

## Project:

Water protection of porous clay based surfaces

## Product:

SurfaPore R

## Key Benefits:

- Very Effective & Nano Based
- High Breathability
- Non Film Forming, Invisible
- Long Lasting & UV Resistant
- Easy to apply on Surface or by dipping
- Water based
- Environmentally friendly
- Cost Effective

## Applications:

- Roof tiles water repellent
- Prevents frost threat
- Prevents mould growth
- Prevents efflorescence and white spot development
- Protects pottery
- Protects absorptive cotto tiles

## Packaging:

1L, 4L, 30L Containers, 1000L IBCs

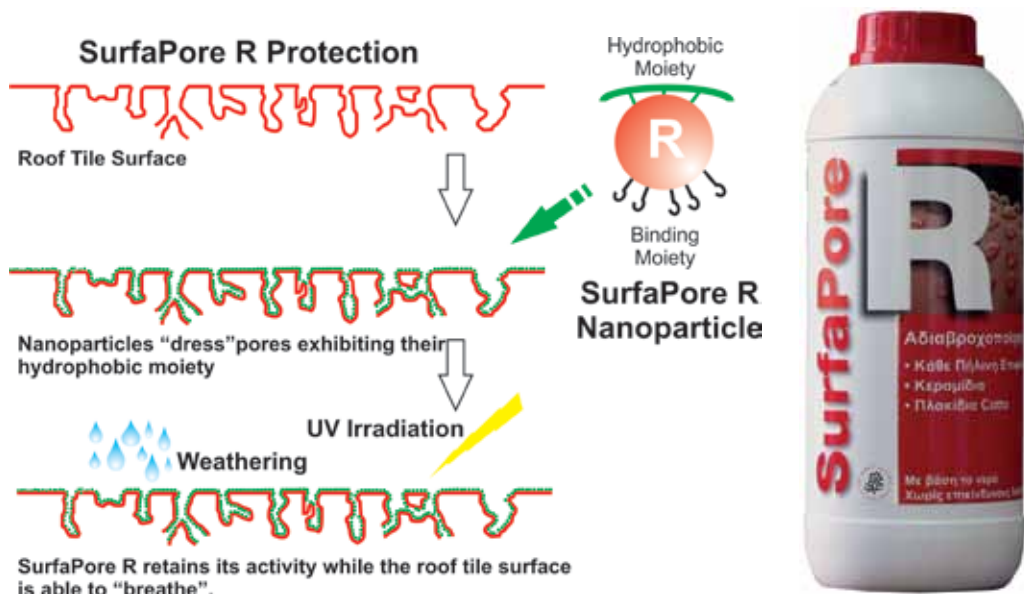
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## SurfaPore® R

### Nanotechnology for any clay based surface such as roof tiles, cotto and pottery.

SurfaPore R protects your clay surfaces from water penetration. Roof tiles and pottery are effectively protected from deterioration and from the unsightly “greening” of mould growth. SurfaPore R preserves the aesthetics of your clay surfaces while protecting them against water and ageing. SurfaPore R was designed to exactly “fit” the unique nature, structural and surface properties of clay based materials. After applying SurfaPore R, your clay surfaces repel water and can remain dry even after rain. By excluding water, you will protect your roof tops and favourite clay based surfaces from “greening” and cracking, due to frost!



SurfaPore® is a registered trademark of NanoPhos SA, PO Box 519, Science & Technology Park of Lavrio Lavrio 19500, Greece

Official Distributor;  
ICM Technology (Thailand) Co., Ltd

**ICM TECH**

E: [sales@icmtechglobal.com](mailto:sales@icmtechglobal.com) T: +66 (0) 2 005 0995

## SurfaPore R Description

SurfaPore R is a water emulsion, composed of nanoparticles, possessing three molecular regions: (a) The core nano-sized particles, suitably engineered to fit into the pores of a clay-based surface, (b) The hydrophobic moiety, attached on top of the core nanosized particles, responsible for the creation of a continuous hydrophobic layer that covers all the clay product's pores, capillaries and free surface and (c) The binding moiety, responsible for anchoring the nano-particle directly onto the clay surfaces.

Most traditional sealers are based on "plastic" or small silicone based molecules (most often corrosive Potassium Methyl Silicate, PMS) that react with atmospheric carbon dioxide to create an impermeable water barrier. Even though their action might initially seem effective, they detrimentally diminish the useful life time of clay based products by restricting their breathing ability or by creating efflorescence spots (white spots). The use of the aforementioned products affects the three most important advantages of clay products: 1) their compatibility to the modern, functional and breathing construction trends, 2) endurance and 3) aesthetic perfection.

