MasterGlenium 315C

High range water reducing admixture for concrete - EN 934-2: T3.1 & T3.2

Material Description

MasterGlenium 315C is a unique third generation superplasticizer based on modified polycarboxylic ether. The product has been primarily developed for the use in the concrete industry where the highest durability and performance is required.

MasterGlenium 315C complies with EN934 part 2 and is compatible with all types of cement.

The Chemistry

What differentiates MasterGlenium 315C from other generations of polycarboxylic ether is a unique mechanism of action that greatly improves the effectiveness of cement dispersion. Traditional superplasticizers based on melamine and naphthalene sulfonates are polymers that are absorbed by the cement granules. They wrap around the granules' surface areas at the very early stage of the concrete mixing process. The sulfonic 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. MasterGlenium 315C 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 MasterGlenium 315C 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.
- MasterGlenium 315C has a long and well established pedigree in a diverse range of applications such as high rise construction, power floated floor slabs and the production of self-compacting concrete.

Characteristics and Benefits

MasterGlenium 315C offers the following benefits:

- Flowable concrete with the lowest water/cement ratio without segregation or bleeding.
- Can permit reduction of curing cycles - i.e. time or temperature.
- Possibility of the elimination of steams 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 MasterGlenium 315C will improve the physical properties and thus the durability of concrete.

MasterGlenium 315C 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.

MasterGlenium 315C decreases:

- Initial Risk of shrinkage.
- Creep.

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Dosage

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

- *By Volume* - 0.18 to 1.10 litres per 100 Kg of cement (binder)
- *By Mass* - 0.20 to 1.20 kg per 100 Kg of cement (binder)

The dosage rates given above are for typical usages, they are not meant as absolute limits, as other dosages may be utilised in special cases according to specific job conditions. If required consult our Technical Services Department for advice. Trial mixes should be carried out to ensure optimum dosage and effect. Where the concrete is to be machine finished by utilising power float or power trowelling methods, we recommend that you contact the Technical Services Department for dosage rate guidance.

Effects of Overdosing

The detrimental effects of an overdose of MasterGlenium 315C will depend upon the magnitude of the overdose in that an increase in initial setting time will occur. Provided the concrete is protected and cured, this will not necessarily result in any reduction in 28 day strength. The consistence (slump, flow or slump flow) of the concrete will be increased or the concrete will have a lower water content than the original mix design due to the additional plasticizing effects of the overdose. In addition to this there may be an increase in air entrainment.

Air Entrainment

Within the recommended dosage range, the use of MasterGlenium 315C will not entrain air in excess of the requirements of BS EN 934-2, Table 2.

Mixing

MasterGlenium 315C 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 MasterGlenium 315C is dispensed 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 it is important to add MasterGlenium 315C first and the other admixtures subsequently.

Compatibility

MasterGlenium 315C can be used with all types of EN 197 Cements. For use with other special cements, contact our Technical Services Department.

MasterGlenium 315C should not be pre-mixed with other admixtures. If other admixtures are to be used in concrete containing MasterGlenium 315C they must be dispensed separately.

Other combinations that are recommended:

- Air entraining agents (such as MasterAir 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 evaporation of mixing water.

When such complimentary admixtures are required it is important that laboratory trials are performed, prior to any supply, to determine the respective dosages of any complimentary admixture, and the suitability, in the fresh and hardened state, of the resultant concrete. In these circumstances we recommend that you consult our Technical Services Department for further advice.

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Packaging

MasterGlenium 315C is available in Bulk, 1000-litre IBC's and 15-litre containers.

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Product Data	
Appearance:	Off white opaque liquid
Specific gravity @ 20°C:	1.10 ± 0.03 g/cm³
pH-value:	6.5 ± 1
Alkali content (%):	≤ 1.00 by mass
Chloride content (%):	≤ 0.10 by mass
Corrosion behaviour:	Contains only components according to BS EN 934-1:2008, Annex A.1
Air Content:	Fulfilled
Water reduction:	≥ 112% of Reference mix
Increase in consistence:	Increase of ≥ 120mm from initial slump or ≥ 160mm from initial flow
Retention of consistence:	At 30 mins ≥ Reference mix at initial
Compressive strength:	Fulfilled
Durability:	NPD
Dangerous substances:	NPD
Logistics	
Shelf life:	12 months if stored according to manufacturer's instructions in unopened container.
Storage conditions:	Store in original sealed containers and at temperatures between 5°C and 30°C. 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.
Handling and transportation:	Refer to MasterGlenium 315C Safety Data Sheet
Disposal:	Refer to MasterGlenium 315C Safety Data Sheet

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DISCLAIMER

MasterGlenium 315C, Master Builders Solutions UK Ltd, Version 7

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.

Health and Safety: *For full information on Health and Safety matters regarding this product the relevant Health and Safety Data Sheet should be consulted. **Spillage:** Chemical products can cause damage; clean spillage immediately.

DISCLAIMER: "Master Builders Solutions UK Ltd" (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.

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Declaration of Performance can be found at:
www.master-builders-solutions.com/en-gb

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