

INTERNATIONAL

# Realtà MAPEI

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# TECHNOLOGY FOR LARGE HYDROPOWER PROJECTS

MAPEI PROBLEM-SOLVING SOLUTIONS ON JOB-SITES THROUGH SPECIFIC PRODUCTS AND TECHNICAL ASSISTANCE

ADMIXTURES FOR CONVENTIONAL CONCRETE

ADMIXTURES FOR ROLLER COMPACTED CONCRETE

ADMIXTURES FOR HIGH STRENGTH CONCRETE

ACCELERATING PRODUCTS FOR SHOTCRETE

MINERAL ADMIXTURES

STRUCTURAL SYNTHETIC FIBRES

JOINTS AND WATERSTOP

SEALANTS

ANCHORING MORTARS AND RESINS

CONCRETE REPAIR SYSTEMS

TBM SYSTEMS AND TRADITIONAL EXCAVATION

WATERPROOFING AND PROTECTION SYSTEMS

RESIN AND CEMENTITIOUS FLOORING SYSTEMS

CRACK INJECTION SYSTEMS



**GUIDO PALMIERI**  
Realtà Mapei  
International's  
Editor-in-Chief

## Long-term vision holds the key

Dear readers,

We are leaving behind us a terrible year. There have been numerous crises in the past for various geopolitical or economic-financial reasons, but they have always been confined to limited geographic areas. For the first time ever in 2020, the (indecipherable and mysterious) Covid-19 pandemic has overwhelmed the entire world with hefty repercussions in terms of both health and the economy: we have all been forced to come to terms with this global phenomenon with varying degrees of success.

If we are to overcome the threat of economic collapse and take advantage of the opportunities that will arise after this emergency, we need to look ahead and think in the long term. This kind of long-term thinking will guide all those

### THE SPECIAL FOCUS ABOUT DAMS SHOWCASES MAPEI'S INNOVATIVE PRODUCTS AND TECHNOLOGY USED FOR PROJECTS IN ITALY AND ABROAD

companies looking to be competitive on global markets. Now, more than ever before, the building industry, including the housing sector, can be the driver behind this recovery. Therefore, in this issue we will be presenting some of Mapei's wide range of products for renovating the home, especially as regards thermal insulation.

On 3<sup>rd</sup> October, the Mose barrier has come into action in Venice to protect the city against high water. The Mose project is shown on the first pages of a special section focusing on dams, an industry in which Italian companies

are leading players all over the world and an industry in which Mapei sets the benchmark with its innovative dam-construction products and technology. Our teamwork section focuses on Vietnam, an extremely dynamic nation that has grown constantly over recent years thanks also to its building industry.

A year after they passed away, various projects (in Milan and Sassuolo) have been launched in memory of Giorgio Squinzi and Adriana Spazzoli, the Group's former CEO and Operational Marketing and Communication Director, respectively.

This issue of *Realtà Mapei International* also provides an overview of Mapei's commitments across the board, presenting the results of the 2019 Sustainability Report, outlining its recent social responsibility projects and - of course - reviewing Sassuolo's football season that began so successfully this year.

Enjoy your reading.



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Sassuolo's defender Rogério Oliveira da Silva



**Cover story**  
The largest hydroelectric power plant in Africa is located in Ethiopia, on the banks of the River Omo, and is powered by the Gibe III Dam. This colossus was completed by using Mapei admixtures for concrete and waterproofing solutions (see p. 14-17).

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# MOSE A BARRIER FOR VENICE

The floodgates of the Mose system positioned at the northern entrance to the Venice lagoon.

The Mose floodgates were raised this year on 3<sup>rd</sup> October. By 10:15 am, all the gates were in position and expectations were high as the system began its first real test under critical conditions. The 78 floodgates were raised and the difference in level between the sea and the lagoon rose to 40 cm. The level of the lagoon did not rise any further and Venice was not flooded.

That was the first official test for a structure that had taken almost two

decades to build, and which was designed to protect Venice from high tides, events which have become all too common.

#### A long-awaited project

MOSE (an acronym for MOdulo Sperimentale Elettromeccanico, or Experimental Electromechanical Module) is a hydraulic structure designed to hold back water if it rises above a certain level. The structure is like an automated dam with 20 m-

wide barriers in various thicknesses that use their own weight and the force of gravity to help them operate. The idea of this kind of system was first suggested 40 years ago. Following numerous delays and public enquiries, construction work commenced 20 years ago and is scheduled to be completed by the end of 2021. The system consists of 78 mobile steel floodgates measuring up to 29 m in height, with each one operating independently. The system is



ON 3<sup>RD</sup> OCTOBER, 17 YEARS AFTER WORK STARTED, THE SYSTEM OF DAMS DESIGNED TO STOP HIGH TIDES MADE ITS DEBUT. SEVERAL MAPEI PRODUCTS WERE ESPECIALLY DESIGNED TO BUILD THE SYSTEM

## Mose is a system of mobile dams that come into service to isolate the lagoon from the open sea during high tides and protect Venice from the risk of flooding

able to isolate the lagoon from the sea during high tides. Other works have also been carried out in the area, such as reinforcing stretches of coastline outside the entrances to the port to alleviate the effect of normal tides and raising quaysides and paving in the lowest areas of the inhabited areas around the lagoon.

The floodgates are housed in concrete caissons positioned on the seabed at the entrances to the three ports on the lagoon - Lido, Malamocco and Chioggia – and are designed to be raised when the tide exceeds a level of 110 cm.

The Mose system is designed to protect Venice and the lagoon from high tides of up to 3 m and from a 60 cm rise in sea-levels over the next 100 years.

### Outlets to the open sea

The Mose system is made up of four barriers positioned at the three outlets to the open sea. The widest outlet – which is the one closest to Venice – is positioned at Lido and is made up of two channels, each with a dif-

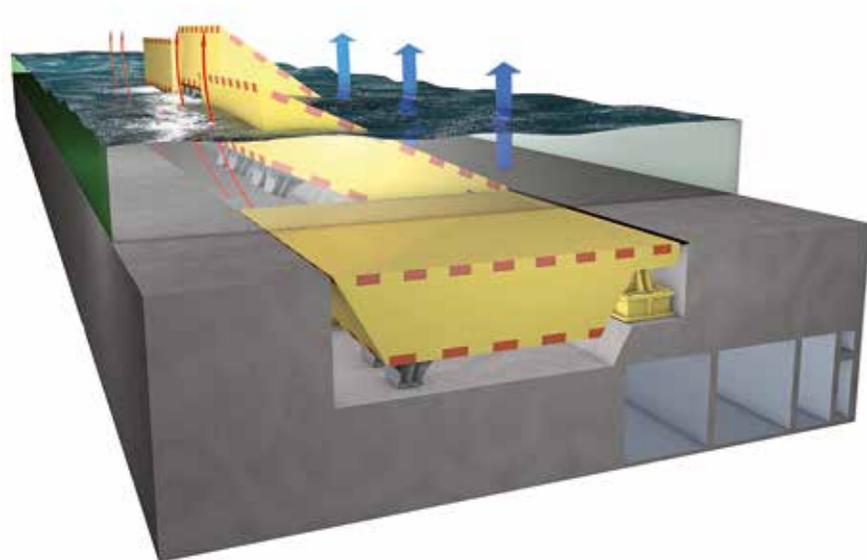
ferent depth. There are two barriers to protect this outlet: the north barrier, which is made up of 21 floodgate modules, and the south barrier with 20 modules. The two barriers are connected by an artificial island where the equipment used to operate and manoeuvre the system is located.

The entrance to the port of Malamocco is the deepest in the lagoon. This is the one used by ships heading to the industrial and commercial port, which is why a navigable basin has been constructed for the ships. The barrier at this entrance is made up of 19 floodgates.

The entrance to the port of Chioggia is used mainly by fishing boats and pleasure craft and a sheltered port with a double navigable basin has been constructed so that boats can enter and exit the port, even when the barrier is closed. This opening is protected by 18 floodgates.

### How the Mose system works

When the floodgates are in stand-by mode they are completely invisible,



**TOP.** The floodgates being manoeuvred into position at the entrance to the port of Chioggia: **LEFT.** The floodgates are housed in caissons sitting on the seabed. When there is a high tide, they rise up and block the sea at the entrance to the lagoon.



full of water and sitting in caissons on the seabed.

When there is a high tide that could potentially flood the surrounding area, compressed air is pumped into the gates to displace the water. As the water is expelled from the floodgates, they swivel on their hinges, rise up out of the caissons and block the entrances to the lagoon. On average, the time required for the floodgates to seal off the port entrances – including the time required to manoeuvre the floodgates into position – is 4 to 5 hours.

The gates only remain in this position during high tide. When the tide ebbs and the lagoon and the sea reach the same level, the floodgates fill with water and then retract into

their housing.

Each floodgate is made up of a hollow metal structure which is attached to the caisson housing with two hinges.

Each floodgate is 20 m wide, while their height depends on the depth of the port entrance channel where they are positioned and their thickness also varies.

The caissons housing the floodgates and the mechanisms used to manoeuvre them form the base of the barrier and are connected to each other by an inspection tunnel.

The structure that connects the barriers to dry land is made up of large support housings which contain all the equipment and plants required to make the gates operate correctly.

## BACKGROUND AND FIGURES

### 1984

A team of experts is commissioned to carry out a feasibility study for a system to protect Venice from high tides.

### 1992

The Mose project is presented. The objective is to build it in three years. Construction of the mobile dams only gets underway in 2003 with a target completion date of 2016.

### 2013

The first gate is raised in October 2013, but enquiries and court cases lead to a block being put on all the open sites until work finally recommences in 2018.

### 2020

On 3<sup>rd</sup> October, all 78 gates are raised for the first time and stop the level of the tide in the lagoon at 70 cm. Venice is not flooded. Completion of the Mose project is scheduled for the end of 2021.

## Costs of the project

**5.5 billion Euros** to construct Mose

**700 million Euros** cost of repairs to structures damaged and deteriorated over the years

**100 million Euros/year** cost of routine maintenance

Source of information in the article: Italian Ministry of Infrastructures and Transport - Interregional Department of Public Works for Veneto - Trentino Alto Adige - Friuli Venezia Giulia, former Magistracy for the Waters of the Province of Venice.

# MAPEI SOLUTIONS FOR THE MOSE PROJECT

Mapei took part in the Mose project as a technical partner and had a dedicated team that regularly interfaced with design engineers, works directors and contractors. The company's Technical Services, working in tandem with the Research & Development laboratories, proposed several special, innovative, high-performance products.

## Grouting the joints

MAPEFILL MF 610 was specifically developed for this project and used for grouting the joints and creat-

ing the watertight seal required in order to connect them with their matching fittings on the caissons housing the floodgates.

The caisson housings were positioned in sequence in a trench and were connected together with a special jointing system made up of two separate elements to form a watertight seal. The first element of the system is the so-called "Gina ring-joint" that keeps the external part watertight and forms a temporary watertight seal between one caisson and the next one while they

are being installed. The second element is the "Omega seal" which is installed inside the Gina joint during construction of the caissons and guarantees that the entire caisson remains watertight.

Reo-plastic concrete was required for this job to ensure it would maintain a high level of workability at high temperatures (around 3 hours at +35 °C). The Gina collar used to house the joint was made from super-duplex stainless steel, an extremely expensive material that left no margin for error during installation.



1. Reinforced concrete caissons used in the Mose project during their manufacture. The joint housings for the caissons were connected together with a jointing system made up with MAPEFILL MF 610.
2. Preparing and positioning formwork on the caissons before pumping MAPEFILL MF 610.



## MAPEFILL MF 610

Expansive grout for precision anchoring in thick layers.

FIND OUT MORE



## HOW WE SOLVED THE PROBLEM OF THE HINGES



WE SPOKE WITH ENRICO PELLEGRINI, FORMER SITE MANAGER FOR GRANDI LAVORI FINCOSIT S.P.A.

### Mr. Pellegrini, what role did you have in the Mose project?

From 2005 to 2015 I was the manager of the site where the precast concrete caissons were manufactured for the inlets to the ports of Lido San Nicolò and Malamocco. The site was located on a 13-hectare artificial embankment created specifically for the project on the island of Pellestrina.

### Which part of the work on the Mose project proved to be the most challenging with regards to its design and the materials to be applied?

The structure of the Mose barriers is made up of two main elements: the reinforced concrete caissons, which anchor the barrier to the seabed, and the metal

floodgates, which are those big, yellow boxes which we can see rising up out of the sea to stop high tides.

The two elements are joined together by a highly sophisticated device: the hinge.

The caissons are fixed permanently to the seabed, whereas the metal floodgates can be removed periodically to carry out scheduled maintenance work.

This means that the hinge element must allow the floodgates to be disconnected from the caissons, which is why it is made out of two parts: the female part, which is fastened permanently to the caisson, and the male part, which is an integral part of the floodgate.

To anchor the steel female part to such an enormous reinforced concrete structure (the largest caissons are as big as a three-story apartment block) with pinpoint precision was a really challenging design and construction matter, which we managed to overcome by applying materials of the very highest quality and by planning the application procedures down to the minutest details.

### What problems did you have to overcome to anchor the hinges in place?

It was extremely important that the female hinges

integrated with the foundation structure to perfection. The difference of the two materials (reinforced concrete and steel), in terms of thermal and elastic behaviour, the difference in the design codes and construction methods applied, as well as the need to create a seal that would remain perfectly watertight at a great depth, required a very careful, in-depth study of the behaviour of the two elements when joined in one single element. Which is why MAPEFILL MF was chosen; a product that would be able to guarantee the maximum level of adhesion between the two elements, with high mechanical properties, while maintaining sufficient elasticity and the ability to be distributed into any tiny gaps in the spaces left to connect the two elements together.

### Any structure immersed in water must be fully waterproof. What were the most significant characteristics of this part of the work?

As I mentioned previously, while the floodgates will have to be extracted so their protective waterproofing system

can be replaced and maintained at regular intervals, this won't be possible for the concrete caissons. This made it extremely important to design one or several systems that would completely waterproof the structure. This is why, for the construction joints, three waterstop systems were provided, with the external one

coated with a cementitious waterproofing membrane. In spite of all these precautions, after carrying out a thorough analysis of the costs and benefits, the contractor decided on site to integrate these safety systems even further by treating the entire surface of the caissons, from top to bottom, with a specially designed formula of MAPELASTIC

FOUNDATION mortar, which was further integrated by applying a coat of a primer specifically designed by the Mapei R&D laboratories.

### Because of the new materials and technologies adopted, do you think the Mose site can be considered a pilot project for other sites of this type?

Obviously I can only speak for the work carried out on the site I was involved with, but I would say that, more



**3.** The precast concrete caissons being manufactured in the Malamocco site.

The Gina joint was connected to the concrete caisson by pumping MAPEFILL MF 610 into formwork. This is a fibre-reinforced powdered grout made from high strength cement, selected aggregates, special admixtures and polyacrylonitrile synthetic fibres. When mixed with water, it forms a fluid grout which

does not segregate and is able to flow even into spaces with a complicated shape. The product has low capillary absorption (complying with EN 13057), is highly impermeable to water, adheres very strongly to iron and concrete and is highly resistant to mechanical stress, including dynamic stress.

than anything else, it was the way the project was managed from a technical point of view that could be used as an example of how to set up a major works site. One such example is the care taken in choosing the right materials, which was dictated not only by the principles of affordability, but also by means of a long series of tests and cost/benefit evaluations.

**You worked very closely with Mapei Technical Services and the company's R&D laboratories in Milan.**

**How did this team-approach work exactly?**

I was in no doubt about MAPELASTIC's waterproofing capacity and elasticity, but I was still concerned about two factors: how strongly it would bond to the substrate and its durability. That's why I personally wrote out a procedure which included an extensive range of tests to be performed on-site to demonstrate which would be the best technology to prepare the base, but also which was the

best primer to apply in order to guarantee the highest level of adhesion for the membrane.

The Mapei product performed better than those of the competitors, thanks also to the direct and prompt interest shown by the company's R&D lab, which made some slight modifications which greatly improved its final performance properties.

Besides, it was really comforting to be able to rely on an experiment carried out by the laboratory at the Polytechnic of Milan, which demonstrated that MAPELASTIC maintains its performance properties, even after a series of extended immersion cycles in seawater. Also worth highlighting is how the

Mapei lab followed our progress throughout the entire construction, which lasted around one year, by coming to monitor and test the application of the product on a regular basis.

We found this to be very reassuring and it provided us with a further guarantee of the final quality of the work we carried out on site.

**It was extremely important to design one or several systems that would completely waterproof the caissons**



mic stress. Thanks to its performance characteristics, MAPEFILL MF 610 fulfilled all the client's requirements during both the application phase and the qualification tests.

**Anchoring the hinges and waterproofing the caissons**

The metal floodgates, which are raised when required to block high tides, are anchored to the reinforced concrete caissons with a hinge mechanism which allows them to be raised and lowered. As Enrico Pellegrini, former Site Manager for Grandi Lavori Fincosit SpA, explained in the interview on the previous pages, to anchor the hinges to the caissons, a great deal of design work and testing was conducted to identify the most appropriate products and technology to fasten a metal component, in this case the hinge, to concrete.

Mapei specifically developed MAPEFILL MF for this application, an expansive, fluid mortar for anchoring elements in position with great precision. The mortar was applied by injecting it into one side of the hinge and then it flowed to perfectly

saturate all the gaps and free spaces to form a single, solid body with the caisson it was anchored to. The waterproofing system for the caissons, which are then placed on the seabed, also had to be carefully designed and thoroughly tested in order to identify products that would guarantee excellent, long-lasting results. After performing tests on site and in the lab, the external surface of the caissons was treated with MAPELASTIC FOUNDATION, a two-component, flexible cementitious mortar for waterproofing concrete surfaces subjected to both negative and positive hydraulic pressure. The product chosen for the inside of the caissons, on the other hand, was MAPELASTIC two-component, flexible cementitious mortar. It was applied after treating the substrates with a specially designed version of PRIMER 3296.

This part of the work, as with the challenge of anchoring the hinges, was closely followed by the Mapei Research & Development Laboratory in Milan, which carried out testing on the application of the products for the entire duration of the site.



**4 and 5.** The metal floodgates are anchored to the reinforced concrete caissons with a hinge mechanism which allows them to be raised and lowered. The hinges were anchored using MAPEFILL MF, an expansive, fluid mortar especially designed for this site.

**MAPEFILL MF**

Expansive fluid anchoring grout.

FIND OUT MORE



**TECHNICAL DATA**  
**MO.S.E. (Experimental Electromechanical Module),** Venice (Italy)  
**Period of construction:** 2003-ongoing  
**Period of the Mapei intervention:** 2007-2015  
**Intervention by Mapei:** supplying products for grouting the Gina joints, anchoring the hinges,

waterproofing the caissons  
**Design:** Italian Ministry of Public Works, Technital  
**Owner:** Italian Ministry of Infrastructures and Transport - Interregional Department of Public Works for Veneto - Trentino Alto Adige - Friuli Venezia Giulia, former Magistracy for the Waters of the Province of Venice

**Malamocco site director:** Enrico Pellegrini  
**Malamocco site main contractor:** Grandi Lavori Fincosit SpA  
**Mapei coordinators:** Claudio Azzena, Pasquale Zaffaroni, Renato Pasqualato, Mauro Orlando (Mapei SpA), Orlando Sas

**MAPEI PRODUCTS**  
**Sealing Gina joints:** Mapefill MF 610  
**Anchoring the hinges:** Mapefill MF  
**Waterproofing caissons:** Primer 3296, Mapelastic, Mapelastic Foundation

For further information on products see [mapei.com](http://mapei.com)



# Laboratory tests to develop products for a truly special project

WE SPOKE WITH CLAUDIO AZZENA, MAJOR PROJECTS DIVISION, MAPEI SpA

**Mapei worked for a long time on the Mose project to regulate and control the flow of the tides. What problems did you come across and how did you manage to overcome them?**

Mapei was chosen as technical partner by all the contractors working on the construction of this incredibly important structure.

The aim of the Mose project is to defend Venice and the Venetian lagoon from high tides by placing mobile, retractable gates at the entrances to the ports where the lagoon meets the open sea and through which the tidal waters flow.

Mapei's contribution to the project increased considerably over the years, ever since the first work we carried out to strengthen the dam walls next to the system. Later on, when building the caissons, we developed products to grout the housings for the joints between the caissons and to anchor the hinges to the caissons, as well as waterproofing the external surfaces of the caissons and solving several other design issues.

**You suggested using MAPEFILL MF for the hinges on the gates, which was specifically developed for this site. What changes did you make to the original formula?**

The hinges play a very important role in the Mose project because they allow the gates to be raised and lowered to stop high tides reaching Venice. A lot of lab testing was carried out on all the components in the hinge/connector system, including the grout which had to connect these mechanical components to the caissons.

So it was really important to develop a product that could be injected from one side of the hinge and then completely saturate every free space or gap, so that it would form a single, integral piece and give excellent results when subjected to stress tests.

Apart from the tests carried out at Mapei Research & Development Laboratory and the full-size mock-up tests to qualify the product, the support provided by Mapei during the actual construction of the hinges helped transform the lab results into excellent results on site.

**The support provided by Mapei during the construction of the hinges helped transform the lab results into excellent results on site**

**You also worked on other projects related to the Mose system on dry land. What problems did you have to overcome with that part of the work?**

Beside stopping high tides flowing through the port entrances, the project also involved strengthening stretches along the coast, raising the shoreline and redeveloping the lagoon in general.

With this in mind, we also collaborated in the work to strengthen the dams at Venice Nicelli Airport, the Cà Roman and San Felice dams and the "Baby-Mose" project in Chioggia to provide the Vena Canal with two floodgates.

For each of these interventions we proposed the most suitable products to grout the Istria stone paving blocks and fill any remaining gaps and voids, as described in the facing page. These works commenced years before breaking the sites for the caissons and show how important the experience and leadership of Mapei are in the field of consolidation work.

Another challenge we were presented with was to design and develop a bespoke product for grouting the so-called "Gina joints", one of the key components of the Mose project. The caissons used to house the barriers are positioned in sequence in a trench and are connected using the system of the Gina joints, made from two separate elements that form a watertight seal. The Gina joints were connected to the concrete caisson by filling the formworks with MAPEFILL MF 610, a fibre-reinforced, expansive grout, which was also developed specifically for this project.

**In what way did Mapei's innovative technology contribute to the successful outcome of this major project?**

This project proved to be a challenge for all those involved at every level, because there was no similar structure anywhere in the world that we could use as a reference to study and develop the most suitable technical solutions to overcome the problems we encountered.

The expertise of the Mapei Research & Development laboratories, the high quality training the company has invested in for its employees over the years and the availability of a wide, reliable portfolio of products enabled us to become a benchmark for all the players involved in the project.

## Additional works in the lagoon



Ca' Roman dam  
**PELESTRINA-CHIOGGIA**

The Istria stone *masegni* (paving blocks typically found in the narrow backstreets of Venice) used to cover the banks of this dam were sealed with MAPEGROUT T60, sulphate-resistant, fibre-reinforced, shrinkage-compensated, thixotropic mortar. Any remaining gaps were filled with STABILCEM very fluid, expanding cementitious binder and a special compound containing the anti-washout admixture RESCON T (manufactured by Mapei AS, the Norwegian subsidiary of Mapei Group).



