

TETRAGUARD AS20

Shrinkage-reducing admixture

DESCRIPTION:

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.

BENEFITS:

Primary

- **Reduction in drying shrinkage**

Significantly reduces drying shrinkage. Shrinkage may be reduced 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.

- **Reduction of drying shrinkage cracking and microcracking**

Reduction in drying shrinkage reduces potential for cracking thereby improving aesthetics, watertightness and durability.

Secondary

- **15+ year history of product performance**

- **10 year data from outdoor freeze/thaw exposure**

- **Reduction in compressive creep**

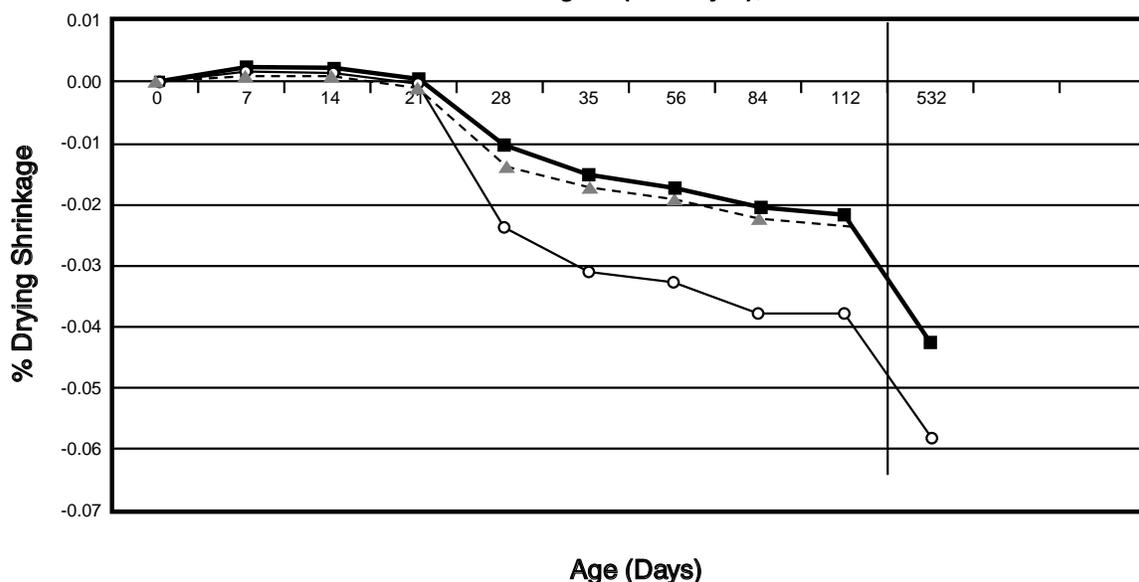
Reduces compressive creep under drying conditions that minimizes prestress loss.

- **Minimize curling**

Reduces stresses induced from one-dimensional surface drying in concrete slabs and floors.

- **Reduction of carbonation**

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



- Reference Mixture
- 2% TETRAGUARD AS20 7.5 L/m³ (1.5 gal/yd³)
- ▲ 2% Competitive SRA 7.5 L/m³ (1.5 gal/yd³)

INTEGRAL ADDITION METHOD:

TETRAGUARD AS20 shrinkage-reducing admixture may be added to the concrete mixture during the initial batch sequence or at the jobsite. The dosage range of TETRAGUARD AS20 is 1.0 to 2.5% by mass of cementitious materials (16 to 40 oz/cwt or 1.0 to 2.5 L/100 kg) in concrete mixtures and mortars to achieve desired shrinkage-reducing performance. For most concrete mixtures, the recommended dosage of TETRAGUARD AS20 shrinkage-reducing admixture is 1.5 gal/yd³ (7.5 L/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.

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.

PACKAGING AND AVAILABILITY:

TETRAGUARD AS20 is available in 53 gallon (200 liter) drums.

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.

TEMPERATURE PRECAUTION:

TETRAGUARD AS20 is a potentially combustible material with a flash point of 98 °C (208 °F). This is substantially above the upper limit of 60 °C (140 °F) for classification as a flammable material, and above the limit of 93 °C (200 °F) where DOT requirements would classify this as a combustible material. Nonetheless, this product must be treated with care and protected from excessive heat, open flame or sparks. For more information consult the MSDS.

NONCHLORIDE:

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

TETRAGUARD AS20 PROJECT SUMMARY:

<u>Date</u>	<u>Project Name</u>	<u>Concrete Volume (m³)</u>
4/83-3/91	Sanyo Chemical Industries	1800
1/85	Gunze Distribution Center	600
9/86-10/90	Green-Cross Corporation	1530
12/89	Ohsui Sangyo Building	500
5/92- 2/95	Meishin Highway Expansion	3770
8/92	Sumida Riverside Building	1200
9/94-2/95	Tomei Highway Expansion	1100
6/94	Tokyo Expressway, Yohama	100
8/94	Terumo Distribution Center	1000
2/95	Abo Tunnel, Nagano Zone	4400
7/95	Gararry Copa	200
10/95	Osaka Institute of Technology	12000
11/95	Saikawa Filtration Plant	2000
7/96	Linear Motor Car Pilot Line	500
7-9/96	Tomei Highway	350
9-12/96	Tokyo Expressway #4	200
1-2/97	Tomei Highway Expansion	70
1-3/97	Imai River Bank Protection	200
5-7/97	Futennoko-ku Reservoir	500
7/97	Shonai Filtration Plant	5000

TETRAGUARD AS 20 Concrete Volume Total	37, 020 m³ (48,128 yd ³)
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For more information, contact your local Master Builders representative.

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