

The proven power of the
Penetron Admix[®] SB on site.

PENETRON[®]
TOTAL CONCRETE PROTECTION

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TOTAL CONCRETE PROTECTION

PENETRON ADMIX[®]
WATERTIGHT CONCRETE SYSTEM



- ✓ Permanent Waterproofing
- ✓ Anticorrosion Protection
- ✓ Chemical Resistance
- ✓ Self Healing Effect

Crystalline Concrete Admixture System

Penetron Admix[®] SB

Lean & Green

The use of Penetron Admix enables a project to earn **GREEN** points by:

- Being free of VOC compounds.
- Not releasing hazardous gas when added to concrete.
- Not requiring heat during application, thereby reducing energy requirements.
- Not causing any disposal problems in the event of demolition.
- Replacing environmentally unfriendly petrochemical products.

Worldwide, there is a strong drive towards LEAN construction. Apart from being more time and cost efficient, lean construction seeks to streamline and improve the building process throughout design, construction, occupation, maintenance, and demolition stages. Focus points include reduction of waste, higher safety factors, optimal material consumption, budget-consciousness, and prevention of delays. Penetron Admix[®] SB contributes to lean construction.



www.penetron.com.au

| Product Performances | Penetron® Admix™ |
|--|--|
| Description | Cement based materials added into fresh concrete at the time of batching that self-heals any cracks up to 0.5mm in the presence of water. |
| Hydrostatic resistance | <ul style="list-style-type: none"> - Ability to self-heal cracks for the life of the structure. - Resists hydrostatic pressure up to 200m head of pressure. |
| Protection of reinforcement | <ul style="list-style-type: none"> - Permanent protection against carbonation, chloride, sulphate, chemicals, etc. - Preserve the protective passivation layer around the reinforcement. |
| Ability to self-heals cracks | The Penetron crystalline stays dormant within the concrete paste and automatically activates as soon as a new wet crack occurs in growing crystals and seals it even decades later. |
| Traceability and QA | Contains a natural green pigment that comes out in the bleed water during the concrete pour and during water curing, which is used for QA purposes and as a proof that the structure is waterproof and durable. |
| Crack resistance | Reduces shrinkage cracking up to 25% at all stages of the concrete hardening. |
| Speed of construction | Mixing at concrete plant at the time of batching, which eliminates any additional labour time and costs on sites. |
| Surface preparation | No surface preparation required. |
| Effect on surface coating and/or tiling | Does not have any detrimental effects on any coating including paint and membranes. |
| Maintenance | No maintenance required. |
| Longevity | Provides an impressive durability to the concrete structures of up to 60 years beyond the design life. |

| Product Characteristics | Penetron Admix SB |
|---|--------------------------|
| One global product | Yes |
| Consistent dosage | Yes |
| Crack healing | to 0.5mm |
| Maximum W/C ratio | No |
| Min cement content | No |
| Harmful odour | No |
| Slows production | No |
| Retards set times | No |
| Complies with AS1478.1-2000 | Yes |
| Published testing refers to single product | Yes |
| Blended cements | Yes |
| Visual tracing agent | Yes |

Why using Penetron in your Structure? Value Engineering

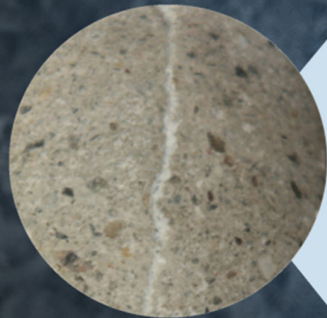
- Eliminates all the substantial complexity surrounding waterproofing design and membrane detailing.
- Simplicity means less room for human error during installation.
- Reduces construction time for membrane-free construction. No membrane means no trade damage.
- More robust, with lower risk of failure.
- Waterproofing protection is inside the concrete and cannot be damaged.
- Penetron admix is neutral to all concrete properties such as set time and finishing.
- Provides waterproof and durable structures; hence, prevents reinforcing steel corrosion.
- Eliminates the need for a separate waterproofing contractor.

- Better return on investment (ROI). 10-50% savings in installed cost versus traditional membranes.
- Penetron offers free service every step of the way – design guidance, preconstruction meetings, construction quality assurance, post-placement inspection, and pre-delivery preparation.
- Penetron offers healthy project warranties to clients upon request and automatic product guarantee.

PENETRON ADMIX

EFFECTS OF PENETRON ADMIX ON THE LIFETIME OF CONCRETE

Benefit Overview



| Property tested | Benefits of concrete with Penetron Admix vs. concrete without PA | Additional benefits |
|--|--|---|
| Drying shrinkage (1 year length changes mm/m) | <24% | Less shrinkage cracking |
| Sulfate resistance changes (ASTM C1012-12) | No internal expansion | No cracking under sulfate attack |
| Chloride diffusion coefficient (m ² /s) (ASTM C1556-04) | <45% | Low chloride diffusion coefficient prolongs service life of the structure |
| Freeze-Thaw Cycle length changes (%) (NCh 2185 Of 92) | <10.53% of control sample | Eliminates need for air entrainment admixtures |
| Reduction of permeability (DIN 1048) | >91% | Activation of crystals reduces permeability |
| Crack width self-healing capacity | ≤0.5mm | Self-healing of new cracks |
| Compressive Strength (Mpa) | Up to 13% | Increases compressive strength |
| Extension of service-life (in years) (Fick Law) | up to 60 years (compared to control sample) | Eliminates need for corrosion inhibitors |

Accepted Reference: BS 8102 – guidelines for protection of Below Ground Structures – waterproofing.

