PENETRON NEWSLETTER

September 2022

Dear reader,

As one of the world's largest carbon emitters, the cement and concrete industry is a key focal point in limiting the effects of climate change. Meeting the challenge of substantially reducing carbon emissions of this sector and eventually becoming carbon neutral needs the rapid development and widespread implementation of new technologies, products, and designs. This requires a profound rethinking of conventional construction practices.

In this edition of the Penetron Newsletter, we look at what can be done today with existing and proven technologies. We highlight Penetron's crystalline technology, and how our solutions can help reduce the overall carbon footprint of concrete structures – as a first step toward a more sustainable construction approach.

We also take a closer look at our most recent international LEED-certified projects that relied on Penetron solutions for more sustainable construction processes and share initial impressions of our latest international product training event in Athens, Greece.

Jozef Van Beeck
Director, International Sales & Marketing
Penetron International

Towards Zero Carbon Concrete

With a contribution of 8%, the global cement industry is the second-largest producer of CO_2 and thus one of the focus points of the COP26 climate targets. Industry, architects, and engineers alike are now tasked with incorporating low carbon products and sustainable solutions into their projects.

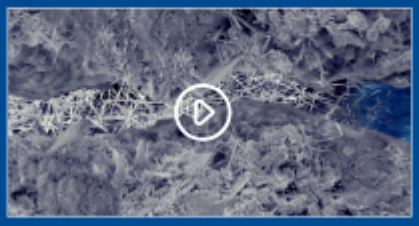
The Penetron product range, specifically PENETRON ADMIX, can assist in providing your structure with the most sustainable, time and cost-effective concrete solutions and significantly reduce your concrete structure's carbon footprint.

By increasing the durability and service life of concrete alone, the carbon footprint of a project can be reduced by up to 50% or more. Additionally, further reductions are realized by the significant reduction in carbon-emitting repair and maintenance cycles (by up to 90%) and the replacement of high carbon emission membranes for below-grade structures with a crystalline technology (in combination with pozzolan cements used with Portland cement).

Depending on the level of commitment towards achieving net zero carbon concrete by 2050, PENETRON ADMIX can reduce your carbon footprint by up to 65% for the overall concrete structure.

For full details, please click here.

HOW PENETRON WORKS



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WITNESS PENETRON'S CRACK HEALING ABILITY

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PENETRON WORLDWIDE

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Penetron International Training Session, Athens, Greece

After a break due to the corona pandemic, Penetron Hellas resumed in-person training sessions in March at our training center in Athens. The Penetron team welcomed attendees from the Middle East and Europe, who came to be trained in the use of the Penetron crystalline product range and its application.

The 2-day training session included a classroom stage and practical, hands-on demonstrations, with presentations by Florian Klouda, Director, International Account Coordination at Penetron International, and Mr. Theodor Mentzikofakis, an industry veteran and Managing Partner of Penetron Hellas, and his team. Participants also enjoyed a Greek cultural tour with activities to round out another successful event.

“Even though participants all followed the Covid safety measures, it felt good to finally meet again, face to face,” stated Theodor Mentzikofakis.

As the world continues to slowly open up again, Penetron looks forward to hosting more in-person events in the future.

Penetron Kuwait attends 41st Engineering Design Fair

The Engineering Design Exhibition focuses on creative, engineering solutions for graduate students at the College of Engineering and Petroleum at Kuwait University. It serves as a platform for graduating students to present themselves and their work to decision-makers and engineering companies. The exhibition presents engineering projects in the fields of civil, mechanical, chemical, petroleum, industrial, electrical and computer engineering and is held at the end of each regular semester. The event, which is supported by the Kuwait Foundation for the Advancement of Sciences for Engineering Design Projects featured 163 projects of a total of 580 students that competed for prizes for best engineering design in each the categories.

The 41st Engineering Design Fair was held from July 5-6, 2022 and attracted over 3500 visitors.

