

The Chemical Company

Shrinkage reducing admixtures

CAA Admixtures Categories for "Special Purposes"

Description of Product

Introduced in 1985, TETRAGUARD AS20 shrinkage-reducing admixture is the first chemical admixture in the world to reduce drying shrinkage in concrete and mortar, and the potential for subsequent cracking.

TETRAGUARD AS20 admixture can be used in any mortar and concrete applications where reduced shrinkage is required.

Product History

TETRAGUARD AS20 shrinkage-reducing admixture was developed in a partnered effort between Nihon Cement Co., Ltd. and Sanyo Chemical Industries, Japan, and patented in 1985. TETRAGUARD AS20 admixture has been used successfully in the Far East construction market since its introduction.

The TETRAGUARD AS20 product was developed to replace/enhance inorganic expansive admixtures that were being used to prevent drying shrinkage cracking. These expansive admixtures acted by inducing compressive stresses in concrete to offset tensile stresses caused by drying shrinkage.

TETRAGUARD AS20 admixture functions by reducing capillary tension of pore water, a primary cause of drying shrinkage.

Features and Benefits

- Significantly reduces drying shrinkage by as much as 80% at 28 days, and up to 50% at one year or beyond when 2% TETRAGUARD AS20 admixture by mass of cement is used in the concrete mixture.
- Reduces stresses induced from one-dimensional surface drying in concrete slabs and floors.
- Reduces compressive creep.
- Reduces carbonation.

- Reduces drying shrinkage cracking and micro cracking thereby improving aesthetics, watertightness and durability.
- Reduces compressive creep under drying conditions that minimizes pre-stress loss.
- Minimises curling.

Effect on Plastic and Hardened Properties

TETRAGUARD AS20 does not substantially affect slump or air content. TETRAGUARD AS20 may increase bleed time and bleed ratio (10% higher). TETRAGUARD AS20 may also delay time of set by 1 to 2 hours depending upon dosage and temperature. Compressive strength loss is minimal with TETRAGUARD AS20 shrinking reducing admixture.

Application Procedure

Dosage

TETRAGUARD AS20 shrinkage-reducing admixture may be added to the concrete mixture during the initial batch sequence or at the jobsite.

To achieve desired shrinkage-reducing performance in concrete mixtures and mortars, the recommended dosage range of TETRAGUARD AS20 is:

By Volume - 1.0 to 2.5 litres per 100 kg of cement (binder)

By Mass - 0.99 to 2.48 kg per 100 kg of cement (binder)

For most concrete mixtures, the recommended dosage of TETRAGUARD AS20 shrinkage-reducing admixture is 7.5 l/m³ (7.43 kg/m³). The mix water content should be reduced to account for the quantity of TETRAGUARD AS20 admixture used.

If the delayed addition method is used, mixing at high speed for 3 to 5 minutes after the addition of TETRAGUARD AS20 will result in mixture uniformity.

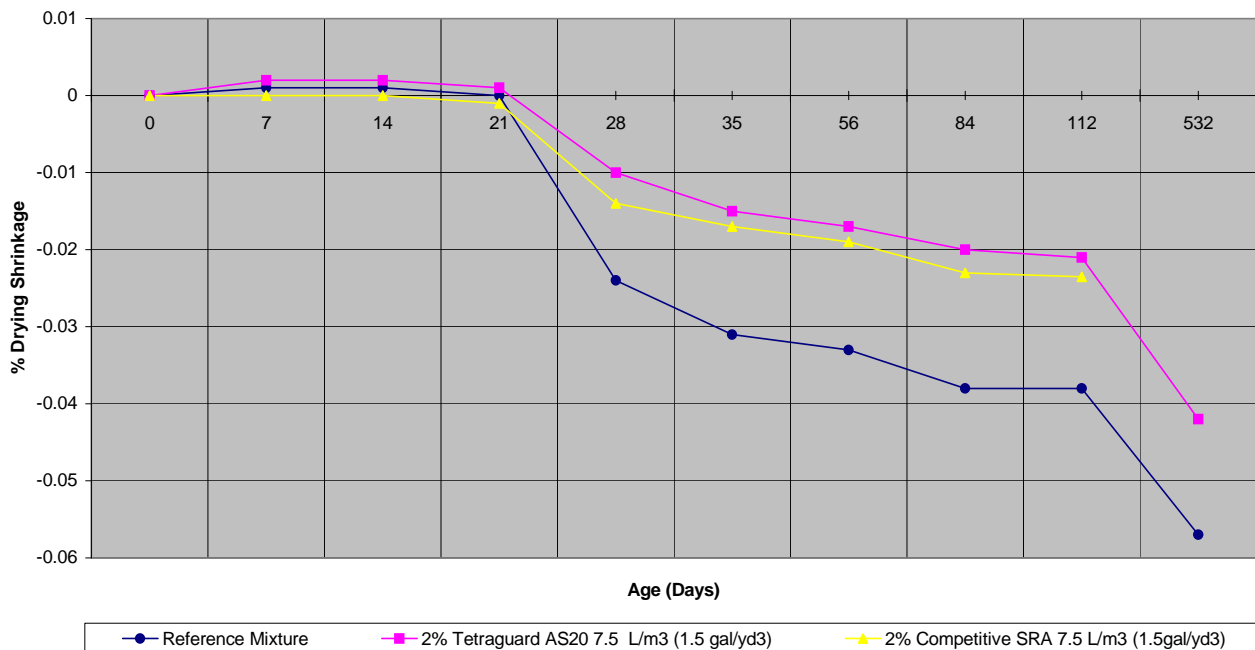
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Technical Data/Typical Properties