Note: Unfortunately, there are no Australian standards that cover this area.

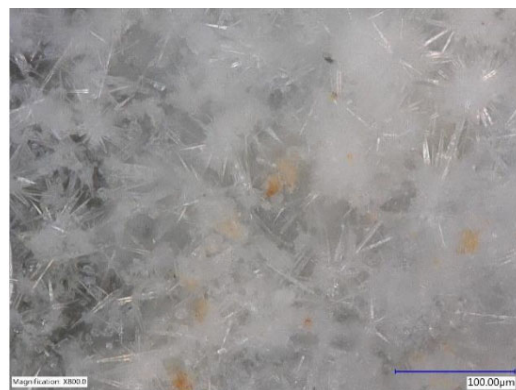
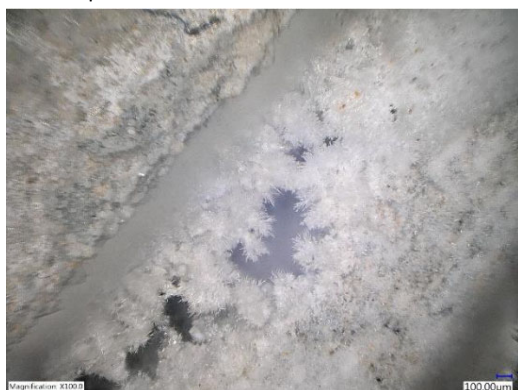
Application procedure with Penetron Admix®

1. Overview of the Penetron Crystalline Waterproofing

PENETRON's crystalline technology enhances the durability, strength, overall performance, and lifespan of concrete.

Our cementitious capillary waterproofing products combine high quality cements, quartz, (special grade) sand and proprietary active ingredients to provide the most effective system to permanently reduce permeability and waterproof concrete.

The active ingredients of PENETRON® react with various concrete minerals, forming insoluble crystals that fill out cracks, pores, and voids up to a width of 0.5mm.




INSOLUBLE CRYSTALS WITHIN THE CRACKS & CAPILLARY TRACTS OF CONCRETE

PENETRON® in its many forms is suitable for use in water reservoirs/tanks, tunnels, basement floors and walls, parking decks, manholes and sewer pipes, sewage and water treatment structures, swimming pools, precast components, PVC walling and underground vaults.

PENETRON® coating is equally effective if applied on either side of a concrete structure or placed integrally at the time of concrete pour and can be applied to both old and new concrete, and concrete block.

2. Product Description



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Penetron Admix Dosing Calculator

| TC | DR | Load Size | No of Bags |
|-----|-----|-----------|------------|
| 400 | 3.2 | 7.4 | 8 |

PENETRON ADMIX® consists of Portland cement and various active proprietary chemicals. These active chemicals react with the moisture in fresh concrete and with the by-products of cement hydration to cause a catalytic reaction, which generates a non-soluble crystalline formation throughout the pores and capillary tracts of the concrete. Thus, the concrete becomes permanently sealed against the penetration of water or liquids from any direction.

3. Mixing Dosage

PENETRON ADMIX® should be mixed at a rate of 0.8% minimum by weight of total cementitious.

4. Mixing Process at ready-mix plant

PENETRON ADMIX® must be added to the concrete at the time of batching. The exact mixing procedure is determined by the batching plant following the Penetron dosing calculator or table.

The mixing sequence will vary according to the type of batch plant operation and equipment. The following are some typical mixing guidelines in a ready-mixed plant:

- Add PENETRON ADMIX® in soluble bag form to the drum of the ready-mix truck.
- Drive the truck under the batch plant and add 60%-70% of the required water and 200-300 kg of aggregate.
- Mix the materials for 2-3 minutes to ensure the PENETRON ADMIX® is distributed evenly throughout.
- Add the balance of materials to the ready-mix truck in accordance with standard batching practices

