

INTERNATIONAL

REALTÁ MAPEI

OLYMPIC GAMES OF MAPEI

Year XI - No. 26 - September 2008

Trade fairs with Mapei

CERSAIE

Bologna – 30th September – 4th October 2008

At Cersaie, the international exhibition of ceramic tile and bathroom furnishings, the new and most interesting solutions for installing ceramics and natural stones (from products for substrate preparation to adhesives, with a special focus on the coloured grouts) will be on display on the Mapei stand.

We wait for you at our stand: External area 45, Stand 18

Thom Mapei for Cersaie 2008



Bologna – 15th October – 19th October 2008

Mapei will also be present at the SAIE International Building Exhibition, a renowned appointment for professionals, designers, architects and business enterprises of this field. The fair will provide Mapei with an important chance to present its full range of cutting-edge products specially designed for the building industry.

We wait for you at our stand: External area 45, Stand 18

MARMOMACC

43 International Exhibition of Stone

Verona – 2nd – 5th October 2008

Once again this autumn Mapei will not miss the world's most important event in the world of marble and stone. And it will be present in great style, showing its technologically most advanced solutions for laying and grouting natural stone coverings.

We wait for you at our stand: Hall 6, Stand E9/F8

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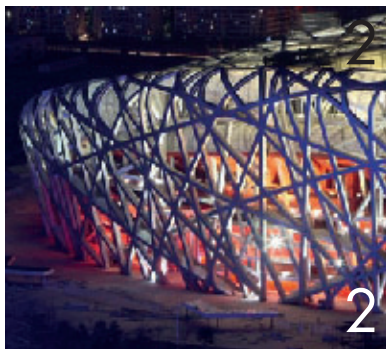
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The 2008 Olympic Games again witnessed Mapei's contribution. In a number of Chinese Olympic stadiums and sport facilities Mapei products ensured a fast and safe completion of the works. In the photo the Shanghai stadium (see article at page 5).



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Restoration has always been an important field for Mapei, involving several activities run in the Company: from R&D to specific technical assistance on the building site. In order to further highlight this sector, Realtà Mapei International, from this issue on, is using two different icons to distinguish the building sites where maintenance and restoration were carried out using Mapei product systems. The former refers to restorations of historical buildings, the latter to renovation of modern architectural complexes. This graphic devise is intended to make these important works easy to recognize, while underlining the Mapei product lines used in these works. In this issue the icons mark the reference projects of the Milan Central Railway Station and the Havana School of Arts Complex.



Olympics in China

Mapei's business operations in China and its involvement in the construction of new sports facilities

We will also be talking about China. After painting a very detailed picture of the national economic situation in the building industry and Mapei's presence in the country back in issue number 20 of *Realtà Mapei International* (July 2006), we now want to take a further look at the focus of everybody's attention during the 2008 Olympic Games in Beijing. The boom in the economy we described back then has been completely confirmed over the last two years: the Chinese GNP has continued to grow at a rate of over 11%, investments in the building industry by over 14%, sales of tiles by 9%, and exports of tiles by at least 20%.

This striking boom in the construction industry has obviously been driven along by all the intense preparations which the city of Beijing has been

undertaking over the last few years in view of the Olympics, which began on 8th August 2008 (a particularly auspicious date according to local beliefs) and drew to a close on 24th August.

Obviously China has worked extremely hard on trying to impress the international community by developing ambitious architectural projects: original sports, commercial, residential and tourist facilities, as well as magnificent road and transport infrastructures.

The idea was clearly to make Beijing look like the modern capital of a modern state, both capable of handling the event they hosted: Barcelona is most certainly the example they followed, drawing inspiration from the complete restyling the Spanish city underwent ready for the 1992 Olympics.

The city and nation as a whole are taking full advantage of the Olympic Games as

a chance to open up to the world and develop both in the short and long-term: 43 billion euros (coming from both public and private financing) were invested in 2007 alone in infrastructures, businesses and services, while an "army" of traffic wardens, policemen/women and volunteers have been enrolled ready for the event.

A clear sign of China's intention of showing the world it is at the very cutting edge are a number of the futuristic architectural projects built in the capital, mainly designed by famous foreign firms such as Herzog & de Meuron, Paul Andreu and OMA: the National Stadium (the "Bird Nest"), the National Theatre (the "Egg"), the new headquarters of the national TV network (the "Falling Towers"), etc.

Another sign of a real desire to invest in the future are some of the centres



designed to host sports events and exhibitions over the next five years, as well as numerous indoor and outdoor facilities built to encourage the capital's inhabitants to get more involved in sports activities.

The building industry for the tourist trade has also experienced notable growth: 290,000 new hotel rooms (800 in higher category hotels and 4000 in hotels of varying standards, hostels and sports centres) have been completed to accommodate the spectators and athletes that took part in the Olympics.

The results of this massive investment strategy are striking: the capital's economic growth over the last five years has been 12.1%, the number of tourists rose by one million in 2006 alone, 300 million euros were gained from various merchandising and licensing operations, while overall profits from

this edition of the Olympic Games was about 12 billion euros.

Mapei is Where Major Games Take Place

"One World - One Dream" is the slogan chosen by the Beijing Organising Committee for the Games of the XXIX Olympiad to evoke the ideals of unity, friendship, progress, harmony and hope in a brighter future, which ought to influence the basic spirit of the Games. This motto sounds surprisingly similar to the sound-bite Mapei chose for its own involvement in several events (trade fairs, sponsorship deals, etc.) in 2008: "One Company - One World". This was the slogan the Company chose to underline its leading position in the chemical products for the building industry sector, and its ability to provide solutions to local problems thanks to its

THE OLYMPIC FIGURES

INVESTMENTS, STRUCTURES AND HUMAN RESOURCES:

43 billion euros invested in 2007 in businesses, services, infrastructures and telecommunications, including approximately 3.4 billion invested in sports facilities and 4 billion in organisational operations

37 sports venues in Beijing (in addition to those in Hong Kong, Qingdao, Tianjin, Shanghai, Shenyang and Qinhuangdao), including 18 newly built facilities

9,000 vehicles provided by the Organising Committee for transportation around Beijing during the Games

3 new underground railway lines built over the last three years

290,000 new hotel rooms, hostels and sports centres recently built to accommodate spectators and athletes

33,000 traffic wardens

80,000 policemen and women

100,000 volunteers for the Games (over 400,000 volunteers working in the city and over one million social volunteers)

AUDIENCE

1,700,000 visitors in Beijing

4 billion TV viewers who followed the Olympic Games

international research operations.

The thing which Mapei has in common with the Olympics, on one hand, and other leading Italian companies like Mondo, on the other, is this international spirit.

Mondo and Mapei are important suppliers of the Organising Committee for the Olympic Games.

Mondo, one of the world's leading companies in manufacturing floors for sports facilities, supplied materials for building the tracks and playing fields for various sports (athletics, handball, basketball, shooting, badminton, etc),

as well as floors for offices, exhibition areas, conference rooms and other service premises.

Mapei, whose main corporate principles have always included internationalization and a commitment to support sport, was bound to play a part in putting on a sports event of this scope and importance. And indeed, as can be seen over the following pages, the Company's products have been used for building and renovating various sports facilities for hosting the Games, complexes designed for accommodating athletes and tourists from all over the world, as well as infrastructures like bridges, viaducts, tunnels and roads, etc., works which form part of the modernisation plan which the Chinese authorities drew up in view of the Olympics.

In the case of certain prestigious sports facilities, such as the National Stadium, the National Indoor Stadium and the Wukesong Basketball Indoor Stadium, the building operations were carried

out to perfection thanks to the extremely efficient working partnership between Mapei and Mondo, so that innovative materials like the rubber coverings used for the athletics tracks or basketball courts were installed using equally avant-garde products, a real tribute to cutting-edge all-Italian technology.

After all, Mapei was able to draw on the experience and reputation it had gained over the years as the supplier of products for building and renovating facilities hosting previous editions of the Olympic Games from Munich 1972 to Athens 2004.

Solid Local Operations

Mapei's "Olympic" supply programme was, at the same time, also made possible by the Company's well-established presence in China, where for a number of years now it has had two manufacturing plants and three subsidiaries capable of supplying the adhesives, sealants and chemical products for building, the real key to the Chinese economy: Mapei China Ltd, whose headquarters are in Hong Kong, Mapei Construction Materials (Shanghai) Co Ltd in Shanghai, and Mapei Construction Materials (Guangzhou) Co Ltd in Canton.

This has enabled Mapei to carry out a number of notable projects in China over the last few years: for example, its products were chosen to be used on numerous Chinese building sites and to construct important works such as Sutong Bridge on the Yangtze River, Victoria Towers in Hong Kong, the section of railway between the cities of Hefei and Wuhan on the high-speed line between Chengdu and Shanghai, etc. Mapei has also made a notable contribution to the construction of major hydraulic works, an industry in which the Chinese authorities are investing an increasing amount of resources and money, partly due to the growing importance of water for every nation's economy, including China's.

For example, the Company supplied the products used in the construction of numerous Chinese dams, most notably the famous "Three Gorges Dam" (photo opposite – see Realtà Mapei International no. 20), plus Shuibuya and Ziping pu dams, and also the aqueduct



THE OLYMPIC FIGURES

SPORT

28 different sports

203 nations taking in part in the events

302 scheduled sports events

10,708 athletes, including


168 Italians

302 gold medals

165 men's competitions

127 women's competitions

10 mixed sports events

on the River Cao. Structures like these allow energy and water to be supplied to key areas of the Chinese economy. Within the commercial network that Mapei has set up in China, there are also various distributors and a notable sales team in the Beijing area, the location of the Olympic Games and key zone for the Chinese national economy, where the Company plans to strengthen its presence in the future. Moreover, Mapei recently enhanced its own distribution network by incorporating some major "do-it-yourself" retail outlets. 

Further information is available from the websites of Mapei's subsidiaries in China: www.mapei-sh.com for Mapei Construction Materials (Shanghai) Co Ltd in Shanghai; www.mapei-gz.com for Mapei Construction Materials (Guangzhou) Co Ltd in Canton; www.mapei.com.hk for Mapei China Ltd in Hong Kong.



The Three Gorges Dam.

Olympic Tour of Mapei

As in all the previous editions of the Olympic Games since Munich 1972, Mapei has made an important contribution to the construction of numerous sports complexes which will host the Beijing 2008 Olympic Games.



National Stadium - Beijing

This imposing, original architectural complex, which has now become one of the most famous symbols around the world for the Beijing 2008 Olympic Games, was designed by the prestigious Swiss architectural studio Herzog & de Meuron, and constructed in five years for a total investment of 320 million Euro. The complex covers an area of 250,000 m² and may hold 91,000 spectators on three different seating levels. The stadium hosted the opening and closing ceremonies of the Games, as well as 57 different athletic, weightlifting, soccer and baseball events. The intricate structure of steel pillars, which are visible from outside, has earned the stadium its nickname of "the Bird's Nest". The roof of the stadium foreseen in the original design has not been installed because of the rising costs of the project, and also because it proved to be difficult to comply with the stringent anti-seismic safety standards. The main track for the athletics events, as well the track for warming up, the floors in the internal areas where all the people pass and for the service areas (registration area, anti-doping area, etc.) have been installed using red rubber coverings (supplied by the Italian company Mondo), and laid using ADESILEX G19* adhesive (with a quick catalyser in order to respect the extremely short lead times for the laying operations).

TECHNICAL DATA

Work: laying the rubber sports tracks and rubber floors

Period of Works: 1st semester 2008

Customer: National Stadium Co. Ltd

Project: Herzog & de Meuron (Switzerland) and China Architecture Design Institute (China)

Installed Materials: rubber sport tracks (Mondotrack FTX) supplied and laid by Mondo (Italy)

Mapei Product: Adesilex G19



TECHNICAL DATA

Work: laying vinyl sport floorings; treating the substrates of the tennis courts; laying ceramic tiles on the swimming-pools

Period of works: 1st semester 2008

Client: General Administration of Sports of China and BOCOG (Beijing Organizing Committee for the XXIX Olympic Games)

Project: Architectural Design & Research Institute of Qinghua University, OSA Architect Agency (Australia) and China Sports Facility Design Center (China)

Laying ceramic tiles in the swimming-pools and treating the substrates of the tennis courts:

Contractor: CSFC (China Sports Facility Construction)

Installation Company: CSFC

Mapei Products: Primer G and Ultraplan (for the substrates of the tennis courts); Granirapid and Keracolor GG+Fugolastic (for the installation of ceramics in the swimming-pools)

Mapei Coordinator: Peter Jew (Mapei Far East)

Laying vinyl floors:

Installed Materials: vinyl sport floorings (Mondosport) supplied and laid by Mondo (Italy)

Mapei Product: Adesilex G19

Shooting Range Hall - Beijing

This structure was designed by the University of Qinghua, Beijing, in collaboration with the Australian design studio OSA Architect Agency. Special attention was paid to the way it integrates with the surrounding environment, the use of eco-sustainable technology and the use of systems which allow for a considerable saving in energy consumption. The stadium may hold 8,954 spectators and includes the areas for the qualifying events and the finals of the shooting contests, apart from service areas for warming up and recreation activities for the athletes. Mapei products were used for the covered tennis courts, where the substrates were treated with PRIMER G* and then levelled off using ULTRAPLAN*, before applying 4 layers of acrylic flooring material.

Mapei products were also used for the construction of the swimming pool: GRANIRAPID* adhesive was used to bond the ceramic tiles in the pool, while the joints were grouted with KERACOLOR GG*, mixed with FUGOLASTIC* additive. Also, approximately 5,000 m² of vinyl sport floorings were supplied by Mondo and laid using ADESILEX G19*.

National Indoor Stadium - Beijing

Although it is certainly less spectacular than the neighbouring "Bird's Nest" stadium, the National Indoor Stadium is still striking for the gently curved shape of its steel roof, positioned on the summit of a central cube-shaped body delimited by a glass façade.

It is the largest poly-functional stadium in Beijing, and can hold up to 20,000 spectators for the artistic gymnastics and handball events, which were held in this stadium during the Olympics, and for the wheelchair basketball event during the Paralympic Games. After the Games, this complex is still used as a backdrop for sports events and training sessions, concerts, shows on ice and acrobatics, as well as various recreational activities. The Beijing Institute of Architectural Design and the Beijing Urban Engineering Design and Research, in collaboration with the Munich Group, have together created a complex which extends over 80,000 m² and which is four storeys high. In this case too, special attention has been paid to the use of eco-compatible high



technology, systems and materials, which guarantee considerable savings in energy consumption and a lower impact on the environment. Mapei ADESILEX G19* and ADESILEX G20* adhesives were used to lay the rubber sport floorings for the handball courts.

