

A close-up photograph of a 3D printed concrete structure, showing multiple layers of curved, overlapping concrete rings. The texture is rough and granular, typical of 3D printed concrete. The background is slightly blurred, showing more of the structure.

# Realtà MAPEI

NORTH AMERICA

Printing 3D homes with MAPEI  
mortar/ink: Technology, innovation  
and compassion at work

ISSUE 37

## PRESIDENT'S LETTER



**Luigi Di Geso**  
President and CEO,  
MAPEI North  
America

### MAPEI innovation combines with 3D technology to create real-world compassion

We have an informal company motto: “Never stop pedaling.” This comes from our company’s love of cycling. That catchphrase guides MAPEI on a global level to always pursue excellence, to strive for the most leading-edge solutions to real-world problems in the construction industry. Because of this, in most scenarios, MAPEI stands in front as the leader, the main innovator in our field. But sometimes, we see sparks of innovation from “outside.”

The top story in this issue celebrates one such spark – our strategic partnership with Black Buffalo 3D – a flash of innovation that drew our attention and led to the creation of **Planitop® 3D** to be printed in their 3D printers.. It also led us both to a partnership with Habitat for Humanity that has created sustainable, attainable homes for those who otherwise might not have the chance at homeownership.

A mortar/ink designed to be printed, *Planitop 3D* not only answers our company’s drive for innovation, but it also fulfills our directive to reach out and help our communities, allowing us to help fix the nation’s housing crisis. It is the latest in a long line of MAPEI’s products, stretching back to 1937, that provide not only the strongest, most durable solutions for the construction industry, but are also the most innovative.

For the families that will eventually live in these houses, and the ones yet to be built, we say “Welcome home.” May these walls protect them with their lasting durability, and may the innovation behind their creation inspire all those sheltered within to pursue their own goals and to always push for excellence. As we like to say, “Never stop pedaling.”

A handwritten signature in black ink, appearing to be 'Luigi Di Geso', written in a cursive style.



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**ON THE COVER**  
 Printing 3D homes  
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 Technology, innovation  
 and compassion at work

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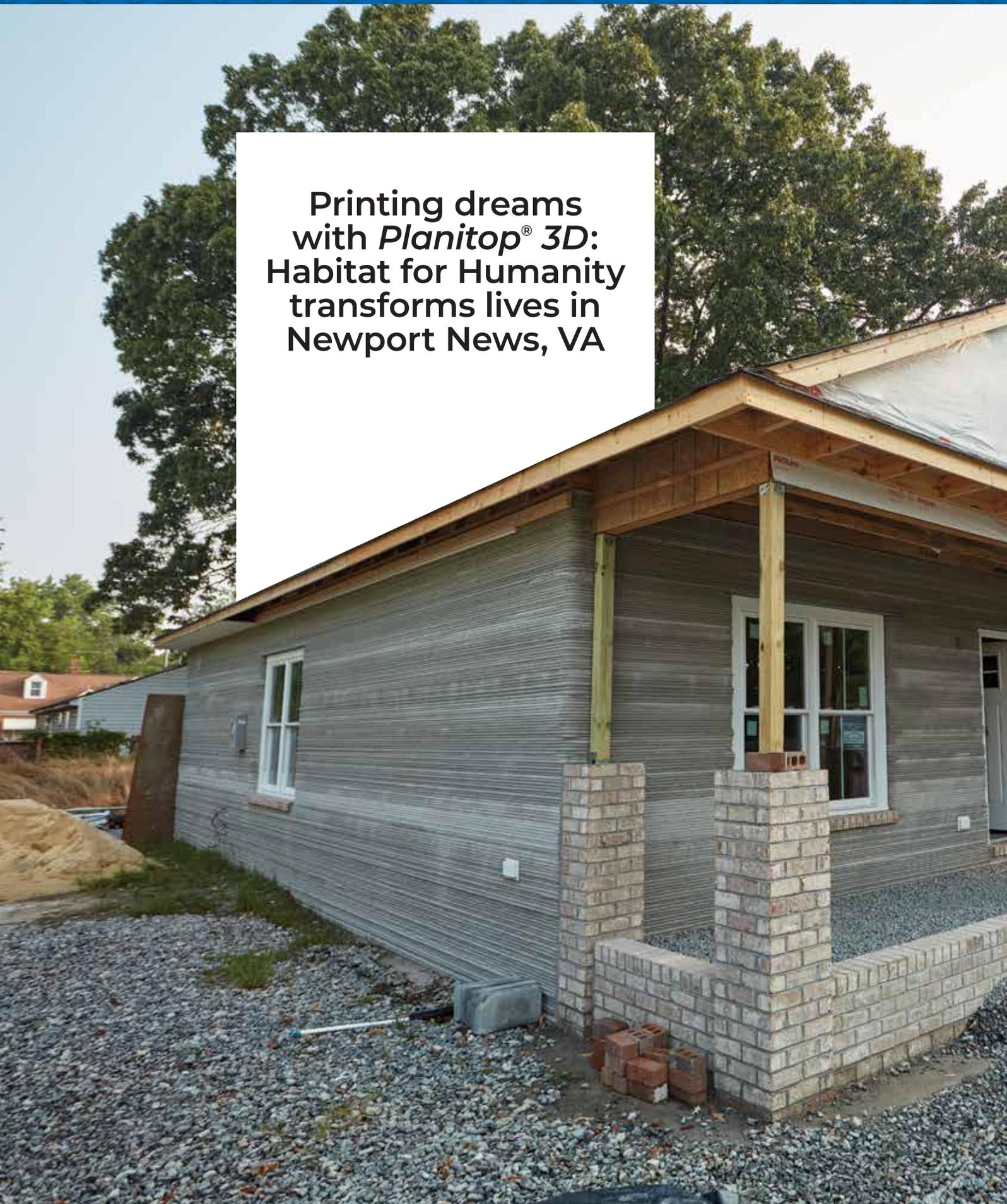
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Printing dreams  
with *Planitop*<sup>®</sup> 3D:  
Habitat for Humanity  
transforms lives in  
Newport News, VA





The combined transformative power of advanced construction materials and cutting-edge technology is evident in the collaboration between MAPEI's *Planitop 3D* ink/mortar and Black Buffalo 3D Corporation's NEXCON printers. Together, they have been revolutionizing the construction process and bringing hope to families in need through a partnership with Habitat for Humanity. During the week of June 12, 2023, an extraordinary event took place in Newport News, VA, showcasing the remarkable impact of 3D-printed housing.

This event was a celebration of innovation, compassion and the spirit of community coming together to make a difference. Habitat for Humanity, known for its commitment to providing affordable housing, joined forces with MAPEI Corporation, a leading provider of advanced construction solutions, and Black Buffalo, pioneers in 3D-printing technology. The result was a groundbreaking initiative that combined the strength and versatility of *Planitop 3D* with the precision and efficiency of Black Buffalo NEXCON printers, to create innovative, affordable homes.

The teamwork between MAPEI and Black Buffalo 3D has redefined what is possible in the world of construction. However, the impact of this strategic partnership goes far beyond the physical structures themselves. It touches the lives of the families who will now have a place to call home – a haven where they can build their futures and create cherished memories. The joy and gratitude expressed by these families were palpable during the Newport News event. The keys to their new homes will symbolize a fresh start, a glimmer of hope for a brighter tomorrow.

The relationship between MAPEI, Black Buffalo 3D and Habitat for Humanity not only transforms individual lives but also revitalizes entire communities. The injection of aesthetically pleasing and sustainable housing solutions brings new energy and vitality to neighborhoods, creating a ripple effect of positivity and empowerment. The impact of this initiative extends beyond the physical structures, fostering a sense of pride and belonging among residents, and inspiring others to embrace the potential of advanced construction technologies.

### The power of *Planitop 3D* and Black Buffalo printers: Unleashing innovation

At the heart of the collaboration between MAPEI Corporation and Black Buffalo 3D lies the revolutionary technology of *Planitop 3D*. This high-performance, cementitious mortar/ink has become a game-changer in the construction industry, offering myriad benefits that elevate the building process to new heights.

*Planitop 3D* is engineered to deliver exceptional durability, efficiency and workability. Its advanced formulation ensures long-lasting performance, withstanding the test of time and environmental conditions. This reliability is crucial in Habitat for Humanity projects, where the aim is to provide homes that will serve generations to come.

Moreover, *Planitop 3D* is the only construction ink/mortar to be internationally coded. "*Planitop 3D* has been granted

official AC509 certification by the International Code Council Evaluation Service (ICC-ES)," explained Steven Day, MAPEI's Director of Operational Marketing. "This means both the ink/mortar and the printing technology itself were subjected to strict rigorous testing and were found to meet building code requirements for 'bearing, non-bearing and shear walls up to 40' [12.2 m] in height.' " AC509 is the ICC code for 3D Automated Construction Technology for 3D Concrete Walls.

"Walls that are printed with *Planitop 3D* and Black Buffalo's NEXCON printers can be compared to those built with concrete masonry unit [CMU] blocks," Day said. Walls constructed through the printing process – using these specific materials – can be considered as strong as those built through conventional construction means.

The strategic partnership with Black Buffalo printers takes the capabilities of *Planitop 3D* to even greater heights. "Large-scale 3D-construction printers and ink/mortar can now improve the way the world faces affordable housing challenges," said Peter Cooperman, Black Buffalo's Interim CMO. "Black Buffalo's state-of-the-art 3D printing technology allows for precision and efficiency in building that were once unimaginable. The combination of *Planitop 3D* and Black Buffalo printers results in a seamless integration of advanced materials and innovative technology, producing homes, emergency shelters and even custom commercial construction that are not only structurally sound but also quickly and affordable built."





The efficiency of this collaboration is a testament to the power of teamwork and technological advancements. With traditional construction methods, building homes requires significant time and effort. However, with the integration of *Planitop 3D* and Black Buffalo NEXCON printers, the process is streamlined and expedited. Construction teams can now achieve precision and complexity in a fraction of the time, allowing them to build more homes and positively impact more lives. When working on a Habitat for Humanity project, such as the one in Newport News, VA, this efficiency translates into cost savings, allowing Habitat for Humanity to allocate resources more effectively and build more homes for families in need.

The environmental benefits of *Planitop 3D* and Black Buffalo NEXCON printers are also worth noting. As sustainability becomes an increasingly important consideration in the construction industry, this strategic partnership demonstrates a commitment to responsible building practices. By minimizing material waste and optimizing resource usage, *Planitop 3D* and 3D-printing technology contribute to a greener future, aligning with the goals of Habitat for Humanity to build homes that are environmentally friendly.

The project in Newport News, VA, serves as a powerful example for the construction industry. It demonstrates the potential of embracing advanced technologies and innovative solutions to address the pressing challenges of affordable housing.

“As we move forward, it is crucial to continue nurturing these collaborations and driving further advancements in construction methodologies,” Day said.

#### **Lasting impact: Empowering families and communities**

The teamwork between MAPEI Corporation and Black Buffalo 3D in the Habitat for Humanity project in Newport News, VA, has left a lasting impact on the families who will call these homes their own, as well as in the community in which they reside. Beyond the immediate benefits of safe and affordable housing, this partnership has empowered individuals and fostered a sense of community pride.

For the families who received these homes, the impact is immeasurable. The security and stability provided by their new residences have laid the foundation for a brighter future. Children now have a place to grow, learn and thrive, fostering their development and nurturing their aspirations. Parents have newfound confidence and peace of mind, knowing that their children have a home in which to flourish.

Beyond the individual families, the impact extends to the entire community. The revitalization of neighborhoods through the construction of aesthetically pleasing and sustainable homes has a profound ripple effect. It instills a renewed sense of hope, rejuvenating the spirit of the community and inspiring others to act.

This project has not only provided tangible housing solutions but has also sparked conversations and encouraged community engagement. It has brought together individuals, organizations and volunteers who share a common vision of creating a better future. The impact of this collective effort can be felt in the renewed sense of pride and ownership within the community.

As the collaboration between MAPEI Corporation and Black Buffalo 3D continues to evolve, there is a shared commitment to expanding its reach, making a positive difference in more communities.

Day summed up the Virginia event, saying, “As we look ahead, we must continue to foster these projects, push the boundaries of what is possible, and strive to create a world where safe, affordable and sustainable housing is accessible to all. Through the power of partnership, we can continue to build dreams, transform lives and make a lasting impact on individuals, families and communities in need.”