San Felice dam  
**SOTTOMARINA DI CHIOGGIA**

The Istria stone *masegni* were again sealed with MAPEGROUT T60 thixotropic mortar and MAPE-ANTIQUE MC lime and Eco Pozzolan based mortar.

Any remaining gaps were filled by injecting them with STABILCEM ARS, a cement-based binder with high sulphate-resistance to make slightly thixotropic fluid slurries and/or superfluid injection mortars, and the anti-washout admixture RESCON T manufactured by Mapei AS, the Norwegian subsidiary of the Group.



Nicelli Airport dam - **LIDO**  
Baby Mose system - **CHIOGGIA**

In these areas, the Istria Stone *masegni* were again sealed with MAPEGROUT T60 and MAPE-ANTIQUE MC mortars. The remaining gaps were then filled with a slurry made up of STABILCEM ARS and RESCON T.

The Vena Canal in Chioggia was provided with floodgates at the two ends, which make up the so-called "Baby Mose" system.



Arsenal  
**VENICE**

The walls of the basin, which will be used to carry out maintenance work on the various elements and structures of the Mose barrier, were waterproofed by applying MAPEPLAN TU 20 waterproofing membrane in PVC-P. Made by Polyglass, a company belonging to the Mapei Group, the product belongs to the MAPEPLAN line of high-performance, highly durable, synthetic waterproofing membranes with excellent workability and weldability.



Omo River (Ethiopia)

# GILGEL GIBE III HYDRO POWER PROJECT

THE DAM WITH THE TALLEST ROLLER-COMPACTED CONCRETE WALL IN THE WORLD WAS COMPLETED WITH MAPEI PRODUCTS

The largest hydroelectric power plant in Africa is located in Ethiopia – to the south-west of the capital, Addis Ababa, on the banks of the Omo River – and is powered by the Gilgel Gibe III dam, a 250 m tall colossus with a 630 m long crest.

Inaugurated in 2016, the dam was constructed by Webuild Group. Along with Gibe I, Gibe II and the Grand Ethiopian Renaissance Dam (GERD, see *Realtà Mapei International* no. 75), it is part of the country's drive to exploit its enormous reserves of water. In fact, the Blue Nile has its source in the Ethiopian mountains and the country is also known as "The water tower of Africa". The aim of the 1.5-billion-dollar Gilgel Gibe III project was to double the country's electrical power generating capacity and to modernise the economy.

The figures for the project give an idea of its sheer size: it took 6.2 million m<sup>3</sup> of concrete to build the dam, a volume equivalent to 2.5 Giza Pyramids in Egypt, and the ten Francis turbines installed in the plant have an installed power of 1,870 MW, the equivalent of two nuclear power stations. The dam wall, made from Roller-Compacted Concrete (RCC), is the tallest of its kind in the world.

The large spillway is incorporated in the central part of the dam body. It includes an overflow crest divided into seven bays, controlled by radial gates, and flip buckets on the chute. Two middle outlets are embedded



1

1. The spillway embedded in the dam body was built by using concrete admixed with DYNAMON SR3 and MAPEPLAST SF.  
 2. The waterproofing system used at the foot of the dam wall included the use of PURTOP 1000 pure polyurea membrane.

in the dam body, being designed to allow the control of the reservoir impounding and are sized to cope with wet season floods release, according to the recommendations of the ESIA (Environmental and Social Impact Assessment) studies. Two 11 m power tunnels, each long over 1 km, form the waterways of the hydropower project. The outdoor powerhouse is located on the left bank and houses the 10 Francis turbines.

**Mapei's contribution: concrete admixtures and waterproofing products**

Mapei participated in the construction of Gilgel Gibe III dam by supplying products for the construction of the main body and spillway of the dam, the protection system for the lake-side face of the dam wall and to create the vertical waterproof joints. For the construction of the main body of the dam and the spillway, Mapei supplied the following admixtures:

- MAPETARD CBS1 liquid set-re-

tarder to prevent the formation of cold joints between layers of roller-compacted concrete applied at different times and guarantee extended workability times;

- DYNAMON SR3 and DYNAMON EW super-plasticisers and MAPEPLAST SF mineral addition based on densified silica-fume were used to maintain the right degree of workability during the high temperatures encountered on site and to increase the durability of the concrete used for the spillway, particularly with regards to erosion and cavitation phenomena. This mix was designed in the Mapei R&D labs to ensure it would meet challenging technical requirements (resistance to abrasion, low consistency, excellent control of setting times);
- DYNAMON SR3 and MAPEFLUID N280 were used for all the side buildings of the dam (power house, diversion tunnels) which were made using conventional vibrated concrete (CVC).



2

**GILGEL GIBE III DAM**

- 1.5 billion US dollars cost of the dam
- 250 m height
- 630 m length of the crest
- 6.2 million m<sup>3</sup> concrete used
- 1,870 MW installed power (equivalent of 2 nuclear power stations)

**Waterproofing solutions**

The client also asked for a waterproofing system to be supplied for the facing band at the foot of the dam wall to prevent the build-up of uplift pressures. The product chosen was PURTOP 1000, a pure polyurea membrane spray-applied on site. The product was subjected to tests to withstand hydraulic pressure of up to 25 bar, pressure-resistance tests, and puncture-resistance tests to guarantee impermeability in extreme conditions. Adhesion tests were also carried out at different curing stages of the substrate and after thermal cycles to make sure the membrane

would maintain a tough, firm grip to the wet roller-compacted concrete substrate. The substrate was simulated in the laboratory to reproduce similar conditions to those found on site in Ethiopia. The priming cycle chosen for this application included BIBLOCK two-component epoxy primer and TRIBLOCK P three-component epoxy-cementitious primer. To protect and maintain the continuity of the waterproofing system, including around the joints in the dam wall, MAPEBAND FLEX ROLL elastic TPE tape was used, which was bonded to the substrate with ADESILEX PG4 epoxy adhesive.

**PURTOP 1000**

Two-component, solvent-free pure polyurea membrane applied by spray to form waterproof coatings for hydraulic works, roofs and bridge decks directly on site.

**FIND OUT MORE**

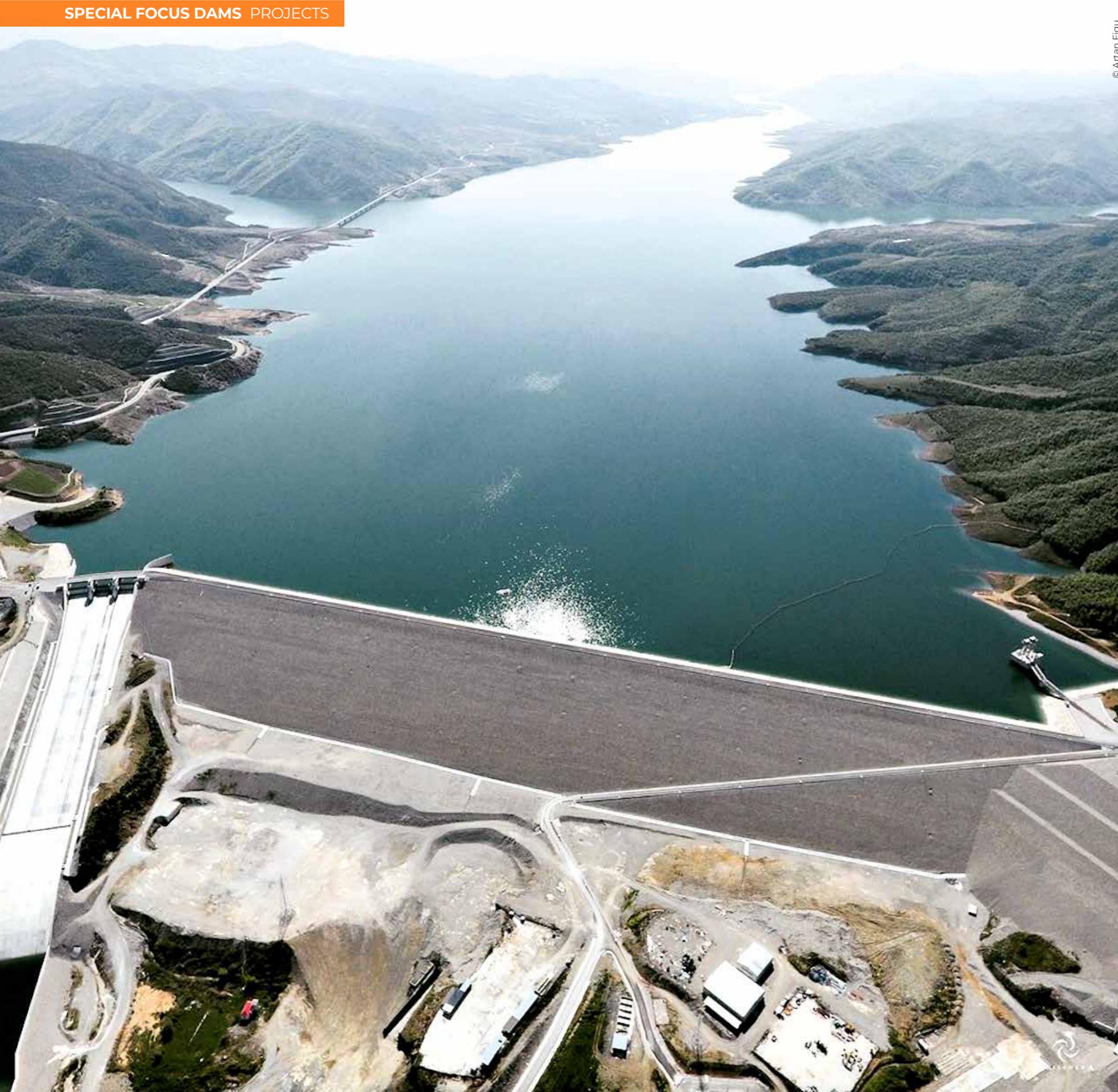


**TECHNICAL DATA**  
**Gilgel Gibe III hydropower project**, Omo River (Ethiopia)  
**Period of construction:** 2006-2016  
**Period of the Mapei intervention:** 2011-2015  
**Intervention by Mapei:**

supplying admixtures for concrete and products for waterproofing joints and concrete surfaces  
**Owner:** Ethiopian Electric Power Company  
**Design:** Studio Pietrangeli  
**Main contractor:** Webuild Group

**Mapei coordinators:** Pasquale Zaffaroni and Roberto Saccone, Mapei SpA (Italy)  
**MAPEI PRODUCTS**  
**Admixtures for concrete:** Mapetard CBS1, Dynamon SR3, Mapeplast SF,

Dynamon EW, Mapefluid N280  
**Waterproofing:** Triblock P, Biblock, Purtop 1000, Mapeband Flex Roll, Adesilex PG4  
 For further information on products visit [mapei.com](http://mapei.com)



© Artan Figu



© Eduard Pagjja

## Banjë (Albania) BANJA HYDROPOWER PLANT

CONCRETE ADMIXTURES AND PRODUCTS  
FOR CONCRETE REPAIR AND WATERPROOFING  
FOR A BIG HYDROPOWER PROJECT IN ALBANIA

The Banja hydropower plant is located in a valley along the River Devoll in Albania, around 70 km south-east of Tirana. It is part of the Devoll Hydropower Project which includes the development, planning, construction and operation of the Banja and Moglicë power plants, with a total installed capacity of approximately 269 MW and a planned annual production of approximately 700 GWh.

The plants were commissioned and are run by the Albanian energy company, Devoll Hydropower Sh.A., which is owned and operated by the Norwegian energy group Statkraft AS. The Banja hydropower plant started operations in autumn 2016 and has an installed capacity of 72 MW and an annual production capacity of around 255 GWh, the equivalent of 5% of the total amount of energy generated in Albania. The plant consists of an embankment dam with an approximately 80 m high clay core. It is equipped with

two large Francis turbine units and one small Francis turbine unit. The plant utilises a head between 175 and 95 m above sea level. At its highest regulated water level of 175 m above sea level, the reservoir has a surface area of approximately 14 km<sup>2</sup> and a storage capacity of 400 million m<sup>3</sup> of water.

The dam also had a significant impact on the inhabitants of the area where it was constructed, near the municipality of Gramsh, one of the poorest parts of Albania. Statkraft

### Problems and solutions

Mapei supplied various concrete admixtures during construction of the Banja dam: super-plasticisers, set-retarders and accelerators to help work progress more smoothly and more quickly during both hot and cold weather.

## BANJA DAM

2016

Entered into operation

72 MW

Installed capacity

255 GWh

Annual production

2000 workers

contributed to its construction

also built new roads and bridges to improve access to the most important towns and cities.

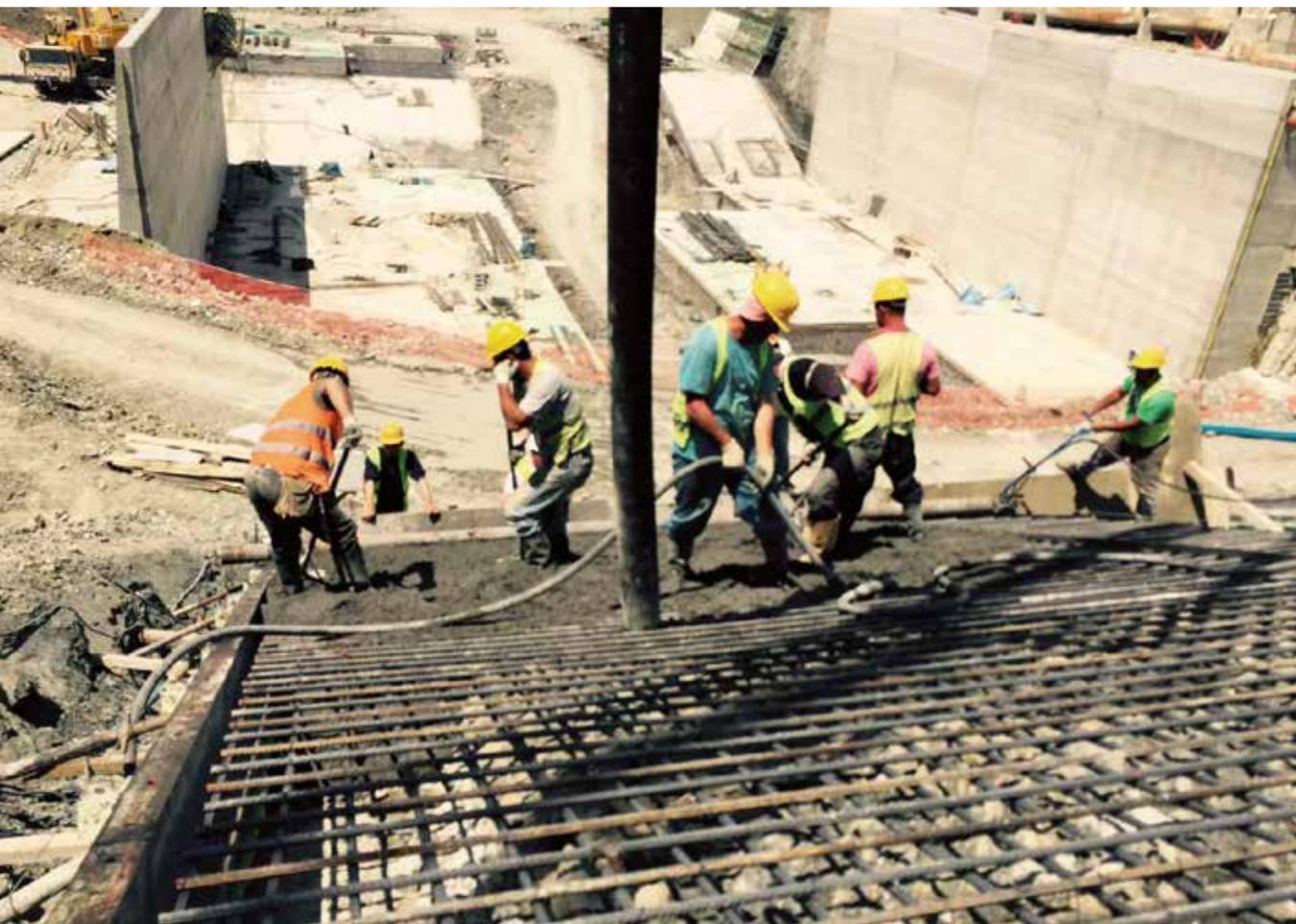
According to the Norwegian company, a workforce of around 2,000 took part in the construction of the dam, considered by the Albanian Prime Minister, Edi Rama, to be "Of enormous importance for the Albanian energy system".

### Admixtures for high-performance concrete

During construction of the dam, Mapei supplied admixtures for the self-compacting concrete used for the penstock that drives the turbines, the concrete used to build the spillway, the concrete used to make components and elements in the hydropower plant and the water tower.

Going into detail, the following concrete admixtures were supplied:

- DYNAMON SR3 and DYNAMON SP1 superplasticizers based on acrylic polymers, characterised by their low water/cement ratio and very high initial and final mechanical properties. DYNAMON SR3 also extends the workability of concrete;
- MAPETARD set-retarding admixtures, to extend the workability of concrete in hot weather;
- MAPEFAST CF/L chloride-free hardening accelerator, to speed up formwork stripping operations in cold weather;
- MAPEPLAST SF, a mineral addition based on densified silica-fume used to improve the resistance to erosion and cavitation in the concrete of the spillway.



**ABOVE.** MAPEFLEX PU65 was used to seal joints in the concrete elements used for the spillway.

**IN THE FACING PAGE.** Concrete was placed after being admixed with Mapei admixtures such as DYNAMON SR3, DYNAMON SP1, MAPETARD, MAPEPLAST SF, and MAPEFAST CF/L.

### Mapei solutions for repairing concrete and sealing joints

Mapei also supplied a number of products from its Building Line to repair the concrete along the walls of the spillway, to seal cracks in the concrete elements, to seal joints in the slabs for the spillway and to waterproof leaks in the penstock. The products used for these works were:

- ·MAPEGROUT T60 sulphate-resistant, fibre-reinforced, shrinkage-compensated thixotropic mortar for repairing the concrete of the penstock;
- ·EPOJET LV two-component, low-

viscosity epoxy resin to form monolithic seals in various concrete structures;

- ·EPORIP two-component epoxy resin for the construction joints in various concrete structures;
- ·ADESILEX PG1 two-component, thixotropic epoxy adhesive for structural bonding;
- ·MAPEFLEX PU65 polyurethane sealant for the joints in the concrete elements of the spillway;
- ·RESFOAM T polyurethane waterproofing resin, which was applied by injection to waterproof the concrete used for the penstock.

**TECHNICAL DATA**  
**Banja hydropower plant,**  
 Banjë (Albania)  
**Period of construction:**  
 2013-2016  
**Period of the Mapei intervention:** 2014-2016  
**Intervention by Mapei:**  
 supplying admixtures for concrete and products

for waterproofing and repairing concrete  
**Client:** Devoll Hydropower Sh.A, Statkraft AS  
**Contractor:** Limak  
**Mapei coordinators:**  
 Roberto Saccone and Pasquale Zaffaroni, Mapei SpA (Italy)  
**Photos:** Statkraft AS

**MAPEI PRODUCTS**  
**Admixtures for concrete:**  
 Dynamon SR3, Dynamon SP1, Mapetard, Mapeplast SF, Mapefast CF/L  
**Concrete repair:**  
 Mapegrout T60  
**Sealing joints and structural bonding:**  
 Epojet LV, Eporip, Mapeflex PU65

**Waterproofing:** Resfoam T  
**Sealing joints in concrete elements:** Mapeflex PU65

For further information on products see [mapei.com](http://mapei.com)

### DYNAMON SR3

Superplasticizer based on acrylic polymer for ready-mixed concrete with long slump retention.

FIND OUT MORE



## Bormes-les-Mimosas (France)

# PORT OF BORMES-LES-MIMOSAS DAM

REPAIRING THE PROTECTIVE BREAKWATER IN A PORT IN THE SOUTH OF FRANCE



1. The breakwater is topped with 215 protective covers in precast concrete, which was manufactured with made-to-measure case-moulds and formulated with DYNAMON XTEND W333 and MAPETARD CBS1 admixtures.
2. Pouring concrete into the mould.



Surrounded by woodland and lush vegetation at the foot of the Massif des Maures Mountains, the famous city of Bormes-les-Mimosas overlooks the Mediterranean in the south of France. Protected from the waves rolling in from the south by the islands of Port-Cros and du Levant, the port, built in 1970, was much more exposed to the waves coming in from the east, becoming vulnerable.

The port is made up of a main dam, a defensive breakwater around 770 m long made from large rocks but, over the last few years, the sea has regularly swept straight over the rocks, especially during three bad storms that left a lot of damage and forced the evacuation of the boats moored in the port.

To make the area safer and protect people and property, the Yacht Club International Bormes-les-Mimosas (YCIBM) commissioned an extensive reconstruction project of the dam that would respect the surrounding landscape.

The reconstruction work consisted of increasing the slope of the embankments with blocks of ECOPODE™ and ACCROPODE™ II concrete. An overflow basin was also created and the height of the wall protecting the covers from the pounding waves was increased. This protection system was left in place because it had proven to be very effective in repelling the force of the waves and had very little impact on the landscape.

### 215 wave-break shields

The breakwater is topped with 215 protective covers in precast concrete.

More than 600 m<sup>3</sup> of concrete was used to make them and each cover, measuring 3 m<sup>2</sup>, was made in its own specially-designed, made-to-measure case-mould with its own distinctive shape and pattern.

“To optimise the formula of the concrete (which in this case was class XS3, with good resistance to sea spray), Mapei supplied a high-performance superplasticiser”, we were told by Mikaëlle Astier, Mapei France sales agent for concrete admixtures for the south-east of France.

The product used in this case was DYNAMON XTEND W333, a superplasticiser which considerably reduces the amount of mixing water required, in combination with the set retardant MAPETARD CBS1, to make sure the concrete had high mechanical properties and that it would maintain its workability.

DYNAMON XTEND W333 is an admixture manufactured and distributed on the French market by Mapei France. “A solution that made it much easier to cast the concrete, which normally takes one and a half hours for each cover”, explained Mikaëlle Astier.

Once an optimum formula had been found, the manufacturing process had to be planned down to the finest detail. “With two moulds we were able to produce 2 covers a



3



4

# SYSTEMS AND MATERIALS FOR **REPAIRING, SKIMMING AND PROTECTING CONCRETE**

day. The concrete was cast every afternoon and the completed pieces were removed from their moulds at the start of the following morning.

The smooth surface of the formwork was treated with MAPEFORM ECO 2000, a vegetable-based release agent, while a wax was applied on the side with the matrix to ensure quality finishing", explained Thierry Haultcoeur, head of the Bonifay plant in Flassans-sur-Issole where the concrete covers were manufactured.

If any of the pieces had defects, they were repaired with NIVOLITE G skimming mortar mixed with PLANICRETE LATEX. These products are manufactured and distributed on the French market by Mapei France.

Once the concrete elements had been completed, they were left under cover for one week before placing them outside.

The spread of Covid-19 brought site operations to a halt and the precast elements were left outside for several months, proof of their resistance to bad weather conditions.

By the end of June, they had been positioned along 600 m of the breakwater.

### Concrete in harmony with the environment

Since the breakwater is in a conservation area, one of the challenges of this project was to integrate the architectural work with the surrounding landscape.