TECHNICAL DATA

Work: laying rubber floorings

Period of Works: 1st semester 2008

Customer: Guocao Investment Development Co. Ltd and BOCOG (Beijing Organizing Committee for the XXIX Olympic Games)

Project: Munich Group (Germany), Beijing Institute of Architectural Design (China) and Beijing Urban Engineering Design and Research (China)

Contractor: Beijing Urban Engineering Group (China)

Installation Materials: rubber sport floorings (Mondoflex) supplied and laid by Mondo (Italy)

Mapei Products: Adesilex G19 and Adesilex G20



TECHNICAL DATA

Work: laying rubber floorings

Period of Works: 1st semester 2008

Customer: Wukesong Culture & Sports Centre Co Ltd and BOCOG (Beijing Organizing Committee for the XXIX Olympic Games)

Project: Beijing Institute of Architectural Design (Huyue Studio and Second Design Studio) and Burckhardt + Partner (Switzerland)

Contractors: Urban Engineering Group (China) and Zhongguancun Construction Associates (China)

Installed Materials: vinyl sport floorings (Mondosport) supplied and laid by Mondo (Italy)

Mapei Product: Adesilex G19

Wukesong Basketball Indoor Stadium - Beijing

The complex, designed by the Swiss design studio Burckhardt + Partners, has a central cube-shaped body. In the original design, the external walls were to be covered by giant LCD television screens. However, after the Chinese authorities carried out a complete review of the design to reduce costs and the impact of the stadium on the local environment, the designers decided to create the facades in glass, supported by a bearing structure in aluminium alloy. The building has 18,000 seats and

is located within the Wukesong Sports and Cultural centre, which covers an area of 50,000 m², and also includes the Wukesong baseball stadium and a further sports field. The stadium hosted various basketball games, both during and after the Olympic Games, and is the home of schools and clubs which play this sport. The rubber floors for the areas used for moving from one area to another within the complex were made using Mondo sport floorings bonded in place using ADESILEX G19*.

University of Technology Gymnasium - Beijing

This complex, with its imposing 93 metre-diameter cupola roof, plaid host for the badminton matches and rhythmic gymnastics events during the Olympic Games. It is now available for students of the University for training purposes, and for professional badminton teams. It covers a surface area of 24,383 m², and has a capacity of more than 6,000 spectators. Mapei ADESILEX G20* adhesive was used to bond the vinyl floors in the courts and the rubber floorings in the areas for moving around the complex, with both types of material supplied by Mondo.

TECHNICAL DATA

Work: laying vinyl and rubber floorings

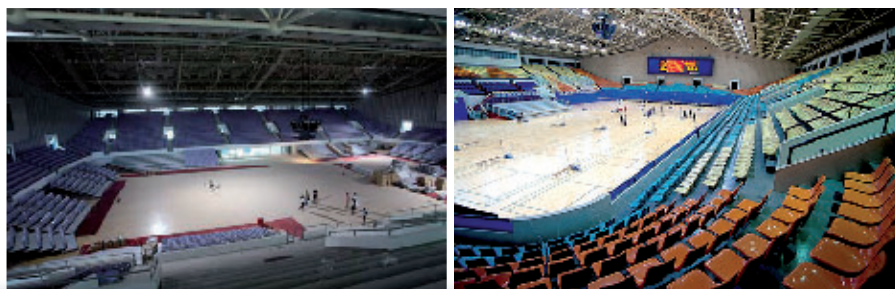
Period of Works: 1st semester 2008

Customer: BOCOG (Beijing Organizing Committee for the XXIX Olympic Games)

Installed Materials: rubber sport tracks (Punti, Futura) and vinyl sport floorings (Mondosport) supplied and laid by Mondo (Italy)

Mapei Product: Adesilex G19





TECHNICAL DATA

Work: laying rubber floorings
Period of works: 1st semester 2008
Customer: BOCOG (Beijing Organizing Committee for the XXIX Olympic Games)
Installed Materials: rubber sport floorings (Mondoflex) supplied and laid by Mondo (Italy)
Mapei Product: Adesilex G20

 **Sports Centre Gymnasium - Beijing**

This centre was extended to host the qualifying rounds and the finals of the handball event during the Olympics, and then for training for the basketball, fencing and rugby events during the Paralympics. It covers an area of more than 47,000 m², and can hold 6,300 spectators. The floor surfaces of the courts and pitches were made using rubber supplied by Mondo, bonded in place using ADESILEX G20*.



 **Olympic Centre Stadium - Tianjin**

Construction of the stadium started in 2003. It covers an area of 78,000 m², with seating available for 60,000 spectators. The stadium was designed by the Japanese studio Axs Sawto Inc. As required by the customer, it takes into account its impact on the local environment, and is equipped with ultra-high technology equipment.

When lit up at night, this imposing structure reminds the observer of a bird's eye, and hosted the qualification matches of the soccer event during the Olympics. The rubber track was supplied by Mondo for a total surface area of approximately 12,700 m², and was bonded in place using ADESILEX G19*.

TECHNICAL DATA

Work: laying rubber sport tracks
Period of works: 1st semester 2008
Customer: BOCOG (Beijing Organizing Committee for the XXIX Olympic Games)
Installed Materials: rubber sport tracks (Sportflex Super X) supplied and laid by Mondo (Italy)
Mapei Product: Adesilex G19

 **Beijing Sport University - Beijing**

This university campus, where Chinese students have graduated in various sporting majors since 1953, was the scenario for pre-event training sessions during the Olympics, for the Italian and the Chinese Olympic squads. The Chinese 110 metre hurdles runner Liu Xiang also trained here. Various indoor and outdoor rubber tracks were supplied by Mondo, and bonded using ADESILEX G19*.

TECHNICAL DATA

Work: laying rubber sport tracks
Period of Works: 1st semester 2008
Customer: BOCOG (Beijing Organizing Committee for the XXIX Olympic Games)
Installed Materials: rubber sport tracks (Sportflex Super X) supplied and laid by Mondo (Italy)
Mapei Product: Adesilex G19



Shanghai Stadium - Shanghai

This international stadium, built in 1997 for the eighth edition of the People's Republic of China National games, can seat 80,000 spectators; hence its nickname "the 80,000 people stadium". It is one of the biggest stadiums in the world and the second biggest in China (after the National Stadium). It hosted various qualifying matches for the Olympic Games soccer event. The new rubber track was supplied by Mondo for a total surface area of approximately 16,000 m², and was bonded in place using ADESILEX G19*.

TECHNICAL DATA

Work: laying rubber tracks
Period of works: 1st semester 2008
Customer: BOCOG (Beijing Organizing Committee for the XXIX Olympic Games)
Installed Materials: rubber sport tracks (Sportflex Super X) supplied and laid by Mondo (Italy)
Mapei Product: Adesilex G19

Mapei products at the Olympic Games

The products mentioned in this article belong to the "Products for Ceramic Tiles and Stone Materials" and "Products for the installation of resilient, textile and wood floors and wall coverings" ranges.

The technical data sheets are available on the "Mapei Global Infonet" DVD or at the web site: www.mapei.com.

Mapei's adhesives and grouts conform to EN 12004, EN 12002 and EN 13888 standards.

Adesilex G19: two-component epoxy-polyurethane adhesive for rubber or PVC floorings. A quick version of this product is also available.

Adesilex G20: low viscosity two-component epoxy-polyurethane adhesive.

Fugolastic: liquid polymeric additive for Keracolor FF and Keracolor GG.

Granirapid (C2F, S1): high performance, deformable, fast setting and hydration two-component cementitious adhesive for ceramic tiles and stone material.

Keracolor GG (CG2): high-performance cementitious grout, polymer modified, for joints from 4 to 15 mm.

Primer G: synthetic resin-based primer in water dispersion.

Ultraplano: ultra-fast hardening (12 hours), self-levelling smoothing compound for thicknesses from 1 to 10 mm.



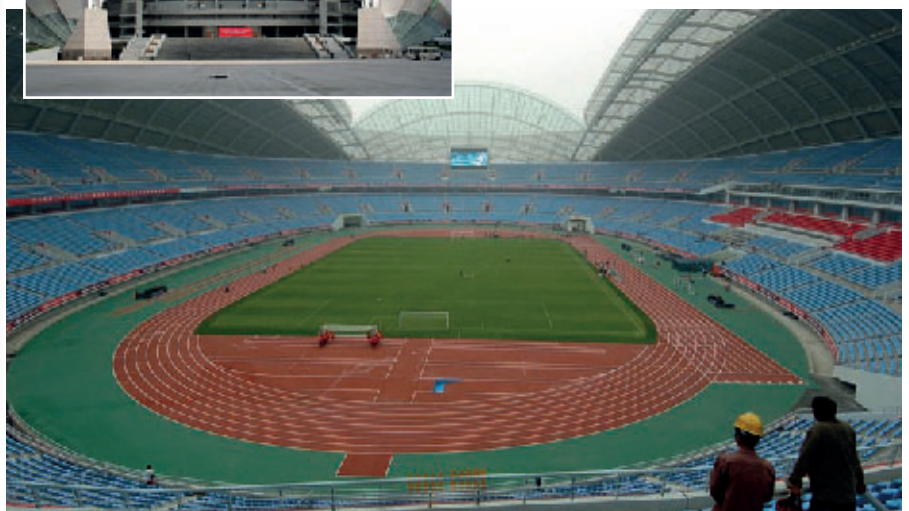
Shenyang Stadium - Shenyang

This structure can now hold up to 60,000 spectators, and was built in little more than one year, just in time to host some of the qualifying matches for the Olympic soccer event.

The new rubber track was supplied by Mondo for a total surface area of approximately 16,000 m², and was bonded in place using ADESILEX G19*.

TECHNICAL DATA

Work: laying rubber tracks
Period of works: 1st semester 2008
Customer: Shenyang Wulihe Sports Development Co. Ltd and BOCOG (Beijing Organizing Committee for the XXIX Olympic Games)
Projects: Shanghai Institute of Architectural Design & Research co. Ltd (China) and Ingerosec Corporation (Japan)
Contractor: China State Construction First Division Construction & Developing Co. Ltd (China)
Installed Materials: rubber sports tracks (Sportflex Super X) supplied and laid by Mondo (Italy)
Mapei Product: Adesilex G19



Venice



Macao is one of the two Special Administrative Regions in the People's Republic of China, the other being Hong Kong. Just as Hong Kong used to be a British colony, this small area of land covering just 29.2 km² with a population of approximately 543,000, was under Portuguese rule from the beginning of the 16th century until December 1999. That was the day when Macao was handed back over to China while, however, maintaining a considerable degree of legal and monetary independence and its own police force, customs, foreign affairs and immigration control. This is the kind of policy which the Chinese

government describes as "one nation, two systems" and which is also in force in Hong Kong.

The Region encompasses the peninsula of Macao bordering on the Chinese province of Guangdong facing the Pacific Ocean and the two islands of Taipa and Coloane. It is easy to see that this is a very peculiar area from the fact that there are three official languages (Portuguese, Mandarin Chinese and Cantonese), its currency (the Pataca), flag (which evokes both its Portuguese origins and current belonging to the People's Republic of China) and the style of the buildings in the old city centre of Macao (now protected as part of

UNESCO's World Heritage) testifying to its glorious past. This area actually used to be a crossroads for trade between Europe, China and Japan and also the place where European missionaries set off to evangelise China.

Nowadays, on the other hand, it is the home of flourishing textiles, electronics and toy industries and a favourite tourist destination. And it is to accommodate the over 9 million people visiting Macao every year that lots of hotels, resorts, stadiums, restaurants and casinos have been built: gambling has actually been legal in Macao since 1962, and this has resulted in a boom in the entertainment industry.

in Macao



Venetian buildings and atmospheres for a luxury resort in Macao. Mapei's best products were chosen for installing several kinds of coverings and treating surfaces

Amidst the Canals, Bridges and Columns...the Right Products

One of the facilities designed to accommodate Chinese and foreign tourists visiting Macao in search of entertainment is the Venetian Macao Resort & Hotel, which covers an area of 101 hectares along the Cotai strip connecting the islands of Taipa and Coloane. This huge tourist facility, covering an area of 50,750 m² and holding the world's biggest casino, is one of the largest in the whole of Asia and was built thanks to an investment of 2.4 billion dollars. The real estate companies handling the project were clearly inspired by the Las Vegas Strip, the

street in the capital of the American entertainment which boasts an enormous concentration of hotels and casinos.

In this new Las Vegas there has been an attempt to recreate the atmosphere of Venice, copying its striking architectural features such as canals, bridges and monumental buildings. About 350 shops running along its own Canal Grande, a web of streets and bridges, and an Arena which can hold 15,000 people attending all kinds of events, have been built here to entertain tourists, who can even tour around the resort in a gondola. 3000 hotel suites, 4 swimming pools, various conference

halls and exhibition areas, and 35 restaurants serving food from all over the world, have been built to ensure tourists are comfortable.

Of course only reliable high-performance products were chosen to build these facilities, which is why, ever since construction work began in 2006, Mapei solutions were the obvious choice for carrying out all the various operations.

For example, KERAPOXY* epoxy adhesive immediately impressed the building companies involved in the project due to its technical properties. This is an improved acid- and slip-resistant adhesive ideal for installing ceramic



1

Photo 1. The building site in the area where the Venetian Macao Resort & Hotel was built.

Photo 2. Mosaic tiles were installed on the swimming-pool surfaces with Keracrete+Keracrete Powder.

Photo 3. Slip-bricks were installed with Kerapoxy adhesive on the facades of the building imitating the Palazzo Ducale in Venice.

Photos 4,5 and 6. Once works are completed, the charme of Venice is fully recreated.



2



4



3

over a total area of 1700 m² using KERACRETE* + KERACRETE POWDER*, a high-performance two-component cementitious adhesive with no vertical slip making it ideal for installing materials in swimming pools, basins, etc.

The joints of these surfaces were later grouted using ULTRACOLOR PLUS*, a high-performance, polymer-modified, anti-efflorescence cementitious mortar for joints measuring between 2-20 mm. This is a fast-setting, fast-drying product, water-repellent with DropEffect® and anti-mold thanks to BioBlock® technology, which turns out to be ideal for grouting the joints of outside facades, balconies, terraces, swimming pools, bathrooms, kitchens and large public premises.

PLANICRETE* synthetic-rubber latex was added to the cementitious mix prepared for the canal renders of the banks of the Venetian Macao Resort & Hotel, before they were coloured blue. The same product was also used when rendering the facades of various buildings in the resort before covering them with tiles. Adding this latex can help the mix adhere to the substrate, increasing its mechanical resistance and reducing the risk of surface cracks. On the other

tiles, stone and other building materials onto the kinds of substrates used in building. Its thixotropy meant it was chosen for installing slip-bricks and marble slabs on the facades of buildings in the Venetian Macao Resort & Hotel designed to imitate San Marco Bell Tower and Palazzo Ducale in Venice. This Mapei product was also used for installing beige and brown coloured marble slabs to create diamond-shaped patterns on the facades of the entrance building to the complex.

The sheets of mosaics of different types and sizes used for the resort's four swimming pools were installed



hand, SILEXCOLOR MARMORINO* was placed on the surfaces of the two columns at the entrance to the complex designed to imitate those in San Marco Square in Venice.

This mineral coating comes in the form of a fine finished silicate-based paste, which is highly decorative and permeable and used on both indoor and outdoor surfaces when, in addition to high levels of permeability to water vapour, an old-fashioned looking finish is required, typical of marble surfaces. The product, applied using a

trowel, is silicate-based and, hence, creates a single body with the substrate, maintaining its permeability to water vapour and, at the same time, guaranteeing it can withstand aggressive agents in the air.

The use of products based on such innovative and high-performance technology guarantees guests at the Venetian Macao Resort & Hotel will be extremely comfortable and, just like in Venice, all the facilities are built to last.

***Mapei Products:** the products mentioned in this article belong to the "Products for Ceramic Tiles and Stone Materials", and "Coating Systems" ranges. The technical data sheets are available on the "Mapei Global Infonet" DVD or at the web site: www.mapei.com.

Mapei's adhesives and grouts conform to EN 12004, EN 12002 and EN 13888 standards.

Keracrete+Keracrete Powder (C2T): high-performance, two component cementitious adhesive with no vertical slip for ceramic tiles, glass mosaic and stone material.

