BASF
The Chemical Company

GLENIUM® 51

Polycarboxylic Ether Based High Range Water Reducing / New Generation Super Plasticizer Admixture

CE
1305-CPD-0097

Description of Product

GLENIUM® 51 is a polycarboxylic ether based, high range water reducing new generation super plasticizer concrete admixture developed for readymix concrete and precast industry that needs high early and final strengths and durability*.

Consistent With the TS EN 934-2 Table 3.1.3.2 and Table 7: High range water reducing / Super plasticizer Concrete Admixture and ASTM C 494 Type F: High range water reducing / Super plasticizer Concrete Admixture Standards.

Fields of Application

- In the production of self consolidating and self compacting concrete.
- In the production of Rheodynamic** concrete that can easily set to densely reinforced concrete elements.
- In the production of 18 - 24 hours and 28 days high strength concrete.
- In the production of precast and prefabricated concrete.
- In the production of readymix concrete.

Advantages

- Improves concrete's early and final compressive and flexural strengths, adherence to steel, and impermeability compared to traditional super plasticizers (NSF or MSF***).
- Improves concrete's mechanic properties like carbonation, resistance to chlorine ion attack, resistance to aggressive chemicals, shrinkage, and creeping.
- Enables the production of low water/cement ratio, low segregation and leaching risk Rheoplastic**** concrete.
- Enables production of high early strength concrete even in low temperatures.
- Minimizes stripping time.
- Improves wear resistance of concrete by reducing segregation and bleeding.
- Reduces application periods of resin based pavement systems on new concrete with its low water/cement ratio, high early strength, and bleeding reduction properties.
- Increases Freezing - Thawing resistance of concrete.
- Reduces curing time and curing temperature in the production of precast elements.
- Can be used with all cement types. Shows less sensitivity to material differentiation.
- **GLENIUM® 51** does not contain chlorine.

Technical Data

Structure of the Material	Polycarboxylic ether based
Color	Amber
Density	1.082 - 1.142 kg/liter
Chlorine Content% (EN 480-10)	< 0.1
Alkaline Content % (EN 480-12)	< 3

Obtained in +20°C, 50% relative humidity conditions

TÜV CERT DIN EN ISO 9001 Zertifikat: 01 100 012854
TÜV CERT DIN EN ISO 14001 Zertifikat: 01 104 052205
TÜV CERT OHSAS 18001 Zertifikat: 01 113 050239

Adding Value to Concrete

YKS®

GLENIUM® 51

The Chemical Mechanism of the New Generation Super plasticizers

In traditional melamine and naphthalene sulphonate based superplasticizer polymers, cement particle surfaces are surrounded during the first stage of concrete mixing process. Suphonic groups of polymer chains increase negative charge of cement particle surfaces and electrostatic force pushes these particles. This electrostatic mechanism causes cement paste to disperse, and in turn enable concrete workability with less water mixture. Along with this, hydration process begins when cement particles contact with water. Rapidly growing hydration crystals change surface mechanics of the particles and prevent free dispersion of them.

The difference of **GLENIUM® 51** from traditional superplasticizers (NSF or MSF based) is the new and unique affect mechanism that improves efficiency of cement dispersion. **GLENIUM® 51** is made of long chain carboxylic ether polymers. At the start of mixing process, electrostatic pushing mechanism is started like in traditional superplasticizers. With this process, a fluid concrete with much lesser water need is obtained. However, chains bound on polymer backbone stabilizes cement particles' dispersion and spreading abilities mostly and form a steric obstacle. Thus, higher fluidity is obtained with less water.

Application Procedure

Binder (cement-micro silica-fly ash) and aggregate must be mixed until a homogenous mixture is obtained. After adding 50%-70% of the water to be added to the mixture, **GLENIUM® 51** must be added to the mixture along with the remaining water. **GLENIUM® 51** must be mixed for 60 sec. or for the duration determined in laboratory experiments in the mixture for a homogenous diffusion.

Dosage

GLENIUM® 51 is suggested to be used as 0.7 - 0.9 kg for 100 kg binder (cement-micro silica-flyash). The dosage to be used must be determined beforehand by laboratory experiments. **BASF Yapı Kimyasalları San. A.S.** Technical Service must be consulted for detailed information.

