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ADRIANA SPAZZOLI.
Realtà Mapei International's Editor-in-Chief.

Sustainability Report 2016

As part of a communications policy based around increasing openness and transparency towards its stakeholders, Mapei SpA, the Group's mother company, is now, unsurprisingly, publishing its first Sustainability Report. This important paper is designed to provide an overview of the aims and targets associated with Mapei's business operations down the years: to improve people's quality of life and protect the environment by researching into and developing increasingly sustainable products.

I firmly believe we should promote Business Sustainability in Italy and abroad, as profit-making is not the only purpose of a company. A company has a clear purpose in society. Ethical, scientific, humane and cultural duties lie at the very foundations of a business's true character and reputation.

That is why all businesses must interact with their surroundings, environment and workers: the stakeholders. A sustainability report encompasses all their requirements and assesses the impact they cause, whether it be positive or negative.

In the introductory letter in which Giorgio Squinzi, the Group's President, presents the Sustainability Report, it states that "tradition, experience and the desire to excel have allowed Mapei to become one of the leading companies in the manufacture of chemical products for the building industry. We are always looking to the future, thinking about what more we can do for our customers, our people and, more generally speaking, the community".

At the end of 2016 the Mapei Group's continual growth - 81 subsidiaries in 53 different countries; 71 manufacturing plants in 33 countries across five continents; 28 Research & Development centres; 1.4 billion Euros invested in manufacturing facilities from 1937 to 2016; 8,493 employees for a consolidated turnover of 2.3 billion Euros on 31st December 2016 - was the result of a success story built around internationalisation, specialisation in the building industry and Research & Development.

Operating in the chemical products industry, over the years Mapei has devised and manufactured a vast array of winning recipes for its products and so it has decided to focus this first Sustainability Report on the recipe that has allowed it to grow sustainably over time and maintain its leadership in the industry. This recipe is made out of a combination of ingredients that are all cleverly dosed and balanced:

- research and innovation working alongside the customer to come up with efficient and sustainable solutions;
- an efficient manufacturing system respecting the territory and environment;
- constant investment in people so as to grow together;
- tradition and excellence at the community's service.

The 2016 Sustainability Report is confined solely to the Group's mother company, Mapei SpA, although the introductory chapter also provides facts and figures about the Mapei Group in its entirety.

The paper has been drawn up in accordance with GRI (Global Reporting Initiative) Sustainability Reporting Standards and focuses on the main environmental, social and economic factors characterising the company.

Reading this first Sustainability Report clearly highlights how genuine commitment to sustainability allows the Group to manage its business operations in a way that brings together its social, environmental and economic values in a carefully balanced and dynamic mix.

For Mapei sustainability means, first and foremost, supplying long-lasting, high-quality products while reducing impact on the health of people, applicators and end users, and all this would not be possible without lots of people's help.

As Giorgio Squinzi notes: "The team spirit running through our Group and the focus on individual talent and the ability to innovate and up-to-date are the real keys to the company's success".

But dedication and focusing on people are not confined to just our staff and business partners: Mapei has always been acutely aware of the importance of generating value across the territory and of being actively involved in the everyday life of the surrounding community, supporting people and activities through cultural-sports sponsorships and social aid.

Mapei's first Sustainability Report is the result of a strong desire to talk about all this, conveying the ethical-transparent approach and powerful sense of business responsibility that have always characterised Mapei.

COVER STORY
A detail of one of Olga Goulandris' works: seamless shapes and textures which interpret reality. The Italian Embassy in Greece welcomed her exhibition in Athens and Mapei Hellas SA supported the artist by supplying products to enhance her mosaics and spheres with new suggestions.

SUMMARY

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21ST JANUARY – LA SCALA OPERA HOUSE – MILAN

CONCERT BY CHICAGO SYMPHONY ORCHESTRA CONDUCTED BY RICCARDO MUTI

Mapei decided to begin its 80th anniversary celebrations by sponsoring the concert given by the Chicago Symphony Orchestra, conducted by the great Maestro Riccardo Muti, who was making his return to La Scala Opera House.

EIGHTY YEARS ON, MAPEI'S STORY CONTINUES

80 years 1937-2017

A YEAR'S CELEBRATIONS IN THE NAME OF CULTURE AND ART TO COMMEMORATE 80 UNFORGETTABLE YEARS OF HISTORY

2017 was a very eventful and successful year. It was bound to be, because it was the year for celebrating Mapei's 80th anniversary.
A long story of successes certainly worth remembering. 80 years of generating constant quality: for customers, clients, the environment and the company's own corporate culture.
In accordance with its tradition of combining work and art, most of the celebrating events held in 2017 took place in famous art locations.
It began with a triumphant concert given by the Chicago Symphony Orchestra at La Scala Opera House in Milan on 21st January - when the great conductor, Riccardo Muti, made his return to La Scala Opera House - and the celebrations then continued throughout the year before drawing to a close in

14TH MARCH – LA SCALA OPERA HOUSE – MILAN

LA TRAVIATA

BY GIUSEPPE VERDI

The bonds between Mapei and La Scala Opera House are strong and deeply entrenched. This just had to be the location for further anniversary celebrations in the company of a group of guests invited to attend a prestigious opera like *La Traviata*.

10TH FEBRUARY – SANTA CECILIA HALL, PARCO DELLA MUSICA AUDITORIUM – ROME

CONCERT BY THE ACCADEMIA NAZIONALE DI SANTA CECILIA CONDUCTED BY DANIELE GATTI

Mapei's 80th anniversary celebrations continued in the striking setting of Santa Cecilia Hall at the Parco della Musica Auditorium with a concert given by the Accademia Nazionale Santa Cecilia Orchestra and Choir conducted by the Maestro Daniele Gatti.

Poland on 21st December.

The events organised in Italy and numerous countries around the world (involving leading figures from the realms of economics and industry, journalism, art, science and culture, as well as representatives from the world of charities and associations), saw the whole of Mapei gather around the Squinzi family.

80 years' experience at its customers' service. This neatly sums up all the celebrations focusing around a wonderful team always ready to take on the challenge of constantly being at the global cutting-edge in quality building to reinforce its leadership.

The slogan accompanying this year's celebrations was "The future begins today". A clear statement that also suggests a new beginning giving real meaning to the ideas shared by a formidable Group destined to keep on growing for many years to come.

Ideas that also emerge in the Mapei company video for Mapei's 80th anniversary celebrations, which recently won the prestigious 49th Key Award in the "Corporate Movies" section.

20TH MAY – SANTA CECILIA HALL, PARCO DELLA MUSICA AUDITORIUM – ROME

CONCERT BY THE ACCADEMIA NAZIONALE DI SANTA CECILIA CONDUCTED BY ANTONIO PAPPANO

13TH JUNE 2017 – LA SCALA OPERA HOUSE – MILAN

LA BOHÈME

BY GIACOMO PUCCINI

8TH JULY 2017 – GREEK THEATRE IN TAORMINA

CONCERT BY TEATRO MASSIMO ORCHESTRA AND CHOIR CONDUCTED BY ZUBIN MEHTA

Taormina's enchanting Greek Theatre hosted Mapei guests at a concert given by Teatro Massimo's Orchestra and Choir from Palermo, conducted by the great Maestro Zubin Mehta, who conducted Beethoven's *Ninth Symphony*.

A GREAT LOVE FOR CULTURE

80 years' experience as a leading player in the building industry with boundless love for culture in all its different forms, real commitment to promoting culture, and a genuine desire to associate Mapei's name with projects in the arts in Italy and around the world, have always been part of the Group's DNA.

Culture and a love of Milan, the city where the company was first founded way back in 1937, are the main reason why most of the celebrations were held at La Scala Opera House in Milan.

Mapei signed its first Corporate Subscription back in 1984 and it went on to become passionately involved in the renovation of the theatre. The artistic partnership between Milan and La Scala Opera House was truly cemented in 2008, when it became a "Founding Member", and the relationship became even closer in 2016 when Giorgio Squinzi joined the Board of Directors.

Mapei is also a Founding Member of the Accademia Nazionale Santa Cecilia and so two wonderful concerts were held at its home – Parco della Musica Auditorium in Rome - to celebrate the anniversary with friends of the company mainly coming from Central Italy. One of the oldest and best-preserved monument in the whole of Sicily was chosen to host the celebrations for Mapei's friends in the

25TH, 26TH AND 27TH AUGUST
21ST "CITTÀ DI MARTINA FRANCA" CABARET FESTIVAL

In the beautiful location of Atrio Ateneo Bruni in Martina Franca (Southern Italy), lots of Mapei guests enjoyed three amusing cabaret evenings.

27TH OCTOBER 2017 – LA SCALA OPERA HOUSE – MILAN

NABUCCO BY GIUSEPPE VERDI

South of Italy. On Saturday, 8th July, a Mapei Grand Gala was held at Taormina's Greek Theatre, a magnificent construction with 24 centuries of history that hosted a quite breath-taking concert given by the Orchestra and Choir of Teatro Massimo from Palermo, conducted by the great Maestro, Zubin Mehta, who conducted a performance of Beethoven's *Ninth Symphony* especially for the occasion, including a rendition of the heartrending *Ode to Joy*.

The entire year was characterised by a series of highly emotional and intensive events in the name of entertainment and socialising, including special celebrating events organised by the Group's subsidiaries in their countries for their clients and partners, as you can read in two articles in this issue of the magazine devoted to Mapei Hellas SA in Greece and ZAO Mapei in Russia. All this was aimed at strengthening the team spirit, which is one of the secrets behind Mapei's success all over the world.

Because, as Giorgio Squinzi, the President of the Mapei Group, pointed out, "Our success, both today and in the future, can be put down to our far-sighted policies and operations implemented by a wonderful team of staff, partners, suppliers and friends, who are the irreplaceable driving force behind our development and innovation."

ONLY THE BEST ON DISPLAY

MAPEI'S GREEK SUBSIDIARY CELEBRATED THE GROUP'S 80TH ANNIVERSARY WITH A SPECIAL EVENT AND EXHIBITION OF MODERN MOSAIC WORKS

Mapei has been operating in Greece for many years now: Mapei Hellas SA, the Group's Greek subsidiary distributing building products on the Greek and Cypriot markets, was set up in Athens in 2001.

Mapei also opened a manufacturing plant in Ritsona in central Greece in 2010 to become more competitive locally and improve services for Greek and Cypriot customers. Production was initially confined to cementitious powder adhesives for ceramics and stone material, but in 2015 it was extended by introducing a range of admixtures for concrete. Mapei solutions for ceramics and stone material, products for the building industry, thermal insulation, waterproofing and structural strengthening, and wall coatings are now manufactured at the production plant in Ritsona, where the Mapei Hellas SA headquarters and warehouse are also located.

From when it was first set up to the present day, and even during the economic recession that hit Greece so hard, Mapei Hellas SA has kept on growing unlike so many other Greek businesses. There is expected to be a particularly large increase in turnover in 2017: +30% compared to the previous year for a total of 14 million Euros. The subsidiary is planning further investments in logistics and other measures designed to boost production and to support this positive trend.

Constant attention to human resources has definitely been a key factor in this startl-ing growth: Mapei Hellas SA currently employs 51 staff and is continuing to invest in training to improve staff performance and, hence, customer services.

Technical assistance is the field in which the Greek subsidiary stands out most on the local market compared to its competitors, providing a superior service to both end users of its products and distributors. Mapei Hellas SA's team of expert technicians provides constant support for its business partners, both by organising training programs and seminars for professionals in the industry and by taking part in conferences held by research centres and institutes.

Over the years this has resulted in the Group's Greek subsidiary becoming increasingly involved in major building projects, such as those to construct or renovate prestigious Greek and Cypriot buildings, including facilities for hosting the Athens Olympics, Athens Metro, the Acropolis Museum in Athens, the Larnaca International Airport in Cyprus and many others.

AN EVENING AT THE EMBASSY: ART AND VIPS

Mapei's 80th anniversary was also celebrated in grand style in Greece. Mapei Hellas SA decided not only to organise an entire day's celebrations but also sponsor a special exhibition that lasted almost 2 weeks from 21st June to 2nd July. We are referring to the "PRINCIPIVM" mosaic installation held at the Italian Embassy in Athens.

Mapei is widely known and respected for its attention to art. Based on its founder Rodolfo Squinzi's belief that "Work can never be separated from art and passion", the Group is constantly committed to supporting events, people and locations in the world of art: from its long-term backing for the La Scala Opera House in Milan, the National Trust for Italy (FAI) and Accademia Nazionale Santa Cecilia in Rome to its partnership in renovating such famous theatres and museums as the Solomon R. Guggenheim Museum in New York, Peggy Guggenheim Collection in Venice, and the aforementioned La Scala Opera House.

This faith in art and determination to keep on progressing to achieve better results was embraced by the Greek artist Olga Goulandris, who also admires the company's remarkable technical expertise and constant investment in research. Mapei Hellas SA's backing for this exhibition is also part of the subsidiary's ongoing commitment to support local cultural events and sports.

Olga's mosaic works displayed in the exhibition set out to explore the relations between different natural elements, making each work a seamless whole without compromising the individuality of its constitutive parts. The creative process she uses is called "intuitive mosaics": there is no specific underlying plan, just constant experimentation into textures, colours and materials.

The artist first came into contact with Mapei a few years ago in Venice, and it was after finding out about the company's various solutions that she created the works forming PRINCIPIVM. They are spheres covered with mosaics, whose irregular surfaces evoke the forms of the sea, motions of the sky, the effects of lights and fluttering landscapes. The mosaics were given a solid base thanks to Mapei products, in particular ADESILEX P22, ULTRAMASTIC III and ULTRATOP COLOR PASTE.

It took two days of hard work to install Olga's works in the Italian Embassy garden in Athens set around a prestigious neoclassical-style building. Built in 1870 right in front of the Royal Palace and designed by the German architect Ernst Ziller as the private home of the banker Stephen Psycha, the building has been home to members of the Greek Royal family since 1902, such as Prince Nikolaos, who subsequently allowed it to be used as the home of the Norwe-

IN THE FACING PAGE. The Mapei manufacturing plant in Ritsona is where the Mapei Hellas SA headquarters and warehouse are also located.
BELOW. The official opening of the PRINCIPIVM exhibition was held at the Italian Embassy in Greece on 21st June, when Mapei Hellas SA celebrated the Group's 80th anniversary.

gian and Italian Embassies. Owned by the Italian Government since 1955, the building also accommodates the Ambassador's residence and chancellery.

The opening ceremony of the PRINCIPIVM exhibition was held in this magnificent setting on 21st June. It was a chance for Mapei Hellas SA to invite lots of special guests: customers, architects, engineers, representatives of building contractors, leading figures from the local economy and industry, and plenty of journalists and VIPs from the Greek cultural-artistic scene. The number of important guests in attendance is further proof of the close ties between Mapei Hellas SA and the Greek industrial community of which it is an active member and supporter.

The event was also attended by His Excellency Efisio Luigi Marras, the Italian Ambassador in Athens, Veronica Squinzi, the Mapei Group's Global Development Director, Flavio Terruzzi, Mapei Director for Europe and Africa, Fabio Fenech, Mapei Corporate Area Manager for Greece, and Laura Bosser, Mapei Corporate HR Manager, as well, of course, as the artist Olga Goulandris. Maurice Karam, the owner of CMC (Mapei distributor in Lebanon), and George Psimolophites for GEVO (Mapei distributor in Cyprus) also attended.

All the guests were welcomed by Dr. Spyros Papagiannakis, the General Manager of Mapei Hellas SA, and were served a welcome cocktail.

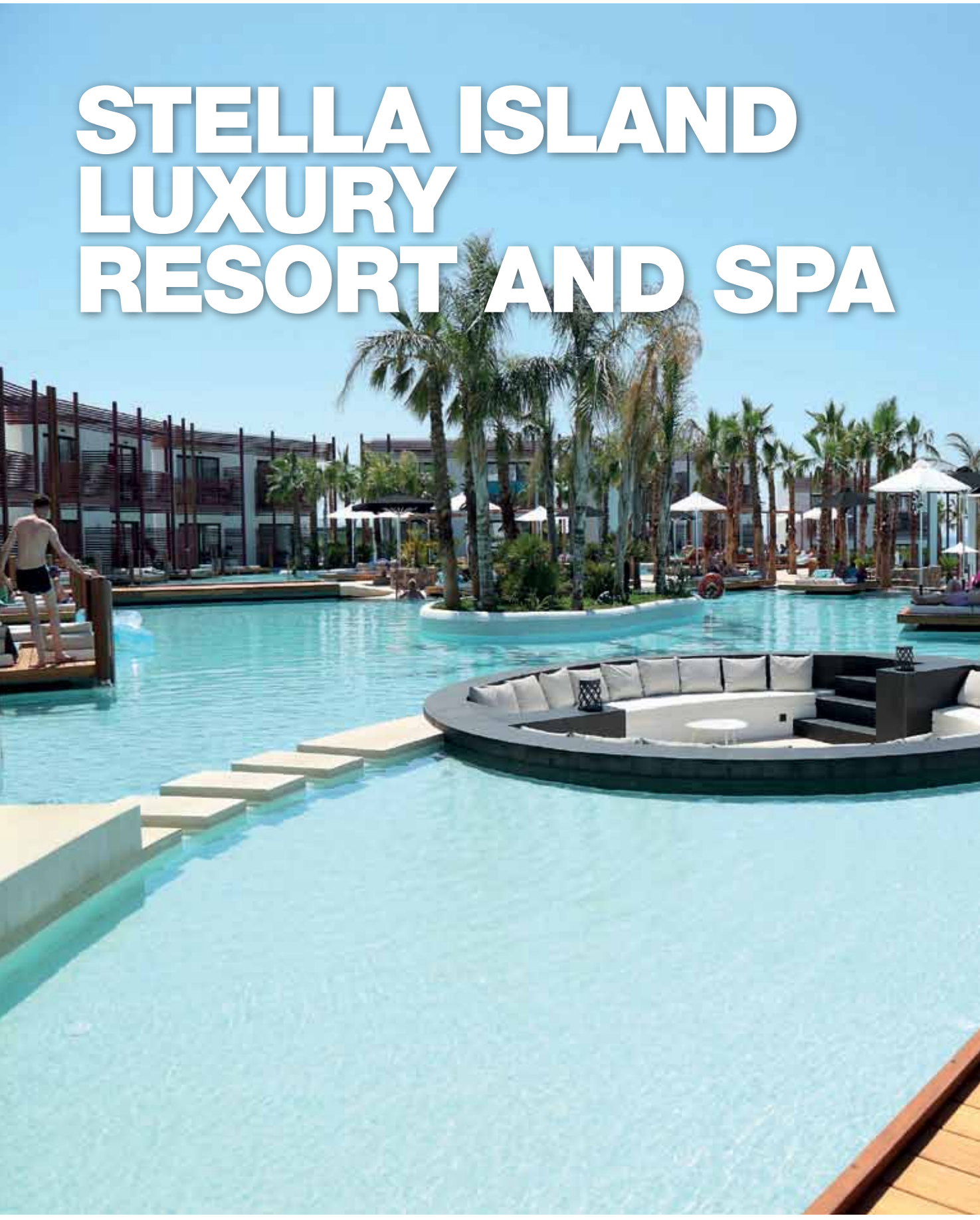
Guests got the chance to visit the interior of the Embassy building before stepping out into the garden, where they were

IN THIS PAGE. The exhibition features mosaic works by the artist Olga Goulandris created using ADESILEX P22, ULTRAMASTIC III and ULTRATOP COLOR PASTE.

PHOTO 1, FROM THE LEFT. The event was also attended by Flavio Terruzzi, Mapei Director for Europe and Africa, Veronica Squinzi, Global Development Director of the Mapei Group, Olga Goulandris, Spyros Papagiannakis, General Manager of Mapei Hellas, Laura Bosser, Corporate HR Manager, and Fabio Fenech, Mapei Corporate Area Manager for Greece.
PHOTO 2. Maurice Karam, the owner of CMC (Mapei distributor in Lebanon), attending the event.
PHOTOS 3, 4, 5 and 6. During the course of the evening Spyros Papagiannakis, Veronica Squinzi, Olga Goulandris, and the Italian Ambassador officially greeted and thanked the guests in attendance.

able to "experiment with" the artworks as an integral part of their surroundings, to the accompaniment of background music specially composed for the exhibition.
This was the setting in which the official speeches were given: Dr. Spyros Papagiannakis thanked Olga Goulandris and the Italian Ambassador for their involvement and support and emphasized the significance of choosing to host the event on Midsummer's Day, when light overcomes darkness, which is the same message of hope for the future of Greece and Mapei Hellas SA that the Greek subsidiary is trying to convey.
The Italian Ambassador emphasised the importance of art and culture even in tricky economic times and underlined the excellent relations between Italy and Greece, mentioning Mapei as a company Italy should be proud of. Olga Goulandris thanked Mapei for supporting her art and exhibition and outlined the sources of inspiration behind the works on display. Veronica Squinzi also mentioned how long Mapei has been operating in Greece, noting that the Group plans to keep on helping its subsidiary grow in this country.
A second event organised by Mapei Hellas SA was held at the Italian Embassy the following evening. This was a less formal occasion during which the Ambassador, artist and General Manager of Mapei Hellas SA hosted various representatives from the Athens cultural scene and some Mapei customers.
Plenty of attention was focused on the gala evenings and exhibition in various local means of communication: newspapers, magazines, TV programmes, websites etc. The overall event and PRINCIPIVM exhibition were rewarded in this year's "Mapei References Grand Prix", an annual competition Mapei reserves for the most important building projects involving its products.

STELLA ISLAND LUXURY RESORT AND SPA



A NEW RESORT SET IN A MAGICAL ATMOSPHERE OFFERING ALL THE LATEST COMFORTS

The island of Crete is the biggest of all of Greece's islands. Crete's tourist industry has really boomed over the last twenty years as it has modernised its existing facilities and built new hotels.

Stella is a 5 star hotel chain in Crete which offers high quality services and accommodation. During 2017 a new wing was added to the already existing Stella Palace Resort and Stella Village hotels: its name is Stella Island Luxury Resort and Spa.

The main architectural concept behind its design is that every single room has either direct access to or oversees the big swimming pool-lagoon like complex, which works as an axle with all buildings "dancing" around it.

There are five different types of rooms to choose from. The Island Villas are an independent accommodation facility and each Villa has its own pool. The Over Water Bungalows along with the Luxury Swim rooms are located on the water allowing guests to dive into the pool directly from their veranda.

The Premium Pool View and Luxury Double View rooms are located on the upper floor of the complex offering magnificent view of the surroundings and of the pool complex itself.

The hotel offers a full pack of services like spa for relaxation and all kinds of watersports, as well as an International Cuisine Restaurant which is located on a wooden external deck overlooking the pool.

HIGH QUALITY INSTALLATION

The hotel ownership chose Mapei products for several applications during construction works.

All Bungalows and Premium Rooms sport wooden floorings installed using ULTRABOND P990 1K one-component, solvent free, ready-to-use, elastic polyurethane adhesive with an extremely low emission level of volatile organic compounds (VOC). This is a moisture curing, ready-to-use product, ideal for bonding all sizes and formats of jointed, pre-finished solid wooden coverings with a ply backing.

Before applying the wooden covering the substrate was prepared with the self-levelling compound ULTRAPLAN ECO 20, which is distributed on the Greek market by Mapei Hellas SA,

PHOTO 1. The Over Water Bungalows along with the Luxury Swim rooms are located on the water, allowing guests to dive into the pool directly from their veranda.
PHOTO 2. In all Bungalows and Premium Rooms floor substrates were levelled with ULTRAPLAN ECO 20.
PHOTO 3. ULTRABOND P990 1K was used to bond parquet in all Bungalows and Premium rooms.

