CRYSTALLINE WATERPROOFING COATING

## DESCRIPTION

PENETRON® is a surface-applied, integral crystalline waterproofing material, which waterproofs and protects concrete in-depth. It consists of Portland cement, specially treated quartz sand and a compound of active chemicals. PENETRON® needs only to be mixed with water prior to application. When PENETRON® is applied to a concrete surface, the active chemicals react with moisture and the by-products of cement hydration to cause a catalytic reaction that generates an insoluble, crystalline structure. These crystals fill the pores and minor shrinkage cracks in the concrete, to prevent any further water ingress (even under pressure). However, the PENETRON® will still allow the passage of vapor through the structure (i.e. the concrete will be able to "breathe"). Even after the concrete has cured, PENETRON® remains dormant in the concrete and will reactivate in the presence of moisture to seal capillary tracts and hairline cracks. In addition to waterproofing the structure, PENETRON® protects concrete against seawater, wastewater, aggressive ground water and many other aggressive chemical solutions. PENETRON® is approved for use in contact with potable water, and is therefore suitable for use in water storage tanks, reservoirs, water treatment plants, etc. PENETRON® is not a decorative material.

## RECOMMENDED FOR

PENETRON® integral crystalline waterproofing can be applied to all structurally sound concrete – new or old. It may be applied to either the positive or negative sides of the concrete face. Typical areas of application are:

- Basement retaining walls
- Parking structures
- Concrete slabs (floor/roof/balcony, etc.)
- Tunnels and subway systems
- Construction joints
- Foundations
- Water retaining structures
- Underground vaults
- Swimming pools
- Sewage and water treatment plants
- Channels
- Reservoirs
- Bridges, dams and roads

## ADVANTAGES

- Becomes an integral part of the concrete
- Can be applied to all structurally sound concrete – new or old
- Penetrates deeply and seals concrete's capillary tracts and shrinkage cracks
- Can be applied from either the positive or negative side
- Waterproofing and chemical-resistance properties remain intact even if the surface is damaged
- Completely effective against high hydrostatic pressure
- More effective overall and less costly than hydrolytic membrane or clay panel systems
- Easy to apply, labor-cost effective
- Increases concrete's compressive strength
- Will not come apart at the seams, tear or be punctured
- Does not require protection during backfilling, placement of steel or wire mesh, and other common procedures
- Seals hairline and shrinkage cracks of up to 1/51 (0,5 mm)
- Resists chemical attack (pH 3-11 constant contact, pH 2-12 intermittent contact) and provides a range of protection from freeze/thaw cycles, aggressive subsoil waters, sea water, carbonates, chlorides, sulfates and nitrates
- Can be applied to moist or "green" concrete
- Protects embedded steel (reinforcing steel and wire mesh)
- Can be used as corrosion protection of reinforcement steel bar
- Nontoxic. Approved for potable water applications (NSF 61)
- Zero VOC – PENETRON powdered products contain zero volatile organic compounds and are safe for use both outdoors and in confined indoor spaces.

## TECHNICAL CHARACTERISTICS

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|---|---|
| *Type* | Cement-base powder |
| *Color* | Grey |
| *Density* | Approx. 1,25 kg/L (78 lb/ft$^3$) |

### Technical characteristics of concrete after PENETRON® application

| Characteristic | Test Result | Test Method |
|---|---|---|
| *Water permeability* | ≤ 1,9x10$^{-14}$ cm/s after 28 days (before treatment 1,8x10$^{-11}$cm/s) | CRD-C-48-73 |
| *Water permeability under head pressure* | Can withstand ≥ 1.54 MPa (16 bar) or 232 PSI (514 ft. head pressure, or 156.78 m) with no measurable leakage | CRD-C-48-73 |
| *Compressive strength* | ≥ 6 % after 28 days | ASTM C39 |
| *Freeze/Thaw Cycle Test* | 50 Cycles – Marked decrease in erosion compared to untreated samples | ASTM C-672-76 |
| *Chemical resistance* | Resistance to alkaline/acid conditions. pH range 3 – 11 constant contact | ASTM C-267-77 |
| *Radiation resistance* | No effect from gamma radiation ≥ 5,76x10$^4$ Rads | ASTM N69-1967 |
| | No effect from gamma radiation 50 M Rads | ISO 7031 |
| *Chloride content* | Negligible amounts of chlorides are contained in waterproofing substance. Penetron's waterproofing effects are NOT related to chlorides | AASHTO T-260 |
| *Nontoxic* | PASSES European Union Environmental Lic | BS 6920: Section 2.5 |
| | PASSES European Union Environmental Lic | 16 CFR 1500 |
| *Potable water user* | Approved | U.S. EPA and State of New York DOH |

All data are average values obtained under laboratory conditions. Impractical use, temperature, humidity and absorption of the substrate may influence the above given values.

## DIRECTIONS FOR USE

**Surface Preparation:** All concrete to be treated with PENETRON® must be clean and have an "open" capillary surface. Remove laitance, dirt, grease, etc. by means of high-pressure water jetting (300 bar), wet sandblasting or surface grinder. Faulty concrete in the form of cracks, honeycombing, etc. must be chased out, treated with PENETRON® and filled flush with PENECRETE MORTAR®. Surfaces must be carefully pre-watered prior to PENETRON® application. The concrete surface must be damp with no wet sheen on the surface.

**Mixing:** PENETRON® is mechanically mixed with clean water to a creamy consistency or that resembling thick oil. Mix only as much material as can be used within 20 minutes and stir mixture frequently. If the mixture starts to set do not add more water, simply re-stir to restore workability.

