

High range water reducing/superplasticizing admixture



CE Approved – Certificate No. 0988-CPD-005
EN934 part 2 tables 3.1 & 3.2

Description of Product

GLENIUM[®] 51 is an innovative admixture based on modified polycarboxylic ether (PCE) polymers. The product has been primarily developed for the use in the concrete industry where the highest durability and performance is required.

GLENIUM[®] 51 complies with EN 934 part 2. and is compatible with all types of cement.

The chemistry of GLENIUM 51

What differentiates GLENIUM[®] 51 from the traditional superplasticizers is a new, unique mechanism of action that greatly improves the effectiveness of cement dispersion. Traditional superplasticizers based on melamine and naphthalene sulphonates are polymers, which are absorbed by the cement granules. They wrap around the granules' surface areas at the very early stage of the concrete mixing process. The sulphonic groups of the polymer chains increase the negative charge of the cement particle surface and disperse these particles by electrical repulsion.

This electrostatic mechanism causes the cement paste to disperse and has the positive consequence of requiring less mixing water to obtain a given concrete workability. GLENIUM[®] 51 has a different chemical structure from the traditional superplasticizers. It consists of a carboxylic ether polymer with long side chains.

At the beginning of the mixing process it initiates the same electrostatic dispersion mechanism as the traditional superplasticizers, but the side chains linked to the polymer backbone generate a steric hindrance, which greatly stabilises the cement particles' ability to separate and disperse.

Steric hindrance provides a physical barrier (alongside the electrostatic barrier) between the cement grains. With this process, flowable concrete with greatly reduced water content is obtained.

Fields of Application

- The excellent dispersion effect makes GLENIUM[®] 51 the ideal admixture for the high quality concrete industry.
- The ability to work with an extremely low water/cement ratio allows for the manufacture of high performance concrete with high early (18-24 hours) and final strengths. Concrete of high density, low permeability is also produced.

Features and Benefits

- Flowable concrete with the lowest water/cement ratio without segregation or bleeding.
- Allows reduction of curing cycles - i.e. time or temperature.
- Possibility of elimination of steam curing.
- Allows concrete production at low temperature.
- Less vibration required even in case of congested steel reinforcement.
- Less workmanship required.
- Improves concrete surface finish and texture.
- Compared to traditional superplasticizers, the addition of GLENIUM[®] 51 will improve the physical properties and thus the durability of concrete.

GLENIUM[®] 51 increases

- Initial and final compressive strength.
- Initial and final flexural and tensile strength.
- E-modulus.
- Adhesion to reinforcement and prestressed steel.
- Resistance to carbonation and chloride ion attack of concrete.
- Resistance to aggressive atmospheric conditions.

GLENIUM[®] 51 decreases

- Risk of shrinkage.
- Creep.

Technical Data/Typical Properties

Appearance	Brown liquid
Specific gravity @ 20°C	1.095 ± 0.02 g/cm ³
pH-value	7.0 ± 1
Alkali content (%)	Less than or equal to 5.0
Chloride content (%)	Less than or equal to 0.10

Application Procedure**Compatibility of GLENIUM[®] 51****GLENIUM[®] ACTIVATOR**

Where elimination of steam curing is intended (at ambient temperatures below 12°C) while still achieving high early strength to enable early demoulding within 24 hours, it may be necessary to add GLENIUM[®] ACTIVATOR with GLENIUM[®] 51. The recommended dosage of GLENIUM[®] ACTIVATOR is 1 litre per 100 kg of cement (binder). This combination guarantees a uniform and fast development of initial and final strength. At temperatures above 12°C the addition of GLENIUM[®] ACTIVATOR is not required.

GLENIUM[®] ACTIVATOR is compatible with all types of cements.

Other combinations that are recommended:

- Air entraining agents (such as MICRO-AIR range) to optimise frost/thaw resistance.
- Silica fume for higher density.
- Expanding agents (such as for controlled shrinkage).
- Synthetic and steel fibres.
- Curing agents against too quick evaporation of mixing water.

GLENIUM[®] 51 is a ready to use admixture to be added to the concrete mix as a separate component.

Optimal concrete plasticizing effect (and thus maximum mixing water reduction) is obtained if GLENIUM[®] 51 is added into the concrete after the first 50-70% of the water has been mixed.

Avoid adding the admixture to the dry aggregate or sand. In all cases the best effect is achieved when GLENIUM[®] 51 is added first and the other admixtures subsequently.

Dosage rate

Depending on specific mix design and requirements, the normally recommended dosage rate is between:

By Volume - 0.183 to 0.913 litres per 100 Kg of cement (binder).

By Mass - 0.2 to 1.0 kg per 100 Kg of cement (binder).

Other dosages may be recommended in special cases according to specific job conditions. Consult our Technical Services Department for advice.

Packaging

GLENIUM[®] 51 is available in 1000-litre IBC's, 205-litre drums and 25-litre containers.

Storage

GLENIUM[®] 51 must be stored in a place where temperature does not drop below +5°C. If product has frozen, thaw at +3°C and agitate until completely reconstituted. Store under cover, out of direct sunlight and protect from extremes of temperature. Failure to comply with the recommended storage conditions may result in premature deterioration of the product or packaging. For specific storage advice consult BASF Construction Chemicals, Technical Services Department.

Shelf Life

12 months if stored according to manufacturer's instructions in unopened containers.

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Health and Safety

*For full information on Health and Safety matters regarding this product the relevant Health and Safety Data Sheet should be consulted.

The following general comments apply to all products.

As with all chemical products, care should be taken during use and storage to avoid contact with eyes, mouth, skin and foodstuffs, (which may also be tainted with vapour until the product is fully cured and dried). Treat splashes to eyes and skin immediately. If accidentally ingested, seek medical attention. Keep away from children and animals. Reseal containers after use.

Spillage

Chemical products can cause damage; clean spillage immediately.

DISCLAIMER

"BASF plc, Construction Chemicals " (the Company) endeavours to ensure that advice and information given in Product Data Sheets, Method Statements and Material Safety Data Sheets (all known as Product Literature) is accurate and correct. However, the Company has no control over the selection of its products for particular applications. It is important that any prospective customer, user or specifier, satisfies him/her-self that the product is suitable for the specific application. In this process, due regard should be taken of the nature and composition of the background/base and the ambient conditions both at the time of laying/applying/installing the material and when the completed work is to be brought into use.

Accordingly, no liability will be accepted by the Company for the selection, by others, of a product, which is inappropriate to a particular application.

Products are sold subject to the Company's standard conditions of sale and all customers, users and specifiers, should ensure that they examine the Company's latest Product Literature.