Compatibility

GLENIUM® 51 can be used with the following materials:

1. If **GLENIUM® 51** is to be used under +15°C where stripping is desired in 18-24 hours, then **Glenium® Activator** is suggested to be used combined with **GLENIUM® 51** if steam cure will not be made. Suggested dosage for **Glenium® Activator** is 1.5 - 3 kg for 100 kg cement. This combination improves early and final strengths. In temperatures above +15°C, there is no need for **Glenium® Activator**.
2. **GLENIUM® 51** is not compatible with other **Rheobuild®** (NSF based) series super plasticizers.
3. Can be used with all cement types.
4. Can be used with silica, flyash and slag where high binding material like Rheodynamic self-compacting concrete is needed to be used.
5. Can be used with air entraining **Micro Air® 200** (environment condition XF1-XF4 according to TS EN 206-1) to increase Freezing - Thawing resistance.
6. Used with **Meyco® MS 610** micro silica (environment condition XA1-XA3 according to TS EN 206-1) to improve the performance of concrete and its strength in aggressive environments.
7. Used with **Meyco® TCC 735** and **Binder® 5** to prevent shrinkage by preventing rapid losing of the water in concrete mixture.
8. Used against fissures from plastic shrinkage with synthetic fibers **Meyco® FIB. SP 530/540/550** and steel fibers.
9. In environments with high temperature and high air flow, must be used with a suitable cure material like **Masterkure® 101, Masterkure® 107, Masterkure®176** or **Masterkure® 181** to prevent the water of the mixture inside the concrete from evaporating.

Watchpoints

- Not suitable to use with **Rheobuild®** series (NSF based) admixtures.
- Concrete design and admixture dosage must be determined by prior laboratory trials according to concrete class and properties.

- The determined binder (cement-micro silica-fly ash), at the end of laboratory trials, thin and rough aggregate must be mixed until a homogenous and dry mixture is obtained. If admixture is added to the dry mixture before adding mixture water, then it will be absorbed by the mixture and uniform distribution will not be obtained. Even if all the mixture water is added on top of this, aimed concrete class and properties cannot be obtained. Since the mixture will need extra water, the water amount in design values will be exceeded and the concrete's mechanical properties will be below the aimed value. For this reason, concrete admixtures must not be added directly to the dry mixture.
- If **GLENIUM® 51** is to be used under +15°C, then necessary precautions have to be taken in cure conditions (temperature and time) and cement doses.
- The performance of **GLENIUM® 51** is reduced if it is mixed with other admixtures in other classes. So, the storing and mixing equipments have to be used after cleaning. Contact **BASF Yapı Kimyasalları San. A.S.** technical service for detailed information.

Packaging

30 kg drum.
220 kg barrel.
1000 kg tank.
Bulk

Storage

Must be stored in original packing, in +5°C environment. If the material freezes because of storing in undesirable environments, it must be thawed by keeping it in room temperature without direct heating, and mixed by mechanical methods until it becomes homogenous. Pressured air must not be used when mixing.

Shelf Life

12 months after the production date under appropriate storing conditions. Opened packages can be used throughout the shelf life if the package cover is well closed.

Health and Safety Precautions

Work cloth, protective gloves, goggles and masks concordant with Work and Worker Health rules must be used during the application. Avoid contact to skin and eyes during storing and application. If such a contact occurs, it must be washed by soap and plenty of water. Consult a physician urgently if swallowed. Food and drink must be kept outside the application areas. Must be stored away from children. Please look at the Material Safety Data Sheet for detailed information.

(*)According to TS EN 206-1 environmental standard about concrete strength
(**)Rheodynamic Concrete: Self-leveling concrete without a need for vibration, with a low distribution (65 - 70 cm), and with low water/cement ratio.
(***)NSF (Naphthalene Sulphonate Based Products); MSF (Melamine Sulphonate Based Products)
(****)Rheoplastic Concrete: Although has the same water/cement ratio with the reference concrete of approximately 7 cm slump, easily flowable (20 - 22 cm slump), non-segrating concrete.

Disclaimer

This information given here is true, represents our best knowledge and is based not only on laboratory work, but also on field experience. However, BASF Yapı Kimyasalları San. A.S. is only responsible from the quality of the product. BASF Yapı Kimyasalları San. A.S. cannot be hold responsible from the results caused by applications of the product not in accordance with the written suggestions of how and where to use the product and/or faulty applications. This technical document is valid until a new one is printed and abates the previous editions. 01/2008.