ADVA® 841U

Versatile polycarboxylic superplasticiser for highly workable concrete mixes with controlled setting time

Product Description

ADVA® 841U is a liquid, high range, polycarboxylate ether-based (PCE) admixture designed to work effectively in concrete mixes with both low and high binder contents. It offers prolonged slump retention and early set times. Due to its excellent setting characteristics, it promotes the use of supplementary cementitious materials (SCMs). It also provides better compressive strengths than naphthalene-based admixtures, and does not display the retardation associated with conventional superplasticisers. Based on dosage, ADVA 841U conforms to ASTM C494 Types A, D, F and G.

Applications

Depending on mix proportions and dosage rates, ADVA 841U can be used both as a mid-range and high range admixture. Typical applications include:

- Concrete grades up to 50 MPa, where controlling setting times using conventional admixtures proves difficult
- High strength and self-consolidating concrete mixes between 50 - 100 MPa
- Fair-faced concrete with high flow and early strength for early stripping of formwork
- Concrete that requires transport or pumping over long distances

Product Advantages

- Enables concrete to retain workability for longer time without seriously affecting setting time, as it delivers very high water reduction at controlled set retardation.
- Versatile admixture that can be used as mid-range or high range admixture across low and high grades of concrete, while at the same time promoting the use of SCMs, providing flexibility and cost efficiency for the ready-mix producer.
- 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	1.10 ± 0.02
Dry Material Content (w/w %)	37.4 ± 5%
Chloride Content	0.2% (max)
Recommended Dosage (Also read Addition Rates)	0.3 - 2% (wt./wt. of cement)

Compatibility with Cements/ Supplementary Cementitious Materials

ADVA 841U 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 841U 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 GCP Applied Technologies.

Compatibility with Other Admixtures

ADVA 841U 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 841U need to be used along with other admixtures.

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 case of such contact, please wash with cold water. In case of ingestion, please 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 841U 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 841U.

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 required slump. However, even then, ADVA 841U is designed to achieve the desired slump retention and rheology without seriously affecting the setting time.

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

Dosage above the optimum addition rate of ADVA 841U can, depending on mix proportions, SCMs and ambient temperature, 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, 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 841U contains no intentionally-added chloride. Although Indian Standard specifies the maximum limit for chloride as 0.2%, chloride impurities in ADVA 841U will always be lower than 0.2%. Therefore, ADVA 841U will not be involved in the initiation or propagation of corrosion of embedded reinforcing steel in concrete.

Method of Use

ADVA 841U is supplied ready for use. It should be added in its supplied form to the concrete after at least 95% of water has been added.

ADVA 841U 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 841U is supplied in 200L drums and 1,000L totes. Alternatively, bulk deliveries can be arranged.

Dispensing

ADVA 841U should be introduced into the mixer by means of an independent automatic dispensing equipment. Please contact your local Grace representative for advice on dispensing.

Storage and Shelf Life

ADVA 841U should be stored away from the extremes of cold and heat. ADVA 841U must always be stored under shade. The shelf life of ADVA 841U is 12 months. Improper storage conditions will catalyse the deterioration process and reduce shelf life.

Specification Clause

ADVA 841U, manufactured by GCP Applied Technologies, shall be used for all cast-in-situ concrete from grades up to M100 to benefit from water reduction and promote durability of the structure. The main active constituents of ADVA 841U shall be Poly-Carboxylic Ethers and shall have a minimum solid content of 35% 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 841U for required performance.

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