ADVA® 976

Polycarboxylic superplasticiser for high slump retention concrete requiring long distance transport or pumping

Product Description

ADVA®976 is a liquid, mid-range, polycarboxylic ether-based (PCE) admixture that produces concrete with workability retention up to three hours, making it ideal for concrete that needs to be transported or pumped over long distances. ADVA 976 delivers workability retention without seriously affecting the initial rheology or set times. Higher workability retentions may also be obtained by careful selection of concrete raw materials and mix proportioning.

ADVA 976 works very effectively in mixes containing supplementary cementitious materials (SCMs), crushed and natural sand. Based on addition rate, ADVA 976 conforms to ASTM C494 Types A, D, F and G.

Applications

Typical applications include:

- Concrete grades up to 50/60 MPa needing long distance travel, perhaps due to traffic conditions
- Projects where workability loss is anticipated, maybe due to pumping at higher altitudes
- Where workability retention over a longer time period is critical
- High flow concrete with good flow retention characteristics

Product Advantages

- Offers high water reduction and excellent slump retention, producing highly workable concrete that stays workable for longer time.
- Delivers very high ultimate and early strengths and an improved surface finish with reduced stickiness.
- Good flow through congested reinforcement without stickiness and low thixotrophy, thereby reducing noise and labour cost from vibration
- In addition, it produces concrete with high Young's Modulus (E), reduced creep, reduced permeability, reduced carbonation and refined microstructure, which all contribute towards improved durability.
- Disperses very fast and does not require long mixing time in the batching plants, providing efficiency in the concrete production process.

Technical Data

Main Active Ingredient	Poly-Carboxylic Ether (PCE)
Colour and Form	Dark brown liquid
pH	7 ± 1
Relative Density	1.096 ± 0.02
Dry Material Content (w/w %)	29 ± 5%
Chloride Content	0.2% (max)
Recommended Dosage (Also read Addition Rates)	0.3-1.5% (wt./wt. of cement)

Compatibility with Cements/Supplementary Cementitious Materials

ADVA 976 can be used with most types of Portland cements. It is also compatible with most supplementary cementitious materials SCMs), such as fly ash, ground granulated blast furnace slag, silica fume, and so on. The performance of ADVA 976 will depend on the chemistry of cement, which changes from source to source. For information on compatibility of our products with different cements at your location, please contact local GCP representative.

Compatibility with Other Admixtures

ADVA 976 is compatible with most admixtures from GCP Applied Technologies, as long as they are separately added to the concrete. The following is a list of compatible products:

- Air entrainers – DARAVAIR®
- Non-chloride Accelerators - DARASET® , POLARSET®
- Retarders - DARATARD®
- Viscosity Modifiers – V-MAR® 3, V-MAR 5
- Corrosion Inhibitors: DCI® , DCI-S
- Shrinkage Reducers - ECLIPSE® Floor
- Integral Waterproofing Admixture - DARAPEL®

Please consult your local GCP representative should ADVA 976 need to be used along with other admixtures.

Storage and Shelf Life

ADVA 976 should be stored away from the extremes of cold and heat. ADVA 976 must always be stored under shade. The shelf life of ADVA 976 is 12 months. Improper storage conditions will catalyse the deterioration process and reduce shelf life.

Health and Safety

ADVA admixtures are formulated from chemicals which present no fire or health hazards. Contact with skin and eyes can cause irritation. In the event of contact, please wash with cold water. In case of ingestion, seek medical attention immediately. On spillage, the floor can become slippery. Please wash down the floor with water.

Please refer to the Material Safety Data Sheet for further information.

Compliance to Standards

- ASTM C-494
- EN 934-2
- IS 9103

Addition Rates

ADVA 976 works over a wide dosage range across a variety of mixes in many regions. Mix ingredients, proportions and actual site conditions will govern the performance of ADVA 976.

The presence of certain types of clay in aggregates can affect the water reduction properties of PCEs. In such cases, a higher dosage may be needed to achieve the required slump.

Trial mixes shall be carried out using actual site materials to arrive at an optimum dosage for each mix. During trials, careful observation of fresh and hardened properties shall be ascertained, including cohesiveness, workability retention, setting characteristics, rate of early strength gain, ultimate strength and shrinkage, where each of these is important.

Please contact your local GCP representative for assistance with trials.

Effects of Overdosing

Depending on mix proportions, SCMs and ambient temperature, dosage above the optimum dosage of ADVA 976 can cause segregation, bleeding and increase in set time.

A small overdose over the optimum addition rate will not generally affect ultimate strength development. However, depending on set time, the stripping of formwork may be delayed.

Mode of Action (Steric Repulsion)

When cement is mixed with water, cement grains entrap water to form clusters or flocs. In a cement-water suspension, conventional superplasticisers rely only on electrostatically charged repulsive forces to deflocculate the cement particles. ADVA polymers disperse flocculated cement particles by the comb/sponge" model. The ADVA comb backbone attaches to the cement particle surface. Its teeth attract water like a sponge, and repel the adjacent cement particles. Water absorbed by the polymer allows controlled cement hydration without rapid slump loss or retardation. This allows for lower dosages and better control.

Chloride Free and Non-Corrosive

ADVA 976 contains no intentionally added chloride. Although Indian Standard specifies the maximum limit for chloride as 0.2%, chloride impurities in ADVA 976 will always be much lower than 0.2%. Therefore, ADVA 976 will not be involved in the initiation and propagation of corrosion of embedded reinforcing steel in concrete.

Method of Use

ADVA 976 is supplied ready for use. It should be added in its supplied form to the concrete after at least 95% of the water has been added.

ADVA 976 disperses into the concrete mix very rapidly in comparison to many other admixtures of this range available in the market. Mixing time for each mix may vary, depending on the mix proportions, water-cement ratio, and type of mixer and mixing energy.

Packaging

ADVA 976 is supplied in 200L drums and 1,000L totes. Alternatively, bulk deliveries can be arranged.

Dispensing

ADVA 976 should be introduced into the mixer by means of an independent automatic dispensing equipment. Please contact your local Grace representative for advice on dispensing.

Specification Clause

ADVA 976, manufactured by GCP Applied Technologies, shall be used for all cast-in-situ concrete from grades up to M60 to benefit from water reduction and promote durability of the structure. The main active constituents of ADVA 976 shall be Poly-Carboxylic Ethers and shall have a minimum solid content of 27.5% and shall comply to IS 9103. Suitable mix designs and trials shall be carried out using on-site materials for establishing dosages with a lab sample of ADVA 976 for required performance.

GCP Applied Technologies Inc., 2325 Lakeview Parkway, Alpharetta, GA 30009, USA

GCP Applied Technologies India Private Limited, Unit No. 208, Second Floor, Time Tower Building, Sector-28, MG Road, Gurugram, Haryana-122002, India

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