Kerapoxy (R2T): two-component, acid-resistant adhesive. Can also be used as a grout.

Planicrete: synthetic-rubber latex for cementitious mixes.

Silexcolor Marmorino: trowelable, highly decorative, vapour permeable, fine finished, silicate-based mineral paste coating, for interior and exterior applications.

Ultracolor Plus (CG2): fast setting and drying, high performance, anti-efflorescence, polymer modified grout, for joints from 2 to 20 mm. Water-repellent with DropEffect® and antimold with BioBlock® technology.



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TECHNICAL DATA

Venetian Macao Resort & Hotel, Macao
(China)

Work: laying ceramic tiles, marble slabs and slip-bricks on facades and swimming-pools surfaces; treating the canals banks surfaces; applying decorative coatings onto the columns

Year of the Works: 2006-2008

Customer: Themeworks (Hong Kong and Macao)

Project: Urbis (Hong Kong) and Aedas (UK)

Work Management: T.S. Tan, Themeworks

Contractor: Ngo Kee (Hong Kong)

Installation Company: Themeworks

Mapei Co-ordinators: Samson Fok and Roger Kwan - Mapei China Ltd - (Hong Kong, China)

MAPEI S Class

by Werner Roßkopf, Mapei GmbH (Germany)

Modern cementitious deformable adhesives for thin to medium-thickness mortar beds are today considered a "must" for tile layers. When this kind of product is employed, the risk of crack formation and deterioration are drastically reduced in a number of application situations, such as when laying ceramic tiles. However, one of the fundamental requisites to obtain perfect results is the use of specific products for preparing the substrate and bonding the covering materials.

To this aim, Mapei is in a position to offer not only innovative solutions, which are the fruit of the Company's consolidated expertise, but also a vast choice of modern S class adhesives. In the Mapei

range, one finds 8 deformable adhesives, that is, classified as S1 class ("deformable") or S2 class ("highly deformable") according to requirements specified by UNI EN 12002 standards. Apart from their deformability, these products also guarantee good resistance to loads applied on the surface.

The new leading-edge product in the Mapei range is KERAFLEX MAXI S1, an S1 class adhesive characterised by its high performance and competitive price, and which may be applied at thicknesses of up to 15 mm. By simply dosing the amount of water used, this product may be applied in either thin or medium-thickness mortar beds, according to specific requirements. This product also gives off very little dust, and not only is it suitable for laying tiles or large stone slabs on uneven surfaces, it may also be used for covering materials which do not have an even thickness and for tiles with reliefs on the back surface. Apart from laying ceramic tiles and mosaic (double-fired, single-fired, porcelain tiles and clinker), KERAFLEX MAXI S1 is also suitable for bonding slabs of

KERAFLEX MAXI S1
... for dust-free operations



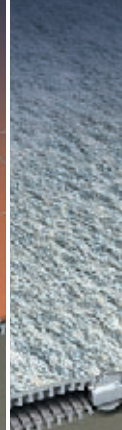
KERAQUICK
... for the challenge against time



ELASTORAPID
... the only all-in-one product



ULTRAFLEX
and ULTRAFLEX S2
... light weight
for a wide range of applications



natural stone, as long as they are not particularly sensitive to moisture. The product is suitable for both indoor and outdoor use, and is characterised by its good workability and good resistance to heavy loads.

This product has recently been further improved with the introduction of Dust-Free technology. The amount of dust given off while pouring, mixing and applying the product is drastically reduced, making the work area more comfortable and healthy for floor layers.

KERAQUICK (S1 class) deformable adhesive has been specially developed for those sites where surfaces need to be put back in service rapidly. This rapid-setting and rapid-hardening adhesive, however, is not only suitable in those cases where work must be carried out in a very short time. Thanks to its special formulation, water is absorbed quickly by the grains of cement, which makes it the ideal product for laying stone materials which are sensitive to staining. And if used together with LATEX PLUS admixture, deformability of the product

is increased up to those levels required for S2 class adhesives.

Fast setting and fast hydration also characterise the S2 class two-component adhesive ELASTORAPID, which is ideal for laying ceramic and natural stone on outdoor balconies and terraces, an area of application which has always posed serious problems for floor layers during their day to day activities. With ELASTORAPID, these problems are now solved very professionally.

The one-component, highly-deformable adhesives (S2 class) ULTRAFLEX S2 MONO and ULTRAFLEX S2 QUICK are also a part of the latest generation of adhesives. Both products are formulated using cement, graded sand, synthetic resins and micronised elastomers, and both products are characterised by their extremely high deformability.

The result is a longer open time (for ULTRAFLEX S2 MONO) and a 30% higher yield compared with traditional powder adhesives. This means total safety for laid surfaces, and a considerable reduction in the amount of adhesive required. As a result, these products are

an extremely strong bond in continuous evolution

ULTRAFLEX S2 MONO
ULTRAFLEX S2 QUICK
... lightweight adhesives,
higher yield
... for all conditions



GRANIRAPID
... for natural stone
and agglomerates



ADESILEX P10 + ISOLASTIC
... to bring out the best
in mosaic



KERABOND + ISOLASTIC
... always a systems
front-runner, the first
deformable system



NEW!!

On show
at Cersaie 2008
one new S Class
product

particularly advantageous for professional users who operate in the building sector.

Further advantages include the ease of transport and handling with these adhesives, which are lighter compared with traditional adhesives, and the wide variety of applications of ULTRAFLEX S2 MONO and ULTRAFLEX S2 QUICK.

In fact, the two adhesives are suitable for laying all types and sizes of tiles on floors and walls, both indoors and outdoors, and even on cementitious screeds which have not yet completed their curing cycle and on deformable substrates. ULTRAFLEX S2 QUICK combines all the advantages described above, together with quick drying and quick setting. Both adhesives also help to drastically reduce the noise produced by footsteps.

GRANIRAPID two-component adhesive, on the other hand, is a "classic" product for laying numerous types of natural and artificial stone materials, both indoor and outdoor. This is an S1 class product, and is fast setting and fast hydrating. Thanks to its special for-

mulation, it dries quickly and is therefore particularly suitable for renovation and repair work where surfaces must be put back into service after only a short period of time. GRANIRAPID is also suitable for bonding floorings subject to heavy loads.

And lastly, amongst the Mapei S class range of adhesives, there is also KERABOND which may be mixed with ISOLASTIC flexible latex admixture, to improve its original characteristics until it becomes highly deformable (S2).

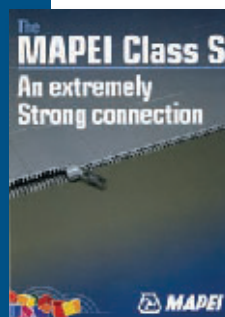
This cementitious adhesive is suitable for bonding all types of medium-sized ceramic tiles and mosaic on both indoor and outdoor walls and floors which are not subject to particularly intense movements.

The same concept may be applied with ADESILEX P10 white, high-performance cementitious adhesive with no vertical slip and extended open times; if mixed with ISOLASTIC latex, its performance and deformability levels may be improved up to those required for S1 class requirements.

In so doing, a product may be obtained which is particularly suitable for laying glass mosaic, even in those environments continuously immersed in water. Mapei Research is a never-ending process, and S class products will continue their evolution from both a technological point of view and in the development and formulation of new solutions.

And already at the next edition of Cersaie there will be one novelty.

Another reason to come and visit the famous Mapei stand during the Bologna trade fair.



A special brochure called "Mapei Class S" dedicated to the Mapei S1 and S2 class adhesives has been produced, and copies are available for those who are interested (realtaapei@mapei.it - fax +39 02-37673.214). The Technical Data Sheets for the products mentioned in this article are available at our website www.mapei.com.



The white giant

Inside the Hotel Neptun in Warnemünde, 1.000 m² of textile floor coverings were laid using Mapei products

By Günther Hermann, Mapei GmbH (Germany)

In April 2007, after 3 months closure for renovation work, the five-star "Neptun" Hotel in the sea-side town of Rostock-Warnemünde on the Baltic Sea, North Germany, was reopened. During the period of the DDR (German Democratic Republic), this was one of the most renowned hotels in East Germany. It was designed by an international team of architects, and built between 1969 and 1971 by the Swedish construction company SIAB. This white giant, 64 metres high and located right

opposite the Warnemünde beach, soon became famous, even outside the confines of East Germany. So it is no surprise if the hotel has successfully faced up to all the changes of the successive periods, such as the sudden boom in sea-side based tourism, a sector which offers a high growth potential for the local economy. In fact, tourist activities within the German Federal State of Mecklenburg-Vorpommern (which also includes Warnemünde), have been in continuous growth for

years and, according to the experts, this trend will continue in the future. The Neptun Hotel is also the most famous building in this locality, especially because it has successfully adapted according to changes in the market. This is thanks partly to the slogan "Nostalgic for the sea", but also to the attractive wellness offers, such as the original, ground-breaking thalassotherapy offered by the hotel, which has been enormously successful with the guests.



Ready for the Future

At the start of 2007, the hotel complex underwent renovation works which, in only 80 days, transformed the hotel into "one of the German five-star hotels with the most highly impressive internal décor and architecture, and the most modern and avant-garde technology regarding safety", as expressed by Hans-Joachim Hasse, a member of the board of the real estate company Deutschen Immobilien AG, responsible for the financial investment of this particular project.

The focal point of the work was the renewal of the building's infrastructure, which was more than 35 years old. Apart from providing all 337 rooms with a new ventilation system, a fire-alarm system was installed and the height of all the parapets on the balconies was increased, according to the latest safety standards.

All four lifts go up to the nineteenth floor, to drastically reduce waiting time for the guests. Other modifications were also carried out, such as the hotel reception, with its new lighting system, decorative elements on the ceiling and refined wall coatings, which all give a new light to the environment. There is also a panoramic view, which may be enjoyed while taking a relaxing sauna in the Arkona Spa Wellness Centre.

An Impressive Laying Operation

The floors in all 14 corridors of the hotel were also renovated, to add a touch of freshness and brightness. The SkyBar, the highest in the whole of Mecklenburg-Vorpommern, now glows with a new light, softer and more pleasing, thanks to the new lighting system and ultra-modern floors, specially created for this occasion.

In the corridors and in the bar, approximately 1.000 m² of textile floor cover-

ing was laid. In particular, tight-knit velvet was used for these surfaces, a popular choice in Northern countries. Various kinds of velvet coverings were laid directly on the cementitious slab without installing a screed beforehand.

The laying company selected to carry out this job, chose the modern and professional solutions offered by one of the largest suppliers in the world of chemical products for the building industry: Mapei.

To improve the bond of the material to the cement substrate, a layer of bonding slurry based on NIVORAPID* thixotropic cementitious levelling mortar, suitable for repairing and levelling off all types of substrate, was applied, together with LATEX PLUS* latex admixture inducing elasticity. After, the surface was treated with PRIMER G* and levelled off using ULTRAPLAN ECO* self-levelling smoothing compound, with very low emission of volatile organic compounds (VOC). The sound-insulation layer and the floor covering were laid using AQUACOL T* adhesive in water dispersion, with very low emission of volatile organic compounds, suitable for bonding various types of textile floor and wall coverings (needle-punch, carpet, etc.).

The use of innovative solutions, such as those proposed by Mapei, guaranteed an excellent final result. Klaus Wenzel, Managing Director of the hotel, stated: "I am proud of the commitment of all those who contributed to the project, working on three shifts to make sure all operations were completed on time". Mr. Wenzel paid thanks to all those involved (the building company, architects and site director) for "the collaboration which led to a quick and simple performance of all the operations".

And to demonstrate the amount of interest generated by the renovation work, the hotel had a high increase in booking for the months following reopening.

This article was taken from "Realtà Mapei", edition N° 6, the German language magazine published by Mapei Group Austrian, Swiss and German subsidiaries, whom we kindly thank.

***Mapei Products:** the products mentioned in this article belong to the "Products for the installation of resilient, textile and wood floors and wall coverings" and "Building Speciality Line" ranges.

The relative technical data sheets are available on the "Mapei Global Infonet" DVD and at the website www.mapei.com.

Aquacol T: adhesive in water dispersion with very low emission of volatile organic compounds (VOC) for textile floor and wall coverings.

Latex Plus: latex admixture to be mixed with Nivorapid and Planipatch to improve deformability and adhesion onto difficult surfaces.

Primer G: synthetic resin-based primer in water dispersion with very low emission of volatile organic compounds (VOC).

Nivorapid: ultra-fast drying, thixotropic, cementitious levelling mortar, also suitable for vertical applications.

Ultraplan ECO: ultra-fast hardening, self-levelling smoothing compound for thicknesses from 1 to 10 mm, with very low emission of volatile organic compounds (VOC).



TECHNICAL DATA

Hotel Neptun, Warnemünde (Germany)

Work: laying textile floor coverings in the corridors and in the SkyBar

Years of Construction: 1969-1971

Year of the Works: 2007

Customer: Deutschen Immobilien AG, Rostock (Germany)

Project: Seeger & Müller, Berlin

Works Management: Thomas Klötzer, Züblin AG, Stuttgart (Germany)

Contractor: Züblin AG

Installation Company: Berliner Ausbau GmbH, Berlin

Mapei Distributor: Berliner Ausbau GmbH

Mapei Coordinator: Bernd Bichowski and Lothar Jacob, Mapei GmbH (Germany)



The School of Modern Dance Before Renovation



The School of Plastic Arts Before Renovation



The Havana School of Arts Complex

Restoration and renovation of an iconic example of Cuban architecture

If you take a look around the area today, it is difficult to imagine that, up until 1961, there was an 18-hole golf course covering an area of 66 hectares. That was the year when Fidel Castro and Che Guevara decided to completely transform the area, and their plan included turning it into an educational complex dedicated to the arts.

The project was entrusted to the Cuban architect Ricardo Porro, who also coordinated the work, with the aim of turning the new philosophy which had taken root in Cuba into reality: the

result being new architectural forms and a new way of interpreting architectural spaces. Two Italian architects, Vittorio Garatti and Roberto Gottardi, were chosen to work alongside Ricardo Porro. Guided by Porro's ideas, even if the trend in the 1960's was to construct buildings using mainly reinforced concrete, they designed a series of buildings with brick walls covered with terracotta tiles. The buildings had Catalan-style vaulted roofs, known locally as *bòvedas*. They were constructed using the ancient technique, which originated from the Mediterranean area,

of cementing together a number of overlapping layers of tiles. These roofs, which are light and very difficult to demolish, required the use of specialised labour and consultancy work of a specialised engineering team.

The same construction technique was used for the various buildings and, to the naked eye, they seem to be homogenous yet discontinuous at the same time, both open and closed, characterised by both narrow and open spaces, sometimes shady while other times swathed in light from the Caribbean Sea.

There are five schools which make up the complex: two designed by Ricardo Porro (the School of Modern Dance and the School of Plastic Arts), one by Roberto Gottardi (the School of Dramatic Arts) and two by Vittorio Garatti (the School of Music and the School of Ballet).

As a result of internal political problems, however, the work was interrupted in 1965, and after a number of years, only a part of the schools had been completed. The Schools of Plastic Arts, Modern Dance and Dramatic Arts were used as originally planned, while the Schools of Music and Ballet were only partially used. In 1976, the Higher



Photos 1, 2, 3 and 4.

After removing the tiles, the external coverings of the cupolas and the *bòvedas* (Catalan-style vaulted roofs) were waterproofed by applying two layers of Mapelastic on their surfaces. To increase performance of the waterproofing system, the first layer was reinforced with Fibreglass Mesh while it was still fresh.