Today, thanks to the materials chosen, it has integrated perfectly with the surrounding coastal landscape.

In fact, the ochre-yellow concrete used for the protective covers is a reminder of the coloured houses in the city of Bormes-les-Mimosas, while the decorative pattern on their surface is similar to the curved forms of Neptune grass, a protected species of alga very common in the Mediterranean, and help soften the aesthetic impact of the concrete blocks.

*This article was taken from issue No. 50 of Mapei & Vous, a magazine published by Mapei France, the French subsidiary of Mapei Group, whom we kindly thank.*

**3.** The smooth surface of the formwork was treated with MAPEFORM ECO 2000 vegetable-based release agent.

**4.** 215 protective covers were set up over 600 m.

### MAPETARD CBSI

Liquid set-retarding admixture with plasticizing effect for conventional concrete and roller compacted concrete.

FIND OUT MORE



#### TECHNICAL DATA

**Port of Bormes-les-Mimosas dam**, France

**Period of construction:** 2019-2020

**Period of the Mapei intervention:** 2019-2020

**Intervention by Mapei:** supplying products for precast concrete elements

**Client:** Yacht Club International de Bormes-

Les-Mimosas (YCIBM)

**Project manager:** Corinthe Ingénierie

**Contractors:** Eiffage Travaux Maritimes et Fluviaux, VINCI Construction Terrassement

**Precast concrete manufacturer:** Bonifay

**Mould manufacturer:** MCB (Moule Concept Béton)

**Quality control:** Véritas  
**Mapei coordinator:** Mikaëlle Astier, Mapei France

**Photos:** Mikaëlle Astier, YCIBM

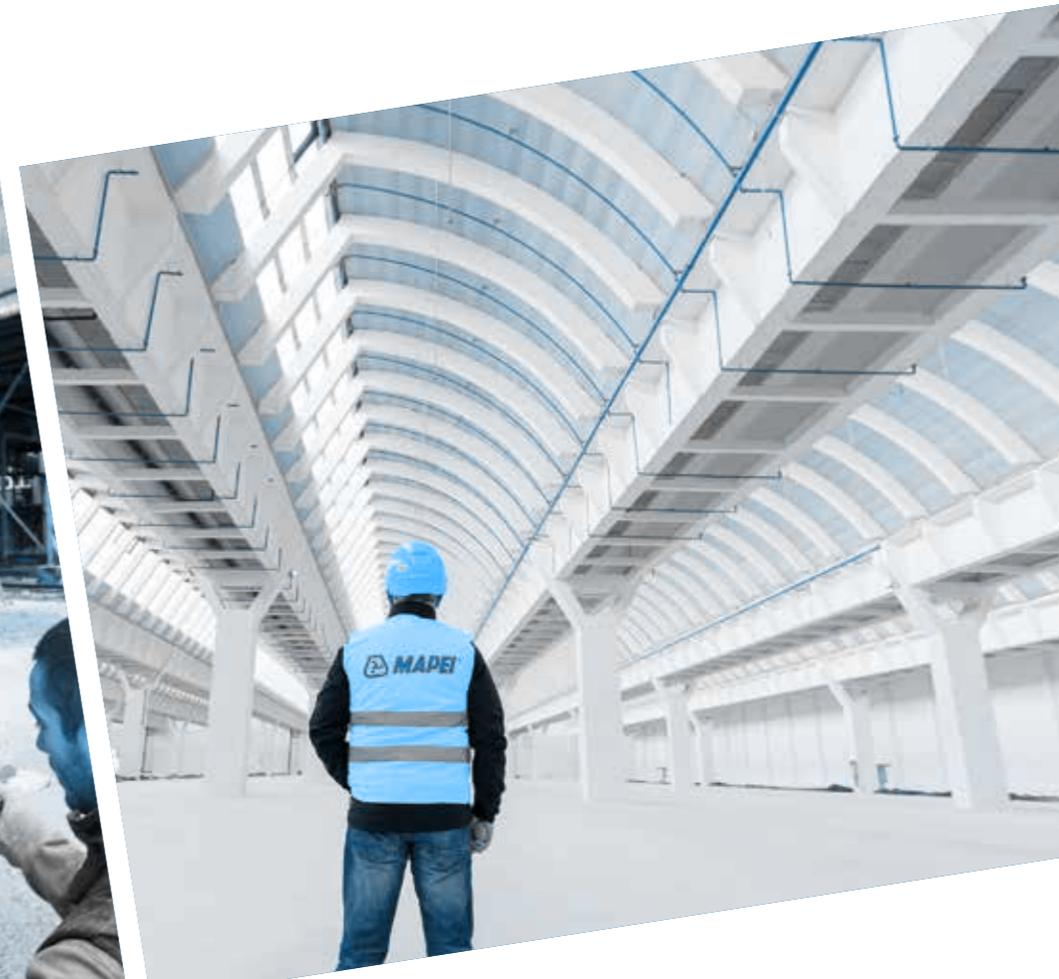
#### MAPEI PRODUCTS

**Admixtures for concrete:** Dynamon Xtend W333\*, Mapetard CBSI, Mapeform ECO 2000\*

**Skimming concrete surfaces:** Nivolite G\*, Planicrète Latex\*

\*These products are manufactured and distributed on the French market by Mapei France.

For further information on products see [mapei.com](http://mapei.com) and [mapei.fr](http://mapei.fr)



A durable, sustainable structure can only be achieved by thinking in terms of systems rather than products, which is why, year in year out, **the building line by Mapei** is extended by introducing new, cutting-edge systems and materials with the aim of supplying **solutions for every type of problem encountered on site.**

EVERYTHING'S **OK** WITH **MAPEI**





# Italy: leading the way in the world of dam construction

WE SPOKE WITH GIOVANNI RUGGERI, PRESIDENT OF ITCOLD (ITALIAN COMMITTEE ON LARGE DAMS)

## What does a dam need to guarantee in order to be fully operational and safe?

A dam must be able to withstand all the loading conditions to which it is subjected and to function within adequate safety margins. This obviously includes continuous, permanent loads, such as the pressure exerted by the water, but also extreme conditions that could impact the dam, such as high magnitude earthquakes or extreme floods.

Many large dams around the world, from the dam on the River Dez and the Aswan High Dam in the 1960's, up to the Grand Ethiopian Renaissance Dam on the Blue Nile, carry the signature of major Italian construction companies. Is this recognition of Italy's long-standing leadership in the sector?

Italian construction companies and design engineers have always made a particularly significant contribution to the development of dams around the world. Recently, the ITCOLD – the Italian Committee on Large Dams – wanted to acknowledge the importance of this work by carrying out a census of all the dams constructed in other countries where the contribution of Italian companies and engineers has played a key role. The results of the census were published in the ITCOLD Bulletin "Italian Dam Engineering Abroad" (that can

be downloaded at <https://www.itcold.it/wpsysfiles/wp-content/uploads/2019/05/RAPPFIN-IDEA-2016.pdf>), which showed that more than 210 dams had been constructed in 70 different countries and in all the continents since the beginning of the 1960's.

## Who are Italy's major foreign competitors at international level? Which parts of the world are currently investing the most in dams?

The construction of new dams has been scaled down drastically compared with the past in Italy, the whole of Europe and in North America. The only country closest

to Europe that has a significant, ongoing dam construction programme is Turkey. There are numerous important dams under construction, on the other hand, in other parts of the world, such as Asia, South America and Africa. The financial support received from the World Bank and other international financial institutions, which had a marked contraction at the beginning of the 2000's, has really started to pick

up again, which is an acknowledgement of the importance dams represent for the development of territories and entire countries. The leading country for dam construction projects is undoubtedly China, which has been making record after record, in terms of both the number of dams and their sheer size. There are now numerous dams in China that are more than 200 m

**The leading country for dam construction projects is China, which has been making record after record, in terms of both the number of dams and their sheer size**

high. Apart from the impressive dam construction programme in China itself, China is also leading the way in the development of dams in other countries, and not only in neighboring Asian countries, but also in other continents.

## How have the latest technologies and new materials changed the construction systems and lead times for dams?

Over the years, the evolution in dam construction has been accompanied and supported by the availability of new materials or construction solutions. Just think about the impact the arrival of concrete has had, for example. More recently, around the world (not in Italy) there has been a lot of development in the construction of dams made from Roller Compacted Concrete, concrete with low cement content placed using methods similar to those adopted in the construction of embankment dams. New, more efficient materials are an important contribution in the construction of better and better dams.

## The issue of dams is an ongoing debate between those who tend to underline and promote their advantages and those who tend to highlight their more problematic aspects. What is your position?

Unfortunately, criticism of dams often attracts comments that are not based on sound technical facts. During these debates you often come across extremist or ideological views which are of no use if you want to have an effective and fruitful exchange of ideas, perceptions and interests. In those areas where dams have been operating unnoticed while providing a useful service to the community, the local territory and communities that are directly involved are more serious and more motivated, they are more ready to acknowledge the enormous benefits the dams bring, including the positive effects on the environment, which often go unmentioned. All this emerged through the irrefutable evidence gathered during the "Dams and the Local Territory" workshops held by ITCOLD Dams Committee over the last few years in various parts of Italy, so that all the stakeholders in those areas where there are dams in operation could voice their opinions.

## DAMS IN THE WORLD

**210 dams** in **70 countries** were built or designed by Italian companies

**20 dams** constructed in Brazil (the country where most dams have been built using Italian companies)



**GERDP - GRAND ETHIOPIAN RENAISSANCE DAM PROJECT**  
Blue Nile River - North-West Ethiopia



**XILUODU HYDROPOWER PLANT**  
Xilodu, Yunnan Province - China



**THREE GORGES DAM**  
Yichang, Hubei Province - China

## ITCOLD



The Italian National Committee on Large Dams (ITCOLD) is an association for promoting and encouraging studies into all kinds of issues related to dams, their construction and operation. Its members include leading businesses in the hydroelectricity industry, ranging from those specialising in the design and construction of dams to dam owners and miscellaneous professionals operating in this field. The Committee is part of the International Commission on Large Dams (ICOLD-CIGB), set up in Paris in 1928, which Italy officially joined in 1936. The Committee's official bylaws initially fell under the jurisdiction of the Italian Ministry of Public Works before it became a private, non-profit association in 1984. The Committee's operations and projects include conferences, seminars, technical visits, and training activities, to discuss various dam-related issues, workgroups focused on specific topics, and other similar workgroups and meetings organised on a national and -international level.

## Valdaone (Trento, Italy)

## MALGA BISSINA DAM

REPAIR AND WATERPROOFING WORK ON THE VALLEY SIDE OF THE WALL OF ONE OF THE THREE LARGE DAMS ON THE RIVER CHIESE

The landscape of the Daone Valley, in the south-west of the Trentino-Alto Adige Region in Northern Italy, was radically transformed in the 1950's with the construction of a number of large dams and hydroelectric power stations fed by the waters of the River Chiese.

In this period two big hydroelectric plants were built at the foot of the mountain, as well as three dams: in Morandin, Malga Boazzo and Malga Bissina, 1788 m above sea level.

The dam in Malga Bissina was built between 1955 and 1957 by a company called Idroelettrica Alto Chiese (part of Edison Group) according to a design by Claudio Marcello. Final

testing was carried out in 1962.

The dam, which is owned by Hydro Dolomiti Energia srl, is a so-called "Marcello type" (lightweight gravity dam with hollow buttresses), made up of 22 hollow elements, each one measuring 22 m in width (with vertical joints among them), and two regular gravity sections. The dam wall is 82.5 m high and the crest of the wall is 3 m wide with a total walkable length of 563.4 m. The reservoir formed behind the dam wall has a total capacity of 61 million m<sup>3</sup>. Because of its height above sea level, to prevent the internal sections being exposed to the effect of the changing atmospheric conditions and to

The render on the insulated walls on the valley side of the dam was repaired with MAPEGROUT EASY FLOW. The walls were then waterproofed with MAPELASTIC GUARD.



the formation of ice and snow drifts, the structures of the compartments between the sections were insulated.

#### Cutting-edge materials for a long-lasting infrastructure

The first time Mapei was asked to participate in work on the Malga Bissina dam was at the beginning of the 2000's when the protective beams for the joints needed to be rebuilt.

Then, in 2019, restoration and waterproofing work started on all the insulated walls on the valley side of the dam. The work, which is scheduled to be completed in 2022, includes the use of various Mapei solutions. MAPEGROUT EASY FLOW one-component sulphate-resistant, fibre-reinforced, shrinkage-compensated, thixotropic mortar was used to repair the render. In this case it was admixed with MAPECURE SRA curing admixture to reduce hydraulic shrinkage and the formation of micro-cracks. This mix was then used to integrate areas up to 8 cm thick with a strengthening mesh embedded in it.

The expansion joints were waterproofed with MAPEBAND TPE tape, bonded with ADESILEX PG4 two-component, low viscosity, thixotropic epoxy adhesive, before sealing them with MAPEFLEX PU30 epoxy-



polyurethane sealant and MAPEFLEX MS45 flexible, thixotropic, quick-hardening silicated polymer-based hybrid sealant.

The insulated walls on the valley side of the dam were waterproofed with MAPELASTIC GUARD, a two-component, flexible cementitious mortar for protecting large concrete structures subjected to high stress. Due to its high content of quality synthetic resins, its hardened layer maintains its flexibility under all environmental conditions.

To reinforce and strengthen the mortar, alkali-resistant MAPENET 150 glass fibre mesh was embedded in the first layer of MAPELASTIC GUARD.

#### MAPEGROUT EASY FLOW

One-component sulphate-resistant, fibre-reinforced, shrinkage-compensated, thixotropic mortar especially suitable for repairing concrete

FIND OUT MORE



#### TECHNICAL DATA

**Malga Bissina dam,**

Valdaone (Province of Trento, Northern Italy)

**Period of construction:** 1955-1957

**Original design:** Claudio Marcello

**Period of the intervention:** 2019-ongoing

**Intervention by Mapei:**

supplying products for concrete repair and waterproofing

**Owner:** Hydro Dolomiti Energia Srl

**Works director:** Michele Buratti

**Head of Civil Engineering**

**Hydraulic Department:**

Enrico Dalla Villa

**Main contractor:**

Co.ge.dit Srl, Fausto Ditomasso

**Mapei coordinators:** Stefano Barachetti and Paolo Banfo, Mapei SpA (Italy)

**MAPEI PRODUCTS**

**Concrete repair:**

Mapegrout Easy Flow,

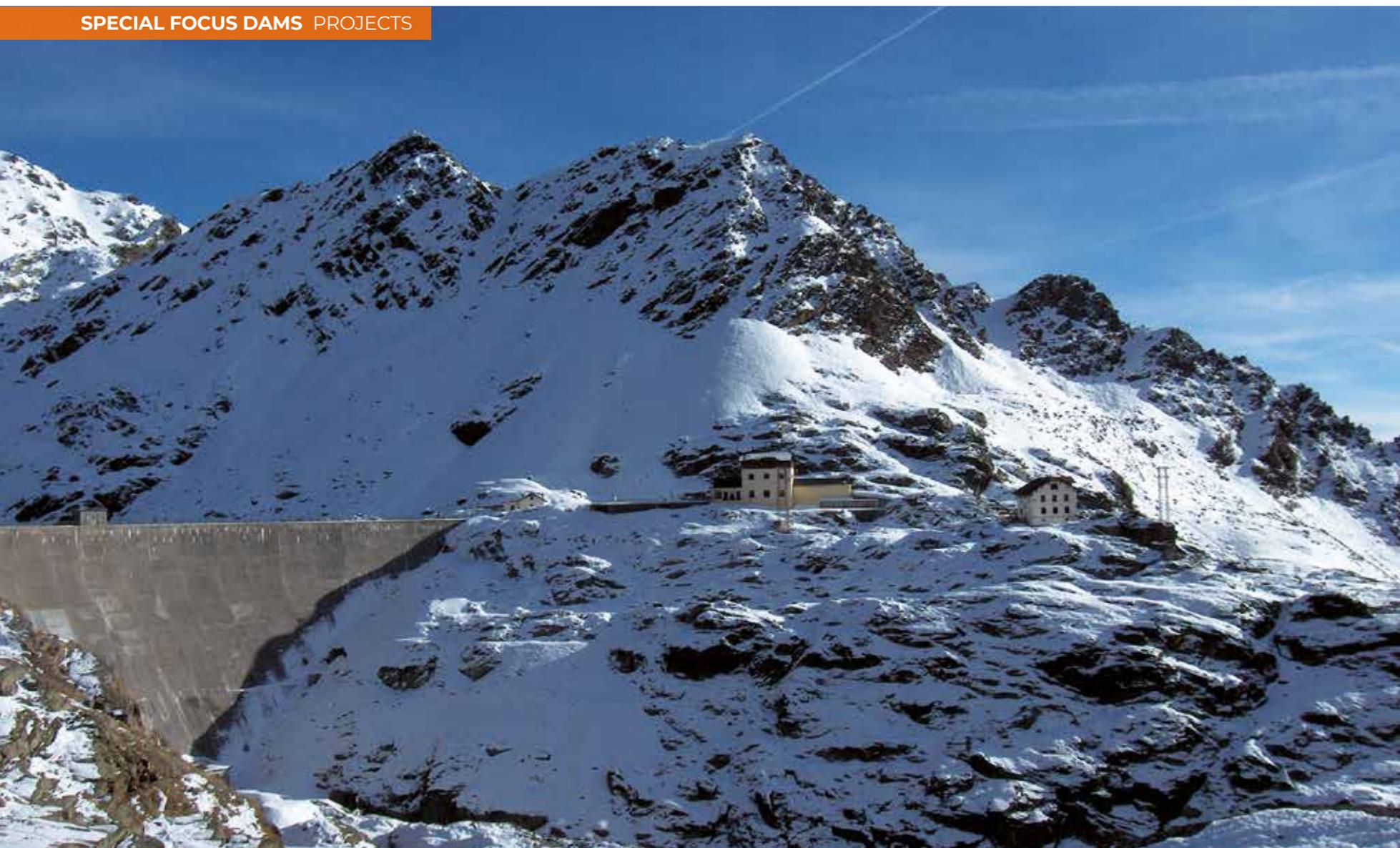
Mapecure SRA

**Waterproofing:** Mapelastic Guard, Mapeband TPE,

Adesilex PG4, Mapenet 150

**Sealing joints:** Mapeflex MS 45, Mapeflex PU30

For further information on products see [mapei.com](http://mapei.com)



## Peio (Province of Trento, Italy) CARESER DAM

CONCRETE REPAIR FOR A DAM CONSTRUCTED IN THE 1930'S  
IN AN EXTRAORDINARY NATURAL SETTING

Val di Sole, in the Trentino Region of Northern Italy, has a long tradition of creating energy from water: from windmills to sawmills, right up to the large hydroelectric plants built between the 1920's and 1950's.

Two large dams located in Val di Peio are still operational today: the Careser and the Pian Palù.

The Careser dam is located at 2,603 m above sea level near the town of Peio and was constructed between 1928 and 1934 to exploit the water

running off from the Careser glacier to generate hydroelectric energy. Surrounded by a majestic Alpine landscape, the lake – covering an area of 0.48 km<sup>2</sup> with a maximum depth of 57 m and a capacity of 15 million m<sup>3</sup> - is enclosed in a gravity-type dam which is 62 m high above the level of the foundations and has a 444 m crest. The dam is connected to the Malga Mare power plant and exploits a drop of 635 m to drive a Pelton turbine that gener-

ates up to 12 MW for a total annual production of 27.7 GWh. The water is discharged from the power plant and, along with water from the River Noce, is channelled to the hydroelectric plant in Cogolo.

### Products for concrete repair

Between 2017 and 2019, important repair work was carried out on 13,000 m<sup>2</sup> of the concrete on the valley-side wall of the Careser dam wall.

### TECHNICAL DATA

**Careser dam, Peio**  
(Province of Trento, Italy)  
**Period of construction:**  
1928-1934  
**Period of the Mapei  
intervention:** 2017-2019  
**Intervention by Mapei:**  
supplying products for

concrete repair and  
waterproofing surfaces

**Owner:** Hydro Dolomiti  
Energia Srl

**Works director:** Michele  
Buratti

**Head of Civil Engineering**

**Hydraulic Department:**  
Enrico Dalla Villa

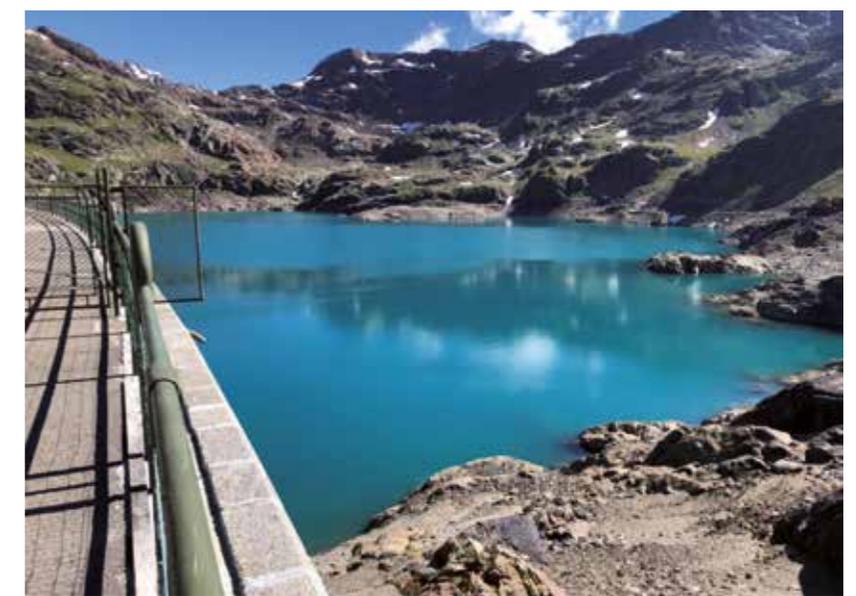
**Main contractor:** Co.ge.dit  
Srl, Diego Ditomasso

**Mapei coordinators:**  
Stefano Barachetti and  
Paolo Banfo, Mapei SpA  
(Italy)

**MAPEI PRODUCTS**  
Concrete repair:

Mapegrout 430,  
Mapegrout MS  
Sealing joints: Mapeflex  
PU40

For further information  
on products see  
[mapei.com](http://mapei.com)



Amongst the various products used for the repair work, a key role was played by MAPEGROUT 430 fine-grained, fibre-reinforced, normal-setting mortar. This is a spray-applied product and, after adding the correct amount of water, it forms a mortar with a thixotropic consistency which is waterproof and very easy to apply, even on vertical surfaces, at a thickness of between 5 and 35 mm without the need for formwork.

MAPEGROUT MS, a fibre-reinforced, micro-silicate based cementitious mortar, which is ideal for levelling off uneven concrete surfaces or surfaces subjected to heavy abrasion, was also used for repairing some areas of the concrete surfaces.

The expansion joints were sealed with MAPEFLEX PU40, a polyurethane sealant with a low modulus of elasticity, specifically formulated for sealing expansion and contraction joints in horizontal and vertical surfaces.

MAPEFLEX PU40 hardens following its reaction with the humidity in the surrounding air and, because of its special characteristics, offers a guarantee of a long service life.

