

EUNISHRINK Eclipse

Shrinkage Reducing Admixture



Product Description

EUNISHRINK Eclipse is a liquid admixture for concrete (or virtually any Portland cement based material) which dramatically reduces the materials shrinkage due to drying. EUNISHRINK Eclipse contains no expansive material, but instead acts chemically to attach the primary mechanism causing shrinkage. Concrete containing EUNISHRINK Eclipse at a dosage of 2% by weight of cement has been shown to reduce shrinkage, as measured per ASTM C157, by as much as 80% at 28 days, and up to 50% at one year or beyond. This level of shrinkage reduction, in well-proportioned concrete mixtures utilizing quality materials has been demonstrated to eliminate cracking due to drying shrinkage in fully restrained concrete. One liter of EUNISHRINK Eclipse weighs approximately 0.93 kg.

Uses

EUNISHRINK Eclipse may be used in any concrete, but will provide the most valued in structures and environments where cracks due to drying shrinkage are prevalent and the repercussions are most severe. Some examples of applications where this is true are bridge decks, parking garages, marine structures, containment structures and high performance floors.

Chemical Action

Drying shrinkage of concrete is a complicated phenomenon which is widely acknowledged to be the function of several mechanisms. The primary driver in the predominant mechanism causing shrinkage for internal relative humidities in excess of 40% is the surface tension of water. As water-filled pores in the size range of 2.5 to 50 nm (nm = nanometers) lose moisture, curved menisci are formed and the surface tension of water pulls the walls of the pores.

(In pores greater than 50 nm, the magnitude, of the tensile force, relative to the size of the pore, becomes negligible; pores smaller than approx. 2.5 nm will not support the formation of a meniscus.) EUNISHRINK Eclipse reduces the surface tension of water. With reduced surface tension, the force pulling on the walls of the pores is reduced, and the resultant shrinkage strain is reduced. With EUNISHRINK Eclipse at a dosage of 2% by weight of cement, this effect results in the ultimate shrinkage reductions in the order of 25 to 50%.

Compatibility

With other admixtures: EUNISHRINK Eclipse is compatible with all conventional air entraining agents, water reducers, and midrange water reducers, superplasticizers, set retarders, accelerators, silica fume admixtures and EUNICOR DCI corrosion inhibitor. Precaution should be taken to avoid mixing EUNISHRINK Eclipse with other admixtures before they enter the concrete. However, once they have been separately added to the mixture, the products will not exhibit any incompatibility. EUNISHRINK Eclipse does have minor retarding properties (set times are typically extended less than one hour). If used in combination with other products exhibiting retarding properties the net retardation may be more than the simple additive effect of the two products used separately.

Addition Rates Range

The recommended addition rate to maximize the effectiveness of EUNISHRINK Eclipse is 2% by weight of cement (or total cementitious material). This equals to 7 kg/m³ or 7.5 liters/m³ for a concrete mixture with 350 kg/m³ of cementitious material. For the range of addition rates between

1% and 2.5%, shrinkage reduction as a function of dosage. is relatively linear and any dosage within this range may be selected to obtain a desired level of shrinkage performance. Addition rates outside this range are not recommended unless adequately tested.

Mixture Adjustments

EUNISHRINK Eclipse contains no water, but is added at fairly high dosages and should be accounted for in mixture design. At a 2% dosage (by weight of cement) in a mixture with 350 kg/m³ of cement, the volume of the product is 7.5 L/m³. This liquid volume will contribute to the overall porosity of the concrete in the same fashion that an added 7.5 L/m³ of water will. In addition the effect on concrete slump will be virtually the same as the equivalent volume of water. It is therefore recommended that when incorporating EUNISHRINK Eclipse into an established mixture design that it should replace an equal volume of water.

Impact

On Fresh Concrete Properties: When substituted in a mixture design for an equivalent volume of water, EUNISHRINK Eclipse has little or no effect on concrete slump. It does however, have a slight retarding effect (typically less than one hour extension of set time, see section on compatibility), and will aid in extending slump life. Where tested to date, mixtures containing EUNISHRINK Eclipse have been described by concrete finishers to be equal or superior in terms of finishing characteristics to reference concrete mixtures. Mixtures with EUNISHRINK Eclipse will require increased amounts of air entrainer to achieve a specified level of air.

On Hardened Concrete Properties: The primary impact of EUNISHRINK Eclipse is the reduction in drying shrinkage as previously detailed, but other hardened concrete properties are affected as well. The addition of EUNISHRINK Eclipse acts to flatten out the heat generation due to hydration, reducing peak temperatures in concrete but also reducing concrete compressive strengths. These reductions in compressive strengths vary from 0 to 15% depending on the mixture and materials used. The typical reduction is of 10% or less. In mixtures proportioned for durability, this level of strength reduction is typically not an issue. For established concrete mixtures where strength must be maintained,

superplasticizers such as EUNIFLOW may be used to cut water to offset the strength reduction of EUNISHRINK Eclipse, without compromising its shrinkage reducing capabilities. For more information on this topic consult our Technical Service Department.

Dispensing

It is preferable that liquid admixtures for concrete should be introduced into the mixer by means of automatic dispensing equipment. A range of equipment is available, and advice on supply and fitting is available on request. As with most concrete admixtures EUNISHRINK Eclipse must not be allowed to come into contact with other admixtures prior to being mixed into the concrete.

Packaging

EUNISHRINK Eclipse is supplied in 210 liter containers. Alternatively, bulk deliveries can be arranged.

Flammability

EUNISHRINK Eclipse has a flash point of 98°C. This is substantially above the upper limit of 60°C for classification as a flammable material, and above the limit of 98°C where DOT requirements would classify this as a combustible material. Nonetheless, this product must be treated with care and protected from excessive heat, open flame or sparks. For more information consult the MSDS.

Health and Safety

Check the EUNISHRINK Eclipse Material Safety Data Sheet, or consult European Concrete Additives.

Contact Information

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v01-02-2022