Photos 5 and 6.

The tiles were laid on the cupolas and on the *bòvedas* with Kerabond adhesive mixed with Isolastic latex. The tile joints were then grouted using Keracolor GG mixed with Fugolastic.



Institute of Arts was created and transferred into some of the buildings, but only until the Schools Authority was in a financial position to maintain their status. In the 1980's, a large part of the structures had unfortunately fallen into a state of disrepair, and had been over-run by the growth of vegetation.

In 1998, the National Monuments Commission declared the zone a protected area, and the World Monument Fund, with the authorisation of the Cuban Government, included the Schools in the list of the 100 world monuments most in danger and waiting to be salvaged.

In 1999 the renovation issue was finally approached seriously, and it was decided to use and complete the original project, with the help of the three designers used right from the beginning. After almost half a century of being left to its own devices, the complex had a number of problems which involved both the architectural structures and the site on which they had been constructed. Also, because of the sheer size of the project, which included 27 different lots, it was decided to start the renovation work of the five most significant buildings, in the following order: the School of Plastic

Arts, the School of Modern Dance, the School of Dramatic Arts, the School of Ballet and the School of Music. This article takes into consideration the renovation operations carried out on the first two, which started in 2003 and which are now entering the final phase. On the 26th of January this year, the work was awarded the gold medal in the renovation section at the 6th Salòn de Arquitectura Cubana (an exhibition devoted to Cuban architecture), and on the same occasion, it was also awarded a prize from the Cuban magazine *Obras*.

A Careful Analysis of the Site

Before starting the intervention, a preliminary phase started in 2000 to carry out a series of topographic and architectural assessment tests. Technical surveys were carried out in order to quantify and evaluate the state of deterioration of the constructive elements for each and every School; the ceramic materials were analysed; a study and inventory of the plant life surrounding the site was completed and the drainage system for the rain water was carefully checked, and was found to be in either a poor state or, in some points, completely blocked. Environmental

studies were also carried out, along with a study of the flooding cycles of the torrent which crosses the site.

In fact, the orographic analysis of the site revealed a variety of hillocks and flat land, which is typical of a golf course, and crossed by the Rio Quibù river.

On the basis of the surveys and analyses carried out, a plan was drawn up to restore the environment of the site and, after a few months of further technical discussions with the specialised building companies involved in the project, in 2002 Ricardo Porro gave his seal of approval to the definition of the work phases. The company assigned to the project decided to use Mapei systems, and chose the Mapei Technical Service Department to follow and supervise the work.

The main intervention was based on the restoration and maintenance of the architectural structure, preceded by repairs of all the damages with full respect for the original design features as for both the architectural solutions and the decorative elements, while the internal layout of the old buildings was modified to make them more suitable for the new requirements of the school programmes.





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Photo 7.
Once the damaged concrete had been removed, the reinforcement rods were exposed. They were then cleaned and treated with Mapefer anti-corrosion mortar.

Photo 8.
The damaged parts were rebuilt using MapegROUT T60 fibre-reinforced thixotropic mortar and MapegROUT Thixotropic controlled-shrinkage mortar.

Photo 9.
The restored surfaces were smoothed and levelled with Mapefinish mortar mixed with Planicrete latex.

By implementing the conservation and protection systems tested in Mapei's R&D laboratories, and which had been singled out specifically for the project by the Mapei Technical Service Department, it was possible to approach and find a solution for all the problems mentioned in the technical specifications for the project. Now let's see exactly how.

The Problem of Graffiti and Vegetation

Initially, the internal and external surfaces were cleaned using high-pressure hydro-jets to remove all the dirt which had been deposited on them over the years. The walls which had been defaced with graffiti and other kinds of writing were cleaned and treated. For the brick walls, WALLGARD GRAFFITI REMOVER GEL* gel detergent based on non-toxic solvents was used to remove graffiti without damaging the surfaces. The tiled areas were cleaned using PULICOL*, a special gel solvent used for removing old adhesive from marble and ceramic tiles, and KERANET*, in this case in liquid form, a cleaning solution which is particularly suitable for the removal of lime efflorescence from the surface of ceramic tiles.

Over the years, the state of abandonment and the lack of maintenance had allowed the trees to grow right up to the boundaries of the buildings. Before starting to work, the surfaces of the walls had to be treated and disinfected using a 10% solution of bleach to completely eliminate all the weeds and roots.

Then, where possible, the old render and masonry work on the walls, the columns, the porticos and the b6vedas were consolidated by applying PRIMER 3296*. Because of the micro-particles of acrylic polymers which form the



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structure of this special primer, it has the property of penetrating into the construction materials, thereby consolidating the substrate.

Reconstruction and Waterproofing of the Structures

The reinforced concrete structures, such as the gutters and parapets, showed particularly high signs of deterioration. Therefore, the portions of concrete in either a poor condition or at risk of detachment were removed, right down to the reinforcement rods. The rods were then cleaned and treated using MAPEFER* corrosion-inhibiting mortar made of polymers in water dispersion. At this point, it was now possible to rebuild the damaged portions using MAPEGROUT T60* fibre-reinforced thixotropic mortar and MAPEGROUT THIXOTROPIC* fibre-reinforced controlled-shrinkage mortar.

The rebuilding operation was then completed by applying MAPEFINISH* two-component cementitious mortar mixed with PLANICRETE* synthetic rubber latex, to even out small imperfections in concrete and to create a

uniform surface after repair work. It was also necessary to renovate, protect and waterproof the cupolas on the buildings and the vaulted roofs of the b6vedas, which were suffering from damage due to damp and detachment of the ceramic material.

For the external coverings of the cupolas and the b6vedas, the expansion joints and the perimeters of the vaulted roofs were first sealed by applying MAPEBAND* alkali-resistant rubber tape with felt bonded in place using MAPELASTIC* mortar, and MAPEFOAM* polyethylene foam cord. The next phase was the waterproofing cycle, carried out by applying two layers of MAPELASTIC* cementitious mortar on the surface, to create waterproof and protective coatings with a high degree of flexibility.

To improve the already excellent performance characteristics of the MAPELASTIC, especially when it is applied on surfaces which are particularly cracked or subject to stresses such as in this case, the first layer was reinforced using FIBREGLASS MESH* while it was still fresh.



final characteristics, and sufficient strengths even under difficult conditions. The joints were then sealed using MAPESIL AC*.

Inside the buildings, the pillars on which the vaulted roofs of the bòvedas and cupolas are positioned were initially consolidated by injecting MAPE-ANTIQUE I* hydraulic binder, made from inorganic materials with a poz-zolanic reaction.

The tiles which were in a poor condition were then removed and were replaced using new ones, again laid in place using KERABOND*+ISOLASTIC*, while the joints were grouted using KERACOLOR GG* and ULTRACOLOR*.

Photos 10 and 11. Inside the buildings, the pillars on which the vaulted roofs of the bòvedas and cupolas are positioned, were initially consolidated by injecting Mape-Antique I. The tiles were then laid using Kerabond+Isolastic. The tile joints were then grouted with Keracolor GG and Ultracolor.



Photo 12. The final protective coat for the concrete was made using Elastocolor Primer, followed by Elastocolor Paint, using a colour similar to the original one.

The Correct Way to Lay Tiles

At this point, it was now possible to lay the tiles on the cupolas and on the bòvedas. The tiles were manufactured especially for this project, by following the original indications of the architects. KERABOND* cementitious adhesive was chosen to bond the tiles, mixed with ISOLASTIC* flexible latex (instead of water) to improve its

performance and deformability to C2 class requirements (improved cementitious adhesive) according to EN 12004 standards, and S2 class requirements (highly deformable adhesive) according to EN 12002 standards. The tile joints were grouted using KERACOLOR GG* high-performance grout, in this case mixed with FUGOLASTIC* liquid additive, to achieve particularly high

Fighting Damp

Both the external and the internal walls were highly damaged, which over the years had completely ruined the original render, making it crumbly. The first operation was to remove all the areas in a poor condition and, after cleaning all the surfaces, the Mapei Technical Service Department recommended the





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Photo 13. The parts of the structures covered with ceramic tiles were protected using Antipluviol S and Antipluviol W colourless impregnating solutions.

Below. The final result of the renovation work.

the MAPE-ANTIQUÉ System to bring the walls back to their original splendour, while at the same time to protect them against damp. A 5mm-thick layer of MAPE-ANTIQUÉ RINZAFFO* pre-packed, salt-resistant mortar, particularly recommended for restoration

work on old, damaged stone, tuff and brick buildings, was applied on the masonry work. The next step was to spread on a layer of MAPE-ANTIQUÉ MC* light-coloured dehumidifying mortar, at a thickness of from 1 cm to 3 cm, to even out the surface. This operation was completed by applying MAPE-ANTIQUÉ FC* light-coloured fine mortar, with a base of hydraulic binders with pozzolanic-reaction, additives, and finely graded natural sand.

And to Finish Off: Protecting and Decorating

For the final protection, ELASTOCOLOR PRIMER* high-penetration fixing primer was spread on the concrete. This product penetrates deep down into the substrate, and guarantees excellent insulation and a good bond for the successive painting cycle. This was carried out using ELASTOCOLOR PAINT* protective elastic paint, in a colour specially chosen to be as similar as possible to the original one.



Two products from the ANTIPLUVIOL line were used to protect the structure covered with ceramic material. ANTIPLUVIOL S* and ANTIPLUVIOL W* colourless impregnating solutions, with the former having a siloxane resin base and the latter a silane and siloxane base in watery emulsion, which protect the surface from the rinsing action of the rain, but without altering its final appearance. When applied on porous substrates, these products penetrate deep down and form a water-repellent layer inside the pores and capillaries. The first part of the intervention, which was to prove long and complex, was carried out successfully thanks to the excellent cooperation between the building company which carried out the work, the designers and the Mapei Technical Service Department. This important restoration project has still to be completed, and at the moment, renovation work is being carried out on the remaining buildings.



***Mapei Products:** the products mentioned in this article belong to the "Products for Ceramic Tiles and Stone Materials" and "Building Speciality Line" ranges. The technical data sheets are available on the "Mapei Global Infonet" DVD or at the web site: www.mapei.com.

Mapei's adhesives and grouts conform to EN 12004, EN 12002 and EN 13888 standards.

Antipluviol S: transparent siloxane resin-based water-repellent compound.

Antipluviol W: colourless, water-repellent silane and siloxane-based impregnator in watery emulsion.

Elastocolor Paint: protective and decorative elastic paint based on acrylic resins in water dispersion.

Elastocolor Primer: solvent-based fixing primer with high penetration properties for porous substrates and curing agent for repair mortars.

Fibreglass Mesh: alkali-resistant fiberglass mesh for reinforcing interior and exterior levelling compounds.

Fugolastic: liquid polymeric additive for Keracolor FF and Keracolor GG.

Isolastic: flexible latex additive to be mixed with Kerabond, Kerabond T, Kerafloor and Adesilex P10.

Kerabond (C1, becomes C2 and S2 class when Isolastic is added): cementitious adhesive for ceramic tiles.

Keracolor GG (CG2): high-performance cementitious grout, polymer modified, for joints from 4 to 15 mm.

Keranet: acid-based cleaner for ceramic tiling. Particularly suitable for removing efflorescent salt and the final cleaning of terracotta. As a powder (concentrated) or liquid (15% water solution).

Mape-Antique FC: cement-free, light coloured, fine mortar for finishing dehumidifying mortars applied on stone, brick and tuff masonry.

Mape-Antique I: cement-free, fillerized hydraulic binder, for consolidating, by injection, stone, brick work and tuff structures.

Mape-Antique MC: pre-packed, cement-free, light coloured dehumidifying mortar for the restoration of damp stone, brick and tuff structures.

Mape-Antique Rinzafo: light coloured salt-resistant, cement-free pre-packed mortar to be used before applying Mape-Antique MC, Mape-Antique CC and Mape-Antique LC dehumidifying mortars on stone, tuff and brick substrates.

Mapeband: alkali-resistant rubber tape with felt for cementitious waterproofing systems and liquid membranes.

Mapefer: two-component corrosion-inhibiting cementitious mortar for protecting reinforcing rods.

Mapefinish: two-component cementitious mortar for finishing concrete surfaces.

Mapefoam: round closed cell expanded polyethylene foam cord as an aid to elastomeric sealants for the correct sizing of the movement joints. Available in coils where the length is proportionate to the diameter.

Mapegrout T60: sulphate-resistant thixotropic fibre-reinforced mortar for the repair of concrete.

Mapegrout Thixotropic: controlled-shrinkage fibre-reinforced mortar for the repair of concrete.

Mapelastic: two-component, flexible cementitious mortar for waterproofing concrete, balconies, terraces, bathrooms and swimming pools.

Mapesil AC: solvent-free, acetic-crosslinking mildew-resistant silicone sealant, available in 26 colours and transparent.

Primer 3296: acrylic primer in water dispersion with strong penetrating action for consolidating porous surfaces and unsound screeds.

Pulicol: gel solvent for removing adhesive and paint.

Planicrete: synthetic-rubber latex for cementitious mixes.

Silexcolor Marmorino: trowelable, highly decorative, vapour permeable, fine finished, silicate-based mineral paste coating, for interior and exterior applications.

Ultracolor (CG2): fast setting and drying, anti-efflorescence grout for joints from 2 to 20 mm, available in 26 colours.

N.B. The product has been replaced by Ultracolor Plus.

WallGard Graffiti Remover Gel: gel detergent for graffiti-damaged surfaces.

TECHNICAL DATA

Havana School of Arts Complex – the School of Plastic Arts, the School of Modern Dance – Havana (Cuba)

Work: reinforcing, waterproofing and finishing the cupolas and the bovedas; laying and grouting terracotta tiles on the bovedas and cupolas; rebuilding the damaged concrete sections; protecting and decorating the masonries.

Years of Construction: early Sixties

Years of Works: 2002 - 2008

Customer: Ministerio de Cultura de Cuba (Cuban Ministry of Culture)

Project: arch. Ricardo Porro, arch. Vittorio Garatti and arch. Roberto Gottardi
Renovation Project: arch. Universo Garcia and colleagues

Work Management: Ministerio de la Construcción de Cuba – MICONS (Cuban Ministry of Building)

Contractors: Contingente Nico Lópes, ENIA, ECOING 5, Carpintería Habana del MICONS, Empresa Constructora Puerto Carenas de la Oficina del Historiador

Mapei Distributor: Arca '99 (Cuba)

Mapei Coordinator: Pedro Graniela (Arca '99) and Renato Soffi (Mapei SpA)



HEALTH FROM WATER IN THE LAND OF WINE

Private luxury in Burgundy: Mapei products are the key features of a striking swimming pool and small spa



Saint Rémy is a small town just three kilometres away from Chalon-sur-Saône, a borough in the department of Saône-et-Loire in Burgundy, a region in central-eastern France between Champagne, l'Île-de-France and Bourbonnais.

The landscape in an area which three extremely important rivers flow into – the Seine, Loire and Rhone - is characterised by world famous vineyards “interrupted” by castles, stone walls, farms, monasteries and Romanesque churches.

The region’s typical architecture features buildings made of ochre-yellow or grey calcareous stone, which the owners have often renovated in accordance with the original designs and materials.

The project described in this article outlines the peculiar purposes which certain spaces were put to during the renovation of an old building.

A striking swimming pool and home spa were constructed inside the old construction.

Mosaics Everywhere in the Pool

The swimming pool, measuring 10x4 m, was constructed inside a courtyard, whose walls are covered with quarry, and the spa complex is located in what, originally, was a stable.

