



Expanplast AE316*

High performance air entraining and Plasticizing admixture

Uses

To produce air entrained concrete for increased durability and resistance to damage by frost and de-icing salts. Typical applications include concrete roads and bridge decks, airport runways and taxiways and other concrete exposed to potential frost damage.

To improve cohesion and workability of concrete mixes where poorly graded aggregates must be used and bleeding, segregation or sand runs occur.

Particularly suitable for use in situations where standard air entrainers are less reliable or less effective. Typical examples include where mixes containing PFA or aggregates with high dust contents are used.

Advantages

Air entrainment increases the resistance of concrete to attack by frost and de-icing salts, reducing problems of surface scaling and concrete failure.

Entrained air bubbles assist in the formation of a stable cohesive mix, reducing segregation and bleeding.

Air entrainment improves workability and helps produce a dense, uniform, close textured surface free from gravel nests and sand runs, further enhancing durability.

Excellent air bubble stability allows use with a wide range of aggregate qualities and mix conditions.

Particularly effective with dusty aggregates and in mixes containing PFA or microsilica.

Particularly designed for less variability in performance at varying concrete temperatures than normal air entraining admixtures.

Description

Expanplast AE316 air entraining admixture is chloride free and based on a synergistic blend of synthetic and naturally occurring surfactants. It is supplied as a brown solution which instantly disperses in water.

Expanplast AE316 acts at the interface between the mixing water and cement/aggregate particles to produce microscopic air bubbles, which are evenly distributed throughout the concrete.

The entrained air enhances durability by providing protection against the rapid temperature changes found in freezing and thawing conditions and with the use of de-icing salts.

Standards compliance

Expanplast AE316 conforms with BS 5075 Part 2 and ASTM C260.

Typical dosage

The optimum dosage of Expanplast AE316 to meet specific requirements must always be determined by trials using the materials and conditions that will be experienced in use. This allows the optimization of admixture dosage and mix design and provides a complete assessment of the concrete mix.

With air entrainers in particular, a large number of factors affect the dosage required to obtain particular desired results. This makes it impossible to predict the dosage required for a specific mix requirement. As a guide, the dosage will generally be in the range of 0.10 to 0.60 liters/100 kg of cement to obtain an air content of $5\% \pm 2\%$ in a medium workability concrete of 300-350 kg/m³ cement content.

Where cement replacement materials are used they should be included in the cementitious content when calculating admixture dosage. Mixes containing only OPC will usually require dosage in the lower half of the normal range. Mixes containing PFA or microsilica are more likely to require dosages in the higher part of the range. The use of lower quality PFA may increase the dosage required, possibly extending the normal maximum dosage up to 0.40 liters/100 kg.

Use at other dosages

Dosages outside the typical ranges suggested on this sheet may be used if necessary and suitable to meet particular mix requirements, provided that adequate supervision is available. Compliance with requirements must be assessed through trial mixes. Contact the Fospak Technical Service Department for advice in these cases.

Properties

Appearance	: Brown liquid
Specific gravity	: Typically 1.00–1.02 at 20°C



Instructions for use

Checking and control

Once a suitable dosage has been selected, care should be taken to ensure consistency of materials used and mixing and delivery procedures. Air content should be checked regularly by such means as the pressure method described in BS 1881 and ASTM C231.

Factors affecting air entrainment

A number of factors can affect the air entrainment obtained for a particular dosage of air entraining admixture, some of which are listed below. The examples given of changes that these factors may make to a concrete mix should be taken as guidelines only and the actual effects in any particular situation confirmed in trials.

