



PENETRON INDUSTRY NEWSLETTER

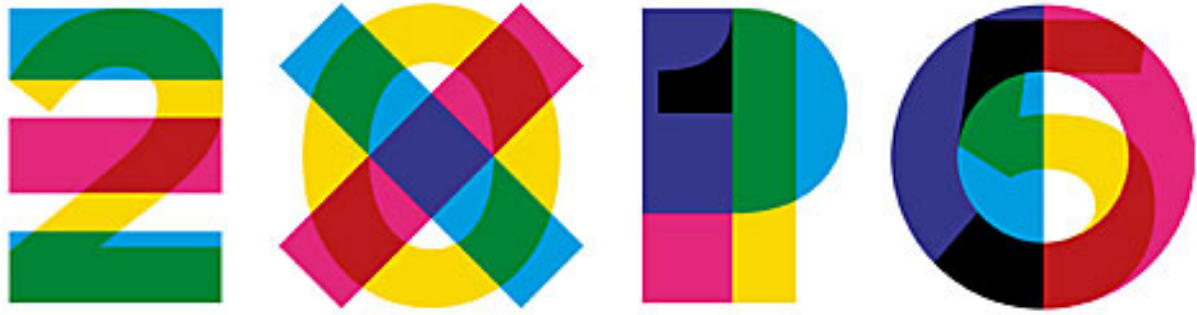
September 2015

[HOME](#) [WHAT IS PENETRON®](#) [PRODUCTS](#) [PROJECTS](#) [CONTACT US](#)

Welcome to another edition of the PENETRON Industry Newsletter.

In this edition, TECH TALK expands further on the [October 2014 issue](#) showcasing the durability that can be achieved with PENETRON ADMIX.

To achieve concrete durability in critical environments, properties like low permeability, low shrinkage, self-healing and protection against chemical attack must be realized. PENETRON ADMIX incorporates the technology that provides such properties and recent testing has shown it can add up to 60 years or more to a variety of concretes, including CEM II /B-P, CEM II / B-S and CEM III/A, in critical environments before the onset of corrosion. In this issue we focus on the self-healing aspect of concrete durability testing.



MILANO 2015

1 MAY • 31 OCTOBER

FEEDING THE PLANET ENERGY FOR LIFE

EXPO Milano 2015 will close its doors on October 31, 2015. The Universal Exhibition is showcasing achievements that societies have made and share new technologies as well as promote creativity and engagement at a global level. By following the theme, "[Feeding the Planet, Energy for Life](#)", over 140 participating countries are showing their commitment to creating sustainable ways of producing and delivering food across the globe.

The United Nations (UN) is also participating in Expo Milano 2015 under the theme, "[The Zero Hunger Challenge. United for a Sustainable World.](#)" The Zero Hunger Challenge is a call-to-action, based on the wish of the UN Secretary General Ban-ki Moon to encourage decision makers to focus their attention on hunger, nutrition and sustainable agriculture. An integral part of the Zero Hunger Challenge, the issue of women's empowerment and gender equality, is a key focus area for the UN at Expo Milano 2015.

PENETRON played a vital role in ensuring the timely completion and durability of some of the infrastructure for EXPO Milano 2015, and the city of Milan. Have a look at the case study 'ZARA EXPO Tunnel' under PENETRON Worldwide.

Jozef Van Beeck
Director International Sales & Marketing



GET THE PENETRON APP **NOW!** ON ANDROID AND iOS

INSIDE THIS ISSUE

Tech Talk : Concrete Durability Research - Self-healing of cracks with PENETRON ADMIX