IN THE SPOTLIGHT

KERAFLEX MAXI S1
It is a deformable (S1), improved (2), slip-resistant (T) cementitious adhesive, (C) with extended open time (E), classified as C2TE S1 according to EN 12004.
It is used for interior and exterior bonding, up to 15 mm thick, of ceramic tiles of every type and size on uneven substrates and renders; for interior and exterior bonding of stone materials; for spot bonding of insulating material in interiors.

the Greek subsidiary of the Mapei Group.
Glass mosaic was installed in the pools with KERAFLEX MAXI S1, deformable cementitious adhesive with extended open time and no vertical slip. The product, which features Low Dust technology and very low emission of VOC, is suitable for bonding ceramic tiles, mosaic and stone material and ideal for the installation of large-size porcelain tiles and natural stone.

The same product was used to install porcelain tiles in the Luxurious Rooms. Joints of both coverings were grouted with KERAPOXY CQ, two-component epoxy grout with BioBlock® technology. The product has a bacteriostatic agent, preventing the proliferation of bacteria and the formation of mould on the surfaces of grouts.
The hotel was designed by Stavros Peppas, a Greek architect specialized in hotels who designed some of the most luxurious hotels in Greece. The guests of Stella Island Luxury Suite spa can now enjoy a comfortable and memorable experience in this chic and stylish resort.

TECHNICAL DATA
Stella Island Luxury Resort & Spa, Chersonisos, Crete (Greece)
Period of construction: 2016-2017
Designer: Stavros Peppas
Client: Tzirakis
Main contractor: Makriyiannakis Manolis
Period of the Mapei intervention: October 2016 - April 2017
Intervention by Mapei: supplying products for preparing substrates, installing porcelain tiles, glass mosaic and wooden floorings
Mapei distributor: Platakis

MAPEI PRODUCTS
Preparing substrates: Ultraplan Eco 20
Installing wooden floorings: Ultrabond P990 1K
Installing porcelain tiles and glass mosaics: Keraflex Maxi S1
Grouting tile and mosaic joints: Kerapoxy CQ

For further information on these products see www.mapei.gr and www.mapei.com

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CRETAMEL

PERFECTLY INSULATED WALLS FOR THE LARGEST HONEY PRODUCER IN CRETE

The Greek island Crete, apart from being a worldwide famous tourist destination, is also well known for its gastronomic specialties such as wines, cheese and above all, the Cretan honey. Because of the big number of unique Cretan herbs and plants, the honey produced in the island has a very special flavor and is sought out from many connoisseurs all around the world.
Cretamel S.A. is the biggest enterprise in the field of honey products in Crete and was founded back in 1996 by a family which is carrying on a long-time tradition in the field of honey production. Their aim is to combine modern technology with their knowledge on the subject in order to produce the finest quality honey products. As their Cretan honey conquered the markets of Greece and Europe, new product lines were created over the years like those including sesame-honey bars, nut bars and nougats.
In 2015 the company management decided to build a new manufacturing unit in order to increase their production and warehouse capacity. The project was completed in January 2017 providing a modernized, cutting-edge facility. It consists of three levels, each one covering 2,900 m^2 floor surface. The basement is used as a warehouse whereas the ground level and the first floor house the production facilities and the offices of the firm.

MAPEI SOLUTIONS FOR THERMAL INSULATION

Mapei contributed to the project in two distinct phases: the application of a thermal insulation system on the outside façades and the installation of ceramic tiles in the interiors.
The owner of the company wanted an energy efficient building, therefore the use of a thermal insulation system in combination with other means (such as solar panels and geothermic tools) was one of his top priorities. The MAPETHERM EPS SYSTEM supplied by Mapei Hellas SA, the Greek subsidiary of the Group, was finally selected among other solutions due to the reliable support by Mapei Technical Services and the fine reputation enjoyed by Mapei products such as MAPETHERM AR1 adhesive and QUARZOLITE TONACHINO coating. Indeed, the excellent properties of both products had already been well appreciated on the Greek market due to their use on several projects both in Greece and in Crete. The MAPETHERM EPS

PHOTO 1. The Cretamel production unit in Heraklion, Crete.
PHOTO 2. The external walls were properly insulated with the MAPETHERM EPS system before being finished with QUARZOLITE TONACHINO.

PHOTOS 3 and 4. Ceramic tiles were installed in the interiors with KERAFLEX MAXI S1 and ADESILEX P9, while joints were grouted with KERAPOXY CQ.

SYSTEM turned out to be the best solution in terms of benefit-cost ratio.

The MAPETHERM EPS SYSTEM involved the use of MAPETHERM AR1 cementitious mortar for bonding the MAPETHERM EPS extruded sintered polystyrene insulating panels, as well as for smoothing the panels with embedded MAPETHERM NET alkali-resistant glass fibre mesh.

MAPETHERM FIX polypropylene fasteners were used to complete the application of the system. The insulated walls were then coated with QUARZOLITE TONACHINO high-protection, thick-layered acrylic coating product with high filling properties.

Ceramic tiles were installed on walls and floors in all the interiors devoted to production using KERAFLEX MAXI S1 deformable, cementitious adhesive with no vertical slip, extended open time, excellent workability and Low Dust technology. Tile joints were grouted with KERAPOXY CQ two-component epoxy grout, easy to apply, with excellent cleanability. Due to its bacteriostatic agent and BioBlock® technology, the product offers the highest degree of hygiene protection, which is especially relevant in food production units. In all the office areas floors were covered with porcelain tiles bonded with ADESILEX P9 cementitious adhesive with no vertical slip and extended open time. Joints were again grouted with KERAPOXY CQ.

Thanks to the use of the Mapei solutions a safe, durable and hygienic environment is now available for the production of the famous Cretan honey.

IN THE SPOTLIGHT

MAPETHERM AR1

It is a grey powder consisting of cement, selected fine grained sands, synthetic resins and additives. It is used for bonding all types of thermal insulation panels on renders, brickwork or concrete walls or ceilings, as well as for smoothing thermal insulation panels with embedded fibreglass reinforcing mesh on internal and external walls. Mixed with water, MAPETHERM AR1 becomes a mortar with the following characteristics: low viscosity, therefore easy to trowel; highly thixotropic; bonding perfectly to all types of insulating panels and to all materials normally used in the building industry; hardening without noticeable shrinkage.

TECHNICAL DATA
Cretamel production unit, Heraklion, Crete (Greece)
Period of construction: 2014-2016
Year of the Mapei intervention: 2014-2016
Intervention by Mapei: supplying products for insulating external walls and installing ceramic tiles in interiors
Client: Rasoulis Ioannis, Cretamel S.A.
Main contractor: Cretamel Technical Department
Installation company: Marios Viniaski
Mapei distributors: Afoi Baxevani

Mapei coordinators: Panagiotis Rerras and Gianni Koropoulis, Mapei Hellas SA (Greece)

MAPEI PRODUCTS
Insulating façades: Mapetherm AR1, Mapetherm EPS, Mapetherm Net, Mapetherm Fix
Finishing the façades: Quarzolite Tonachino
Installing ceramic tiles: Keraflex Maxi S1, Adesilex P9
Grouting joints: Kerapoxy CQ.

For further information on products see www.mapei.com and www.mapei.gr

3 ANNIVERSARIES IN ONE

ON THE SAME DAY MAPEI CELEBRATED 80 YEARS IN BUSINESS, 20 YEARS IN RUSSIA AND 10 YEARS' OPERATING AT THE STUPINO PLANT

2017 is a special year for ZAO Mapei, the Group's Russian subsidiary. It is celebrating three important anniversaries this year: the 80th anniversary of the founding of the mother company, Mapei SpA, the 20th year that Mapei has been operating in Russia, and the 10th anniversary of the manufacturing plant in Stupino, which is located approximately hundred kilometres south of Moscow.

The Group has been marketing its building products in Russia since 1997, first through Mapei OOO, a limited company with offices in Moscow, and then from 2004 through ZAO Mapei, a corporation that opened its own head office in a prestigious neighbourhood of the nation's capital in 2007.

In 2002 manufacturing also began in a small production unit in Juzhny Port in the nation's capital, but it was only in 2007 that a Mapei manufacturing plant opened in Stupino to supply the entire Moscow region. In July 2013 a second ZAO Mapei plant was officially opened in Aramil in the Yekaterinburg region of the Urals. Thanks partly to the Russian railway system and its closeness to the eastern borders, this manufacturing plant distributes the company's products to the eastern part of the country, Siberia and even the Kazakh market.

On 4th July 2016, ZAO Mapei purchased a plant in Kikerino, 80 km to the south of Saint Petersburg. This acquisition was aimed at allowing Mapei to cover the vast north-west regions more effectively, while also providing access to the Arctic, an extremely interesting geographical location, particularly following the discovery of vast supplies of natural gas, which requires sophisticated building technology due to the extreme weather conditions.

After the facility was purchased, it was completely modernised under the direct supervision of the Group's Engineering Central Services department. The works, which will be completed in winter 2018, are aimed at modernising the existing facility, extending the storage facilities, and incorporating new production lines.

ZAO Mapei's three manufacturing plants have a yearly output of 140,000 tons of products: they include Mapei coatings (which were used in the huge residential complex Living Art in

WITH THREE MANUFACTURING PLANTS IN KEY LOCATIONS FOR THE RUSSIAN ECONOMY, MAPEI IS STRATEGICALLY CLOSE TO CUSTOMERS IN BOTH RUSSIA AND NEIGHBOURING COUNTRIES

IN THIS PAGE.
ZAO Mapei manufacturing plants in Stupino (above), Aramil (right) and Kikerino (below).

Moscow, as mentioned in *Realtà Mapei International* no.47), products for installing ceramics and natural stone, thermal insulation products, mortars for repairing concrete, levelling and waterproofing products, and other building materials.

In addition to its headquarters in Moscow, ZAO Mapei also operates in Saint Petersburg through a business facility that has achieved notable results down the years both in terms of turn-over and the prestigious projects it has been involved in. It is also worth mentioning the "Venice of Russia's" real vocation for repairing and renovating buildings which well suits Mapei's experience and special products.

Mapei's expansion into Russia also involved the creation of a distribution network covering all the territories of the Russian Federation from Kaliningrad on the Baltic Sea to Khabarovsk in the far east. ZAO Mapei's sales team has grown over the years and has, for some time now, been operating in key cities like Saint Petersburg, Nizhny Novgorod, Kazan, Yekaterinburg, Tyumen, Ufa, Tolyatti, Samara, Rostov-on-Don, Krasnodar, Novosibirsk and also Sochi, where the 2014 Winter Olympics were held.

All this is designed to meet the needs of a market with outstanding potential that has allowed ZAO Mapei, which now employs 200 staff, to grow unceasingly from when it was originally founded right through to the present day.

ZAO Mapei operates on the top end of the Russian market for chemical products for building, as demonstrated by KERACOLOR FF being awarded the "Innovation of 2017" Prize by INFOline for standing out among building products on the Russian market for its innovative approach, visual impact, packaging, competitivity and marketing value.

Thanks to the high quality of its materials, ZAO Mapei has also helped in the construction of important works right across Russia, notably including Sheremetyevo International Airport (Terminal D) in Moscow (see *Realtà Mapei International* no. 40), the system of tunnels serving the new Moscow-Sochi motorway (*Realtà Mapei International* no. 51), the footbridge across the River Ural in Orenburg (acting as a link between Europe and Asia), the Millennium Park residential complex in Moscow (*Realtà Mapei International* no. 48), various shopping malls, sports facilities for the 2014 Winter Olympics in Sochi (*Realtà Mapei International* no. 47) and the 2015 World Aquatic Championships in Kazan (*Realtà Mapei International* no. 55), the renovation of the television tower in Ostankino, and the Cathedral of Christ the Saviour and part of the Kremlin walls in Moscow (*Realtà Mapei International* no. 12).

ZAO Mapei mainly exports to countries from the former Soviet Union, such as Azerbaijan, Kazakhstan - where a branch office providing customer service has been operating for years - Armenia, Belarus, Turkmenistan, Kyrgyzstan, Uzbekistan and, recently, Mongolia.

MAPEI IN RUSSIA: A POWERFUL COMBINATION OF ATTENTION TO HUMAN RESOURCES, RESEARCH, INNOVATION, AND TECHNICAL EXPERTISE

20 years in Russia 1997-2017
10 years in Stupino 2007-2017
80 years in the world 1937-2017

TRIPLE CELEBRATIONS

ZAO Mapei decided to devote a special day's celebrations for three separate anniversaries: an event involving a press conference and a banquet with a "mystery" program was held at its manufacturing plant on 14th September. Representatives of building companies, distributors, designers, architects, engineers, VIPs from the Russian industry and economy, journalists and members of ZAO Mapei staff all congregated in the plant area in the morning. Here, as well as enjoying various refreshments, they were entertained by the music of a string quartet, jugglers and actors performing shows with chemistry experiments.

They were welcomed by various executives of ZAO Mapei and the mother company, such as Veronica Squinzi and Marco Squinzi, respectively the Mapei Group's Global Development Director and Research & Development Director, Luciano Longhetti, General Manager of ZAO Mapei and also the Group's Strategic Planning Manager, Luca Damia, Mapei's Corporate Area Manager for Russia, Valentina Rosi, Deputy General Manager of ZAO Mapei, and Yuri Martirosov, Deputy General Manager for Sales of the Russian subsidiary.

The official welcome was followed by a press conference to which a number of representatives of the Italian and Russian media were invited, along with journalists from specialist magazines and local TV channels. Speeches were given by Marco Squinzi and Veronica Squinzi, Nikola Jovanovic, First Secretary of the Italian Embassy's Economic and Commercial Office in Russia, Luciano Longhetti and Pavel Ivanovich Chelpan, the Mayor of Stupino.

Marco Squinzi described Mapei as one of the main foreign investors in the Russian building industry with excellent prospects for future growth. Veronica Squinzi pointed out that Mapei's booming business in this country is supported by a winning mix of innovation, high-quality products and excellent technical assistance services. All this has also allowed Mapei to help restore and conserve Russia's cultural and artistic heritage.

Pavel Ivanovich Chelpan pointed out that the Stupino district, which used to be the centre of the manufacturing industry for plane and ship engines back in the days of the Soviet Union employing staff with notable technical expertise, is now a "gateway to Italy", considering the significant number of Italian businesses that have decided to open manufacturing plants over the last few years. He also noted that Mapei deserves special credit for standing out in Russia not just for its business operations, but also the for friendly relations it has developed with its partners and for various charity enterprises it has undertaken, like, for example, helping with the construction of an Orthodox Church in Stupino.

ABOVE. Marco Squinzi, Veronica Squinzi, Nikola Jovanovic (First Secretary of the Italian Embassy's Economic and Commercial Office in Russia), Luciano Longhetti, and Yuri Martirosov, all spoke at the special press conference.
LEFT. The logos ZAO Mapei used to celebrate the three important anniversaries of 2017.
BELOW. Pavel Chelpan, the Mayor of Stupino, with Marco and Veronica Squinzi.
BOTTOM OF THE PAGE. Marco and Veronica Squinzi with Valentina Rosi in the background.

IN THESE PAGES. The day's events culminated in a banquet during which guests were entertained by music, games, speeches and much more.

Luciano Longhetti emphasised that Mapei's success is mainly due to its ongoing business partnerships, which, in turn, owe much to the high quality of its products and services, as well as the day-to-day efforts of both its staff and business partners.

But the real party began afterwards. Everybody in attendance watched the video that the Mapei Group shot to celebrate its 80th anniversary, illustrating the Group's long history and its worldwide importance. ZAO Mapei's executive management team then took the stage to officially thank all the guests for attending and showed them a video about Mapei's progress on the Russian market.

The video also included a presentation of the manufacturing plant in Kikerino and the Training Centre that will be opened at the Stupino plant by summer 2018. The centre is designed for customers and partners interested in learning more about the properties and applications of Mapei products.

The guests, divided into groups, then got the chance to visit the plant accompanied by members of staff, who illustrated the processes and technology involved in manufacturing Mapei materials.

These visits were followed by a banquet that was the day's real highlight. As well as tasting some delicious dishes, guests took part in a science fiction-style performance. They were told that a document written by Mikhail Lomonosov, one of the greatest Russian scientists of the 18th century, had recently been discovered in the Russian government archives. In this document Lomonosov claims he has learnt a secret from Leonardo da Vinci: in the 21st century Italian and Russian scientists will jointly discover the "formula of success" in the town of Stupino. And on the evening of 14th September, Leonardo da Vinci and Lomonosov appeared to ZAO Mapei guests, who got to witness this important scientific discovery: the secret of success turned out to be that powerful combination of attention to human resources, research, innovation, technical expertise and internationalisation that has enabled Mapei to keep on growing all over the world and in Russia.

DENKMAL: RESTORATION GOES ON SHOW IN MOSCOW

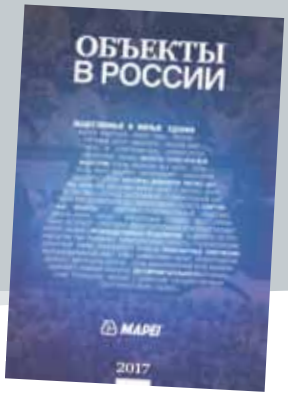
DENKMAL, a trade fair dedicated to the world of restoration, a sector that is arousing more and more interest in the Russian Federation, was held in Moscow from the 8th to the 10th of November. Numerous producers of building materials, specialised restoration companies and specifiers, as well as local restorers, took part in the event. This was the fourth edition of the trade fair and the first one which, thanks also to the support of ICE (Italian Trade Agency), included Mapei with its own stand in a strategic position within the Assorestauro (Italian Association for Architecture, Art and Urban Restoration) collective.

On this occasion, ZAO Mapei, the Russian subsidiary of the Group, had the chance to make numerous contacts with professionals from the sector and show their own range of solutions and technologies for restoration work. And to help encourage interest, the Russian subsidiary also produced a dedicated catalogue of Mapei products for this particular sector.

A convention was also held inside the trade fair which had been organised by Assorestauro in collaboration with ICE, during which presentations were made by representatives of all the Italian companies from within the collective. The aim of the convention was to present the Italian approach to renovation and conservative restoration.

During the convention Davide Bandera, Product Manager for Mapei's line of restoration systems for historical buildings, presented a paper on Mapei's dedicated technologies for this sector.

In other conventions Assorestauro also presented other restoration projects carried out in Cuba and Moscow to the public visiting the trade fair, projects for which Mapei has supplied, and is still supplying, its own innovative solutions.



INNOPOLIS UNIVERSITY AND SPORTS COMPLEX

MAPEI SOLUTIONS IN THE RUSSIAN HUB FOR HIGH-TECH INDUSTRIES

Mapei mortars, such as MAPEFILL, MAPEGROUT 430 and MAPEGROUT THIXOTROPIC, were used to complete the campus of the Innopolis University in the Republic of Tatarstan.

Innopolis is a city of the Republic of Tatarstan, belonging to the Russian Federation. Its history begins on June 9th, 2012, when Dmitry Medvedev, the Chairman of the Government of the Russian Federation, together with Rustam Minnikhanov, the President of the Republic of Tatarstan, and Nikolay Nikiforov, Minister of Communications and Mass Media of the Russian Federation, laid a capsule with a message to future residents at the ground-breaking site of the construction. Three years later, on June 9th, 2015, Innopolis held its foundation ceremony.

The economy of the city is based on high-tech industries. The Innopolis Special Economic Zone (SEZ) was established on the territory of the city in order to bring to Innopolis the largest and promising technology companies from all over the world. Innopolis is an attractive place to live and work in comfortable conditions. By 2021, its population may reach 155,000 inhabitants, 60,000 of which will be engaged in Information Technology.

The city has now a unique, eco-friendly city environment with modern infrastructure and many opportunities for education and professional development.

One of the key elements of the city's development was the construction of the Innopolis University, an innovative institution that trains specialists in the IT field. The project of the University was developed jointly with the University of Carnegie Mellon (USA), which is one of the leading information technology schools.

Specializing in the field of modern information technologies, Innopolis University is not only one of Russia's youngest universities, but also the new city's intellectual center. The teaching staff includes leading Russian and foreign specialists in IT and science robotics. Driven by the demands of both business and industry, the educational programs are committed to producing a high-quality stream of professionals for companies located in Innopolis.

The Innopolis sports complex is also an important part of the

Mapei products for ceramic tile installation, such as ULTRACOLOR PLUS, were used both in the University campus and in the sport complex.

The pool substrates in the sports complex were waterproofed with MAPELASTIC before bonding the ceramic tiles with KERACRETE+KERACRETE POWDER.

city environment, promoting a healthy lifestyle among residents. The three-story building attracts visitors with its unique interior design and great vibes. Its total complex area is 9,000 m^2. It offers residents and city guests an universal sports hall for team sports, a 25 m swimming pool, a jacuzzi, a gym, saunas and hammams.

MAPEI SOLUTIONS FOR THE PROJECT

In the Innopolis University MAPEGROUT THIXOTROPIC fibre-reinforced, shrinkage-compensated mortar and MAPEGROUT 430 fine-grained, fibre-reinforced, normal-setting thixotropic mortar were used to smooth concrete surfaces, due to their high flexural and compressive strengths.

MAPEFILL, a high-flow non-shrinkage cementitious anchoring grout characterized by high adhesion to iron and concrete and excellent resistance to mechanical stress, was used for anchoring works in a shower cabin.

During the construction of the Innopolis sports complex, the above-mentioned products were also used for similar interventions.

Mapei solutions also played a key role in the construction of the swimming pool and the hot tub of the complex.

To provide the necessary waterproofing, MAPELASTIC was chosen. This is a two-component, flexible cementitious mortar for waterproofing balconies, terraces, bathrooms and swimming pools. The product ensures protection of renders or concrete surfaces with cracks caused by shrinkage, against penetration of water even under pressure up to 1.5 bar.

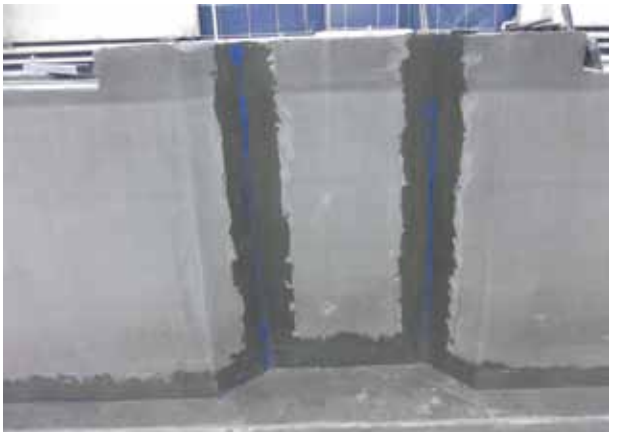
For elastic waterproofing of joints, MAPEBAND alkali-resistant rubber tape was used before covering the surfaces with ceramic tiles.

When installing the tiles, KERACRETE + KERACRETE POWDER two component adhesive system (the latter is distributed on the Russian market by ZAO Mapei) was applied, which is especially suitable for bonding tiles in swimming pools. The system is made up of a synthetic rubber latex mixed with sand and cement and has excellent mechanical strength, impact resistance, vibration resistance, resistance to temperature changes and ageing.

For grouting tile joints, ULTRACOLOR PLUS was used. This is a high-performance, anti-efflorescence, quick-setting and drying polymer-modified mortar with water-repellent DropEffect® and mould-resistant BioBlock® technology which guarantees an uniform color, blocks the formation of micro-organisms that cause mould damage and reduces the absorption of surface water.

All these solution helped to create comfortable areas for those living in and visiting one of the most innovative places on earth.

The surfaces of the hot tub in the sports complex were waterproofed with MAPELASTIC.



MAPEBAND alkali-resistant rubber tape was used in the pool for the elastic waterproofing of joints between walls and between walls and floors.

