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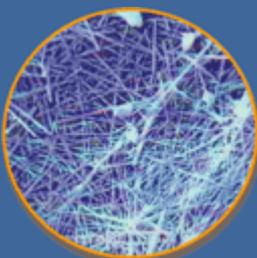
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## FAST FACTS

Penetron crystals are insoluble and waterproof concrete for the entire life of the structure.



## Internal Waterproofing for Concrete

### Penetron® Industry Newsletter

March 2010

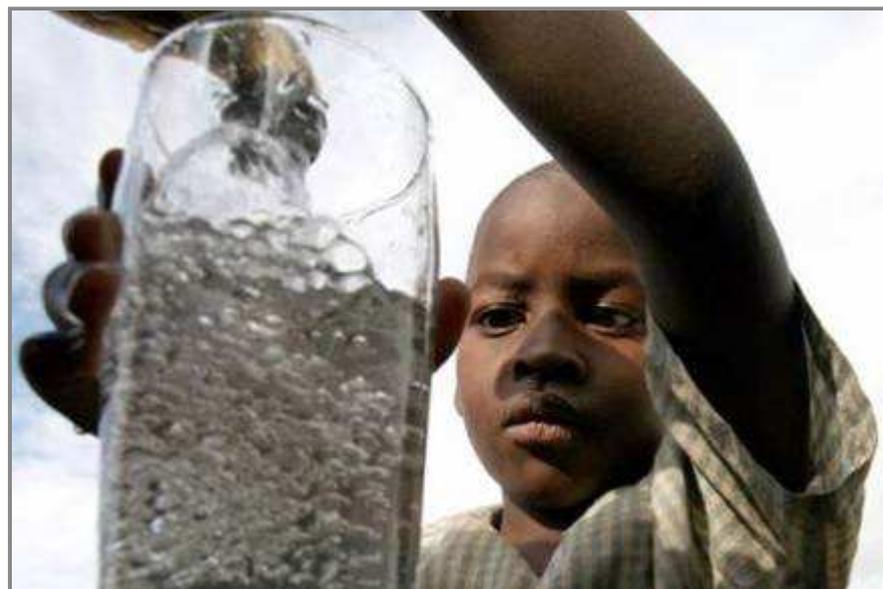
Designers of concrete structures have traditionally focused on the strength characteristics of the material. In recent years, the industry has started to adopt a more holistic approach by emphasizing the life-cycle cost of a structure. Hence the **durability of concrete** is now viewed as equally important as mechanical properties and initial cost.



The oldest known concrete shell, the [Pantheon in Rome](#), was completed about AD 125, and is still standing

It is estimated that, in developed countries, about 40 percent of total construction resources are applied to repair and maintenance, and only 60 percent to new construction.

Apart from the socioeconomic implications of durability, there is also a clear link between durability and the environment. By extending the life cycle of construction materials, we conserve valuable natural resources. [Read more on this topic under this issue's feature: durability of concrete.](#)



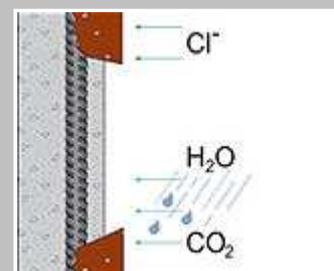
Further, focus on another great initiative from Engineers Without Borders, [the Ntisaw village water project in Cameroon.](#)



### Penetron® Feature: Durability of concrete and water

**Water is a primary agent for both creation and destruction of concrete – and is deeply involved in nearly every form of concrete deterioration.**

Field experience shows that, in order of decreasing importance, the principal causes for deterioration are the corrosion of reinforced steel, exposure to cycles of freezing and thawing, alkali-silica reaction, and chemical attack. With each of these four causes of concrete deterioration, the permeability and the presence of water are implicated in the



An intricate web of insoluble crystals forms in the presence of Penetron® and H<sub>2</sub>O creating a permanent protective seal



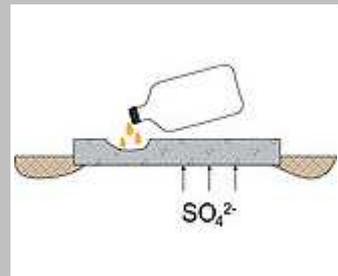
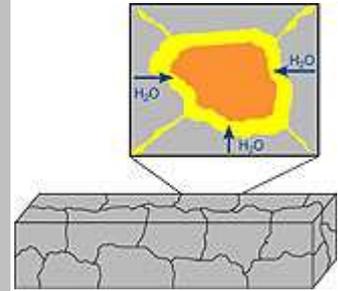
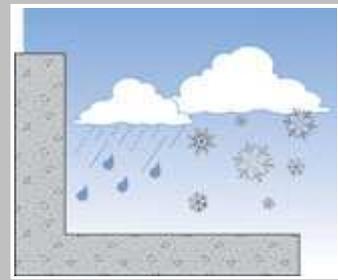
Witness Penetron's crack sealing ability

mechanisms of expansion and cracking.

By ensuring that concrete is waterproof, not just on the surface, but in-depth, we can prevent the main causes of deterioration from happening.

Penetron products are integral waterproofing agents that deliver just that;

- Preventing the corrosion of steel by preventing chemicals from entering the concrete and helping to maintain an alkaline environment
- Preventing damage from freeze-thaw by drying out concrete in-depth
- Preventing alkali-silica reaction by denying the reaction the water it needs
- Preventing chemicals from entering the concrete by sealing the capillaries and pores



Incorporating Penetron products in concrete dramatically increases its durability. In concrete terms, this means the design life of the structure is extended as well as huge savings on repair and maintenance.