## MAPEI kicks off the 2023 show season

2023 began with a return to Las Vegas and back-to-back shows



### The World of Concrete (WOC)

January 17 - 19, 2023

Las Vegas Convention Center, Las Vegas, Nevada

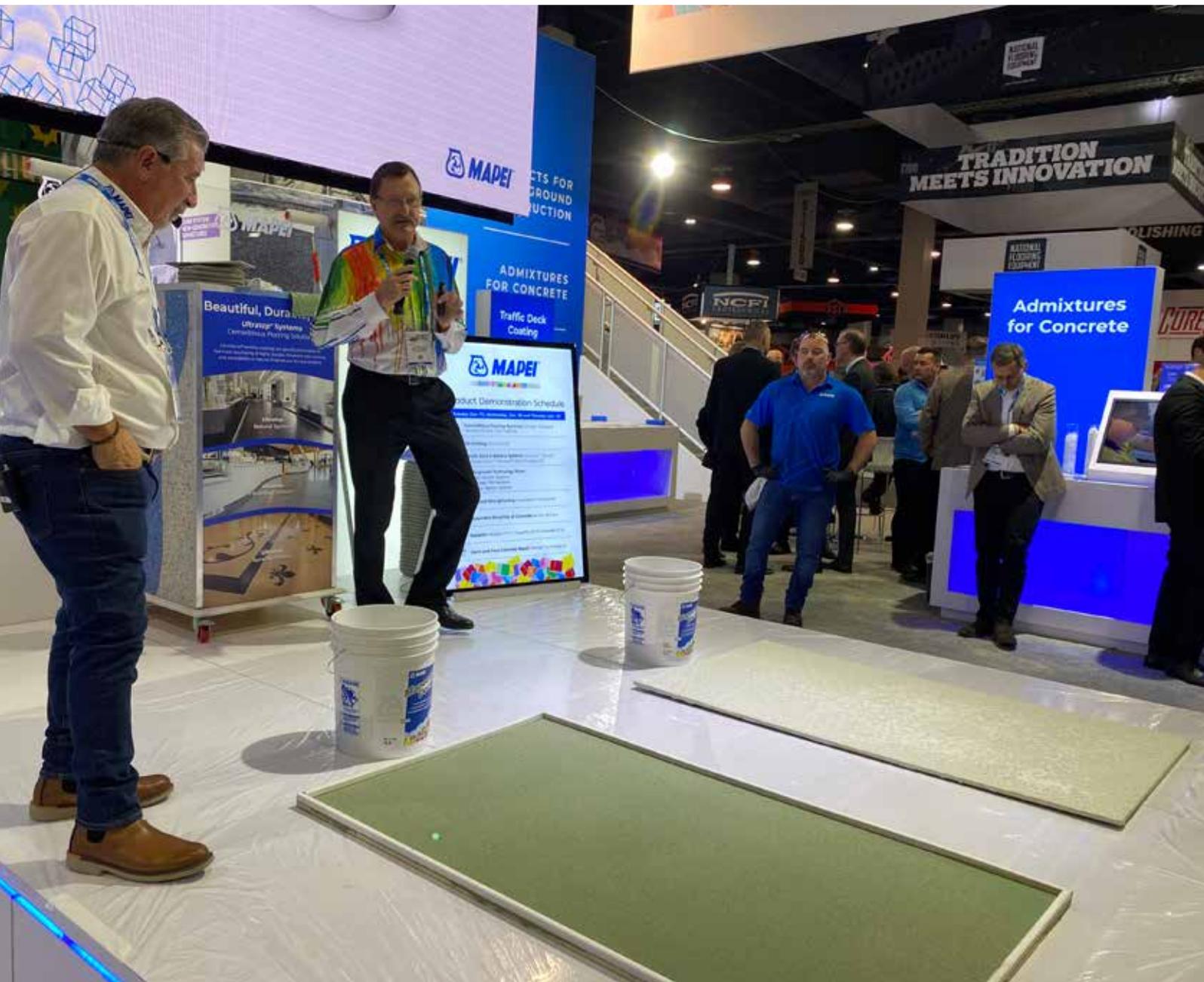
Approximately 48,000 industry professionals from around the world attended the 49<sup>th</sup> annual World of Concrete (WOC), which was held at the Las Vegas Convention Center. The event featured approximately 1,500 companies – both domestic and international – exhibiting across more than 700,000 net square feet (65 032 m<sup>2</sup>) of indoor and outdoor space.

As in past years, MAPEI's two-story, 60 ft. x 40 ft. (2,400 sq. ft. or 223 m<sup>2</sup>) booth dominated the convention floor – centered around a demonstration stage and filled with innovative system solutions. For a second year, MAPEI's product demonstrations were emceed by Sam Biondo, MAPEI Corporation's National Technical Presenter. As emcee, Biondo interacted with the MAPEI team and with the gathered crowd, asking perceptive, real-world questions that drew people to the booth.

Maurizio Luccarelli, Business Development Leader for Cementitious and Resin Flooring, demonstrated **Ultratop® Loft** systems. Rankin Jays, Business Development Leader for Coatings, showcased systems with **Mapecoat™ Deck S** and **Mapecoat Deck T**, providing examples of solutions for waterproofing and coating decks, balconies, walkways and more. MAPEI UTT experts – including Monica Rourke (Regional Manager Waterproofing and Injection Systems), Dr. Cristina Oñate (Product Line Manager Mechanized Tunneling, North America) and Tanner Murt (Business Development Manager Western US) – showed MAPEI's superior injection waterproofing and soil conditioning systems with dynamic and attention-getting presentations.

The innovations continued with **Planitop® 3D** mortar/ink. Kevin Smith, CRS Director of Product Development and Product Management, was joined by Peter Cooperman, the CMO of MAPEI's strategic partner, Black Buffalo 3D, on the stage to describe the houses that are being printed in conjunction with Habitat for Humanity. In addition, they discussed our recent industry-leading ICC-ES AC509 certification for 3D-automated construction for concrete walls.

We also "set the stage" for the upcoming product launch of the **CUBE System** solutions for admixtures designed to reduce the environmental impact of concrete production. We did so not including it in our press media, but rather discussing it on the stage during the **Re-Con Zero Evo** demonstration, which emphasized the need for sustainable practices in the concrete industry – including sustainable concrete. The demo also included a mini cement truck – with a working cement mixer – on stage. It was a unique way to demonstrate an innovative product, and it filled the aisle with people stopping to watch the demonstration, and more importantly, staying to ask questions and get information afterward.





**The International Surface Event (TISE)**  
**January 31 - February 2, 2023**  
**The Mandalay Bay Convention Center, Las Vegas, Nevada**

The International Surface Event (TISE) drew approximately 20,000 industry professionals from around the world to the Mandalay Bay Convention Center. Composed of three trade shows (SURFACES, StonExpo/Marmomac and TileExpo), TISE featured approximately 600 manufacturers and suppliers of tile, stone, marble, resilient, laminate, hardwood, carpet and rugs.

It was a busy and successful show for MAPEI. In fact, our booth was awarded "Best in Show" from *Tile Magazine* for its eye-catching displays and attention-drawing demos. As in the past, our 50 x 40 (2,000 sq. ft. or 186 m<sup>2</sup>) space featured a large demo stage backed by a massive video screen. The MAPEI Demo Team, led by Sam Biondo, drew large crowds each day to see our innovative solutions.

The crowds not only gathered around our demonstrations, but they also gathered around a mock shower installation featuring our *Shower System 4 LVT*. New products demonstrated included a variety of solutions for LVT including *Ultracoat® ReNewIt* products for renovating rather than replacing LVT. Products in this system include *Mapecoat 4 LVT*, *Ultracoat ReNewIt Primer* and *Ultracoat HT 2K*. Roller-applied *Ultrabond ECO® 379* high-performance multi-flooring adhesive, *Planiseal® MBT* tape-based moisture-barrier and primer for self-leveling underlayments, and our new *MapeLevel™ Easy System* of caps and spacers for tile lippage control were also shown on the stage and in the booth.

Both shows were successful opportunities for us to reach our audiences and to convey the message that MAPEI innovation remains at the front of the industry.





A waterproofing system featuring MAPEI's *Planiseal CR1* membrane was installed in the underground parking complex.

The Arbordeau condominium complex features 120 town houses and apartment flats that are situated on 15 acres in the heart of Devon, a quiet suburb that is outside of historic Philadelphia, PA.

As the name "Arbordeau" suggests, the architecture of the complex is European style, meaning that the townhouses and flats are grouped in clusters around circles. This design creates a sense of community, of space and of privacy, as each cluster has its own village feel. All parking is underground, and residents have direct access from their parking spots to their homes.

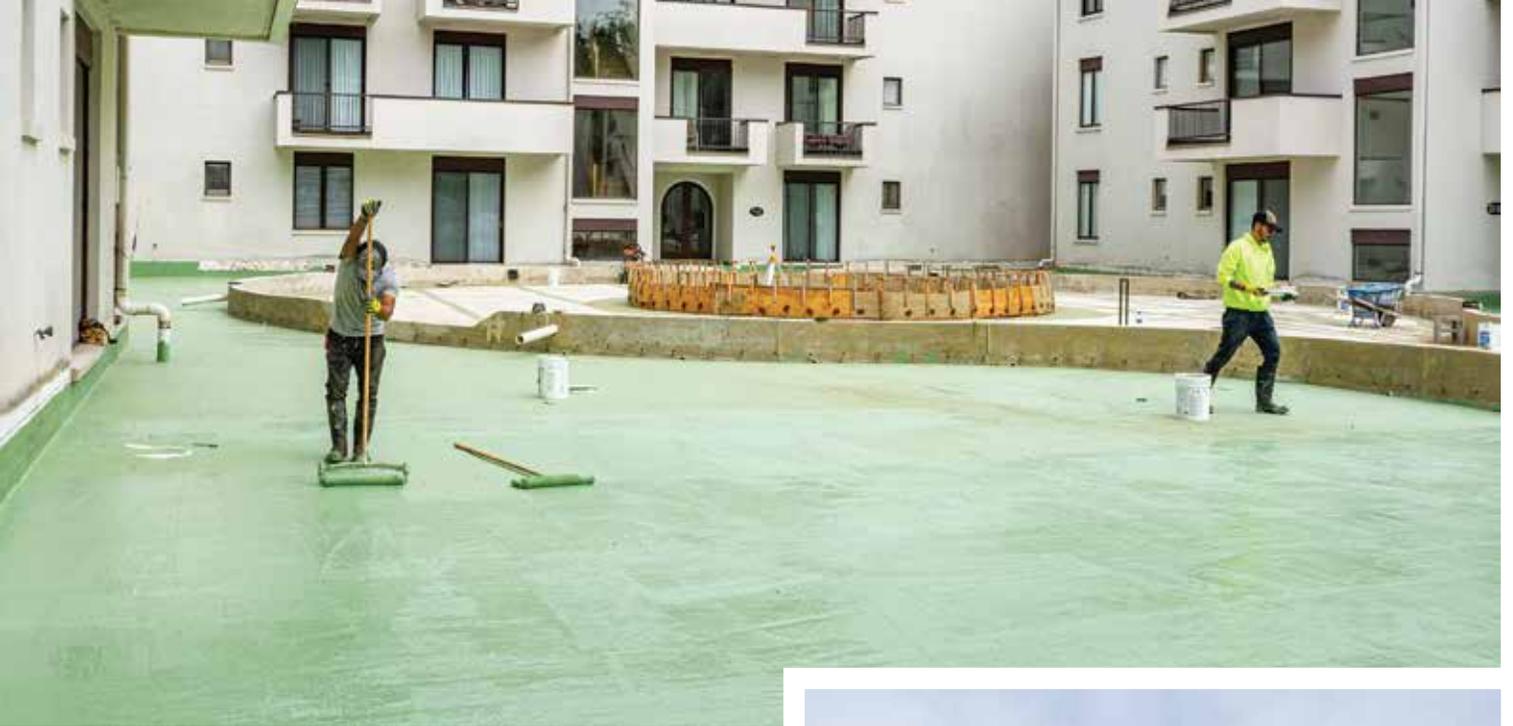
It was the underground parking that brought MAPEI to Arbordeau. Given that the complex was originally built in 1974, by 2020 the waterproofing membranes over the parking garages needed repairs. Although the garages had been previously patched through the years, the owners were looking for a long-lasting solution.