Appearance	Transparent liquid
Specific Gravity @ 20°C	0.99 g/cm ³

Test Results

ASTM C 157 Drying Shrinkage
14 Day Moist Curing
Cement = 365kg/m³ (616lb/yd³), w/c = 0.45



Compatibility with Other Admixtures

TETRAGUARD AS20 shrinkage-reducing admixture is compatible with all-conventional air-entraining agents, water reducers, mid-range water reducers, superplasticizers, set retarders, accelerators, silica fume admixtures, and corrosion inhibitors. Admixtures should be added separately to the concrete mixture to ensure desired results.

Non-chloride

TETRAGUARD AS20 admixture will not initiate or promote corrosion of reinforcing steel embedded in concrete; pre-stressed concrete or concrete placed on galvanised steel floor or roof systems. Neither calcium chloride nor any chloride-based ingredients are used in the manufacture of TETRAGUARD AS20 shrinkage-reducing admixture.

Storage

TETRAGUARD AS20 must be stored in a place where temperature does not drop below +5°C. If product has frozen, thaw at +3°C and agitate until completely reconstituted. Store under cover, out of direct sunlight and protect from extremes of temperature. Failure to comply with the recommended storage conditions may result in premature deterioration of the product or packaging. For specific storage advice consult BASF Construction Chemicals, Technical Services Department.

Packaging

TETRAGUARD AS20 is available in 1000-litre IBC's, 208-litre drums and 25-litre containers.

Shelf Life

Minimum 12 months if stored according to manufacturer's instructions in unopened containers.

BASF plc,
Construction Chemicals,
P.O. Box 4,
Earl Road,
Cheadle,
Cheshire, SK8 6QG
Tel: +44 (0) 161 488 5258
Fax +44 (0) 161 488 5220
www.basf-cc.co.uk

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Health and Safety

*For full information on Health and Safety matters regarding this product the relevant Health and Safety Data Sheet should be consulted.

The following general comments apply to all products.

As with all chemical products, care should be taken during use and storage to avoid contact with eyes, mouth, skin and foodstuffs, (which may also be tainted with vapour until the product is fully cured and dried). Treat splashes to eyes and skin immediately. If accidentally ingested, seek medical attention. Keep away from children and animals. Reseal containers after use.

Spillage

Chemical products can cause damage; clean spillage immediately.

DISCLAIMER

"BASF plc, Construction Chemicals " (the Company) endeavours to ensure that advice and information given in Product Data Sheets, Method Statements and Material Safety Data Sheets (all known as Product Literature) is accurate and correct. However, the Company has no control over the selection of its products for particular applications. It is important that any prospective customer, user or specifier, satisfies him/her-self that the product is suitable for the specific application. In this process, due regard should be taken of the nature and composition of the background/base and the ambient conditions both at the time of laying/applying/installing the material and when the completed work is to be brought into use.

Accordingly, no liability will be accepted by the Company for the selection, by others, of a product, which is inappropriate to a particular application.

Products are sold subject to the Company's standard conditions of sale and all customers, users and specifiers, should ensure that they examine the Company's latest Product Literature.