



**PENETRON**<sup>®</sup>  
TOTAL CONCRETE PROTECTION

# **PENESEAL PRO**

**Sub-Surface Sealing of Concrete  
Against Water Penetration**



# PENESEAL PRO – for exposed concrete surfaces



Photo credit: Multimedia University Malaysia

## **Pinewood Iskandar Malaysia Studios, Johor Bahru, Malaysia**

Located in an intensely humid climate, this state-of-the-art film and television production facility needed a comprehensive waterproofing solution for exposed concrete. The 4,100 m<sup>2</sup> (44,132 ft<sup>2</sup>) poured concrete roof was successfully sprayed with PENESEAL PRO.



## **Aviatorilor Metro Station, Bucharest, Romania**

Part of the Bucharest Metro, the Aviatorilor station underwent repair work for cracked concrete in the station's basement and tri-level parking garage. The floors were quickly and easily treated with PENESEAL PRO to seal cracks and protect the concrete against foot traffic and water ingress.



## **Neuroscience Research Center, Randwick, NSW, Australia**

This seven-floor facility features a double-height basement and three above-ground floors that house laboratories, clinics, a cafeteria and seminar spaces. PENESEAL PRO sealer was applied to the large second floor podium slab.



## PENESEAL PRO® : A clear concrete sealer for in-depth protection

Looking for a waterproofing solution for exposed concrete structures? Do you need a sealer that responds to thermal stresses and cracks?

Ideal for waterproofing and protecting directly exposed concrete surfaces subject to thermal movement, PENESEAL PRO forms a sub-surface barrier to protect against water penetration and seal hairline cracks. This spray-on liquid sealer reacts with the concrete to form a sub-surface gel to seal pores, capillaries and cracks. PENESEAL PRO remains active and continues to seal hairline cracks (due to thermal expansion and contraction) in the presence of water.

### Typical uses:

PENESEAL PRO is ideal for concrete roofs, traffic bearing structures, and wherever concrete is directly exposed to the elements:

- Building exteriors
- Bridges & flyovers
- Runways & driveways
- Terraces & outdoor areas
- All exposed concrete surfaces

For durability/service life enhancement and protection for all types of concrete and applications, PENETRON crystalline technology is the proven system of choice.

### The PENESEAL PRO advantages:

- Permanent sealing: existing and new hairline cracks are sealed on contact with water
- Protects against water, chloride and sulfate ingress
- Enhances resistance to chemical attack, carbonation and efflorescence, including diluted acid or alkali attack
- Does not affect bond with subsequent product applications
- Increases surface hardness (8 on Mohs scale) to approximately 20 mm (13/16") depth
- Simple, fast and economical application compared to other systems
- Can be walked on six hours after first water curing
- Does not peel or scratch and can be polished
- No negative screed necessary
- Non-toxic and suitable for potable water storage structures
- Water soluble and complies with environmental, health & safety regulations

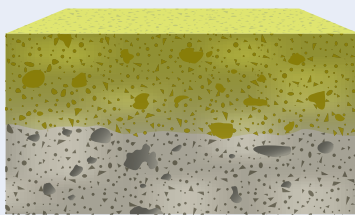
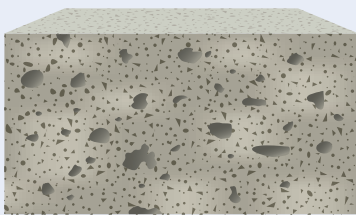
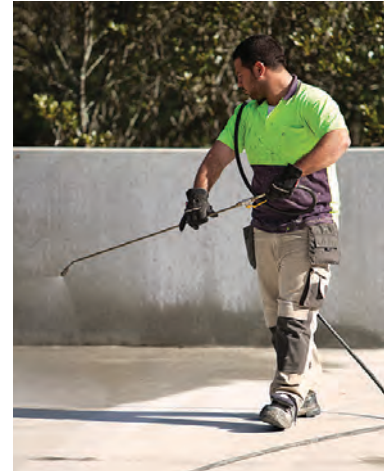




# How does it work?

## Optimal sealer for exposed concrete

Virtually immune to thermal stress, PENESEAL PRO forms a gel that accommodates for the movement of cracks. It is widely used to waterproof concrete roofs, terraces, bridges, highway and road structures, airport runways and home driveways.



### Before treatment

Pores and capillaries in untreated concrete are subject to penetration by moisture, oils, acids, etc. and allow the release of concrete dust.

### After treatment

PENESEAL PRO penetrates into the concrete surface, where it reacts with the free lime and alkali to form a sub-surface gel that seals pores, capillaries and cracks in the concrete.