A design specification was written, and contractor Hudak Infrastructure was hired. However, the originally specified waterproofing product was expensive. Familiar with MAPEI, Hudak reached out to the company for an alternative that would have the same warranty but be less expensive. MAPEI had just the right product: *Planiseal CR1*.

After meeting with MAPEI's technical service and sales representatives, the owners agreed to the cost-saving solution. MAPEI's warranted waterproofing system solution featuring *Planiseal CR1* provided a much more efficient and effective solution to the parking garages' waterproofing needs. The switch was made, and MAPEI was officially "on the job."



Arbordeau condominium complex – Devon, PA, USA



## MAPEI on the job

Both the contractor and the owners requested on-site training and supervision from MAPEI throughout the course of the installation. It was not because the products are difficult to install, but rather because the advice was so helpful that the install went quickly and smoothly. In addition, MAPEI's Technical Services team was able to train the installing crew on the appropriate way to apply *Planiseal CRI*.

Unlike other waterproofing membranes, *Planiseal CRI* is a single-component, 100%-solids, cold-fluid-applied, fast-setting structural membrane with low VOCs, and it can be applied in exterior and interior settings. While most waterproofing crews are used to mopping hot tar, MAPEI's *Planiseal CRI* applies like a coating with little to no VOCs, meaning that crews can use it indoors, on walls and in occupied spaces with little to no smell.

The application steps of the project were simple. First, the Hudak crew removed all debris from the substrate (including asphalt, soil, concrete curbs and vegetation), clearing the deck down to structural slab. Any previous waterproofing membrane was removed via scarification and shotblasting.

Once the substrate was cleaned, the crew performed concrete repairs, sloping as needed to create drainage. Next, using rollers, crew members installed two coats of *Planiseal CRI* – with *MAPEI LMR Fabric* embedded between the coats – on top of the properly prepared cracks and control joints. Then, on top of the waterproofing membrane, the crew installed *Mapedrain 30* drainage composite and new drains as needed.

"The entire project has been accomplished in three phases so far," explained David Marofsky, MAPEI's Concrete Restoration and Waterproofing Specialist, who was involved in the project.

Marofsky added, "Phase 1, known as 'ILE D'Huyere,' was August 2020 and encompassed 10,000 square feet [929 m<sup>2</sup>]. Phase 2, known as 'Dezac,' was in June of 2021 and was 11,000 square feet [1 022 m<sup>2</sup>] of waterproofing. Phase 3, known as 'Gevrey,' took place in June of 2022 and totaled 14,000 square feet [1 301 m<sup>2</sup>] for a grand total of approximately 35,000 square feet [3 252 m<sup>2</sup>] over two years."

If there is a Phase Four, by all accounts it will be just as successful as the first three. And another parking garage will be watertight thanks to *Planiseal CRI*.



## TECHNICAL DATA

**Arbordeau condominium complex** – Devon, PA, USA

**Project category:** Residential

**Years of construction:** 2020 to 2022

**Years of MAPEI involvement:** 2020 to 2022

**MAPEI coordinators:** Joe Markert and David Marofsky

**Project owner:** Arbordeau Condominium Company

**General contractor:** Hudak Infrastructure

**Installer contractor:** Hudak Infrastructure

**Project manager:** Andon Hudak

**Project size:** About 35,000 square feet (3 252 m<sup>2</sup>) over 3 phases

Phase 1 (ILE D'Huyere): 10,000 square feet (929 m<sup>2</sup>)

Phase 2 (Dezac): 11,000 square feet (1 022 m<sup>2</sup>)

Phase 3 (Gevrey): 14,000 square feet (1 301 m<sup>2</sup>)

**Challenges:** Once MAPEI was on the specification, MAPEI representatives were required to provide on-site training and supervision throughout the project. Working around residents requires complex staging.

### MAPEI Products

- *Mapedrain™ 30*
- *MAPEI LMR Fabric*
- *Planiseal® CRI*

## High-Flying Coatings

MAPEI's *Mapecoat Deck T* protects a hotel-casino with a history worthy of Hollywood



Radisson Valley Forge – King of Prussia, Pennsylvania, USA





When a popular eastern hotel and casino was looking a little time-worn, the owners turned to MAPEI and 176,000 sq. ft. (16 351 m<sup>2</sup>) worth of our concrete restoration products.



Originally built in 1972 as a part of a “mixed use” development, this modernist tower now stands next to a casino, which is perhaps fitting given that its history was at times like that of a Hollywood script.

According to facts found online, developer J. Leon Altemose<sup>1</sup> decided to build using non-union workers. This was a highly controversial move in a state where union loyalties ran deep. The unions protested. In fact, on the night of June 5, 1972, the construction site was fire-bombed. This “Goodfellas-esque” history is very ironic because, since 2012, the 15-story octagonal tower has stood as part of a hotel-casino complex.

By 2021, however, the tower’s facade needed a refresh. Enter MAPEI and 176,000 sq. ft. (16 351 m<sup>2</sup>) of concrete restoration products including our latest, *Mapecoat Deck T*.

### MAPEI on the job

In this case, networking and knowledge paid off. As explained by David Marofsky, MAPEI’s Concrete Restoration and Waterproofing Specialist who was involved with this project, “I met Tony Cicero, owner of Gibble Construction, the general contractor and installing contractor [for the Radisson project] at a waterproofing training that [MAPEI] completed with one of our distributors at our Swedesboro plant in the spring of 2019. He told me about this project. I went and looked at it with him and helped formulate a repair strategy and recommended products. A small amount of work was done that year, but then the world stopped for COVID in 2020, and the main project didn’t start until 2021.” And when the project finally started, it was with a “bang.”

Just because the explosions had long-ago been tamed, it didn’t mean that the excitement ended at this property. Staging this project was no exception – although the Hollywood stunts were now more of a “circus” variety. To perform the work, the Gibble crew had to access the balconies and facade from

<sup>1</sup>[https://www.inquirer.com/philly/obituaries/20080416\\_Controversial\\_developer\\_J\\_Leon\\_Altemose.html](https://www.inquirer.com/philly/obituaries/20080416_Controversial_developer_J_Leon_Altemose.html)



swing stages suspended from the roof of the building. Given the building's height, scaffolding was out of the question. The hotel would remain open during the project, but "the world itself was essentially shut down because of COVID," Marofsky said. "There were hardly any visitors. And any debris was caught by a lower roof that encircled the entire building."

Staging from the roof, the Gibble crew had to rappel down the side of the building, working with power washers, chipping guns, and rollers from custom-built mobile stages. "The swing stage installation was complicated due to the shape of the building and the top protruding out over the main facade. Special accommodations had to be made and custom stages built," Marofsky continued. Personal protective equipment (PPE) played an extensive part of this project, with crews wearing five-point safety harnesses.

And what work were they performing while harnessed up? First, all deteriorated concrete on balconies and on the facade was removed via chipping guns. The surface was then cleaned and repaired using MAPEI Concrete Restoration Systems (CRS) products – *Maferfer 1K*, *Planitop XS*, *Planitop X*, *Planitop 18 ES* and *Maeflex EMC-1*. When the repairs had been completed, the coatings were installed.

The facade and balconies were power washed. Then *Mapecoat Deck T* and *Elastocolor Coat* were applied according to Technical Data Sheet instructions. "*Mapecoat*

*Deck T* was launched at World of Concrete 2021, and it was a perfect match for this project, which was originally slated for a urethane coating [*Mapecofloor*]," Marofsky said.

"*Mapecofloor* is more suited for high-traffic areas, requires multiple coats and is a two-component product. *Mapecoat Deck T* is single-component – which was a huge consideration given the application parameters of this jobsite. Just like *Elastocolor Coat* (used for the facade), *Mapecoat Deck T* can be tinted any color and is perfect for light-traffic areas like balconies. These balconies do not even get used, as the doors are screwed shut." This was a dramatic first major project for *Mapecoat Deck T*, as there were 240 balconies to be coated in high-flying fashion.

Marofsky estimated the final project totals as:

- Stucco application: Approximately 40,000 sq. ft. (3 716 m<sup>2</sup>)
- Brick coating: Approximately 100,000 sq. ft. (9 290 m<sup>2</sup>)
- Balcony coatings: Roughly 18,000 sq. ft. (1 672 m<sup>2</sup>) for the tops, and 18,000 sq. ft. (1 672 m<sup>2</sup>) for the bottoms of 240 balconies

In addition, "70% of the 240 balconies needed some sort of repair prior to coating," he explained.

By all accounts, the applications were a hit worthy of a Hollywood happy ending. The hotel owners are pleased with the results, and the high-flying crew has a unique success story to add to their repertoire.

## TECHNICAL DATA

**Radisson Valley Forge** – King of Prussia, PA, USA

**Project category:** Tourism and Wellness

**Year of construction:** 2021

**Year of MAPEI involvement:** 2021

**MAPEI coordinator:** David Marofsky

**Project owner:** Boyd Gaming

**General contractor:** Gibble Construction

**Installer contractor:** Gibble Construction

**Project manager:** Nick Cicero

**Foreman:** Adam Gaston

**Project size:** Approx. 176,000 sq. ft. (16 351 m<sup>2</sup>)

**Challenges:** Crew members had to work in five-point safety harnesses while suspended in the air. The property was open during the project, although traffic was relatively light due to it being the height of the COVID pandemic.

## MAPEI Products

- *Elastocolor*® Coat
- *Mapecoat*™ Deck T
- *Maferfer*™ 1K
- *Maeflex*® EMC-1
- *Planitop*® 18 ES
- *Planitop* X
- *Planitop* XS



Suzanne and Walter Scott Aquarium at Omaha's Henry Doorly Zoo and Aquarium – Omaha, NE, USA

## Paver Installation Makes a Splashy Impression

MAPEI's system solutions provide an impressive, detailed installation at a busy aquarium

One of the busiest and most popular zoos in the United States recently updated the entryway, facade and restrooms of its beloved aquarium. Zoo officials knew that they wanted to install something that would not only be durable enough to withstand the foot traffic and spilled food and drinks that come with their guests, but would also be attractive and unusual. They turned to MAPEI for system solutions.

The Suzanne and Walter Scott Aquarium at Omaha's Henry Doorly Zoo and Aquarium in Omaha, Nebraska, had been given private funds for a rehab project.

As the largest aquarium inside a zoo, the Scott Aquarium features a 70-foot (21.3-m) shark tunnel, sea turtles, Antarctic penguins and a host of warmwater fish. The aquarium hosts coral reefs and replicates polar regions, salt and freshwater exhibits, and even the Amazon. It is a popular focal point for the community and is even used for after-hours events.

The project to update the entryway, facade and restrooms of the beloved aquarium facility would be followed closely by the community – and the results needed to meet a high standard.



The Omaha Zoological Society wanted to replicate, as much as possible, the patterns of the aquarium's underwater world that the guests would be enjoying in the exhibit. The organization wanted something with details, something that went beyond "standard concrete."

It was ultimately decided that the undulating underwater patterns would best be replicated by pavers – either installed in an asphaltic set to be completed by a landscape company or in a direct-bond installation to be completed by a tile contractor.

Tile contractor Universal Flooring advocated for MAPEI products, and MAPEI worked with the tile contractor and with the distributor, Daltile Omaha, to put a submission package together. After a conference call with Daltile Omaha, MAPEI sales representative and project coordinator Brett Robben, and MAPEI Director of Architectural Sales Mike Granatowski, all on the call were convinced that MAPEI system solutions were the best for the project.

The second phase was to convince the owner (the zoo), architect/designer (Stanley J. How Architects), and contractor (Kiewit Corporation) that MAPEI's system solutions were superior to the proposed installation from the landscape company.

During a roundtable meeting with 15 representatives from all involved companies, Robben presented MAPEI's system solutions that included reference projects from MAPEI's Website as well as Tile Council of North America (TCNA) installation details and Technical Data Sheets.

Robben answered all the questions that were posed, demonstrating knowledge of the products and of the project. He also showcased the superior nature of MAPEI's system solutions. In addition, MAPEI demonstrated that it works with a team: At the presentation, MAPEI had four representatives from Daltile Omaha, one from MAPEI and two from Universal Flooring, whereas the landscape company had one representative who presented limited information.

True to MAPEI form, Robben outlined a detailed plan that covered the project from the CADs to the finish – system solutions involving technical knowledge and innovative products. At the end of the presentation, Universal Flooring and MAPEI were awarded the job.

