

AL ZAMIL الزامل  
Industry, Trade & Transport للصناعة و التجارة و النقل

**PENETRON**  
TOTAL CONCRETE PROTECTION

# PENETRON®

## 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, 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 sea-water, wastewater, aggressive groundwater 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.

### APPLICATIONS

- 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

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### 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, wet sandblasting or wire brushing. 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 the PENETRON® application. The concrete surface must be damp but with no wet sheen on the surface.

#### Mixing:

PENETRON® is mechanically mixed with clean water to a creamy consistency or 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:

Application method	Vertical surfaces	Horizontal surfaces
Brush	5 parts PENETRON® to 2 parts water	3 parts PENETRON® to 1 part water
Spray	5 parts PENETRON® to 2.75-3.25 parts water	

#### 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 1.25-1.5 lb/yd<sup>2</sup> (0.7-0.8 kg/m<sup>2</sup>) applied by brush or spray. Please contact your Penetron Representative for alternative application methods that may be applicable to your project and help to increase production.

**Horizontal flatwork:** PENETRON® at 2 lb/yd<sup>2</sup> (1.1 kg/m<sup>2</sup>) applied in one slurry coat to hardened concrete. Alternatively, PENETRON® can be dry sprinkled at 1.8 lb/yd<sup>2</sup> (1 kg/m<sup>2</sup>) and trowel-applied to fresh concrete when it has reached initial set.

**Construction joints:** PENETRON® at 3 lb/yd<sup>2</sup> (1.6 kg/m<sup>2</sup>) applied in slurry or dry powder consistency immediately prior to placing the next lift/bay of concrete.

**Blinding concrete:** PENETRON® at 2.5 lb/yd<sup>2</sup> (1.4 kg/m<sup>2</sup>) applied in slurry or dry powder consistency immediately prior to placing the overlying concrete slab.

# PENETRON®

## Post-treatment:

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

## CLEAN UP

Use water to clean all tools immediately after use.

## SPECIAL CONSIDERATIONS

- Do not apply PENETRON® at temperatures at or below freezing or to frozen or freezing 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.
- PENETRON® is not a decorative material.

## PACKAGING

PENETRON® is available in 50-lb (22.7-kg) bags or 55-lb (25-kg) pails.

## STORAGE / SHELF LIFE

PENETRON products must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is one year when stored under proper conditions.

## TECHNICAL SERVICES

For more detailed instructions, alternative application methods, or information concerning the compatibility of the PENETRON treatment with other products or technologies, contact the Penetron Technical Department or your local Penetron representative.

## 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. KEEP OUT OF REACH OF CHILDREN.



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EN 1504-2, 1504-3, 1504-7  
Penetron International, Ltd.  
601 South Tenth Street, Unit 300  
Allentown, PA 18103  
08

PENETRON

for structural and non-structural repair CC mortar  
Compressive strength: R3 (≥ 25 MPa)  
Chloride content: < 0,05 % by mass  
Adhesive bond: R3 (≥ 1,5 MPa)  
Restrained shrinkage, expanding: NPD  
Corrosion behaviour: Deemed to have no corrosive effect  
Elastic modulus: NPD  
Thermal compatibility: NPD  
Reaction to fire: Class A1  
Dangerous substances: NPD  
Permeability to water vapour: Class I < 5 m  
Corrosion protection: Coated zones free from corrosion  
Capillary absorption and Permeability to water: < 0,1 kg/m<sup>2</sup>·h<sup>0,5</sup>  
Resistance to Severe Chemical attack: Class II < 50% reduction in hardness

TOTAL CONCRETE PROTECTION®

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## 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 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, seawater, carbonates, chlorides, sulfates and nitrates.
- Can be applied to moist or "green" concrete.
- Protects embedded steel (reinforcing steel and wire mesh).
- Non-toxic (NSF/ANSI 61 certified for potable water applications).
- Zero VOC - PENETRON powdered products contain zero volatile organic compounds and are safe for use both outdoors and in confined indoor spaces.

**WARRANTY:** PENETRON INTERNATIONAL, LTD. warrants that the products manufactured by it shall be free from material defects and will conform to formulation standards and contain all components in their proper proportion. Should any of the products be proven defective, the liability to PENETRON INTERNATIONAL, LTD. shall be limited to replacement of the material proven to be defective, and PENETRON INTERNATIONAL, LTD. shall in no case be liable otherwise or for incidental or consequential damages. **PENETRON INTERNATIONAL, LTD. MAKES NO WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED.** User shall determine the suitability of the product for its intended use and assume all risks and liability in connection therewith.