- a) Sands of apparently the same grading may have significantly different effects on the level of air entrainment, depending on factors such as silt content, particle size distribution and particle shape. Where changes in sand source or content must be made, or where sand varies within the same source, a careful check must be made on the effects on air entrainment.
- b) Increased cement fineness or cement content will tend to decrease air content. Changes in cement source and type may also lead to changes in the admixture dosage required to obtain a particular air content.
- c) The presence of carbon or organic impurities may reduce the effectiveness of an air entrainer and require an increased dosage. This will not usually be a problem but care may be required when using PFA, certain pigments or lignite bearing sands.
- d) Increased concrete temperature will tend to reduce air entrainment. Typically a rise from 10°C to 32°C may halve the level of air. In normal mixing conditions daily fluctuations will not give significant variations.
- e) Variations of mixer type and transit time may change the level of air entrainment. Small losses may occur during pumping. These will generally be consistent for a given set of conditions. High air contents may significantly reduce pump efficiency over long pump distances.
- f) Normal compacting procedures will not affect air entrainment. Prolonged vibration should be avoided.
- g) Increased dosages may be required at low workability levels to achieve the required air content.

Compatibility

Expanplast AE316 is compatible with other Fospak admixtures used in the same concrete mix. All admixtures should be added to the concrete separately and must not be mixed together prior to addition. The resultant properties of concrete containing more than one admixture should be assessed by the trial mix procedure recommended on this data sheet.

Expanplast AE316 is suitable for use with all types of Portland cement. Contact the Fospak Technical Service Department for advice on use with special cements and blends containing cement replacement materials.

Dispensing

The correct quantity of Expanplast AE316 should be measured by means of a recommended dispenser. The admixture should then be added to the concrete with the mixing water to obtain the best results. Contact the Fospak Technical Service Department for advice regarding suitable equipment and its installation.

Effects of overdosing

An overdose of double the intended amount of Expanplast AE316 will result in a significant increase in air entrainment, which will reduce strength. The degree of this effect will depend on the particular mix design and overdose level.

Increased air content from an overdose will tend to have an increased plasticizing effect. Some slight increase in setting time may also occur.

Curing

As with all structural concrete, good curing practice should be maintained. Water spray, wet hessian or a Expancure* spray applied curing membrane should be used.

Limitations

In some situations the powerful nature of Expanplast AE316 may result in very low dosages which can be difficult to dispense accurately. In such cases, the use of a less powerful product such as Expanplast AE300* is recommended.

Technical support

Fospak provides a technical advisory service for on-site assistance and advice on admixture selection, evaluation trials and dispensing equipment. Technical data and guidance can be provided for admixtures and other products for use with fresh and hardened concrete.



Estimating

Supply

Expanplast AE316 : 210 liters drums and in bulk

Dosage

Expanplast AE316 : 0.10 to 0.60 liters/100 kg cement

Storage

Expanplast AE316 has a minimum shelf life of 12 months provided the temperature is kept within the range of 5°C to 50°C. Should the temperature of the product fall outside this range then the Fospak Technical Service Department should be contacted for advice.

Freezing point : Approximately 0°C

Precautions

Health and safety

Expanplast AE316 is alkaline and an irritant and should not be swallowed or allowed to come into contact with skin and eyes.

Suitable protective gloves and goggles should be worn.

Splashes on the skin should be removed with water. In case of contact with eyes rinse immediately with plenty of water and seek medical advice. If swallowed seek medical attention immediately - do not induce vomiting.

For further information consult the Material Safety Data Sheet available for this product.

Fire

Expanplast AE316 is water based and non-flammable.

Cleaning and disposal

Spillages of Expanplast AE316 should be absorbed onto sand, earth or vermiculite and transferred to suitable containers. Remnants should be hosed down with large quantities of water.

The disposal of excess or waste material should be carried out in accordance with local legislation under the guidance of the local waste regulatory authority.



CONSTRUCTION CHEMISTRY

Additional Information

Fospak manufactures a wide range of complementary products which include:

- waterproofing membranes & waterstop
- joint sealants & filler boards
- cementitious & epoxy grouts
- specialized flooring materials

Fospak additionally offers a comprehensive package of products specifically designed for the repair and refurbishment of damaged concrete. Fospak's 'Systematic Approach' to concrete repair features the following:

- hand-placed repair mortars
- spray grade repair mortars
- fluid micro-concretes
- chemically resistant epoxy mortars
- anti-carbonation/anti-chloride protective coatings
- chemical and abrasion resistant coatings

For further information on any of the above, please consult your local Fospak office - as below.

* Denotes the trademark registered

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