### MAPEI on the job

This remodeling project was an extensive one. The project specifications featured a 12,000-square-foot (1 115-m<sup>2</sup>) aquarium entryway and food-court area for the Sea Turtle

Café. The café plans included 1,000 square feet (92.9 m<sup>2</sup>) of an exterior glass-tile facade with waterjet glass outlining the words, “Sea Turtle Café.”

The entryway and food-court area were highlighted by 2,000 square feet (186 m<sup>2</sup>) of exterior Dekton (ultra compact, high-performance tile panels) walls. The project also included 7,500 square feet (697 m<sup>2</sup>) of floors and walls in exterior and interior restrooms.

The remodel started in July 2019, but it was not until October that Universal Flooring was able to begin its portion of the project and start work on the floors and walls.

To approach the project in the most efficient manner, the tile crews were divided into one main crew for the exterior pavers, restrooms and glass, and another crew for the Dekton panels. Crews ranged from two to four people, depending on the day’s scope of work.

Although the install was straightforward, the jobsite presented multiple challenges. The aquarium remained open to its inhabitants and to its visitors during the remodel. For this reason, attention to detail and safety (always a top concern) was even more apparent on this project.

A clear, clean, well-defined path to the doors of the aquarium had to always remain visible and accessible so that the interior could stay open. This was no easy task when overhead trades (for example, those performing the complex steel and metal facade installation) were working while the tile installers worked below. It required a precise coordination of daily, weekly and monthly schedules.

A large part of the daily jobsite meetings was to ensure that all were on the same schedule, and it was not simply a matter of safety. For example, the Universal Flooring crew had to coordinate closely with the concrete contractor so that the concrete contractor could cut relief joints in the slab that was directly under Universal Flooring’s movement joints. The placement of the joints was critical and, because two different crews were responsible for the crucial joints, it was vital that they coordinate their installations and placements.

Robben said, “We had to coordinate the new concrete being poured to overlay our saw cuts/control joints and carry them through the intricate detail/pattern of the tile.” Robben continued describing the flooring installation in general. “The new concrete substrate had slope and drainage designed into it as well, to get water off of the slab,” he said.

The tile crew followed behind. “Surface preparation was performed, and *Mapecem Quickpatch* was installed. Then, *Mapelastic 315* was applied for crack isolation,” Robben said. “The pavers were installed with *Granirapid* and *Kerapoxy CQ* was used for grout, with *Mapesil T* for movement accommodation.”

The close coordination between the concrete and tile contractors also provided a well-textured slab for the *Mapelastic 315* membrane to bond to – maybe a little too well, the contractors would joke between themselves.

The tiles feature a wavy pattern that is meant to mimic waves and light shining through water. It is a beautiful pattern but requires skills to install: The tile contractor had to place the tile and cut radius designs into it.

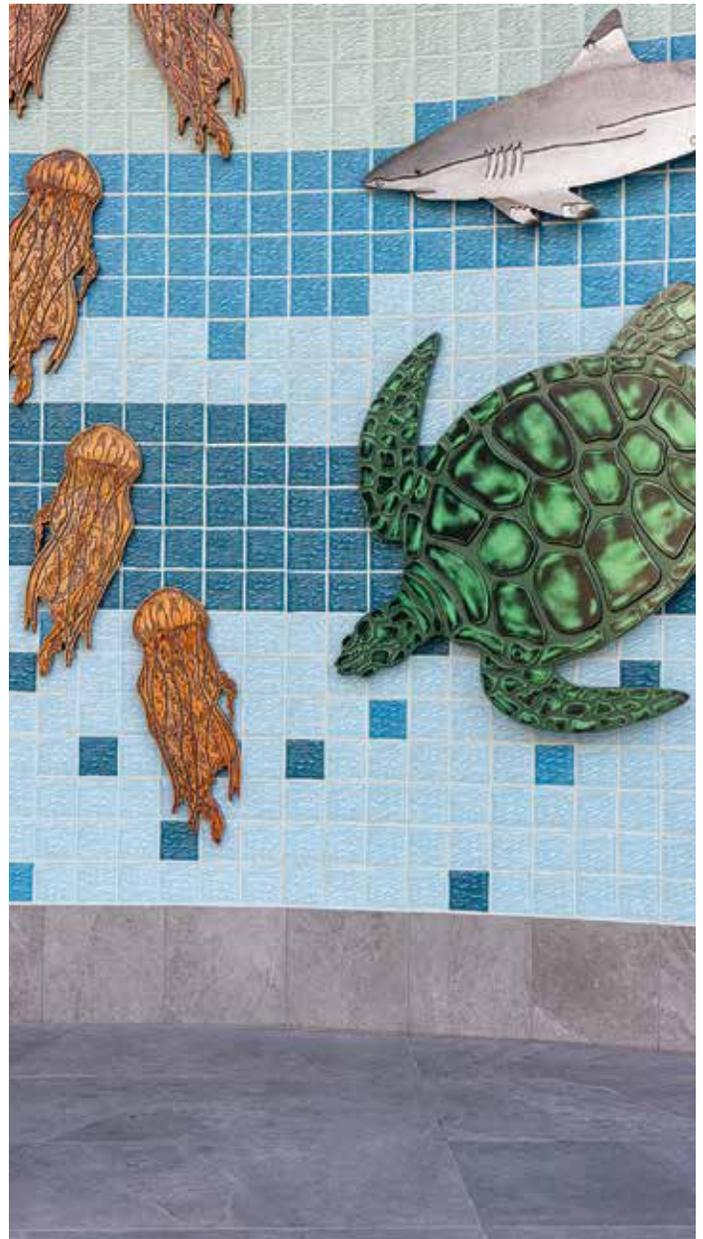


Because the *Mapelastic 315* and the *Granirapid System* mortar bonded so well to the excellently prepared substrate, the tile crew had to be very careful to ensure that the tile was properly placed. Once the tile was down, it was not coming back up. And this was especially important because the tile was patterned and the pattern had to match. The finished floor is a true testament to the skill of the Universal Flooring crew.

In addition to the aquatic creatures, tourists, tight scheduling and competing trades, the tile crew had to deal with Mother Nature herself. Crew members experienced the elements of an exterior installation throughout the harshest winter months before the project was completed in April 2020. They had to schedule around winter in Omaha, with some days seeing an average daily high of 43°F (6°C).

However, as MAPEI proved in the very first meeting before it even won the job, teamwork wins the day. The job finished on time and on budget, and zoo officials are very happy with their rejuvenated aquarium. The aquarium’s inhabitants appear to also be happy with their remodeled home.

Visitors will probably remember the beautiful entryway but only as a fleeting start to the aquarium visit, and that is how it should be. They should remember being immersed “underwater” in a world of patterns where light plays through the waves and sea creatures appear and suddenly vanish. They should remember their visit to the Henry Doorly Zoo’s aquarium and wish to return. These memories should begin the moment that they set foot onto the aquarium’s pavers – pavers that were installed with system solutions (and teamwork) from MAPEI.



## TECHNICAL DATA

### Suzanne and Walter Scott Aquarium at Omaha’s Henry Doorly Zoo and Aquarium – Omaha, NE, USA

**Project category:** Tourism and Wellness

**Years of construction:** 2019-2020

**Years of MAPEI involvement:** 2019-2020

**MAPEI coordinator:** Brett Robben

**Project owner:** Omaha Zoological Society

**Architect/designer:** Stanley J. How Architects

**MAPEI distributor:** Daltile

**General contractor:** Kiewit Corporation

**Project manager:** Jerry Begley

**Project size:**

12,000 square feet (1 115 m<sup>2</sup>) of exterior Daltile porcelain pavers

7,500 square feet (697 m<sup>2</sup>) of floors and walls in interior and exterior restrooms

1,000 square feet (92.9 m<sup>2</sup>) of exterior glass

2,000 square feet (186 m<sup>2</sup>) of exterior Dekton panel walls

**Challenges:** The aquarium remained open throughout the project, so scheduling and safety were major concerns. The crew also had to schedule around the elaborate overhead work of the steel and electrical crews. Concrete and tile crews had to work in close concert to ensure that joints and the intricately patterned tiles were properly placed. Exterior work had to be scheduled around the winter months.

#### MAPEI Products

- *Granirapid*® System
- *Kerapoxy*® CQ
- *Mapecem*® Quickpatch
- *MAPEI Flexcolor*® CQ
- *MAPEI Ultralite*® Mortar
- *Mapelastic*® 315
- *Mapesil*® T
- *Ultracolor*® Plus FA



## Extraordinary products for ‘beautiful’ towers

MAPEI supplies premium products for a premier project

Products from MAPEI’s Concrete Restoration Systems line were crucial in the construction of new-build twin towers of refined estate homes and penthouse residences built within the scenic West End section of Vancouver, British Columbia.

The name “Mirabel” stems from the Latin word *mirabilis*, meaning “wondrous” or “of wondrous beauty.” When developer Marcon Construction in 2017 chose that name for its twin-tower condominium project that is located within the West End section of Vancouver, the bar was set high.

The corner of Vancouver’s Davie and Broughton streets had been the site of two aging apartment buildings. By 2021, the site’s transformation into a complex with two neighboring 18- and 19-story buildings – comprising 153 luxury units and 68 social-housing units – was complete.

Dave Randall, MAPEI Business Development Manager for Western Canada, and his colleague, MAPEI sales representative Anthony Petrunia, served as MAPEI coordinators on the project, which entailed the use of products within an area covering 89,000 square feet (8 268 m<sup>2</sup>) altogether.

“Many different MAPEI products were used on this project,” Randall said. “This twin-tower design is very modern and is in a beautiful area of Vancouver. It greatly improved the neighborhood.”



Mirabel towers – Vancouver, BC, Canada



## MAPEI on the job

Once the main structure was erected, Marcon's crews used products from the Concrete Restoration Systems line to prepare concrete slabs and help form exterior balconies. These products included **Topcem Premix** screed mortar, **Mapecem Quickpatch** concrete patch for filling larger voids and **Planitop X** repair mortar for vertical surfaces. **Planigrout 755** construction grout also was used where needed.

Installers from Robertson Floors Ltd. took over at that point. The concrete slabs were verified to an International Concrete Repair Institute (ICRI) concrete surface profile (CSP) of #2. Areas needing leveling were then coated with **Primer L** advanced-technology, acrylic latex primer to enhance the adhesion of **Novoplan 2 Plus** high-strength, cement-based self-leveling underlayment.

No modern residential high-rise is complete without adequate sound reduction to maintain a peaceful living environment, and the luxury residences of the Mirabel are no exception. So the next step was to install MAPEI's "3-in-1" answer for crack isolation, waterproofing and sound reduction: **Mapeguard 2**.

**Mapeguard 2** not only helps to prevent existing or future in-plane floor cracks, but also reduces the transmission of impact sound (footsteps, dropped objects, etc.) and airborne sound (voice, TV, etc.) through floors when installed under ceramic tile, stone or wood floor coverings. To keep the installation on schedule, the team from Robertson Floors was able to make quick work of this stage, by reaching for the versatile and fast-drying **MAPEI SM Primer** to bond the **Mapeguard 2** membranes onto the leveled substrates.

### Wet areas

Quick-drying, premium **Mapelastic AquaDefense** advanced, liquid-rubber waterproofing membrane was applied over bathroom walls before they were tiled to provide a thin, continuous barrier to protect adjacent rooms and floors below from water damage. Interior designer Alda Pereira specified natural marble for wall and floor tiles in the condominium units; they were set using **Keraflex SG** polymer-modified mortar, which is formulated to be non-sag for walls and nonslump for floors. Additionally, its smooth consistency due to MAPEI's Easy Glide Technology™ helped make application quick and easy.

Interior-lobby floor tile

The main lobby floors were tiled using **Ultraflex RS** premium, rapid-setting thin-set mortar, which has a high content of unique dry polymer that results in excellent adhesion to the substrate and tile. **Ultraflex RS** is formulated with MAPEI's proprietary High-Hydrated Cement Technology (HCT™), which offers superior drying-out characteristics for quick curing and does not contribute to efflorescence.

All tile grouting was completed using polymer-modified **Ultracolor Plus FA** grout, which is formulated with DropEffect™ technology to reduce surface absorption and help repel water, dirt and grime from penetrating grout joints. This grout also maintains color consistency and inhibits efflorescence for easy maintenance. Finally, **Mapesil T** 100%-silicone sealant was used for expansion/movement joints.