PENETRON INTERNATIONAL, LTD.

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(631) 941-9700 • info@penetron.com • penetron.com

## PENEPLUG<sup>®</sup>

### CRYSTALLINE WATERPROOFING RAPID SET WATERPLUG

#### DESCRIPTION

PENEPLUG<sup>®</sup> is a rapid setting, integral crystalline cementitious waterstop designed to stop active water leaks and moisture ingress. PENEPLUG<sup>®</sup> can be used internally or externally as a waterproof plugging mortar or where rapid setting and early strength gain is required.

#### APPLICATIONS

Concrete  
Masonry  
Earthenware  
Stone

#### ADVANTAGES

Plugs/stops active water leaks  
Seals leaking joints, form tie holes or cracks  
Sets in approximately 30 seconds after mixing  
Durable  
Can be used underwater  
Can be mixed with water or used dry  
Easy to apply  
Zero VOC - PENETRON powdered products contain zero volatile organic compounds and are safe for use both outdoors and in confined indoor spaces

#### STORAGE / SHELF LIFE

PENEPLUG<sup>®</sup> should be stored dry at a minimum temperature of 45°F (7°C). When properly stored in a dry cool place in unopened and undamaged original packaging, shelf life is 12 months.

#### PACKAGING

PENEPLUG<sup>®</sup> is available in 40-lb (18-kg) bags or 55-lb (25-kg) pails.

#### DIRECTIONS FOR USE

##### Surface preparation:

The substrate must be clean, sound and free of any surface contamination, such as oils, coatings, paints, dirt, etc. Leaking areas must be cut back to sound material, leaving an appropriate chase for receiving PENEPLUG<sup>®</sup>.

##### Mixing:

Setting time is dependent largely on the amount of mixing water used. Standard mixing ratio at 68°F (20°C) is 2.5 lb (1.1 kg) PENEPLUG<sup>®</sup> and approximately 1 cup

(0.25 l) of water. Water must be added to PENEPLUG<sup>®</sup> and mixed quickly. The mix should have a dry pack (dry earth) consistency, holding a shape when squeezed in your hand but easily crumbled when pressed with fingers. Mixing time is about 15 seconds, with setting occurring about 30 seconds later. In cold weather, use lukewarm water. In higher temperatures, use cold water.

##### Application:

To avoid waste, only small quantities of PENEPLUG<sup>®</sup> should be mixed. After mixing, apply PENEPLUG<sup>®</sup> to the appropriate area immediately. Material should be formed into a wedge and forced into the leak. This can be accomplished with the use of a block of wood and hammer. Work the plug well into the area and then, applying as much pressure as possible, hold firmly in place for about 30 seconds or until set. After the leak has stopped, prime the area with a bond coat of PENETRON<sup>®</sup> and then fill the remaining void to the surface with PENECRETE MORTAR<sup>™</sup>. Remove excess material. After lightly pre-wetting, apply a final coat of PENETRON<sup>®</sup> to the repaired area.

In certain circumstances, PENEPLUG<sup>®</sup> may be applied as a dry powder. After preparing the surface as described above, place and hold the powder directly over the leak for 30-60 seconds.

#### SAFE HANDLING INFORMATION

PENEPLUG<sup>®</sup> 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. 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. KEEP OUT OF REACH OF CHILDREN.



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EN 1504-3

Penetron International, Ltd.  
601 South Tenth Street, Unit 300  
Allentown, PA 18103  
08

PENEPLUG

for structural and non-structural repair CC mortar

Compressive strength: Class R3 (≥25 MPa)

Chloride content: < 0,05 % by mass

Adhesive bond: NPD

Restrained shrinkage, expanding: NPD

Elastic modulus: NPD

Thermal compatibility (Part 1): NPD

Corrosion behaviour: deemed to have no corrosive effect

Reaction to fire: NPD

Dangerous substances: NPD

**WARRANTY:** PENETRON INTERNATIONAL, LTD. warrants that the products manufactured by it shall be free from material defects and will conform to formulation standards and contain all components in their proper proportion. Should any of the products be proven defective, the liability to PENETRON INTERNATIONAL, LTD. shall be limited to replacement of the material proven to be defective, and PENETRON INTERNATIONAL, LTD shall in no case be liable otherwise or for incidental or consequential damages. **PENETRON INTERNATIONAL, LTD. MAKES NO WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED.** User shall determine the suitability of the product for its intended use and assume all risks and liability in connection therewith.