IN THE SPOTLIGHT

MAPELASTIC

It is a two-component cementitious mortar, ideal for the waterproofing and protection of concrete structures, renders and cementitious screeds. MAPELASTIC remains constantly flexible under all environmental conditions and resistant to the chemical attack of de-icing salts, sulphates, chlorides and carbon dioxide. It has excellent bonding properties to all concrete, masonry, ceramic and marble surfaces, as long as they are sound and sufficiently clean.

This property, together with its resistance to the deteriorating effect of UV rays, ensures that structures waterproofed with MAPELASTIC have a long service life.

It remains flexible at very low temperatures (-20°C) and protects the surface of concrete from CO_2 penetration for more than 50 years.

TECHNICAL DATA

University campus and sports complex, Innopolis, Republic of Tatarstan (Russian Federation)
Period of construction: 2013-2015
Year of intervention: 2014
Intervention by Mapei: supplying products for smoothing concrete, anchoring, waterproofing, and installing ceramics
Designer: Kazan Giproniiaviaprom
Client: Innopolis Main Investment and Construction Department
Contractor: Kamgesnergostroy
Mapei distributor: Avitrade, s.r.o
Mapei coordinators: Sergey Kuznetsov and Igor Kazakov, ZAO Mapei (Russian Federation)
Photos: Diana Grischenko

MAPEI PRODUCTS

Repairing concrete elements: Mapegrout Thixotropic, Mapefill, Mapegrout 430
Waterproofing pool substrates: Mapelastic, Mapeband
Installing ceramic tiles and grouting joints: Keracrete+ Keracrete Powder*, Ultracolor Plus.

*This product is distributed in Russia by ZAO Mapei.

For further information on products see www.mapei.ru and www.mapei.com


TOY

MAPEI FOR CHILDREN

ZAO MAPEI TOOK PART IN THE REPAIR OF SEVERAL CHILDREN'S SCHOOLS, SPORTS AND ENTERTAINMENT COMPLEXES IN RUSSIA.

"Children are always happy about being active. This is very useful, and therefore we should not hinder them." We could not agree more with this thought of Jan Amos Comenius (1592-1670), a famous Czech educator and humanist remebered mainly for his innovations in teaching methods. Children should stay healthy, live in a comfortable environment, where they can learn, play sports and grow up safely. ZAO Mapei, the Russian subsidiary of the Mapei Group, has also contributed to the creation of favorable conditions for the children's development, taking part in the construction and repair of children's institutions in many areas of Russia. Each of these facilities deserves special attention.

CENTRAL CHILDREN'S STORE ON LUBYANKA IN MOSCOW

The Desky Mir toy store, built in 1953-1957 in Moscow, became the largest children's store in the USSR and the first commercial building constructed according to international standards. In 2005, it reopened under the name of **Central Children's Store on Lubyanka** as the largest complex of children's stores in the world. From 2008 to 2015, the store was closed for renovation. Mapei's participation in this project consisted in supplying products for installing ceramic tiles and stone. Porcelain tiles were installed using ULTRALITE S2 one-component, lightweight cementitious adhesive and KERABOND+ISOLASTIC adhesive system. Granite slabs were installed with GRANIRAPID adhesive in areas with high traffic. To grout tile joints, ULTRACOLOR PLUS anti-efflorescence, quick-setting and drying polymer-modified mortar was chosen. Today the "Temple of Childhood", as it is sometimes called in Moscow, welcomes a large number of visitors, without having to be ashamed for its appearance and the quality of its flooring.

SCHOOL FACILITIES

When sending children to school, parents always want to be sure that their kids study in safe and comfortable rooms, fully compliant with the relevant building and health standards. A number of ZAO Mapei's projects dealt with the construction and repair of secondary and upper secondary schools.

One of these facilities is the **Moscow Secondary School** for 1100 pupils in the residential district of **Govorovo**, not far from Moscow. The total area of the building is over 29,000 m^2. Mapei's experts were involved to eliminate defects such as cavities and cracks in the concrete of structural columns and ceilings using MAPEGROUT FAST-SET R4, which is manufactured and distributed on

PHOTOS 1 and 2. The sports facilities at school no. 93 in Saint Petersburg were completed with Mapei products.
PHOTO 3. ZAO Mapei contributed the Gazprom for Children programme by supplying products to renovate about 20 sports field in several Russian cities.

the Russian market by ZAO Mapei, and MAPEGROUT 430 repair mortar.

One of the most exciting new Russian projects in the field of education is the **Letovo School**, near the village of Letovo, not far from Moscow. Its opening is scheduled for 2018. The school will open its doors to high school students, selected on a competitive basis from all over Russia. The total area of the facility is 45,000 m^2, including a school for 1100 pupils, dormitories for pupils and teachers, infrastructure and administration facilities, and engineering infrastructures. At this facility, ZAO Mapei contributed to eliminate the defects in concrete columns and ceilings by supplying MAPEGROUT 430 and MAPEGROUT FAST-SET R4 mortars.

The **Upper Secondary School No. 56 in Saint Petersburg** is the largest upper secondary school in the entire Northwest region. It comprises two elementary schools, middle and high schools (97 classes in total), a psychology and pedagogics medical and social center, a holiday village, etc.. During the 2014-2016 period, ZAO Mapei contributed to prepare substrates in the corridors and lay rubber floor coverings in the gym using products such as PRIMER G, ULTRAPLAN ECO 20 (manufactured and distributed on the Russian market by ZAO Mapei), and ADESILEX G19.

At the **Elite Private High School No. 2075 in Moscow** Mapei contributed to lay cementious floorings with ULTRATOP LOFT F and ULTRATOP LOFT W trowellable pastes.

SPORTS FACILITIES FOR CHILDREN

The benefits of sports for children's health cannot be overestimated. Last year, Mapei helped **School no. 93 in Saint Petersburg** in preparing the substrates in the gym and installing

PHOTOS 4 and 5. At H_2O acquatic centre in Rostov-on-Don Mapei supplied products for waterproofing substrates and installing ceramic tiles in the children's area.

PHOTOS 6 and 7. In the kindergarten of the Art complex in Krasnogorsk Mapei products were used to prepare floor substrates and install ceramic tiles.

sports flooring with the use of PRIMER G, ULTRAPLAN ECO, ULTRABOND ECO VS90 PLUS.

At the **Secondary School No. 2 in Volosovo**, in Eastern Russia, ZAO Mapei participated in the renovation of the football pitch by supplying the two-component polyurethane adhesive ULTRABOND TURF 2 STARS to bond synthetic grass.

As part of the "Gazprom for Children" program, a social project led by the Russian company Gazprom to support sports and cultural activities, ZAO Mapei helped with the repair of about 20 sports fields in the Volosovsky, Vyborgsky and Primorsky districts of Saint Petersburg.

ZAO Mapei was also involved in the renovation of two sports complexes in the city of Rostov-on-Don: SC Coral and Waterpark H_2O.

The swimming pool of **SC Coral** has a 50x21m basin with 8 lanes and a drop of depth from 1.8 m to 5 m. It was constructed according to the Olympics standards. During the renovation works at this facility, ZAO Mapei supplied products for preparing the substrates, waterproofing, installing ceramic tiles and grouting joints such as PLANICRETE, MAPELASTIC, IDROSILEX PRONTO (which was later superseded on the international market by PLANISEAL 88), MAPEBAND, ADESILEX T SUPER, KERACRETE, and ULTRACOLOR PLUS.

Waterpark H_2O is one of the best recreation places for children and their parents in the city of Rostov-on-Don. This complex includes a number of swimming pools, water slides and rides, baths and saunas, water bars and cafes. ZAO Mapei participated in the waterproofing and ceramic installation works of the children's area. For these purposes, the following products were supplied: PLANICRETE, MAPELASTIC, IDROSILEX PRONTO, MAPEBAND, ADESILEX T SUPER, KERACRETE, ULTRACOLOR PLUS, ADESILEX P10, ISOLASTIC, and ADESILEX P9.

KINDERGARTENS

The main challenge in the construction of a kindergarten is to provide ideal conditions for rest, entertainment and education. This was taken into account when building the **kindergarten of the residential complex ART in the city of Krasnogorsk**, not far from Moscow. This is a creative project with original architectural and design solutions, the result of the joint work of Russian and European experts. In the complex, there are spacious playrooms, a comfortable swimming pool, sports and music halls, and cozy bedrooms to provide a homely environment.

ZAO Mapei was involved in the construction of the swimming pool by supplying the following products: TOPCEM PRONTO,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NIVOPLAN PLUS, and PLANICRETE for preparing the substrates; MAPEFILL for anchoring; IDROSTOP, MAPELASTIC, MAPEBAND, and MAPENET 150 for waterproofing; KERACRETE to bond the ceramic tiles; ULTRACOLOR PLUS for grouting joints and MAPESIL AC for sealing expansion joints. ULTRACOLOR PLUS grout was also used on the colored façade of the kindergarten to fill wide joints.
When building the **GREENLandia** residential complex near Devyatkino metro station in St. Petersburg, ZAO Mapei helped preparing the substrates in the kindergarten of the complex by supplying ULTRAPLAN ECO 20 smoothing compound.

THEATRES
The **Tatar State Puppet Theatre Ekiyat in Kazan** is one of the oldest theaters in the Russian Federation, established in 1934 as the "First International State Puppet Theater". Ekiyat in Tatar means “folk tale”. The theater has two halls: the Great Hall with 250 seats and the Small Hall with 100 seats. Here children meet the heroes of their favorite tales and are introduced to the art of theater. ZAO Mapei also took part in the process of renovation of the building: MAPEGROUT THIXOTROPIC mortar was used to repair concrete structures, while ULTRACOLOR PLUS was used to grout tile joints.

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CHILDREN'S CAMP
ZAO Mapei also participated in the reconstruction of buildings in the **Artek International Children's Center**, located on the southern coast of Crimea in the village of Gurzuf. In former times, it was the most famous Soviet pioneer camp and a mark of the country's pioneer organization. The renovated buildings provide greater comfort for those staying at the children's camp. In the process of repair, MAPELASTIC was used for waterproofing, MAPEGROUT THIXOTROPIC for repairing concrete, MAPEFER 1K for protecting the steel reinforcement rods from corrosion, MAPEFILL for anchoring works and ULTRACOLOR PLUS for grouting tile joints.

CHILDREN'S HOSPITALS
ZAO Mapei also devoted much effort to the renovation and construction of children's hospitals in Russia. During the construction of the **Federal Research and Clinical Center of Pediatric Hematology, Oncology and Immunology named after Dmitry Rogachev (D. Rogachev FNKC DGOI)** in Moscow, a number of products manufactured by Mapei and Sopro Bauchemie GmbH, a subsidiary of the Mapei Group, were used. When installing ceramic tiles in the laboratory the following Sopro products were used to prepare the substrates, installing ceramic tiles, grouting joints and clean the surfaces: SOPRO EPG 522, SOPRO DBE 500, SOPRO FEP 504, and SOPRO EAH 547. In the bathrooms of the inpatient care department the substrates were levelled with SOPRO AMT 468 and waterproofed with SOPRO FDF 525, before installing ceramic tiles with SOPRO NO.1 adhesive and grouting joints with SOPRO FL 526. In the laundry, kitchen and other service areas the levelling of the substrates was carried out with NIVOPLAN PLUS (manufactured and distributed in Russia by ZAO Mapei) + PLANICRETE; ceramic tiles were installed with GRANIRAPID two-component, fast-setting and hydrating adhesive; joints were grouted with KERAPOXY acid-resistant, epoxy grout, and ULTRACOLOR PLUS; the tiled and grouted surfaces were cleaned with PULICOL 2000 solvent gel.
MAPEGROUT 430 was used to smooth over surfaces defects (honeycombs, construction joints, spacer holes, etc.) in monolithic concrete structures.

PHOTOS 8 AND 9. The Tatar State Puppet Theatre Ekiyat in Kazan was renovated using Mapei solutions.
PHOTO 10. Renovation works at the Artek International Children's Center saw the use of Mapei products.
PHOTOS 11 and 12. D. Rogachev Hospital in Moscow was built using Mapei materials.


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GBUZ City Tuberculosis Hospital No. 2 in Saint Petersburg is a multifunctional hospital with 470 beds for the treatment of patients with tuberculosis. In the children's department of the hospital, ZAO Mapei helped preparing the substrates and laying PVC coverings. For this purpose, the following products were used: PRIMER G and ULTRAPLAN ECO 20 for preparing the substrates, ULTRABOND ECO 375 for bonding vinyl floors and ULTRABOND ECO 4LVT for bonding luxury vinyl tile coverings.
Preparation of the substrates using ULTRAPLAN ECO 20 was also carried out at the **Children's Oncology and Hematology Department of the City Clinical Hospital No. 31 in Saint Petersburg**. This department is the only one in the North-West of Russian Federation offering children treatment of all types of cancer.
Similar works were carried out with similar products at the **City Children's Hospital No. 1 in Saint Petersburg.**

SOLIDARITY PROJECTS
In addition to participating in the repair of children's schools, sports and entertainment complexes, ZAO Mapei also pays great attention to solidarity, including assistance to several childcare centers and large poor families all over the Russian Federation.
For instance, the Russian subsidiary of the Mapei Group supplied free-of-charge products to help the building of one kindergarten in Stupino, as well as four kindergartens and one orphanage house in the Moscow region.
Kindergartens and schools, children's hospitals, sports facilities and theaters that become more beautiful, more comfortable, more reliable, can help feel the kindness and care about our younger generation better than any words.


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THE CHURCH OF THE NATIVITY IN BETHLEHEM

HIGHLY RELIABLE MATERIALS AND TECHNIQUES EMPLOYED FOR STRENGTHENING AND RESTORING WOODEN STRUCTURES

Restoration work on the Church of the Nativity in Bethlehem – one of the most popular sites for pilgrims visiting the Holy Land – started in September 2013 and is still in progress.

Along with Piacenti SpA from Prato (Central Italy), the company which directed and carried out the consolidation work, Mapei and its products and systems for strengthening and restoring wooden structures played an active part on this complicated and particularly significant site.

The prestigious basilica is one of the most antique Christian churches and is steeped in spirituality. It was built around 330 AD by Emperor Constantine and his mother Elena on the ruins of an ancient Pagan temple, where the first Christians celebrated the birth of Jesus. Rebuilt and extended in the 6th century by Emperor Justinian I, it was modified again during the Crusades era and then again over the following centuries, and is today a monument of considerable historical and artistic significance.

Over the course of the centuries a Franciscan convent, an Orthodox monastery and an Armenian monastery were built around the structure. This is why there are now three different Churches (Roman Catholic, Greek Orthodox and Armenian) jointly administering this place of worship which, since 2012, has been an UNESCO World Heritage Site.

The recent restoration work on this symbol of Christianity has never interrupted the wave of pilgrims visiting the Church, which is why this site stands out in particular for the complexity of the logistical operations to manage and carry out the work, made even more difficult by the range of skills required to carry out the work and the organisation and transfer of all the resources required for the work.

There is a condition of Status Quo of the Holy Land Sites inside the Church to accommodate the rights and jurisdiction of each of the three religious communities (Greek Orthodox, Catholic represented by the Order of Franciscan missionaries serving the Holy Land, and Armenian Orthodox), with which the main contractor had to interface on a regular basis.

It was only thanks to a delicate and complicated work of coordination and dialogue, involving the Palestinian authorities, that it was possible to develop an articulated, organic study and a research, structural upgrading and restoration programme for the internal and external decorative and structural features of the Church over the last six years.

The uniqueness of this important historical site, along with the significance of the project, meant that the study and specification phase of the construction details of the building, the materials used to build the church and their state of conservation, had to be particularly detailed and complex.

A document published in 2000 by UNESCO (Wenzel-Szaktilla-Pliett 2000) had already highlighted the precarious state of the roof and the subsequent damage it had caused, due to water seepage in the church and on the plaster, the mosaics and the floor. A fully documented report from 2010 on the level of damage of the church was published by a multi-disciplined task-force coordinated by the Ferrara Research Consortium of the University of Ferrara (Central Italy), with the aim of developing a restoration project.

On the 26th of August 2013 Piacenti SpA, which had been se-

lected following an international tender, signed a contract to carry out the restoration and conservation work on the roof by restoring the physical and mechanical functions of the timber roof structure and replacing 2,000 m^2 of lead sheeting on the roof.

The same company was then awarded a contract to carry out further work: restoration of the internal and external stone surfaces and renders of the church, the valuable wall mosaics, the ante-chamber near the entrance to the church, the main wooden and metal doors to the church and the wooden architraves of the colonnade.

The work was contracted out by the Palestinian National Authority which delegated the work to a Presidential Committee. Among the sponsors one finds more than 26 Christian and non-Christian countries, private citizens and bodies and various Palestinian banks. 64 different companies and numerous experts took part in the project, amounting to a total of more than 170 people.

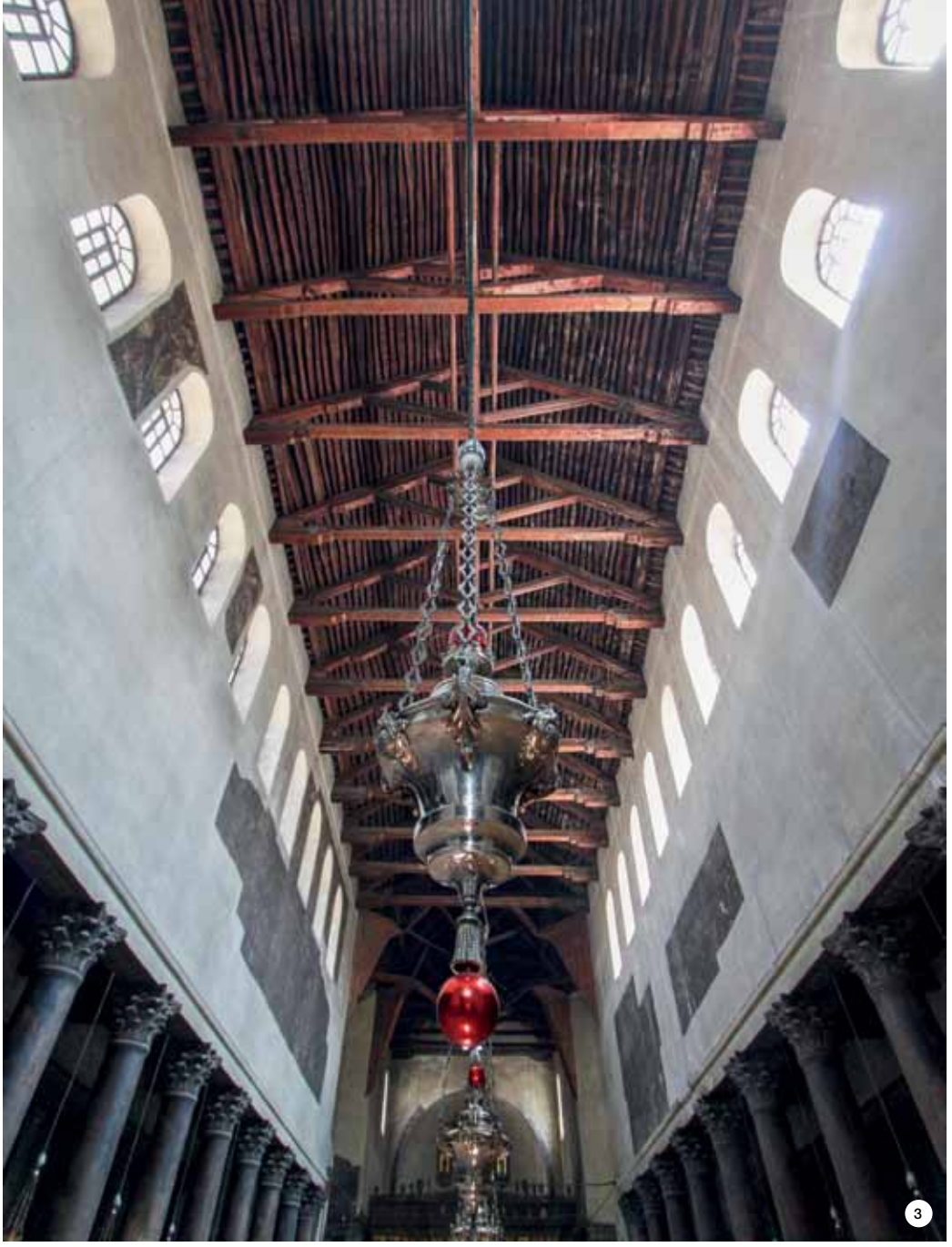
A SITE THAT NEVER STOPS

There are currently four different teams operating on the site, made up of highly specialised Italian craftsmen coordinated by a technical team based in Bethlehem, which are also supported by a similar number of technicians based in the Piacenti SpA's headquarters in Italy.

This site requires constant, ongoing control and coordination and maximum efficiency in order to keep in line with the work schedule, as well as to compile documentation on a daily basis to record all the areas covered, the products used and the way the actual work has been carried out.

PHOTOS 1 and 2. The Church of the Nativity before and after the restoration of the roof.
PHOTO 3. The timber truss structure of the roof after completion of the strengthening and restoration works.
PHOTO 4. The timber truss structure of the roof before the restoration works.

Development work on all the materials used to build the church and the way they are treated has required very thorough research work through in-depth preliminary diagnostics and testing, often requiring the intervention and support of expert consultants with knowledge of specific fields of restoration, to help overcome problems regarding the main characteristics of the actual building, structural engineering, diagnostic analysis,



the reconstruction of historical/construction events over the years, etc.

Numerous problems have arisen over the years, both while setting up the site and when actually carrying out the numerous, complex types of intervention: from the preparation and positioning of the scaffolding (for which multi-directional scaffolding imported from Italy was used to make the work areas more comfortable and to provide access to all the areas of the church) to the development of special operational technology and equipment for the roof (where a special air chamber was created to allow ventilation between each layer), and from the timber truss structure of the roof (where the damaged and deteriorated portions were replaced with implants made from the same type of antique wood using a bespoke procedure developed for the type of structure and wood actually found on site) to the decorated surfaces (which were carefully studied through archeometric analysis and then treated with a targeted consolidation, cleaning and integration cycle using the most up-to-date methods).

SOME OF THE SITE FIGURES

170
PARTNERS, COLLABORATORS, SUBCONTRACTORS AND CONSULTANTS

2,800
M² OF SCAFFOLDING

20
TONNES OF ANCIENT WOOD

200
KG OF RESIN FOR WOOD

55,000
SCREWS JUST FOR THE ROOF

2,000
M² OF PHENOLIC PLYWOOD

2,800
M² OF LEAD SHEETING

2
TONNES OF PRATO WOOL

4
YEARS OF WORK

130
M² OF MOSAIC RESTORED

1
ARMENIAN GATE RESTORED

2
RENOVATED COLUMNS

59
WORLD LEADERS ON VISIT


5


6


7


8

DIAGNOSTIC ANALYSIS AND TESTING TO CHOOSE MAPEI

As far as the materials used in this intervention are concerned, they were chosen by carrying out a series of preliminary laboratory tests and on-site testing to make sure they complied with the specified thermal and hygrometric requirements, as well as they were able to withstand the loads and stresses acting on them. Going into detail, the structural strengthening work on the timber truss roof, which was carried out by inserting implants and anchor points, required meticulous work to write the procedures, perfect the operational methods, choose and verify the materials by carrying out a diagnostic survey.

Following the analysis, which was carried out by comparing the results of the monitoring campaign by LegnoDoc Srl from Central Italy and the samples taken, the product chosen to bond the wooden structures and the connector rods of an appropriate diameter inserted into the structures was MAPEWOOD PASTE 140 two-component, thixotropic epoxy adhesive. This product is the ideal solution for repairing timber beams and truss by anchoring metal bars to them, because it hardens without shrinking and forms a paste with exceptional bonding properties, high levels of tensile and flexural strength and a flexural modulus of elasticity that ensures a sound structural joint is formed.

