

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 added to batches of concrete during mixing process. The active waterproofing chemicals which react with moisture and free lime in the concrete or cement-based materials, it causes a catalytic reaction that creates long chained complexes a non-soluble crystalline formation which crystallizes in the pores and capillary tracks.

In a long run, under a supersaturation environment inside concrete, **PENTENS T-308** initiates crystallization process. When this process takes place, millions of needle-like crystals form and fill the naturally occurring capillary pores and microscopic voids within the concrete. Path 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 cracking caused by shrinkage. **Pentens T-308** is also self-sealing.

Uses

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

- Basement floors and retaining walls
- Concrete flat roof
- Water retaining structures
- Lift Pits
- Swimming pool

Advantages

- Low VOC
- Environmentally Friendly
- Easy to use – only mixing with concrete.
- It provides significant cost saving because it eliminates labour cost for the application process.
- 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 by crystal formation.
- Protection from any direction.
- Time-Saving.
- Non-toxic.
- Environmental friendly.

Technical & Physical Data

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

Dosage Rate

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

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

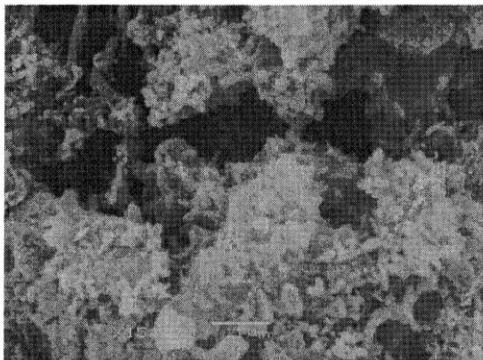
Consult with PENTENS Technical Department Representative for assistance in determining the appropriate dosage rate and for further information regarding enhanced chemical resistance, optimum concrete performance, or meeting the specific requirements and conditions of your project.

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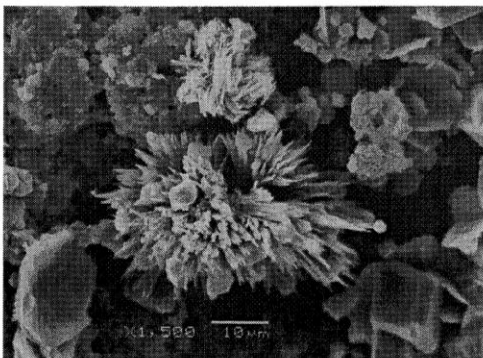


Crystallization Growth

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) is to 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 the stage of nucleation that the atoms arrange in a defined and periodic manner that defines 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 that succeed in achieving the critical cluster size. Subsequently, nucleation and growth continue to occur simultaneously while the supersaturation exists. Super-saturation 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

Total Halogenated Organic Solvent

(ISO 11890-2) (%) Not Detected

Total Aromatic Organic Solvent

(ISO 11890-2) (%) Not Detected

Epichlorohydrin

(ISO 11890-2) (%) Not Detected

N-Methyl Pyrrolidinone

(ISO 11890-2) (%) Not Detected

Formaldehyde

(High Performance Liquid Chromatography) (%) Not Detected

Alkyl Phenol Ethoxylate

(LCMS-MS) (%) Not Detected

Flash Point

(ASTM D3828-07a) (°C) > 61

Instruction for Use

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

For project site, mix **PENTENS T-308** with water to form very thin slurry (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 aggregate, 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 mixed 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 latest particular grade of concrete shall be complied 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.