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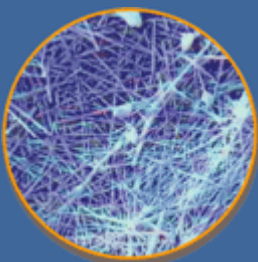
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FAST FACTS

The Penetron system will self-heal micro-cracks in concrete throughout the life of the structure.



An intricate web of insoluble crystals forms in the presence of Penetron and H₂O creating a permanent protective seal

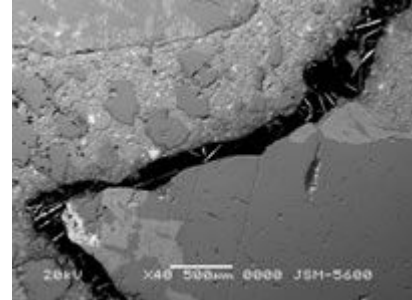
Internal Waterproofing for Concrete

Penetron Industry Newsletter

March 2007

Introduction: Self Healing Building Materials

Quick on the heels of the trend towards “smart” buildings, the building industry is now witnessing a sharply increasing preference by designers and specifiers for self healing building materials. Research groups throughout the world have started to explore concepts and materials systems that impart self-healing properties for a variety of applications. The upcoming 1st International Conference on Self-Healing Materials in Noordwijk, Netherlands (April 18 to 20, 2007, visit www.selfhealingmaterials.nl for further information) will take stock of insights and benefits gathered thus far. The Penetron system exemplifies this emerging trend as it self-heals micro-cracks in concrete throughout the life of the structure. [Read more in the “self healing of cracks in concrete” feature below.](#)



Penetron News: Ü-Zeichen (U-sign) - Germany

The German "Ü-Zeichen" (U-sign) for construction products certifies that products fulfill the highest quality standards, meet or exceed stringent application criteria, and comply with German environmental and health regulations. After extensive testing by the Materialprüfungsanstalt (MPA) at the University of Stuttgart, Germany, Penetron Admix has been approved to feature the U-sign on its packaging. This approval gives German concrete manufacturers, developers, architects, and designers access to one of the world's most effective waterproofing products and guarantees a top quality product for concrete waterproofing.

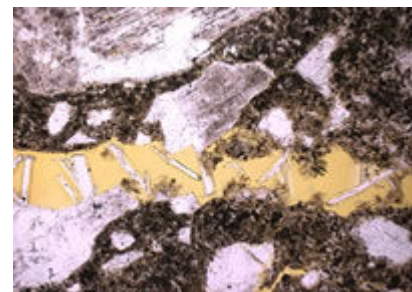
Testing undertaken by the MPA confirmed that Penetron Admix has no negative corrosion effect on reinforcement steel according to test norm DIN V 18998. The maximum chloride content lies far below norm requirements of 0.1%. Penetron Admix also meets the requirements related to maximum alkali content of <9.3%, which eliminates the risk of alkali-silica reactions with aggregates in the concrete mix.



The German Ü-Zeichen (U-Sign) showcases ICS Penetron International Ltd.'s commitment to providing and continually improving high quality waterproofing systems.

Feature: Self healing of cracks in concrete

1. The PENETRON® chemicals penetrate into the capillary tracts of the concrete by pressure of osmosis, Brownian movement and dry particle reactions.
2. The active ingredients of PENETRON® react with various concrete minerals forming insoluble crystals which fill out cracks, pores and voids up to a width of at least 400 microns. This crystalline growth will

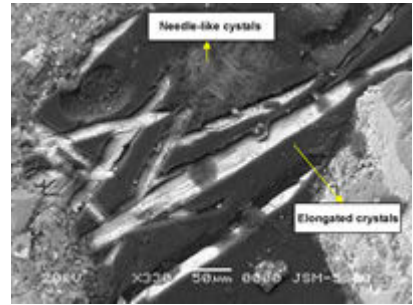
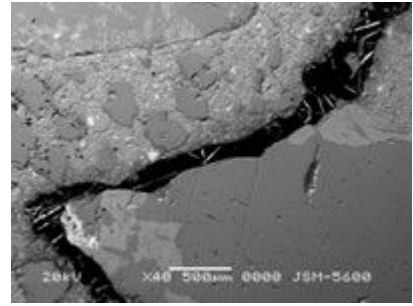


eventually take place deep inside the concrete structure .

3. Water molecules (and a wide range of chemicals) are no longer able to pass through the concrete. However, air can still pass allowing the concrete to breathe and avoiding vapor pressure to build.

4. In the absence of further moisture, PENETRON® components lie dormant. Should moisture recur at any time, the sealing process resumes automatically and advances ever deeper into the concrete.

PENETRON® continuously seals and re-seals. Once applied, the effect of PENETRON® is permanent.



Penetron Worldwide

Mittewald Tunnel – Bressanone, Italy

The Mittewald tunnel is an old provincial highway tunnel in the region of Trentino Alto Adige near Bressanone in Northern Italy. The goal of the project was the restoration of a 180m tunnel part by removing a 10-15cm layer of deteriorated concrete by means of hydro-sandblasting and to rebuild this layer with Penetron Admix Enhanced Shotcrete (PAES). A new drainage system in the construction joints was designed to protect the tunnel cap from hydrostatic pressure. After the application of PAES Penetron Admix had completely stopped the water penetration through the shotcrete, facilitating the water flow in the new drainages.



ENEL Hydroelectric Power Plant – Andonno (Cueno), Italy

As Italy's largest power and second-largest gas company, ENEL supplies electricity to more than 32 million customers in Europe, North and Latin America and has a generating capacity of 53000 megawatt. The company operates 46 thermal plants, 500 hydro facilities, 32 geothermal plants, 17 wind farms and 4 photovoltaic plants and more than a million kilometers of power lines in Italy and overseas.

Recently Penetron was entrusted to restore a 2km section of the main tunnel in one of ENEL's most important, national hydroelectric power plants in Andonno (Cuneo), Italy. A total area of 24000 square meters was waterproofed and joints, cracks and tunnel walls of the project were repaired satisfactorily. The tunnel walls were treated with Penetron, which was applied by spray application. Joints and cracks were treated with Penecrete Mortar and an additional amount of Penetron in a liquid consistency that was injected by resin to ensure a deep penetration of the Penetron crystals into the concrete structure where cracks had damaged the surface. This method ensures a further tightening of the concrete matrix preventing water



ingress through joints and cracks.



The Smith – New York, USA

Located on Smith Street in Brooklyn, NY and fittingly named “The Smith”, this 13-story, mixed use building is being developed by Boymelgreen. The project consists of 62,000-square-foot of residential space located on floors 5 through 13 featuring 50 residential units, 60,000 square feet of hotel, retail, office, and community space located on the lower four floors and a 34,000-square-foot underground parking garage.

The hip, sophisticated vision of celebrated designer Nick Dine of Dine Murphy Wood infuses The Smith's 50 residences with an easy elegance that sets the standard for modern luxury. The casually chic environments created by Mr. Dine are amplified by over nine-foot ceilings and oversized windows that offer incredible views of New York's cityscape.



"This building reflects the spirit of its surroundings and provides the ideal setting for a contemporary, urban lifestyle."

Not just another pretty building with a brick exterior fascia the entire perimeter cavity space is protected on the interior with Penetron, creating a full perimeter, protective envelope for the entire building.

www.penetron.com/en/

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