### MAPEGROUT MS

Cementitious fibre-reinforced  
thixotropic mortar with added  
micro-silicates

FIND OUT MORE



## Amatrice (Province of Rieti, Italy)

# SCANDARELLO DAM

CONCRETE REPAIR AND A NEW WATERPROOFING SYSTEM FOR THE LAKE-SIDE FACE OF THIS CENTURY-OLD DAM



Construction of the reservoir at Scandarello near Amatrice (Province of Rieti, Italy) to produce and distribute electricity, commenced in 1918 following a decision by the Italian energy company U.N.E.S. which was acquired in 1962 by the energy group ENEL. The dam was designed by Angelo Omodeo in 1917 and is a concrete gravity-type structure which went into service in 1924. The Tronto lake, which covers an area of around 2 km<sup>2</sup> and is around 40 m deep, is fed

by a tributary of the River Tronto, the Scandarello stream, from which the dam takes its name. The dam wall is 44 m high and the crest of the wall is 200 m long.

The power plant is situated at the base of the dam and has an output of 2.5 MW. When it was originally built it had one hydroelectric generator and then, in 1944, its output was increased by adding a second generator. More recently, a mini hydroelectric power plant was created us-

ing the minimum in-stream flow of 250 litres/second from the discharge valve at the bottom of the dam. The output of the plant is 100 kW, sufficient for 220 homes.

### High-performance and durability to repair the concrete

Over the course of 2019, Enel Green Power commissioned Co.ge.dit Srl to carry out the maintenance work and refurbishment of the dam.

Mapei Major Projects Division was involved in the project right from the very start, initially by providing their specialised consultancy service, and then with personnel from the Technical Services to support and supervise the contractor while they were carrying out the various phases of the work.

The lake side of the wall was repaired by applying a large quantity of MAPEGROUT EASY FLOW, one-component sulphate-resistant, fibre-reinforced, shrinkage-compensated, thixotropic mortar which is recommended for restoring concrete structures deteriorated by sulphate salts in the water or ground. To let the expansive properties fully develop in open air, MAPEGROUT

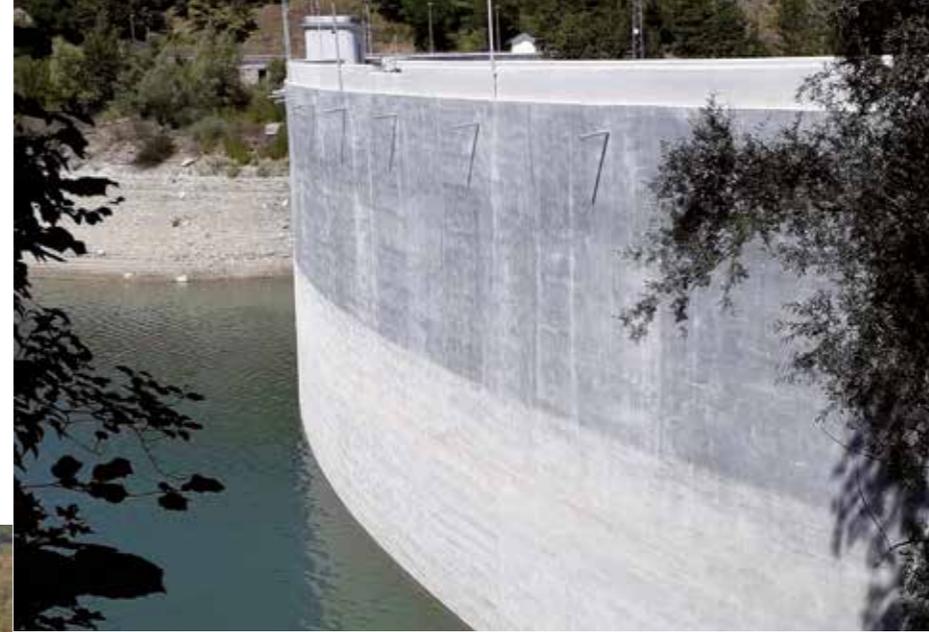
EASY FLOW was admixed with 0.25% of MAPECURE SRA. This is a curing admixture with the ability to reduce hydraulic shrinkage and the formation of micro-cracks.

The joints in the valley side wall were repaired with MAPEGROUT 430 fine-grained, fibre-reinforced, normal-setting thixotropic mortar.

The structural joints were waterproofed with IDROSTOP, hydrophilic expandable rubber section, especially designed to form watertight construction joints in construction up to a hydraulic pressure of 5 atm.

IDROSTOP PVC BE was also used during this phase of the work, a PVC waterstop used to make water-tight structural joints in reinforced concrete structures containing water. The product features good resistance to mechanical stresses, the aggressive action of chemical products, sea-water and acids.

The waterproofing work on the lake side of the dam was completed with MAPELASTIC GUARD, two-component, elastic cementitious mortar, which is used to protect large concrete structures subjected to high levels of stress and the action of water and atmospheric agents.



**LEFT.** The lake-side concrete wall was repaired by applying MAPEGROUT EASY FLOW, sulphate-resistant, fibre-reinforced, shrinkage-compensated, thixotropic mortar.

### MAPEGROUT 430

Fine-grained, fibre-reinforced, normal-setting thixotropic mortar for repairing concrete.

FIND OUT MORE



### TECHNICAL DATA

**Scandarello dam,**  
Amatrice (Province of Rieti, Italy)

**Period of construction:**  
1918-1924

**Original design:** Angelo Omodeo

**Year of the intervention:**  
2019

### Intervention by Mapei:

supplying products for concrete repair and waterproofing the surfaces

**Owner:** Enel Green Power SpA

**Design:** Enel Green Power SpA

**Works direction:** Matteo

### Sbarigia

**Main contractor:** Co.ge.dit Srl, Domenico Di Tomasso

**Mapei coordinators:** Stefano Barachetti, Lorenzo De Carli, and Paolo Banfo, Mapei SpA (Italy)

### MAPEI PRODUCTS

**Concrete repair:** Mapegrout Easy Flow, Mapegrout 430, Mapecure SRA

**Waterproofing surfaces:** Idrostop PVC BE, Idrostop, Mapelastic Guard

For further information see [mapei.com](http://mapei.com)



Oroville dam  
Oroville - California (USA)



GERDP - Grand Ethiopian  
Renaissance Dam Project  
Blue Nile - Ethiopia



# MAPEI SOLUTIONS FOR DAMS



## CONSTRUCTION TECHNOLOGY FOR LARGE HYDROPOWER PROJECTS

An increase in the world's population and the natural ambition for a better standard of living still make the design, construction and management of dams an important subject. Dams allow water to be controlled and managed for irrigation purposes, thereby encouraging the cultivation of vast areas of land. They also create a permanent barrier along a natural water way allowing hydro-electric energy to be generated, which is the main source of renewable energy. A dam may also be used to control the level of a water course to prevent hydro-geological disasters and to promote new ways of transporting goods.

Mapei follows and supports large hydropower projects from the design to every stage of their lives. The same care and attention required for the construction of a dam is also necessary when carrying out maintenance operations by adopting appropriate repair procedures. A dam needs constant monitoring throughout its entire life cycle to identify potential defects. Thanks to targeted research work, Mapei has developed dedicated systems and technologies for both construction and maintenance work and is constantly alongside design engineers and building companies providing technical support of the highest quality.

### Types of dam

Dams may be built using rocks and earth (embankment dams) or concrete. Concrete dams may be divided into two categories: gravity dams, made from RCC (Roller-Compacted Concrete), and arch dams, made from normal concrete.

### Products for building dams

Mapei develops and supplies products and solutions for construction work and has a complete range of products available for building dams, canals and hydraulic tunnels.

Mapei can offer the following solutions:

- Admixtures for conventional concrete and RCC (Roller-Compacted Concrete)
- Admixtures and fibres for shotcrete
- Admixtures for high-strength concrete
- Admixtures for injection slurries
- Products for mechanical excavation and conditioning
- Waterproofing mortars and membranes
- Materials for treating facing walls
- Sealants and membranes for joints
- Grouts for anchoring
- Waterstops
- Epoxy resins
- Underwater putties

### Products for repairing dams

The long-life span of a large hydropower project often imposes repair work to be carried out in order to maintain and guarantee the overall efficiency of the structure.

Sometimes upgrading is required to withstand a variation in working conditions.

Over the years, Mapei has developed a specific range of products that offer a valid solution for different kinds of interventions such as:

- Repair mortars
- Structural strengthening systems
- Admixtures for concrete and shotcrete
- Waterproofing membranes and mortars
- Grouts for anchoring
- Sealants and membranes for joints



### Research to ensure durability

Design, construction, maintenance. Mapei supports each stage of large hydropower projects. The company has always been highly committed to Research & Development, continuously and significantly investing in this field. Mapei products are the result of the company's commitment to excellence in research, with the goal of developing innovative formulas that may be integrated into complete application systems that are very effective in terms of results.

Over the years, Mapei has made the reliability of its products a key focus point: ensuring increased durability means preventing or at least delaying further maintenance interventions.

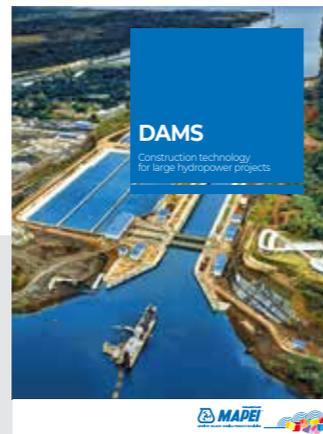
A further, concrete commitment to sustainable development, minimising the waste of resources and time.



### Technical services: from design support to site support

Mapei has always been a favoured partner for designers and specialists working on large hydropower projects. Through its network of technicians, the company is able to provide solutions to problems arising in these works all over the world.

Indeed, Mapei has made Technical Services one of its strong points. Each day, the company is present with qualified technicians on sites in more than 128 different countries around the world. By working alongside teams from big contractors, Mapei is able to demonstrate its experience of correct installation methods and provide its expertise and solutions. In every corner of the world, starting from the initial design stages of a hydropower project, Mapei has teams of highly specialized technical staff available, supplying consultancy on the products to be used and technical support to help solve every type of problem. For a result which always lives up to expectations.



You can download the brochure on Mapei solutions for dams at [https://cdnmedia.mapei.com/docs/librariesprovider2/lines-technical-documentation/dighe-mapei\\_gb\\_web.pdf?sfvrsn=ef0bb7ee\\_14](https://cdnmedia.mapei.com/docs/librariesprovider2/lines-technical-documentation/dighe-mapei_gb_web.pdf?sfvrsn=ef0bb7ee_14)



Colombo Lake dam  
Branzi, Province of Bergamo (Italy)



Scandarello dam  
Amatrice (Italy)



Malga Bissinia dam  
Valdaone, Province of Trento (Italy)

# MAPEI FOR YOUR HOME

Choose reliability, durability and respect for the environment.

Restoring masonry, strengthening structures, waterproofing your terrace, installing flooring and paving, refurbishing your bathroom, painting and protecting your façades. Put your trust in **more than 80 years of experience** gained by Mapei on sites **all around the world**.

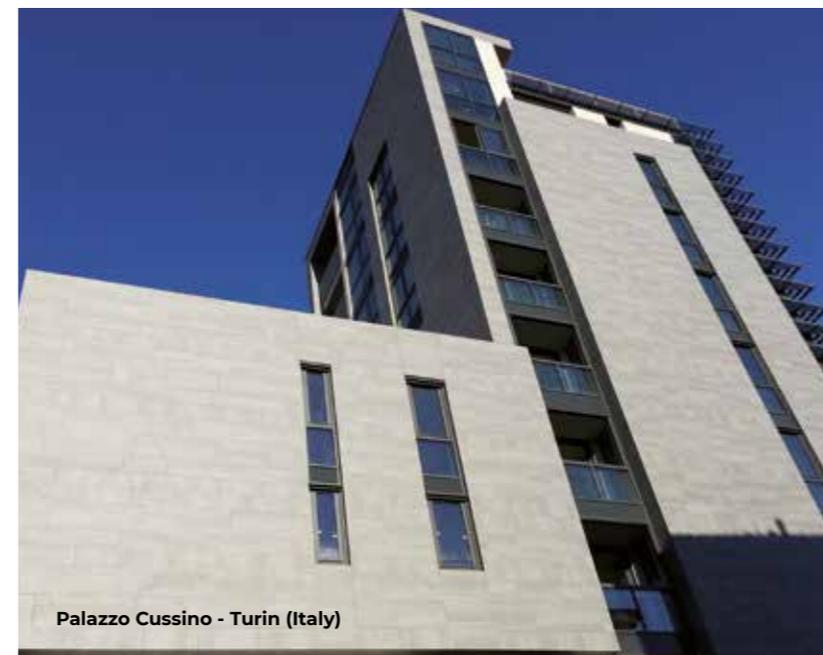
EVERYTHING'S OK WITH MAPEI

Learn more on [mapei.com](http://mapei.com)



Residencial Cap Blanc - Ibiza (Spain)

## MAPETHERM living comfort and energy savings



Palazzo Cussino - Turin (Italy)

FROM THE MAPEI  
R&D LABORATORIES:  
THE BEST  
SOLUTIONS  
TO THERMALLY  
INSULATE  
BUILDINGS

### A SUSTAINABLE SYSTEM

MAPETHERM SYSTEM comes complete with an EPD (Environmental Product Declaration), a report that details all the environmental impacts of a product throughout its life cycle, measured according to standardised LCA (Life Cycle Assessment) methodology. Mapei has always been particularly committed to sustainability and issues a "green passport" for its products, or P.A.S.S. (the acronym for Profile and Aspects of Sustainability in Synthesis), which lists all the sustainability characteristics of a product (see the picture below). This data sheet also contains information on the contribution a product makes towards green ratings for building, particularly LEED v4.

**MAPETHERM ARI GG**  
Malta cementizia monocomponente a grana grossa per l'incollaggio e la rasatura di pannelli termoisolanti e per sistemi di isolamento a cappotto.

One component, large-grained cementitious mortar for bonding and leveling thermal-insulating panels and thermal insulation systems.



**Prodotto - Product**

EPD Environmental Product Declaration ✓  
VOC Volatile Organic Compounds ✓  
RECYCLED CONTENT ✓

**Edificio - Building**

LEED v4.1 ✓  
MR Building Product Disclosure and Optimization - EPO ✓  
EQ Low-Emitting Materials ✓

solo per l'Italia - only for Italy

**CAM - CRITERI AMBIENTALI MINIMI**

2.11 Sistema di gestione ambientale ✓  
2.3.5 Emissioni dei materiali ✓  
2.4.12 Contenuto di materiale riciclato ✓  
2.4.13 Assenza di sostanze pericolose ✓

Questo P.A.S.S. è stato realizzato su Cartamela, carta ricavata dai residui di lavorazione industriale delle mele.  
This P.A.S.S. was printed on Apple Paper, a variety of paper obtained from waste material from industrial apple processing.

The aim of a thermal insulation system is to prevent heat flowing from the inside towards the outside in winter and from the outside towards the inside in summer. This type of system is essential when building constructions based on cost-effectiveness, environmental sustainability and living comfort criteria. Thermal insulation is included in measures covered by Governments in many countries offering tax incentives to promote energy savings. The MAPETHERM external thermal insulation system is a valid ally in meeting many of the requirements stipulated in these initiatives, from an aesthetics point of view and to obtain a higher energy rating.

### The MAPETHERM system

Developed by the Mapei Research & Development Laboratories, the MAPETHERM system is the result of an in-depth study of all the key components used in the external insulation system and of the variables that affect its performance. This system guarantees lower energy consumption in both summer and winter and improves overall living comfort by balancing the temperature between rooms and walls, thereby eliminating condensation from water vapour inside the walls of buildings. The key component of the system is the adhesive which, if used correctly, has the capacity to make the thermal insulation system more effective and durable over the years. MAPETHERM adhesives are highly effective in contrasting deformations caused by the different temperatures generated on the two faces of the panels, making it possible to install innovative insulating systems safely, whatever type of panel is used. Each MAPETHERM SYSTEM pack-

age has its own products and application cycle, guaranteeing that installation is always both simple and quick. MAPETHERM SYSTEM may also be used to upgrade existing thermal insulation systems that have deteriorated over the years due to the effects of time and weather. The product systems offer solutions to meet a host of needs, such as high thicknesses, high bonding strength in the case of critical substrates and high resistance to impact loads and stresses typically found in communal areas in apartment blocks and in more exposed areas. Also, the system is so versatile that even natural stone and ceramic may be applied to cover the surface, including those made up of large-size thin tiles.

### Renovating existing buildings

To create new insulating systems and upgrade damaged or deteriorated systems, Mapei proposes MAPETHERM FLEX RP, an elastic skimming product highly resistant to impact loads, particularly recommended for insulating buildings in areas exposed to aggressive atmospheric agents and substances. The innovative characteristics of MAPETHERM FLEX RP are due to a mix of different technologies:

- BioBlock® to protect surfaces against the aggressive nature of mould and mildew;
- Fast Track Ready, which considerably reduces the overall installation time, by eliminating long curing cycles typical of cementitious-based skimming products and the need for a primer before applying a finishing product;
- The "lightness" of the product, thanks to ULTRALITE technology, which improves overall yield during the application phase.

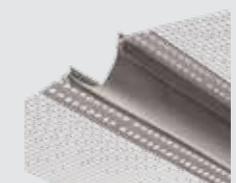
1. Cementitious render (Nivoplan + Planicrete)
2. Adhesive (Mapetherm ARI GG)
3. Insulating panel (Mapetherm EPS)
4. Smoothing compound (Mapetherm ARI GG)
5. Glass fibre mesh (Mapetherm Net)
6. Coloured acrylic base coat (Quarzolite Base Coat)
7. Coloured acrylic coating (Quarzolite Tonachino)

Fig 1. Mapetherm EPS - ETA 10/0025 thermal insulation system.



### CHOOSE MAPEI FOR YOUR THERMAL INSULATION SYSTEM

Mapei solutions enable you to install the most suitable external thermal insulation systems to match a building's structural, environmental and substrate characteristics. **The offer is for a complete system:** in fact, Mapei supplies not only adhesives and skimming products suitable for any type of system, but also insulating panels and a host of accessory items such as glass fibre meshes, anchors and profiles.



MAPETHERM FLEX RP is available in 0.5 mm and 1.5 mm grain sizes for different types of application.

### Installing porcelain tiles on façades

Mapei proposes MAPETHERM TILE SYSTEM to install thin porcelain tiles on insulating panels. It consists of PLANITOP HDM MAXI in combination with MAPEGRID G 120 mesh for high mechanical resistance. This system creates reinforced structural render that may be applied on all the most commonly used insulating panels employed for external insulation systems. MAPETHERM TILE SYSTEM is easy to maintain, is resistant to attack from chemicals and pollution and has unique aesthetic characteristics.

### Thick applications

For applications requiring high thicknesses, Mapei has developed MAPETHERM ARI LIGHT cementi-

tious mortar and adhesive, ideal for creating reinforced skim coats on external thermal insulation systems, as well as for restoring damaged and deteriorated façades before applying a paint cycle.

This product comes with ULTRALITE technology and has a particular formulation which allows thick layers to be formed in a single application (up to 8/10 mm) and to skim irregular and uneven areas before installing an external system with just a single product for three different types of application.

When used as skimming mortar, MAPETHERM ARI LIGHT fills gaps in render on façades under maintenance and restores the flatness of substrates.

When used as adhesive, on the other hand, it bonds insulating panels to substrates, and when used for skimming in combination with MAPETHERM NET, it forms thick layers of reinforced render.

## Lisbon (Portugal)

# BRAÇO DE PRATA RESIDENTIAL COMPLEX

THERMAL INSULATION FOR A LUXURIOUS RESIDENTIAL COMPLEX IN LISBON DESIGNED BY RENZO PIANO

Braço de Prata is a commanding, new luxury residential complex currently undergoing completion situated north of Lisbon, between the districts of Alfama and Parque das Nações. Designed by Renzo Piano, it has been built following the redevelopment and conversion of a former armaments factory.

The complex extends over an area of nine hectares and is made up of 12 buildings, and features 499 luxury apartments, around 7,000 m<sup>2</sup> of service facilities, office space and more than 19,000 m<sup>2</sup> of retail outlets.

The intention of Renzo Piano, who worked together with the Portuguese design studio CPU, was to create a new quarter along the banks of the River Tago that encircles a central piazza, combining traditional Portuguese features – such as ceramic tiles on the façades of the buildings – with more modern constructive techniques typically found in contemporary architecture.

The idea was also to create spaces to be enjoyed by all the local residents, with restaurants, bars and shops along the banks of the river. Mapei participated in this important project by supplying a thermal insulation system, waterproofing products and coating products for the walls.

### Thermal insulation

After carrying out a series of tests, MAPETHERM SYSTEM was chosen for the external thermal insulation of the buildings. Going into detail, MAPETHERM ARI one-component,



cementitious adhesive and mortar, which has high bonding strength and a low level of viscosity that ensures excellent workability, was used to bond and smooth the insulating panels for the external thermal insulation systems. Thanks to its high level of thixotropy, MAPETHERM ARI may be applied on vertical surfaces without sagging and without letting even large-size insulating panels slip. The surfaces of the walls were finished off with the SILANCOLOR cycle, which consists of an undercoat of siloxane coloured SILANCOLOR BASE COAT, with good defect-covering and filling properties, SILANCOLOR TONACHINO siloxane plaster and, lastly, water-repellent, transpirant siloxane SILANCOLOR PAINT PLUS, which has a good level of resistance to mould and algae.

### Waterproofing solutions

MAPELASTIC, an elastic two-component cementitious mortar for waterproofing balconies, terraces, bathrooms and swimming pools, was used for the waterproofing of the balconies. For roof waterproofing, in order to combine the design requirement of fire resistance with aesthetic appeal, Mapei supplied PURTOP FR, a two-component, solvent-free, hybrid polyurea membrane to be sprayed using a high-pressure bi-

mixer pump. With the application of PURTOP FR it was possible to guarantee a waterproof and perfectly fire-resistant system.

AQUAFLEX ROOF PREMIUM, a ready-to-use water-based polyurethane membrane with excellent waterproofing, elasticity and fire resistance properties, was applied onto the PURTOP FR layer to give the covering the desired aesthetic result without losing its fire-resistance. It was thus possible to satisfy all the requests related to the project.

The Mapei solutions worked exceptionally well and the works director chose Mapei as sole supplier for the next stages of the project.

### MAPETHERM ARI

One component cementitious mortar for bonding and levelling thermal insulating panels and thermal insulation systems.