The results were only obtained after impregnating the surfaces with MAPEWOOD PRIMER 100, an epoxy impregnator in water dispersion used to consolidate wooden structural elements damaged by fungi or woodworms. This product is specific for priming the end-parts of structural elements in high density wooden beams, truss elements and pillars (such as oak and chestnut) that need to be repaired by grafting inserts bonded with MAPEWOOD PASTE 140 or MAPEWOOD GEL 120.

The latter product, an epoxy adhesive used for the structural consolidation of wooden elements by bonding grafted inserts, was also used on site to bond new wooden parts to

IN THE SPOTLIGHT

MAPEWOOD PASTE 140

It is a solvent-free epoxy adhesive of a thixotropic consistency composed of two premeasured parts.

Once the two parts have been mixed, the product can be applied manually with a flat trowel. MAPEWOOD PASTE 140 can be easily applied both on vertical and horizontal surfaces.

It hardens without shrinkage becoming a paste with excellent bonding and mechanical strength compatible with wood.

It is ideal for bonding new timber parts to existing timber structures, filling holes both in the existing timber structural element that needs to be repaired and in the new wood element in order to anchor connecting reinforcing rods and/or plates.

the existing wooden structure.
Once MAPEWOOD GEL 120 has been mixed, it is easy to apply and hardens without shrinking, to form a compound with exceptional bonding strength and compatibility with wood and excellent resistance to mechanical loads and stresses.

DECORATED AND RENDERED SURFACES

As with all the other work carried out, the procedures used to repair the renders and to treat the painted surfaces and mosaics were chosen, developed and verified following an exhaustive cognitive study to identify the forms and mechanisms of the ongoing deterioration and the technical and construction characteristics of the materials, so that the work would be carried out in a modulated way according to the type and level of deterioration, while guaranteeing the utmost care for the areas under repair.
A highly articulated, targeted plan of action was adopted to restore the mosaics on the walls and to repair and consolidate widespread areas with MAPE-ANTIQUE F21 superfluid, salt-resistant, fillerized hydraulic binder, where some of the tiles had become detached from the substrate. It also included the interventions to consolidate the surface of the glass tiles suffering from scattering, remove the deposits damaging the tiles and to carry out repairs on the missing areas.
The result is to have given a new voice and dignity to the mosaic decorations, which before the intervention had been severely compromised by seepage and, even more importantly, had become mute and degraded by the dark veil which hung over them.
Amongst the numerous surprises which came to light during the work, worthy of mention is the discovery of a portion of mosaic depicting an angel in its entirety, which had been hidden beneath the dull layer, dating back to the cycle of work carried out in the 13th century. A number of other testimonies of the past were also unearthed during the work in collaboration with a team of archaeologists.
And finally, also worthy of mention is the restoration of the decorative inlays in the wooden architrave running above the colonnade, which had been partially hidden by a layer of concretion, and the restoration of the finely crafted East Gate.
Today, at a distance of four years from the start of work on site, it is possible to appreciate the results of the superhuman efforts that have been made on the areas that have already been renovated.
In the meantime, restoration work is ongoing and the team working on the Church of the Nativity is searching for the most suitable solutions to guarantee the best care and protection for the monument.


9


10


11

PHOTO 5. In the first phase of the restoration works the wooden surfaces were impregnated with MAPEWOOD PRIMER 100.
PHOTO 6. MAPEWOOD PASTE 140 was chosen to bond the wooden structures and the connector rods.
PHOTO 7. The wooden structure before finishing.
PHOTO 8. At the end of the restoration works the colors of the wooden elements were brought back to their original splendor.
PHOTO 9, 10 and 11. The restoration works also involved wall mosaics.

TECHNICAL DATA
Church of the Nativity, Bethlehem (Palestine)
Period of construction: 3rd century AD
Period of intervention: 2013-2017
Intervention by Mapei: supplying products to restore wooden elements and repairing and consolidating walls
Client: Palestinian National Authority
Designers: CNR Ivalsa, LegnoDoc Srl
Works direction: C.D.G. Bethlehem
Contractor: Piacenti SpA
Mapei coordinators: Davide Bandera and Daniele Sala, Mapei SpA (Italy)

MAPEI PRODUCTS
Strengthening and restoring wooden structures: Mapewood Primer 100, Mapewood Paste 140, Mapewood Gel 120
Repairing and consolidating walls: Mape-Antique F21

For further information on these products see www.mapei.com

ELNÒS SHOPPING CENTRE BY IKEA IN BRESCIA

A NEW SHOPPING CENTRE INCORPORATES THE IKEA STORE IN A HUGE SHOPPING GALLERY

An investment of 200 million Euros, 145 stores and shops, a surface area of 88,000 m², including the Ikea store which is connected to the new centre, a parking area with location sensors for 4,300 vehicles and an expected 6 million visitors in the first year alone. These are the main figures for Elnòs Shopping, an Ikea-branded shopping centre inaugurated last year in Roncadelle, a town near Brescia (Northern Italy). It was built in one and a half years on the site of a redeveloped former industrial area and has been awarded energy class A certification, the highest level according to the current Italian standards. The centre was built by the Inter Ikea Centre Group, the operational division of the Swedish furniture brand created in 2001 with the specific task of designing and managing shopping centres all around the world along the lines of Ikea's typical family-friendly format, that is, in comfortable surroundings with play areas and other activities for children.

The company has already developed 30 shopping centres in Europe and has another 16 projects in the pipeline for Europe and China.

THE BIRTH OF A COMMERCIAL PROJECT

The Elnòs centre was built next to the previous Ikea store, which was inaugurated in 2005, and the initial idea was to integrate the Swedish furniture store with a shopping centre with direct access to the existing Ikea store. The structure of the shopping gallery is made up of two rings – the first and second floor – with each level having a surface area of 17,000 m² and around 3,000 m² of bathrooms. Mapei Technical Services were contacted by the company contracted to install ceramic tiles in various areas and, after carrying out a survey of the site, they proposed several solutions. These suggestions were met with

PHOTO 1. Mapei supplied the admixtures EXPANCRETE, MAPECURE SRA 25, DYNAMON XTEND W100 R and DYNAMON XTEND W300 N for the concrete used for the foundation plinths, the walls in the stair and lift wells and the floor slabs.

PHOTO 2. The substrate was skimmed and levelled off where required with PLANITOP FAST 330.
PHOTOS 3 and 4. Porcelain tiles were installed on the floors of the two rings with KERAFLEX MAXI S1 using the "double-buttering" technique. Joints were grouted with ULTRACOLOR PLUS.

a favourable reception from the client and involved installing ceramic tiles on a concrete slab.

Mapei Technical Services were initially contacted to give advice on the most suitable admixtures for the concrete used on site to make the foundation plinths, the cores of the main structure and the concrete slabs.

After carefully analysing the work to be carried out, Mapei proposed two admixtures from the DYNAMON XTEND SYSTEM range, EXPANCRETE expansive agent for shrinkage-compensating concrete and MAPECURE SRA 25 liquid admixture for reducing the hydraulic shrinkage of concrete.

To formulate the mix design, the admixtures supplied together with EXPANCRETE and MAPECURE SRA 25 were the super-plasticisers DYNAMON XTEND W100 R and DYNAMON XTEND W300 N. The latter two products are liquid admixtures for high quality concrete, specially formulated to make concrete with a low water/cement ratio and a long maintenance of workability, including in warm climates and high temperatures.

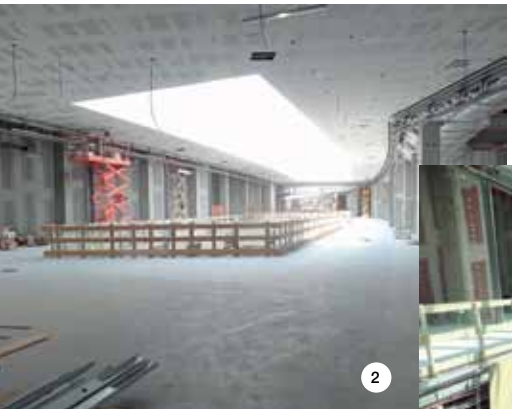
Thanks to their special and innovative formulations, these two admixtures are efficient agents used to disperse ce-

IN THE SPOTLIGHT

MAPECURE SRA 25

It is a liquid admixture especially formulated to reduce the formation of cracks induced by hygrometric shrinkage in conventional and self-compacting concrete.

MAPECURE SRA 25 is particularly recommended for the production of ready-mixed concrete for internal and external concrete industrial floors; for ready-mixed and pre-cast concrete where considerable reduction of cracking induced by hydraulic shrinkage is required; for concrete with very low or no final shrinkage, used in combination with EXPANCRETE expansion agent (MAPECRETE SYSTEM).



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ment particles, so that the amount of water required for mixing is considerably reduced. Compared with normal concrete without an admixture, DYNAMON XTEND W300 N may be used to design concrete mixes with more than 20% less water.

SUBSTRATE PREPARATION

Once this part of the work had been completed, the next step was to install 60x60x1 cm and 15x90x1 cm ceramic tiles on a total surface of around 37,000 m^2. Before installing the chosen flooring, the substrate needed to be verified to make sure it was well cured and clean, had no traces of dust and that there were no loose areas or any substance that would affect adhesion of the tiles. Any cracks found in the substrate were opened up and all the dust was removed, after which they were sealed monolithically by filling them with EPORIP two-component, solvent-free epoxy adhesive. After filling the cracks, the adhesive was broadcast with sand while it was still wet to favour the bonding of the following products.

In the areas that needed to be skimmed it was recommended to use PLANITOP FAST 330 quick-setting, fibre-reinforced cementitious mortar which is used to smooth irregular internal and external substrates to quickly make them suitable for laying ceramics and stone. Before skimming the substrate it was also recommended to apply a coat of PRIMER G synthetic resin-based primer diluted 1:1 with water to anchor any remaining dust.

In the areas where it was not possible to maintain the position of the control joints already made because of the size and shape of the ceramic tiles, it was recommended to seal them by filling them with EPORIP, after opening them up with a specific tool and removing all the dust from the joints. By carrying out this operation it was then possible to make new control joints in the concrete floor according to the shape and dimensions of the tiles.

PHOTOS 5 and 6. The two rings of the gallery after completion of the works.

INSTALLING THE CERAMIC TILES

For bonding the ceramic covering, Mapei Technical Services suggested using KERAFLEX MAXI S1 high-performance cementitious adhesive, which is particularly suitable for installing large-size porcelain tiles and natural stone. This product is a non-slip adhesive with good deformability and, thanks to the use of innovative Low Dust technology, the amount of dust given off while mixing the adhesive is considerably lower. It was recommended to use the "double-buttering" technique to install the tiles, that is, the adhesive is applied on both the installation surface and the back of the tiles. Using the double-buttering technique enables gaps and voids between the substrate and tiles to be eliminated, thereby reducing the risk of tiles breaking due to heavy or spot loads,which must always be taken into consideration in areas with large numbers of people and where goods are moved around, such as in shops and stores.

The tile joints were grouted with ULTRACOLOR PLUS high performance, quick-setting and drying, polymer-modified mortar with water-repellent DropEffect® and anti-mould BioBlock® technology.

To speed up this phase it was recommended to apply ULTRACOLOR PLUS at 23°C so that the flooring could be opened to light foot traffic within just 3 hours of being grouted.

SEALING THE JOINTS IN THE FLOORINGS

The structural joints were sealed with special, preformed joints which allow for the movements expected in the flooring over the years. To seal the expansion joints it was recommended to use MAPESIL AC pure, mould-resistant, acetic silicone sealant, which is used for sealing expansion joints of ± 25% expansion of the initial size. The same product was also used for the junction points between the ceramic flooring and the skirting around the edges of the gallery, the drains and the pillars.

TECHNICAL DATA
Elnòs Shopping Centre, Roncadelle, Province of Brescia (Italy)
Period of construction: 2014-2016
Period of the intervention: 2014-2016
Intervention by Mapei: supplying admixtures for concrete and products for installing porcelain tiles, grouting tile joints and sealing expansion joints
Design: Inter Ikea Center Group
Client: Ikea SpA
Main contractor: Carron, Martini Prefabbricati
Installation company: Ripa
Mapei distributors: Holcim, Martini Prefabbricati
Mapei coordinators: Matteo Venturini, Andrea Siboni, Stefano Baracchetti, Alberto Di Milito, Luigi Senatore, and Giordano Bracchi, Mapei SpA (Italy)

MAPEI PRODUCTS
Formulating the concrete: Dynamon Xtend W100 R, Dynamon Xtend W300 N, Expancrete, Mapecure SRA 25
Preparing the substrates: Eporip, Primer G, Planitop Fast 330
Installing ceramic tiles: Keraflex Maxi S1
Grouting and sealing joints: Mapesil AC, Ultracolor Plus

For further information on the products see www.mapei.com

MAPEI

MARINE

A COMPLETE RANGE OF PRODUCTS FOR THE SHIP-BUILDING INDUSTRY

The ship-building industry has evolved significantly over the last few decades due to the constant development and progress in construction technology and the continuous research work carried out on materials. An innovative process that encompasses cargo ships, vessels for military use and cruise liners, as well as pleasure boats and ocean-going yachts.

And on top of the consolidated requirements in terms of durability and resistance to aggressive atmospheric and environmental agents, or wear caused by the movement of high volumes of passengers and loads, a new list of requirements also has to be taken into consideration.

The need to offer rooms and spaces with increasingly high levels of comfort and liveability acts as a stimulus for research to develop new solutions, materials and finishes that combine aesthetics and functionality. The requirements in terms of health, safety, and hygiene that must be guaranteed for ship's passengers are also becoming increasingly stringent.

The answer to these needs and requirements is Mapei Marine, a dedicated line of products for the ship-building industry, which has been developed thanks to the exclusive wealth of experience that Mapei has built up in this specific application field.

Solutions and products developed through a process of research, carried out in the name of sustainability and attention to mankind and the environment, which integrate together synergically to provide a truly complete system that guarantees certified quality, excellent performance characteristics, functionality, reliability, durability, ease of use, and simple application.

PUBLIC AREAS

MARBLE, WOODEN AND TEXTILE FLOORS

Mapei solutions are the right choice to create elegant floors in large entertainment areas, thanks to the use of controlled-shrinkage cementitious substrates, high performance adhesives and grouts with an uniform colour. Manifold solutions for wooden floorings, particularly suited for both the more elegant areas and areas subjected to high foot traffic, including restaurants, bars, and decks.

1_Deck

2_Primer: ECO PRIM MARINE

3_Underlay: MAPECEM MARINE 1000

4_Adhesive: GRANIRAPID

5_Grout: ULTRACOLOR PLUS

PUBLIC AREAS

IN INTERIORS

Space-sharing areas and meeting points, where architecture and design play a key role, can be further enhanced by adopting Mapei solutions, through flooring choices that help create flooring with an enjoyable look and original, harmonious materic effects.

1_Deck

2_Primer: ECO PRIM MARINE

3_Underlay: MAPECEM MARINE 1000

4. Skim-coat: MAPEDECK EPOFLOOR broadcast with QUARTZ 0.5

5_Top coat: MAPEDECK MONO DESIGN

PASSENGER CABINS

FLOORS

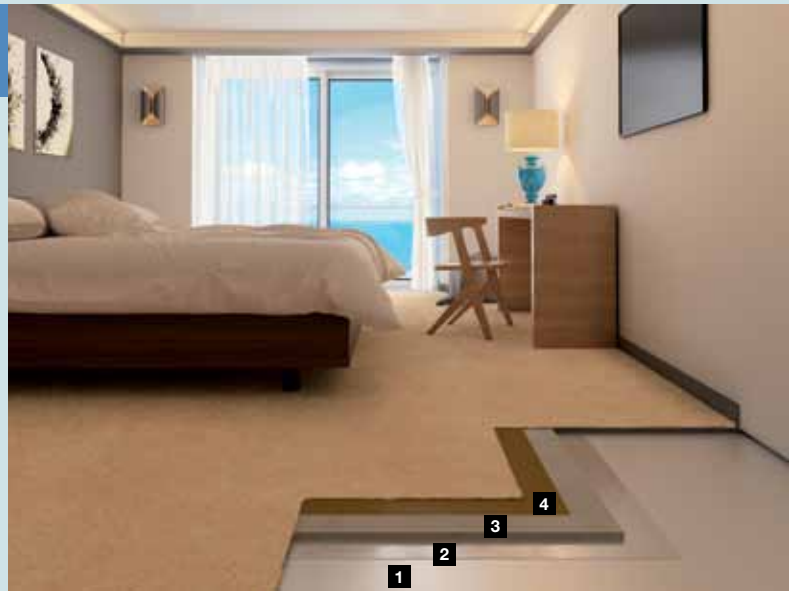
Cabins are now on a par with the most prestigious hotel rooms and every minor detail must be faultless, starting from the flooring. To get the best results what could be better than a combination of self-levelling, fibre-reinforced substrate mortars with solvent-free, fibre-reinforced adhesives, ideal for any type of floor?

1_Deck

2_Primer: ECO PRIM MARINE

3_Underlay: ULTRAPLAN MARINE 900

4. Adhesive: ULTRABOND ECO 170



OPEN DECKS

INSTALLATION OF ARTIFICIAL GRASS

Areas used mainly for relax are characterised by the use of artificial grass which requires the most appropriate installation solutions.
Mapei offers everything you need to get excellent results: aesthetically perfect surfaces with high durability.

1_Deck

2_Primer: MAPEDECK PRIMER 200

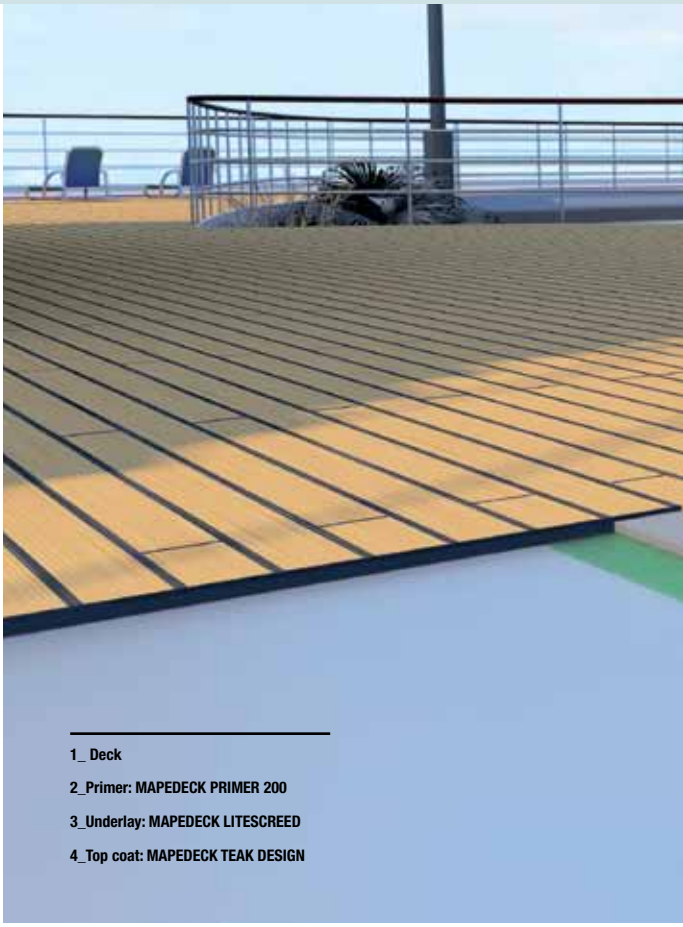
3_Underlay: MAPEDECK LITESCREED

4_Adhesive: ULTRABOND TURF PU 2K

5_Turf

MAPEDECK SYSTEMS

Just like the most modern cities, cruise ships are equipped with every type of comfort. And the ships that carve their way across the oceans today are evolving continuously in terms of aesthetics, luxury and quality. In these fantastic surroundings the decks – both internal and external – play an important role, in that they are one of the places on a ship where passengers find great pleasure in spending most of their time.
Systems and solutions for flooring on decks are becoming increasingly important features of contemporary ship design, because they help create that special atmosphere designers are always striving to achieve. In the light of these developments, Mapei has developed new flooring systems for decks that allows architects and designers to create a wide variety of solutions with considerable aesthetic impact: MAPEDECK SYSTEMS. MAPEDECK SYSTEMS are a combination of cutting-edge performance characteristics and high aesthetic value. With these systems it is possible to create spaces that are both elegant and versatile, which at the same time safeguard the resistance and service life of the flooring itself, even in areas exposed to the most intense foot traffic.
MAPEDECK SYSTEMS for flooring are applied in situ. Most of the floorings may even be opened to foot traffic the day after they have been installed. This rapid installation procedure means that large areas of flooring can be installed in a short space of time. And the various colours and decorative elements available allow creativity to be expressed through a vast array of models and patterns.



1_ Deck

2_Primer: MAPEDECK PRIMER 200

3_Underlay: MAPEDECK LITESCREED

4_Top coat: MAPEDECK TEAK DESIGN

CERTIFICATIONS

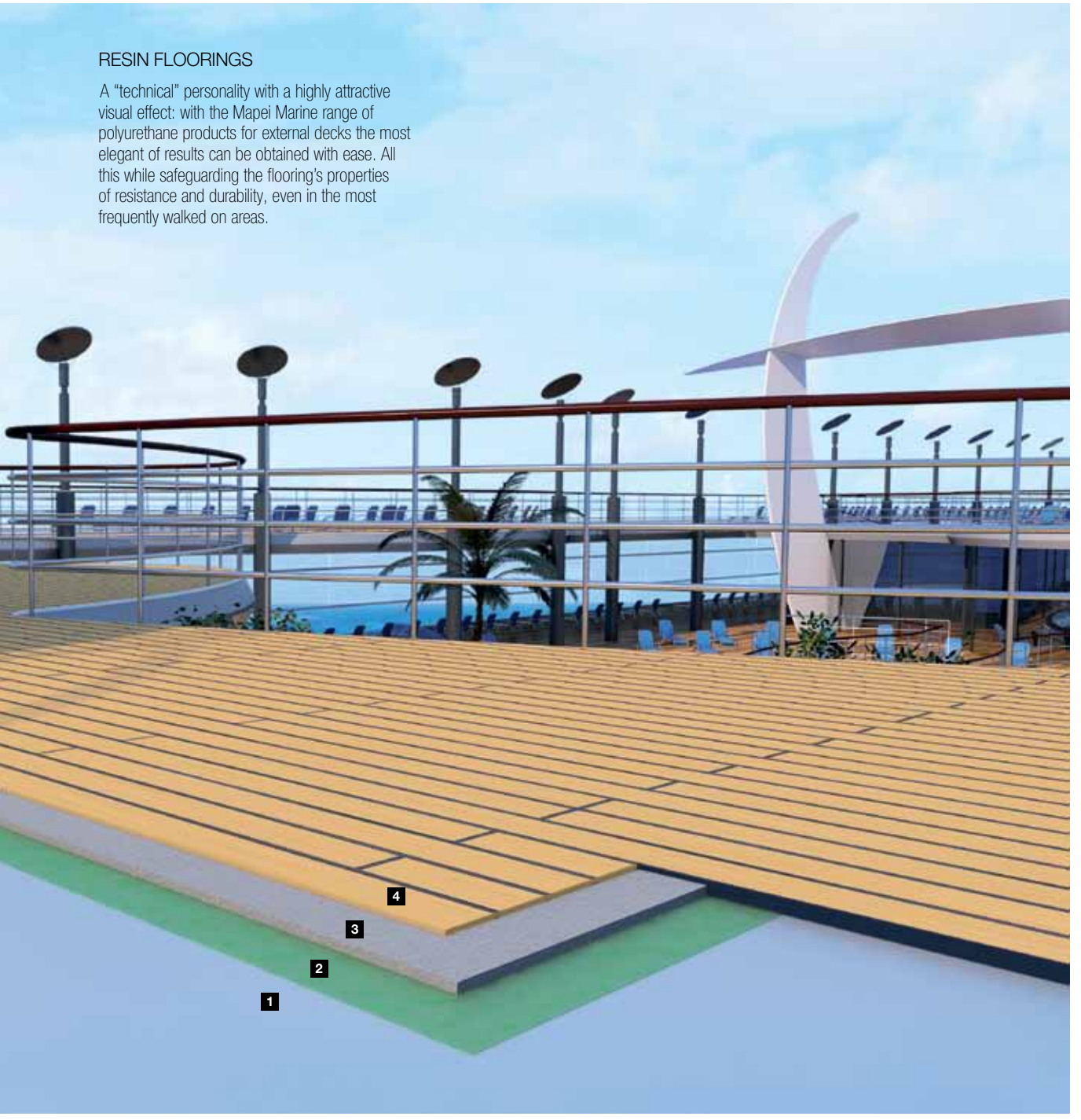
MAPEI SYSTEMS ARE CERTIFIED BY RECOGNISED EXTERNAL INSTITUTES AND LABORATORIES.

