

## SUPER CRYSTAL KOTE L 101

### CRYSTALLINE WATERPROOFING ADMIXTURE WITH PLASTICIZING EFFECT

#### PRODUCT DESCRIPTION:

**SUPER CRYSTAL KOTE L101** (PC 2160) is a liquid admixture that initiates a crystalline reaction in concrete. The reaction takes place with the free lime of the concrete and creates a permanent reduction of water permeability. The crystalline effect allows the structure to self-heal shrinkage cracks under contact. **SUPER CRYSTAL KOTE L101** is a crystalline and water reducing waterproofing admixture for concrete. It is very economic and easy to apply. **SUPER CRYSTAL KOTE L101** creates a crystalline structure inside the concrete reducing the amount and diameter of the capillary pores. At the same time the amount of mixing water can be reduced, which leads to a smaller amount of capillary pores.

#### STANDARDS:

**SUPER CRYSTAL KOTE** exceeds the requirements of EN 934-2 for concrete admixtures and is classified as a water reducing additive according table 2.

#### PERFORMANCE TEST DATA:

| PROPERTIES   | SUPER CRYSTAL KOTE L 101 |
|--|--------------------------|
| Colour   | Clear Transparent Liquid |
| Density, kg/l  | 1.16                     |
| <b>Water impermeability acc. EN 12390-8</b>                |                          |
| Positive Side  | 13 bar (190 psi)         |
| Negative Side  | 13 bar (190 psi)         |
| <b>Compressive Strength compared to untreated concrete</b> |                          |
| 28 days  | +/- 0%                   |
| Self healing of static cracks                              | Max. 0.4 mm (16 mils)    |
| pH   | 11.5                     |
| Fire rating EN13501-1                                      | Class A1                 |

#### ADVANTAGES

- Self seals both existing and futuristic static cracks of up to 0.4 mm
- Properly formulated mix designs result in waterproof concrete resistant against up to 13 bars
- Quick dispersion; easy to mix no lumping or need for extensive mixing times
- Increased resistance against low-ion soft water and aggressive media with a pH range of 3-12
- Suitable for potable water

## AREA OF APPLICATION

- Basements and below grade parking structures
- Potable water structures
- Sewage retaining structures
- Tunnels and pipes
- On grade slabs, rafts and pile caps
- Providing waterproof shotcrete

## APPLICATION METHODOLOGY

### A. Concrete requirements

Waterproof concrete requires several measures to ensure a dense structure.

Cement: **SUPER CRYTAL KOTE L101** can be used with most CEM I – III R and N (ASTM Type I – V) cements. Only cement types with more the 50% Pozzolanic content are not suitable. Cement content must be at least 280 kg/m<sup>3</sup> (472 lbs. per yd<sup>3</sup>).

Fly ash: Total fly ash must be less than 50% of the cement content.

Water: Potable water quality with a maximum dosage of 55% on cement content (water/cement ratio < 0.55).

Pozzolans: Pozzolanic additives Microsilica and slag compete with **SUPER CRYTAL KOTE L101** for the available lime. In these cases laboratory tests should be conducted beforehand to determine suitability, especially when “pozzolanic-containing” cements are used.

Aggregates and sand: Ensure a proper sieve curve according to good concreting practice as outlined for example in the ACI guidelines.

Admixtures: **SUPER CRYTAL KOTE L101** is compatible with most concrete admixtures. Mixes containing strong water reducers or super plasticizers must undergo suitability tests to avoid possible segregation, especially at high dosage rates.

Rebar: Amount and layout of reinforcement must be planned to minimize the risk of crack development. The rebar design is not influenced by the use of **SUPER CRYTAL KOTE L101**.

### B. Processing

a.) Batch-plant: Add **SUPER CRYTAL KOTE L101** together with the mixing water. Reduce mixing water by 5 liter per m<sup>3</sup> (1 gal per yd<sup>3</sup>) compared to an untreated mix design. Use normal mixing procedure.

b.) Concrete truck: Add **SUPER CRYTAL KOTE L101** into the drum when the truck arrives at the job site. Mix for 8 min. at high speed before pumping. Preliminary lab trials are mandatory for this type of administration to adjust the required mixing water at the batch plant and at the job site.

c.) Site mixes: Concrete mixed in small tumbler mixers can also be improved with **SUPER CRYTAL KOTE L101**. Add the product in the calculated amount together with the water into the mixer. Start with a semi dry mix and adjust to the desired consistency after at 3 minutes of mixing.

### C. Placing

Standard concrete placing practice in accordance with ACI Recommendations or equivalent International codes must be followed to ensure optimum results.

### D. Curing

Follow standard curing procedures for the site conditions. Take the required steps by either water curing as specified or applying

**SHELL CURE 131P** or **SHELL CURE 181R** curing compound as per requirement.

## ESTIMATING

Dosage per m<sup>3</sup> concrete

| Water Cement                                   | 40%                 | 45%                 | 50%                 | 55%                  |
|--|---------------------|---------------------|---------------------|----------------------|
| 280 kg/m <sup>3</sup> (472lb/yd <sup>3</sup> ) | 5.60 kg (9.42lb.)   | 6.30 kg (10.60 lb.) | 7.00 kg (11.78 lb.) | 7.70 kg (12.96 lb.)  |
| 310 kg/m <sup>3</sup> (522lb/yd <sup>3</sup> ) | 6.20 kg (10.43 lb.) | 6.98 kg (11.74 lb.) | 7.76 kg (13.06 lb.) | 8.52 kg (14.34 lb.)  |
| 340 kg/m <sup>3</sup> (573lb/yd <sup>3</sup> ) | 6.80 kg (11.44 lb.) | 7.66 kg (12.89 lb.) | 8.50 kg (14.31 lb.) | 9.36 kg (15.75 lb.)  |
| 370 kg/m <sup>3</sup> (623lb/yd <sup>3</sup> ) | 7.40 kg (12.45 lb.) | 8.32 kg (14.00 lb.) | 9.26 kg (15.59 lb.) | 10.18 kg (17.13 lb.) |

## Cleaning

**SUPER CRYSTAL KOTE L 101** can be removed in the fresh state with water.

## DOSAGE

The water content in any concrete mix is directly related to the porosity of the resultant concrete. Hence, the dosage depends on the amount of mixing water (aggregate moisture included) in the batch mix. **SUPER CRYSTAL KOTE L101** is added at a rate of 5% by weight of the total water (mixing water + aggregate moisture) i.e. 5 kg per 100 liter (4.2 lbs. per 10 gal.). In a typical 300 kg per m<sup>3</sup> (505 lbs. per yd<sup>3</sup>) total cementitious and a water : cement ratio of 0.40, use 6 kgs of **SUPER CRYSTAL KOTE L101** (Please refer to the guideline table under “Estimating” later on in this technical data sheet.

## PACKAGING

**SUPER CRYSTAL KOTE L 101** is available in 200 litre container.

## STORAGE AND SHELF LIFE

**SUPER CRYSTAL KOTE L101** can be stored in unopened original packs for 12 months at 10-35°C (50-95°F) in a dry storage place protected against sunlight.

## HEALTH AND SAFETY

**SUPER CRYSTAL KOTE L 101** should not be swallowed or allowed to come in contact with skin or and eyes. Suitable protective gloves and goggles should be worn. Splashes on 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.

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