As an added benefit, all products used in this project were third-party tested and third-party certified for low VOC content and low VOC emissions. As a result, the products achieved Indoor Advantage Gold certification from SCS Global Services to meet California Department of Public Health (CDPH) Standard Method v1.2-2017. The testing of these products is the most stringent type of testing that is available in North America.

**Novoplan 2 Plus** is also Red List Free, having been verified per the most current Red List on the Website for the Living Building Challenge (LBC).

With final touches such as imported Italian cabinetry and built-in wall safes in the luxury units, the new towers are truly an upgrade over the nondescript, low-rise apartments that they replaced. With the use of so many FastTrack Ready™ and high-end MAPEI products, the Mirabel towers were completed in 2021. Their "wondrous beauty" is a sight to behold – almost as much as the striking views of the Rocky Mountains that they provide to their new residents.



**TECHNICAL DATA**

**Mirabel towers** – Vancouver, BC, Canada

**Years of construction:** 2020-2021

**Year of MAPEI involvement:** 2021

**MAPEI coordinators:** Dave Randall and Anthony Petrunia

**Project owner:** Marcon Construction

**Architects:** Richard Henriquez and Alda Pereira (interiors)

**General contractor:** Marcon Construction

**Installer:** Robertson Floors Ltd.

**MAPEI distributors:** Prosol Inc. and Central Concrete Accessories

**Photographers:** Take Off Photography and Luke Potter Photography  
**Project size:** 89,000 sq. ft. (8 268 m<sup>2</sup>)

**Challenges:** A selling point for the developer was the proximity of the project to the breathtaking views of the Rocky Mountains and the Strait of Georgia. To that end, architect Richard Henriquez's plans called for large, sweeping balconies jutting out from each of the condo apartments. The use of MAPEI's **Planitop X** cementitious repair mortar for vertical surfaces was essential to completing their construction to specification.

**MAPEI Products**

- **Keraflex™ SC**
- **Mapecem® Quickpatch**
- **Mapeguard® 2**
- **MAPEI SM Primer™**
- **Mapelastic® AquaDefense**
- **Mapesil® T**
- **Novoplan® 2 Plus**
- **Planigrout® 755**
- **Planitop® X**
- **Primer L™**
- **Topcem™ Premix**
- **Ultracolor® Plus FA**
- **Ultraflex® RS**



## MapeLevel™ Easy System

Tile lippage-control, edge-leveling system using caps and threaded spacers

1

### MapeLevel Easy threaded spacers



MapeLevel Easy threaded spacers are part of the system that offers combinations of caps and threaded spacers for lippage control in ceramic and stone tile installations ranging from 1/8" to 3/4" (3 to 21 mm) in thickness. Available in five thicknesses and three versions, the high-density polyethylene spacer fragments are recyclable. When used with MapeLevel Easy Caps, the MapeLevel Easy System can eliminate the effects caused by slight variations in substrates and tiles, promoting a flat tile surface.

2

### MapeLevel Easy Cap



MapeLevel Easy Cap edge-leveling caps can be applied easily and quickly. The reusable, polypropylene and low-density polyethylene caps feature an open-view design that allows installers to check for lippage control.

### MapeLevel Easy Shield



MapeLevel Easy Shield scratch guard is sold separately.

3

### MapeLevel EasyClick Cap



MapeLevel EasyClick Cap squeeze-button caps offer an even faster application, with a built-in scratch guard. These reusable, polypropylene and low-density polyethylene caps feature an open-view design that allows installers to check for lippage control.

## How to prevent latex leaching on exterior tile installations

Tile installations are popular, but what isn't popular are the stains that can streak down the tile surface if the mortars are exposed to the environment. Learn the steps here to prevent latex leaching.

Exterior installations continue to grow in popularity in the ceramic tile industry. This can be for multiple reasons, including a cleaner and more contemporary look, better mortars and grouts, and lower-absorption large-format and gauged porcelain tiles (GPT). Today's large-format and gauged porcelain tiles today really lend themselves to be an exterior-cladding material competing with many other exterior claddings, because this installation offers a flatter appearance and a large variety of sizes and colors, as well as ease of maintenance and cleanability. However, a lot of critical decisions and planning are required when considering an installation of tile on an exterior substrate. These are obviously not the same as interior projects; they must be protected from weather until completed and cured. This can be a difficult task.

When an exterior installation includes low-absorption porcelain (less than 5 percent) over a waterproof membrane with today's polymer-/latex-rich mortars that are not protected from the environment, the installation has the potential to experience latex leaching (migration).

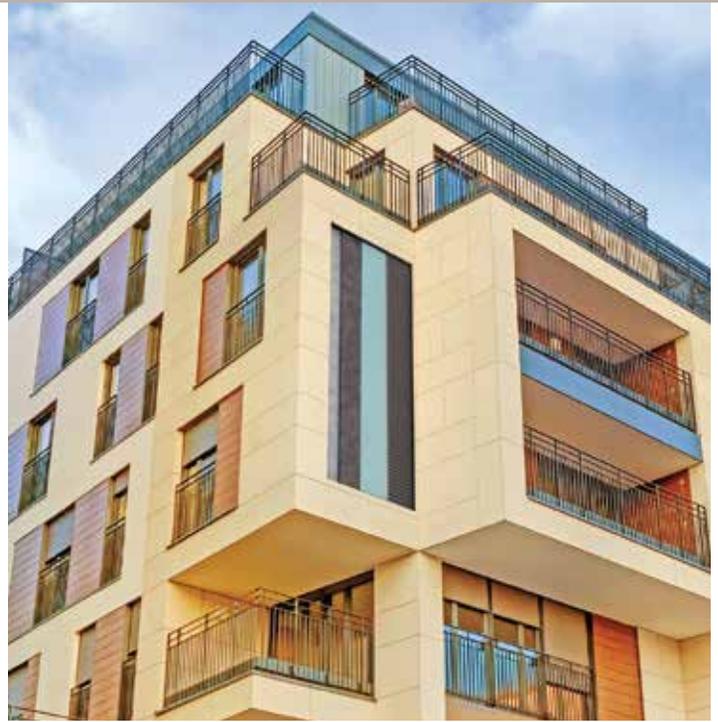
The National Tile Contractors Association (NTCA) Reference Manual defines latex leaching as latex migration. Their definition for latex migration is: "White, rubbery substance coming through the joints. Similar in appearance to efflorescence. Unlike powdery efflorescence, latex residue will be rubbery." To me, latex leaching looks like diluted or watered-down caulking or paint. This additive to cement-based adhesives and grouts comes in several forms. They are generally referred to as polymer or latex, and they come in a liquid form that can be added to unmodified mortars or grouts. They can also come in the form of powder, dry-mixed with the other ingredients in single-component cementitious mortars and grouts. The most common types are ethylene-vinyl acetate (EVA), also known as polyethylene vinyl acetate (PEVA) and styrene-butadiene rubber (SBR) known as latex. This additive is common in today's cement-based mortars and grout because, if formulated correctly, they can improve the mortars and grouts increasing flexibility, water resistance, sheer strength and compressive strength. For cement-based mortars and grouts to gain these potential benefits, the latex must be allowed to dry with the cure of the cement.



If I took a 1-gallon, high-quality latex admixture and left the lid off it, eventually all the water would evaporate away, leaving a rubbery substance in the bottom of the 1-gallon container. If the lid remained on, the latex would stay in the solution and you will never get the rubbery substance. The same is true when latex is added to our mortars or grouts. To reap the benefits of increased flexibility, water resistance, sheer strength and compressive strength, we need for the latex to dry out. If it stays in solution because it is submerged too early in a pool or water feature or used in an ANSI A118.15 HET mortar where snow or rainwater is pouring on the wall of a large-format or gauged porcelain tile panel installation because the metal parapet cap was not installed for weeks or months after the tile was completed, the odds are good that the installation will experience latex leaching.

Today, porcelain tile is very common. It is frequently used on exterior installations due to most porcelain being denser, less porous, and a harder tile that offers greater resistance against stains and water than ceramic tile. Always verify with the tile manufacturer that the tile you selected is suitable for exterior installation. Porcelain tiles are typically suitable because of their low absorption rate that is less than 0.5 percent. The tiles are heated at extreme temperatures, resulting in an extremely rigid, durable and stain-resistant tile that is impenetrable to moisture. When installed correctly, they can be used in the harshest of climates and can withstand cold, rain and extreme weather conditions.

Modern tiles are larger, with dust-pressed tiles as large as 4 feet x 4 feet (1.22 x 1.22 m) and gauged porcelain tile panels larger than 6 feet x 10 feet (1.83 x 3.05 m). Today, the International Building Code (IBC) states in Chapter 14, Paragraph 1404.10.2: "Exterior adhered masonry veneers-porcelain tile. Adhered units weighing more than 3.5 pounds per square foot shall not exceed 48-inches in any face dimension not more than 9 square feet in total face area. Adhered units weighing less than or equal to 3.5 pounds per square foot shall not exceed 72-inches in any face dimension not more than 17.5 square feet in total face area. Porcelain tile shall be adhered to an approved backing system." This was a change in the building code. According to previous versions of the code from 2009 to



2020, tile size should not exceed 24 inches (61 cm) in any face dimension nor more than 3 square feet (0.28 m<sup>2</sup>) in total face area. The code change in 2021 allowed tile up to 7 times larger. This was a real win for the tile industry that passed because of lower absorption tiles in addition to better substrates, mortars and grouts.

The best tile mortars for exteriors combine bond strength with flexibility to allow for movement in the substrate caused by fluctuating changes in moisture and temperature levels. Today's improved thin-set mortars are superior to mortar standards in the past. For example, today's ANSI A118.15 Improved Modified High-Performance mortars are not only subjected to freeze/thaw cycling, as an additional testing requirement found only in ANSI A118.15, they are also subjected to heat aging. The heat aging test uses two 2-by-2-inch (5-by-5-cm) tiles bonded face to face with an ANSI A118.15 Improved Modified High-Performance mortar with an 1/8-inch (3-mm) offset. These samples are cured at lab temperatures for 14 days and then placed in an oven at 158°F (70°C) for 14 days. The samples are then put into the shear jig and sheared apart. In the case of porcelain tile, the minimum shear strength is 400 psi (2.76 MPa). This is an excellent example of a lab test for these high-performance thin-set mortars that are expected to perform best in the exterior environment.

When installing mortars that are approved for exterior use, always consult with the mortar manufacturer, but I believe depending on your installation area's temperature swings, most will recommend an ANSI A118.15 Improved Modified High-Performance mortar. For large-format tile and GPT panels, most use a large-and-heavy-tile (LHT) mortar because of the ability for that mortar to go thicker, up to 1/2 inch (12 mm). For the exterior installation of GPT, the ANSI A108.20 installation standard requires application of thin-set mortar on both the substrate and the tile. Poor substrate preparation for large-format tile can also have thicker applications of thin-set mortar.

There are many other things to consider when installing exterior tiles, with one of the most critical being surface preparation to bring the substrate within tolerance. For

tiles larger than 15 inches (38 cm) on one edge, the industry requirement for the substrate tolerance is 1/8 inch (3 mm) in 10 feet (3.05 m) and 1/16 inch (1.5 mm) in 2 feet (1.5 mm) in 0.61 m) from the required plane when measured from the high points in the surface.

You must reach out to your setting material manufacturer to find a suitable render or repair material for exterior walls. It should have the ability to float out minor imperfections, including bird baths or big bows in the framing or substrate. Thin-set mortar should not be used for truing of substrates. If you are using an exterior mortar bed on the walls, whether bonded or metal lath and building paper, with properly placed casing beads and expansion joints you should be able to screed the base flat enough to bring the walls within tolerance.

Once the walls are flat, it is important to understand how you will manage water. In the case of a mortar bed or stucco base coat on walls, it may not require additional waterproofing, but you may choose to add it for additional protection. When the installation will include building paper, an air barrier or waterproofing, it is critical that you understand the necessary flashing and how you properly tie into it. Ideally the flashing is already installed: Head flashing in windows and doors, kickout flashing where one roof may meet another wall, and flashing around all openings. With framed construction that involves cement board (CBU), it is common to apply a waterproof membrane over the top of the cement board after it has been installed and properly taped. It is critical that sealants be installed as soon as possible, to keep water pouring off a flashing and into the wall. I have witnessed this on a commercial fast-food restaurant: Water poured into the wall because the sealant was not installed for weeks where the tile terminates at the flashing.

