



Penetron



INTEGRAL CAPILLARY WATERPROOFING SYSTEMS

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FAST FACTS

The Penetron system still allows concrete to breathe, avoiding build up of vapor pressure

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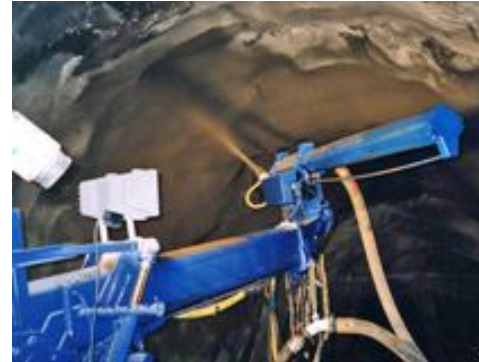
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Penetron Industry Newsletter

November 2005

Greetings,

Welcome to another edition of the Penetron concrete waterproofing update. One of the reasons our clients like the Penetron system is because it is so versatile. You can apply it by brush, spray, as an admixture and as a dry shake, which allows for creative problem



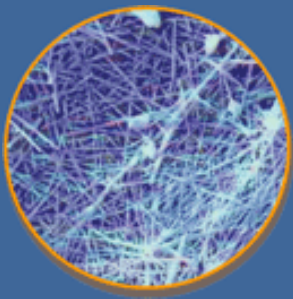
solving. In the last newsletter, we saw how Penetron can be used to waterproof a base slab from the positive side. This newsletter focuses on another creative solution : using Penetron Admix to waterproof shotcrete (PAES)... this method has already been used successfully in major tunnel projects in Scandinavia and Italy and stands to become an industry standard....read on

! Company News - Penetron becomes sustaining member of ACI

As a Sustaining Member of the American Concrete Institute (ACI), Penetron continues to underline its dedication to improving the design, construction, manufacture, and maintenance of concrete structures. Penetron chose to support the ACI as it has been the premier source for information on concrete construction since 1904 and continues to be a pioneer in all concrete-related fields: research and development, structural design, architectural design, construction, and product manufacture. Through a host of activities such as continuing education, certification, seminars, publications and conventions, ACI plays an active and vital role in the concrete industry including the development of codes and standards that affect each and every concrete project across the United States.



American Concrete Institute®
Advancing concrete knowledge



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



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Product Feature - Penetron Admix Enhanced Shotcrete (PAES)

Tunnel waterproofing is often done by using shotcrete structures that lead the water from the rock into a subsurface draining system. The main problem with this solution is making the shotcrete waterproof. Water leakage is normally caused by cracks in the shotcrete, bad workmanship and porous shotcrete. The traditional remedy was to spray Penetron onto the shotcrete surface. While this is very efficient, it is also labor intensive and hence expensive... In recent years, a better solution was found; using Penetron Admix enhanced shotcrete!

Penetron Admix enhanced shotcrete (PAES) has been extensively tested by accredited concrete laboratories. The test results show that PAES reached the maximum result in the freeze/thaw test SS(EN)-137244 and reduced the depth of penetration of water under pressure Norm SS EN-12390-8 from 21mm for the control concrete to 7mm for PAES. The adhesion values of this shotcrete also increases.



CASE STUDY - TUNNEL LINING WATERPROOFING FOCUS



BOTNIABANAN Railway project, Sweden



[\(Click above to enlarge map\)](#)

The BOTNIABANAN Railway project, a 250 km long new railway with around 25km of tunnels is under construction and located 550 - 800km north of Stockholm along the Baltic Sea coast. The specifications of all products to be used on this project are

extremely demanding and stringently controlled, with environmental considerations, zero pollution and ground water contamination all high on the list of priorities. With Penetron's 10 year long experience in Sweden on waterproofing traffic tunnels and after several years of testing for compliance with environmental standards, Penetron was allowed to demonstrate its waterproofing abilities on this project.



Since then, the tunnels treated with the traditional Penetron spray-on method on this project up to November 2005 include Askottberget 3.3km, Varvsberget 2km, Stranneberget 1.4km, Kalldalsberget 1.1km, Hjalta 1.2km and Oberget 0.5km. The railway is scheduled to start operation in 2008.

A special Penetron Admix enhanced shotcrete (PAES) was developed in 2003 and has been tested for 2 years on special sections of this project. The results were carefully observed and evaluated, resulting in the use of PAES on a full scale section of the Askottberget tunnel.



Mezzaselva tunnel in Bolzano, Italy

The engineers on this project could not use a PVC membrane due to a lack of space, which opened the door for PAES on this project. In 2004, Penetron Admix was mixed with the shotcrete at the batching plant, after which PAES was applied with an average thickness of 10cm.

The application was a complete success, with even a previously severely leaking construction joint treated with the enhanced shotcrete ending up completely dry.





Lutetian Garden, Jinzhou, China

This huge development in Jinzhou, 4 hours north of Beijing in Liaoning Province is now the top residential compound in the city.

All basement areas in the complex have been successfully treated with the Penetron system. Abundant cracking had occurred on the project prior to the Penetron application, resulting in many leaks. All the leaks were stopped with Penepug and the cracks repaired with Penecrete mortar, after which the whole underground structure was coated with Penetron. This job includes the waterproofing of the entire underground carpark, connecting the two main buildings, with the Penetron system. The Project was finished in 2002 with the owner so pleased with the results that he insisted that his own penthouse terrace in one of the buildings be waterproofed with Penetron rather than the product specified for the exposed areas.



House of Rest, Zelehnogorsk, Russia

This cathedral is of immense importance in Russia as the last Russian Tzar Nicholas II and his family are buried in St. Catherine Chapel (Ekaterininsky Predel) of this Peteropavolovsk Cathedral in St. Petersburg.



This project underwent a major repair and maintenance treatment in 1995. At that time, the Penetron system was used for the protection and waterproofing of all above and below grade masonry.



RCC Steeping Vats, Shirala, India

Penetron Products were used to waterproof as well as protect the concrete surface from chemical attack at M/s. Yashwant Glucose Co-op. Ltd.

At the plant, concrete vats are utilized for boiling maize grains prior to recovery of starch from maize. The process involves temperatures of around 70 degrees Celsius and induces SO₂ gas which forms Sulphuric Acid (H₂SO₄) which subsequently affects the concrete surface (pH 2.8 to 4)



The Penetron System was used to treat the huge vats while Penecrete Mortar was used to fill the construction joints. Total treated area was about 1000 sqm and 300 linear meters of construction joints



Notice to Readers

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Penetron products are currently available in over 60 countries. Should you wish to be contacted by a local representative and learn how Penetron can solve your concrete problems, please [contact us](#).

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