***Mixing ratios:***

5 parts PENETRON® to 3 – 3,5 parts of water (by volume).

**Application:**

***Slurry Consistency:*** Apply PENETRON® in one or two coats according to specification by masonry brush or appropriate power spray equipment. When two coats are specified apply the second coat while the first coat is still "green".

***Dry Powder Consistency (for horizontal surface only):*** The specified amount of PENETRON® is distributed in powder form through a sieve or a semi-mechanical barrow spreader and troweled into the freshly placed concrete once this has reached initial set.

**Application Rates:**

***Vertical Surfaces:*** Two coats of PENETRON® at 0,7-0,8 kg/m² (1,25-1,5 lb/yd²) applied by brush or spray. Please contact PENETRON HELLAS for alternative application methods that may be applicable to your project and help to increase production.

***Horizontal Flatwork:*** PENETRON® at 2 lb/yd² (1,1 kg/m²) applied in one slurry coat to hardened concrete. Alternatively, PENETRON® can be dry sprinkled at 1 kg/m² (1,8 lb/yd²) and trowel applied to fresh concrete when it has reached initial set.

***Construction Joints:*** PENETRON® at 1,6 kg/m² (3 lb/yd²) applied in slurry or dry powder consistency immediately prior to placing the next lift/bay of concrete.

***Blinding Concrete:*** PENETRON® at 1,4 kg/m² (2,5 lb/yd²) applied in slurry or dry powder consistency immediately prior to placing the overlying concrete slab.

**Post-treatment:** The treated areas should be kept damp for a period of three to five days and must be protected against direct sun, wind and frost, by covering with polyethylene sheeting, damp burlap or similar.

**SPECIAL CONSIDERATIONS**

Do not apply PENETRON® at temperatures at or below freezing or to froze surfaces. PENETRON® cannot be used as an additive to concrete or plasters (PENETRON ADMIX® should be considered for these applications). PENETRON® should not be confused with a coating or membrane.

**PACKAGING**

PENETRON® is available in 22,7 kg (50 lb) bags, 25 kg (55 lb) and 5 kg (11 lb) pails.

**STORAGE / SHELF LIFE**

When properly stored in a dry place in unopened and undamaged original packaging, shelf life is 24 months.

**SAFE HANDLING INFORMATION**

PENETRON® 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 Safety Data Sheet. PENETRON HELLAS S.A. has recently updated Safety Data Sheet on the safe use of PENETRON® products. Each Safety Data Sheet contains health and safety information for the protection of your employees and your customers. KEEP OUT OF REACH OF CHILDREN

**CERTIFICATION**

CE

1305
Penetron International, Ltd.
601 South Tenth Street, Unit 300
Allentown, PA 18103
20
1305-CPR-1390
DOP NO: 10.00001D310322-01
EN 1504-2
PENETRON
Products and systems for the protection and repair of concrete structures
Adhesive bond: R3 (≥ 1,5 MPa)
Permeability to water vapour: Class I < 5 m
Capillary absorption and Permeability to water: < 0,1 kg/m²·$h^{0.5}$
Resistance to Severe Chemical attack: Class II < 50% reduction in hardness

1085
Penetron International, Ltd.
601 South Tenth Street, Unit 300
Allentown, PA 18103
08
1085-CPR-0040
DOP NO: 10.00001D310322-01
EN 1504-3
PENETRON
Products and systems for the structural and non-structural protection and repair of concrete structures
Compressive strength: R3 (≥ 25 MPa)
Chloride ion content: < 0,05 % by mass
Adhesive bond: R3 (≥ 1,5 MPa)
Restrained shrinkage, expanding: NPD
Carbonation resistance: Deemed to have no corrosive effect
Elastic modulus: NPD
Thermal compatibility: NPD
Reaction to fire: Class A1
Dangerous substances: NPD

1305
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Allentown, PA 18103
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1305-CPR-1390
DOP NO: 10.00001D310322-01
EN 1504-7
PENETRON
Products and systems for the protection and repair of concrete structures
Corrosion protection: Coated zones free from corrosion

## WARRANTY - DISCLAIMER

PENETRON HELLAS S.A. warrants that its products are manufactured under certified ISO Standard procedures, are of excellent quality and shall be free from material defects and contain all components in their proper proportion. Should any of the products be proven defective, the liability to PENETRON HELLAS S.A. shall be limited to replacement of the material proven to be defective, since the standard application procedures have been met and the suitability of the product for the particular application have been proven. PENETRON HELLAS S.A. makes no warranty as to merchantability of fitness for a particular purpose. User, after contacting the distributor of the product, shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith. While every care has been taken, the information provided in this product's data sheet make no part of any contract. All recommendations, technical data and test data contained in this product's data sheet are based upon the results of control laboratory tests or in actual field tests. However, PENETRON HELLAS S.A. makes no warranty of any kind, concerning this data. In any case, this data is given in good faith based in the PENETRON HELLAS S.A. experience, till the publication of this sheet. Due to variance in storage, handling and applications of the materials, PENETRON HELLAS S.A. accepts no liability for the results obtained. It is suggested that potential users try small applications to determine the suitability of each individual product for their specific requirements. The users should always refer to the most recent edition of the product's data sheet. PENETRON HELLAS S.A. may particularly differentiate its versions of the product's data sheet compared with those of PENETRON INTERNATIONAL LTD or respective PENETRON companies worldwide. These changes are due to text formatting, different application weathering and procedures or different product names and aim at the optimal consumer information.



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