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TOTAL CONCRETE PROTECTION<sup>®</sup>

# PENECRETE MORTAR™

## CRYSTALLINE WATERPROOFING MORTAR

### DESCRIPTION

PENECRETE MORTAR™ consists of Portland cement, specially treated quartz sand and a compound of active chemicals.

The active chemicals react with moisture and the by-products of cement hydration to cause a catalytic reaction, which generates an insoluble integral crystalline complex. These crystalline complexes grow in the presence of water and block the capillaries of the concrete and minor shrinkage cracks, thus waterproofing the concrete. Chemical activation begins when the powder is mixed with water and may take several days to completely block the capillaries, depending on ambient temperature and environmental conditions.

### APPLICATIONS

- Applied in conjunction with PENETRON® for:
  - Installation of seal strips, reglets and coves at joints to assure water tightness
  - Patching of tie holes and faulty construction joints
  - Patching and filling of routed out cracks
  - Repairing of spalled and honeycombed areas

### ADVANTAGES

- Can be applied to the positive or negative water pressure sides of a structure
- Resists strong hydrostatic pressure
- Seals cracks up to 1/51" (0.5 mm)
- Easy to use – needs only to be mixed with water prior to application
- Allows the concrete to "breathe"
- Can be skim coated or feather edged
- Can be applied to moist concrete
- Fast setting
- Inorganic – contains no polymers
- NSF 61 certified for use in potable water applications
- Non-flammable
- Resists abrasion and mechanical wear
- Freeze/thaw resistant
- Zero VOC - PENETRON powdered products contain zero volatile organic compounds and are safe for use both outdoors and in confined indoor spaces

TOTAL CONCRETE PROTECTION®

### DIRECTIONS FOR USE

#### Surface preparation:

All surfaces to be patched, repaired or sealed with PENECRETE MORTAR™ must be clean and sound. Cracks should be routed out to a U-shaped configuration, approximately 3/4" (19 mm) wide and a minimum of 3/4" (19 mm) deep. Tie holes should be roughened prior to filling. Spalled and honeycombed areas must be thoroughly cleaned and chiseled back to sound concrete prior to repair. Remove all dirt, cement laitance, form release agents, curing compounds, paints, coatings, etc. by means of wet or dry sandblasting, high pressure water jet or other suitable mechanical means. Surfaces must be well moistened to a dull dampness at the time of application. The concrete should be damp with no wet sheen on the surface.

#### Mixing:

**Routed cracks, coves and non-moving joints:** Add water to PENECRETE MORTAR™ until a medium stiff, trowelable consistency is reached. The texture of the mix should be pliable enough to be trowelled into the cracks with some pressure, but not so pliable that it would run out or sag out of the crack.

Approximate mixing ratio (by volume) is 4.5 parts powder to 1 part water. Alternatively, 3.4 oz (101 ml) of water to 1 lb (454 g) of PENECRETE MORTAR™ powder.

**Tie holes and pointing applications:** Add only a small amount of water. Mixed consistency should be that of "dry earth," holding a shape when squeezed in your hand but easily crumbled when pressed between fingers. Mix only as much material as can be used within 20 minutes.

#### Application:

**Cracks/seal strips (reglets & coves):** After proper surface preparation and routing to appropriate configuration, prime areas to be patched or repaired with a slurry coat of PENETRON® and while "green" (tacky), fill cavity flush to surface with PENECRETE MORTAR™ in mortar consistency.

**Spalled and honeycombed areas:** Prepare surface and chisel back to sound concrete. Prime area to be repaired with a slurry coat of PENETRON®. While still "green" (tacky), apply PENECRETE MORTAR™ in layers of 1/2" (13 mm) not to exceed 2.5" (6.4 cm). Each layer should be allowed to set long enough that it will leave only a slight indent, approximately 1/16" (1.6 mm) when pressed with a finger. Where possible, the surface of the repair should be packed tightly using a hammer and block of wood.

**Tie holes and pointing applications:** Prepare surface and chisel back to sound concrete. Prime area to be repaired with a slurry coat of PENETRON® and while still "green" (tacky), apply PENECRETE MORTAR™ in "dry earth" consistency. PENECRETE MORTAR™ should be tightly rodded into tie holes or packed tightly using a hammer and block of wood.