Engaging with the next generations of engineers has always been important to Penetron", says Mostafa Sheikh Sulaiman, representative of Penetron Kuwait, "hence it was important for us to sponsor an event that allows them to introduce themselves to the industry and potential employers. At the same time, we want to remind them of Penetron's concrete waterproofing and durability solutions that will allow them to build more sustainable and support carbon emission reductions on their future projects."

Mr. Mostafa Sheikh Sulaiman of Penetron Kuwait at the Penetron booth during the 41st Engineering Design Fair.

Piraeus Port Plaza, Piraeus, Greece

Piraeus Port Plaza spans three city blocks with a total plot area of 17,841 sqm and consists of eight buildings with a total buildable area of 77,050 sqm. With a budget of over €100 million, the project vision is to regenerate the center of Piraeus by developing and renewing a previous tobacco industrial facility into a complex of modern sustainable office buildings built according to sustainability standards to help combat climate change. While the exterior industrial architecture was preserved, the new design benefits from abundant natural lighting and ventilation, which allows the sea breeze to pass through the interior of the building.

The project employed a variety of strategies to reduce energy and water use, create a healthy indoor environment, and rationalize the use of resources. Accordingly, the project achieved a significant reduction in energy and water use. Passive design elements, such as energy efficient window glazing and upgraded HVAC building systems, contributed to a considerable reduction in energy demand for lighting and cooling. In parallel, the design was optimized to provide improved thermal comfort conditions for the occupants and visitors.

With three below-ground levels next to the Piraeus Port, PENETRON ADMIX was the obvious choice for a concrete waterproofing solution. Supporting the LEED Gold certification of Piraeus Port, Penetron products were chosen due to their sustainability certifications, including EPD and GREENGUARD Gold. Specifying PENETRON ADMIX enabled the designers to forego unsustainable (and more costly) waterproofing membranes to extend the life of the concrete structure and thereby reduce the carbon footprint of this project.

One & Only Aethesis, Glyfada, Greece

Nestled in the Southern coastal area of the Athenian Riviera – a fabled land, home to ancient wonders and unique natural springs – the newest One & Only Aesthesis Hotel evokes nostalgia that takes you back to the glamour of the past.

Located just outside the city of Athens, this exclusive 21-hectare beachfront estate and One & Only's ultra-luxury lifestyle experience are the perfect destination for any Greek adventure. Minutes from the vibrant metropolis of Athens and surrounded by an endless blue sea with islands dotting the horizon, this is only the 2nd One & Only Aesthesis Hotel in Europe, a highly private and exclusive brand.

One & Only Aesthesis embodies the glamour of the Aegean with 127 guestrooms, breathtaking suites, and private villas – all designed with private pools, perfect for couples or families. This 5-star resort hosts a Chenot Spa, renowned leader in health and wellness using natural remedies, and two signature restaurants featuring a locally sourced menu.

