

Expanplast* AEA260



Air entraining 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 extensive areas of 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.
- As part of a combined admixture system for the production of ready mixed retarded mortar.

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 to produce a dense, uniform, close textured surface free from gravel nests and sand runs, so further enhancing durability.
- Excellent air bubble stability allows use with a wide range of aggregate qualities and mix conditions.

Standards compliance

Expanplast* AEA260 complies with BS 5075 Part 2, BS 4887 Part 1, ASTM C260 and with the Department of Transport Specification for Highway Works.

Description

Expanplast* AEA260 is a chloride-free air entraining admixture based on neutralized vinsol resin. It is supplied as a light brown solution which instantly disperses in water.

Expanplast* AEA260 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.

Technical support

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

Typical dosage

The optimum dosage of Expanplast* AEA260 to meet specific requirements must always be determined by trials using the materials and conditions that will be experienced in use.

The normal dosage range of Expanplast* AEA260 is 0.02 – 0.50 liter / 100 kg of cementitious material.

As a starting point for trials a dosage of 0.03 liter / 100 kg of cement will typically give an air content of 5% ± 1.5% in a medium workability concrete of 300 to 350 kg/m³ cementitious content. Where cement replacement materials are used they should be included in the cementitious content for purposes of calculating admixture dosage. The presence of PFA or microsilica may increase the dosage required to obtain a particular air content. Further details on typical dosage levels are given later in this data sheet.

Use at other dosages

Dosages outside the typical ranges suggested on this data 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 Customer Service Department for advice in these cases.

Properties

Appearance	:	Light brown liquid
Specific gravity	:	Typically 1.00 – 1.03 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 will tend to increase air entrainment. Increased 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 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* AEA260 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* AEA260 is suitable for use with all types of ordinary Portland cement. Contact the Fospak Customer Service Department for advice on use with special cements and blends containing cement replacement materials.

Dispensing

The correct quantity of Expanplast* AEA260 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 Customer Service Department for advice regarding suitable equipment and its installation.

Effects of overdosing

An overdose of double the intended amount of Expanplast* AEA260 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.

Typical performance examples

Many variables in concreting materials and conditions can affect the selection and use of an admixture. Trials should be made using relevant materials and conditions in order to determine the optimum mix design and admixture dosage to meet specific requirements.

Typical performance examples from evaluation studies of Expanplast* AEA260, are included on this data sheet. The values quoted are representative of results obtained and are provided as illustrations of the performance in different situations. Because of the variability of concreting materials, the results should only be taken as typical of the performance to be expected. Results quoted in individual examples should not be taken as necessarily directly comparable with other examples given here or results obtained elsewhere for Expanplast* AEA260 or other products.

Unless otherwise specified, all testing was carried out to the relevant parts of applicable standards.

Figure 1: Example of typical dosage of Expanplast* AEA260 to give a range of air contents

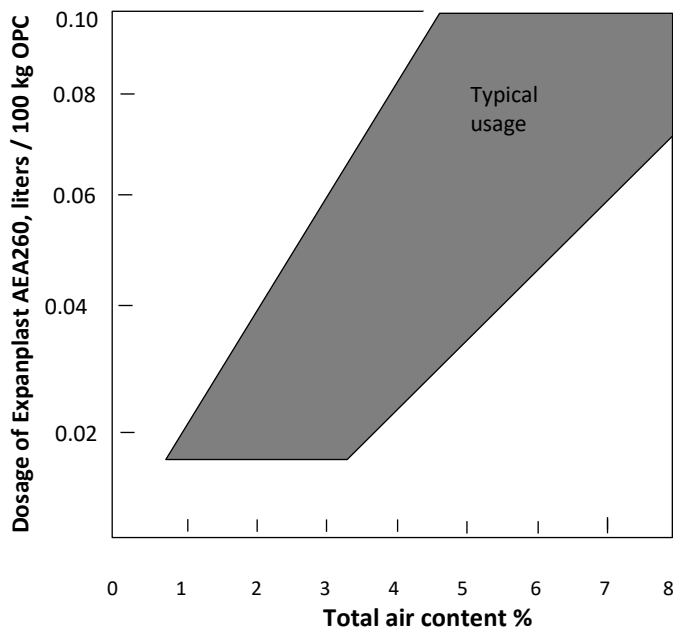
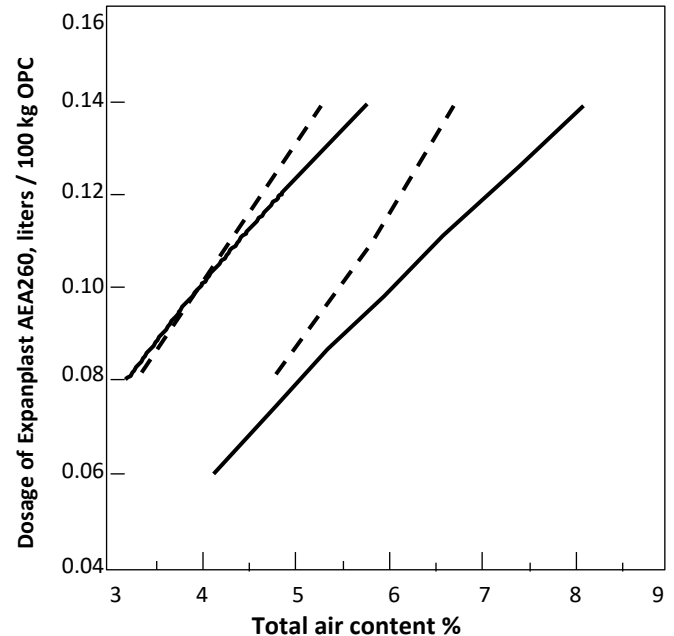


Figure 1 shows the range of air contents that are typically obtained at particular dosages of Expanplast* AEA260 over a range of mix conditions and variables. Particular combinations of conditions may give results outside the indicated area.

Figure 2: Example of variability of air content caused by particular aggregate and cement source variations



The lines on Figure 2 are paired, the solid lines show results from one particular aggregate source and the dashed lines from a different source. In each pair, the upper line and lower line show the effect of two different cement sources.

These results relate specifically to the aggregate and cement sources used in the example, other sources and mix design are likely to give different results.

Limitations

Some cement replacement materials, particularly low grade PFA, may lead to a significant increase in the dosage of Expanplast* AEA260 required to produce a desired air content.

In such situations the use of an air entrainer based on synthetic surfactants, such as Expanplast* AEA260*, is recommended.

Estimating packaging

Expanplast* AEA260 is available in drum and bulk supply. For larger users, storage tanks can be supplied. Details of specific packaging volumes are available on request.

Storage

Expanplast* AEA260 has a minimum shelf life of 12 months provided the temperature is kept within the range of 2°C to 50°C. Should the temperature of the product fall outside this range then the Fospak Customer Service Department should be contacted for advice.

Freezing point: Approximately 0°C.

Precautions

Health and safety

Expanplast* AEA260 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 Product Safety Data Sheet available for this product.

Fire

Expanplast* AEA260 is water based and non-flammable.

Cleaning and disposal

Spillages of Expanplast* AEA260 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.

*** Denotes the trade mark registered**

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