The designer decided to use a range of Mapei products to install the coverings on the swimming pool surfaces, edges and columns placed around the outside.

The bottom and walls of the concrete pool were first waterproofed using MAPELASTIC* cementitious mortar. MAPELASTIC* is supplied in two

pre-dosed components to be mixed together without adding water. The mortar is then applied with a trowel or sprayed onto to clean surfaces dampened with water. The resulting covering is waterproof, protective and highly flexible.

A FIBREGLASS MESH* was placed between the two layers of MAPELASTIC* to further reinforce the treated surface and reduce the risk of the concrete cracking. A glass mosaic in light-blue shades (mosaic tiles measuring 2x2 cm) was used to cover the swimming pool.

The mosaic was bonded onto the surface of the walls and bottom of the pool using GRANIRAPID*, a fast-setting, two-component, cementitious adhesive. GRANIRAPID* high-performance adhesive features extraordinary bonding, fast setting and hydration properties. It is highly resistant to impact vibration, temperature changes, ageing and dilute chemical agents. It is ideal for laying ceramic tiles on swimming pools surfaces. The product allows basins and pools to be filled with water after 3 days.

The columns placed around the perimeter of the pool were again covered with a mosaic bonded with GRANIRAPID*; the joints were grouted using two component acid-resistant KERAPOXY* epoxy mortar. This product is particularly suitable for all those premises calling for perfect hygiene and good resistance to even the most aggressive chemical agents.

The floor around the pool was covered with natural stone bonded with PLANOBOND* high-performance cementitious adhesive, and the joints were grouted using KERACOLOR RUSTIC*. This high-performance mortar (only available on the French market and marketed by Mapei France) allows the construction of rustic-looking joints measuring between 5 and 50 mm. The product can be used on floors and walls and is available in three colours: grey, a stone colour and pinkish beige.

To make the space holding the swimming pool more striking and practical, a glass roof was placed over it, which may be removed to soak up

Photos 1 and 2.

The swimming pool and columns around it are covered with mosaics. The mosaic tiles were set in place using Granirapid adhesive and the joints on the columns were grouted using Kerapoxy.



PROJECTS

the sunshine on sunny summer days. The room has also been fitted with large monitors and interactive lights to make it as resting and relaxing as possible.

Installation Operations in the Spa and Hammam

The client decided to create a space devoted to health and well-being in the part of the building previously used as a stable with the swimming pool alongside it, so he asked for a small but fully-equipped spa to be built (the acronym spa, "salus per aquam", basically means a thermal bathing facility).

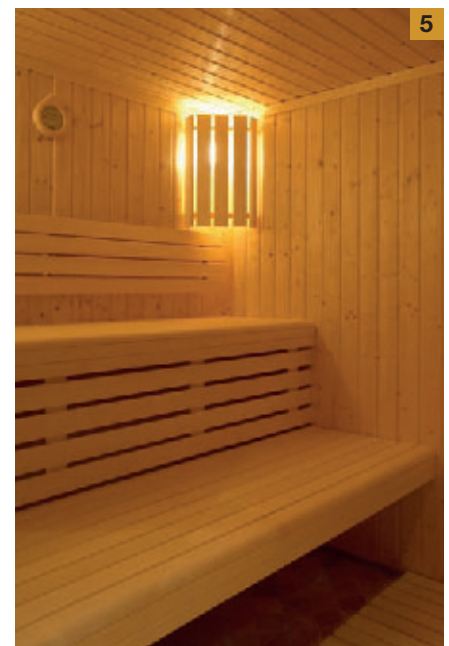


Photo 3.
The marble floor in the spa area was installed using Granirapid adhesive. The joints were grouted using Ultracolor Plus high-performance grout. The characteristic spruce wood barrel for the Finnish sauna is "accommodated" in a small basin completely covered in mosaics bonded with Granirapid and grouted with Ultracolor Plus.

Photo 4.
The natural stone slabs around the pool edges were installed using Planobond adhesive; the joints were grouted using Keracolor Rustic, a mortar marketed by Mapei France.

Photo 5.
The Finnish sauna.

Photo 6.
The hammam is completely covered in mosaic bonded with Granirapid; the joints were grouted using Kerapoxy.



The spa is composed of a Finnish sauna covered in natural spruce wood, a hammam, and a shower.

The floor in the spa area is covered with marble tiles, again bonded using GRANIRAPID*, while in this case the joints have been grouted using ULTRACOLOR PLUS*. ULTRACOLOR PLUS* is a high-performance grout, which, thanks to DropEffect® and BioBlock® technologies, guarantees a high level of water-repellence and anti-mold effect over a long period of time.

In a separate corner facing the sauna, there is a characteristic spruce wood barrel holding cold water, which you can dip into after using the sauna, in order to create that invigorating "thermal reaction" associated with this kind of health treatment. The wall behind it and the small basin holding it are covered in mosaic, bonded using GRANIRAPID*, and the joints were

again grouted using ULTRACOLOR PLUS*.

The hammam is completely covered in mosaic, once again installed using GRANIRAPID*.

The final effect is truly startling: a special private area devoted to well-being, where water is the main feature. A place where the materials had to be reliable and, at the same time, aesthetically pleasing.

In this little area of land, right in the heart of France, you can refresh your body and mind (thanks partly to what Mapei has done), perhaps while enjoying a nice glass of good old Burgundy.

This article is taken from issue no 20 of "Mapei&Vous", the in-house magazine published by Mapei France, to whom we would like to express our thanks.

*Mapei Products:

the products mentioned in this article belong to the "Products for Ceramic Tiles and Stone Materials" and "Building Speciality Line" ranges.

The technical data sheets are available on the "Mapei Global Infonet" DVD or at the web site: www.mapei.com.

Mapei's adhesives and grouts conform to EN 12004, EN 12002 and EN 13888 standards.

Granirapid (C2F, S1): high performance, deformable, two-component cementitious adhesive with rapid setting and hydration for ceramic tiles and stone material. It can be also used to bond glass mosaic.

Keracolor Rustic (CG2): grouts for rustic-look joints (5-50 mm). It is available in three different color shades. N.B. The product is only available in the French market.

Kerapoxy (RG): high performance, two-component, acid-resistant grout and adhesive with no vertical slip for installing and grouting ceramic tiles and stone material (with joints over 3 mm). It is available in 26 different color shades.

Planobond (C2E): high performance full contact cementitious adhesive with extended open time, for interior and exterior ceramic tile and stone material flooring.

Fibreglass Mesh: alkali-resistant fibreglass mesh for reinforcing waterproof protections, anti-fracture membranes and insulation coatings.

Ultracolor Plus (CG2): fast setting and drying, high performance, anti-efflorescence, polymer modified grout, for joints from 2 to 20 mm. Water-repellent with DropEffect® and antimold with BioBlock® technology.



TECHNICAL DATA

Private swimming-pool and spa, Saint Remy (France)

Work: waterproofing the pool surfaces, laying glass mosaic and natural stone in the swimming-pool basin and in the spa areas

Year: 2006

Work Management: Mr Cabarcos of Sarl Vincent (Saint-Rémy, France)

Installation Company: Sarl Vincent

Mapei Distributor: Agence Doras (St-Marcel, France)

Mapei Coordinator: Jean-Jacques Richard, Mapei France

Milan Central Railway Station

Now that the first phase of the renovation has come to an end, work continues with Mapei again leading the way on site

After the Teatro alla Scala, the Pirelli Skyscraper and the Basilica of Saint Ambrogio, yet another grandiose restoration and reclamation operation is being completed in the heart of Milan, and again with the contribution of Mapei. This time, it's the Central Railway Station where work started in 2005. This is one of the most important conservative renovation projects in the field of urban architecture in Italy.

Railway architecture is going through a new season of change and, as declared by Mauro Moretti, the Managing Director of the Italian National Railways Group (Gruppo Ferrovie dello Stato), "stations are once again becoming privileged subjects, reflecting the pattern of transformation which urban areas and economic and social scenarios are undergoing".

And this is also because, continued Moretti, "a station represents movement, it is part of a journey whose boundaries cross over into a city and territorial environments and unites, not only idealistically, the entire European railway network".

It is worth remembering that Milan Central is the second largest railway station in Italy for size and volume of passengers, and is a hub for 500 trains a day, two underground railway lines, is right alongside the City Railway Bypass, is a terminus for a number of bus and tram routes and a drop-off point for the airports shuttle services. The upgrading of the entire infrastructure system of this important railway hub represents, therefore, the answer to the increasing demand for metropolitan and regional mobility. At the same time, renovation of Milan Central Railway Station is a fundamental operation in view of the extraordinary event that Milan will shortly be experiencing, the 2015 Universal Expo.

THE AREAS WHERE MAPEI PLAYED A MAJOR ROLE

A. Structural reinforcement works for static reinforcement of the extrados of the vaulted roofs in the Carriage Gallery.

B. Restoration of part of the decorative cement in the Carriage Gallery and of part of the intrados and protective decoration of the surfaces.

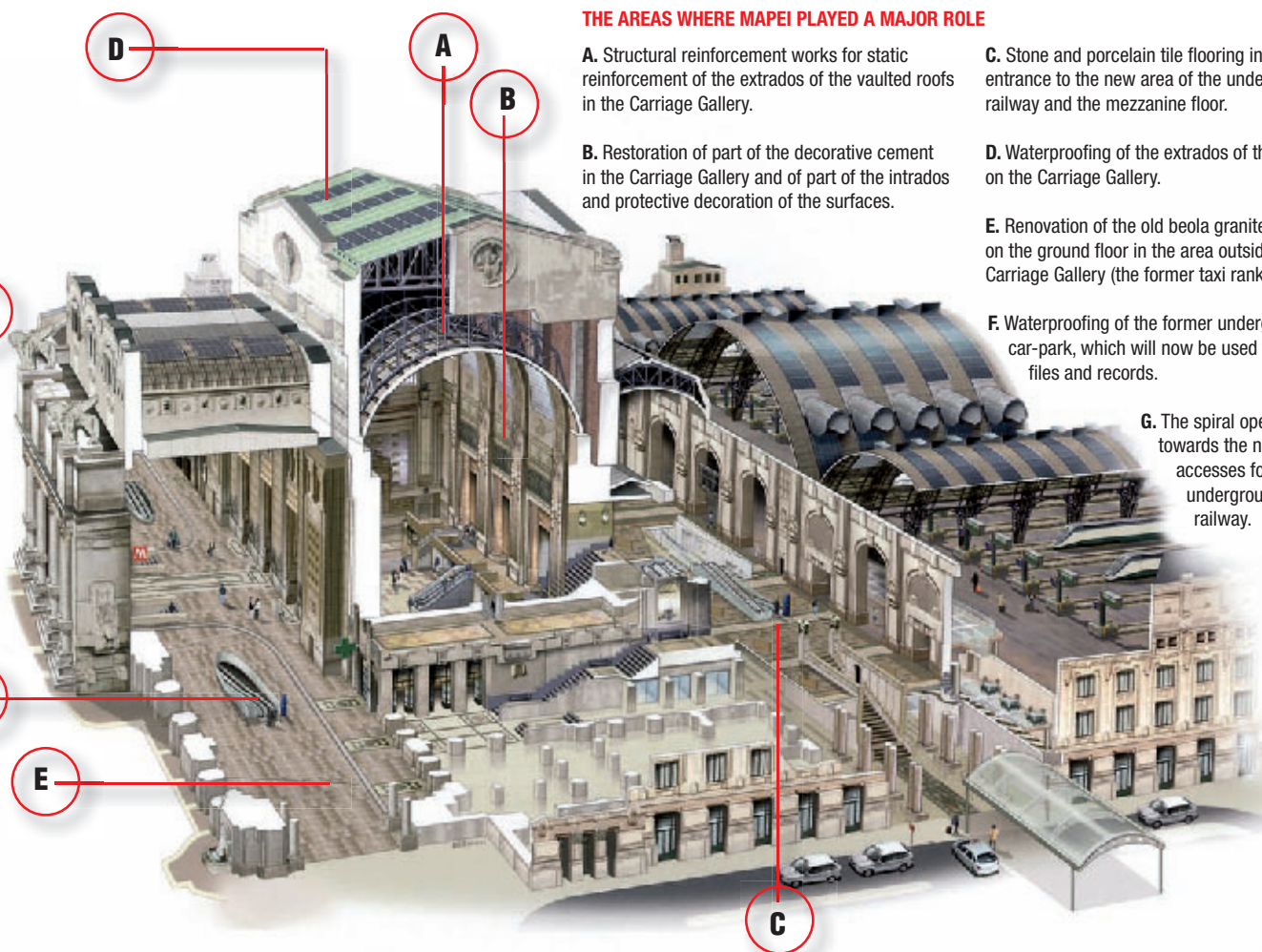
C. Stone and porcelain tile flooring in the entrance to the new area of the underground railway and the mezzanine floor.

D. Waterproofing of the extrados of the domes on the Carriage Gallery.

E. Renovation of the old beola granite floors on the ground floor in the area outside the Carriage Gallery (the former taxi rank).

F. Waterproofing of the former underground car-park, which will now be used to store files and records.

G. The spiral openings towards the new accesses for the underground railway.



Designed by Mirko Milanese

The Renovation Project

“The idea that animates the overall renovation project for Milan Central Railway Station”, stated Fabio Battaglia, Managing Director of Grandi Stazioni SpA (the Italian company within the Ferrovie dello Stato Group with the full responsibility for renovating and enhancing the value of the properties comprising Italy’s largest railways stations, as well as a number of major railway stations), “is driven by the high architectural value of the entire complex: the station is an artistic patrimony for the City, whose beauty will be protected and brought back to its antique splendour”.

Designed by Ulisse Stacchini at the beginning of the 20th century, it is a kaleidoscope of polychromatic marble, a continuous array of monumental environments, where the natural light plays games against the travertine, exalting the carvings, decorations and stucco surfaces of rare beauty and expressive intensity. An integral part of the renovation project of the station was an intensive conservative restoration programme of the original works, created together with the City

of Milan Superintendent for Cultural Works. Every surface was cleaned, consolidated and renovated using the original materials. Where this proved to be impossible, materials with a similar constitution were used, and then protected against attack due to harsh weather conditions and the passage of time.

“The challenge with this project” declared the designer, the Italian architect Marco Tamino, “was to develop innovation without cancelling the identity of the place; rather, it now has more character and more energy”. One of the guidelines followed by the designer was to minimise the impact of the project. In fact, as Tamino underlined, “the forms, lines and construction technology of the new architectural elements inserted into this context are strong and innovative, yet they avoid formal intrusions and rivalry with the older architecture”.

The first stage of the work is now finished, and involved the most complex part of the project: consolidation of the vaulted roofs on top of the station, starting from the Carriage Gallery (Galleria

delle Carrozze), up to the Ticket Hall and ending up at the Central Gallery. After consolidating the main architectural structures, the second phase involved reorganisation of the internal walkways. The works programme goes on day and night, and is taking place under unique logistical conditions: restructure a terminal, in this case the Milan Central Railway Station, without effecting the normal daily railway traffic and the services offered by the station to more than 350,000 people who use the station every day. The excellent results in the logistics of the project are made possible by design studies which are carried out daily on the field by the technical site staff of the main building contractor, Rizzani De Eccher. After the final cleaning operations of the vaulted roofs in the Carriage Gallery and in the Gallery at the head of the station, one can now admire the contrast between the renovated walls and those which have still to be touched.

Now let’s take a closer look at the various intervention cycles, in which Mapei products and systems have always played a leading role.