This symbol is a conformity mark which proves that the product is suitable for marine equipment in compliance with the Marine Equipment Directive (MED) 96/98/EC and subsequent amendments. For the products with this marking, Mapei is also allowed to affix the U.S Coast Guard approval number as allowed by the "Agreement between the European Community and the United States of America on mutual recognition of certificates of conformity for marine equipment" signed on February 27th, 2004.

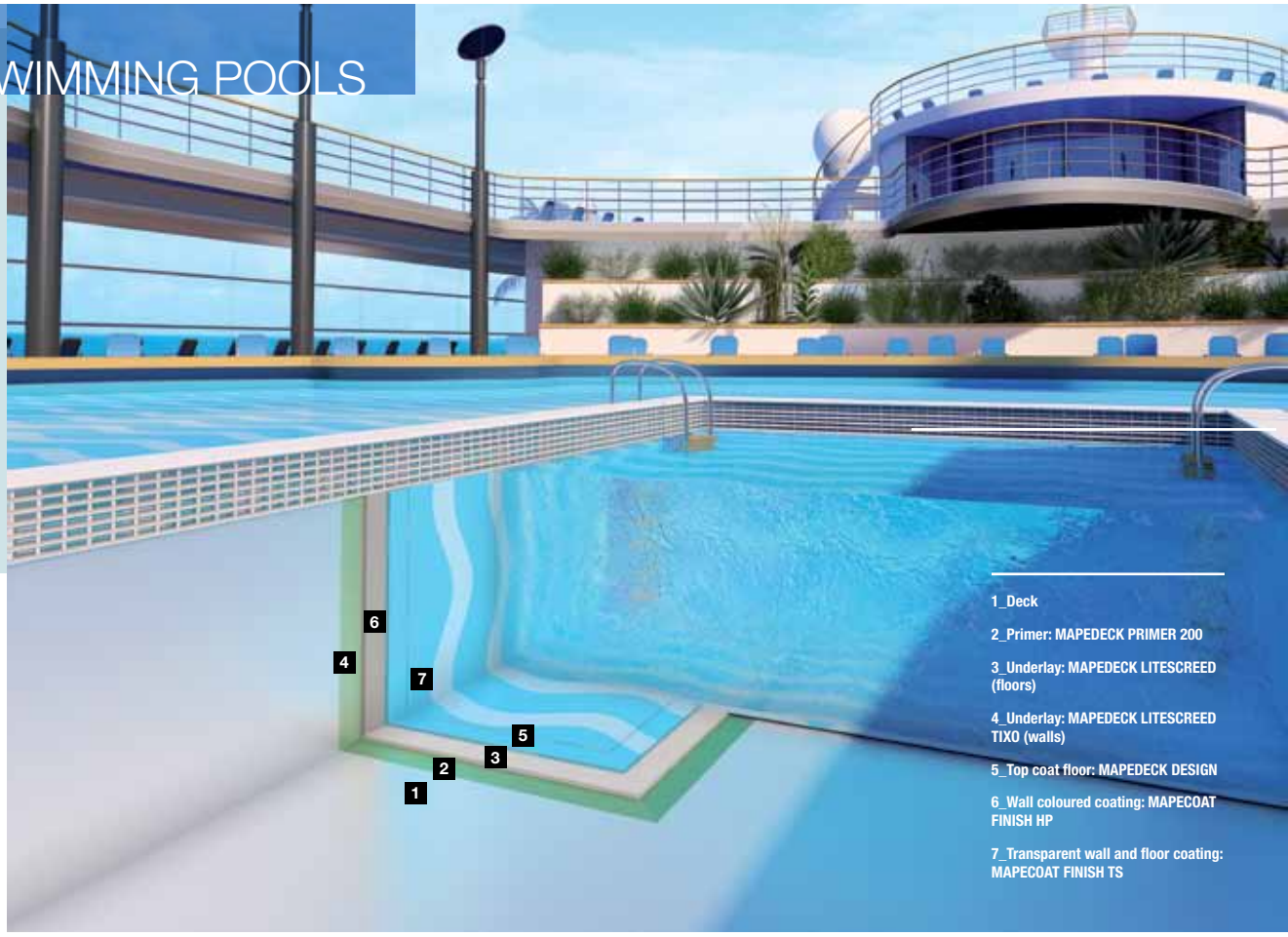
This symbol is used to identify Mapei products which give off a low level of volatile organic compounds (VOC) as certified by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.), an international organisation for controlling the level of emissions from products used for floors.

RESIN FLOORINGS

A "technical" personality with a highly attractive visual effect: with the Mapei Marine range of polyurethane products for external decks the most elegant of results can be obtained with ease. All this while safeguarding the flooring's properties of resistance and durability, even in the most frequently walked on areas.



SWIMMING POOLS



1_Deck

2_Primer: MAPEDECK PRIMER 200

3_Underlay: MAPEDECK LITESCREED (floors)

4_Underlay: MAPEDECK LITESCREED TIXO (walls)

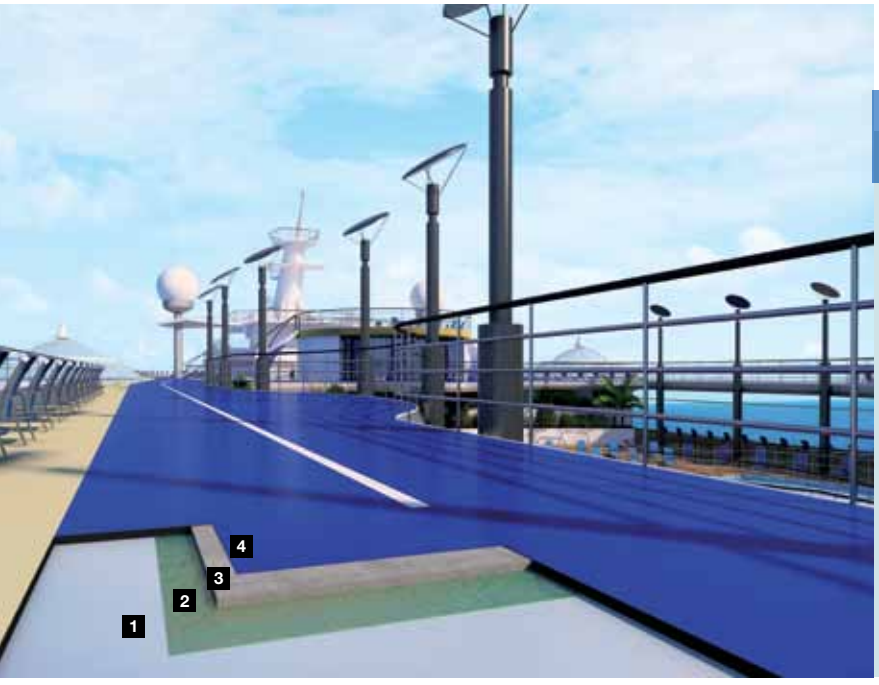
5_Top coat floor: MAPEDECK DESIGN

6_Wall coloured coating: MAPECOAT FINISH HP

7_Transparent wall and floor coating: MAPECOAT FINISH TS

MOSAIC, CERAMIC AND RESIN COVERINGS

A cruise liner without a swimming pool would be unthinkable; mosaics and ceramics installation can be very critical and only the most suitable and reliable products will suffice. Mapei Marine also includes a range of resin products that allow to create attractive finishes when covering vertical and horizontal surfaces in swimming pools. For mosaic or ceramic tiled coverings, Mapei Marine proposes a complete range of products to level off surfaces and to bond, seal and grout coverings in swimming pools.



SPORTS AREAS

RESIN FLOORINGS

Areas dedicated to physical activities and sport on cruise liners are becoming increasingly popular and safety and enjoyment are crucial. Mapei Marine proposes a complete range of specific products and solutions to meet these requirements.

1_Deck

2_Primer: MAPEDECK PRIMER 200

3_Underlay. MAPEDECK FLEXISCREED

4_Top coat: MAPEDECK SOFT DESIGN

MAPEI

MARINE

ULTRACARE 4 YACHT

A SPECIAL PRODUCT LINE FOR LEISURE SAILING

The world of leisure sailing has been on an innovative journey over recent decades that has led to a more widespread use of technology. There is an increasing need to comply with requirements such as durability, resistance to atmospheric agents, and wear and respect for the environment, as well as with higher standards of comfort that combine aesthetics and functionality, without ever overlooking important factors such as safety and hygiene.

And Mapei has the answer for all these requirements: Mapei Marine and its ULTRACARE 4 YACHT line of products, developed specifically for this sector.

The latter also includes a dedicated line for routine and unscheduled maintenance of boats, with products for finishing and polishing, teak treatment, and cleaning operations along with manifold putties and accessories.

METSTRADE 2017

THE MOST INNOVATIVE SOLUTIONS FOR THE MARINE INDUSTRY ON DISPLAY

MetsTrade is the international trade show dedicated to marine equipment, and is by now a landmark for the sector.
From the 14th to the 16th of November the 30th edition of this event took place in RAI Amsterdan Convention Centre in Amsterdan (Netherlands) and broke new ground in terms of exhibitors and visitor numbers, welcoming 24,856 visitors from 116 different countries, out of which 10,500 from abroad, 6% more than in 2016.
68% of all new visitors came from abroad, with the top five foreign visitor countries being Italy, the United Kingdom, Germany, France and Spain.
1,552 exhibitors met distributors and customers from all over the world, from New Zealand to Canada, from South Africa to Singapore.
"MetsTrade is the Mecca of the marine industry" so Atul Gupta, director of the Indian company Multiflex Marine, claimed: "and by far the best show of its kind anywhere in the world. We exhibit at many exhibitions worldwide but nothing beats MetsTrade". And Mapei could not miss it!
This year was the first year of the introduction of the Young Professionals Club lounge, a sort of social gathering for young professionals attending the trade fair, with Millennials being involved to talk about luxury goods to the future generations.

DECK YOURSELF OUT WITH TOP-QUALITY ITALIAN PRODUCTS

Mapei attended the event with its own exhibition space, bringing to the fore its products and systems for the marine industry, which combine the company's know-how and Research strength with the easiness of application and a wide range of colours. Mapei aims at going beyond each material and meeting designers' and clients' current needs.
That's why the company chose to propose its Marine tailor-made and made-in-Italy systems with a new look and more emphasis on aesthetics and design: to the visitors' eyes they become genuine furnishing accessories.

MAPEI KEEPS YOU SAFE ON THE HIGH SEAS

Integrated, sustainable, highly performing and certified: Mapei systems offer concrete solutions, which come from the sound experience made by its technicians on the ground…and on the high seas.
During the trade show, visitors were able to watch Mapei technicians carry out live practical demonstrations of solutions for the care and maintenance of boats. The Mapei Marine products range is cross-sectoral: from adhesives to waterproofers, from sealants to resin-based products.

MARINE GRADE SEALANTS

Through its collaboration with Wolz Nautic Italy, Mapei presented the grey silicone sealant for caulking teak MAPESIL M300G TDK: an one-component product resistant to atmospheric agents specifically developed for caulking joints in traditional wooden decking systems on boats and yachts.

MAINTENANCE, THE KEY TO STAYING AFLOAT

Mapei Marine proposed its 15 "ULTRACARE 4 YACHT" solutions and accessory tools, a range of solutions for the care and routine and non-scheduled maintenance of boats.

This comprehensive family of products allows to restore the beauty of surfaces and give new life to yachts: specific products to remove dirt, to polish and protect surfaces, both internally and externally, and multi-purpose putties for filling and finishing operations.

SOLUTIONS FOR KITCHENS, SAUNAS, CABINS, AND DECKS

For public and internal areas, at MetsTrade Mapei proposed highly technological systems for all types of flooring on boats, yachts, cruise ships, and dinghies: products for substrates, adhesives and grouts with Fast Track Ready technology, primers and adhesives for installing wooden and textile floorings and, lastly, solutions for resin seamless flooring with harmonious, original patterns.

Mapei also displayed solutions for wellbeing areas and swimming pools, both for waterproofing saunas, bathrooms and tubs and for installing and grouting mosaic.

For kitchens and galleys, where certain standards of health and cleanliness need to be maintained, Mapei proposed products and solutions that comply with the levels of hygiene required: solutions for installing ceramics or creating seamless resin surfaces.

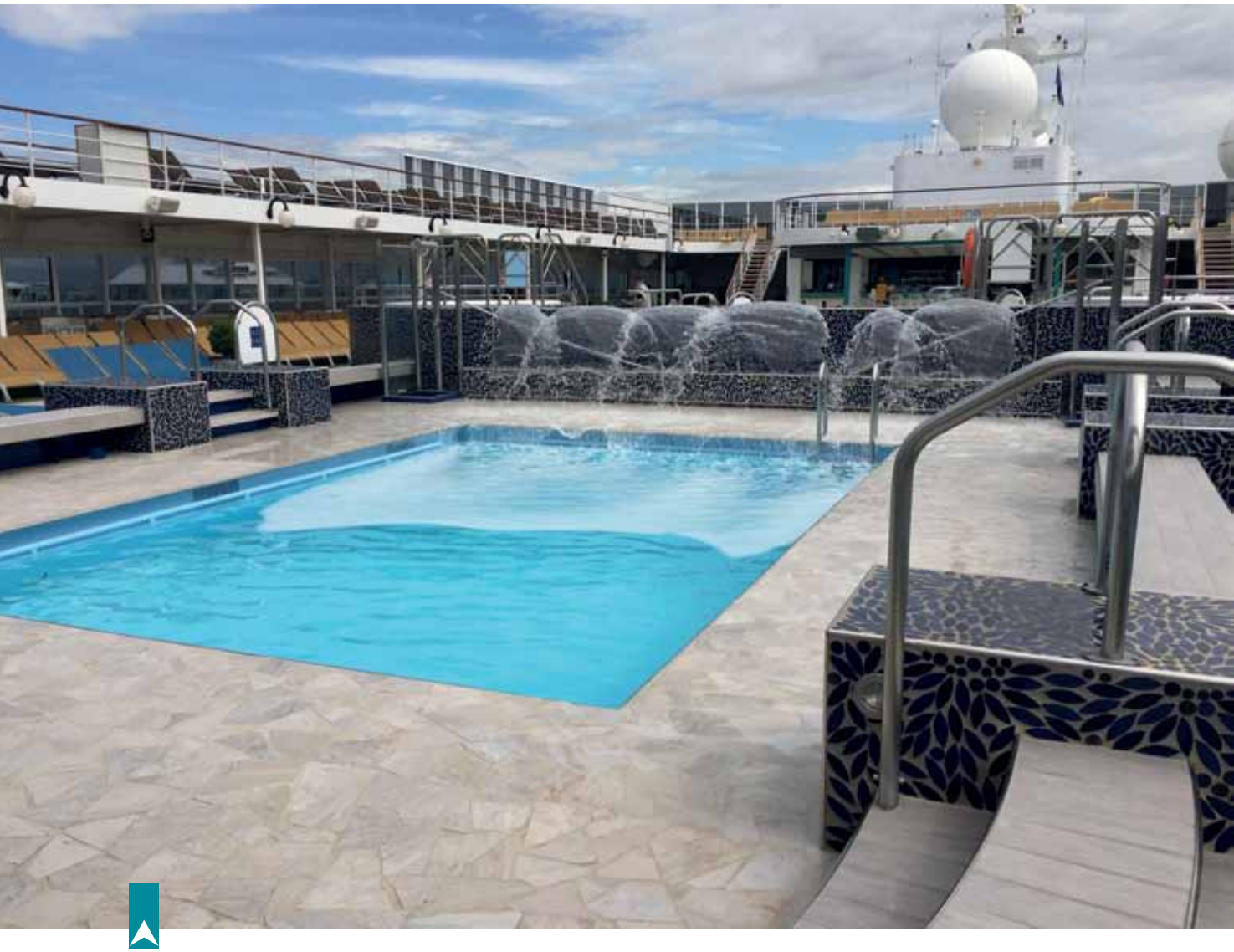
For cabins and internal areas used by the crew, Mapei solutions combine practicality, resistance and aesthetics and help safeguard the wellbeing of users thanks to products with very low emission of volatile organic compounds (VOC).

And lastly, for internal spaces, Mapei displayed products with chemical resistance to atmospheric agents and resistance to footsteps.

MetsTrade 2018 will take place from 13th to 15th November.

ON THE HIGH SEAS AROUND THE GLOBE

A SELECTION OF INTERVENTIONS CARRIED OUT ON CRUISE SHIPS USING PRODUCTS FROM THE MARINE LINE



COSTA NEORIVIERA

The Costa neoRiviera cruise ship was built in 1999 and is currently owned by Costa Crociere. The swimming pool on deck 9 was completely refurbished using various products from the Mapei Marine line. The company Basilico carried out this intervention in 2016 using MAPECOAT GUARD 100 multi-purpose epoxy coating with excellent anti-corrosion properties and MAPEDECK PRIMER 200, an adhesion promoter for polyurethane systems. The products chosen to level the artificial beach and the bottom of the pool were MAPEDECK LITESCREED, self-levelling, lightweight, self-extinguishing polyurethane base layer for the vertical surfaces and walls, and MAPEDECK LITESCREED TIXO, lightweight flexible polyurethane for levelling vertical surfaces. KERAPOXY CQ was chosen for bonding while the final coating was carried out with MAPECOAT FINISH HP and MAPECOAT FINISH TS aliphatic, polyurethane finishes.

GNV LA SUPREMA

La Suprema cruise ship is part of the fleet owned by the Italian shipping line Grandi Navi Veloci. There is an area on deck 9 which is reserved for dogs. In 2017 this area was completely overhauled. The products chosen for this intervention were MAPEDECK PRIMER 200, an adhesion promoter for polyurethane systems, MAPEDECK LITESCREED lightweight polyurethane base layer fillerized with MARINE FILLER 20 expanded cellular filler to make the substrate and MAPEDECK DESIGN to form a seamless resin coating. The final finish was created by applying MAPEDECK WAX.

CARNIVAL INSPIRATION

The Carnival Inspiration is a cruise ship owned by Carnival Cruise Lines. In 2017 the company Polywave installed flooring on deck 0, which is reserved for members of the crew. The flooring consisted of a MAPEDECK EPOSCREED LITE epoxy self-levelling underlay with a seamless coat of MAPEDECK EPOFLOOR epoxy self-levelling top-coat finished off with MAPEDECK FINISH 100.

NCL SKY

A deck in the entrance area to the Sky cruise ship, owned by Norvegian Cruise Line, was completely rebuilt. The company Polywave carried out the work using products from the Mapei Marine line: MAPEDECK EPOSCREED LITE self-levelling epoxy compound for the substrate, MAPEDECK TEAK DESIGN self-levelling compound to create the flooring with teak-effect, MAPEDECK CAULKING polyurethane resin for deck caulking, and MAPEDECK WAX for the finish.

RESERVOIRS FOR ARTIFICIAL SNOW PLANT AT MONTE PORA

WATERPROOFING TWO RESERVOIRS IN A SKI RESORT WITH MAPEPLAN T WT FPO/TPO MEMBRANE BY POLYGLASS

The Monte Pora Ski Resort is located between upper Valseriana and Valle Camonica in Northern Italy.
It ranges from 1,380 m to 1,880 m above sea level and has always been one of the closest and preferred destinations of the inhabitants of Northern Italy.
The organisation that runs the resort has made significant investments to improve the quality of the facilities so that it may be used throughout the winter. The reservoirs used to feed the artificial snow plant are extremely important features of the resort and were recently waterproofed with MAPEPLAN T WT FPO/TPO membrane made by Polyglass S.p.A., a subsidiary of the Mapei Group.

WATERPROOFING THE RESERVOIRS

The smaller reservoir was reconditioned in the autumn of 2013. Made from reinforced concrete, it is around 4 m deep and has a capacity of around 10,000 m^3. Its sides are made from precast concrete panels and they were found to have

serious seepage damages through the joints between the panels. Some of the panels were also unstable.
After carrying out a structural restoration work on the damaged precast panels, the internal surfaces of the reservoir were waterproofed with a 2.0 mm thick FPO/TPO membrane: MAPEPLAN T WT.
The MAPEPLAN T WT waterproofing membrane was dry installed and mechanically fastened to the load-bearing structure using fasteners positioned underneath the overlaps in the membrane itself.
This particular installation technique, which leaves the membrane loose from the substrate, along with the high mechanical properties and flexibility of the membrane and the hot-air welded overlaps in the membrane, enabled a complete, seamless waterproofing layer to be installed in the reservoir which is highly functional, with a long service life in the more critical areas, such as the joints between the vertical panels and the joints between the sides and the bottom of the reservoir.
In the autumn of 2016 the reserve of water has been increased by building a second reservoir set into the ground with a capacity of around 30,000 m^3 and a water head of around 6 m. This reservoir was also waterproofed with MAPEPLAN T WT membrane, but in this case it was 2.3 mm thick.
After preparing and rolling the ground, the MAPEPLAN T WT membrane was installed between special geocomposites to provide protection and drainage, while the edges around the reservoir were covered with a layer of small and medium sized stones to help it blend into the surroundings.
The new reservoir for the artificial snow plant was inaugurated on Sunday, the 18th of December, 2016 and during the party a human chain formed a group hug around the lake, with more than 500 people taking part in this special event.
Thanks to these two reservoirs, numerous kilometres of ski trails have been sprayed with artificial snow using a battery of modern snow cannons.

IN THE FACING PAGE. The two reservoirs after completion of the works.
PHOTO 1. The reinforced concrete basin before the intervention.
PHOTO 2. Installing MAPEPLAN T WT in the reinforced concrete basin.
PHOTO 3. The reservoir after the installation of MAPEPLAN T WT.
PHOTO 4. The reservoir after being filled with water, ready to be used for artifical snow.

MAPEPLAN T WT WATERPROOFING SYSTEM

The successful completion of the two reservoirs for the snow plant at the Monte Pora Ski Resort was also made possible thanks to the special characteristics of MAPEPLAN T WT, such as:

- Possibility to absorb differential movements and settling in the substrate;

PHOTOS 5 and 6. Installing MAPEPLAN T WT onto the sides and bottom of the water reservoir.
PHOTO 7. Installing MAPEPLAN T WT in difficult weather conditions.
PHOTO 8. The new reservoir was inaugurated on Sunday, the 18th of December 2016, with a human chain forming a group hug around the lake.

- May be installed in extreme surroundings and during severe weather conditions;
- High mechanical strength;
- Rapid installation times;
- Withstands critical service conditions such as ice, low temperatures and rapid emptying;
- Limited maintenance required;
- Blends in with particularly beautiful natural surroundings;
- Possibility of monitoring the waterproofing system after commissioning;
- Long service life;
- Easy to repair if accidentally damaged;
- High dimensional stability and low coefficient of thermal expansion;
- Impermeable to water in pressure;
- Resistant to mechanical wear and loads;
- Resistant to UV rays and atmospheric agents;
- Resistant to plants, roots and microorganisms;
- Resistant to heat and freezing weather;
- Resistant to ageing;
- Non-toxic: MAPEPLAN T WT membranes comply with the requirements for contact with drinkable water;
- Waterproofing system tested and commissioned on site
- Complies with the requirements of the harmonised standards EN 13361 *"Geosynthetic barriers. Characteristics required for use in the construction of reservoirs and dams"* and EN 13362 *"Geosynthetic barriers. Characteristics required for use in the construction of canals"*.
- Highly ecological with low impact on the environment, as confirmed by its certified EPD (Environmental Product Declaration) evaluation.