### Penetron® News: Engineers Without Borders undertakes the Ntisaw village water project in Cameroon



Just a few of the beneficiaries of the Ntisaw Village Water Project.

The United Nations announced recently that unsanitary water is killing more people than wars and other violence. This includes 2.2 million people whose deaths are attributed to diarrhea, mostly from dirty water, and 1.8 million children under the age of 5 who succumb to waterborne diseases.

ICS Penetron International plays its part in assuaging this problem through its efforts with Engineers Without Borders (EWB). The 2009 Penetron-EWB grant has been awarded to the EWB Chapter at the University of Illinois at Urbana-Champaign (EWB-UIUC). Penetron congratulates EWB-UIUC for their Ntisaw Village Water Project located in Cameroon, West Africa.

More than 1000 villagers of Ntisaw lack consistent access to clean drinking water. A reliable source of water will improve health of all villagers as well as provide educational and entrepreneurial opportunities for girls and women whose role has traditionally been to carry water between the spring and the village.



EWB-UIUC has stepped up to the challenge of designing and constructing a potable water catchment and distribution system for Ntisaw. Penetron is pleased to support EWB-UIUC and their meaningful work in Cameroon. [Read more.](#)

## Penetron® Worldwide:

### Tropicana City Mall, Petaling Jaya, Malaysia



The Tropicana City Mall was developed by Dijaya Corporation Berhad. The Mall is comprised of 4 retail levels, a 12 storey office tower and 3 basement levels. The total gross floor area is approx. 700,000.00 square feet (65032 m<sup>2</sup>).

The project features an exposed partially cast basement that stood abandoned for ten years, raising concerns about the durability of the structure. This part of the structure needed special attention as it showed heavy leakage at the time of project resumption, presenting a huge challenge for any waterproofing contractor.

After entertaining several bids from competing contractors, the client ultimately chose to go with the Penetron system for rectification and waterproofing of the base slab. The decision was based on Penetron's long track record in the Malaysian market as well as its reputation for quality and service.

The products used on the project include Penecrete Mortar, Penetron, Peneplug and pressure grouting. The overall client satisfaction level is evident from the [recommendation letter received from Meinhardt Consultants.](#)

### Palais Royale, Mumbai, India

Mumbai is experiencing a huge building boom. Planning and construction has begun on hundreds of new mid and high-rise buildings in the city's central business district, in the former mill lands and Dharavi.

The most conspicuous is the Palais Royale, commercial and residential tower. With a height of over 320 m, it is set to dominate the city's skyline after completion. Developer Shree Ram Urban Infrastructure has achieved LEED platinum certification from the Indian Green Building Council, setting new standards in water and energy management, waste recycling and reduced carbon emissions. LEED – Leadership



in Energy and Environmental Design – is an internationally recognised Green Building Rating System developed by the U.S. Green Building Council. It provides a suite of standards for environmentally sustainable construction.

Palais Royale is also a unique project in terms of waterproofing. Since the structure will be handed over to the buyers as a shell, the buyers have the freedom to design the interiors of the floor space as per their requirements. As this is one of Mumbai's most prestigious residential developments, the structural consultants and architects needed to ensure that every slab is absolutely watertight. They then started looking for a suitable product to make the concrete slabs impermeable. After doing their research, they invited Penetron representatives for a presentation and subsequently decided to incorporate Penetron Admix in all 58 floor slabs of the structure.



## Howard Lamade Stadium, Williamsport, Pennsylvania, USA



On August 30, 2009, at the Howard J. Lamade Stadium, Team Chula Vista overpowered Team Chinese-Taipei in a 6 - 3 victory to capture the title of Little League World Series Champions.

Little League International is the largest youth sport organization in the world with over 2.6 million participants in over 100 countries supported by over 1.5 million adult volunteers and with 200 international youth teams competing. The Howard J. Lamade Stadium is the centerpiece of their headquarters and has been the home of the Little League World Series finals for over 50 years. Playing at the Howard J. Lamade Stadium in Williamsport, PA is the “big” dream of every Little League baseball team in the world.

The Stadium was named after Howard J. Lamade, a successful publisher of "Grit" magazine (a rural lifestyle magazine still in existence today). Lamade was also top executive with Little League Baseball and was instrumental in building it into a national institution that has since grown into an international institution.

Since its initial construction in 1959, Lamade Stadium has evolved from a ball field to a Baseball Complex with a seating capacity of 40,000. However, 50 years of exposure to the elements will eventually take its toll. Penetron Admix was included in a recent reconstruction project at the stadium for its ability to waterproof and protect concrete. The existing wall that served to separate the elevation difference from the stadium seating to the world famous dugouts had deteriorated due to water infiltration and successive freeze thaw scaling and damage. The wall supported the concourse walkway to seating and was covered by a protective matting/ dugout wall mats to protect the players from the badly damaged concrete. The existing concourse slab itself had previously been repaired with an emulsion type coating but the coating had lifted and the slab was also spalling badly as a result of aggressive freeze

thaw action. The project team of Brinjac Engineering, Zartman Construction and Centre Concrete worked together to redesign and replace the existing wall with a new Penetron Admix treated wall and new entrance slabs. The concourse was also widened and new curb and drainage was constructed to minimize flooding of the field from the water in the stands. Additionally, drainage was improved to provide safer and easier access to stadium seating.

"We are honored to have been involved in keeping alive the tradition of such a long standing athletic institution." stated Christopher Chen, Director of North American Sales & Marketing for ICS Penetron "As a company with a wide international presence, we are keenly aware that understanding, communicating and working with diverse nations, peoples and cultures is critical to our success. Involvement with organizations such as Little League International, reminds us of how important these basic connections are and how much can be achieved by observing them in all that we do."

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