PENETRON WORLDWIDE

Zara Expo Tunnel Lot 1A, Milan, Italy

Mornos Canal, Athens, Greece

El Quimbo Hydroelectric Plant, Colombia

University of Miami Hurricane Simulator, Miami, USA

Agri-Hub, Pretoria, South Africa



**DOWNLOAD
THE PENETRON
BROCHURE**



**SEND TO A
FRIEND**



SUBSCRIBE



**HOW
PENETRON
WORKS**

**VIEW A 3 MINUTE
VIDEO DEMONSTRATION**



**PENETRON APP
DOWNLOAD HERE**

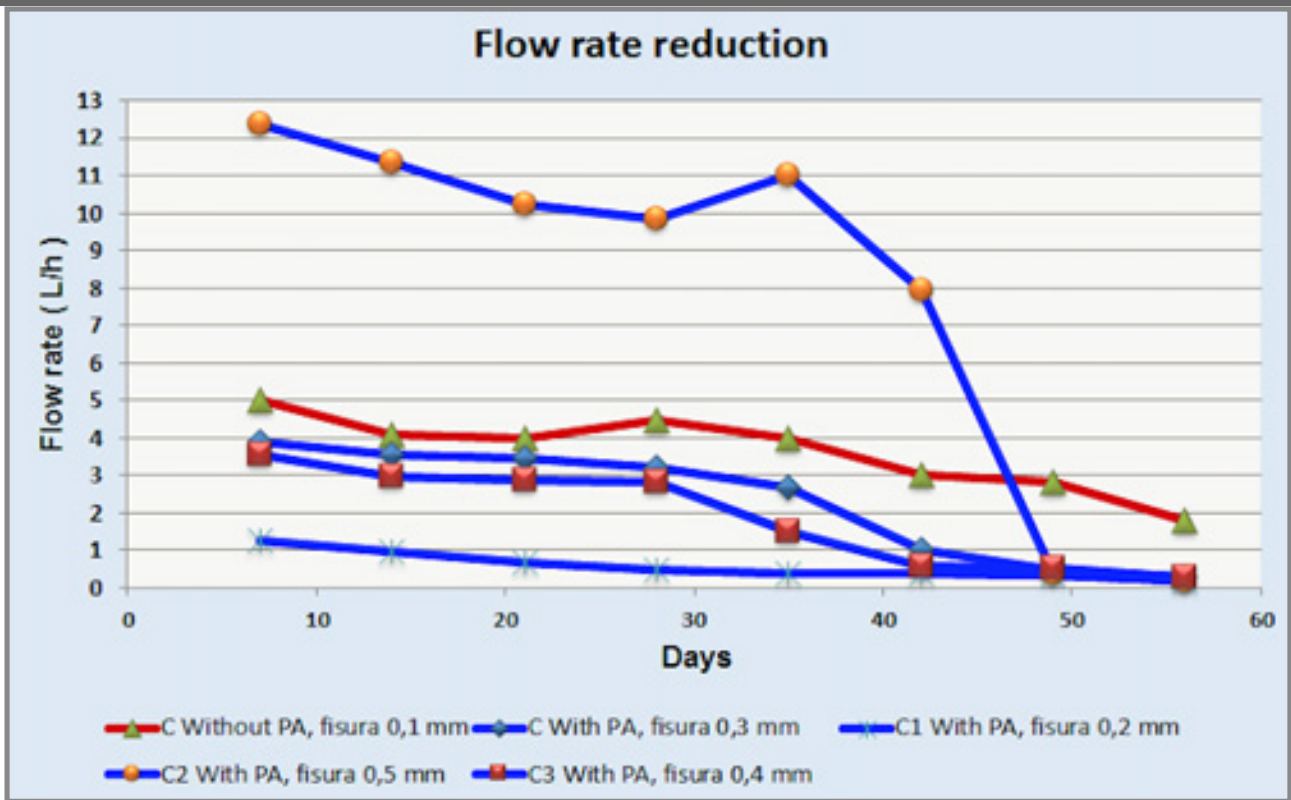
Follow us 

**Tech Talk : Concrete Durability Research - Self-healing of cracks with
PENETRON ADMIX**

Concrete specimens were prepared in molds with a pre-installed perforated plastic pipe, and subjected to enough pressure to cause a crack. Then, internal water pressure was created and the rate of waterflow through the cracks was measured over 60 days. The results were then compared to the control sample.




After applying 16 Bar of water pressure for 8 weeks, the water flow through the cracks of the PENETRON ADMIX - treated specimen had on average reduced by 95%. The control samples' autogenous self-healing was limited to about 60%.




