added to regain workability loss & compensate for water loss in mixes. This may not adversely affect the ultimate strength of concrete & may also achieve higher strengths than normal concrete.

WORKABILITY

The intrinsic behaviour of PCE admixtures offers no delayed retardation even with prolonged slump life when compared to SNF based admixtures.

Noticeable delayed retardation occurs when sulphate resisting cements/supplementary cementitious materials are used & ambient temperatures are low.

The carefully selected imported components disperse well on low slump concrete & enhance the slump to workable condition. This polymer will not delay concrete retardation, ultimate strength & offers ON TIME setting & similar strengths.

EFFECTS OF OVERDOSING

Severe overdosing of CFLOW™ 319 (say above 0.4%) can lead to high workability mixes with segregation & bleeding, prolonged duration of initial & final set times, increased air entrainment & plastic shrinkage cracks.

COMPATIBILITY

CFLOW™ 319 is compatible to be used in combination with water proofing admixtures, air entrainers, accelerators, retarders, corrosion inhibitors & shrinkage reducing admixtures.

Please consult technical department of CBS Chemicals for recommendation before adding other admixtures.

PACKAGING

CFLOW™ 319 is supplied in 210 Litre HDPE drums; alternatively 1000 Litre IBC's & bulk deliveries can be arranged.

STORAGE & SHELF LIFE

CFLOW™ 319 should be stored in a shaded cool & dry place. Shelf life of CFLOW™ 319 is 12months from the date of manufactured if kept in unopened, undamaged, original sealed packaging & kept within the range of 10°C to 50°C.If the product is frozen, thaw at +5°C or above & remix with mild agitation.

Failure to comply with recommended storage may deteriorate the product or packing.

HEALTH & SAFETY

CFLOW™ 319 is water based, non-flammable & non-hazardous. However it should not be swallowed or allowed to come into contact with skin & eyes. Suitable protective gloves & goggles should be worn. Splashes on the skin should be removed with water. In case of contact with eyes rinse immediately with plenty of water & seek medical advice. If swallowed, seek medical attention immediately - do not induce vomiting. For further information refer to the material safety data sheet.

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