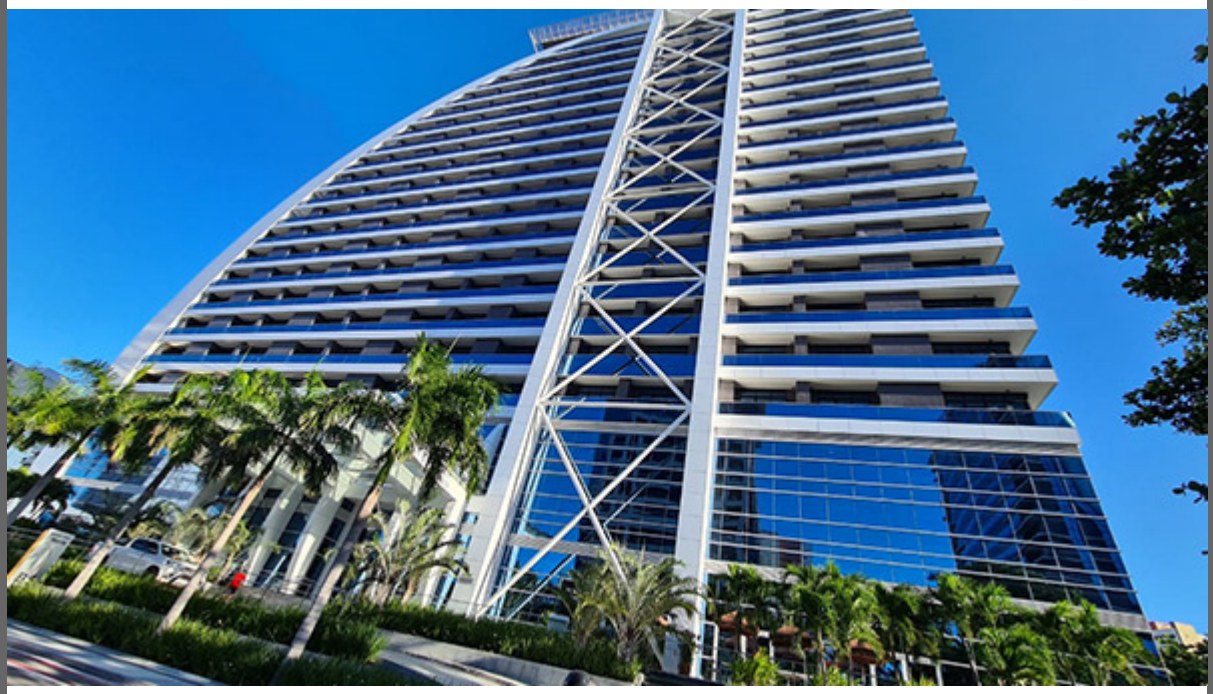
With our commitment to sustainability, Penetron products are both GREENGUARD and EPD-certified, which supported the LEED-certification of this iconic project. Penetron Hellas supplied 5,000m³ of PENETRON ADMIX, which was used for the waterproofing and durability of the swimming pools, all underground structures, and the fire-fighting water storage tanks. All construction joints and pipe penetrations were sealed using 735m of PENEBAR SW55, a hydrophilic swellable-type waterstop. The tie rods were repaired with PENECRETE MORTAR, a crystalline waterproofing mortar used to fill large cracks.

BS Design Corporate Towers, Fortaleza, Brazil

The BS Design Corporate Towers bring together innovative design, comfort, and sustainability. The project is also the first LEED GOLD-certified building in Fortaleza, the capital of Ceará state in northeastern Brazil. Designed by Daniel Arruda, the architectural style is iconic, innovative, and timeless, and was realized by BS Par, the project contractors. The two staggered towers are inspired by a raft's sail and are connected at the top, creating a free span of 35 meters. At the ground level, this allows for a large public square open to the city. The sales value of this project was estimated at US$ 100 million.

Because Fortaleza is a coastal city, concerns were raised about the water table fluctuation and the risk of chloride penetration into the concrete structure of BS Design Towers, which extends 5 levels below ground.

To ensure the durability, as well as support the sustainability requirements of the project, PENETRON ADMIX-treated concrete was used for the entire foundation of this landmark building.



Forluz Company Headquarters, Belo Horizonte, Brazil

The new Forluz corporate headquarters, located in Belo Horizonte, is the first development in the state of Minas Gerais to receive the LEED GOLD certification. In addition, the building also received the PROCEL Seal for its extraordinary energy efficiency.

Architects Gustavo Penna and Alexandre Bragança, together with VIA Engenharia, lived up to expectations by creating this remarkable design, characterized by innovation, respect for the environment, and a bold architectural style.

The US$65 million project comprises 30 floors; with 25 above-ground office floors and 5 underground levels, which house retail areas and a parking garage, for a total building area of 58,995 m². Sustainable technologies include solar energy systems, the use of natural light, water recycling, and optimized energy use.

PENETRON ADMIX, PENETRON, PENEBAR SW-55 were used in the foundation, making it impermeable to water and all liquids, and substantially more durable.

AQWA Corporate, Rio de Janeiro, Brazil

The AQWA Corporate project is the first office development in Brazil developed by renowned architect Norman Foster, of Foster+Partners, and Tishman Speyer Developments. The structural engineering was done by JKMF of São Paulo.