FIND OUT MORE



### TECHNICAL DATA

**Braço de Prata**, (Portugal)

**Period of construction**

2016-ongoing

**Period of the intervention:**

2016-ongoing

**Year of the Mapei intervention:**

2017-ongoing

**Intervention by Mapei:**

supplying products

for thermal insulation, waterproofing balconies and roofs, coating the façades

**Owner:** VIC

**Design:** Renzo Piano

Building Workshop, CPU

**Works direction:** Neoplano

**Contractors:** Cofrasilvas

(VIC), Kenotecil, Isotexa, Castan

**Mapei distributors:**

Kenotecil, Isotexa, Castan

### Mapei coordinator:

Gonçalo Tavares, Lusomapei (Portugal)

### MAPEI PRODUCTS

**Thermal insulation:**

Mapetherm AR2,

Mapetherm ARI

**Waterproofing:**

Mapelastac, Primer G,

Mapefinish, Mapenet 150,

Primer SN, Purtop FR,

Mapecoat I 600 W, Aquaflex Roof Premium  
**Wall coatings:** Silancolor Base Coat, Silancolor Tonachino, Silancolor Paint Plus

For further information on products see [mapei.com](http://mapei.com) and [mapei.pt](http://mapei.pt)



1



3

## Mosonmagyaróvár (Hungary) ONE-FAMILY HOUSE

MAPEI PRODUCTS FOR THERMAL INSULATION AND INSTALLATION OF CERAMIC TILES IN THIS ELEGANT PRIVATE HOUSE

This one-family house is situated on the bank of the Leitha River meandering through the town of Mosonmagyaróvár, in northwestern Hungary. A true island of peace, it features simple, clean lines and impressive ceramic coverings. Mapei contributed to its completion by supplying products for thermal insulation, the installation of ceramic tiles and wall coatings.

### Solutions for thermal insulation

Energy efficiency in residential buildings has become a top priority in Hungary. Consequently, design-

ing and constructing houses with reduced energy consumption and properly insulating the exterior walls of newly erected structures have gained vital importance. Mapei Kft., the Hungarian subsidiary of the Group, was able to supply a proper solution for this project.

The external walls of the house were thermally insulated by applying the MAPETHERM system on a total surface area of 319 m<sup>2</sup>. Contractors installed MAPETHERM EPS extruded sintered polystyrene insulating panels over the walls and MAPETHERM XPS polystyrene insulating panels over the footings of the building, using MAPETHERM RAGASZTÓTAPASZ, a mortar manufactured and distributed in Hungary by Mapei Kft., for their bonding. Upon fastening the MAPETHERM IDK-N anchors (which are also manufactured and distributed by Mapei Kft.), they skimmed the surfaces once again with MAPETHERM RAGASZTÓTAPASZ, using MAPETHERM NET glass fibre mesh for its reinforcement.

The external wall surfaces were subsequently treated with SILANCOLOR BASE COAT colored siloxane undercoat and coated with SILANCOLOR TONACHINO siloxane plaster.



2

### Installing ceramic tiles

Inside the house, contractors succeeded in creating a very homely and friendly environment. Mapei products were used for bonding ceramic tiles in two bathrooms, a kitchen and all aisleways.

In the bathrooms, the substrates were first treated with PRIMER G, a synthetic resin-based water-dispersion primer. They were then levelled with PLANITOP FAST 330 fibre-reinforced cementitious mortar. Waterproofing operations were carried out with MAPELASTIC and MAPEGUM WPS membranes and MAPEBAND tape.

All ceramic coverings, from the smallest to the largest tiles, were installed with KERAFLEX LIGHT S1 adhesive (which was later superseded by is KERAFLEX EASY S1). The joints were grouted with KERACOLOR FF FLEX, a product manufactured and

1. This elegant private house was completed with Mapei products for thermal insulation and the installation of ceramic tiles.

2. The façades were insulated with the MAPETHERM SYSTEM, then coated with SILANCOLOR BASE COAT and SILANCOLOR TONACHINO.

3. Ceramic tiles were bonded on the floors by using KERAFLEX LIGHT S1 (now superseded by KERAFLEX EASY S1).

distributed on the Hungarian market by Mapei Kft., while expansion joints were sealed with MAPESIL AC.

The kitchen floor was covered with custom-shaped, hand-made ceramic tiles manufactured in Hungary, again installed with KERAFLEX LIGHT S1 and grouted with KERACOLOR FF FLEX. Expansion joints were again sealed with MAPESIL AC.

90 × 45 cm ceramic tiles were chosen for the aisleways and installed with KERAFLEX S1 here.

### MAPETHERM NET

Glass fibre mesh resistant to alkalis, ideal for reinforcing skim coats for repairing façades and installing Mapetherm thermal insulation systems.

### FIND OUT MORE



### TECHNICAL DATA

**One-family house,** Mosonmagyaróvár (Hungary)

**Period of construction:** 2016-2018

**Period of the intervention:** 2016-2018

**Design:** CAN Architects Studio Ltd., Dávid Németh

**Owner:** László Lovász

**Main contractor:** Suri Bau Ltd.

**Intervention by Mapei:** supplying products

for thermal insulation, installation of ceramic tiles and coating façades

**Thermal insulation contractor:** Mati Bau Ltd.

**Ceramic installation company:** Trusbau Ltd.

**Mapei distributor:** Suri Bau Ltd

**Mapei coordinator:** Ádám Pavelka

### MAPEI PRODUCTS

**Thermal insulation system:** Mapetherm

EPS, Mapetherm XPS, Mapetherm IDK-N\*, Mapetherm Ragasztótapasz\*, Mapetherm Net

**Wall coatings:** Silancolor Base Coat, Silancolor Tonachino

**Substrate preparation and waterproofing:** Primer G, Planitop Fast 330, Mapelastic, Mapegum WPS, Primer FD,

**Installation of ceramic tiles:**

Keraflex Light S1\*, Keraflex S1  
**Grouting joints:** Keracolor FF Flex\*  
**Sealing expansion joints:** Mapesil AC

\* These products are manufactured and distributed on the Hungarian market by Mapei Kft. (Hungary)

For further information see [mapei.com](http://mapei.com) and [mapei.hu](http://mapei.hu)

# Pesaro (Italy) PALACE RESIDENTIAL COMPLEX

STRUCTURAL STRENGTHENING AND EXTERNAL THERMAL INSULATION FOR A HOTEL CONVERTED INTO A LUXURY RESIDENTIAL BUILDING

In 2019 the Hotel Palace, in Pesaro (Central Italy), was completely renovated and converted into a modern apartment block with twenty luxurious residential units. Work included restoration of the damaged concrete, wrapping the pillars of the first two storeys with carbon fibre fabric and installing a new external thermal insulation system and new parapets. The load-bearing pillars of the first two storeys of the building were strengthened with MAPEWRAP C UNI-AX SYSTEM, a structural strengthening system consisting of high-strength, high-modulus unidirectional carbon fibre fabric (FRP) and epoxy resins to impregnate and bond the fabric.

## Thermal insulation

The first phase of the renovation work on the facades included removing the old render and thoroughly cleaning all the surfaces. The reinforcement rods left exposed were treated with MAPEFER two-component, anti-corrosion cementitious mortar. The concrete in these areas was repaired with fine-textured MAPEGROUT 430 fibre-reinforced, thixotropic mortar. EPS insulating panels were bonded onto the irregular areas of the substrates with MAPETHERM ARI one-component cementitious mortar to obtain a flat surface.

Once the MAPETHERM Ba aluminium starting profiles with drip channels had been positioned, the insulating panels were bonded in place and skimmed with MAPETHERM ARI GG cementitious mortar.

The panels were fastened in place mechanically with MAPETHERM FIX, special studs with a plug in metal/nylon pin and a polypropylene body. Lengths of MAPETHERM PROFIL were applied around all the corners and openings, while MAPETHERM

DRIPNOSE BEAD, PVC corner profiles with drip channel and alkali-resistant glass fibre mesh, were attached around the edges of the windowsills, windows and balconies so that rain-water could drain off correctly.

All points of contact between the insulating panels and the outside of the building, between the joints in the external thermal insulating system and between the other parts of the building (windowsills, window casings and openings in general) were sealed with MAPEFOAM closed cell polyethylene foam cord and MAPE-FLEX AC4 paintable acrylic sealant.

The joints were reinforced with a special pre-formed mesh which was embedded in the MAPETHERM ARI GG (along the straight parts) and the MAPETHERM FLEX RP layers (the rounded parts).

In correspondence with the rounded edges of the building, two coats of MAPETHERM FLEX RP elastic skimming compound and base coat were applied, with MAPETHERM NET glass fibre mesh embedded between the two coats.

All the other surfaces were skimmed with two coats of MAPETHERM ARI GG, again with MAPETHERM NET reinforcing mesh embedded between them.

## Wall coatings

Once the skim coat had cured, the surfaces were treated with pigmented QUARZOLITE BASE COAT acrylic undercoat. The areas around the recesses in the façade were finished off with two coats of ELASTOCOLOR RASANTE SF high-thickness, fibre-reinforced elastomeric coating. All the other surfaces, on the other hand, were finished off with ELASTOCOLOR TONACHINO PLUS elastomeric, water-repellent plaster.



1. Pre-formed reinforcing mesh was embedded in MAPETHERM FLEX RP and positioned along the joints around the surfaces with rounded edges, and then blended in with the mesh embedded in the MAPETHERM ARI GG along the straight surfaces.
2. Close-up of the completed rounded surfaces.



## MAPETHERM FLEX RP

Cement-free, fibre-reinforced, lightweight, elastic, skimming paste and base coat resistant to biological agents for internal and external use.

FIND OUT MORE



## TECHNICAL DATA

**Palace Residences,** Pesaro (Italy)

**Period of construction:** 2018-2020

**Period of the Mapei**

**intervention:** 2019-2020

**Intervention by Mapei:** supplying products for structural strengthening, repairing concrete, insulating walls and coating the façades

**Owner:** Hotel Palace

**Design:** Gaudenzi Ferretti & Partners

**Works direction:** Gaudenzi Ferretti & Partners

**Main contractor:** Lancia Srl

**Mapei distributor:** S.a.p.i.l. Srl

**Mapei coordinators:** Stefano Mazzotti and Robertino Cavalletti, Mapei SpA (Italy)

## MAPEI PRODUCTS

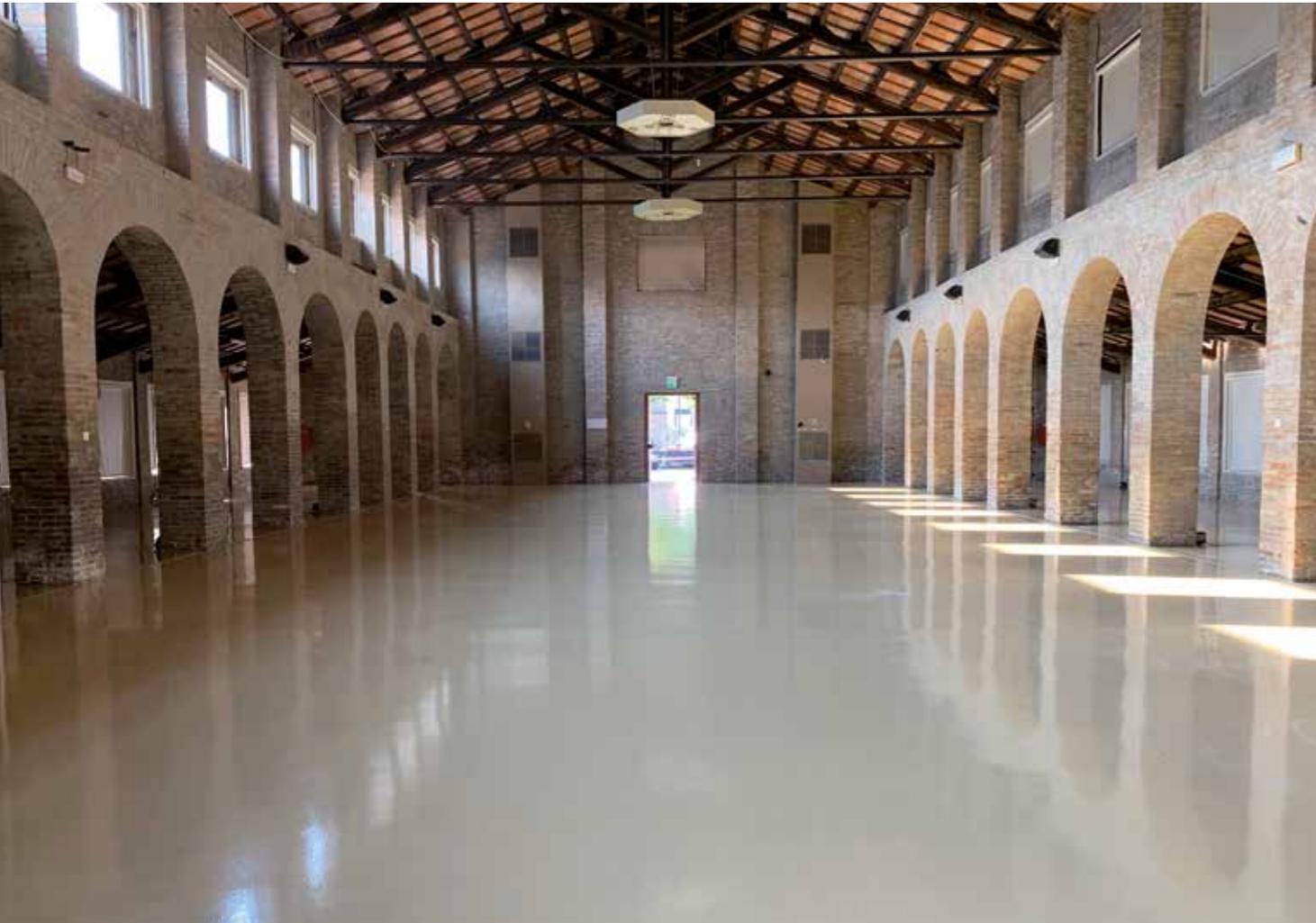
**Structural strengthening:** MapeWrap C UNI-AX System

**Concrete repair:** Mapefer, MapegROUT 430

**Thermal insulation:** Mapetherm ARI, Mapetherm ARI GG, Mapetherm Flex RP, Mapetherm Ba, Mapetherm Profil, Mapetherm Fix,

Mapetherm Dripnose Bead, Mapefoam, Mapeflex AC4, Mapetherm Flex RP, Mapetherm Net  
**Wall coatings:** Quarzolite Base Coat, Elastocolor Rasante SF, Elastocolor Tonachino Plus

For further information on products see [mapei.com](http://mapei.com)



## Ravenna (Italy) ALMAGIÀ

### CONVERSION OF A HISTORIC SULPHUR WAREHOUSE INTO A POLYFUNCTIONAL CULTURAL CENTRE

Almagià is a cultural hub located in the warehouse of a former sulphur refinery in the dock area of Ravenna (Central Italy). Built in 1888 according to a design by Giuseppe Castellucci for the company Vito Almagià, the refinery remained in service for almost the whole of the last century until it was gradually decommissioned.

The warehouse is an industrial building with striking architectural lines: built entirely in exposed masonry, the layout is similar to that of a basilica, with a central aisle, two lateral aisles and a portico along each of

the two short sides of the building. Acquired by the local council in the 1990's, the structure was included in the Urban Redevelopment Programme, PRG '93.

The redevelopment work included a full restoration of the warehouse to turn it into a centre for exhibitions, theatrical productions and concerts. Under the guidance of the Department of Youth Affairs, over the years the centre became a very popular polyfunctional hub with live shows and a small theatre.

The area was redeveloped in 2020. The work included rearranging the

layout of the external courtyards, refurbishing the building and updating the service and plant equipment in the main hall. The structure is now used both as an auditorium and a small theatre – with a mobile platform and 268 seats – as well as for conventions and exhibitions. For the latter type of event, some of the seats are removed in order to free up around half of the central aisle so that it may be used as an exhibition space. The two lateral aisles, on the other hand, have no permanent or fixed obstacles and have been turned into large foyers.



**RIGHT.**

Before applying MAPEFLOOR SYSTEM 33 for resin floors, the substrates were grinded with a diamond grinding disk.

**Laying resin floors**

After years of use, the old flooring was badly worn and cracked, and new flooring had to be laid. The aim of laying new epoxy resin flooring (total surface area 800 m<sup>2</sup>) was to bring out the characteristics and historic value of the building and improve its functionality, but without detracting from its particular aesthetics and historic identity.

Mapei Technical Services recommended using MAPEFLOOR SYSTEM 33, a system used to create industrial flooring that has to withstand medium to heavy traffic, and which has a smooth, highly attractive finish while offering good resistance to wear and abrasion from pedestrian traffic.

The work began by sealing the cracks in the substrates with EPORIP solvent-free epoxy adhesive.

After cleaning the surface and vacuuming off the remaining dust, a coat of PRIMER SN, two-component fillerized epoxy primer, mixed with QUARTZ 0.5 quartz sand, was applied with a straight steel trowel to even out the substrate. While it

was still wet, PRIMER SN was lightly broadcast with QUARTZ 0.5. After 24 hours, once the primer had hardened, the excess sand was removed, and the surface was sanded and cleaned of all the dust.

The next step was to prepare MAPEFLOOR I 300 SL, two-component multi-purpose epoxy formulate, mixed with MAPECOLOR PASTE (a special pigmented paste specifically formulated to pigment the neutral bases of MAPEFLOOR systems) in the colour required (RAL 1015), and QUARTZ 0.25 quartz sand, until an homogeneous blend was obtained. MAPEFLOOR I 300 SL was then spread out onto the surface to be coated evenly and uniformly using a notched spreader with "V"-shaped teeth. While the product was still fresh, a spiked roller was immediately passed over the surfaces to eliminate any air entrained into the product during mixing. The average thickness of the entire coating ranged from 2 to 4 mm.

The coating work was completed in 10 days, to the satisfaction of the installation company and the owner.

**MAPEFLOOR I 300 SL**

Two-component, multipurpose, neutral epoxy formulate to form coatings up to 4 mm thick on floors.

**FIND OUT MORE**



**TECHNICAL DATA**

**Almagià**, Ravenna (Italy)

**Design:** Giuseppe Castellucci

**Year of construction:** 1888

**Year of the intervention:** 2020

**Intervention by Mapei:**

supplying products for laying resin floors

**Design and works director:** Berti

**Owner:** Ravenna City Council

**Contractor for floors:** Tekno Pav Srl

**Mapei coordinators:**

Roberto Migliorini and Devis Visani, Mapei SpA (Italy)

**MAPEI PRODUCTS**

Preparing the substrates: Eporip, Primer SN, Quartz

0.5, Quartz 0.25  
Coating resin floorings: Mapecolor Paste, Mapefloor I 300 SL

For further information on products see [mapei.com](http://mapei.com)



**LEFT.** The building industry has been growing fast in Vietnam for at least 10 years and is expected to continue to do so in the near future.  
**ON THE OPPOSITE PAGE.** The Mapei Vietnam manufacturing plant in Chu Lai, not far from Da Nang in central Vietnam, has been in operation since 2007.

# Building gives Vietnam a boost

MAPEI HAS A MANUFACTURING PLANT IN THE COUNTRY SPECIALISING IN SEVERAL PRODUCT LINES: FROM MATERIALS FOR INSTALLING CERAMIC TILES TO ADMIXTURES FOR CONCRETE

At a time of global economic uncertainty, Vietnam is an exception: while most national economies in many geographical regions are witnessing a sharp decline of several percentage points in their GNPs, this country has already recorded +1.81% growth during the first half of 2020, according

to an estimate made by the General Statistics Office of Vietnam, and is expecting even better figures by the end of the year.

Such a high performing economy is partly due to the excellent state of the building industry, which has grown by +85% over the last 10 years



and whose overall manufacturing output was worth over 13 billion Euros in 2019, equal to 5.94% of the country's GNP.

Despite the negative impact of Covid-19, the Vietnamese building industry has grown by 4.5% over the first six months of 2020 compared to the same period in 2019, much faster than the GNP itself. It is expected to

grow by a total of 5.2% in 2020 and destined to speed up to rise by 7.7% in the 2021-2024 period.

The Vietnamese government plans to support this growth by boosting infrastructures for rail, air and road transport and energy production, as well as implementing numerous measures to attract foreign investment in the country.

## HERE ARE OUR PLANS TO BECOME EVEN MORE COMPETITIVE



A CONVERSATION WITH TONY ONG, GENERAL MANAGER OF MAPEI VIETNAM

**Despite having slowed down due to the effects of Covid-19, Vietnam's economy has not ground to a halt. Were national and international measures taken to prevent the kind of downturn that happened in other parts of the world?**

The pandemic has certainly had a negative effect on foreign investment in Vietnam, which had previously been at record-breaking levels. Foreign investment in projects in Vietnam were worth 13.76 billion US dollars in September 2020, i.e. 96.8% of the corresponding figure for the same period the previous year. As regards newly registered capital, adjusted capital, and capital contribution, Vietnam attracted a total of 21.20 billion US dollars up to September 2020, 81.1% of the corresponding figure for the same period last year. Having said that, it is worth acknowledging the great efforts and effectiveness of the fast and stringent measures adopted by the Vietnamese government to contain the Covid-19 pandemic. Following a drop in exports, the government implemented a series of incentives to meet the needs of both small and medium-size businesses that play a key role in the

country's overall economy. We are confident that the last part of 2020 will be positive and followed by years of economic growth once again. The country can also boast some notable achievements, such as the enforcement of the EU-Vietnam Free Trade Agreement (EVFTA), the EU-Vietnam Investment Protection Agreement and, on 15<sup>th</sup> November this year, the ratification of the Regional Comprehensive Economic Partnership (RCEP), an agreement between 15 countries in the Asia-Pacific region (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Vietnam, Australia, China, Japan, New Zealand and South Korea).

**Which sectors offer Mapei the best growth opportunities on this market?**

Those sectors offering the best growth prospects are definitely connected with housing and business projects carried out by local and foreign investors; those connected with the use of wind and hydroelectric energy aimed at meeting the nation's current and future needs; the modernisation of existing airports and seaports and the construction of new infrastruc-

**Mapei in Vietnam**

In such an encouraging and promising scenario, Mapei was bound to be present and it has indeed been operating in Vietnam since 2003, when it opened a business office in the capital city Hanoi.

Due to the remarkable success of the Group's high-tech products on the local market ever since then, the need soon arose to begin manufacturing Mapei products locally: at the end of 2004 it was decided to build a manufacturing plant in the Chu Lai Open Economic Area of the province of Quang Nam, which was officially inaugurated

**The Covid-19 pandemic has not slowed down an industry that has played a crucial part in the nation's growth over the last 10 years**

in 2005 (see *Realtà Mapei International* no. 19). This manufacturing plant is strategically located approximately 80 km from Da Nang, the biggest city in central Vietnam. The plant is relatively close to the airport, seaport, several motorways,

highways and railway lines, as well as sources of miscellaneous raw materials. The plant was completed in May 2007. It covers an area of almost 52,000 m<sup>2</sup>, approximately 6000 of which serving manufacturing operations, 450 for the canteen, over 620 for offices and approximately 450 for staff locker rooms. This is where

the Vietnamese subsidiary manufactures materials belonging from six product lines: materials for installing ceramic tiles and stone; waterproofing materials; admixtures for concrete; cement additives; and products for underground works. All by means of processes conforming to the guidelines set for ISO 9001:2008 certification.

**Training, marketing and technical assistance**

After starting up local production, Mapei Vietnam was able to take full advantage of the opportunities

offered by this country and it has kept on growing since then, both in terms of sales and facilities, opening business offices in the north and south of the nation. All this is also due to Mapei Vietnam's ability to understand and meet the market's needs and the demands of its own customers.

To help its customers, the subsidiary regularly organises training sessions about the correct use of its own products, including lessons and practical demonstrations given by its own experts, who help operators in the industry deal with the problems they encounter in their work. Mapei Vietnam's training operations also involve its own human resources with courses and workshops held both locally and abroad.