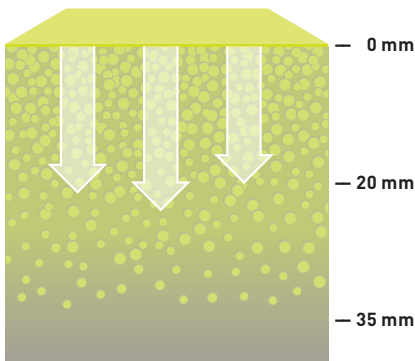


After it is applied to the concrete, **PENESEAL PRO** forms a gel that accommodates the movement of cracks due to thermal expansion and contraction. It remains active inside the cracks and capillaries. If the concrete develops new cracks (due to settlement, thermal stress or external action), any moisture or rainwater that enters the cracks reactivates PENESEAL PRO. New cracks are sealed to prevent water penetration.

## How PENESEAL PRO works:

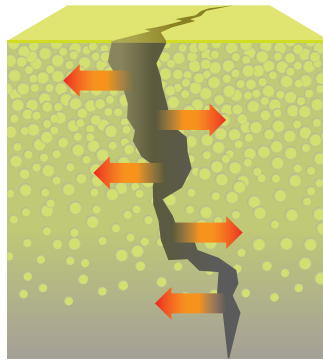
# 1

PENESEAL PRO penetrates below the concrete surface, creating a sub-surface barrier.



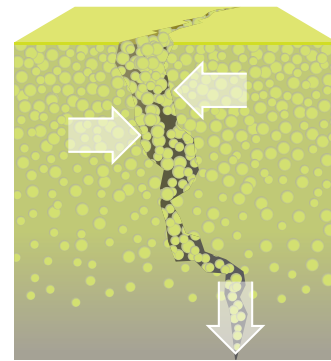
# 2

Thermal stress causes new cracks, creating a waterproofing problem.



# 3

PENESEAL PRO reacts with water and concrete to seal new cracks.



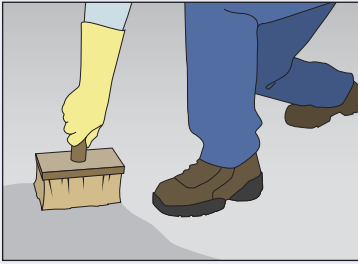
## A unique subsurface, gel-like barrier that protects concrete

The ingredients in PENESEAL PRO unleash specific reactions to protect concrete against water penetration:

- PENESEAL PRO penetrates into the concrete when first applied and watered in.
- PENESEAL PRO reacts with the matrix, creating a sub-surface barrier.
- The gel-like barrier is activated when it comes in contact with water, blocking any water or moisture from penetrating the concrete.
- PENESEAL PRO continues to seal new hairline cracks that develop due to thermal stress.
- When water enters the concrete through any new cracks, the PENESEAL PRO continues to fill pores, capillaries and cracks and completely seals them against water penetration
- The gel barrier remains dormant until it comes into contact with water. This cycle continues as long as moisture is present.

This process illustrates the protective capabilities of PENESEAL PRO. The gel barrier remains active in the presence of water and seals future hairline cracks.

# Getting the application right



## Preparing the surface

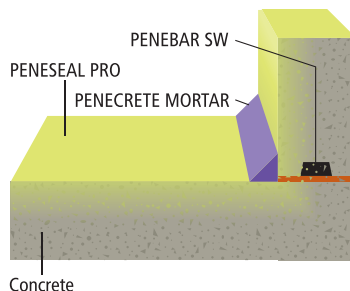
- Surface should be at least 14 days old (28 days is recommended), clean, free of dust and dry (no damp areas).
- Surface damage, such as honeycombs and voids, must be routed out and repaired with PENECRETE MORTAR.
- Completely remove any form-work oil, curing compounds or previous treatments.
- Old concrete and concrete affected by carbonation may need treatment with calcium for adequate reaction.

## Application

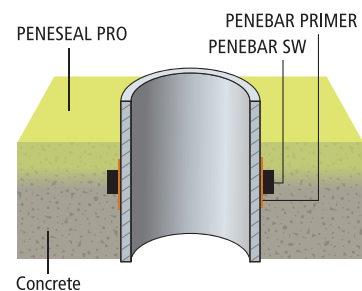
- 1 Always agitate the product before use. Apply at temperatures between 5° and 35° C (41 – 95° F) and avoid application when rain is imminent or in heavy wind.
- 2 Flood cracks with PENESEAL PRO at approximately 1 liter / 5 linear meters (1 qt per 15 ft).
- 3 Spray at low pressure and in low wind conditions.
- 4 When surface is dry to the touch (2 – 6 hours after application), flood with abundant water. If it rains before the surface dries, a second application is needed after drying.
- 5 24 hours later, flood surface with abundant water once again.
- 6 Another 24 hours later, repeat the flooding process with abundant water yet again.
- 7 After third flooding, the treated area can be ponded to verify the waterproofing performance.