TECHNICAL DATA
Reservoirs for artificial snow at Monte Pora Sky Resort, Castione della Presolana, Province of Bergamo (Italy)
Years of intervention: 2013 and 2016
Intervention by Polyglass: supplying FPO/TPO membranes for waterproofing the reservoirs
Client: IRTA S.p.A.
Design: Tekn&co s.r.l.
Contractor: IRTA S.p.A.
Waterproofing company: Isoledil s.r.l.

POLYGLASS PRODUCT
Waterproofing tank and basin: Mapeplan T WT

For further information on products see the websites www.mapei.com and www.polyglass.com

Mapeplan® T WT is a FPO flexible polyolefin synthetic membrane for the waterproof lining of reservoirs, tanks and canals. It is manufactured by means of a modern multi-extrusion coating process, using high-quality raw materials and a fibreglass mat carrier. Green and non-toxic, in perfect harmony with man and the environment.

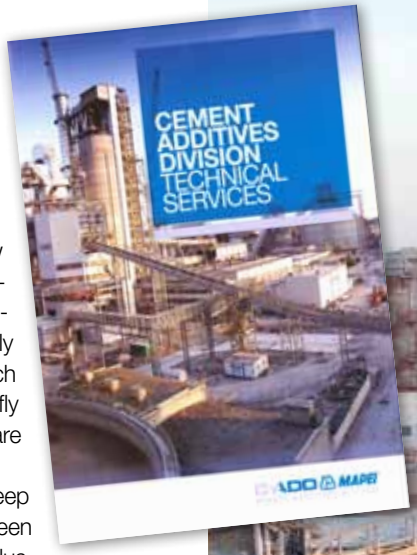
GREEN BUILDING COUNCIL ITALIA MEMBER

WWW.POLYGLASS.COM

ROOFING AND WATERPROOFING SYSTEMS
POLYGLASS®
MAPEI GROUP

TOP LEVEL TECHNICAL ASSISTANCE FOR MODERN CEMENT INDUSTRY

THE ANALYTICAL TECHNIQUES USED IN MAPEI RESEARCH & DEVELOPMENT LABORATORIES



In 2016 the global cement production was estimated at 4.6 billion tonnes, as mentioned, for example, in the Cembureau Activity Report 2016, available on the website of Cembureau (European Cement Association).

As usual, Asian countries account for three quarters of the total, with China being the biggest producer (2.3 billion tonnes). 4.6 billion tonnes would allow the batching of 15 billion m^3 concrete, around 2 m^3 for each person living on earth. Concrete is the most common building materials, thanks to its good mechanical performances, flexibility in use, durability and, last but not least, low cost. On the other hand, concrete and the Portland cement industry raise some environmental concerns, mainly related to the emission of greenhouse gases.

The manufacturing process of Portland cement is standardized and widely described in several publications. Raw materials (usually limestone and clays) are quarried, blended and ground in order to prepare the so-called "raw meal". This is used as feeding for the kiln, where Portland clinker is produced. Clinker is then finely ground together with gypsum and secondary mineral additions in order to obtain Portland cement.

High CO_2 emissions are associated to clinker production; hence, considering the stringent requirements in greenhouses gases reduction, blended cements with low clinker content (and several secondary cementitious materials – normally indicated as SCMs - such as limestone, pozzolan, fly ash, slag and so on) are the most widely used.

In the latest decades deep improvements have been made in the cement industry with the purpose of substituting traditional fuels (such as petcoke or natural gas, used to reach the high temperature needed for clinker production) with blends of different substances, coming from renewable resources or waste management.

Recent technologies for clinker production and the increased use of secondary cementitious materials promote different clinker chemistry and mineralogy studies, that should be taken into account in order to produce high quality cements. Hence, the optimization of cement performances is becoming a multi-disciplinary approach. As a matter of fact, it requires the correct management of physic-mechanical, mineralogical and microscopy data.

What are the most useful analytical techniques to study cements?
When it comes to understand the difference between cement samples, the help of a well-equipped analytical laboratory is quite valuable. Big changes can be seen in reactivity and physical behavior, after the introduction of secondary fuels or the use of SCMs. Several techniques are helpful in assessing the influence of different parameters. In this article, we review the ones that, in our opinion, are the most important. The focus is on their significance as an analytical tool rather than on the scientific principles behind each of them. As a matter of fact, modern cement industry requires top level technical assistance. Hence, only top level companies, with a high specialization in cement chemistry, mineralogy and additives formulation, can be a reliable partner. All the techniques described here (and many more) are available in Mapei highly specialized Research&Development labs.

Particle size distribution
The particle size distribution (PSD) is a description of the number and dimensions of the particles that compose cement. It can be analysed in different ways. One of the most widely used methods is laser diffraction. Several instruments are available on the market, and the powder can be either dispersed in a flux of dry air or in a non-reactive liquid, e.g. ethanol. PSD can be used as a quality control parameter (for fineness checks, normally focused on a specific particle diameter) and as a means to assess the performance of the cement grinding process. This involves the calculation of the so-called "Tromp curve", through which the optimization of the process can be determined. Grinding aids play a crucial role in the efficiency of the separator (the device that in modern cement grinding process allows obtaining a material with controlled fineness): a well-designed grinding aid can reduce the reject stream and minimize the bypass.

X-ray fluorescence
X-Ray fluorescence (XRF) substituted the manual analysis of clinker and other components in most modern cement plant laboratories.
It is a quick, reliable and relatively easy method to determine the chemical composition of a sample, allowing to check constancy of composition, the presence of minor elements, etc.

Quantitative X-ray diffraction
Quantitative X-Ray diffraction (XRD with Rietveld refinement) is an excellent tool to evaluate the mineral phases in materials. It reveals important features of cement minerals, including the real amount of individual phases, the types of calcium sulfate, the polymorphism of calcium silicates, aluminates and ferrite, and the presence of free lime, portlandite, and minor but important alkali sulfate phases. The information provides guidance to the cement processing condition. More importantly, it is a powerful tool for troubleshooting performance issues in the field.

Thermogravimetric analysis
In thermogravimetric analysis, a sample of material is heated from a very low temperature (e.g. -40°C) up to high temperature (e.g. 1000°C), and all weight

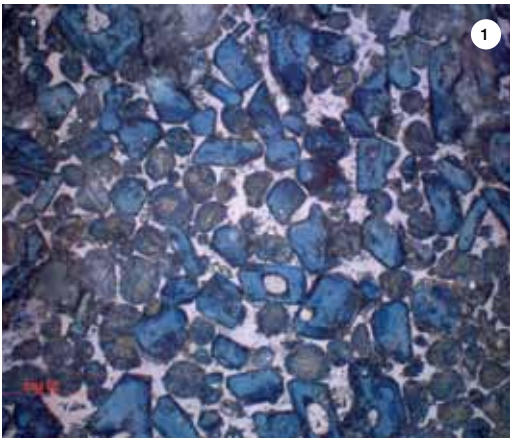


FIGURE 1. Optical microscope image taken in reflective light. Alite (blue), Belite (brown), and interstitial phases such as Aluminate (greyish) and Ferrite (light grey) are easily recognizable.
FIGURE 2. SEM image of the separator reject of a cement ground without grinding aid: the finer particles are agglomerated over bigger particles.
FIGURE 3. SEM image of separator reject of a cement ground with a Mapei grinding aid: the percentage of fine particles is much lower and agglomeration is much decreased.

changes are recorded. This allows to assess several characteristics of finished cement, namely pre-hydration, calcite content, dehydrate and hemihydrate calcium sulfate water loss, syngenite presence, and possibly others, as a quantitative determination. Normally this technique is coupled with Differential Thermal Analysis (DTA), that adds information relevant to the heat exchange (showing if the transformations are exothermic or endothermic). TGA and DTA can be very helpful in diagnosing many issues reagarding cement quality, storage flowability and prehydration.

Differential scanning calorimetry

Differential Scanning Calorimetry (DSC) is similar to TGA-DTA analysis, but instead of weight changes, heat transfer is recorded and measured. This allows to quantify the energy associated to phenomena triggered by temperature change. In cement analysis, DSC is particularly accurate in the determination of gypsum dehydration rate, providing guidance on mill operations. In general, the gypsum dehydration rate influences cement performances in several ways: an incorrect gypsum dehydration can negatively affect the normal hydration profile of cement, change its hydration kinetics, modify the flowability of the cement mortar and the concrete slump.

Isothermal and adiabatic calorimetry

The isothermal calorimetry is an excellent tool to determine cement hydration kinetics and monitor the cement hydration process. The hydration profiles from calorimetric tests can help to predict the sulfate balance, the strength development potential and the cement compatibility with concrete admixtures. Isothermal calorimetry is a very good technique to assess differences in hydration profile provided by cement additives used as performance enhancers.
Adiabatic calorimetry is complementary to the isothermal calorimetry. Hydration kinetics are studied at the temperatures generated by the heat of reaction of cement, with no correction as in isothermal experiments. Concrete, or mortar, specimens are used, to better simulate a real-world situation. This allows to troubleshoot concrete performances more effectively, and it is a useful method to study the interactions between cement additives and concrete admixtures.

SEM and optical microscopy

Burning, cooling and process conditions of the kiln at cement plants are directly responsible for the reactivity of the mineral phases of the clinker and the quality of cement. Optical microscope analysis directly reveals the burning process of the clinker, including the size of the crystals and their distribution in the matrix, kiln atmosphere and reduced condition, burning temperature, and primary and secondary cooling rates. Preparation of the clinker sample (see Figure 1) includes selecting a significant specimen, crushing it and sieving it to select an homogenous crystal size, embedding it in resin, polishing with a suitable equipment, and observing it in reflected light. The scanning Electron Microscope (SEM) is a very powerful instrument that can be used to directly observe the shape and dimensional distribution of cement and raw meal particles. At the same time, with EDX spectroscopy, it is possible to detect the chemical composition of particles or areas of the sample. The technique has proved itself very useful in troubleshooting raw meal (the blend of limestone and clay used for clinker production) issues and their combinability in the kiln. Through observation of the particles of cements, interesting information on the morphology and physical behavior can be obtained (see figures 2 and 3). Crossing the information coming from all these analytical techniques can provide the difference in being able to meet the market's requirements for a modern cement plant, and to select the right cement additive to help a plant to do it in the most economical way.

Paolo Forni, Matteo Magistri. Cement Additives Division, Mapei SpA

Respect for the environment and society is vital for our survival

CEMENTOS PORTLAND DE LEMONA WAS FIRST ESTABLISHED IN 1917 AND CELEBRATED ITS 100TH ANNIVERSARY IN GRAND STYLE THIS YEAR. LET'S FIND OUT MORE ABOUT THIS COMPANY BY SPEAKING TO ITS PLANT MANAGER, ELENA GUEDE

Congratulations on your anniversary! What is your secret?
To reach this landmark we have really had to work hard on adapting to our surroundings, constantly reinventing ourselves while holding onto our own personality and identity. There is no secret to success, just real determination to do well while envisaging economic and legal changes that might have some negative influence and getting ready to take on new challenges.

Are there any particular moments in the company's history that have been turning points marking the transition from the past to the future of your business operations?
Over the last few months we have retraced our history attempting to sum up its most important moments… They undoubtedly include the takeover in 1989, the appointment of a new Board of Directors at the same time to make sure the company continued on a family-run basis and then the first experiments with alternative fuel in the kiln. We were the first in the whole of Spain to use shredded tyres and meat and bone meal (MBM). Developing innovative projects has also resulted in our travelling around Europe and opening up our minds, improving our business's impact on the environment, drastically reducing emissions of gas and various types of particles into the air and reducing noise levels. Last but not least, CRH's (an international manufacturer of cement, aggregates, concrete products and asphalt) takeover was a gambol that really paid off for us and helped to reach our 100th anniversary.

What effect did the extremely bad recession of 2008-2009, which had such a major impact on the building industry in Spain, have on you?
The recession hit us really hard. At the time we were part of the Cementos Portland Valderrivas Group, whose operations were mainly focused in Spain. The market slowly began to shrink and that resulted in a drop in both production and investment until ultimately all operations were halted at the plant. It was a very tricky period of upheaval during which we lost a lot of customers.

Did you manage to turn the situation around?
The turning point was when we were taken over by CRH, which allowed us to keep the manufacturing plant running all year long and benefit from a stable national and international market.

You have been the plant manager for the last four years, although you have actually worked there since 1995. What goals did you set yourself when you became plant manager?
My appointment as plant manager came at one of the worst moments for the company: the plant had been closed for nine months with a reduced manufacturing output, a strike was under way and lots of workers had lost their jobs. It was hard to set any medium/long-term goals, the priority was to solve the problems we had at that time and make sure the company stayed in business. The targets we set were to make the manufacturing processes as efficient as possible, reduce the amount of time the kiln was not in operation and reach thermal/electrical consumption levels on a par with the rest of the Group's European factories, without overlooking the idea of using alternative fuels and secondary raw materials. We can now claim to have reached these goals: the Lemona plant meets even the most stringent standards.

How can you make sure your business remains sustainable in the long term?
The sustainability of a business model depends primarily on the stability of the national market, to the detriment of exports. Our plant is already organised to achieve maximum output and we also plan to make a few changes to the plant, such as revamping the clinker roller press to improve efficiency and grinding costs.

You became the first woman in Spain to head a cement plant. Are you proud of this achievement?
I am not particularly proud of being the first woman to head a cement plant in Spain or in our group, but I am very proud of being at the helm of a team of dedicated and responsible people, who have allowed me to achieve the targets I have already mentioned. It is no secret that this is a predominantly male-dominated business, but for that very reason being in this position allows you to keep on learning and doing better.

What do you think the building industry needs to do to attract more female talent?
Changes of this scope take time and require progress to be made in the industry. There are increasingly fewer obstacles to change: companies have their own equality programmes and women are increasingly choosing careers in engineering or technology. These are also cultural changes, so they vary from country to country, but I believe that if women are willing to take a chance on this kind of technical career, then there is nothing to stop them from achieving these professional goals.

What influence do sustainability and business innovation have?
Sustainability is in the company's DNA. Since our plant is located in the middle of a small town like Lemona, respect for the environment and local community are vital for our survival. Our economic progress has always progressed hand-in-hand with investment in the environment, such as changes in manufacturing models and gas purification processes to keep within the most stringent limits on emissions and noise levels. We have had ISO 14001 certification since 2000. We were also one of the first companies in the industry to adopt the EMAS Management System and we have been drawing up our own Sustainability Report since 2003. This has resulted in our winning numerous national and international awards. Sustainability has progressed hand-in-hand with innovation: we were pioneers in developing waste management projects, controlling emissions into the air, developing new cement and concrete-based products, and reducing CO_2 emissions to a minimum, being actively involved in both national and European innovation programmes over the last 20 years.

How can the cement industry make sure that certain types of waste do not end up in dumps?
The cement manufacturing industry has a vital part to play in the worldwide management of waste. When waste cannot be reused or recycled, it must be used for a secondary purpose in cement plants.
As an example, when certain plastics can no longer be reused, such as the film used for bags for holding rubbish/garbage or others of low-quality, they can be suitably adapted to be used as fuel in the clinker kiln instead of other fossil fuels such as petcoke. This means they do not need to be disposed in landfills, where they would remain for a hundred of years without degrading.
Waste that can still be recycled or reused should not be sent to cement plants, just waste for which all other options have been considered and which the plant could make use of as a material or for energy purposes. This is the case, for instance, with tyres, meat and bone meal, foundry sand and slag from steel works etc.

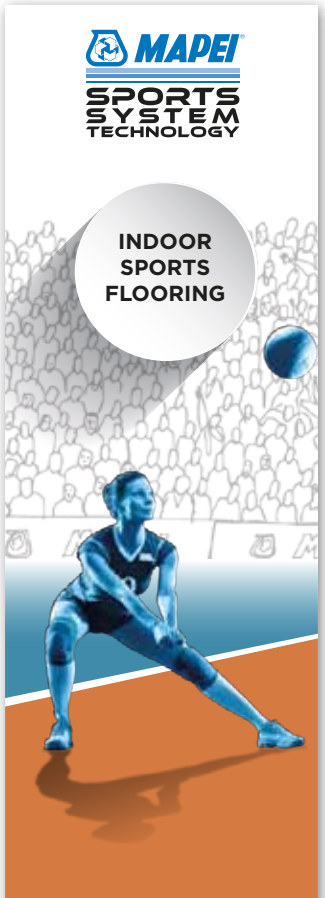
How would you describe your experience working with Mapei products?
We were one of the first cement plants to carry on industrial tests and use Mapei cement additives in Spain and so far they have certainly met the standards we expect and the needs of our production process.

FROM VIZCAYA TO THE REST OF THE WORLD

Cementos Portland Valderrivas began to really boom in the 1950s-1960s, when lots of public works, dams and industrial areas were constructed in Spain. As Elena Guede points out, from the very beginning the company has provided "the cement for completing the most emblematic infrastructures, like, for example, Rontegui Bridge, the terraces of San Mamés Stadium, Bilbao Commercial Port and Airport, Euskalduna Conference Centre and Concert Hall, the BEC (Bilbao Exhibition Centre) and magnificent Guggenheim Museum Bilbao, even giving material form to structural concepts by artists of the calibre of Chillida".
Its cement has even been used in projects in other Spanish areas, such as Puerto de Ferrol Dam, the A68 motorway from Zaragoza to Bilbao, Burgos Airport, the Museum of Human Evolution in Burgos, Plaza de Toros and the Gaunas Stadium in Logroño, without forgetting all the other works in countries where Cementos Lemona has exported to, such as Congo, the Netherlands, and United Kingdom, just to mention a few.

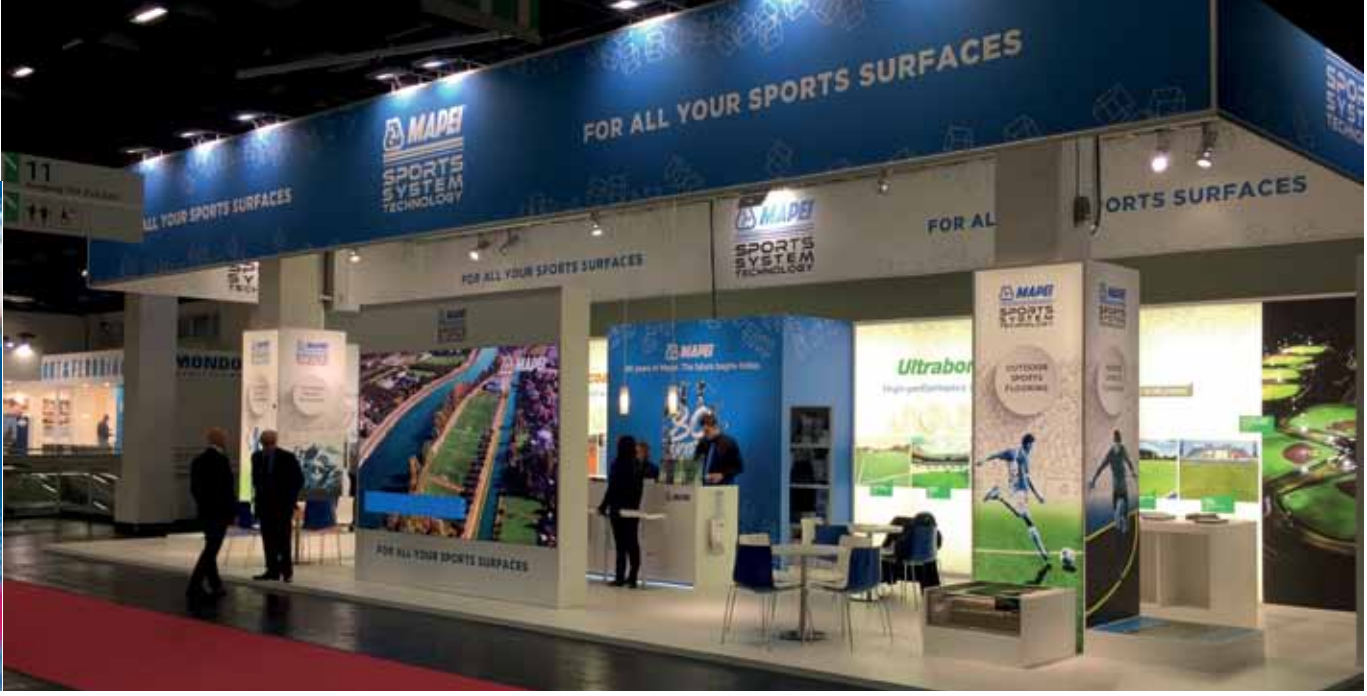
COLOGNE'S WORLDWIDE **HUB FOR SPORTS**

People moving within a society which is changing: this was the core theme of FSB, the International Trade Fair for Amenity Areas, Sports and Pool Facilities, which took place in Cologne (Germany) from 7th to 10th November, rich in workshops and congresses.
This year the trade fair reached its 25th edition, with 634 exhibiting companies from 45 countries on an exhibition space covering 65,000 m². These included 164 exhibitors from Germany and 470 exhibitors from abroad. The share of foreign exhibitors was 74 %. Around 26,600 trade visitors from 114 countries came to the trade fair duo comprising of Aquanale and FSB. The share of foreign visitors was 62%.
"The trade fair is the trend, contact and business forum for sports facilities, swimming pools, playground planning, amenity area and urban design! The number of visitors, level of internationality and visitor quality clearly underline this leading position" explained Katharina C. Hamma, Chief Operating Officer of Koelnmesse GmbH.
The future of sports and amenity facilities is strictly connected with the increasing significance of the multifunctionality of places of exercise for lifestyle activities, a stronger focus on universal design suitable for the disabled in line with the ageing society, and the obligation towards sustainable construction for the achievement of climate protection goals.



MAPEI FOR ALL SPORTS SURFACES

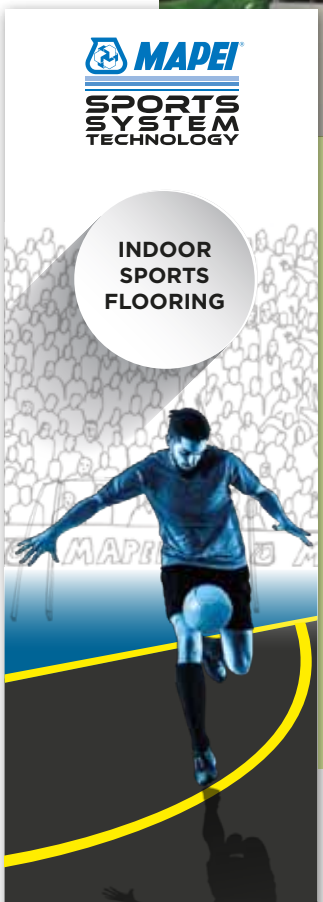
Designing, building and maintenance: for every and each execution stage of sports facilities and surfaces, at FSB 2017 Mapei suggested specific, tailored solutions for grass and resin surfaces, for wooden floorings, for rubber athletic tracks, for stadiums, velodromes, and skating rinks.
The Mapei stand was divided into various areas, with each area designed according to the type of technology, the type of sports surface or the type of structure where they are to be installed. All was conveyed by clear communication means: special icons showed the application field or the product's technical characteristic on both stand and displayed



documentation.
All Mapei systems on display at FSB comply with the specifications and standards of the most important sporting bodies, such as FIFA (Fédération Internationale de Football Association) for soccer pitches, ITF (International Tennis Federation) for resin tennis courts and AITG (Italian Golf Technicians Association) for golf courses.
Thanks to the comprehensive range of products on offer and their reliability, Mapei has become a partner for various sporting bodies, such as the aforementioned AITG, and an Official Supplier for FIT (Italian Tennis Federation).
At FSB 2017 Mapei showed visitors a complete range of products, which make the company the ideal technical partner for building sports surfaces.