Every year, Mapei Vietnam takes part in important trade fairs and conferences to present its new high-tech products and solutions to local industry. It is hardly surprising, therefore, that the Vietnamese subsidiary has been a leading player in the local building sector for several years now, a position it intends to keep.

ture facilities; cement production; and investment by Chinese, South Korean and Japanese companies which are moving their manufacturing operations to Vietnam.

**Which lines of products will Mapei be focusing on in Vietnam?**

Definitely admixtures for concrete and cement additives, as well as building products and materials for installing ceramic tiles and stone material.

**Training is one of Mapei's trump cards: what do you do to attract better resources? Can you find suitably trained technicians and experts on the domestic market?**

To attract better human resources, we focus on the experience candidates already have and the results they have achieved in the past, as well as their potential for improving Mapei Vietnam in terms of knowledge of products and professional contacts. It is not easy to find suitably trained technicians and experts, but the reputation of the Mapei brand has helped in this respect. Part of our strategy is also the "Support

and Train" principle, which is aimed at guaranteeing a professional approach and proper system for getting the most from our staff. For us it is important that our employees and business partners share Mapei Vietnam's vision, the Group's values, and the aim to take every available opportunity for growth.

**Are there plans to boost Mapei's manufacturing operations in Vietnam even further?**

Yes, it is possible that a new manufacturing plant will be built in the south of the country in the medium term (2-3 years). This would allow us to reduce the costs of logistical operations and speed up product delivery times. This would make us even more competitive on the market, and we would also be able to improve our customer services. Generally speaking, we aim to take giant leaps forward in our growth process and, bearing in mind that certain segments of the market have not been "attacked" yet and considering the scope of our range of products and the support we receive from various realms of the industry, I am certain we will succeed.



The Mapei Vietnam plant also includes an area for manufacturing products in powder form (above) and one for manufacturing liquid products (left).

**MAPEI VIETNAM**

**1**  
**MANUFACTURING PLANT**  
IN CHU LAI, NOT FAR FROM DA NANG

**3**  
**SALES OFFICES**  
IN HANOI, DA NANG AND HO CHI MINH CITY

**50**  
**STAFF**

**4.3**  
**MILLION EUROS**  
INCOME IN 2019  
(4.8 IN 2020)

**9.000**  
**TONS/YEAR**  
MANUFACTURING OUTPUT IN 2019

## Ba Na Hills, Da Nang (Vietnam)

# GOLDEN BRIDGE

MAPEI ADMIXTURES CONTRIBUTE BRINGING LIFE TO A CONCRETE GIANT



### Problems and solutions

The construction process had to be implemented amidst the forest and in mountainous areas. It was impossible to mix concrete on site: Ready-mixed concrete had to be transported for long distances at high temperatures yet maintaining the required mechanical strengths. The solution was provided by DYNAMON SR2 VN, a superplasticizer for ready-mixed concrete which is manufactured and distributed by Mapei Vietnam. Its international counterpart is DYNAMON SR2.

Standing out of the magnificent nature of Ba Na Hills in Da Nang City, the Golden Bridge, also known as CauVang, is no less than an iconic masterpiece of Vietnam. Since its official launch, its reputation went beyond Vietnam's borders: it has been praised as one of the world's most spectacular walking bridges by international prestigious architecture newspapers and social networks. As a part of the SunWorld Ba Na Hills area, the Golden Bridge is nested on the Paradise Garden and is used to take visitors from the mountain foot or French village to Le Jardin D'Amour

gardens. The bridge was named "Golden Bridge" as its guardrails has been covered with gold. Lift by two giant stone hands, the bridge spans 12.8 m wide and 150 m long and comprises 8 arches, the longest of which measures 21.2 m. According to TA Landscape Architecture design studio, its design embodies the hands of the Mountain God drawing from inside a rocky mountain a golden sash to carry villagers to the Paradise Garden, perfectly matching the fantasy and fairy theme of Ba Na Hills. At the height of 1,414 m above sea

level, the Golden Bridge is even more overwhelming with the ancient-looking and mossy giant hands supporting the bridge in the green majestic nature embraced by cloud and mist. The bridge was considered by Archdaily, one of the world's leading architectural news weblog, as one of the world's most unique bridges. The bridge was also praised by other architectural sites such as Design Boom and Creapills. CNN named it on *The Guardian's* list of most striking pedestrian bridges and *The Independent's* top 10 most incredible bridges. It was also featured on

the Instagram account of Street Art Globe (an account with 7.1 million followers) where a video on the bridge had 1.3 million views and more than 4,000 comments.

### Building in the forest with Mapei solutions

It can be said that the bridge is a place where man-made and nature-made beauty, construction technology and art meet. The giant hands look like they are carved from stone, but they aren't. The skeleton of the hands was designed and covered with steel meshes before it was covered with

**ABOVE.** Lift by two giant stone hands, the Golden Bridge is 150 m long and comprises 8 arches. Its guardrails are covered with gold.



**ABOVE.** Ready-mixed concrete was used for the piles and the foundation. DYNAMON SR2 VN admixture ensured it featured the required mechanical strengths to support the whole bridge's weight, even if it was cast at high temperatures.

fiberglass. The entire construction of the bridge took about a year and was very ambitious and challenging. The construction process was fully implemented amidst the forest and mountainous areas where every access was very limited. Therefore, it was impossible to mix concrete on site. Besides, transporting ready-mixed concrete for such

a long distance at high temperatures yet maintaining the required mechanical strengths for pillars and foundation to support the whole bridge's weight was really a thorny problem for the owner, Sun Group. After site-trials, evaluation of product quality and cost effectivity, Mapei Vietnam, the local subsidiary of the Mapei Group, was entrusted to be the supplier of concrete admixtures for all pillars and foundation of the projects. Mapei Vietnam's Technical Services proposed to use DYNAMON SR2 VN, a superplasticizer based on acrylic polymer for ready-mixed concrete, which is manufactured and distributed by Mapei Vietnam and especially suitable wherever there is the need for a strong water reduction, along with relatively high mechanical strength. Its performances make it particularly suitable when it is necessary to carry out casting at high temperatures and when the concrete must be transported over long distances. The counterpart of DYNAMON SR2 VN on the international market is DYNAMON SR2.

#### DYNAMON SR2

Superplasticizer based on acrylic polymer specially designed for the ready-mixed concrete industry, belonging to the Mapei Dynamon SR system.

#### FIND OUT MORE



**TECHNICAL DATA**  
**Golden Bridge,** Sun World Ba Na Hills, Da Nang (Vietnam)  
**Design:** TA Landscape Architecture  
**Period of construction:** 2016-2018

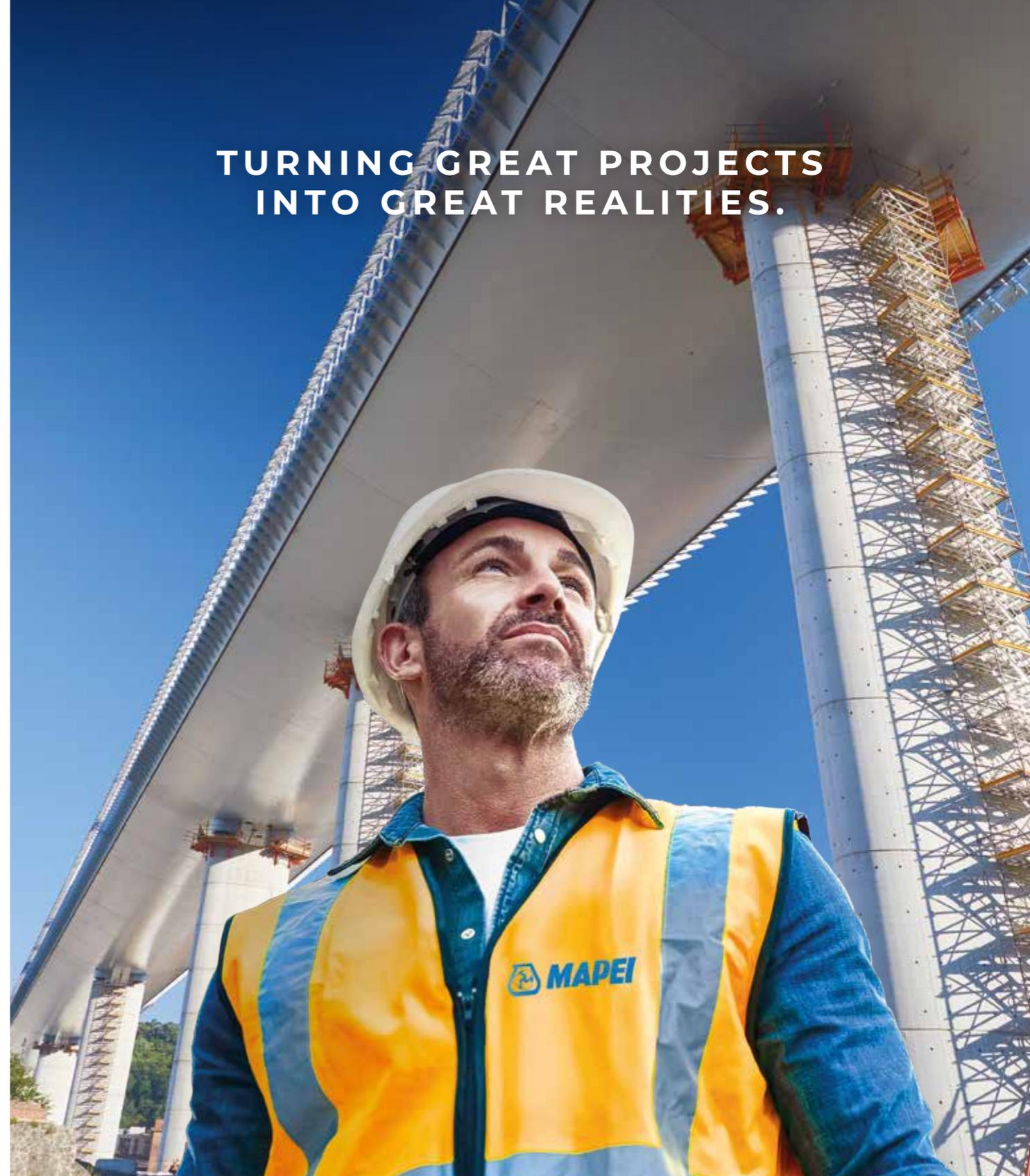
**Owner:** Sun Group  
**Period of the Mapei intervention:** 2017-2018  
**Intervention by Mapei:** supplying admixtures for the ready-mixed concrete used for the foundation and pillars

**Mapei coordinator:** Nguyen Van Khue, Mapei Vietnam  
**MAPEI PRODUCTS**  
Admixtures for concrete:  
 Dynamon SR2 VN\*

\*This product is manufactured and distributed on the Vietnamese market by Mapei Vietnam

For further information on products see [mapei.com](http://mapei.com) and [mapei.com.vn](http://mapei.com.vn)

## TURNING GREAT PROJECTS INTO GREAT REALITIES.



Mapei took part in the construction of the new Genoa Saint George Bridge by providing know-how, Mapei-brand products and an on-site technical consultancy service. A mix of innovation, commitment and passion to create an exceptional and sustainable construction project.

EVERYTHING'S OK WITH **MAPEI**





## Phenikaa University HANOI

The campus of Phenikaa University extends over an area of 14 hectares. Since 2017 the university has been actively looking for the best talents in Vietnam with the aim of training them and developing their skills, particularly in subjects related to science and technology. The project for the construction of the campus included the adoption of eco-sustainable construction methods, the planting of numerous gardens and

the installation of the most up-to-date didactic equipment. The campus includes 12 teaching blocks, student dorms, green areas and sports facilities. Mapei Vietnam supplied solutions for installing ceramic and stone, such as ADESILEX P9, cementitious adhesive with extended open time and no vertical slip, and KERA-COLOR SF super-fine, cementitious grout for joints up to 4 mm wide.

**TECHNICAL DATA**  
**Period of construction:** 2016-ongoing  
**Design:** Vietnam investment consulting and construction design joint stock company (CDC., JSC)  
**Period of the Mapei**

**intervention:** 2019-ongoing  
**Owner:** Phenikaa Ha Noi University  
**Main contractor:** SG3, JSC  
**Mapei coordination:** Mapei Vietnam

**MAPEI PRODUCTS**  
 Adesilex P9, Keracolor SF



## Mui Trau tunnels HOA BAC

The La Son-Tuy Loan Expressway is a 77.6 km stretch of road running through central Vietnam and part of the Ho Chi Minh Highway, a 3,000 km stretch of road running through 28 towns and cities. The La Son-Tuy Loan Expressway has four lanes of traffic and plays a fundamental role in the economic and social development of the provinces of Da Nang and Thua Thien-Hue. It took around 3 years to construct the express-

way and various tunnels along the route. These included the twin Mui Trau tunnels which are amongst the most modern road tunnels ever built in Vietnam. Each tunnel is 2,260 m long and has two lanes of traffic. The concrete used for the tunnels was admixed with MAPEQUICK AFK 888 accelerator for shotcrete and the super-plasticisers MAPEFLUID N 100 SP\*, DYNAMON EASY 11 and DYNAMON SR2 VN\*.



**TECHNICAL DATA**  
**Period of construction:** 2015-ongoing  
**Period of the Mapei intervention:** 2015-2019  
**Owner:** Ministry of Transportation of Vietnam

**Contractors:** Son Hai Group, Song Da Company  
**Mapei coordination:** Mapei Vietnam

**MAPEI PRODUCTS**  
 Mapequick AFK 888, Mapefluid N 100 SP\*, Dynamon Easy 11, Dynamon SR2 VN\*





## The Peak (M8 building) HO CHI MINH CITY

The Peak is the fourth and final lot of the Midtown residential complex in the heart of Ho Chi Minh City and joins the other three lots of the complex called The Grande, The Symphony, and The Signature. It extends over an area of more than 27,725 m<sup>2</sup> and includes two buildings, M8A e M8B, characterised by their curved forms which help them blend in with the surrounding landscape and with the River Saigon that flows

nearby. The Peak also has numerous green spaces and gardens for the residents, a gymnasium, a swimming pool, indoor and outdoor play areas and a library. Mapei products were also used in the construction of building M8, such as KERASET and ADESILEX P9 adhesives to install interior and exterior porcelain floor and wall coverings and KERACOLOR FF and KERACOLOR GG to grout the joints.

### TECHNICAL DATA

**Period of construction:** 2018-ongoing

**Design:** Kyta Architects

**Period of the Mapei intervention:** 2019-2020

**Owners:** Phu My Hung Development Corp.,

Daiwa House Group, Nomura Real Estate Group, Sumitomo Forestry Group

**Main contractor:** Hoa Binh Construction Group

**Installation company:** Hoa Binh Construction Group

**Mapei coordination:** Mapei Vietnam

### MAPEI PRODUCTS

Keraset, Adesilex P9, Keracolor FF, Keracolor GG

## Hoiana HOI AN

Hoiana is Vietnam's first fully integrated resort. It extends over an area of around 1,000 hectares overlooking the sea to the south of Hoi An and includes a 5-star hotel, a casino and several entertainments centres, as well as a large golf course. It was partly opened to the public in 2019. The ceramic and stone floor and wall coverings in the hotel and the lobby of the casino were installed using the KERABOND T+ISOLASTIC 50\*

adhesive system and KERACOLOR SF and KERACOLOR FF grouts for joints. The substrates of the indoor swimming pools in the casino and hotel were waterproofed with MAPELASTIC before installing the ceramic tiles with ADESILEX P10+ISOLASTIC 50\* and grouting the joints with KERACOLOR FF+FUGOLASTIC.

The joints in the spa centre, on the other hand, were grouted with ULTRACOLOR PLUS.

### TECHNICAL DATA

**Period of construction:** 2017-2020

**Design:** Wimbley Allison Tong & Goo (WATG)

**Period of the Mapei intervention:** 2019-2020

**Owner:** VinaCapital, Chow-Tai-Fook Group &

The Suncity Group

**Main contractor:** Cofico

**Installation companies:** Cofico, Cotecons

### MAPEI PRODUCTS

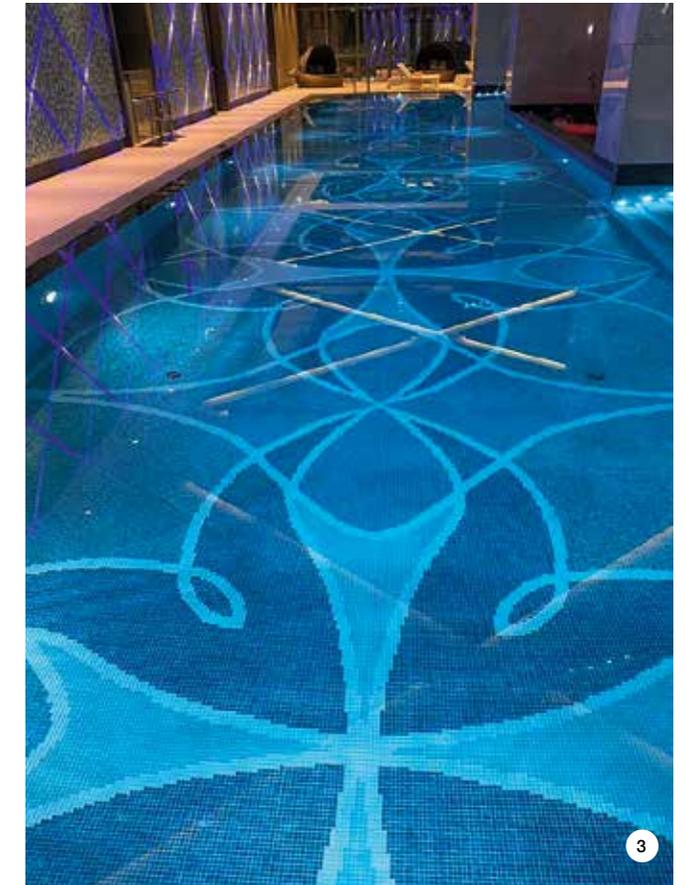
Adesilex P10, Isolastic 50\*, Kerabond T, Keracolor FF, Keracolor

GG, Ultracolor Plus

\*These products are distributed in Vietnam by Mapei Vietnam.

For further info on products see [mapei.com](http://mapei.com) and [mapei.com.vn](http://mapei.com.vn)





## Tashkent (Uzbekistan) HILTON TASHKENT CITY

HIGH-QUALITY PRODUCTS FOR CERAMIC TILES IN A LUXURIOUS SPA IN A BRAND-NEW FIVE-STAR HOTEL

Tashkent is the capital of Uzbekistan and one of the most densely populated cities in Central Asia. During its lengthy history it has been subjected to Islamic, Chinese and, last century, Soviet influence. After being destroyed by Genghis Khan in 1219, it became a flourishing passageway along the Silk Route, an independent City-State in the 18<sup>th</sup>-20<sup>th</sup> centuries, the capital of Turkestan under the Russian Empire, and an important city in the Soviet Union. Following an earthquake in 1966, it was almost completely rebuilt and over recent years it has set out to become a modern metropolis. This has led, for example, to the creation of a multipurpose business centre called "Tashkent City". The centre is

located in the Shaikhantakhur district over an area of 80 hectares and features business spaces, residential areas and a retail and leisure offering, including a flagship congress hall and an adjacent high-rise 5-star hotel. With a sleek outline, the five-star hotel and the congress centre deliver Tashkent City's first definitive statement of transformation, marrying contemporary design with tradition. The new Hilton hotel is centrally located, providing a great position for both corporate and leisure travelers. The natural daylight streaming through the modern glass façade ensures a bright and welcoming atmosphere. The hotel's lounge restaurant is situated on the 22<sup>nd</sup> floor at the highest point of the city. The Serenity

Spa center offers a swimming pool with Jacuzzi, a 24-hour fitness center, five treatment rooms, a VIP area with Jacuzzi, Finnish and steam saunas and a 27 m<sup>2</sup> swimming pool with built-in hydromassage.

### State-of-the-art installation of ceramic tiles in the spa

The Serenity Spa had to be built using high-quality products that can withstand regular exposure to temperature changes and high humidity levels. Mapei products proved to be up to the task. For bonding the ceramic and porcelain tiles, Mapei offered ADESILEX P10, high performance, white cementitious adhesive, with no vertical slip and extended open time for glass, ceramic and

1. The Hilton Tashkent Hotel is located in the Tashkent City business centre.  
2 and 3. ADESILEX P10, high performance adhesive, and high-quality grouts for joints (KERAPOXY DESIGN, ULTRACOLOR PLUS and KERACOLOR FF), were used to install ceramic and porcelain tiles in the Serenity Spa of the hotel.

marble mosaic. The product, mixed with the correct amount of water or ISOLASTIC latex additive becomes a white creamy paste which is easily workable, featuring excellent adhesion to all conventional materials used in building. It is highly thixotropic and, therefore, can be applied on a vertical surface without slumping or slipping even when heavy tiles are used. It also features particularly extended open and ad-justability time.

After installing porcelain tiles on the floors, the tile joints were grouted with KERACOLOR FF, high performance, polymer-modified, water-

repellent, cementitious grout with DropEffect® technology.

As for the areas requiring high levels of resistance to wear and water, the grouts chosen for the joints were KERAPOXY DESIGN, two-component, decorative, acid resistant epoxy grout, and ULTRACOLOR PLUS, high-performance, anti-efflorescence, non-irritating, quick-setting and drying polymer-modified mortar with mould-resistant BioBlock® technology. ULTRACOLOR PLUS also features the DropEffect® technology which makes joints water-repellent, reduces dirt collection and facilitates cleaning.

### ADESILEX P10

High performance, white cementitious adhesive, with no vertical slip and extended open time for glass, ceramic and marble mosaic.

#### FIND OUT MORE



**TECHNICAL DATA**  
**Hilton Tashkent City,**  
Tashkent (Uzbekistan)  
**Period of construction:**  
2018-2019  
**Year of the Mapei intervention:** 2019

**Owner:** Akfa Dream World  
**Design:** ARUP  
**Main contractor:** Discover Invest  
**Mapei distributor:** Italmixes  
**Mapei coordinator:**

Denis Rasputin, AO Mapei (Russian Federation)  
**MAPEI PRODUCTS:**  
Installation of ceramic tiles in the spa:  
Adesilex P10

Grouting joints: Ultracolor Plus, Kerapoxy Design, Keracolor FF

For further information on products visit [mapei.com](http://mapei.com) and [mapei.ru](http://mapei.ru)

# The new Assolombarda Auditorium has been named after Giorgio Squinzi

THE HALL'S NAMING CEREMONY WAS HELD AT THE ASSIOLOMBARDA HEADQUARTERS IN MILAN ON 2<sup>ND</sup> OCTOBER

On 2<sup>nd</sup> October, one year after the passing of Giorgio Squinzi, former CEO of the Mapei Group, Assolombarda (the Association of the companies located in Milan and in the Provinces of Lodi, Pavia, Monza and Brianza) decided to pay tribute to his memory by naming the auditorium of its Milan headquarters after him and even enclosing one of its most favourite mottos "Never stop pedalling".

