

PENTENS T-308

Crystalline Admixture Waterproofing

Product Data Sheet



Description

PENTENS T-308 is a reactive crystalline type waterproofing material which is formulated by proprietary blends of chemicals (mainly organic and inorganic salts), quartz, sand and cement. PENTENS T-308 is an environmentally friendly and low VOC material. It is an integral waterproofing system that is being added to batches of concrete during mixing process. The active chemicals which react with moisture and free lime in the concrete or cement-based materials will cause a catalytic reaction that creates a non-soluble crystalline formation which crystallizes in the pores and capillary tracks.

In the long run, under a supersaturation environment inside concrete, PENTENS T-308 initiates crystallization process. When this process takes place, millions of needle-like crystals are formed and fill the capillary tracks, pores and microscopic voids within the concrete. Paths for harmful moisture and aggressive chemicals are blocked permanently.

PENTENS T-308 is added to batches of concrete during the mixing process for new construction projects. The high-growth organic component of the product reacts with water and unhydrated particles in concrete to form millions of needle-like crystals. These crystals grow and migrate through the concrete to fill in hair-thin pores and microscopic voids up to 0.4mm that would otherwise serve as passages for harmful moisture.

PENTENS T-308 technology enhances the natural hydration process in concrete, increasing compressive strength over time and dramatically reducing cracks caused by shrinkage.

Uses

PENTENS T-308 is used to waterproof areas as indicated below:

- Basement floors and retaining walls
- Concrete flat roofs
- Water retaining structures
- Lift pits
- Swimming pools

Advantages

- Low VOC.
- Environmentally friendly.
- Easy to use - only mix with concrete.
- It provides significant cost saving because it eliminates labour cost in the long run.
- Integral protection for the entire concrete.
- Permanent protection even if the surface is damaged.
- Can seal the capillaries and minor shrinkage cracks up to 0.4mm through crystal formation.
- Protection from any direction.
- Time-saving.
- Non-toxic.

Technical & Physical Data

Form	Cement powder (grey)
Chloride Contents BS 507S	Nil
Potable Condition BS 6920 Part 1:2000	Complied
Coefficient of Water Permeability (m/s) ADM/CE/017:2013	1.13×10^{-13}
Depth of Penetration of Water Under Pressure DIN 1048	<30mm
Can Seal Hairline Cracks	Up to 0.4mm
Shelf Life	1 year when unopened and undamaged
Storage Condition	Store in a dry, cool place
Packaging	25kg /pail

Dosage Rate

PENTENS T-308: 0.8% - 1.0% by weight of cementitious content.

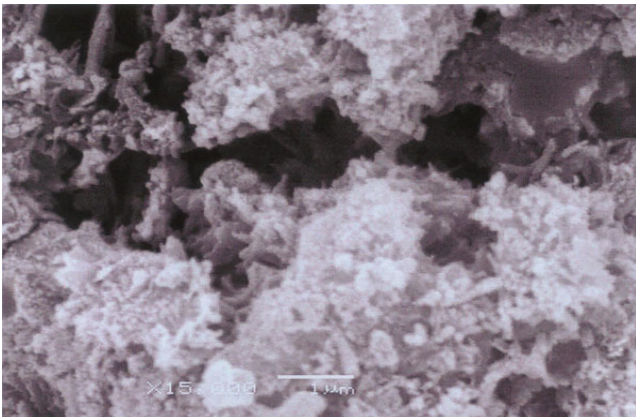
Note: Under certain condition, the dosage may be between 2%-3% depending on the quantity and type of total cementitious material.

Consult with PENTENS Technical Department Representative for assistance in determining the appropriate dosage and for further information on enhanced chemical resistance, optimum concrete performance or meeting the specific requirements and conditions of your project.

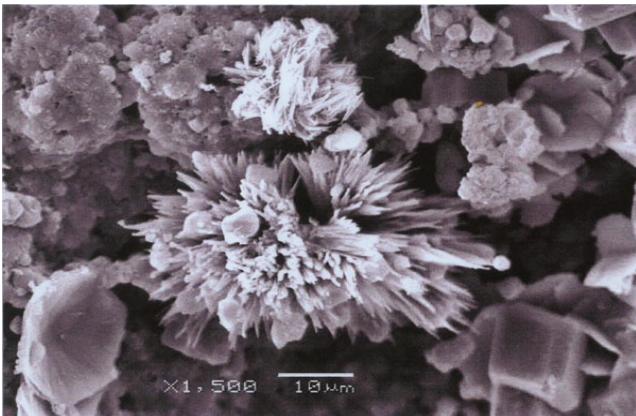
Crystallization Growth

The crystallization process consists of two events: nucleation and crystal growth. Nucleation is the step where the solute molecules dispersed in the solvent start to gather to create clusters in the nanometer scale (elevating solute concrete in a small region) and become stable under the current operating conditions. These stable clusters constitute the nuclei. The clusters need to reach a critical size in order to become stable nuclei. Such critical size is dictated by the operating conditions (temperature, super saturation, irregularities, etc.). It is at this stage of nucleation that the atoms arrange in a defined and periodic manner to define the crystal structure - note that “crystal structure” is a special term that refers to the internal arrangement of the atoms.

The crystal growth is the subsequent growth of the nuclei to achieve critical cluster size. Subsequently, nucleation and crystal growth continue to occur simultaneously in the presence supersaturation. Supersaturation is the driving force of the crystallization, hence the rate of nucleation and growth is driven by the existing supersaturation in the solution.



Micro Structure Analysis – Untreated Concrete



Micro Structure Analysis – Treated Concrete

Green Label Test Data

Heavy Metals:

(EPA 3025 / EPA 6010B : ICP)

a. Cadmium (Cd)	Not Detected
b. Lead (Pd)	Not Detected
c. Total Chromium (Cr)	Not Detected
d. Mercury (Hg)	Not Detected

Volatile Organic Compounds (ISO 11890-2) (g/L)	1.21
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Total Halogenated Organic Solvent (ISO 11890-2) (%)	Not Detected
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Total Aromatic Organic Solvent (ISO 11890-2) (%)	Not Detected
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Epichlorohydrin (ISO 11890-2) (%)	Not Detected
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N-Methyl Pyrrolidinone (ISO 11890-2) (%)	Not Detected
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Formaldehyde (High Performance Liquid Chromatography) (%)	Not Detected
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Alkyl Phenol Ethoxylate (LCMS-MS) (%)	Not Detected
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Flash Point (ASTM D3828-07a) (°C)	>61
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Instruction for Use

Trial mix shall be conducted for concrete intended to utilise PENTENS T-308 to waterproof a particular concrete structure.

On project site, mix PENTENS T-308 with water to form a very thin slurry mixture (e.g.: 25kg of powder mixed with 31.5 liters of water). Pour the required amount of material into the drum of the ready-mix truck. The cement and water should be batched and mixed in the plant in accordance with standard practices (taking into account the quantity of water that has already been placed in the ready-mix truck). Mix for at least 5 minutes to ensure even distribution of the PENTENS T-308 throughout the concrete.

Note: It is important to obtain a homogeneous mixture of PENTENS T-308 with the concrete. Therefore, do not add dry PENTENS T-308 powder directly to wet concrete as this may cause clumping and thorough dispersion will not occur.

The targeted compressive strength of a particular grade of concrete shall comply with BS 5328:1981 or its latest revision. The use of PENTENS T-308 shall be under adequate supervision. For further advice, please contact PENTENS Technical Representative.