

# ECLIPSE® 4500

## 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 4500 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).

### 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

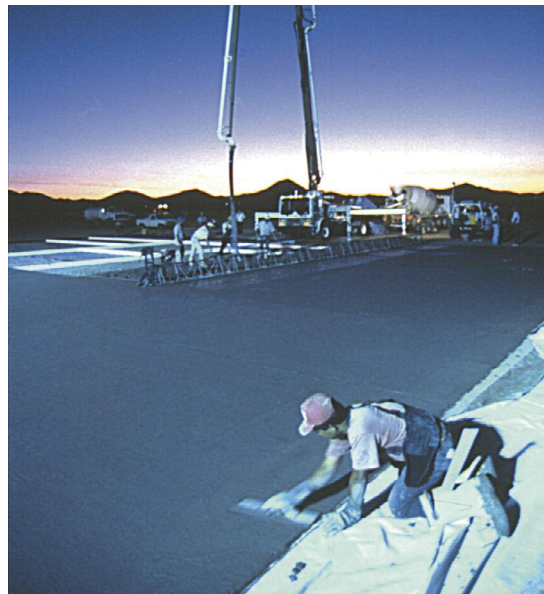
#### Impact on plastic and hardened concrete properties—

Figure 1 illustrates ASTM C157 drying shrinkage reduction up to 90 days (after 7 day curing) for concrete mixtures containing 0.75 gal/yd<sup>3</sup> (3.7 L/m<sup>3</sup>) and 1.5 gal/yd<sup>3</sup> (7.4 L/m<sup>3</sup>) 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 shrinkage characteristics for a specific mix design and set of materials.

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.

### 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



## 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 Aggregate Size   | Minimum Plastic Concrete Air Content |
|--------------------------|--------------------------------------|
| ¾ in. (9.5 mm)           | 7.5%                                 |
| ½ in. (12.5 mm)          | 7%                                   |
| ¾ in. (19 mm) or greater | 6%                                   |

## Addition Rates

Typical Eclipse 4500 dosage rates are 0.5 to 1.5 gal/yd<sup>3</sup> (2.5 to 7.5 L/m<sup>3</sup>). However, dosage rates ranging from 0.2 to 2.0 gal/yd<sup>3</sup> (1.0 to 10 L/m<sup>3</sup>) can be utilized to meet specific drying shrinkage requirements. Dosage rates as low as 0.2 gal/yd<sup>3</sup> (1.0 L/m<sup>3</sup>) 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 Grace 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

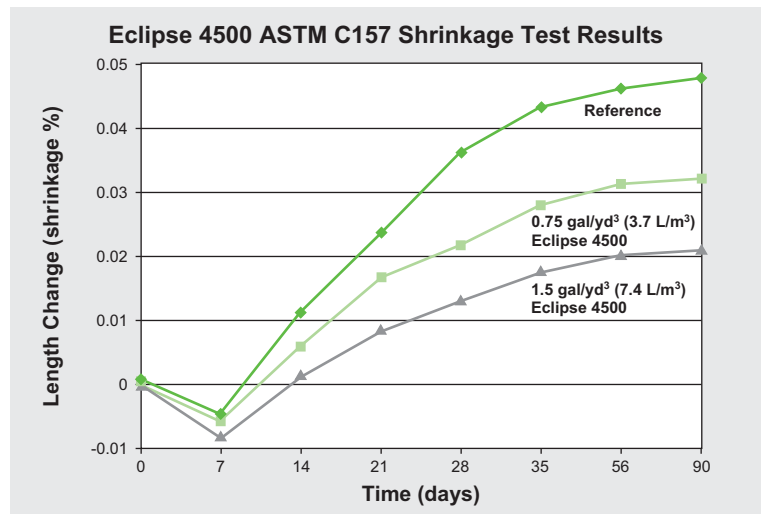


Figure 1

water. Different sequencing may be used if local testing shows better performance. Please see Grace 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 Grace representative for specific guidance.

## Packaging & Handling

Eclipse 4500 is available in bulk quantities by Grace 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 W.R. Grace & Co.–Conn.

## 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 combustible 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 MSDS.

[www.graceconstruction.com](http://www.graceconstruction.com)

North American Customer Service: 1-877-4AD-MIX1 (1-877-423-6491)

Eclipse, the Eclipse logo, MIRA, ADVA, Daravair, Darex and DCI are trademarks of W. R. Grace & Co.–Conn. registered in the United States and other countries.

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate and is offered for the users' consideration, investigation and verification, but we do not warrant the results to be obtained. Please read all statements, recommendations or suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation or suggestion is intended for any use which would infringe any patent or copyright.

W. R. Grace & Co.–Conn., 62 Whittemore Avenue, Cambridge, MA 02140.  
In Canada, Grace Canada, Inc., 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

This product may be covered by patents or patents pending.  
EC-20E Printed in U.S.A. 11/12

Copyright 2012. W. R. Grace & Co.–Conn.  
FA/PDF

**GRACE**