A tribute to a businessman who always believed in associationism, holding various positions both in Italy (he was President of the Italian Federation of the Chemical Industry from 1997 to 2003 and from 2005 to 2011 and also President of Confindustria, the Confederation of the Italian manufacturing and service companies, from 2012 to 2016) and abroad (he was President of CEFIC, the European Chemical Industry Council, from 2010 to 2012). The naming ceremony was attended by his children Veronica Squinzi and Marco Squinzi, both Mapei's CEOs, and his sister Laura Squinzi, President of Mapei's Board of Directors accompanied by her daughter Simona Giorgetta, a member of Mapei's Board of Directors.

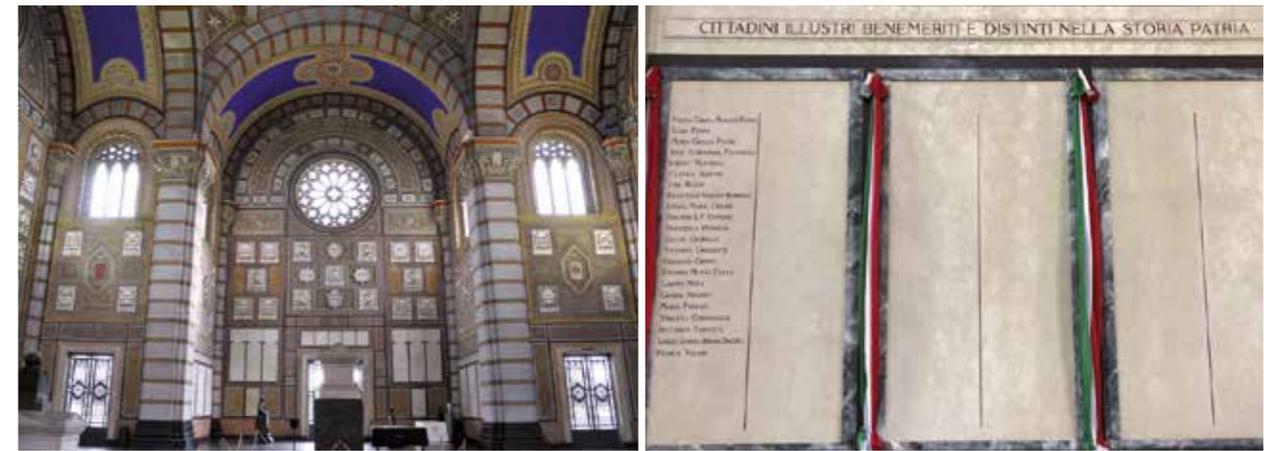
"We are genuinely proud and excited about Assolom-

*barda's wonderful tribute to our father and his deep involvement in promoting entrepreneurship and associationism, something he truly believed in and was fully committed to. This kind of recognition of his work encourages us to continue along the same path with just as much passion, enthusiasm and dedication",* so Veronica Squinzi and Marco Squinzi commented.

A number of officials and delegates from the business world in Lombardy also attended the ceremony, such as Carlo Bonomi, President of Confindustria, and Alessandro Spada, President of Assolombarda, who remembered Mr Squinzi as being "one of the greatest businessmen in Italian history. A perfect example of courage and vision, a man who was equally committed to his family, business, entrepreneurial associationism, sport, culture and social work. We hope he will continue to be a shining example inspiring us as we set about our own projects and ideas". Spada and members of Assolombarda hoped that the hall dedicated to Giorgio Squinzi would gradually develop into a congregation and meeting place for "planning for the future together" based around successful "team-work", something Giorgio Squinzi believed in so strongly.

#### FROM LEFT.

Alessandro Spada, Simona Giorgetta, Marco Squinzi, Veronica Squinzi, Laura Squinzi and Carlo Bonomi in the Assolombarda Auditorium named after Giorgio Squinzi.



## Giorgio Squinzi and Adriana Spazzoli inscribed in the Memorial Chapel of Milan

Giorgio Squinzi, former CEO of the Mapei Group, and Adriana Spazzoli, the Group's former Director of Operational Marketing and Communication, who passed away at the end of 2019, were both inscribed in the Memorial Chapel of the Monumental Cemetery in Milan on 2<sup>nd</sup> November, a shrine devoted to the memory of Milan's most illustrious citizens.

Along with 16 other famous figures from Milan, who have helped raise the status and reputation of this city, the two entrepreneurs were unanimously chosen by a committee chaired by Lamberto Bertolé, Milan City Councillor.

During the ceremony attended by the Mayor of Milan, Giuseppe Sala, and the Squinzi family, Giorgio Squinzi and Adriana Spazzoli's names were inscribed in the Memorial Chapel, a Pantheon for citizens of Milan, with

the following motivations: "Giorgio Squinzi and Adriana Spazzoli, a couple in everyday life and at work, symbolise Milan's great tradition for family industry. Thanks to their inventiveness, Mapei is now a leading global player in chemical products for the building industry. They were also firmly committed to sponsoring Italian football and cycling at the very highest levels, as well as keen supporters of culture in our city. Mapei is, in fact, one of the Founding Partners of La Scala Opera House".

Giorgio Squinzi and Adriana Spazzoli had indeed a great passion for business, culture, sport and the city of Milan, where Mapei was originally founded and with which it has always maintained very close ties. The close bonds with the city were also emphasised by Veronica Squinzi and Marco Squinzi, Mapei's current CEOs, who noted:

"Our parents always took part in city life with great enthusiasm and devotion. Everything they did for Milan came from their hearts, unhesitatingly and with great passion. They helped promote some of Milan's important landmarks, as well as promoting many solidarity projects for the city".

## CasArché: the community for mothers and their children has been named after Adriana Spazzoli



On Saturday 3<sup>rd</sup> October during Arché Live, CasArché was officially named after Adriana Spazzoli, Mapei Group's Director of Operational Marketing & Communication until 2019 and a great supporter of the Arché Onlus Foundation.

Veronica Squinzi and Marco Squinzi, who are both Mapei's CEOs, thanked Father Bettoni - who first established Arché in 1991 in response to the HIV health care emergency among children - for this honour and stated: "We firmly believe

that our mother would have been delighted. She was a very keen supporter of all Arché Foundation events and was committed to community projects in the realm of social

support. Knowing that several mothers and their children will be taken in at Casa Adriana seems to us to be a wonderful way of remembering that our mother's support for

the Arché cause is still very much ongoing".

CasArché, now called Casa Adriana, provides a home for nine mothers and their children with problems related to maltreatment, immigration, social alienation and mental fragility, who receive assistance in finding their own home and work, so that they can recover both physically and mentally. The building, formerly a nursery school, was set up in 2016 with the help of products and technical assistance donated by Mapei (see *Realtà Mapei International* no. 79).



# Sustainability, a growing contribution

THE 2019 SUSTAINABILITY REPORT HAS BEEN PUBLISHED FOR MAPEI SpA AND THE GROUP'S ITALIAN SUBSIDIARIES

In 2019 important progress was made in the realm of sustainability, one of the guiding threads at the focus of Mapei's corporate strategies alongside internationalisation, specialisation, and Research & Development. The results of Mapei's increasing commitment to innovation, attention to the environment, the development of its own staff, and support for local communities, clearly emerge in the 2019 Sustainability Report.

*"Sustainability has always been a key aspect of Mapei's manufacturing and business system. Ever since the very beginning, the company has always paid careful attention to both the environment and society. Business operations are managed so that social, environmental, and economic values are inter-related to each other. Indeed, we believe it takes more than economic success to grow, a business must also be socially responsible towards its own people and the communities it belongs*



**In 2019 stakeholders were awarded the equivalent to 836.5 million Euros**

to" so Veronica Squinzi, Mapei's CEO, claimed when presenting the Group's 2019 Sustainability Report.

The report, which is being published for the fourth time, takes into account operations carried out by the holding company Mapei SpA and its Italian subsidiaries: Adesital SpA, Cercol SpA, Mosaico+ Srl, Polyglass SpA, Vaga Srl and Vinavil SpA. The report also covers the company Fili&Forme, which was taken over by the Group in April 2018 and incorporated into Mapei in May 2020.

One figure sums up Mapei's sustainability operations and progress on this front. In 2019 stakeholders were awarded the equivalent to 836.5 million Euros.

*"Sustainability is a vital driver behind the Mapei Group's growth. It takes the form of ongoing research to provide long-lasting high-quality products, while reducing impact on people's health and safety. A manufacturing system capable of constantly reducing environmental*

impact, while focusing on people and on community and local projects" so Marco Squinzi, Mapei's CEO, commented.

Here is a brief outline of the most important results from 2019 mentioned in the four chapters of the Report.

## RESEARCH & DEVELOPMENT

This is the "brains" behind Mapei's growth that has managed to constantly extend and innovate the portfolio of products available to clients and users: 326 new products were launched on the market by the Group's Italian companies over the three-year period 2017-2019, including 87 in 2019. There has been a rise in investment in R&D operations of 39.8 million Euros, which is a 4% increase compared to 2017. Mapei's success in research is partly due to the very close ties it has developed over the years with the scientific community, as well as its joint ventures with universities and research centres. Research work is backed up by studies into assessing the impact products have on the environment and miscellaneous operations in the circular economy. Ongoing efforts to reduce the consumption of virgin raw materials and the amount of waste generated played a major part in important recognitions the Group received in 2019.

## MANUFACTURING PROCESSES

Commitment to "sustainability" works in two directions: increasing the efficiency of manufacturing operations while, at the same time, reducing the associated environmental impact as far as possible. For this very purpose, Mapei regularly monitors environmental data connected with the operations of all the Group's Italian companies, such as the consumption of energy and water resources, emissions of polluting substances into the air, and waste generation. Another figure sums up this

commitment: as regards the disposal of waste generated in 2019, the amount sent for recovery/recycling was 53.9% compared to 46.1% that was sent for disposal. Within the realm of manufacturing, it is also worth mentioning the sustainable management of the supply chain, with most suppliers being chosen in the vicinity of its manufacturing plants to reduce the associated environmental impact.

## FOCUS ON PEOPLE

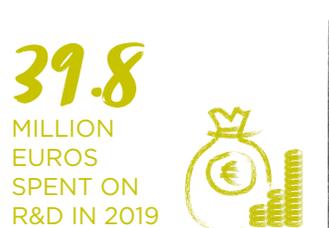
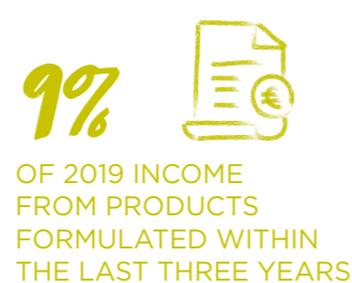
Mapei has always acknowledged that people are the real key to success and corporate growth. At the end of 2019, the Mapei "family" employed 2297 staff (+3% compared to the previous year), 97% of which have full-time contracts. There are a number of activities to promote welfare and safety. Good practices in relation to its staff resulted in Mapei being awarded Federchimica's (the Italian Federation of the chemical industry) "Best Corporate Experiences 2019" award at National Safety, Health and the Environment Day. Mapei is also involved in social inclusion and diversity programs.

## SUPPORT FOR THE COMMUNITIES AND LOCAL AREAS

Every year Mapei makes a contribution to support the local communities in which it operates in the firm belief that businesses cannot ignore the duty, and pleasure, of contributing to their development and success. Funding of approximately 32 million Euros was given to various projects (cultural, sporting and social) across Italy in 2019. Mapei is engaged right across-the-board. A passion for sport, love of art, culture, music and attention to other people has always been a key part of the Group's history. Thanks to all kinds of different projects, Mapei is committed to maintaining close ties with local communities.

## SUSTAINABILITY: THE FACTS AND FIGURES

All the figures are related to the Mapei Group's Italian subsidiaries\*



An excerpt from the report written in English is available from the website [mapei.it](http://mapei.it)

\* U.S. Sassuolo Calcio s.r.l. and Mapei Stadium s.r.l. are excluded from these bounds.

# 2020 Cresco Award

ITALIAN CITY COUNCILS REWARDED FOR SUSTAINABLE GROWTH PROJECTS



The fifth edition of the Cresco Award drew to a close on 19<sup>th</sup> November. This contest, which is promoted by the Sodalitas Foundation in partnership with ANCI (National Association of Italian City Councils) and sponsored by the European Commission and Italian Ministry of the Environment, rewards Italian city councils for their commitment to sustainable growth in accordance with the goals set by the UN's 2030 Agenda for Sustainable Development. About 100 projects were entered by 83 associations, which can be added to the over 500 projects entered in the previous editions of the prize: a unique body of knowledge touching on a variety of different issues ranging from sustainable mobility and the circular economy to local energy sustainability, open innovation and inclusiveness at school. Once again this year, Mapei supported the Sodalitas Foundation in promoting sustainability projects organised by Italian city councils: the company was one of 17 businesses associated with the Foundation that awarded a total of 17 commendations to local councils. Mapei was keen to award a prize to the city council most committed to implementing projects aimed at enhancing urban areas through a combination of normative procedures and new technology, available to everybody and designed to last. During the online ceremony attended by Angelo Nobili, Mapei Group's

Product Manager for Resilient Line and Sports System Technology, the Business Prize entitled "Systems for improving urban paving and cycle paths for a new kind of sustainable and enduring mobility" was awarded to Collebeato Borough Council in the province of Brescia for its project entitled "Porta del Parco". *"A more sustainable lifestyle is possible - so Veronica Squinzi, Mapei's CEO, commented - and Mapei promotes this kind of lifestyle by encouraging industry and the supply chain to use materials that make products last longer, are technologically cutting-edge, and focused on the health of both installers and consumers. This project allows the Sodalitas Foundation to raise awareness of this key issue among local bodies governing the community. This and other social responsibility projects are at the focus of Mapei's strategy, because we believe that the only way to do business is to always act responsibly and sustainably".* Mapei joined the Sodalitas Foundation in 2011 and over the years has been involved in a number of its social responsibility projects. In 2016, Adriana Spazzoli, the Group's former Director of Operational Marketing & Communication, took over the Presidency of the Foundation. Veronica Squinzi joined Sodalitas' Board in 2020 (see *Realtà Mapei International* no.80), reasserting the company's commitment to social responsibility.



## Disanima Piano: summer music in Mantova

Once again this year Mapei is supporting the non-profit cultural association Disanima Piano, which organises a series of annual musical, art, theatrical and photography events. In addition to its spring and autumn seasons, when shows are put on in various locations, the association also organises its own festival held at Scalori Gardens in Mantua (Northern Italy), featuring concerts, exhibitions, art displays and performance art. Mapei was the Main Sponsor of an evening event at the 2020 Disanima Festival: a concert given by the singer-songwriter Giovanni Caccamo entitled "Piano voice summer tour" that was held on Saturday 5<sup>th</sup> September at Bike-in-Campo Canoa Arena in Mantua

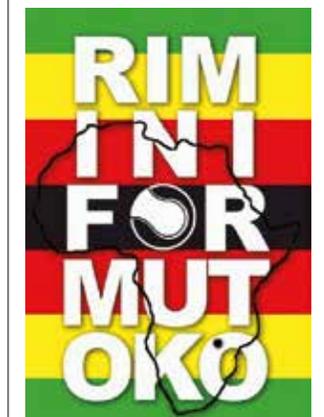
## Online Auction for San Patrignano

A charity auction organised by San Patrignano (a community based in Coriano, Central Italy, welcoming those suffering from drug addiction and marginalization) was held online from 29<sup>th</sup> October to 16<sup>th</sup> November to raise funds for its projects. Just like every other year, the aim of the auction was to help cater for the San Patrignano community's basic needs so it can keep on helping people in accordance with its three guiding principles: rehabilitation, education and prevention. The money from the auction will be used to help young people at the community, ensuring they have a home, health care, legal aid and specific professional training. All this is part of a program designed to help them recover and return to society and their families. Once again this year many companies supported San Patrignano as partners in the auction. About one hundred items were chosen, including photographs by leading artists, products of the highest craftsmanship by famous names from the world of fashion and design - working in partnership with San Patrignano's arts and crafts sections - fashion accessories, jewellery and watches, high-quality wines and artworks. Mapei has been supporting the community for many years and took part in the project by buying a page in the auction catalogue.

## From Rimini to Mutoko to help the needy

RiminiForMutoko Onlus, which was founded in 2016, promotes and organises charity projects in Italy and abroad, partly by supporting missions around the world. It gets its name from Mutoko, a town in Zimbabwe 150 km away from the capital Harare. Its Catholic mission called "All Souls" is also the home of Luisa Guidotti Hospital, which the association supports through numerous projects. Like, for example, "Operation Heart" that allows many patients to be brought to Italy from Zimbabwe - mainly children - who are suffering from heart diseases and need treatment not available in their own country, and also "Health for Mutoko" that is designed to provide a range of vitally important and urgent goods required to keep the hospital and its diagnostic service running.

Projects undertaken in Italy include "Build Together", which has already been a success in terms of helping people who are struggling to find work, get back into society and become independent, and "Free Throw: Wheelchair Basketball", which is intended to promote sports among people with disabilities. Mapei has been supporting the association for various years and its donations in 2020 will go towards these projects.



# Sassuolo off to a flying a start

CARNEVALI "REMEMBERING GIORGIO SQUINZI AND ADRIANA SPAZZOLI HELPS US GIVE OUR BEST"

"I want to see my team Sassuolo in the Champions League", so Giorgio Squinzi, the former CEO of the Mapei Group, used to say. The only way to make the old owner's dream come true is to finish in the top 4 of the Italian Serie A, no easy matter. But it is not totally impossible based on what we have seen up until December: the team managed by Roberto De Zerbi has been playing some spectacular football and has been in second place behind AC Milan for most of the autumn. "Sassuolo's progress - so Giovanni Carnevali, Sassuolo's CEO and General Manager, noted - is in line with the aims and goals set by Giorgio Squinzi and Adriana Spazzoli, Sassuolo's former Vice President. As managers, we have tried to bring these plans to fruition. Mr De Zerbi has developed his own style of play and the team has improved. I believe that Giorgio Squinzi e Adriana Spazzoli are looking down at us from above and protecting us. They are helping us keep on improving, so we



**FROM LEFT.** Locatelli in action against Crotone, Vlad Chiriches in the match against Napoli, and Rogerio, an attacking fullback.

can do our absolute best. We have already played in the Europa League, but it is everybody's dream to qualify for the Champions League, not just Sassuolo's. I cannot emphasise how difficult that will be". Of course, the team's fans are ecstatic and hope to celebrate qualifying for the Champions League at the end of May 2021.

## FOUR YEARS IN THE BLACK

Sassuolo has turned a profit for four years in a row and keeps on improving its league position. It is worth pointing out that the club is based in a city with 41,000 inhabitants in a region where there is plenty of competition from other teams in the top division. "Not many teams in the Italian Serie A manage to turn a profit - so Mr Carnevali told us -. We have always managed to combine good performances on the pitch with good financial results at a time when football and the Italian Serie A are in a disastrous state. The 2020-21 season is even more complicated because

we have to play behind closed doors due to Covid-19. Clubs can get no takings from gate money or selling season tickets. Matters are made worse by reduced income from TV rights, so it will be hard to keep in the black".

Sassuolo is still in a qualifying position for the Champions League heading into December, despite home draws against Cagliari, Torino and Udinese. "We have no complaints - so Mr Carnevali claims - we are pleased with what we have achieved over the first few months of the season. It is a tricky period due to Covid-19 and we have had our problems. Of course, we have to try and do better and work harder if we are to achieve something really big".

## NO BREAK FOR THE TEAM

Sassuolo finished the 2019-20 season with a flourish and the last match was not played until 2<sup>nd</sup> August. "We never really stopped but the short break prevented us from completing our usual summer training camp.

Fortunately, having a highly competitive squad of players meant we were able to handle this almost non-stop period from July to September".

Sassuolo fans need to have strong nerves. Sassuolo won 4-3 away to Bologna after coming back from two goals down. The home match against Cagliari finished 1-1 and the game against Torino ended 3-3. In both matches the team had to come from behind. "It proves how determined we always are to get the best result possible. It shows we have plenty of heart and character. That is important because it shows that even when we are 3-1 down, like in the game against Bologna, we still keep on trying to win right until the very end. It was hard for our fans to watch, but they were happy in the end. Our team never gives up and always believes it can win".

Sassuolo won 4-1 away from home against Spezia and at home to Crotone. It also won 2-0 against Napoli. "The game against Napoli was our

best match of the season", Carnevali noted. Various first-team players missed that match after testing positive for Covid-19. "That was our best match in terms of the football we played, and we managed to win away from home against a great team. We had had a difficult week due to complications associated with Covid-19 that badly affected our preparations, but on the field we showed we have our own definite style of play and even those players who had not played much until then proved they were up to the challenge".

## STAR PERFORMERS

Which players have surprised you by how well they have performed at the beginning of the season? "Locatelli, Berardi and Caputo have improved and been very consistent in all our matches. They deserved to be called up for the Italian national team. Boga, who put in some amazing performances at the end of the 2019-20 season, fell ill with Covid-19 at the be-

ginning of the new season and was side-lined for 40 days. He had to work really hard to get back to full fitness. He will be one of our key players from now onwards", Mr Carnevali added.

## WONDER GOAL

Vlad Chiriches scored a fabulous goal against Torino. Carnevali claimed: "He is an extremely talented player but lacks a bit of consistency. In any case, his experience is extremely useful for us".

And what about Rogerio? "As the team has improved - so Mr Carnevali noted - he has shown his great qualities. Even though he is only 22, he is one of the most talented left-backs around".

Maxime Lopez, aged 23 and a very talented player, scored the second goal against Napoli. Despite being so young, he has already played in the 2017-18 Europa League final "He is a hugely talented player and fits in perfectly with Mr De Zerbi's style of play", Mr Carnevali said.

Sassuolo's CEO and General Manager, Giovanni Carnevali.



## Mapei Stadium hosts Italian national team and Super Cup final



On November 15<sup>th</sup> the Italian national football team beat Poland 2-0 to go to the top of its Nations League qualifying group. The Italian team beat Poland 2-0 and had a definite Sassuolo flavour: Manuel Locatelli played the match with great energy and accuracy; Domenico Berardi scored two goals; Gian Marco Ferrari was sitting on the bench. On Wednesday 20<sup>th</sup> January Mapei Stadium will be hosting the Italian Super Cup final between Juventus and Napoli.

## A road named after Giorgio Squinzi, a field in Adriana's memory

A new road leading to Mapei Football Center has been named after Giorgio Squinzi, the Mapei Group's former CEO, and a synthetic grass pitch inside Mapei Football Center has been dedicated to Sassuolo's former Vice President, Adriana Spazzoli.

The official opening ceremony for both the road and playing field took place on the morning of 15<sup>th</sup> November, just after the Italian national football team completed its final training session at Mapei Football Center, ready for the match that took place that evening against Poland.

The ribbon-cutting ceremony for the new road was attended by Marco Squinzi, Giorgio and Adriana's son and Mapei's CEO, Gabriele Gravina, Chairman of the Italian Football Federation, Gian Francesco Menani, the Mayor of Sassuolo, Carlo Rossi, President and CEO of Sassuolo, Giovanni Carnevali, Sassuolo's General Manager and CEO, and Gianmaria Manghi, representing Emilia Romagna Regional Council.

Later on, "Adriana Spazzoli" playing field was also officially unveiled.



**ABOVE.** The ribbon-cutting ceremony for the new road named after Giorgio Squinzi took place on 15<sup>th</sup> November.