MAPESOIL: SPORTS SURFACES WITH IN-BUILT HORIZONTAL DRAINAGE

The MAPESOIL system allows the installation of permeable sports surfaces without the need for pipework. It includes the special MAPESOIL VD hydraulic binder, which lies immediately below the sand substrate for the turf, to carry water away from the court or pitch. This type of sub-base has a much higher drainage capacity than traditional systems and, by placing the screed closer to the surface, water flows away more quickly. This solution is suitable for sports surfaces used for football, golf, baseball, hockey and rugby, to name but a few.



ULTRABOND TURF: ADHESIVES FOR ARTIFICIAL GRASS

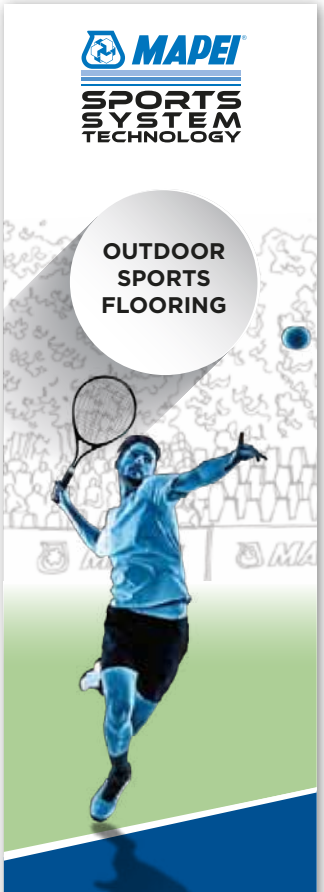
The family of ULTRABOND TURF polyurethane adhesives enables artificial grass playing surfaces to be laid in compliance with the standards of FIFA, golfing bodies and many other sports governing bodies.
They are used to lay the jointing strips between adjacent rolls of artificial grass and are characterised by their ease of application, excellent rib stability, including in hot weather, and high bond-

"MULTIFUNCTIONALITY WAS THE MAIN MESSAGE PERCEIVED DURING THIS EDITION OF FSB", DECLARED ELISA PORTIGLIATTI, PRODUCT MANAGER FOR THE MAPEI SPORT LINE, WHO HAS BEEN STUDYING THIS SPECIAL SECTOR FOR YEARS

ing strength.
ULTRABOND TURF adhesives are well renowned and available all around the world where they are used to bond grass playing surfaces for both important international tournaments and for public and amateur use.

MAPECOAT TNS AND PU SYSTEMS FOR SPORTS SURFACES

At FSB Mapei showcased its comprehensive range of acrylic and polyurethane resin systems available for sports surfaces. These systems have high performance characteristics as well as being solvent-free, elastic and resistant to UV rays. Installation is quick and simple and they are available in 24 different colours.
They are recommended for indoor and outdoor sports surfaces such as tennis courts, multi-purpose playing surfaces, in-line skating rinks, velodromes, stadiums tribunes, sports facilities, and others.
Mapei has the following systems available for tennis courts: MAPECOAT TNS PROFESSIONAL, MAPECOAT TNS CUSHION, MAPECOAT TNS COMFORT, MAPECOAT TNS REMOVE, MAPECOAT TNS BINDER and MAPECOAT TNS REINFORCED.
For multi-purpose playing surfaces (volleyball, basketball, handball and 5-a-side soccer), apart from MAPECOAT TNS MULTISPORT COMFORT and MAPECOAT TNS MULTISPORT PROFESSIONAL, at FSB Mapei also proposed the polyurethane resin systems PU MULTISPORT COMFORT and PU MULTISPORT PROFESSIONAL.
For in-line skating rinks and velodromes, Mapei has developed MAPECOAT TNS ROLLER PROFESSIONAL and MAPECOAT TNS CYCLE TRACK, both of which are particularly resistant to abrasion and to mechanical stresses and loads.
For tribunes in stadiums and sports facilities Mapei proposed MAPECOAT TNS TRIBUNE, a system used to create walkways inside stadiums and sports complexes which is particularly resistant to abrasion and pedestrian traffic.



"The fair went really well. – says Fabio D'Amato, Corporate Product Manager for the Mapei sport line – we made a lot more new contacts than in the previous years, also because the Mapei brand is more widely known and because we have a comprehensive range of solutions. This trade fair is aimed at experts, users and installers from the sector who see Mapei as a company that is always developing new solutions. The MAPECOAT TNS REINFORCED and MAPECOAT TNS CYCLE TRACK systems were certainly highly appreciated. We are also focusing on redevelopment work because, as far as Europe is concerned, apart from building new facilities, there is an increasing amount of redevelopment on old sport complexes".

ADESILEX G19 FOR RUBBER ATHLETIC TRACKS

ADESILEX G19 is Mapei's proposal for the installation of indoor and outdoor rubber athletic tracks. It has already been used to install numerous athletics tracks for the most prestigious international events, such as the Olympic Games, the first of which was the 1976 Montréal Olympics.
ADESILEX G19 stands out for its strength and high level of adhesion to the most widely used substrates in the building industry, as well as to synthetic rubber. It is resistant to mechanical stresses and loads associated with athletics events and helps athletes achieve the highest levels of performance.

ULTRACOAT SPORT SYSTEM FOR WOODEN SPORTS SURFACES

For wooden playing surfaces at FSB Mapei proposed ULTRACOAT SPORT SYSTEM, a water-based coloured finishing system comprising: ULTRACOAT PREMIUM BASE two-component, water-based basecoat characterised by high isolating properties, excellent defect-hiding capacity, easy buffing and ease of application; ULTRACOAT HT SPORT two-component, water-based polyurethane lacquer specifically developed to meet the requirements of wooden playing surfaces; ULTRACOAT SPORT COLOR one-component, water-based, coloured acrylic paint for marking out courts and pitches and colouring playing zones on wooden sports surfaces.

The next edition of FSB will be held in Cologne from the 5th to the 8th of November 2019.

SEMINOLE COUNTY SPORTS COMPLEX IN SANFORD (USA)

ABOVE. Seminole County Sports Complex in Sanford (USA).
BELOW. Nine of the fifteen state-of-the-art lighted athletic fields are made of synthetic turf installed with ULTRABOND TURF PU 2K adhesive.

ULTRABOND TURF PU 2K: A VALUABLE ALLY FOR AN AWARD-WINNING PROJECT

Located on 102 acres in Sanford (Florida, USA), the new 27-million-US-dollar tournament sports complex features 15 baseball/softball multi-purpose fields (9 synthetic and 6 natural turf) that can also be used for soccer, football and lacrosse. The 15 fields are located in four different hubs. A centrally-located administration building includes offices and a meeting room with the capacity to hold 120 people.
The complex has already booked 38 tournaments throughout 2016 and into 2017 and is expected to attract over 100,000 athletes and spectators and generate more than 36,000 hotel room stays, resulting in a more than 50 million US dollar impact to the local economy within its first eight months of operation.

CUTTING-EDGE TURF INSTALLATION

Nine of the fifteen state-of-the-art lighted athletic fields are made of synthetic turf installed with ULTRABOND TURF PU 2K adhesive. This is a two-component, solvent and water-free polyurethane adhesive for bonding jointing strips between synthetic grass sheets, both indoors and outdoors. It is easy to apply and particularly recommended for those users who are allergic to epoxy or epoxy-polyurethane products. In the winter, it works better than epoxy-polyurethane products, which set slower at low temperatures. When ULTRABOND TURF PU 2K is used for bonding ULTRABOND TURF TAPE 100, it results in pitches which meet FIFA standards.
At Seminole County Sports Complex ULTRABOND TURF PU 2K adhesive was also used for field installations, batting cage areas, and surrounding areas that used synthetic turf. Four of the fields are “385’ to center field” synthetic grass fields (about 33.5x19 m, rectangular); five are “350’ to center field” synthetic grass fields (about 32x19 m, rectangular).
Due to the excellent results of the installation, two prestigious awards were bestowed on the installation company and the contractor: Medallion Athletic Products, Inc., received the 2016 Silver Award for Multi-field Construction from the American Sports Builders Association while the general contractor, Wharton-Smith, Inc., Construction Group, won the 2016 Award of Merit from the Associated Builders and Contractors (ABC) Awards of Excellence program for the sports complex.

TECHNICAL DATA

Athletics Fields at Seminole County Sports Complex, Sanford, Florida (USA)
Year of construction: 2016
Year of the intervention: 2016
Client: Seminole County
Design: HKS, CPH
Contractor: Wharton Smith Inc. Construction Group
Installation company: Medallion Athletic Products Inc.
Mapei distributor: Shaw Sports Turf
Mapei coordinator: Michael McManamon, Mapei Corp. (USA)
Photos: McManamon, Raul Ballestrer

MAPEI PRODUCT

Installing turf: Ultrabond Turf PU 2K

For further information on products see www.mapei.com and www.mapei.us

BURNIE TENNIS CLUB IN TASMANIA

MAPECOAT TNS CUSHION HELPED TO BUILD TENNIS COURTS FOR A SPECIAL EVENT IN AUSTRALIA

Held at the Burnie Tennis Club in Tasmania (Southern Australia), the 2017 edition of the ATP (Association of Tennis Professionals) Burnie International Tennis Tournament not only provided a massive sporting spectacle for the tennis public but also showcased perfect tennis courts thanks to the use of MAPECOAT TNS CUSHION.

ATP Burnie International Tennis Tournament features an ATP Challenger tennis event and an ITF (International Tennis Federation) Pro Circuit women's event. The tournament has been held every year since 2003 except 2016 when the courts were closed for a major upgrade.

A CUSHION FOR THE COURTS

The 1.06-million-Australian-dollar (about 680,000 Euro) upgrade has been jointly funded by the Australian Government through a Community Development Grant Program with a contribution by the State Government, Tennis Australia, Burnie Tennis Club and the Burnie City Council. Mapei contributed to the upgrade of the center from a '3 coat Professional' system to a '9 coat MAPECOAT TNS CUSHION' system.

MAPECOAT TNS CUSHION is a medium-elasticity, multi-layered system made from acrylic resins in water dispersion with special fillers used to make playing surfaces suitable for professional-level tennis with high resistance to wear, UV rays and various weather conditions.

When MAPECOAT TNS CUSHION is applied on surfaces, it forms a semielastic playing surface that has excellent play-

IN THESE PAGES. The Burnie Tennis Club showcases perfect tennis courts thanks to the use of MAPECOAT TNS CUSHION medium-elasticity, multi-layered system made from acrylic resins.

IN THE SPOTLIGHT

MAPECOAT TNS FINISH 1.3.4

It is a coating product made from a balanced mix of acrylic resins in water dispersion and selected fillers for new indoor and outdoor tennis courts and for overlaying existing resin courts.
MAPECOAT TNS FINISH 1.3.4 is available in three courtpace categories (1, 3 and 4) and is certified by the ITF (International Tennis Federation). It has excellent resistance to abrasion and guarantees the durability of surfaces. MAPECOAT TNS FINISH 1.3.4 is resistant to all types of climates, aggression from smog and sunlight and offers hard-wearing, durable protection for substrates. It is available in various colours from the standard colour chart and according to individual samples using the ColorMap® automatic colouring system.

ing comfort and performance characteristics, such as perfect bounce of the ball, quick, safe changes in direction and an excellent compromise between balance and slide for players.
The project commenced with the application of MAPECOAT TNS GREY BASE COAT acrylic resin-based basecoat and filling paste on the entire 8,575 m^2 surface. This process was followed by the application of a further two coats of MAPECOAT TNS GREY BASE COAT creating the cushion base for the tennis courts. Two coats of MAPECOAT TNS FINISH 1 were applied followed by one coat of MAPECOAT TNS FINISH 3 which gave the tennis courts the desired speed as specified by Tennis Australia, the governing body for tennis in Australia. Both MAPECOAT TNS FINISH 1 and MAPECOAT TNS FINISH 3 are coloured acrylic resin-based coatings for indoor and outdoor tennis courts and multi-purpose playing surfaces, certified by ITF.
The white line marking was created using MAPECOAT TNS LINE acrylic resin-based paint.
The contractors completed a total of 11 full size tennis courts and 4 half size Hot Shot tennis courts using this system with outstanding results.
Completed in the blue shade (a symbolic colour for the Australian open tennis event), the upgrade of the courts at the Burnie Tennis Club was welcomed by executives from ATP, the International Tennis Federation (ITF), Tennis Australia, the Burnie Tennis Club, players and officials of the tournament.
The Burnie City Council Major Anita Dow commented that, "The courts look fantastic. The Burnie Tennis Club can now open itself up to a host of other major tennis events such as the 2017 Australian Masters and it is also in a better position to be able to further support junior development."

TECHNICAL DATA
Burnie Tennis Club, Burnie, Tasmania (Australia)
Year of construction: 2016
Year of the Mapei intervention: 2016
Client: Burnie Tennis Club
Contractor: RT & NJ Construction Services
Project manager: Travis Knight
Installation company: Tuff Turf Pty Ltd
Mapei coordinator: Neil McIntosh, Mapei Australia Pty Ltd.

MAPEI PRODUCTS
Renovating tennis courts:
Mapecoat TNS Grey Base Coat, Mapecoat TNS Finish 1, Mapecoat TNS Finish 3, Mapecoat TNS Line

For further information on products see www.mapei.com and www.mapei.com.au

GREATER SHEPPARTON SPORTS PRECINCT

BUILT USING INNOVATIVE PRODUCTS SUCH AS MAPESOIL FOR THE SUBBASE, THE PRECINCT MAY BE A VENUE FOR THE 2030 COMMONWEALTH GAMES

Completed in 2016 for the community of the Goulburn Valley in Southern Australia, the Greater Shepparton Regional Sports Precinct is a regional sports hub with facilities for athletics, football, hockey, netball and a range of other uses.

This 21 million Australian dollar (over 13 million Euro) project is one of the most significant sports centre in regional Australia and is paramount in a bid by 11 regional Victorian towns and cities to host the Commonwealth Games in 2030.

Having regularly hosted state-wide sports championships in numerous sports and welcomed international competitions in squash, BMX, triathlon, and beach volleyball, it may well be that the precinct will, in just over a dozen years, host one of the world's largest sporting events.

INNOVATIONS FROM ABROAD FOR THE SUBBASE

Among innovations within the precinct, the contractor Tuff Turf Pty Ltd completed the design and construction of two synthetic grass all-weather playing fields.

In both hockey fields the synthethic grass covering was installed with ULTRABOND TURF 2 STARS two-component, rapid-setting polyurethane adhesive with very low emission of volatile organic compounds (VOC). The lines were marked with ULTRABOND TURF TAPE 300 jointing strip.

With the final stages of the redevelopment well underway, the contractors also took on the challenge of the design and construction of a running track surface approved to the standards of IAAF (International Association of Athletics Federation). Again with problematic subbase issues, the contractor looked for an answer to keeping the costs associated with the removal of vast amounts of material to a minimum. As a result, they approached Mapei Australia Pty Ltd (the Group's local subsidiary) for their recommendation on the use of MAPESOIL 100, a product specifically produced for sub-base stabilisation as compared to conventional products. Although MAPESOIL 100 had been extensively used in Europe at recognised projects such as Luigi Ferraris Stadium in Genoa, Chievo Training Centre in Verona, Juventus Sta-

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PHOTO 1. Geotechnical tests were conducted on the soil to be treated.
PHOTO 2. Spreading and mixing MAPESOIL 100.
PHOTO 3. Compacting MAPESOIL 100 with a roller.
PHOTO 4. Mixing and compacting the mix.
PHOTO 5. The track before completion of the works.
PHOTO 6. ULTRABOND TURF 2 STARS was used to bond turf in two hockey pitches in the precinct.

dium and Training Centre in Turin, and Atalanta Training Centre in Zingonia (Italy) to name a few, this was to be the first installation of this type in Australia.
With the use of MAPESOIL 100 to stabilise the sub-base, the contractor found the answer to overcoming this problematic site. The use of this stabilising product by Mapei meant that there was a 75% reduction in waste soil removal from site.
The contractor took on this alternate treatment process after months of geotechnical testing which gave them the security of achieving the results required for the perfect sub-base.
As a consequence, detailed tests were conducted at every possible hold point of the construction to ensure Australian standards were met and specifications followed. It came as no surprise that all results obtained from tests, especially as for CBR load-bearing index values and density ratio, outperformed expectations of the Australian team given that the MAPESOIL 100 had not been utilised on a project in Australia previously.
Geotechnical tests were conducted to measure certain values so as to ensure optimum results were obtained. After initial test results were obtained, the installation of MAPESOIL 100 commenced.
After the application of the MAPESOIL 100 with the addition of water to achieve the optimum moisture content (OMC), the involved areas were mixed, graded and then rolled to achieve compaction of the sub-base. On the completion of compaction the surface was kept moist to ensure a proper seasoning of the surface.
The final result was a credit to all concerned and certainly allowed the acknowledgment that sub-base stabilisation should now look to the MAPESOIL system as a real and viable option for the future in all Australian sports venues.

IN THE SPOTLIGHT

MAPESOIL 100
It is a hydraulic, high-performance, fibre-reinforced powdered stabilising agent used to treat and consolidate soil and recycled or raw aggregates. It is used for stabilising sub-bases for artificial turf playing surfaces, such as synthetic grass football pitches; for cold-recycling old sub-bases from existing sports surfaces made from bitumen conglomerate; for creating sub-bases for playing surfaces by recycling old, worn out synthetic playing surfaces; for stabilising existing clay courts and converting them into artificial grass pitches, etc.. Thanks to its high performance characteristics, sub-bases constructed using MAPESOIL 100 are particularly suitable for installing the latest generation of synthetic grass (such as "FIFA PRO"), as well as for installing top level playing surfaces as specified by the relative Sports Federations for other disciplines.

TECHNICAL DATA
Athletics track and hockey pitches at Greater Shepparton Regional Sports Precinct, Shepparton (Australia)
Year of construction: 2016
Year of the intervention: 2016
Intervention by Mapei: supplying products for the subbase and for installing synthetic grass surfaces
Client: Shepparton City Council
Contractor: Tuff Turf Pty Ltd
Project manager: Travis Knight
Mapei coordinator: Neil McIntosh, Mapei Australia Pty Ltd

MAPEI PRODUCTS
Stabilising the subbase: Mapesoil 100
Installing synthetic grass: Ultrabond Turf 2 Stars, Ultrabond Turf Tape 300

For further information on the products see www.mapei.com and www.mapei.com.au

THE FRIULI STADIUM - DACIA ARENA

TO THE RIGHT. An external view of the Friuli Stadium, also called Dacia Arena: the 20th stadium in Italy for capacity, it is the home ground of Udinese Serie A team.
BELOW. MAPECOAT TNS URBAN coloured acrylic resin was chosen to coat the concrete floors.

The Friuli Stadium, which for sponsorship reasons is also known as the Dacia Arena, is the largest football stadium in the city of Udine (in the Northern Italian region of Friuli Venezia Giulia), the second largest in the same region and the 20th in terms of capacity in Italy.
It used for the home matches played by Serie A team Udinese, which in 2013 was given the right by the local City Council to use the playing surface and manage the structure for 99 years. The stadium was inaugurated in 1976 and, since then, it has been refurbished several times. It now has a capacity of 25,144 for football matches and around 35,000 for non-sporting events. The most recent important refurbishment work was divided into different phases so that Udinese wouldn't be forced to play their home matches elsewhere while the work was being carried out.
During the summer of 2013, the athletics track was dismantled and the football pitch was moved next to the main covered stand. In the same period, new squad benches were installed and the parapet for the moat at the foot of the stand was modified. The real work started on the 30th of April 2014 with the complete demolition of the old North Terrace and removal of the structure's lighting system. In June 2015 the North Stand and the East Stand were completed and the two floodlight towers on the east side were dismantled.

THE WALKABLE AREAS IN THE STADIUM WERE COATED WITH MAPECOAT TNS URBAN

On the outside of the stadium, the façade of the three new sides is characterised by 10,000 three-dimensional, rhomboid inserts which give the entire structure a scale-effect that reflects the sunlight and changes colour according to the weather conditions. Thanks to this particular effect the stadium has also been nicknamed "The Diamond".
The steps in the stands and terraces have been fitted out with 28 rows of multi-coloured seats.
The Friuli Stadium was completely opened on the 17th of January 2016 on the occasion of the Udinese's home game against Juventus, the 20th match of the season.
Today, it is a modern stadium with cutting-edge characteristics in the football world and it is the third stadium in chronological order to be owned by a football club, after the Juventus Stadium of Turin (Northern Italy) and the Mapei Stadium-Città del Tricolore in Reggio Emilia (Central Italy).

GUARANTEEING FUNCTIONALITY AND SAFETY

When constructing, refurbishing or managing any sports stadium, it is extremely important to guarantee a certain level of functionality and safety for all its users.
Every area of a stadium, whether used for the actual games or events, the technical areas used by those working in the stadium or areas open to the general public, must take into consideration the various requirements in terms of safety as

MAPECOAT TNS URBAN
It is a coating product for external surfaces made from a balanced mixture of acrylic resin in water dispersion and selected fillers. MAPECOAT TNS URBAN is used to form walkable surfaces in external and internal areas with high resistance to atmospheric agents such as smog and UV rays, aggressive chemicals contained in de-icing salts and abrasion caused by the action of footsteps, thereby guaranteeing durability over the years. It may be applied on both old painted surfaces and on new surfaces.
MAPECOAT TNS URBAN is a product certified by the ANAS (Italian National Autonomous Roadways Corporation) laboratories for:

- high resistance to freeze/thaw cycles in compliance with EN 1367-1;
- high resistance to the aggressive action of fuel, lubricants and saline solutions in compliance with the UNICHIM method No. 394;
- high skid resistance in compliance with EN 1436 (62 B.P.N. as per British Portable tester Number).

MAPECOAT TNS URBAN is available in 20 standard colours and in a wide range of other colours upon request.


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specified by the norms and standards issued by national sports governing bodies.
The surfaces used for pedestrian traffic, especially in areas used by the general public, must guarantee the following aspects:
- surfaces must have an adequate non-slip finish, especially in external areas affected by weather conditions which could make surfaces damp or wet (surfaces, for example, must have the correct level of porosity to guarantee stability during use);
- they must have a high level of resistance to abrasion. Floors are exposed to the constant action of footsteps and, in the case of sports stadiums, this action takes place and is concentrated into periods of just a few hours during sports or other events;
- cleanability of the surfaces, using proper materials to make floors that are easier to clean and/or wash in order to maintain them presentable and prevent floors from premature ageing;
- resistance to the action of chemicals caused by contact with de-icing salts applied during the winter to prevent ice forming or snow settling, so that the floors may still be used in the event of bad weather;
- good resistance to weather conditions and smog to prevent the surface deteriorating, thus increasing the durability of surfaces over the years.

ALL THE ADVANTAGES OF THE MAPECOAT TNS URBAN SYSTEM

For all the reasons mentioned above, it was decided to coat the concrete floors for pedestrian use, a total surface area of 1,200 m^2, with the acrylic resin-based system MAPECOAT TNS URBAN.
This system meets all the requirements listed above and creates a monolithic, waterproof surface, that is, a surface that cannot be damaged by water or freeze/thaw cycles. Thanks to its high extension rate of 110%, which has been measured according to the parameters in DIN 53504 standard, the system can also withstand the heavy stresses and loads normally acting on surfaces in structures such as a football stadium.
The coating applied, therefore, maintains the integrity and durability of the cementitious structure over the years, has particularly high performance characteristics and forms an attractive finish.