PENETRON ADMIX provides self-healing ability of cracks up to 0.4mm for the entire service-life of the concrete.

WITNESS PENETRON'S CRACK HEALING ABILITY

[Click here to view the video](#)



BEFORE



AFTER

PENETRON WORLDWIDE

Zara Expo Tunnel Lot 1A, Milan, Italy



The “Zara-Expo” road connector project, carried out by the Metropolitana Milanese SpA of Milan, Italy underwent many changes over the past decade before last month’s inauguration. PENETRON crystalline technology was specified to ensure a permanent concrete waterproofing solution.

The new “Zara-Expo” connector links the Via Eritrea in Milan, to the EXPO 2015 exhibition area. The new connector also links the Molino Dorino-A8 highway connection with the new Cascina Merlata junction on the A4 that leads to the Lombardy Lake Regions.

Currently, only authorized buses, taxis and vehicles are allowed on the road while work is being completed on the bike lanes, an adjacent soccer field on Via Aldini and the landscaping above the Boccioni tunnel sections. The road is 1.8 km (1.1 miles) long, including the Boccioni tunnel sections (602 m / 1,990 ft.) with two lanes in each direction. Each tunnel measures 10.5 m wide x 6 m high (34 ft. X 19 ft.), with a maximum in-ground depth of about 12 m (40 ft.).



Original construction plans called for a welded PVC-geotextile liner to provide waterproofing. This was replaced with a crystalline admixture, PENETRON ADMIX that was mixed into the concrete during batching to ensure a permanent, integral solution that provides self-healing capabilities for the life of the concrete.

The PENETRON solution ensured an impermeable concrete surface in the tunnels that handily exceeded the official project specifications. The remaining work on the Zara Expo connector will be completed by mid-summer 2015.

Mornos Canal, Athens, Greece



Home to over three million Greeks and one of the oldest cities in the world, Athens depends on the Mornos Canal for drinking water. A combination of PENEPLUG, PENETRON and PENECRETE MORTAR were recently used on the exterior and interior surfaces to successfully repair leaks in the canal.

The Mornos Canal is the main source of drinking water for Athens, delivering 380 million m³ (over 100 billion gallons) of water to the largest Greek metropolis every year. The main canal is 192 km (119 miles) long and alternates between underground tunnel structures and above-ground canals. It is also connected to a number of supporting canals.

The Mornos Canal, managed by the Athens Water Company, starts at the site of the Mornos River dam. This reservoir, which contains 780 million m³ (over 206 billion gallons) of water, is one of the largest in Europe, located about 200 km (124 miles) northwest of Athens. The Athens Water Company also maintains a network of water refineries, dams, pipe systems, filter tanks, etc.



PENETRON HELLAS, the Greek subsidiary of PENETRON International, carried out the repair work on the canal. The project consisted mostly of repairing and sealing numerous cold joints and cracks that had developed in the concrete. In a first step, PENEPLUG, a rapid-setting plugging mortar, was used to stop active leaks; PENETRON crystalline topical waterproofing material was applied on the exterior surfaces. PENETRON and PENECRETE MORTAR were used on the interior surface for topical repairs and to seal the remaining leaks.

The customer Athens Water Company was completely satisfied with the results of the PENETRON System on this first phase of repair works and is currently considering its use in the upcoming project phases (19,770 acres).

El Quimbo Hydroelectric Plant, Colombia

Opened for operations in mid-2015 the US\$ 490 million project of “El Quimbo” hydroelectric power plant in the Huila district, 250km south-west of Bogota is the latest addition of power plants along Colombia’s main river, the Rio Magdalena.

The project includes a 160-meter (525 feet) tall and 700-meter (2,300 feet) wide main dam, a 66-meter (216 feet) tall and 400-meter (1,312 feet) long secondary dam and a 400MW power station. The new artificial basin created is the largest in Colombia and forms a 55-km (34 miles)-long reservoir of over 8’000 hectares (19,770 acres).