In especially demanding environments, cement grouts are factory-blended or mixed with polymer additives to create better stain resistance and color brilliance with higher bond and compressive strengths. Polymer-modified cement grouts are more resistant to freeze/thaw damage, lower any water penetration, and can also increase grout flexibility, providing increased crack resistance. Products complying with ANSI

A118.7 (High Performance Cement Grouts for Tile Installations) are ideal for exterior applications. They have a lower absorption than ANSI A118.6 grouts. High Performance Cement Grouts are generally available in a wide variety of colors and frequently have color-coordinated sealants for movement joints. If the grout joint is left exposed to the weather, latex leaching will usually come out through the grout joint with the water as it evaporates to the exterior.

Due to installations of gauged porcelain tile panels larger than 5 x 10 feet (1.52 x 3.05 m), it is not uncommon to see all the grout joints filled with sealant on exterior installations, to follow the movement joint requirements. When a GPT installation is left exposed to weather and then sealant is installed in all the grout joints before the installation is given time to dry out, there will be latex leaching.

All tile installations require movement joints but, due to increased moisture and temperature swings, it is critical that they are installed on exterior projects. Consult TCNA Method EJ171 and ANSI A108.01 for the proper selection of sealant and the frequency of the movement joint placement. On exterior installations, the frequency is increased to 8 feet up to 12 feet in each direction. More frequent joint placement may be required depending on materials and environmental conditions. For movement joints to work effectively, movement joint cavities must be open and free of grout, mortar and setting materials. Install movement joints per ASTM C1193 Standard Guide for Use of Joint Sealants. Tile edges to which the sealant will bond must be clean and dry. For proper use, always consult the sealant manufacturer's specifications.

Protecting an installation from weather is critical not just during installation but also while it is curing. This usually requires tenting. After the tile is installed, it should be protected from weather. If an open tile installation gets a good rain before grout is installed, it can take on a lot of water; then installers show up the next day, grout the wall and are surprised when the grout has efflorescence or latex leaching down the tile. Latex migration can also occur due to bad sequencing of work: For example, the tile is installed but the roofer doesn't install the metal cap on the parapet till weeks later. The framed cement board has topical waterproofing, a thick bedding of thin-set mortar, and a low-absorption porcelain tile is installed. It rains a couple of days, and the wall takes on a lot of water. The metal cap is installed on the roof weeks later, and all the water in the assembly only has one path out, through the grout. This can also occur due to a poor installation or lack of flashing, lack of sealants, etc. For these reasons, carefully review all potential areas where water may enter the installation before beginning the installation. Protect the installation before, during and while the assembly is curing. It should also be noted that high humidity and cooler temperatures can also increase cure times.

Submerged installations must be allowed to cure. The curing time required by the setting material, grout and sealants should be discussed with the setting material supplier. The Tile Council of North America Handbook (TCNA) states: "When latex/polymer modified Portland cement mortar is used to install ceramic, glass, and natural stone tiles in an area that may not thoroughly dry out in use (e.g., swimming pools and gang showers, etc.) or where initial drying is inhibited (between tile and impervious substrates), it is recommended that the completed installation be allowed to dry out thoroughly before exposure to water. This drying period can range from 14 to more than 60 days depending upon the temperature

and humidity and other climatic conditions, and whether the installation is interior or exterior. Consult setting material manufacturer for minimum set times before grouting tile or allowing traffic, water exposure, or submersion."

When installing 8-by-8-inch (20-by-20-cm) or larger impervious tile over a waterproof membrane, crack-isolation membrane or other impervious substrate, longer curing times may be required. Curing times may also be extended with narrow grout joints and when high-performance grouts such as those meeting ANSI A118.3, A118.5 and A118.7 are used. When one or more of these conditions exists, delaying grouting will allow better evaporation of excess moisture.

When longer cure times are required on floors, extend the amount of time before allowing traffic on the floor.

A rapid-setting latex-/polymer-modified cement mortar may need to be specified for faster curing. Consult the manufacturer for recommendations and requirements. Because polymers vary considerably, the directions of the latex/polymer mortar manufacturer must be followed explicitly.

Latex leaching is not new; it has been an issue for many years. We are seeing an increase today due to waterproof membranes on the substrate, highly modified mortars, low absorption and larger porcelain tiles, as well as poorly coordinated construction details.

Latex leaching can be avoided. If you are planning an exterior installation, it is important that you consider protection of the installation. Make sure you are selecting quality mortars like those meeting ANSI A118.15 and verify your coverage by removing tile on occasion. Before grouting, be sure that the installation is kept dry and that rain is not expected later in the day. During installation and at a minimum for at least 3 days after completion, protect the completed installation from rain and freezing conditions. Keep excessive water out of the installation by verifying that sealants are installed, flashing is done properly, and roofing or metal caps are directing water away from the wall installation. Take the time to discuss your installation needs with other trades like roofers or sealant contractors. If you keep these points in mind and you select quality tile, waterproofing, mortars, grouts and sealants that work together as a complete system, you should have a beautiful exterior installation with great durability.



**About the author**

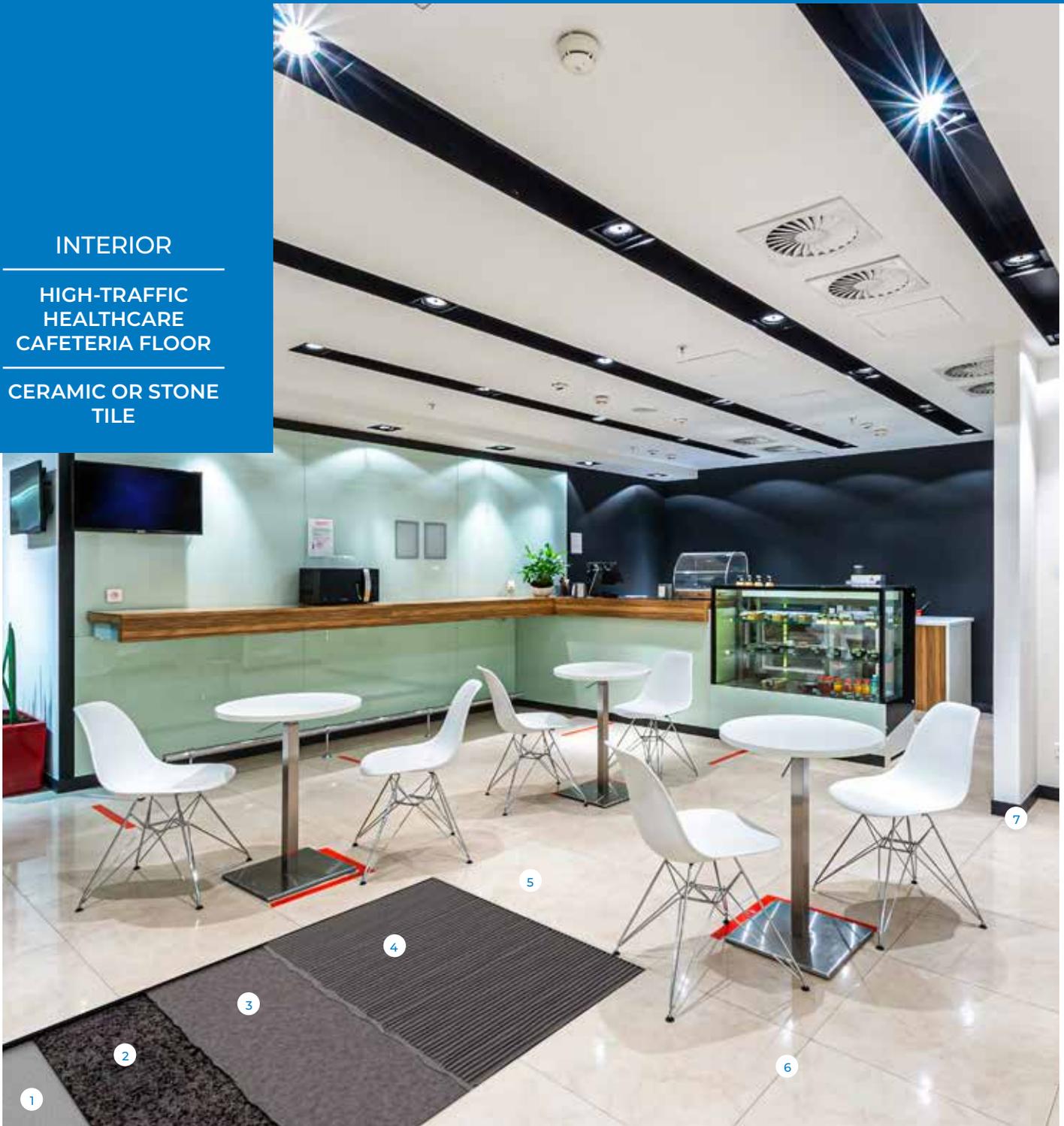
Jim Whitfield FCSI, LEED AP is the Director of Technical Services at MAPEI. He is actively involved in the tile industry standards committees (TCNA Handbook, ANSI A108 committee), is an NTCA Ambassador and proud member of the Technical Committee, and

is currently the President of the Materials & Methods Standards Association (MMSA).

INTERIOR

HIGH-TRAFFIC  
HEALTHCARE  
CAFETERIA FLOOR

CERAMIC OR STONE  
TILE



A healthcare facility's cafeteria experiences both foot traffic and food spills. This means that the flooring must be able to withstand high-volume traffic as well as possibly staining foods, including tomato sauces and mustard. Plus, that flooring must meet the exacting cleanliness standards of the healthcare facility. This MAPEI system solution covers all those requirements and incorporates two of our most popular products, *Keraflex Super* mortar and *MAPEI Flexcolor CQ* grout.

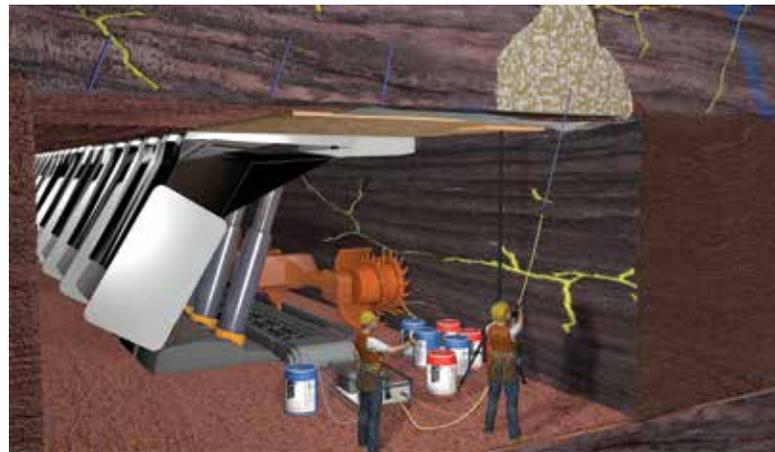
**Challenges:** High-traffic, high-visibility areas requiring cleanliness and sanitary maintenance for the comfort of patients, visitors and medical professionals alike

**Solution:** High-quality installation mortar with an easily maintained grout

- 1 Concrete
- 2 Cleavage membrane
- 3 *Modified Mortar Bed*
- 4 *Keraflex™ Super*
- 5 Large-format tile or stone
- 6 *MAPEI Flexcolor® CQ*
- 7 *Mapesil® T Plus*

## MAPEI underground technology: customized solutions

MAPEI's Underground Technology Team (UTT) offers a comprehensive range of chemical, mineral and cementitious grout options to help our underground mining customers solve challenging problems in ground consolidation, soil stabilization and anchoring.



Chemical injection resins include polyurethane (PUR) and polyurea silicate (PUS) variations for quick and permanent stabilization applications. Filling cavities and voids is a common challenge in mining and underground construction. When Part A and Part B of a chemical grout are combined, there is an exothermic reaction during which the product turns into a foaming adhesive mass that will stop water, fill voids, and glue unstable rock into a solid mass. With our expertise and years of experience, we assist our clients in choosing the right technologies for specific uses.