AQWA is strategically located along the waterfront in the heart of Rio de Janeiro's Porto Maravilha urban regeneration district. Sustainability was a key focus of this LEED GOLD-certified project and as a result, incorporates unique features such as: air conditioning condensation, a system to capture and reuse of 80% of rainwater for use in irrigation of gardens and bathrooms, and an in-house wastewater treatment system.

The 22-story, twin-tower building consists of 125,000 m² of office space with retail and public spaces. All floors provide a unique 360-degree view, including sights such as the Rio-Niterói Bridge, Sugarloaf Mountain, and Christ the Redeemer, which has been voted one of the New Seven Wonders of the World.

Because of its proximity to the sea, the concrete foundations are in constant contact with salt water. To protect the substructure against deterioration due to water and chloride penetration, PENETRON ADMIX was added to the concrete of the entire foundation.

Strata Wynwood, Miami, USA

The $71 million Strata Wynwood project was developed by CIM Group and One Real Estate Investment. Located in Miami's popular Arts District, the 1.78-acre (7,200 m²) site spans a full city block. The multi-use development comprises 27,000 ft² (2,455 m²) of street level retail and studio space, with three office floors (approximately 60,000 ft²/5,455 m²) above. The site is topped by two eight-story towers housing 257 apartment units (with studio and 1-3-bedroom layouts) overlooking the amenity areas, which include a business center and computer lab, outdoor pool with cabañas, a clubhouse, a fitness center, and a residents' lounge and grill. Strata Wynwood also has a garage with 480 parking spaces.

Since Florida is essentially a porous layer of limestone sitting on bedrock, any project site in Miami with below-grade structures is going to be confronted with a lot of groundwater seeping into the construction site.

Penetron was asked to provide a more reliable – and cost effective – alternative to the originally specified membrane system. The local Penetron expert worked together with Stantec Consulting

Services, the project's structural engineer, and Paramount, the waterproofing consultant, to come up with an optimal concrete waterproofing solution. Cemex, the ready-mix concrete supplier, provided a PENETRON ADMIX-treated concrete mix for the below-grade pad foundation footings and elevator pits of the Strata Wynwood project. PENEBAR SW-55, a swellable waterstop, was installed along the construction joints and around penetrations found in the elevator pits.

Territoria Apoquindo Office Towers, Las Condes (Santiago), Chile

Until the 1930s, the city of Las Condes was little more than a rural backwater east of the capital. Today, as part of the Santiago metropolitan area, it is an affluent city with a booming business sector. Featuring a mix of elegant residential neighborhoods and towering business centers, most of Las Condes' commercial activity is situated along Apoquindo Avenue, which is often referred to as "Sanhattan."

The Territoria Apoquindo Office Towers at Apoquindo 5400 were designed by De Iruarrizaga & Leterier Arquitectos, a well-known Chilean architectural team responsible for numerous high-profile projects across the greater Santiago area. The three office towers of the Territoria Apoquindo project are each 20 stories tall and comprise a total of 35,000 m² of floor space. The top of each tower features a landscaped roof garden while the ground floor areas and the central plaza feature park-like green spaces and extensive retail areas for shopping and entertainment.

The six underground levels that form the Territoria Apoquindo tower foundations, the 1,200-car parking garage, and further basement structures, also house a large bicycle garage and a pedestrian tunnel that provides direct access to the nearby Santiago Metro subway station.

A competitive crystalline admixture was initially specified by the engineers at Territoria to secure these structures against the high groundwater at the construction site. To be on the safe side, the engineers also reached out to a local team of concrete experts about a high-performance solution that would permanently protect the extensive underground concrete structures.

The team at Penetron Chile worked out a tailor-made solution addressing all desired performance parameters of the concrete mix and further assurance was provided by the extensive track record of Penetron in similar projects in the region. This ultimately convinced the client of the unmatched Penetron performance when it comes to permeability-reducing and self-healing.

After successful testing, Society Petreos, the local ready-mix supplier, added PENETRON ADMIX to over 2,100 m³ of concrete used for the below-grade basement walls and the foundation slabs. To secure the interfaces between the walls and slabs, around 300 m of PENEBAR SW-45 ensured a permanent seal for the new concrete joints.