ECLIPSE® 4500 Data Sheet

Shrinkage reducing admixture ASTM C494 Type S

Product Description

ECLIPSE® 4500 is a liquid admixture for concrete that dramatically reduces drying shrinkage and the potential for drying shrinkage-induced cracking and curling. Rather than functioning as an expansive agent, ECLIPSE® 4500 acts by reducing the surface tension of pore water.ECLIPSE® is specifically formulated for use in air-entrained concrete exposed to freezing and thawing conditions. ECLIPSE® 4500 is a clear liquid admixture that weighs approximately 7.7 lbs/gal (0.92 kg/L).

Product Advantages

- Reduces drying shrinkage up to 80% at 28 days and 50% at 1 year and beyond
- Enables normal performance of air-entraining admixtures
- Reduces the potential of cracking due to drying shrinkage in full or partially restrained concrete
- Reduces curling
- Improves durability, which reduces maintenance and repair costs

Uses

ECLIPSE® 4500 may be used in any concrete but provides the most value when used in concrete located in freeze-thaw environments where the potential for cracking due to drying shrinkage is prevalent and undesirable. Typical applications include, but are not limited to bridge decks, parking garages, marine structures and containment structures. ECLIPSE® 4500 can be used in ready mix, precast and prestress concrete; in addition to mortar, grout and wet mix shotcrete.

Performance

Impact on plastic and hardened concrete properties — Figure 1 illustrates ASTM C157 drying shrinkage reduction up to 90 days (after 7 day curing) for concrete mixtures containing 0.75 gal/yd^3 (3.7 L/m^3) and 1.5 gal/yd^3 (7.4 L/m^3) of ECLIPSE® 4500. This data depicts typical ECLIPSE® 4500 test results for a well proportioned concrete mixture. However, pre-job drying shrinkage testing it is recommended to determine actual drying shrink-age characteristics for a specific mix design and set of materials.

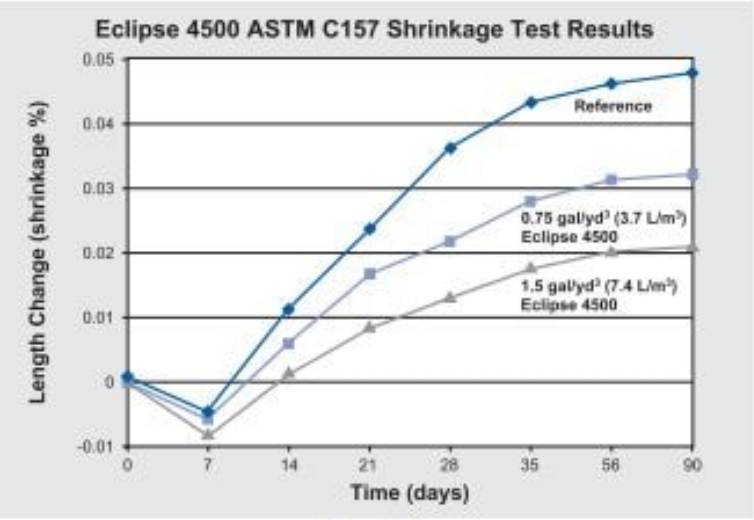

Figure 1

ECLIPSE® 4500 impacts workability (slump) similarly to an equal volume of water; therefore, ECLIPSE® 4500 should replace an equal volume of water. ECLIPSE® 4500 may have a slight retarding effect on a concrete mix, typically less than one hour. It is recommended that ECLIPSE® 4500 be used with near neutral setting polycarboxylate-based admixtures (including the MIRA® and ADVA® product lines). ECLIPSE®4500 may also cause a decrease (typically less than 10%) in early and later age compressive strengths. ECLIPSE® 4500 is a non chloride containing, non-corrosive admixture that will not initiate or contribute to the corrosion of reinforcing steel.

Air management guidelines

Concrete containing ECLIPSE® 4500 typically requires slightly higher AEA dosages to achieve similar plastic air content compared to an identical concrete mixture not containing ECLIPSE® 4500.

The following guidelines are recommended for concrete containing ECLIPSE® 4500 and subject to freezing and thawing conditions. These guidelines were developed and validated through extensive laboratory and field testing. Note that minimum plastic concrete air contents represent plastic air at the point of placement.

- Minimum compressive strength at 28 days of 4,500 psi (31 MPa)
- Maximum water-cementitious materials ratio of 0.45
- Minimum fresh concrete air content in accordance with the maximum aggregate size

MAXIMUM COARSE AGG SIZE	MINIMUM PLASTIC AIR CONTENT
3⁄8 in. (9.5 mm)	7.5%
1⁄2 in. (12.5 mm)	7%
3⁄4 in. (19 mm) or greater	6%

Addition Rates

Typical ECLIPSE® 4500 dosage rates are 0.5 to 1.5 gal/yd^3 (2.5 to 7.5 L/m^3). However, dosage rates ranging from 0.2 to 2.0 gal/yd^3 (1.0 to 10 L/m^3) can be utilized to meet specific drying shrinkage requirements. Dosage rates as low as 0.2 gal/yd^3 (1.0 L/m^3) have been successfully used in concrete mixes which are just outside drying shrinkage specifications. It is recommended that trial mixtures be evaluated for shrinkage reduction in accordance with ASTM C157 prior to construction.

Compatibility with Other Admixtures and Batch Sequencing

ECLIPSE® 4500 is compatible with the complete line of GCP Admixtures. In mixtures containing mid-or high-range water reducers, it is recommended that ECLIPSE® 4500 be used with polycarboxylate-based MIRA® mid-range water reducers and ADVA® high-range water reducers. ECLIPSE® 4500 is fully compatible with ASTM C260 air entrainers including DARAVAIR® and DAREX® and with calcium nitrite-based products including DCI® and DCI® S.

In general, ECLIPSE® 4500 may be added to the concrete batch sequencing at any time, however, preferably after the dry materials and most of the water. Different sequencing may be used if local testing shows better performance. Please see Technical Bulletin TB-0110, *Admixture Dispenser Discharge Line Location and Sequencing for Concrete Batching Operations* for further recommendations. ECLIPSE® 4500 should not come in contact with any other admixture before or during the batching process, even if diluted in mix water. Pretesting of the concrete mix should be performed before use and as conditions and materials change in order to assure compatibility and to optimize dosage rates, addition times in the batch sequencing and concrete performance. Please consult your GCP representative for specific guidance.

Packaging & Handling

ECLIPSE® 4500 is available in bulk quantities by GCP metered systems, in 275 gal (1,040 L) totes, or in 55 gal (208 L) drums.

Dispensing Equipment

A complete line of automatic dispensing equipment is available through GCP.

Flammability

ECLIPSE® 4500 has a flash point of 216°F (102°C). This is substantially above the upper limit of 140°F (60°C) for classification as a flammable material and above the limit of 200°F (93°C) for classification as a combustable material by DOT requirements. Nonetheless, this product must be treated with care and protected from excessive heat, open flame or sparks. For more information, consult the SDS.

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