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The first step of the work was to roughen the existing surface with a single-head brushing machine and remove all the dust formed in order to remove any loose material from the surface.
After filling the gaps in the concrete floor with PLANITOP 100 fine-textured, rapid-setting mortar, the surfaces were primed by applying a coat of MAPECOAT I 600 W two-component, transparent epoxy primer with a roller to form a better grip between the existing concrete floor and the following coat of acrylic resin.
The next step was to apply a coat of MAPECOAT TNS WHITE BASE COAT with a trowel, an acrylic resin basecoat and filling paste in water dispersion with selected fillers. The result was a flat, even surface that prevents the formation of puddles and standing water.
Once the basecoat had dried, a spreader was used to apply two coats of MAPECOAT TNS URBAN coloured acrylic resin-based coating with selected fillers, which forms the layer most exposed to wear.
Work was completed by applying a coat of MAPECOAT TNS PROTECTION two-component transparent finish, which provides extra protection and improves the mechanical characteristics of surfaces and reduces dirt pick-up, so surfaces are easier to clean.


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PHOTO 1. The first step was to prime the surfaces with MAPECOAT I 600 W.
PHOTO 2. MAPECOAT TNS WHITE BASE COAT was used to form a flat, even surface.
PHOTO 3. Two coats of MAPECOAT TNS URBAN coloured coating were applied with a trowel.
PHOTO 4. Work was completed with a finishing coat of transparent MAPECOAT TNS PROTECTION.

TECHNICAL DATA
Friuli Stadium – Dacia Arena, Udine (Italy)
Year of construction: 1976
Period of the Mapei intervention: 2013-2016
Intervention by Mapei: suppling products to coat and protect concrete surfaces
Client: Udinese Calcio SpA
Designer: Studio Area Progetto Associati
Main contractor: Pre System Spa
Flooring contractors: Tagliapietra Srl, Basilano, and Edil Campana Srl
Mapei coordinators: Mauro Orlando, Francesco Faggian and Marco Cattuzzo, Mapei SpA (Italy)

MAPEI PRODUCTS
Filling concrete gaps: Planitop 100
Priming concrete surfaces: Mapecoat I 600 W
Coating concrete surfaces: Mapecoat TNS White Base Coat, Mapecoat TNS Urban and Mapecoat TNS Protection

For further information on products visit www.mapei.com

20 YEARS OF POLYURETHANES

ANTONIO AUSILIO TELLS US ABOUT THE GROWTH OF ONE OF THE MOST INNOVATIVE MAPEI RESEARCH GROUP

Twenty years have gone by since the distant days of 1997 when Enrico Pozzi, an expert in chemistry and polyurethane materials, was taken on by Mapei to head the newly created R&D Polyurethanes group.

The same year the company was celebrating the sixtieth anniversary of its foundation. The management, well aware of the new challenges appearing on the horizon as a direct result of Mapei's rapid expansion onto the international market and the impact of globalisation, put into operation a plan to considerably strengthen the Corporate Research & Development laboratory.

Mapei's commitment to R&D is still considered to be one of the company's keys to success, but never had this commitment been so emphasised as between the end of the 1990's and the beginning of the 21st century.

The Polyurethanes Lab, similarly to others that would soon follow, played an important part in this small revolution. As with all things new, the beginning was not easy and it took several years to see the first polyurethane-based products bearing the Mapei brand.

This slow start, however, is in stark contrast with the current situation, where almost every Mapei line includes various polyurethane-based products in its portfolio. It is important to note that part of the problem was due to the different approach required for the polyurethane-based materials compared with the products made by Mapei up until that time.

In addition, there are also the undeniable difficulties that we still have to face during the production of these materials: it is no coincidence that the Polyurethanes Lab is the department that carries out the largest number of industrial trials in the company's main manufacturing facility in Robbiano di Mediglia, not far from Milan.

Over the years, this apparent weakness has been transformed into a point of strength. Once we learned how to deal with the complexities, we started developing products that most of our competitors are still unable to offer, enabling Mapei to consolidate its position as a reference company for the market.

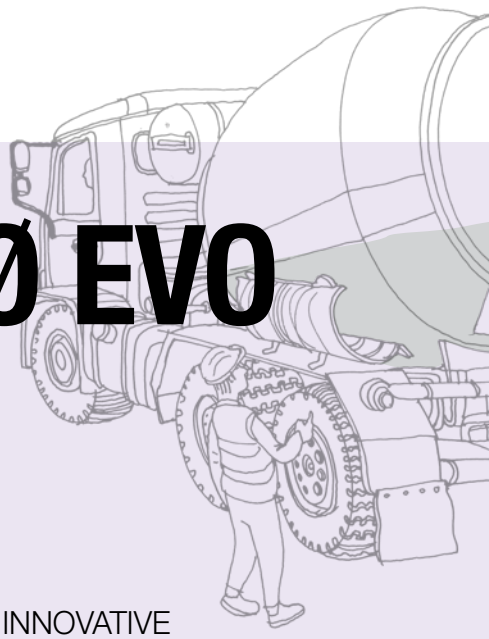
It would take too long to list all the products developed over the years and it would suffice to name just the most representative: the family of the silane-terminated polyurethane-based adhesives for wooden flooring (ULTRABOND ECO S940 1K, ULTRABOND ECO S948 1K, ULTRABOND ECO S955 1K and ULTRABOND ECO S968 1K) which, year after year, is allowing Mapei subsidiaries in North Europe to conquer increas-

ingly significant portions of the market.
Or the family of the adhesives for artificial turf (ULTRABOND TURF PU 1K, ULTRABOND TURF PU 2K and ULTRABOND TURF 2 STARS), highly appreciated for their exceptional quality both in Europe and the USA.
And also the products from the PURTOP line, polyurea-based or hybrid polyurethane-polyurea-based waterproofing membranes, the success of which is testified by the fact that Mapei has started producing them not only in Italy, but also in Turkey and Malaysia (and production will also start soon in India).
From amongst these products, a special mention must go to PURTOP FR, the only product in this category that meets the requirements for the classes D, s3-d0 and B_{fl}-s1 according to the European standard EN 13501-1, which guarantees a better reaction to fire when waterproofing a roof.
And, last but not least, MAPEFLEX PU 45 FT multi-purpose sealant and adhesive, a high-technology evolution of a product that was already highly appreciated, MAPEFLEX PU 45.
The product which embodies the Polyurethanes Laboratory more than any other, however, is undoubtedly ULTRABOND P990 1K, the first ever one-component polyurethane adhesive for wooden flooring to be welcomed by the Italian market, a market notoriously dominated by two-component epoxy-polyurethane products. Even though other technologies have made their mark over the years, especially in North Europe, ULTRABOND P990 1K has always been a guarantee of reliability, so much so that numerous installers still consider it to be the best one-component adhesive for wooden flooring on the European market.
If we move over to North America, the real market for one-component polyurethane adhesives for wooden flooring, the success of this adhesive is even more emblematic. In the spring of 2003, when the first batch of ULTRABOND 990 (the American version of ULTRABOND P990 1K) came off the production line at the company's Garland facility in Texas, the Mapei brand was still practically unknown on the USA and Canadian market for wooden flooring adhesives. But the quality of this product was immediately picked up on by users. Sales took off immediately and the growth in sales has never stopped, even during the years of economic recession following the financial crisis of 2007.
Over the years, in order to meet the demands of the US market, ULTRABOND 990 has been replaced by other adhesives (ULTRABOND ECO 975, ULTRABOND ECO 980 and ULTRABOND ECO 995), but their success has never shown signs of decreasing. And in Texas, every year, thousands of tonnes of these adhesives are being produced. Their success has been so great that Mapei can now boast the title of being the leading manufacturer of polyurethane adhesives for wooden flooring in America.
The consistent increase in volumes produced, and the decision to introduce new polyurethane-based materials, has made it very difficult to continue following the research work conducted in the United States directly from Italy. Which is why, little more than two years ago, a local Polyurethanes Laboratory was built in Texas with the intention to supply, apart from research activities, better support for the production processes.
For some time Mapei has been a global company and, at the same time, the Polyurethanes Lab has had to be equipped to meet the demands of the various markets distributed around the five continents.
Whatever the circumstances, the Mapei Polyurethanes group has never lost the desire to create something new. We just need to mention that, thanks to three products developed by the Polyurethanes Lab (ULTRABOND ECO S968 1K, ULTRABOND ECO S1000 1K and ULTRABOND ECO MS 4 LVT), for three years running, from 2015 to 2017, Mapei has won the prestigious Innovations@Domotex award at the famous Domotex trade fair in Hannover (Germany).
Similarly, we have never been lacking in commitment to develop materials for new applications. Perfect examples are the numerous products created in the last few years for the Mapei Marine line for the ship-building industry.
The challenges we will have to face in the coming years will certainly be not less complicated than those of the past.
But the Polyurethanes Lab will always be up to the challenge, with determination, as it has always done for its first twenty years.

Antonio Ausilio. R&D Polyurethanes Group Leader,
Mapei SpA



RE-CON ZERØ EVO



RE-CON ZERØ EVO
THE KEYSTONE FOR SUSTAINABLE CONCRETE IN JAPAN

THE JAPANESE COMPANY NR-MIX DEVELOPED INNOVATIVE CONCRETE USING RE-CON ZERØ EVO

Concrete, with more than 23 billion tons produced every year, is the most widely used material in the world. This is due to its exceptional characteristics: wide availability, inexpensiveness, possibility to form any kind of geometric shapes in the fresh state and to harden in strong and durable structures. Nevertheless, the production of concrete implies several drawbacks related to the consumption of natural resources, carbon emissions and waste production.

One of the biggest problems in terms of waste is returned concrete. This is the residual unset concrete that, for different reasons, is not used at the jobsite and comes back to the ready-mixed concrete plant inside the truck mixer. One of the reasons for returned concrete is that costumers prefer to order an excess of concrete in order to avoid shortage during construction; in other cases, the fresh delivered concrete might not meet the quality specifications (consistency, temperature, time of delivery) and it is rejected by the costumer.

The amount of returned concrete in industrialized countries varies from 2 to 3% of the overall concrete production; this means that, every year, from 500 to 700 million tons of concrete are not used and come back to the ready-mix concrete plants with the truck mixers; in most cases, it becomes a waste, representing a serious environmental problem at the plant.

In 2012 Mapei developed RE-CON ZERØ, followed by the next generation product RE-CON ZERØ EVO, a bi-component powder additive to recover returned concrete. By adding RE-CON ZERØ EVO to the truck mixer, it is possible to transform, in few minutes of mixing and without any waste production, returned concrete into aggregates, which can be totally recovered and recycled to produce new concrete.

With RE-CON ZERØ EVO, returned concrete is transformed into aggregates which can be used for new concrete.

RE-CON ZERØ EVO is the most sustainable system to recover returned concrete, because landfilling is completely avoided and, with the "in-house" production of 2.3 tons of aggregates from 1 m^3 of returned concrete, quarrying is reduced and natural resources are preserved. The economic saving arises from the total cut of the disposal costs and the reduction in the supply of virgin aggregates.

Japan is one of the countries where RE-CON ZERØ EVO is most successful, thanks to the commitment of NR-MIX (Nagaoka Ready-Mixed Company), Mapei exclusive distributor of RE-CON

Mitsuya Miyamoto, CEO of NR-MIX, with Giorgio Squinzi, President of the Mapei Group.

Mitsuya Miyamoto and Alberto Ferrari, International Business Manager for NR-MIX.

The new NR-MIX plant in Nagaoka hosts the production of an innovative concrete, ECON®, based on 100% aggregates produced from returned concrete admixed with RE-CON ZERØ EVO.

ZERØ EVO for Japan. NR-MIX is a family company, established in 1967, and 2017 is the 50th anniversary of its foundation. The current CEO, Mitsuya Miyamoto, 39 years old with a Master Degree in Political Economy at Meiji University of Tokyo, strongly believes in innovation and circular economy. For these reasons, he considers RE-CON ZERØ EVO as the keystone to improve the sustainability of concrete in Japan.

With his technical team, he developed an innovative concrete, ECON®, based on 100% aggregates produced from returned concrete admixed with RE-CON ZERØ EVO. This new concrete is now produced at the new batching plant in Nagaoka, in the Shizuoka Prefecture, in Central Japan. Thanks to the excellent performance and durability and the low environmental impact, ECON® is now widely used as non-structural concrete for slabs, foundations and parking lots all over Japan.

Mitsuya Miyamoto is also the President of GNN, an association of more than 100 Japanese ready-mix concrete companies, many of them using RE-CON ZERØ EVO to recover returned concrete. He is also very active in introducing, through GNN, innovative technologies and materials in the Japanese concrete industry, assisted by his International Business Manager Alberto Ferrari.

Mapei and NR-MIX, in cooperation with Shiraishi Kensetsu Ready-Mix Company, based in Okayama Prefecture, in 2015 developed RE-CON ZERØ SPRAY, a special liquid additive which is sprayed inside the drum of the mixer and eliminates the need of washing the truck mixers after the delivery of concrete. RE-CON ZERØ SPRAY allows to save large volume of washing water and contributes to reduce wastewater and pollution in the ready-mix concrete plants.

Recently, Mapei and NR-MIX, in cooperation with the Japanese Concrete Pumping Association and Kawabata Kogyo, a Japanese manufactuter of pump machines, have developed RE-CON ZERØ PUMP, an unique product which allows to recover residual concrete from the tanks of the concrete pumping trucks. The first full container of RE-CON ZERØ PUMP will be shipped soon to Japan from the Mapei plant in Robbiano di Mediglia (Northern Italy).

Japan is one of the most advanced industrial countries, leaning forward with innovative spirit for creating new sustainable products and developing new sustainable technologies. Mapei and NR-MIX play an important role in this process, contributing with the RE-CON ZERØ product line to make the Japanese concrete industry more and more sustainable.

Giorgio Ferrari. Research & Development Laboratories, Mapei SpA

BEPPE IACHINI

"SASSUOLO IS MORE THAN CAPABLE OF MOVING UP THE TABLE"

SASSUOLO'S NEW TEAM MANAGER IS FEELING CONFIDENT

Sassuolo's new team manager is Giuseppe Iachini, aged 53. He used to play professional football as a midfield player for various top teams in the Italian Serie A. The Club parted ways with Christian Bucchi after Sassuolo's 2-0 defeat against Verona on the 14th day of the league season. Beppe Iachini has signed a contract that will keep him at the club belonging to the Mapei Group until June 2019.

"I would like to thank the President and all the managing staff for choosing me - so said Iachini, the former team manager of such long-standing clubs as Chievo, Udinese and Palermo - I do not have a magic wand and I realise that I cannot solve all the problems overnight, but I am certain that I can do a good job here with Sassuolo. I am a former professional footballer and have the experience and determination to work effectively. Sassuolo has a great squad and plenty of potential to move back up the table".

Iachini already knows what it is like to take over from managers, who found themselves in really tricky situations. "I've already managed to overcome the difficulties I have had to face. Sassuolo is a team with the potential to improve thanks to its perfect blend of youngsters and experienced players; the team will have to understand what I expect from them. I know exactly what I am looking for".

Sassuolo has only scored eight goals in its first 14 matches. "I would never dare to question the results and work of my predecessor – so Iachini points out, a real midfield general back in the days when he played professional football for Verona, Fiorentina, Ascoli and Venezia – I want this excellent squad to gain confidence. There is a lot of work to be done".

Other teams struggling in autumn 2017 also came knocking at Iachini's door: "Five teams contacted me before Sassuolo, both Italian Serie A and foreign teams, and after giving it careful thought I decided to wait for the ideal opportunity to arise. Sassuolo's serious approach, structure and general atmosphere make it just the right fit for me."

BERARDI NEEDS TO REDISCOVER HIS GOAL-SCORING TOUCH!

Over the last few years, the forward, Domenico Berardi, has been described as Sassuolo's real star. Unfortunately, over recent times the striker has lost his goal-scoring touch and not been as effective as usual in build-up play. "Berardi? There is always a way to get the best out of any player. I need to do that for all the players, it is part of my job, and I hope I can help everybody to play their best, including Berardi".

YOUNG LIONS

Sassuolo has talented young players of the calibre of Scamacca, Adjapong, Mazzitelli, Sensi, Cassata and others, who have not yet made the most of their physical capabilities and technical skills. "Bringing on young players really motivates me. Nevertheless, being young does not mean you have a right to play, neither does it exclude you from being picked for the first team. What counts is what the young players do during the week's training. My staff and I need to make sure our young players learn as quickly as possible what they need to do to improve the team's performance".

ABOVE. Sassuolo's new team manager, Giuseppe Iachini, with Giovanni Carnevali, CEO and General Manager of Sassuolo.

A PRIZE TO THE VIDEO: "80 YEARS OF MAPEI"

MAPEI HAS WON THE 49TH KEY AWARD IN THE "CORPORATE/INDUSTRIAL FILMS" CATEGORY

Mapei has been awarded another important prize to round off the year of its 80th anniversary celebrations.

Mapei's official "80 years of Mapei" video, shot in 2017 by Real Time Srl in Milan, has won the 2017 Key Award in the "Corporate/Industrial Films" category.

An important achievement, rewarding the creativity and commitment of the entire Operational Marketing and Communication Department led by Adriana Spazzoli, as well as the Company in its entirety.

Organised by Media Key editorial group, which has been a benchmark for operators in the business communication and marketing industry since 1982, the Gala Prize-giving Ceremony for the winners of the 49th Key Award was held in Milan on 28th of November at the Auditorium of the International University of Languages and Media and presented by Germano Lanzoni, a famous local stand-up comedian and the official voice of A.C. Milan.

Over 200 campaigns were entered in the 27 categories examined by a panel of 46 judges.

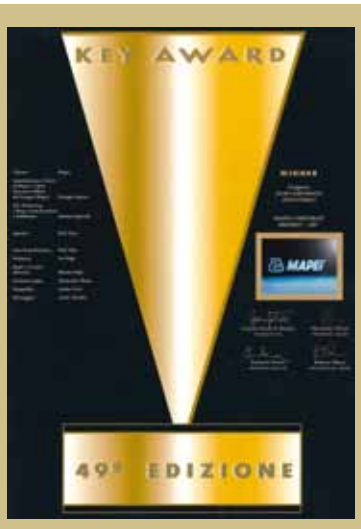
First organised in 1988, the Key Award has gradually asserted itself as the most important Italian prize exclusively for advertising films. It is aimed at encouraging creativity in devising and shooting advertising films for TV, film, the web and mobile phones to make them better means of communication and raise their technical-aesthetic standard, so that Italian advertising productions can raise their bar and really became a "made in Italy" guarantee.

As well as the prize that went to Mapei, special awards were also given out during the event for: Best Sponsorship of The Year awarded to RAI TV and TIM for the 2017 Sanremo Music Festival; the Excellence Key Award; the Marketing Communication Effectiveness Key Award won by CheBanca's official advertising campaign; and the Editor's Choice awarded to the radio campaign to celebrate Yoox's anniversary.

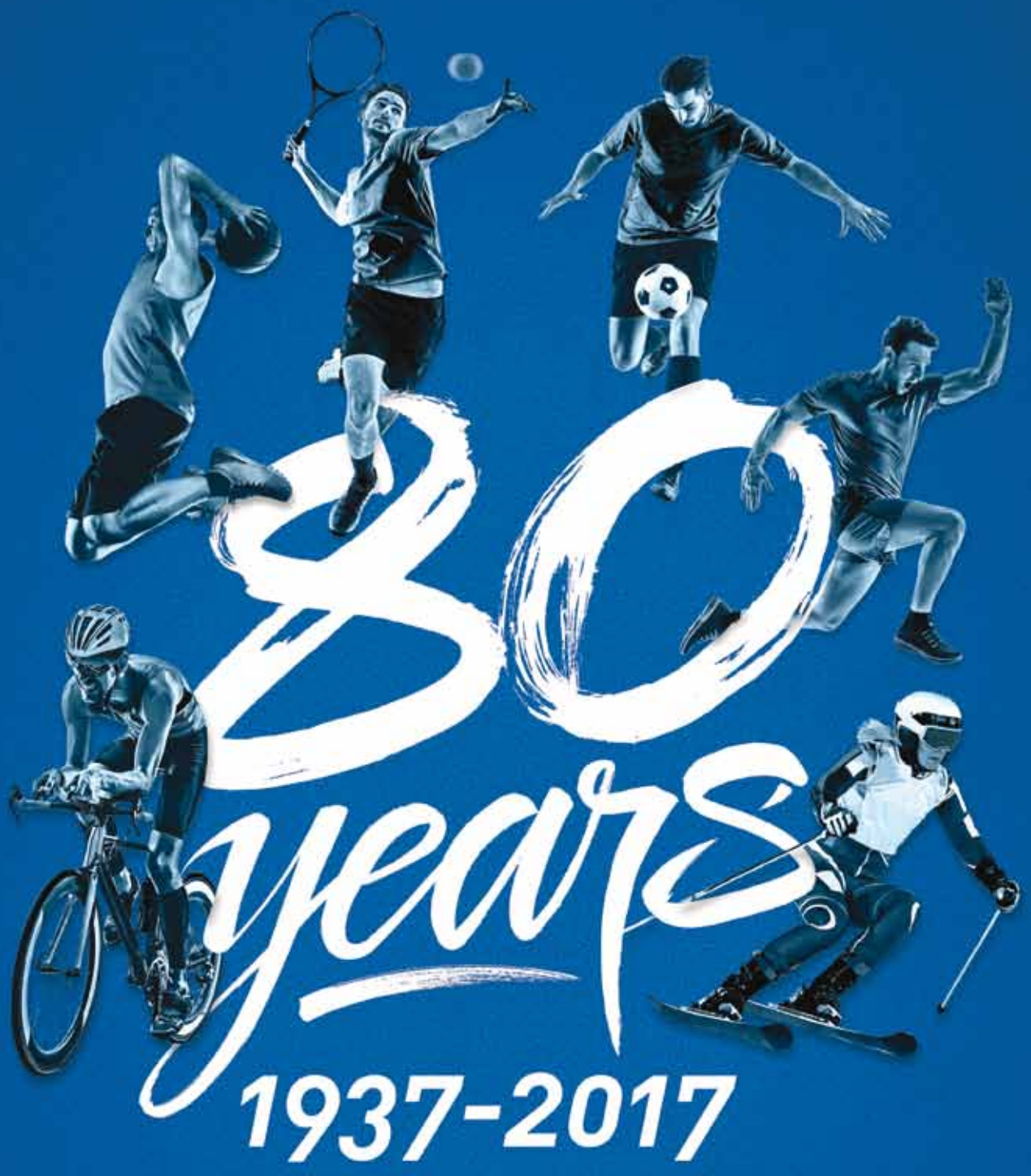
The "80 years of Mapei" corporate video was devised to provide an overview of the Group and its business operations in pictures and video frames and, at the same time, celebrate the people, achievements and projects carried out during the company's eighty-year history.

Adriana Spazzoli, the Group's Operational Marketing and Communication, explained the reason for the video's success: "The video is simple and easy to understand, lasts just over three minutes featuring plenty of pictures and facts and figures, and manages to describe all of Mapei's operations in full."

"We were delighted to receive this award - so she added - because it comes at the end of a year of celebrations that we organised with great enthusiasm right through 2017, together with our partners, the institutions and the wonderful Mapei team in its entirety".



TOP OF THE PAGE. The "80 Years of Mapei" video being awarded at the Key Award prize-giving ceremony. From left on: Alessandro Mazza and Andrea Turri (Real Time), Gabriella Mancini (La Gazzetta dello Sport), Lidia Mandelli and Davide Acampora (Mapei SpA), Giulia Ghedini (Real Time) and Germano Lanzoni.



For **80 years Mapei** has been close to the world of sport: a passion that started with cycling and then went on to embrace football and other sports. For **80 years Mapei** have been supplying their products for building projects and sports arenas all around the world, guaranteeing reliability, safety and long-lasting durability.

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