## Applying PENESEAL PRO: Technical guidelines

Apart from the standard PENESEAL PRO application procedures, the following measures should be considered during supplementary detailing:



**Cold joints:** A variety of systems can be used here, including PENESEAL PRO waterstop (new construction joints) and PENETRON crystalline topical material (existing construction joints).



**Penetration:** Install PENESEAL PRO waterstop around the penetration.

# Permanently seals exposed concrete surfaces

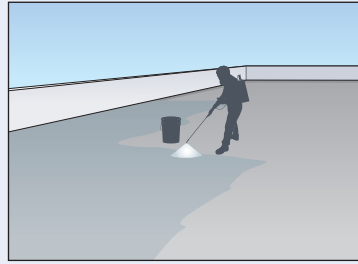


## Packaging

- 19 liter pails
- 208 liter drums

## Equipment

This can range from simple hand spraying equipment for small areas to motorized spray units for large projects. Covering 100 – 151 m<sup>2</sup> per hour can be done with a simple backpack spray unit. After application, all equipment should be thoroughly cleaned with water.



## Coverage

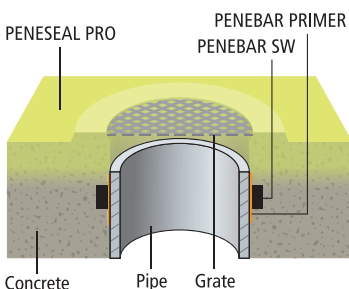
1 liter to 4 – 6 m<sup>2</sup> (4 m<sup>2</sup> for rough, porous surfaces, 6 m<sup>2</sup> for very smooth, dense surfaces and 5 m<sup>2</sup> for normal surfaces); for cracks, add 1 liter per 5 linear meters.

## Special Considerations

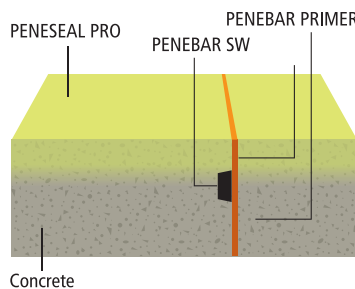
- Apply only with a low pressure sprayer. Do not use airless sprayer.
- Avoid inhalation.
- Use rubber gloves, suitable protective clothing and chemical goggles.
- Wash after handling.

### Do not apply PENESEAL PRO in the following cases:

- As a replacement or a solution for poor design, detailing or workmanship.
- For repair of structural or design cracks. For cold joints, expansion joints, penetrations and pour joints, products such as PENECEMTE MORTAR or PENEBAR SW waterstop should be applied.
- For floor hardening, use PENESEAL FH instead.
- For negative side waterproofing, use PENETRON crystalline waterproofing material instead.
- On large cracks, which should be initially repaired with PENECEMTE MORTAR and a topical cover layer of PENETRON.



**Drain:** PENEBAR SW waterstop should be installed around the pipe.



**Construction joints:** Apply a topical layer of PENETRON crystalline material and/or install PENEBAR SW waterstop between pours.

### Please note:

- For large moving cracks, PENESEAL PRO should be ponded by creating a small dam.
- PENESEAL PRO can be used on concrete containing fly ash, slag or silica fume (with less than 30% of the total cementitious materials in the concrete mix). Before use, test on a small area or obtain concrete mix design. To increase suitability, a calcium treatment may be applied to the surface. This will also increase effectiveness on old and heavily carbonated concrete.



# PENESEAL PRO

## for exposed concrete surfaces

### Grand Hyatt Hotel, Kuala Lumpur, Malaysia

This 40-floor tower has over 400 rooms and suites, as well as serviced apartments, offices and a four-level underground parking garage. PENESEAL PRO was applied on a 4,647 m<sup>2</sup> (50,020 ft<sup>2</sup>) concrete roof.



## Total Concrete Protection

PENESEAL PRO liquid sealer has been proven effective in major projects worldwide. The performance and reliability of our reactive penetrating concrete sealer has firmly established the company as an industry leader.

With locations in all key markets, including facilities in Asia, Europe, North America, the Middle East and South America, PENETRON develops and manufactures high quality products for a wide range of applications. PENETRON products and technical support are available through a comprehensive network of distributors.



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