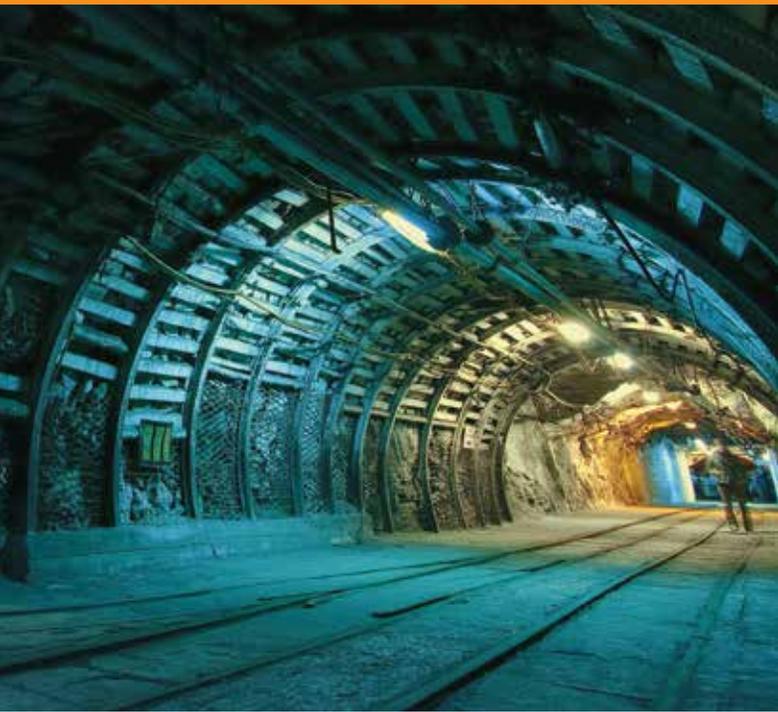
The heat reaction delta is drastically different between PUR and PUS products, with the PURs being the hotter of the two. In our case studies, we have learned that when filling voids in coal mines, MAPEI UTT's *Silicajet EXP* [NA: manufactured in North America] is the ideal product, because it expands 20 to 40 times but produces around half the heat as other PUR products on the market. PURs do have a critical role to play in underground mining, and MAPEI UTT's *Foamjet T* [NA] has been a workhorse when it comes to stopping water, consolidating dikes or filling voids created by naturally forming vugs or faults.

MAPEI UTT's solution for anchoring cable bolts is found in a PUS technology, *Silicajet ANK* [NA]. This product does not

expand and has a short reaction period, making it ideal for use when installing cable bolts. *Silicajet ANK* obtains all its strength in the first hour after installation; therefore, miners have been able to get underneath installed cable bolts in a matter of hours, instead of days. This reduces the amount of downtime – and lost revenue – for the mine. Our miners have also found that *Silicajet ANK* can be pumped into hollow bar. Hollow bar is usually filled with pumpable cementitious grouts.

Our customers have been coming to us looking for an alternative to sausage-style polyester resin cartridges simply because the cartridges are becoming increasingly tough to find. The issues with the global supply chain have not been kind to polyester resin; some key ingredients are very difficult to source right now. Miners can be very risk-averse. *Silicajet ANK* also ensures that the components are completely and correctly mixed before they're injected, while with sausage cartridges the quality of the mix is heavily dependent on the rod and the expertise of the operator. Bad mixing can lead to groundwater pollution, since the single components can dissolve in it when left out of the reaction due to bad mixing.

We spent two years testing our chemical grout technologies with numerous stakeholders. In doing so, we have validated



Product Name	Description	Foam Factor
<b>Cementitious</b>		
<i>Stabilcem T</i>	One-component, pre-blended, shrinkage-compensated thixotropic mortar – sanded	N/A
<i>Stabilcem AG</i>	One-component, pre-blended, shrinkage-compensated thixotropic mortar – unsanded	N/A
<i>Microcem 8000</i>	Micro-fine, hydraulic binder with pozzolanic action for ground consolidation and ground waterproofing	N/A
<i>Microcem 12000</i>	Micro-fine, hydraulic binder with pozzolanic action for ground consolidation and ground waterproofing	N/A
<b>Two-Component PUR</b>		
<i>Foamjet T</i>	High-viscosity, ultra rapid-setting, two-component polyurethane resin, injected for consolidating and waterproofing of structures subject to strong water ingress	3-10
<i>Foamjet F</i>	Ultra rapid-setting, two-component polyurethane resin with fluid consistency, injected for consolidating and waterproofing of structures subject to water ingress	20
<b>Two-Component PUS</b>		
<b>Non-expanding</b>		
<i>Silicajet ANK</i>	Two-component, organo-mineral resin for anchoring structural bars	–
<b>Expanding</b>		
<i>Silicajet EXP</i>	Two-component, organo-mineral, fast-reacting and high-foaming resin for void filling	30-40

that our chemical grout technologies are not only useful, but better in many ways than traditional competitive technologies.

MAPEI UTT does offer our clients a complete line of cementitious grouts. Our ***Stabilcem T*** and ***Stabilcem AG*** are excellent bagged grouts designed to be used with anchor bolts and cable bolts for the stoppage of water ingress or stabilizing weak ground. Our clients have also had success with our microfine cement line of ***Microcem 8000*** and ***Microcem 12000***. The Blaine fineness is measured in terms of the specific area of cement expressed as total surface area in square centimeters per gram. *Microcem 8000* has a cement Blaine of 8000, and *Microcem 12000* has a cement Blaine of 12000. All of MAPEI UTT's cementitious grouts have excellent pot times and incredible high early strengths.

MAPEI UTT offers complex products designed to meet the individual demands of underground and severe jobsites. Our expert team combined with our diverse range of solutions will help solve the most challenging projects with innovative, trusted technology. For more information, visit [utt.mapei.com/en/home-page](http://utt.mapei.com/en/home-page).



#### About the author

Tanner Murt is MAPEI UTT North America's Business Development Leader for the Western U.S. Tanner provides technical support to customers in both the tunneling and mining industries. He has a BS in industrial engineering from West Virginia University and is an NCEES-certified Engineer in Training.



Don't replace your  
luxury vinyl tile:  
**ReNewIt™** with MAPEI's  
**Ultracoat®** system



Luxury vinyl tile/plank (LVT/LVP) flooring is designed to be both aesthetically pleasing and hygienic. It takes a beating from foot traffic and cleaning, becoming worn and trapping dirt/bacteria in the process. Rather than removing and replacing your LVT and LVP floor, you have another solution – one that will help save time, money and the environment.

As a world leader in chemical products for the construction industry, MAPEI has designed systems to solve floor-maintenance problems quickly and efficiently: Clean, renovate and protect existing LVT/LVP flooring using our *Ultracoat ReNewIt* systems.

**The ingredients for LVT/LVP renewal**

Clean the existing LVT/LVP floor with a one-two punch of ***Ultracoat ReNewIt Remover*** and ***Ultracoat ReNewIt Cleaner***. *Ultracoat ReNewIt Remover* is a cleaner and polish remover that provides a deep-down cleaning, removing existing contaminants from the floor. *Ultracoat ReNewIt Cleaner* is a

# Ultracoat®

## The system at a glance

MAPEI's *Ultracoat ReNewIt* systems can include the following products for a complete floor cleaning and renovation system.

- *Ultracoat ReNewIt Remover*: Ready-to-use and works quickly to remove polish and contaminants from the floor
- *Ultracoat ReNewIt Cleaner*: Ready-to-use cleaner that removes contaminants and will not leave a residue on the floor
- *Ultracoat ReNewIt Primer*: Two-component bonding agent that is clear and quick-drying, ensuring adhesion of the new finish to the existing flooring
- *Ultracoat HT 2K*: Two-component, waterborne polyurethane finish that is low-odor, low-VOC and UV-resistant, providing superior resistance to traffic and abrasion. It protects and hermetically seals the joints to make the flooring look newer as well as easier to clean and maintain, thereby providing a cleaner environment at a lower cost of maintenance.
- *Mapecoat 4 LVT*: Two-component, aliphatic, anti-slip, polyurethane finish in water dispersion that provides a non-slip finish with a high resistance to wear

*Ultracoat ReNewIt* systems seal the joints, creating an attractive, protected, monolithic coating that withstands wear and tear and will be easier to clean. Contact your MAPEI representative about them today.

Before



After



spot-free cleaner and rinsing solution designed to remove any remaining dirt before the application of *Ultracoat ReNewIt Primer*.

Renovate and protect existing flooring with *Ultracoat ReNewIt Primer* in combination with *Ultracoat HT 2K* or *Mapecoat™ 4 LVT*. *Ultracoat ReNewIt Primer* quick-drying bonding agent allows the new finish to adhere to the existing floor. *Ultracoat HT 2K* low-odor, low-VOC, polyurethane finish renovates and hermetically seals the existing flooring, reducing the chance for mold, bacteria and germs to form between floor joints. If needed, *Mapecoat 4 LVT* anti-slip polyurethane finish can be used instead of *Ultracoat HT 2K* to provide an additional measure of non-slip resistance.

Instead of tearing up your existing LVT/LVP floor, *ReNewIt...* with help from MAPEI. To find out more, about this system solution, contact your MAPEI representative or visit our Website at [www.mapei.us](http://www.mapei.us).



## Sustainability Manager awarded LEED Fellowship

Sustainability Manager selected as one of 20 sustainability leaders to receive highest recognition for green building professionals



MAPEI Corporation is pleased to announce that our Sustainability Manager, Brittany Storm, has been selected to the 2022 class of LEED Fellows by the U.S. Green Building Council (USGBC) and Green Business Certification Inc. (GBCI). GBCI is the premier organization independently recognizing excellence in green business industry performance and practice globally.

Twenty professionals from around the world were recognized in the 2022 class for their mastery of LEED – the world’s most widely used green building rating system – and exceptional work in advancing green building practices.

“Behind every green building project are dedicated professionals who are committed to creating more sustainable and healthy buildings and communities. The LEED Fellows program is aimed at recognizing those individuals and their achievements in the built environment,” said Peter Templeton, President and CEO of USGBC and GBCI. “This year’s class of LEED Fellows represents a group of bold and innovative leaders who have made a lasting, positive impact on their communities through their impressive career achievements.”

Jim Whitfield, MAPEI’s Director of Technical Services, stated, “This is an incredible honor, and we are very proud of Brittany’s accomplishment. There are over 200,000 USGBC members; it

is quite an acclamation to be elevated to Fellow. Last year, 21 members were elevated.

“To be eligible, a nominee must have held a LEED AP with specialty credential for a minimum of eight years,” Whitfield continued. “The nominee must also demonstrate at least 10 years of exceptional impact with LEED in the key mastery elements of technical proficiency, education and mentoring, leadership, commitment and service, and advocacy.”

Storm commented, “It is an honor to be recognized by the USGBC, and I look forward to continuing to advance the principles behind LEED on future projects.”

Luigi Di Geso, MAPEI North America’s President and CEO, remarked, “We are proud of Brittany’s accomplishments and proud of her push to further incorporate sustainability into every possible aspect of operations at MAPEI. We congratulate her on this great milestone and look forward to future innovations.”

The 2022 LEED Fellows were recognized on November 1, 2022, during the annual Greenbuild International Conference & Expo, which was held at the Moscone Center in San Francisco, California.

# Building a SUSTAINABLE future together



**Sustainability** is part of **everything** we do. **MAPEI** has always been **fundamentally committed** to sustaining the **environment** for today and tomorrow. We invest in R&D to ensure that our products are **reliable, durable** and have the **lowest impact possible on human health and the environment**.

For more details, visit [www.mapei.com](http://www.mapei.com).



## MAPEI now on SpecLink

# SpecLink

specifying engineers plan and build project specifications in a quicker, more efficient manner.

SpecLink has developed one of the most advanced specification-writing software programs on the market for the architect, engineer, contractor and owner (AECO) sector. The program is also tailored to the building-products manufacturers, including MAPEI, who are included by name within the program.

This sophisticated software's database includes over 820 sections, which can be collapsed or expanded and allow users to create outline, short-form or full construction specifications.

MAPEI's product documentation is now available on SpecLink, an online tool that is designed to help architects and

"SpecLink joins MasterSpec and ARCAT in MAPEI's wide range of tools for architects," said Mike Granatowski, MAPEI's National Architectural & Commercial Project Director. "These programs provide the first steps in our system-solution approach to projects. Now that we are in all three programs [SpecLink, MasterSpec and ARCAT], we will be able to reach all our major clients in some fashion."

Granatowski continued, "With our participation in these programs, we can reach design teams before the project begins to help them find the best products for their project and meet their goal – be it sustainability, codes, costs or something else – from the specification through to the final steps of the job. MAPEI has complete system solutions of products, and these programs allow us to reach the specifiers at the very beginning to create a complete and individualized solution for each jobsite."