A. Structural reinforcement works for static reinforcement of the extrados of the vaulted roofs in the Carriage Gallery



Foto 1.
Original condition.

Photo 2.
Cleaning the extrados.

Photo 3.
Applying Mapegrout T60.

Photo 4.
Applying MapeWrap 31 adhesive.



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The first operation was to carefully clean the entire surface, to eliminate the dirt deposited on the roof over the years and any loose parts.

Rebuilding of the concrete areas removed after carrying out preparation work for this phase and smoothing over the surfaces, was carried out using MAPEGROUT T60* single component, fibre-reinforced cementitious mortar for repairing concrete.

This product was applied using the fresh on fresh technique on top of EPORIP* epoxy based adhesive, which had been applied using rollers and brushes on the areas to be repaired.

Once this operation had been completed, and once the mortar was well cured, the reinforcement operations using products from the MAPEWRAP range could commence.

The cycle involved applying a pre-

liminary layer of MAPEWRAP PRIMER 1* epoxy primer, for the preparation of substrates which are the object of static reinforcement.

The surface was then smoothed over before applying the carbon fibre sheets, and this operation was carried out using MAPEWRAP 12*, two-component epoxy putty with a thixotropic consistency.

The mono-directional carbon fibre fabrics chosen for this operation were MAPEWRAP C UNI AX*. The fabrics were positioned by impregnation using MAPEWRAP 31*, a special two-component epoxy adhesive for this type of bonding operation. To prepare for the final painted layer, quartz was carefully sprinkled on the resin while its surface was still fresh.

A very important and delicate operation was the sealing and waterproofing of the joints in the concrete surfaces.

The expansion joints were waterproofed by positioning MAPEBAND TPE* (Thermoplastic Polyolefin Elastomeric) tape across the section of the concrete, bonded in place with ADESILEX PG4*, two-component epoxy adhesive with modified rheology for structural bonds.

Before sealing the joints, MAPEFOAM* expanded polyethylene foam cord was inserted in them to achieve correct dimensions of the joints. They were sealed with MAPEFLEX PB25*, two-component, thixotropic sealant composed of a polyurethane polymer devoid of free isocyanates and special hardener which contains tar of petroliferous origin.

While the work was being carried out, a number of tie-rods were found to be rusty to such an extent that they needed to be either reinforced or replaced. The ceiling roses were also repaired

and reinforced with cords. In those areas where reinforcement was carried out, a special carbon fibre cord made from MAPEWRAP C FIOCCO* was used (diameter 12 mm).

Once the structural work had been completed, the entire surface had to be painted with a product which, over the years, will also allow for easy clean-

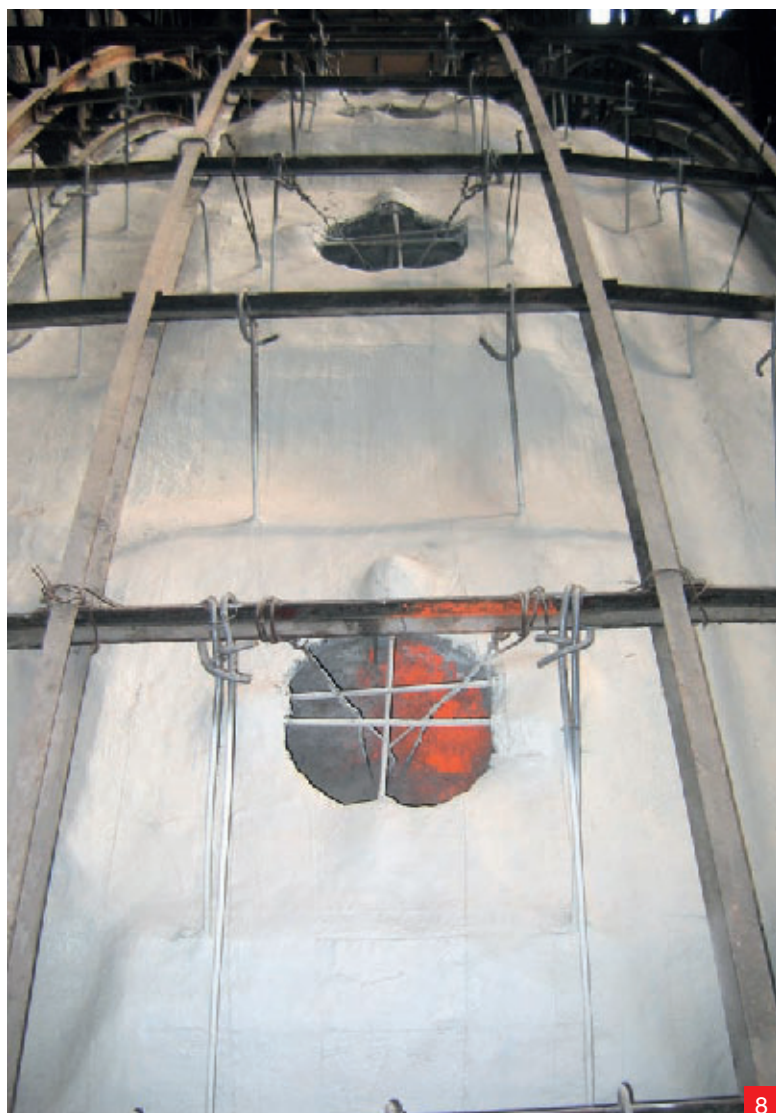
ing operations. After trying out a number of samples, the painting operation was carried out using COLORITE PERFORMANCE*, pure acrylic resin-based paint in water dispersion which leaves a long-lasting, durable finish.



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*Photo 5.
Preparation work
before laying
MapeWrap C UNI AX.*

*Photo 6.
Mapeband TPE
elastic tape applied
on the expansion
joints.*

*Photo 7.
Fixing the ceiling
roses with MapeWrap
C Fiocco.*

*Photo 8.
Extrados of the
Carriage Gallery
painted with Colorite
Performance.*

***Mapei Products Used in Section A:**

Adesilex PG4: two-component, thixotropic, epoxy adhesive with modified-rheology for bonding Mapeband, Mapeband TPE, PVC braces, Hypalon and for structural bonding.

Colorite Performance: pure acrylic resin-based paint in water dispersion for protecting and decorating external and internal surfaces.

Eporip: two-component epoxy adhesive for bonding new to old concrete and monolithic sealing of cracks in screeds.

Mapeband TPE: TPE tape for flexible sealing and waterproofing of expansion joints and cracks subject to movement up to 5 or 10 mm wide.

Mapeflex PB25: two-component elastic polyurethane-resin and tar-based sealant with thixotropic consistency resistant to hydrocarbons.

Mapefoam: closed cell polyethylene foam cord for the correct sizing of movement joints. It is available in coils where the length is proportionate to the diameter.

Mapegrout T60: sulphate-resistant shrinkage-compensated fibre-reinforced thixotropic mortar for the repair of concrete.

MapeWrap 12: two-component slow setting thixotropic epoxy putty for levelling concrete surfaces.

MapeWrap 31: two-component superfluid medium viscosity epoxy adhesive for impregnation with MapeWrap "dry system".

MapeWrap C Fiocco: carbon fibre cord for impregnating with MapeWrap 21 (two component, super-fluid epoxy resin). The products in the MapeWrap C Fiocco range are made from unidirectional carbon fibre with a high modulus of elasticity.

MapeWrap C UNI AX: high strength unidirectional carbon fibre fabric with high modulus of elasticity (230,000 N/mm²). The fabric is available in two weights and each type with different heights.

MapeWrap Primer 1: two-component epoxy primer specific for the MapeWrap system.

B. Restoration of part of the decorative cement in the Carriage Gallery and part of the intrados; protective decoration of the surfaces

This operation was carried out by initially removing the loose and damaged portions.

All the rust was completely removed from the reinforcement rods, which were then treated with MAPEFER* corrosion-inhibiting cementitious mortar.

The concrete was then rebuilt using MAPEGROUT T60* fibre-reinforced, controlled-shrinkage mortar.

To form an even finish on the repaired areas, and also to protect them, they were treated with SILANCOLOR PRIMER* followed by a coat of SILANCOLOR PAINT*. The silicone resin-based SILANCOLOR PRIMER* and SILANCOLOR PAINT* were also used to paint and protect the render in the large arrivals area for the trains. ANTIPLUVIOL W* water-repellent impregnator, on the other hand, was used to protect the areas in decorative cement.

Photo 1.
The situation before the works.

Photo 2.
Rebuilding using Mapegrout T60.

Photo 3.
Applying the Antipluviol W treatment.

Photo 4.
The Gallery after restoration work.



*Mapei Products Used in Section B:

Antipluviol W: water-based emulsion of a colourless, water-repellent silane and siloxane-based impregnator.

Mafer: two-component corrosion-inhibiting cementitious mortar for reinforcing rods.

Mapegrout T60: sulphate-resistant shrinkage-compensated fibre-reinforced thixotropic mortar for the repair of concrete.

Silancolor Paint: high vapour-permeability and water repellent silicone resin based paint in water dispersion for exterior applications.

Silancolor Primer: silicone-resin based insulating primer in water dispersion to uniform the absorption of the substrate before the application of Silancolor Paint, Silancolor Tonachino and Silancolor Graffiato.

C. Stone and porcelain tile flooring in the entrance to the new area of the underground railway and the mezzanine floor

The areas involved in this operation were the entrance to the new area in the underground railway and the mezzanine floor.

In these areas, it was also necessary to prepare the substrates. The first step was to mechanically scarify the surface to make the base suitable for laying the screed.

The screed was installed by bonding it to the substrate using bonding slurry made from PLANICRETE*, synthetic rubber latex, water and TOPCEM*, a special high-performance hydraulic binder.

The screed was made by pouring TOPCEM PRONTO* (pre-packed, ready-to-use, normal-setting, controlled-shrinkage mortar for fast-drying screeds) while the bonding slurry was still fresh (the "fresh on fresh" technique). In some areas, where the

Photo 1.
A view of the site.

Photo 2.
Preparation of the substrate with Topcem Pronto.

Photo 3.
Laying the slabs of Sicilian Perlato marble with Adesilex P4.

Photo 4.
Laying the slabs of Sicilian Perlato marble with white version of Keraflex.

Photo 5.
Grouting the joints with Keracolor FF.



height had to be regulated, or where an extremely smooth, flat surface was required, ULTRAPLAN MAXI* ultra-fast hardening, self-levelling cementitious smoothing compound was applied.

Once these layers had been prepared, the floor covering was then laid.

30x60 cm Sicilian Perlato marble slabs with a thickness of 3 cm were used, and were bonded in place using either ADESILEX P4* (rapid-setting, improved cementitious adhesive) and the white-coloured version of KERAFLEX* (normal-setting, improved thixotropic cementitious adhesive), according to the thickness to compensate for and according to the time required before putting the floors back into service.

The joints were grouted using KERACOLOR FF* cementitious grouting mortar.

The final operation was to use ADESILEX P4* for bonding a perfectly flat layer of porcelain tile featuring a bubbled sur-

face especially devised for the visually impaired people.

*Mapei Products used in Section C:

Adesilex P4 (C2F): high performance rapid setting full contact adhesive for ceramic tiles and stone material (3 to 20 mm adhesive thickness).

Keracolor FF (CG2): high performance, polymer-modified, water-repellent, cementitious grout with DropEffect® technology for joints up to 6 mm.

Keraflex (C2TE): high performance cementitious adhesive, with no vertical slip and with extended open time for ceramic tiles and stone material (thickness of adhesive up to 5 mm).

Planicrete: synthetic-rubber latex for cementitious mortars.

Topcem: special hydraulic binder for normal-setting, fast drying (4 days) and controlled shrinkage screeds.

Topcem Pronto: ready-to-use, pre-packed, normal-setting mortar with controlled shrinkage for fast-drying screeds (4 days).

Ultraplan Maxi: ultra-fast hardening self-levelling smoothing compound for thicknesses from 3 to 30 mm.

N.B. Mapei's adhesives and grouts conform to EN 12004, EN 12002 and EN 13888 standards.

D. Waterproofing of the extrados of the domes on the Carriage Gallery



Photo 1.
Monolithic sealing of the blocks with Mapesil BM.

Photo 2.
Applying Elastocolor Primer.

Photo 3.
Painting the surface with Elastocolor Paint.

Photo 4.
The final result.



In this case too, preparation of the substrates was important, and all loose parts were removed mechanically and all the dirt was removed from the surface.

The joints of the decorative stone surfaces were waterproofed with MAPEBAND TPE*, bonded to the bottom using ADESILEX PG4* epoxy adhesive. In order to allow for maximum deformation of the silicone sealant when in service, the correct size of the joints was created using MAPEFOAM* expanded polyethylene foam. They were then sealed using MAPESIL BM* odourless silicone sealant with neutral cross-linking and a low modulus of elasticity, for movement joints with maximum 25% expansion of initial size. To hide the repair work, a coat of ELASTOCOLOR PRIMER*, to even out the absorption, followed by a coat of ELASTOCOLOR PAINT* were applied. In some of the more critical areas, MAPELASTIC SMART* was applied.

* Mapei Products Used in Section D:

Adesilex PG4: two-component, thixotropic, epoxy adhesive with modified-rheology for bonding Mapeband, Mapeband TPE, PVC braces, Hypalon and for structural bonding.

Elastocolor Paint: protective and decorative elastic paint for concrete and renders based on acrylic resins in water dispersion.

Elastocolor Primer: synthetic resin-based primer in solvent, designed to provide maximum insulation and to improve the adhesion of Elastocolor Paint, Elastocolor Rasante and Elastocolor Rasante SF to the substrate.

Mapeband TPE: TPE tape for flexible sealing and waterproofing of expansion joints and cracks subject to movement up to 5 or 10 mm wide using both Mapeband TPE 170 and

Mapeband TPE 325.

Mapefoam: closed cell polyethylene foam cord for the correct sizing of movement joints. Available in coils where the length is proportionate to the diameter.

Mapelastic Smart: two component, high flexibility cementitious mortar, applied by brush or with a roller, for waterproofing concrete surfaces such as foundations, retaining walls, balconies, terraces, bathrooms and swimming pools, and for protection against aggressive chemical agents.

Mapesil BM: odourless, neutral cross-linking, low modulus silicone sealant for movement joints with maximum 25% expansion of initial size, suitable for water draining systems and for general use.

E. Renovation of the old beola granite floors on the ground floor in the area outside the Carriage Gallery (the former taxi rank)



Photo 1.
Demolition of the old floor.

Photo 2.
Preparation of the new floor slab with metallic equipment.

Photo 3.
Pouring the concrete with Dynamon SX 14 admixture.



Photo 4.
Grouting the floor with sand supplied by VA.GA.

Photo 5.
Hydro-jet cleaning of the new beola granite floor.

The work took longer than scheduled in this area for a number of reasons. The old floor covering was completely removed, the floor slabs were demolished and excavation work was carried out over a vast area. In fact, a new exit for the underground railway will be built in this area, with moving walkways to carry passengers to the station ticket office. There will also be a number of shops and commercial activities in this area.

The first results were first noticed when the new floor slab was reinforced and the concrete was poured on.

It is worth pointing out that the wooden panels of the formwork were treated with DMA 1000 FORM RELEASE AGENT* and the Monvilbeton concrete poured on was mixed with DYNAMON SX 14* and MAPEPLAST PMX* admixtures to increase cohesion of the mix and to make it more homogenous and

compact.