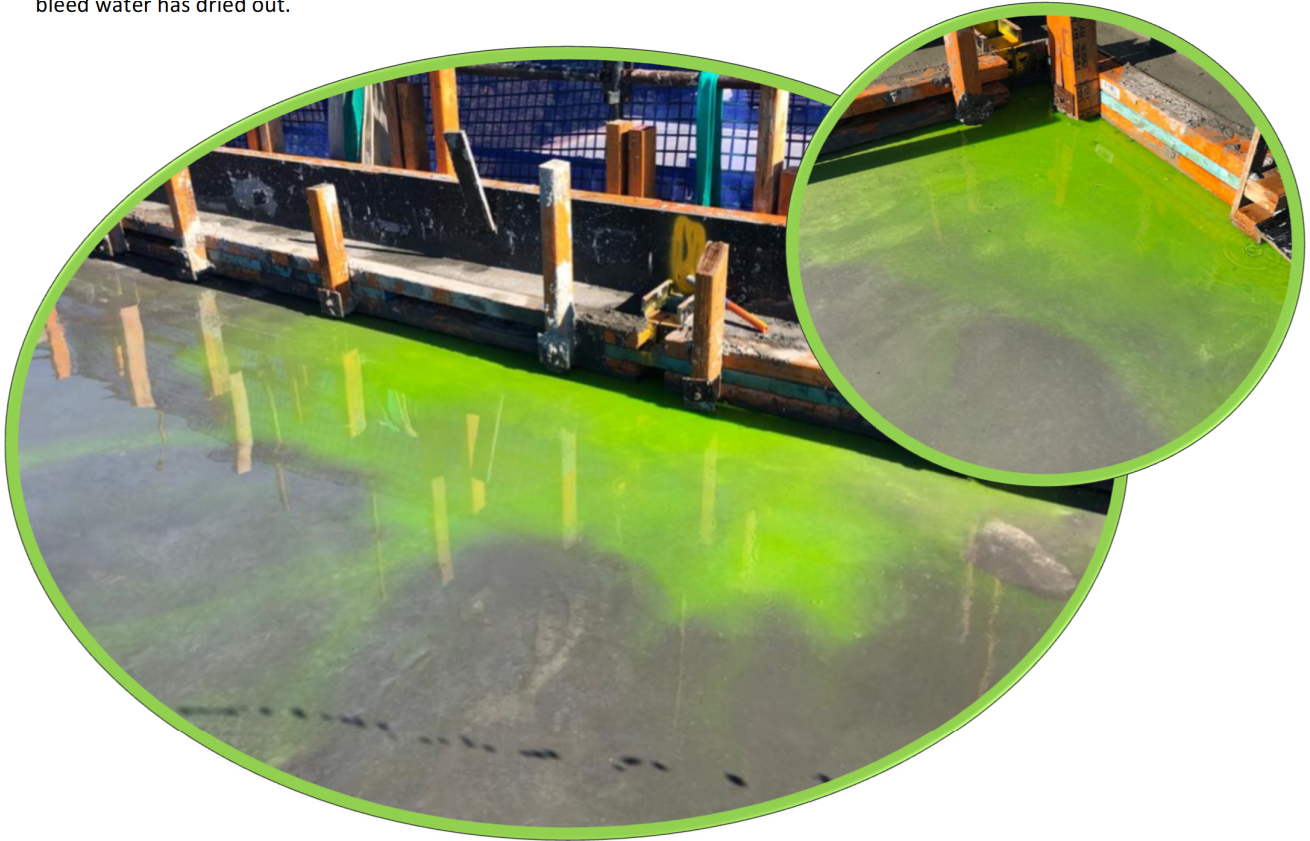
NOTE: It is important to obtain a homogeneous mixture of PENETRON® ADMIX with the concrete. Therefore, do not add dry PENETRON® ADMIX powder directly to wet concrete as this may cause clumping and thorough dispersion will not occur.



Mixing PENETRON ADMIX at the concrete batching plant

PENETRON® ADMIX Green Tracer

- PENETRON ADMIX TRACER is incorporated within the ADMIX to identify its presence in the freshly cast concrete by giving the bleed water a distinct green colour.
- The green Tracer does not discolour concrete nor affects the performance of the ADMIX. The colour shall dissipate once the bleed water has dried out.

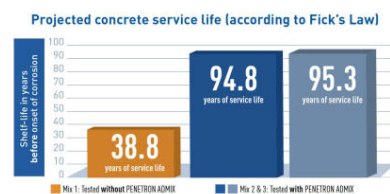


- The used amount of PENETRON® ADMIX in the concrete does not affect the normal practices of good concrete design, placement, vibration, and curing.
- PENETRON® ADMIX is not affecting concrete slump or workability. In case concrete slump needs to be adjusted we are adding the necessary quantity of a certified superplasticizer, instead of water. Water is not advisable to be added beyond the designed amount after concrete is mixed.
- PENETRON® ADMIX can be used with all types of concrete admixtures and all types of cements, all grades of concrete and w/c ratio that varies from 0.25 to 0.67.

SAFE HANDLING INFORMATION

PENETRON® ADMIX contains cement which is alkaline. Will irritate eyes and skin and may cause skin sensitization. Wear appropriate eye, skin and breathing protection when using this product. Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. For further information please refer to Material Safety Data Sheet. KEEP OUT OF REACH OF CHILDREN.

DURABLE CONCRETE STARTS WITH
PENETRON ADMIX™





The Singapore Environment Council hereby grant

Penetron International Ltd

45 Research Way Suite 203, East Setauket,
NY 11733, USA

the right to use the Singapore Green Label for

PENETRON ADMIX

032-119-0867

Environmentally Preferred Coating

(In accordance to SEC Green Label Category 32: Painting and Surface Coating Version 2)

Validity: 25 August 2020 to 24 August 2022

JEN TEO
Executive Director
Singapore Environment Council



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