## Floorcloud platform now hosts MAPEI innovation



Specification data for approximately 200 of MAPEI's flooring-installation products is now available on Floorcloud, an online technology platform that was developed to allow users to remotely "monitor, communicate and store" jobsite-condition data in real time.

Floorcloud monitors jobsite conditions such as ambient temperature, humidity and dew point, as well as concrete moisture and temperature. Sensors report the data back to Floorcloud's proprietary software, which is compatible on both desktop and mobile devices; this allows users to actively monitor the conditions of the project whether they are on site, in the office or anywhere with a cell phone connection. Further, the platform houses a manufacturer database of specification information so that real-world jobsite data can be compared in real time with manufacturer's recommendations.

"The Floorcloud platform offers another tool for contractors and architects to help ensure that projects run smoothly. Our participation in this program is another important step in our system-solution approach to providing a total customized solution for each project with which we are involved. [Other

online programs include SpecLink, MasterSpec, Specpoint and ARCAT.] However, Floorcloud is the first to really focus on the project from the flooring contractor's perspective and to provide a 24/7 tool based at the jobsite," said Jim Whitfield, MAPEI's Director of Technical Services. "Floorcloud puts the critical product information in everyone's hands on site and in real time."

Whitfield continued, "MAPEI's participation in these programs means that we reach project teams at every step of the process before the project begins to help them find the best products for their project and meet their goals, whether they are sustainability, codes, costs or assistance with product selection. From the specification to the jobsite and the install, we now can recommend an online program, in addition to our in-person representatives, to help our clients. MAPEI offers system solutions; these programs allow us to create a complete and individualized solution for each jobsite. Floorcloud captures the jobsite itself."





## MAPEI hosts auditor workshop

As part of MAPEI North America’s efforts to continuously improve its Business Management System (BMS), a workshop to enhance competence of BMS internal auditors took place over the first week of November at MAPEI North America’s headquarters located in Deerfield Beach, FL.

MAPEI facilities are already certified ISO 9001 and ISO 14001, but the implementation of the ISO 45001 (Occupational Health & Safety Management System) is moving forward, and our auditors need to be prepared to face this challenge.

A full three days of training were provided covering OSHA regulations and process improvements, as well as strategies to build rapport and teambuilding.

“The organization of this workshop demonstrates MAPEI’s understanding of the important role that internal auditors play in the success of our BMS,” said Gianpiero Cancelli, Director of North America QEHS Management Systems. “They are key players in ensuring our operations and activities permanently satisfy our customers, protect the environment, and guarantee the safety and health of our employees.”

## Be bold for change on International Women’s Day

MAPEI celebrated International Women’s Day on Wednesday, March 8, recognizing the women in our lives and the remarkable contributions they made across the company. Our corporate office and a few MAPEI plants – including in Garland, Dalton, Calhoun and San Bernardino – reflected on the progress being made and giving equity a huge embrace.





## Tech Tips

Installing large-format tiles and using pressure-sensitive adhesives



### Installing large-format tiles

As tile manufacturing technologies have advanced, so have the sizes of tiles being produced and sold. We are not that far away from a time where a 12" x 12" (30 x 30 cm) tile was considered "large-format." The most common shapes and sizes of tile on the market are now 12" x 24" (30 x 61 cm) rectangular tiles and plank-shaped tiles that are often 6" (15 cm) wide and 36" to 48" (91 to 122 cm) in length. If you think this is a dramatic change, consider that there are 5' x 10' (1.5 x 3 m) porcelain panels being produced and installed every day around the world. This shows how far the industry has advanced in a short period of time.

A tile is considered large-format if it has one side greater than 15" (38 cm) in length. This distinction creates several significant changes in the requirements for the substrate preparation and installation of these tiles. ANSI standards for substrate flatness for smaller tiles are 1/4" (6 mm) maximum variation over 10' (3 m) and 1/8" (3 mm) over 2' (0.6 m). For a large-format tile, the ANSI standards call for 1/8" (3 mm) maximum variation over 10' (3 m) and 1/16" (1.5 mm) over 2' (0.6 m). This means

that you need to pay special attention to the flatness of your substrate and make sure you prepare it accordingly. MAPEI has a full suite of surface-preparation products that can help you achieve a flat substrate.

You also need to pay attention to the tile mortar you select, especially if you are installing a large-format tile. Large-and-heavy-tile mortars, or LHT mortars, were once referred to as medium-bed mortars. These are thin-set bonding mortars for ceramic and stone tile, which have been formulated to minimize slump and facilitate a thicker bond coat. These thicker bond coats, which should not exceed 1/2" (12 mm) after the tile is embedded, are helpful in achieving the required mortar coverage. Tiles are allowed to have some warpage, which means they are not completely flat, so this is another reason why the thicker bed is useful as tiles get larger. Another concern is slump, which can occur if the mortar is not designed for thicker beds and heavier tiles. This can manifest as a sunken corner or edge of a tile, creating unsightly lippage and even a trip hazard. New additions to the ANSI standards help identify mortars that are appropriate for large-and-heavy-tile installations with an "H" designation.

## Pressure-sensitive adhesives

Pressure-sensitive adhesives have gained tremendous popularity over the past 5 to 10 years. The continued growth of the market for luxury vinyl tile (LVT) and luxury vinyl plank (LVP) has been a big part of this movement. Pressure-sensitive applications, or “dry to the touch” adhesive applications, have become more popular because they allow for an easier and efficient mode of installation. The dry adhesive lets the installer work on top of the vinyl plank or tile during the installation and work from the middle of the room to the edges. Because of the long open times, or the amount of time the adhesive remains “tacky” or “sticky,” installers can spread large areas and then install these large areas with great efficiency. Because the adhesive is dry and tacky, the installation gains strength from increased traffic that pushes the flooring down onto the adhesive.

For all the advantages of pressure-sensitive applications, there is one significant disadvantage: The strength of a pressure-sensitive bond is less than that of a wet or semi-wet adhesive application. When LVT or LVP is laid into a wet adhesive and allowed to dry properly, the resulting bond is significantly stronger. This is important because of the inherent dimensional instability of some products on the market. Even if a vinyl plank or tile meets the industry standard for dimensional stability (ASTM F2199), the amount of dimensional movement allowed can still result in significant visual concerns. The thermal contraction of vinyl tile or planks can result in end gapping and the thermal expansion can result in end peaking.

It is imperative that you review the finished flooring manufacturer’s installation instructions and their recommended method of installation. If the finished flooring manufacturer recommends that you set their product into a wet adhesive, then you should follow those application instructions with MAPEI adhesives. This is significant because laying into a wet adhesive changes the acceptable substrate moisture levels as well as substrate porosity requirements, and the process for laying into a wet adhesive is completely different than a dry adhesive.

The general trend in the past decade has been a movement towards the idea that most modular resilient products can be installed in a pressure-sensitive method, but recent trends are the opposite. MAPEI has a full suite of resilient flooring adhesives that can be used in wet, semi-wet and pressure-sensitive applications. The most important takeaway is to be certain that you know how your LVT or LVP is recommended to be installed and not just assume you know.



### About the author

Logan Reavis is the Manager of Technical Services at MAPEI. He has been with MAPEI since 2014 and is a USGBC LEED Green Associate. Logan grew up around the floor covering industry and, shortly after completing his Bachelor of Business Administration Degree

from The University of Texas at Arlington, began his career in the industry. He brings 20 years of experience in floor covering after spending time in distribution and on the flooring contractor side of the business.





The MAPEI Technical Institute (MTI) provides the highest-quality, basic product knowledge with online trainings (including frequent Webinars and MTI-TV Tech Tips) as well as demonstrations and hands-on education to architects, contractors, installers and distributors in 10 locations: Deerfield Beach (FL), Fredericksburg (VA), San Bernardino (CA), Garland (TX), Dalton (GA), West Chicago (IL) and Swedesboro (NJ), all in the USA; and Laval (Quebec), Brampton (Ontario) and Delta (British Columbia), all in Canada.



Types of training events



Product Knowledge



Customer Locations



Lunch & Learn



Conferences



At a May 2023 Tile and Stone Installation Systems MTI in Albuquerque, NM, attendees were provided with both classroom and hands-on training for a variety of MAPEI products. These products included **Keraflex® Super** and **Mapeheat™** radiant floor-heating system.

MTI training thriving online and in person

MAPEI's Technical Institute offers a variety of educational options for in-person and online learning.

Want to get hands-on? Join us at one of our in-person classroom training events. Whether held at one of our training facilities in the United States or Canada, or on-site at the location of one of our distribution partners, the classes offer a mix of practical classroom and hands-on education taught by MAPEI Technical Institute's trainers.

Don't have time to join us at an in-person class? Learn online with one of our informative Webinars. Addressing topics from across all our product lines, these Webinars are presented by our industry-leading experts.



U.S. Trainings

To find out more about attending an MTI training event in the USA, scan here.



Online Trainings (U.S. only)

Can't make it in person? No problem. To find out how to register for an online Webinar, scan here.



Canada Trainings

To find out more about attending an MTI training event in Canada, scan here.

# For 85+ years, the world has been our jobsite. Wherever you go, **MAPEI is there.**



MAPEI's products are manufactured with minimized energy consumption and manufactured locally in production facilities that respect the environment. Our products are certified according to the most stringent official standards. For its thousands of jobsites around the world, MAPEI has provided the most complete range of products available. Often invisible, always indispensable: That is what using MAPEI products means.

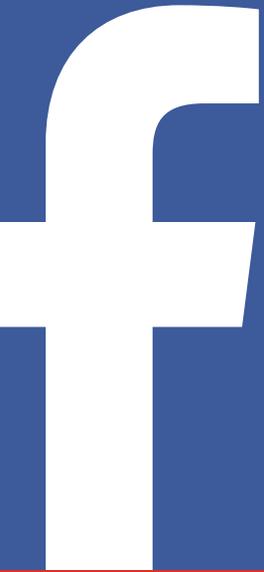
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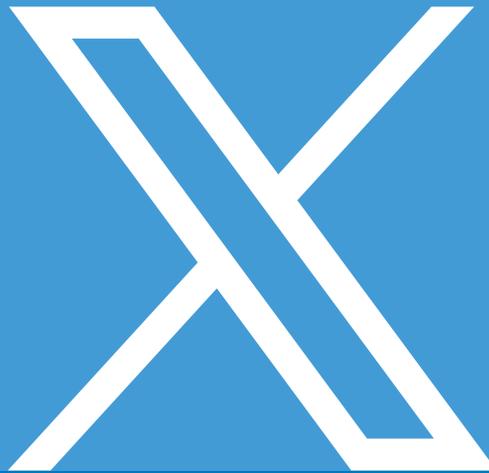
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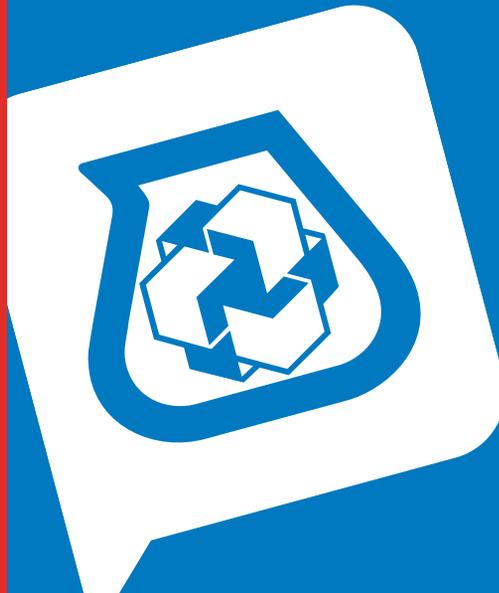
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# The sound of **COLOR**

MAPEI's **six new** grout color collections feature 12 **new** colors

MKT: 23-2482 PR: 10043



Like favorite songs that you always hum and new tunes that stop you in your tracks, MAPEI'S new grout palette features a mix of old favorites and hot new selections. Want to just chill out? Or perhaps you prefer to samba the night away? In either case, these colors will sing to your mood.

The refreshed palette of six new color collections includes 12 entirely new colors. And everyone loves a classic duo. You'll find both grouts and matching caulks in the new color collections, all providing the industry-leading performance that you expect from MAPEI.

Find your color vibe today at [www.mapei.com](http://www.mapei.com).