The plant is owned and operated by Emgesa, a subsidiary of Italian ENEL Group, which is doubling its energy production generated by their sister plant Betania further downstream on the Magdalena River.

In total, El Quimbo covers approximately 8% of Colombia's energy requirements and is a vital component of the country's infrastructure and development.

After casting a total of 250'000 cubic meters (327,000 cubic yards) of concrete, cracks had formed on the spillway at El Quimbo due to aggressive temperature changes. These cracks were a concern for the developers in regards to the durability and operation of the plant with a service life of 50 years.

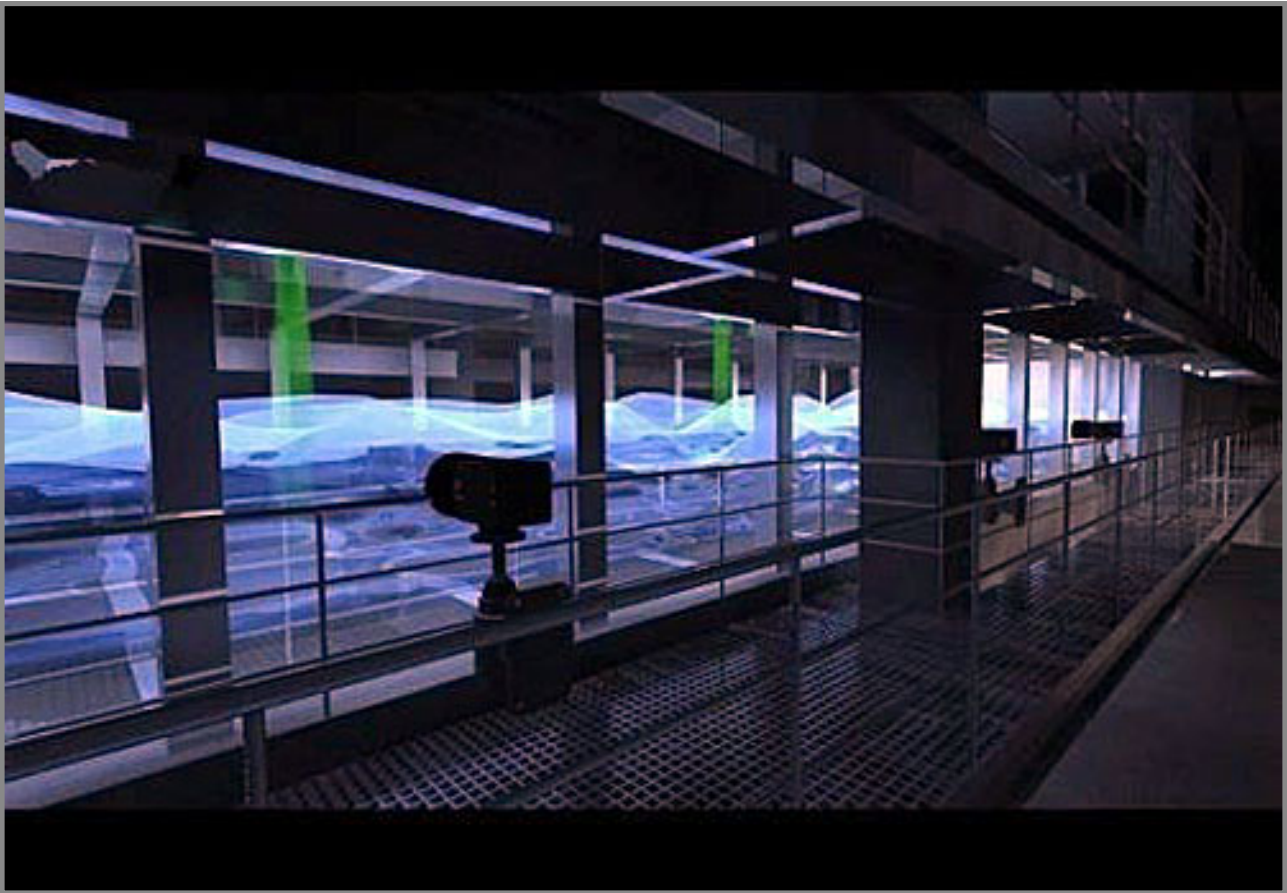
In order to prevent any issues from arising in the future, the contractor, Impregilo, looked into different options. After a performance evaluation both Impregilo and the designer Ingetec were fully convinced that only PENETRON could provide an efficient, long-term and cost-effective solution to their problem and ensure the durability of the concrete. Another advantage offered by PENETRON the material could be applied on wet surfaces, as the contractor could not guarantee a dry surface at all times as required for other solutions in discussion.