## "Generation S", football for all



## ETHICS, CULTURE AND SPORT FOR THE YOUNGER GENERATIONS

Sassuolo is planning for the future. "We want to support small sports clubs that embrace our values", "We would like to help young people in sport and everyday life", "We support educational and innovative projects amongst the needy and less fortunate, because football and sports are excellent means of turning today's young people into better adults in the future". These are just some of the things Giorgio Squinzi and Adriana Spazzoli, re-

spectively the Group's former CEO and former Director of Operational Marketing and Communication, frequently used to say. They always believed in sport and promoting ethics and culture. In accordance with their desires, a new project entitled "Generation S" is among the activities being planned to celebrate the hundredth anniversary of Sassuolo Football Club. "The project - so Giovanni Carnevali emphasised, Sassuolo's CEO and General Manager - is innovative and completely free to take part in. It is aimed at promoting work with young people among everybody who shares Sassuolo's principles and work methods".

**IT IS FOR BOYS AND GIRLS**

The project is focused on amateur boys and girls clubs all over Italy, so that they can take part in activities, events and training programs, and the idea is to even export it to other countries.

Passionate football fans will think that Generation S is an elegant way of finding new young talent for Sassuolo's youth teams, which are already flourishing.

"That is not its main purpose - so Mr Carnevali was keen to point out - since the project mainly focuses on ethical-social considerations to provide amateur football schools and clubs with new services. We will also be trying to improve young people from a social-ethical viewpoint, teaching them to respect rules and other people".

**CODE OF ETHICS**

Sassuolo has drawn up a code of ethics and all the clubs that join "Generation S" will have to sign it. Sassuolo will be organising training courses and conferences for the clubs, which will mainly be held at Mapei Football Center or Mapei Stadium, but not all of the guest speakers involved will come from Sassuolo: other professional sports people will tell their stories and give tips and advice. Each conference will look at a different subject. "When technical-sporting aspects are discussed - so Mr Carnevali went on to say - the focus will be on team managers and trainers. Other subjects will include nutrition, marketing, psychology, education and social networks, as well as sustainability and green projects. We will cover all kinds of issues

that might be important to ordinary clubs interested in finding out how Sassuolo goes about its business". Generation S is designed for all clubs: even those connected with other professional teams, and everybody will be entitled to take part in Sassuolo's projects.

Mr Carnevali went on to talk about a familiar problem: "There are young kids at amateur clubs who go to school and finish their lessons at, say, 1 pm and then have training from 2:30 pm. It is important to teach young people how to eat in certain situations".

It is worth pointing out that before Covid-19 struck, Sassuolo allocated 450-500 seats in the stands to young footballers for its home matches, so they could enjoy the thrill of going through the locker rooms and out onto the pitch and visiting the press area and VIP lounge.

There will, of course, be some differences between ordinary participants and clubs that actually join Sassuolo through Generation S. "All those who join will get the chance to take part in training courses on technique, tactics and training methods with some of our managers and trainers, held at their own sports centre. The idea is to try to pass on Sassuolo's know-how to member clubs" Mr Carnevali claimed.

"Certain requisites will have to be met to join as satellite clubs, and the number of clubs involved must allow us to work together closely for monitoring purposes and to scout for players who might have a future with Sassuolo" he added.



**RIGHT.**  
Team manager Gianpiero Piovani and, in the following photos, the central defenders Martina Lenzini, aged 22, and Maria Luisa Filangeri, aged 20, who also play for Italy.



# Sassuolo is up with the top women's teams

PIOVANI: "WE NEED TO KEEP ON IMPROVING"

Sassuolo women's team is near the top of the league table, just like the men's team. After the first seven games of the Italian women's A league, the team managed by Gianpiero Piovani was just behind Juventus and AC Milan. "I did not expect to start the 2020-21 season so well – Mr Piovani noted - because we knew we had a lot of work to do with all the new players in the squad. Then, as we started training, I realised my players had great technical skills and plenty of personality".

There is a great team spirit. "That is something very important in football - so the team manager emphasised - and even though our players all have their own jobs to do, they are more than ready to help out their teammates. Technically speaking, we have a stronger squad this year. The girls train with great enthusiasm and attention to detail. They can do things that might seem quite ordinary for men but are quite startling for women players".

Lady Luck has not smiled on Sassuolo, and the team has had to do

without three players from the very start of the season due to cruciate ligament injuries: the goalkeeper Nicole Lauria, the midfielder Alice Parisi, and the striker Claudia Ferrato.

## PROVIDING PLAYERS FOR ITALY'S NATIONAL TEAMS

All the hard work of Alessandro Terzi, Development Director in charge of Sassuolo Women's Football Area, and his staff has been rewarded with several players being called up for Italian national teams. "Up until 2018 - so Mr Piovani pointed out - Sassuolo had only ever had three players called up for the full Italian team and very few others for the various youth teams. The number of players called up for Italian national teams has now doubled, so the club's hard work has been rewarded. We have the support of Mapei, which really believes in the women's squad. The girls are aware of this and they are fully committed".

Does the Sassuolo women's team feel it is better than their male coun-

terparts managed by Roberto De Zerbi? Mr Piovani refuses to make comparisons: "For us the men's team is the example we want to follow and, after watching videos of them play, we try and copy them. I really admire Mr De Zerbi's work, and we try to play the same way, building up from the back and not relying on long balls. We are also trying to improve our passing game in midfield and make sure our strikers are really mobile. We work on every aspect of the game and, in our own small way, we want to copy the Sassuolo men's team: after all, we are one club, one family".

Mr Piovani has plenty of praise for the goalkeeper, Diede Lemey, the extremely mobile players Davina Philtjens, Mana Mihashi and Kamila Dubcova, and all the other foreign players who have fitted in so well. "My foreign players wanted to learn Italian as soon as they arrived in the country. It was immediately obvious they wanted to communicate with the rest of the team both on and off the field. Technically, they are doing

well, they have raised the bar".

Third place after seven matches is just the start for the team manager, although he knows that the league table in autumn does not tell the whole story: "We have not yet reached the same level as Juventus, AC Milan, Fiorentina and Roma, but we are catching up fast. We need to give even more and never give up. We will fight until the very end to finish as high up the table as possible".

In autumn, Mr Piovani began rotating the squad: "I took advantage of the new rules allowing five substitutions, ensuring everybody the chance to play. At the moment, there are certain key players, such as our goalkeeper Lemey, as well as Dubcova, Lenzini, Pirone and Filangeri".

The striker Michela Cambiaghi had injury problems last year and could not play for a long time, but she is now getting back to her best.

"Michela is a quality player, and the club has great faith in her. Indeed, Sassuolo has just given her a new two-year contract. Then I also have Benedetta Brignoli in midfield, who is an outstanding player when the pace of the game is a bit slower. She tends to struggle when the pace speeds up, but she still has plenty to give".

And then there is the phenomenal

Haley Bugeja from Malta, born in 2004, whose goals have helped keep Sassuolo at the top of the table. With the ball at her feet, Bugeja is really fast, she can get round her opponent and score spectacular goals.

"When I announced that I wanted to play her in the first team straight away," so Piovani noted, "I was criticised. People said I would burn her out before she even got started. I have always said that the best players should play and Bugeja has certainly rewarded my faith in her. Of course, being so young, we should not be surprised if she has certain lapses during matches".

## PLAYING AGAINST JUVENTUS

At the beginning of the 2020-21 season Sassuolo won important matches against Inter Milan and other top teams. The only game the team lost was 4-0 away to Juventus. "For 70 minutes we showed we could compete with Juventus, and you could tell from watching their players that they were scared of us. According to the match-analyst data, we had much more possession of the ball until the 65th minute, but then things turned around". It is worth noting that Juventus's team manager, Rita Guarino, admitted that 4-0 was not a fair reflection of the game: "There was not that much difference between the teams".

"In our own small way, we want to copy the Sassuolo men's team: after all, we are one club, one family".

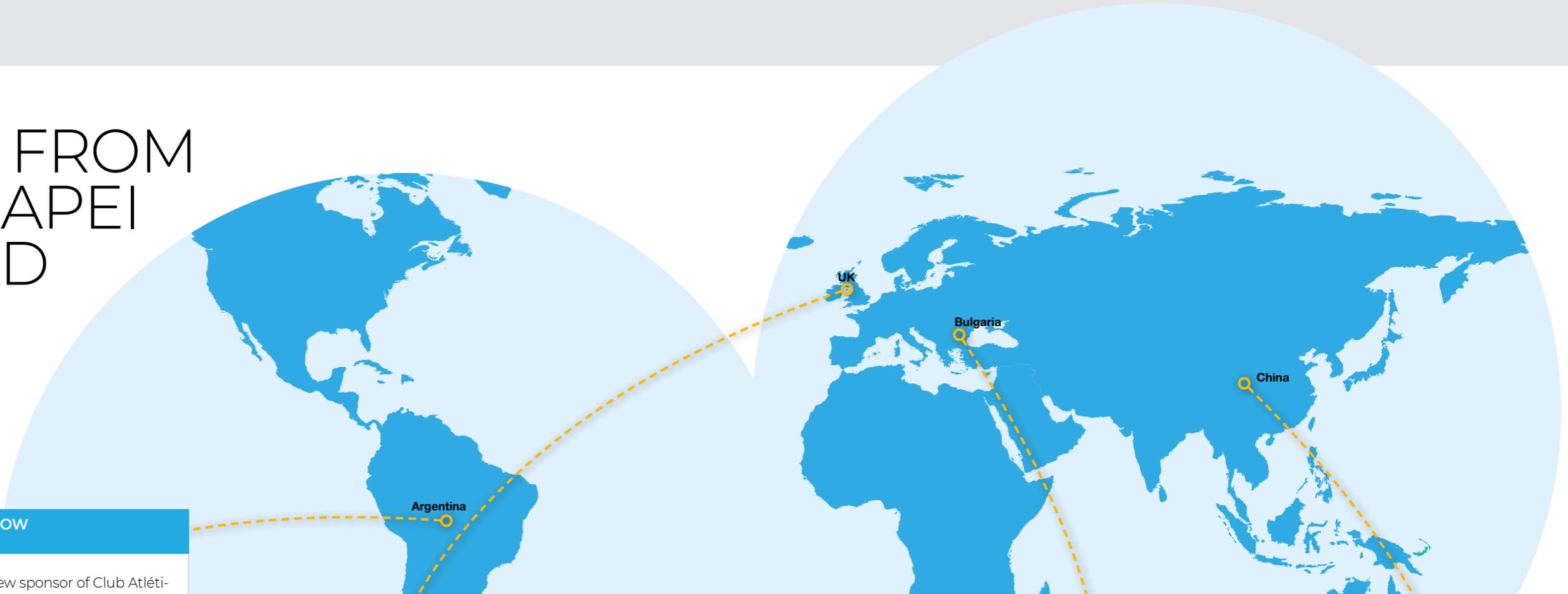
## MANA MIHASHI MODELS THE THIRD JERSEY

The Japanese central defender, Mana Mihashi, posed wearing Sassuolo's third jersey for the 2020-21 season manufactured by Puma. The jersey's background colour is electric blue, with an almost three-dimensional pattern of green triangles. It has been made with Puma dryCELL thermo-regulation technology, an improved moisture management system that ensures perfect body temperature. The sleeves are green around the edges.



# NEWS FROM THE MAPEI WORLD

EVENTS, SPONSORSHIPS AND PROJECTS BY THE GROUP'S SUBSIDIARIES



## ARGENTINA – MAPEI NOW SPONSORS LANÚS

Mapei Argentina is the new sponsor of Club Atlético Lanús (in the photo below), a football team from the Lanús district of Buenos Aires that plays in the Primera División, Argentina's top league. Founded in 1915, Club Atlético Lanús is famous on the world football scene for its numerous national and international successes, such as the Copa Conmebol in 1996 and Copa Sudamericana in 2013. It was also the runner-up in the Copa Libertadores de América in 2017. This sponsorship deal will strengthen the Mapei Group's ties with international sport, re-asserting those values that have always been part of its DNA: hard graft, teamwork and the determination to constantly take on new challenges.



## UK- OTAEGUI WINS THE SCOTTISH CHAMPIONSHIP

On 18<sup>th</sup> October Adrian Otaegui (in the picture) won the Scottish golf championship held at the Fairmont St Andrews course, his third win on the European Tour. He had 10 birdies in a final round of 63. Otaegui, who has been sponsored by Mapei UK for some time now, had previously won the 2017 Saltire Energy Paul Lawrie Match Play and 2018 Belgian Knockout. In 2019 Otaegui held a golf clinic during a National Golf Day organised by Mapei UK at Woburn Golf Club, together with golf coach Chris Ryan, who is also sponsored by Mapei UK. Phil Breakspear, General Manager of Mapei UK, stated that: "It has been our privilege to support Adrian over the last couple of years. We are delighted to see his hard work pay off with this thoroughly deserved win".



## BULGARIA - MAPEI SPONSOR THE UEC EUROPEAN TRACK CHAMPIONSHIPS

This year's UEC European Track Championships were held in Plovdiv, in central Bulgaria, from 11<sup>th</sup> to 15<sup>th</sup> November. Mapei Bulgaria, the Group's local subsidiary, sponsored the championships organized by the Bulgarian Cycling Federation. Despite issues caused by Covid-19, which also meant there were no spectators at the track, over 200 cyclists from 22 nations took part in the races in 11 different events. This was a chance for Mapei Bulgaria to strengthen, on a local level, traditional ties between sport and the Group's corporate culture. The Mapei logo could clearly be seen on banners around the track, as a backdrop to the prize-giving ceremonies, and in the rest/relaxation areas for the cyclists. It was also clearly visible during TV coverage on local channels and Eurosport.



## CHINA – "MULAN LADY" AWARD GOES TO IRENE TANG

The Ready-mixed Mortar Branch of the Chinese Building Materials Federation awarded the "Mulan Lady" Prize to Irene Tang (second from the right in the photo), Deputy General Manager of Mapei Guangzhou, on 6<sup>th</sup> November. This award goes to women who have made a notable contribution to the Chinese building industry. Irene Tang has, indeed, played a key role in the widely spread process currently underway in China of replacing the traditional sand/cement-based system with systems based around innovative adhesives for installing ceramics. Winnia Zhou, Director of Research & Development, also received a prize for her contribution to the Chinese building industry. Mapei was also recognized with "Influential Brand in the Industry" award.



# Kerapoxy CQ

THE BACTERIOSTATIC,  
HIGH-PERFORMANCE EPOXY GROUT

Easy-to-use, anti-acid, easy-to-clean, with a **bacteriostatic** agent, two-component **epoxy filler**, ideal for grouting the joints of ceramic tiles and mosaics. The **BioBlock®** technology blocks the formation and growth of micro-organism in damp environments.

EVERYTHING'S **OK** WITH **MAPEI**

Learn more on [mapei.com](http://mapei.com)



## QUESTIONS & ANSWERS



# Hygiene and ceramic surfaces

## MAPEI EPOXY GROUTS HELP KEEP JOINTS HYGIENIC AND SAFE

In certain settings the hygiene of ceramic tile surfaces is critical. Canteens, refectories, schools, hospitals, wellness centres and many other settings are all places where hygiene is not just a question of common sense; it is mandatory according to current norms and standards and according to each specific area of use.

### How can you improve the level of hygiene of ceramic surfaces?

To put it briefly, by reducing or completely eliminating the porosity of the floor or wall covering. Indeed, less porosity means less chance of dirt pick-up, fewer or no residues on surfaces and easier cleaning. Non-absorbent and glazed tiles, for example, help to achieve such an objective.

### What about having joints between each single tile?

Ceramic floor and wall coverings are formed by a combination of ceramic tiles and joints. A joint is a break or interruption in the surface. If you want to improve the overall level of hygiene of a ceramic tile/joint system, not only should you use non-absorbent tiles, the grout for the joints must also be non-absorbent and resistant to the harmful action of germs and bacteria.

### Are there products with such characteristics available?

Amongst the various types of mortar used to grout the joints of ceramic tiles, epoxy resin-based products are the best way of improving the hygiene of floor/wall coverings. Not only are these types of product impermeable, they also have excellent resistance to the aggressive action of chemicals. In past issues of *Realtà Mapei International* (no. 58, 61 and 80), you can find lots of information on how to use this particular family of products.

### Which Mapei grouts can help improve the hygiene of ceramic surfaces?

One example is KERAPOXY CQ, an epoxy resin-based product certified by the University of Modena (Italy) as a grouting mortar protected against the formation and proliferation of micro-organisms. Thanks to BioBlock® technology, it prevents the formation of mould on the surface of joints and makes the whole ceramic surface more hygienic and healthier.

Marco Albelice. Technical Services, Mapei SpA (Italy)

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## Products in the spotlight

PROTECTING FAÇADES, WATERPROOFING IN A VERY SHORT TIME AND INSTALLING OVER "DIFFICULT" SUBSTRATES: A FEW SOLUTIONS BY MAPEI



### MAPEGUARD UM 35

It is an uncoupling, anti-fracture, waterproofing membrane made from a layer of honeycomb HDPE with a rough surface and polypropylene fabric backing.

**MAPEGUARD UM 35** is used on cracked or not fully cured substrates, to install ceramic tiles or stone material in both interior and exterior, without having to copy the layout of control joints and expansion joints.

It is an ideal to solve issues related to difficult substrates, while guaranteeing a successful installation of ceramic tiles and stone material.

FOR CRACKED OR NOT FULLY CURED SUBSTRATES



### ELASTOCOLOR TONACHINO PLUS

Fibre-reinforced, rustic effect coating for all surfaces (new, old, painted, with hairline cracks), it is ideal to protect against climatic conditions that facilitate the growth of algae and mould (damp climates, north-facing façades). It ensures long-lasting protection, eliminating the causes provoking deterioration in façades. It is available in a wide range of colors obtained using the ColorMap® automatic tinting system. **ELASTOCOLOR TONACHINO PLUS** meets the main requirements of EN 1504-9 and EN 1504-2 standards and has its own Environmental Product Declaration (EPD).

PROTECTION AGAINST THE DETERIORATION OF FAÇADES



### MAPELASTIC TURBO

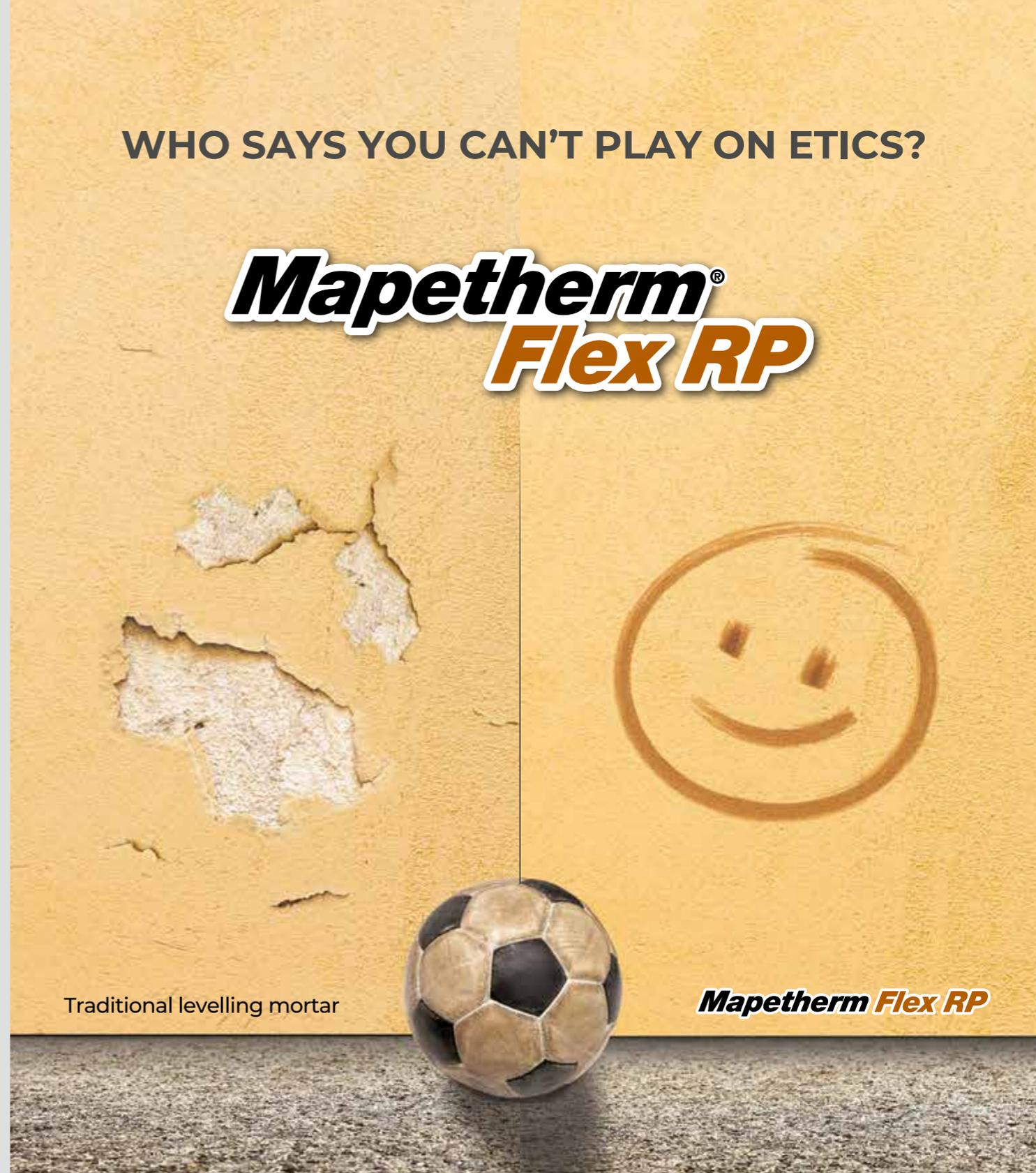
Two-component, rapid-drying elastic cementitious mortar **MAPELASTIC TURBO** can be applied on different types of materials, including at low temperatures. It used for waterproofing swimming pools, terraces, balconies and flat roofs. With its accessories, it makes up a complete system, the only one in the market that allows to complete waterproofing work in a very short time. Once dry, it features perfect adhesion and stable elasticity and might be tiled over in a short time. It is CE marked according to EN 14891 and EN 1504-2 standards and is certified EC1 Plus (very low emission of volatile organic compounds) by GEV.

FOR RAPID WATERPROOFING



WHO SAYS YOU CAN'T PLAY ON ETICS?

# Mapetherm® Flex RP



Traditional levelling mortar

Mapetherm Flex RP

**Mapetherm Flex RP** is a **ready-mixed, cement-free, mould and algae resistant skim coat**. It features **high impact resistance** and can also be used for **repairing deteriorated thermal insulation systems**.

EVERYTHING'S **OK** WITH **MAPEI**



FOR A HOME THAT IS ALWAYS COMFORTABLE,  
ONLY THE BEST THERMAL INSULATION WILL DO.



Everybody would like to improve the energy efficiency of their home or a building, but it is important to find the correct, eco-sustainable products to guarantee long-lasting protection. **Mapetherm system** is the best choice to create a sense of wellbeing while saving on energy, making the spaces cool in summer and warm in winter.

EVERYTHING'S **OK** WITH **MAPEI**

Learn more on [mapei.com](https://mapei.com)

 **MAPEI**  
ADHESIVES - SEALANTS - CHEMICAL PRODUCTS FOR BUILDING