The structure was then waterproofed using traditional techniques, while the beola granite was laid on a bed of sand and cement. The sand for grouting (621-type sand for building with 0,1-4 mm grain size) was supplied by the Mapei subsidiary VA.GA.

* Mapei Products Used in Section E:

DMA 1000 Form Release Agent: emulsion form release agent for easy removal of wooden forms.

Dynamon SX 14: fine aggregate supplementing superplasticiser for concrete with low loss of workability and high reduction of mixing water.

Mapeplast PMX: admixture for enhancing the pumpability of concrete.

F. Waterproofing of the former underground car-park, which will now be used to store files and records

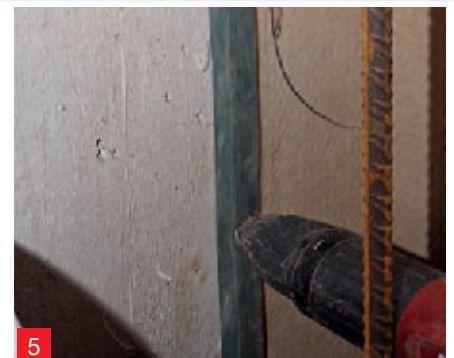


Photo 1.
Demolition of
the floor slabs.

Photo 2.
Preparation of the
Mapeproof sheets.

Photo 3.
Laying the
Mapeproof sheets.

Photo 4.
Preparation of the
Idrostop B25
bentonite jointing tape.

Photo 5.
Positioning
the jointing tape.

This vast underground area was waterproofed with the MAPEPROOF* bentonite system. The existing concrete surfaces was first levelled off using MAPEGROUT T60*. The bentonite sheets were laid by overlapping them by 15 cm, and nailing them in place to the base. IDROSTOP B25* hydro-expansive bentonite jointing tape was laid around the perimeter of the area. After this operation, a 20 cm-thick layer of reinforced concrete with DYNAMON SX 14* admixture was poured on.

*** Mapei Products Used in Section F:**

Dynamon SX 14: fine aggregate supplementing superplasticiser for concrete with low loss of workability and high reduction of mixing water.

Idrostop B25: hydro-expansive, bentonite jointing tape for sealing construction joints.

Mapegrout T60: sulphate-resistant

shrinkage-compensated fibre-reinforced thixotropic mortar for the repair of concrete.

Mapeproof: waterproofing bentonite sheet for vertical and horizontal surfaces on underground structures, composed of two geofabrics in needle-punched polypropylene, which form a sandwich around a uniform layer of micronised natural sodium bentonite.

G. The spiral openings towards the new accesses for the underground railway



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Photo 1.
Floors installed with
Adesilex P4.

Photo 2.
Positioning one of the slabs.

Photo 3.
Sealing the expansion
joints of the slabs with
Mapesil AC.

Photo 4.
One of the two new
openings upon completion
of the work.



3

In the Carriage Gallery, the design for the new openings for the moving walkways which lead to the underground railway follow the soft lines of the architectonic flow which surrounds them, and the geometry of the vaulted roofs. The Montorfano granite which decorates the spiral surfaces of the openings also has a soft feel: this quite surprising pattern is the result of the complicated, high-technology NC machining operation which was used to shape the marble, following a continuously variable truncated cone form. The Mapei products used in this case were, as usual, up to the task. In fact, the marble was laid using ADESILEX P4* and sealed with MAPESIL AC*.

*** Mapei Products Used in Section G:**
Adesilex P4 (C2F): high performance rapid setting full contact adhesive for ceramic tiles and stone material (3 to 20 mm adhesive thickness).
Mapesil AC: one-component mildew resistant acetic cross-linking silicone sealant.



4



Various Operations

The main contracting company, Rizzani De Eccher, carried out directly a number of operations using other important Mapei products, as follows:

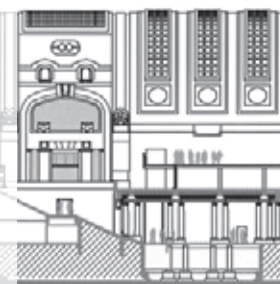
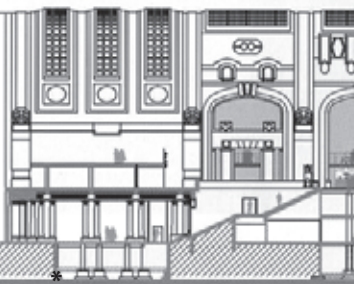
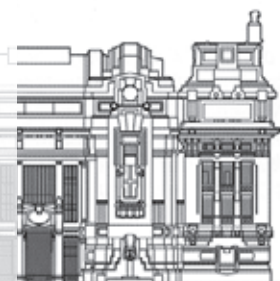
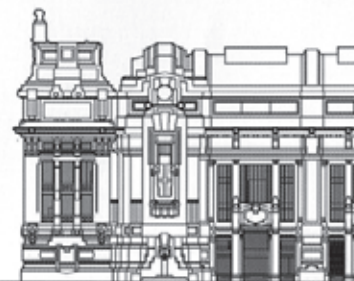
- MAPEGROUT FAST-SET* was used for quick repair work on the concrete parts;
- MAPEGROUT HI-FLOW* and STABILCEM* were used successfully for anchoring work;
- PLANITOP 100* was used to seal off honeycombs in the poured concrete used for the columns in the mezzanine floor area.
- MAPEPROOF* was used for waterproofing the retaining walls.

Mapei is There!

Once again.....Milan Central Railway Station is open for work and Mapei, with their technicians and products, is there!

In fact, a renovation site characterised by the complexity of the design and engineering aspects such as this one can not be without the Company's experience and high technology products.

In a city which is forever changing, and which looks ahead to the Universal Expo 2015, a grand entrance to the city of Milan is getting ready to welcome the future. And in the future of Milan, which witnessed the Company's birth and growth, Mapei is forever present with concrete evidence of their work which testifies the efficiency of the Company's products and the value of their technicians at work on site.





*** Mapei Products Used in Various Operations:**

Mapegrout Fast-Set: controlled-shrinkage, fibre-reinforced mortar, with rapid setting and hardening for the repair of concrete.

Mapegrout Hi-Flow: shrinkage-compensated fibre-reinforced grout for concrete repair.

Mapeproof: waterproofing bentonite sheet for vertical and horizontal surfaces on underground structures.

Planitop 100: light grey, rapid setting, fine mortar for repairing and smoothing concrete and renders.

Stabilcem: superfluid expanding cementitious binder for injection slurries, mortars and concrete.

Mapei Products:

The products mentioned in this article belong to the "Products for Ceramic Tiles and Stone Materials", "Building Speciality Line" and "Admixtures for Concrete" ranges. The technical data sheets are available on the "Mapei Global Infonet" DVD or at the web site: www.mapei.com.



TECHNICAL DATA

Milan Central Railway Station, Milan (Italy)

Years of Construction: 1925-1931 on a project designed by Ulisse Stacchini in 1913

Years of Works: 2005-2008

Customer: Grandi Stazioni Spa

Work Management: eng. Antonio Acerbo

Operational Directors: Luigi Berti, Maria Cannatelli, Paola Cappellini, Antonella Flores, Leopoldo Freyrie, Gabriele Salvatoni and Nadir Bisa

Supervisor: Stefano D'Ambrosio

Safety Coordinator during the Designing and Working Phases: CO.DI.ME.

Architectural Project:

arch. Marco Tamino

Structural Project: Massimo Antonelli

Equipment Project: Lorenzo Pagnoncelli

Building Site Communication:

Sabina Passacantilli

Graphic Project: Alessandro Cardinali

Contractor: A.T.I.

Main Customer: Rizzani De Eccher Spa

Customers: Busi Impianti Spa and Elyo Italia Srl

Installation Companies: Donelli Srl (Legnano, Italy), Platter Edilizia & Restauri Srl (Ora, Italy), Europav Srl (Limite di Pioltello, Italy), So.Tema (San Gemini, Italy)

Responsible of the Construction Job Order: Mauro Turrini

Construction Site Director: Corrado Caldera

Mapei Coordinators: Paolo Baldon, Giulio Morandini, Massimiliano Nicastro, Igor Pellegrini, Massimo Seregini, Francesco Stronati, Dino Vasquez (Mapei SpA)

The Most Beautiful Railway Station in the World

Milan Central Railway Station (Milano Centrale) is one of the most important railway stations in Europe. This railway hub was inaugurated in 1931 to replace the old Central Station (1864) which could no longer handle the volume of traffic after the opening of the Sempione Tunnel (1906). Vittorio Emanuele III King of Italy laid the foundation stone for the new station on the 28th of April, 1906. Construction work started in 1925. Because of the economic crisis in Italy during the First World War, work went ahead very slowly and the project, which was quite a basic one at the start, gradually become more complex and more imposing. This occurred especially when Benito Mussolini became Prime Minister, who wanted the station to represent the power of the Fascist regime. The main modifications carried out were to redesign the platforms and to introduce enormous steel arches, the work of Alberto Fava, which were 341 metres long and covered an area of 66,500 m². Construction got back to full pace in 1925, and on the 1st of July 1931, the station was officially inaugurated in the presence of the Minister for the Postal Service and Communications, Costanzo Ciano. Nowadays, more than 350,000 passengers pass through the station on an average of 500 trains every day, for a total of 120 million people every year. Milan Central Railway Stations, defined

by Frank Lloyd Wright, one of the all time architectural geniuses, as "the most beautiful railway station in the world", will be the only crossroads for the TAV (High-Speed railway) network which is currently under construction between the Turin-Milan-Venice, Milan-Rome-Naples and Milan-Genoa routes.

In the middle, Italian Minister Costanzo Ciano and the architect Stacchini (on the left behind the Minister) inaugurated the Milan Central Railway Station in 1931.



MapeWrap System

Innovative system for the strengthening and increased stability of load-bearing structures in reinforced concrete, masonry, wood and steel.

By Giulio Morandini, Mapei SpA Technical Service Department

MAPEWRAP SYSTEM

MAPEWRAP SYSTEM is a complete system of products based on carbon fibres, glass fibres, metallic fibres and epoxy resins for the restoration and increased stability of reinforced and prestressed cement, steel and masonry structures.

ADVANTAGES

There are numerous advantages deriving from the use of products from the MAPEWRAP SYSTEM range compared with traditional repair technology, the most important are as follows:

- Quick and easy to lay. Thanks to their extremely low weight, products from the MAPEWRAP SYSTEM range may be applied without having to use any particular tools or equipment, with the use of only a small team of operators in an extremely short time and, quite often, without even having to interrupt use of the structure.
- High durability.
- No corrosion problems of the strengthening materials applied, unlike steel plates applied for localised repair operations using the béton plaqué technique.
- No increase in mass of the structure: interventions carried using the MAPEWRAP SYSTEM do not increase the mass of strengthened structural elements; this aspect is extremely important, especially when applied for seismic protection, where the stresses are proportional to the mass involved.
- Increased ductility of the strengthened element
- Reduced increase of the original thickness: the use of MAPEWRAP SYSTEM does not cause a relevant increase of the original sizes. The increase of the original thickness is usually no more than 3-4 mm.



Photo 1. Planitop HDM special cementitious mortar combined with Mapegrid G220.

Photo 2. Applying Planitop HDM Maxi cementitious mortar before laying Mapegrid G 220.

Photos 3 and 4. Binding pillars and beams with MapeWrap System.

FRP'S IN THE CONSTRUCTION INDUSTRY

The use of FRP's in the construction industry regards mainly the sector involved in static upgrading of deteriorated or damaged structures, and static upgrading for anti-seismic purposes. In this sector, the operational techniques based on the use of conventional materials are not without difficulty, and there are also doubts as to the durability of the intervention carried out.

With this in mind, a repair operation based on the use of high-performance composite materials is more economic than with the use of conventional materials, if we take into consideration the time and equipment required for the intervention, costs deriving from interruption to use of the structure and an estimate of the service life of the structure after the intervention.

WHAT TYPES OF FRP ARE USED?

The main parameter which defines the characteristics of FRP fibre strengthening is not its tensile strength, which is far higher than the loads to which FRP strengthening is subjected to, but rather the material's modulus of elasticity.

The higher the modulus of elasticity of the fibres, the higher the amount of rigidity they may supply.

The most suitable fibres for use in the restoration of reinforced cement structures are medium-strength carbon fibres (tensile yield strength > 2000 MPa) with a medium to high modulus of elasticity ($E = 170-200-250$ GPa). For the restoration of masonry buildings and wooden structures, characterised by a lower modulus of elasticity, it is better to use fibre composites with a lower modulus of elasticity than carbon fibres. In this case, therefore, it



FRP MATERIALS

The term FRP stands for Fibre Reinforced Polymer. FRP's are part of the larger family of "structural composites", that is, those materials (including reinforced concrete) which are made up of two phases: strengthening in a non-continuous form characterised by its high mechanical performance, and the matrix, in the form of a continuous element, and usually mechanically weaker. The particular characteristic of structural composites is that they offer better, or more "complete", mechanical performances than those of the single component phases. In composites with a polymer matrix (FRP's for example), the matrix is usually made up of an epoxy resin, while the strengthening material is made up of carbon or glass fibres.

is better to use glass fibre-based composites, characterised by a modulus of elasticity lower than 80 GPa, which means that they are more compatible with masonry supports from an elastic-mechanical point of view.

As far as the polymer matrix is concerned, epoxy resins are preferable to polyester ones, especially because they bond better to cementitious substrates.

A special depliant on the MapeWrap System was published by Mapei and can be requested at: realtamapei@mapei.it or by fax at: +39-02-37673214.

The technical data sheets of this range products are available at www.mapei.com.

NANOLATEXES IN THE BUILDING INDUSTRY

The following article has been taken from a paper presented at the “Nanotechnologies in Paints for the Environment” session of the Eurocoat 2007 Convention, held during the paint and varnish industry’s international Expo in Genoa (Italy) in November 2007

by Antonio Mader and Antonietta Schirò, Vinavil R&D laboratories

Nanotechnology, or rather, phenomena on a nanometric scale and ways of manipulating such phenomena, has always existed. What is new compared with the recent past is the coining of the phrase “nanotechnology”, in that on the basis of a solid scientific background, we are more aware of the importance of the nanometric scale and, above all, there are now special instruments available which are capable of taking quantitative measurements of what occurs at these dimensions.

The difference between “mass” objects and those organised on a nanometric scale are due to various reasons:

- the importance of surface area with respect to volume;
- the effect of confinement, with evidence of quantum effects (which are not discussed here) or, as in the case of polymeric materials, particular performance characteristics;
- equations with reference to a macroscopic scale have no meaning, and the phenomena are better described with reference to statistical thermodynamics.

To give an idea of the dimensions being discussed, a human hair is just a few microns thick. A nanometer corresponds to a thousandth of a micron.

A molecule of water is approximately 0.3 nm in diameter.

A nanometer, compared with a meter, is like comparing a dice with the earth. In the beat of your eyelids, your hair grows one nanometer.

“Nanotechnology” is widely diffused in nature, and the

study of the phenomena has led to the development of new products; for example, the “lotus effect” has led to the development of anti-graffiti coatings.

Raw materials required for nanotechnology are now available at an acceptable price.

Advantages of Nanolatexes

As manufacturers of products in water dispersion, we have often asked ourselves which particular characteristics could nanolatexes have, and therefore, how they may be applied to the building industry.