**NOTE:** For all applications, PENETRON® should be applied as a surface treatment as soon as PENECRETE MORTAR™ has set (approximately 1-2 hours). If this is not practical, leave surface rough for subsequent surface treatment to bond.

# PENECRETE MORTAR™

## Curing:

Provide protection against extreme weather conditions, such as heavy rain or freezing conditions, during the setting period. Curing is not normally required except during hot, low humidity weather. In these conditions, a light mist of water approximately 24 hours after the repair is completed will help to ensure a controlled cure. In extreme dry heat, water misting may be required more frequently.

## SPECIAL CONSIDERATIONS

DO NOT apply PENECECRETE MORTAR™ at temperatures below 40°F (4°C), to a frozen substrate or if temperatures will drop below freezing during the curing period (approximately 24 hours).

This product is not recommended for use in expansion joints or other joints designed for movement. PENECECRETE MORTAR™ can be applied in 1/2" (13 mm) layers not exceeding 2.5" (6.4 cm) to prevent shrinkage cracks in the mortar.

## CONSUMPTION & YIELD OF 50-LB (22.7-KG) BAG

All values are approximate depending on surface conditions.

### U-shaped cracks and reglets

Size	1"x1" (25 mm x 25 mm)
Consumption	1.0 lb/ft <sup>2</sup> (4.9 kg/m <sup>2</sup> )
~Yield/bag	50 ft (15.2 m)

### Coves, triangular shaped

Size	1.5"x1.5" (38 mm x 38 mm)
Consumption	1.0 lb/ft <sup>2</sup> (4.9 kg/m <sup>2</sup> )
~Yield/bag	50 ft (15.2 m)

### Tie holes

Size	1"x1"x1" (25 mm x 25 mm x 25 mm)
Consumption	N/A
~Yield/bag	600 nos

### Honeycomb and surface patching

Approximately 0.4 ft<sup>3</sup> (0.01 m<sup>3</sup>) / bag

## PACKAGING

PENECECRETE MORTAR™ is available in 50-lb (22.7-kg) bags or 55-lb (25-kg) pails.

## STORAGE / SHELF LIFE

PENETRON products must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is one year when stored under proper conditions.

## TECHNICAL DATA

### Compressive strength (ASTM C-109):

1 day	1600 psi (11 MPa)
3 days	2400 psi (17 MPa)
7 days	5800 psi (40 MPa)
28 days	6900 psi (48 MPa)

### Tensile Strength (ASTM C-190):

1 day	320 psi (2.2 MPa)
3 days	520 psi (3.6 MPa)
7 days	730 psi (5.0 MPa)
28 days	900 psi (6.2 MPa)

## TOTAL CONCRETE PROTECTION®

**NOTE:** Cooler temperatures, inadequate ventilation and higher humidity can extend drying times. All data derived from tests under laboratory conditions; field conditions may yield slightly different results.

## TECHNICAL SERVICES

For more detailed instructions, alternative application methods, or information concerning the compatibility of the PENETRON treatment with other products or technologies, contact the Penetron Technical Department or your local Penetron representative.

## SAFE HANDLING INFORMATION

PENECECRETE MORTAR™ contains cement that 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. KEEP OUT OF REACH OF CHILDREN.



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EN 1504-3

Penetron International, Ltd.

601 South Tenth Street, Unit 300

Allentown, PA 18103

08

PENECECRETE

for structural and nonstructural repair CC mortar

Compressive strength: Class R4 (≥ 45 MPa)

Chloride content: < 0,05 % by mass

Adhesive bond: NPD

Restrained shrinkage, expanding: NPD

Elastic modulus: NPD

Thermal compatibility (Part 1): NPD

Corrosion behaviour: deemed to have no corrosive effect

Reaction to fire: NPD

Dangerous substances: NPD

**WARRANTY:** PENETRON INTERNATIONAL, LTD. warrants that the products manufactured by it shall be free from material defects and will conform to formulation standards and contain all components in their proper proportion. Should any of the products be proven defective, the liability to PENETRON INTERNATIONAL, LTD. shall be limited to replacement of the material proven to be defective, and PENETRON INTERNATIONAL, LTD. shall in no case be liable otherwise or for incidental or consequential damages. PENETRON INTERNATIONAL, LTD. MAKES NO WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED. User shall determine the suitability of the product for its intended use and assume all risks and liability in connection therewith.

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