NanoPhos introduces a brand new approach. Instead of covering the clay surface with polymerizing additives, SurfaPore R dresses the pores, the capillaries and the "free" surface of clay based products with hydrophobic materials. Instead of covering your favourite roof tiles, let them breath protected. Pores still exist, capillaries are still effective channels of humidity and air transportation, but the liquid water droplets cannot touch your clay surface.

**Water Absorption:** Results are based on laboratory testing of roof tiles samples provided by independent roof tiles manufacturers A, B & C. Water absorption is calculated after 24h of immersion in a water bath and expressed as %w/w: Manufacturer A, reference: 13.66% With SurfaPore R: 0.53%. Manufacturer B, reference: 5.26% With SurfaPore R: 0.54%. Manufacturer C, reference: 7.79% With SurfaPore R: 0.84%.

**Mass loss after freeze-thaw salt stress (EN 13581:2002):** The SurfaPore R treated sample does not exhibit mass loss after 20 cycles.

**Water absorption coefficient due to capillary action (EN 1015-18:2003):** ater absorption coefficient due to capillary action is inversely proportional to waterproofness and was measured  $C_m=0.08 \text{ kg}/(\text{m}^2 \cdot \text{min}^{1/2})$  for SurfaPore r and  $C_m=0.33 \text{ kg}/(\text{m}^2 \cdot \text{min}^{1/2})$  for reference.

**Water Vapor Transmission of materials (ASTM E96):** Water Vapor transmission loss was determined as the rate of water vapors pass through a 2cm thick ceramic sample. Vapor Permeability Loss: 4.94% (surface application).



Ceramic bricks with and without SurfaPore R after immersion in saltwater for 24 hours

VOC (Volatile Organic Compounds): Maximum VOC content of this product is 1g/L.

### Application Note

**Surface Application:** The application surface should be dry and clean. Apply SurfaPore R by using a brush, a roller or spray gun. No dilution is required. On very absorptive surfaces re-apply within 3 hours. **Dipping:** Dip the clay based surface in SurfaPore R for 30 seconds. In any case (surface application or dipping) test results on a small area before full scale application. Maximum water repellency is achieved 24 hours post application.

**Consumption:** Estimated consumption rate 9-11 m<sup>2</sup>/L, strongly dependant on the properties of the surface applied.

### Physical Properties

Condition: Milky White, Water Emulsion with slight odour and pH = 5.5±0.5.

Boiling & Flash Point: >100°C

Auto Ignition Point: >100°C

Density: 1.00 ±0.03 g·cm<sup>-3</sup>

Viscosity: 2 mPa·s

SurfaPore R is not considered an oxidant.

### Safety & Storage

The product is not classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). Avoid breathing dust / fume / gas / mist / vapours / spray. Use only outdoors or in a well-ventilated area. Avoid from freezing. Expiration Date: Two years after the production date.



## What is Nanotechnology?

Nanotechnology refers to the scientific field, which deals with very small structures, usually sized below 100 nm. One nanometer (nm) is one billionth of a meter (10<sup>-9</sup> m) - it is so small that if earth were one meter in diameter, then one nanometer would have been the size of an apple! Nanosized materials reveal unique properties when compared to ordinary, bulk materials or even molecules.

## NanoPhos at a Glance...

At NanoPhos, we take advantage of the unique properties of nanotechnology and invent clever materials that solve every day problems. By harnessing nanotechnology, we seek to create a more comfortable, safe and trouble-free living environment. We transfer innovations out of our lab into the hands of consumers. Our vision is clear: "Tune the nanoworld to serve the macroworld" – in simple terms we make nanoparticles solve common problems. NanoPhos was recognized in January of 2008 by Bill Gates as one of the most innovative companies and also received the 1<sup>st</sup> prize for innovation at the prestigious 100% Detail Show in London. NanoPhos is a rapidly growing company that is actively expanding its distribution network. Currently, the company is present in the UK, Norway, Sweden, Denmark, Portugal, Spain, France, Italy, Greece, Cyprus, Egypt, Sudan, Saudi Arabia, Bahrain, UAE, Qatar, Oman, Iran, India, New Zealand, China, Japan, Mexico, Guatemala, Thailand, Malaysia and Singapore.

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NanoPhos SA has been approved by Lloyd's Register Quality Assurance to follow the EN ISO 9001:2000 Quality Management System and the environmental management system EN ISO 14001:2004 for the development, production and sales of chemical products for cleaning and protection of surfaces and nanotechnology products. Furthermore, it is certified for occupational health and safety management systems with OHSAS 18001:2007.

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