Subsequently, a total area of close to 14,000 square meters (150,700 square feet) of the spillway were treated with the PENETRON repair system to the full satisfaction of the client.



University of Miami Hurricane Simulator, Miami, USA

The massive Indoor Hurricane Simulator at the University of Miami's Marine Science Center is now up and running, kicking up a storm in tropical weather research. This giant aquarium recreates 150-mph (240-km/h) wind conditions and is built on PENETRON concrete technology to ensure a durable and waterproof structure.



The University of Miami recently inaugurated a \$45 million Marine Technology & Life Sciences Seawater Complex, which houses SUSTAIN (SURge-SSTRUCTure-Atmosphere Interaction), a hurricane simulation tool. The size of a small house, SUSTAIN has the unique ability to create category-5 level hurricanes inside the lab, across a field of waves made of real sea water pumped into the building at 1,000 gallons (3,785 liters) per minute. It is comprised of three major components:

A 1400-horsepower fan originally used to ventilate mine shafts, it is used here to create 241km/h (150-mph) hurricane winds.

A wave generator pushes salt water with 12 different paddles to make waves of various sizes, angles, and frequency, creating anything from a calm swell to sloppy chaotic seas.

The tank is 6m (20 feet) wide and 20m (66 feet) long, and it is made of 7.6cm (3 inch) thick clear acrylic so the conditions inside can be observed from all sides.

With this new research tool, scientists will be able to better understand the process by which hurricanes are fueled by warm water. Bob Atlas, who is in charge of NOAA's Atlantic Oceanographic and Meteorological Laboratory, explains, "NOAA has to be able to predict the storm. But ultimately, what the public needs to know is if their streets and homes will be flooded, and if their homes will survive when the hurricane hits. SUSTAIN will make a difference."

As the tank used at the University of Miami is using a large amount of seawater and is generating large hydrostatic forces an absolutely reliable solution for the waterproofing and protection of the main system components was required.

The PENETRON crystalline waterproofing material was applied to the foundations of the elevated

hurricane testing tank to prevent any water from entering the concrete matrix, even under high hydrostatic pressure and to significantly enhance the durability of the structure.

Agri-Hub, Pretoria, South Africa



Pretoria's brand new business destination, Agri-Hub situated at the foot of the Brondberg Ridge houses a state-of-the-art building technology and natural, serene environment for its tenants.

Built sustainably to comply with to SABS SANS 204 legislation, it includes the use of energy-efficient green technology, natural building materials and solar lighting throughout the common areas of the compound.

Agri-Hub is centrally located, providing access to major highways conveniently linking the center to Pretoria and Johannesburg.

The compound features three new blocks across a central basement offering ample parking space and access to a conference center and a dedicated coffee shop. Further amenities include an entertainment area, 24-hour security guards, on-site facility management and cleaning services.

The buildings provide a total of 6000 m² (64,583 square feet) of office space, 300 parking lots and are designed for small, medium and large size tenants.

The project was designed by Royal HaskoningDHV and built by JTSON Construction.

PENETRON ADMIX and PENBAR SW-55 were used in the post-tension parking deck to provide waterproofing and concrete durability. Roof slabs of all office blocks, the guardhouse and the

guesthouse were sealed using PENETRON ADMIX, PENEBAR SW-55, PENETRON and PENECRETE MORTAR.

WITNESS PENETRON'S CRACK HEALING ABILITY

[Click here to view the video](#)



ISO 14001