1. One important characteristic, which is common to all latexes, is the use of water as dispersing medium.
2. High productivity. Generally speaking, polymerisation speed in heterogeneous phase is inversely proportional to the diameter of the particle; the kinetics of polymerisation are, therefore, particularly favourable.
3. High surface area. This is illustrated in Fig. 1, which shows that conventional latex has a specific surface area of around 20 m²/g, ten times lower than that of nanolatex.
4. Surface functionality. As the size of the particles reduce, the importance of the surface area with respect to the volume increases. In this way, when the functional particles polymerise, most of the functional groups will tend to go to the surface.
5. Filler covering. This is a result of points 3 and 4. For

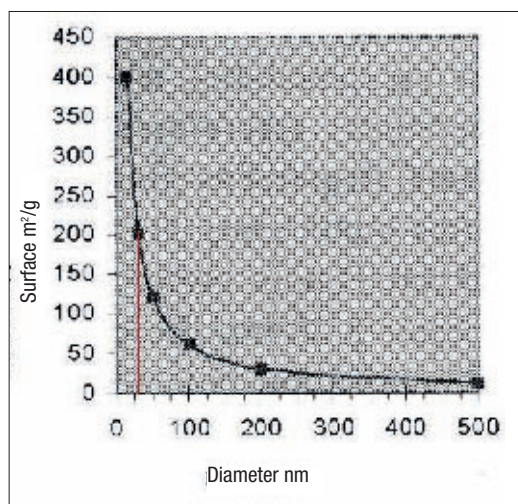


Fig. 1. Specific surface (see [3]).
A 30 nm nanolatex is highlighted.

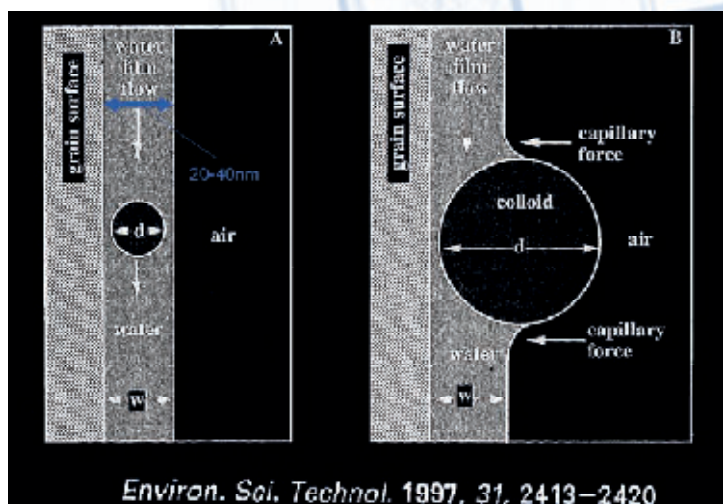


Fig. 2. Transport model of thin liquid films.
For $w/d > 1$, there is efficient particle drag.

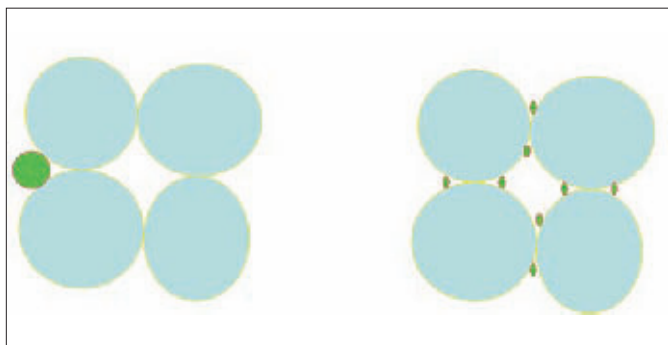


Fig. 3. This figure illustrates the favourable behaviour of nanolatexes in binding inconsistent granules.

CHARACTERISTICS OF LATEXES CURRENTLY ON THE MARKET

	Crilat 4896	Crilat 4815
Solid content %	31	32
Viscosity mPa.s	<200	<500
Particle size range nm	50-70	25-40
Stabilising system	cationic	anionic
Tg °C	20	15
MFFT °C	5	0
pH	4-6	7-8

Table 1. Nanolatexes currently produced by Vinavil.

example, 30 g of 30 nm nanolatex will cover a total of 3 kg of 1 micron diameter filler.

If the functionality of the nanolatex is designed correctly, apart from acting as a binder, it may also act as a dispersing agent.

- Film formation.** Scientific studies [1] have shown that, at similar glass transition temperatures, a polymer dispersed in fine particles will film at a lower temperature compared than with larger particles. In this way, latexes may be created which film at considerably lower temperatures compared with the glass transition temperature, taking advantage also of the morphology of the particles produced. Also, if the monomers are correctly selected, water will have little effect on the polymer after film formation.
- Imbibition and penetration into porous substrates.** It is logical to assume that fine particle dispersions penetrate better into porosity compared with larger particles. However, what really happens in detail is never so simple, and in this case too there are other phenomena which play their part. When a liquid perfectly wets the surface of a solid, the mass of the liquid is preceded by a precursor layer, which may be up to 20-40 nm [2]. It is quite clear that, if the dimensions of the particles are in this range, they will be dragged by the liquid which penetrates, otherwise they will be blocked by the surface of the solid (Fig. 2), only the watery phase will penetrate and

there will be a concentration of the dispersion on the surface, with an increase in the viscosity and, sooner or later, destabilisation. Other aspects to guarantee good penetration are rheology (the liquid must have low viscosity at low shear), and the colloidal stability of the liquid (it must not coagulate if there are salts present).

- Consolidation.** In this case too, it is logical to assume that the use of small particles will be advantageous. The number of particles is proportional to $1/r^3$. Small particles allow for a higher number of hooking points between the grains of a substrate which is not very compact. However, the way in which the particles are positioned must also be taken into consideration. This is illustrated in Fig. 3.
- Transparency.** In order to create transparent latex, the particles must be considerably smaller than the wavelength of light. Figure 4 compares various types of latex. It may also be noted that conventional latex, with a concentration of 0.5 g/l dry content, is completely opaque, compared with 30% dry content for nanolatexes.

Other phenomena which must be taken into consideration when discussing nanolatexes, and which up until now have not been the subject of in-depth studies, are the effect of confinement of the macromolecules, diverse polymerisation mechanisms and the different role of entropic and enthalpic phenomena compared with "macrolatexes". All of these factors influence both the characteristics of the latexes and the finished product.

If these points are examined carefully, there are grounds to presume that nanolatexes may also be employed as primers.

Requirements of a Primer

The aim of a primer is to consolidate a substrate which is not very compact (for example, a deteriorated façade), and to prepare the substrate for the application of further coatings. This must be carried out without changing the appearance of the surface and without having a negative impact on the surrounding environment.

What is required from a primer, therefore, is as follows:

- no solvents or volatile compounds
- penetration capacity
- consolidating properties
- adhesion
- no alteration to the appearance of the surface to be treated
- reduction of porosity
- water vapour permeability

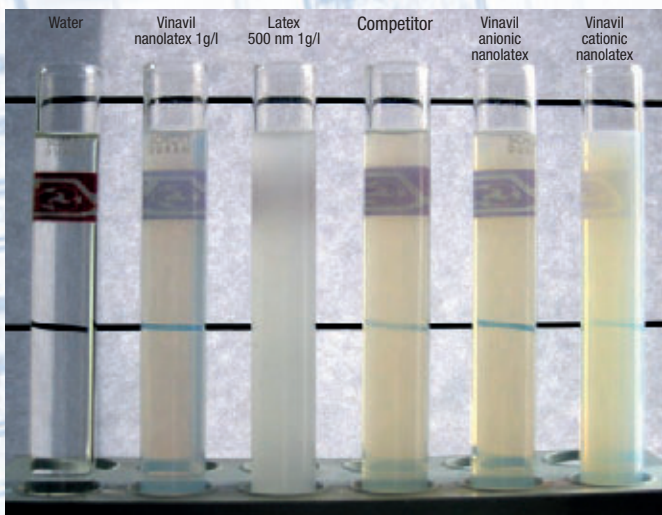


Fig. 4. Transparency of nanolatexes.

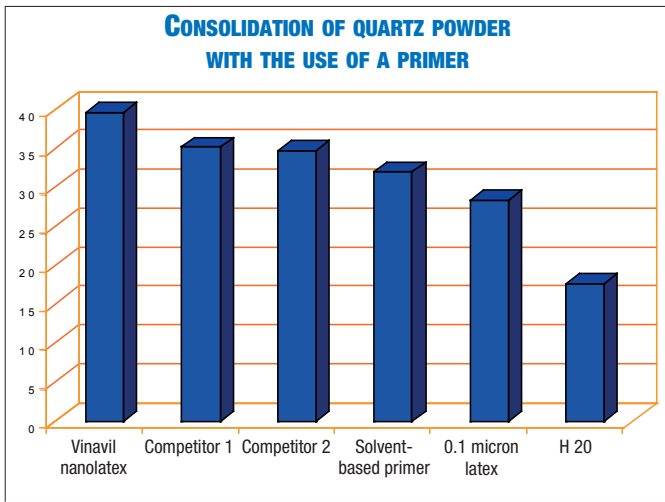


Fig. 5. Consolidation of quartz powder (utterly incoherent substrate)

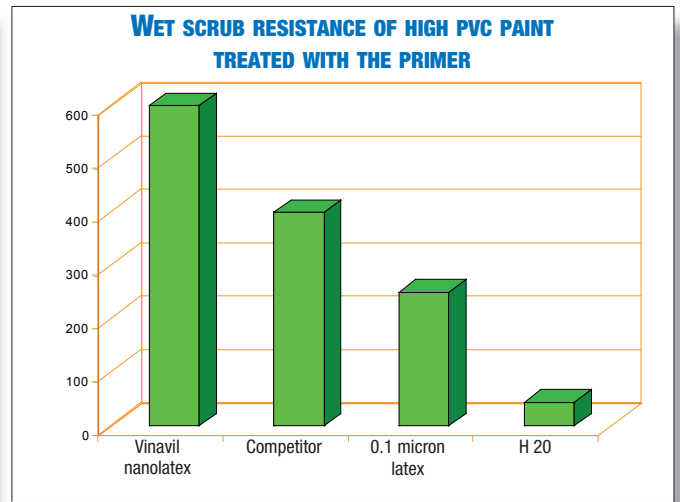


Fig. 7. Consolidation of high PVC paint.

On the basis of what has been discussed above, it is clear that a correctly formulated nanolatex is a suitable solution to form a primer with appropriate performance characteristics.

Vinavil manufactures and sells two nanolatex products (Table 1) which are used as primers, with a cationic or anionic stabilising system. The cationic nanolatex is inherently biocide, a characteristic which is highly desirable in the building industry.

Another particular feature in other applications is its property of dispersing surface electric charges, thus obtaining an anti-static effect.

At the moment, no standards have testing methods for its use as a primer. Therefore, we have developed test methods which could be used to evaluate various applications.

The most significant are described below.

Laboratory Test Results

Consolidation and penetration are two phenomena which are closely interconnected.

A latex which does not penetrate will consolidate the surface layer very well, leaving an unwanted glossy finish, but the underlying layer will remain incoherent. Latex which penetrates deep down into the substrate, however, will consolidate a superior mass of the inconsistent substrate, with a very low polymer mass/incoherent mass ratio. Therefore, if all other conditions are the same, abrasion resistance per unit thickness will be lower. At the same penetration depth and with the same quantity of polymer, the nanostructure of the latex will be crucial. In certain specific cases, to find the

best conditions it will be necessary to carry out a series of trials by dosing the amount and concentration of latex used. To get a clear picture of the reliability of the quality of our products, we carried out a different series of tests, with different degrees of consistency of porous substrates.

Consolidation of Powders. This test is conducted to evaluate the quantity of quartz powder that a nanolatex is able to consolidate. The graph in Figure 5 illustrates how the nanolatex-based primer has a better consolidating effect.

This test was also carried out with other powders, such as cement and calcium carbonate, and the same results were reached.

Consolidation of Render. This test is conducted to evaluate the dry abrasion resistance of weak, cement-free

render, consolidated using a nanolatex-based primer.

In order to have a better interpretation of the results obtained, the weight loss is reported on a graph.

An analysis of the results obtained shows how the nanolatex-based primer increases the abrasion resistance of the substrate (see Fig. 6).

Consolidation of high PVC paint.

This test is conducted to evaluate consolidation of old paint with a poor consistency on which the nanolatex is applied. For obvious reasons, once dry, the appearance of the paint must not change.

An analysis of the results shows that the high PVC paint on which the nanolatex-based primer was applied has an improved wet scrub resistance (see Fig. 7).

Fig. 8 shows two images from a scanning electron microscope of

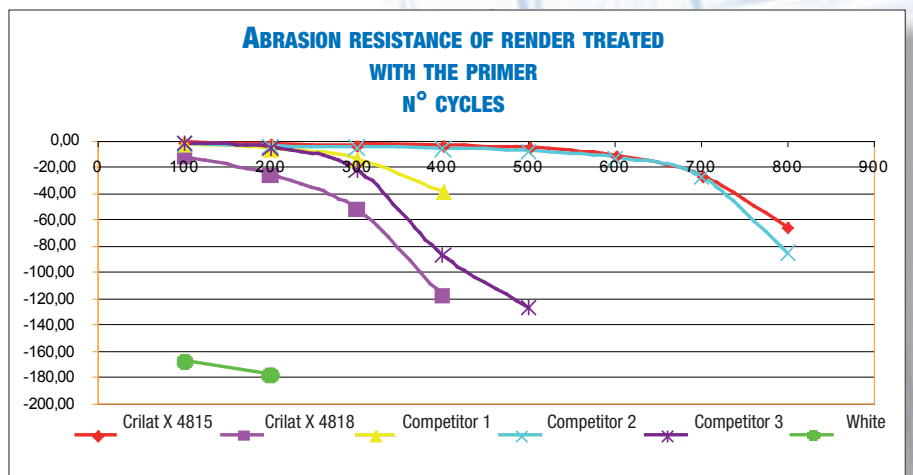


Fig 6. Consolidation of render



Photo 1. The application of Primer 3296 was tested at Monte di Procida (Province of Naples, Italy).

an extremely porous substrate with a very high surface area, before and after impregnation. It may be noted that, even under such unfavourable conditions, a considerable amount of porosity remains which, even if the barrier is reduced, will allow vapour to pass through. The capacity of nanolatexes to guarantee a good bond of successive layers on difficult substrates was also evaluated (for example, on gypsum), and their adhesion strength after immersion in water. Good results were obtained, especially when compared with conventional latexes.

Applications

With the use of cationic nanolatex, Mapei has developed a consolidating agent called Primer 3296. A thesis has been discussed at the University of Naples, entitled "Innovative technology for the protection of erodible ridg-

es: a case study at Monte di Procida" using Primer 3296 (see photo 1).

This product has also been used for more than 10 years in the building industry to consolidate indoor and outdoor incoherent, chalky substrates. Anionic nanolatex, which was developed more recently, is used for similar applications.

One interesting application is its use for impregnating wood.

This material could also be developed to produce high-performance paint.

Conclusions

Greater awareness of phenomena which occur on a nanometric scale, and subsequent testing (both in application and synthesis of polymers), has led to the development of new materials with better performance characteristics than the traditional ones, with full respect for the environment. 🇪🇺

Figures from 3 to 7 were made by the Vinavil R&D Laboratories in Villadossola (Italy).

We would like to thank the following for their kind collaboration: Vincenzo Barraco and Silvia Passeri from the Mapei R&D Laboratory, Matteo Rizzonelli and Luca Ballarati from the Vinavil R&D Laboratory, the Mapei and Vinavil Analysis Laboratory and the University of Pavia.

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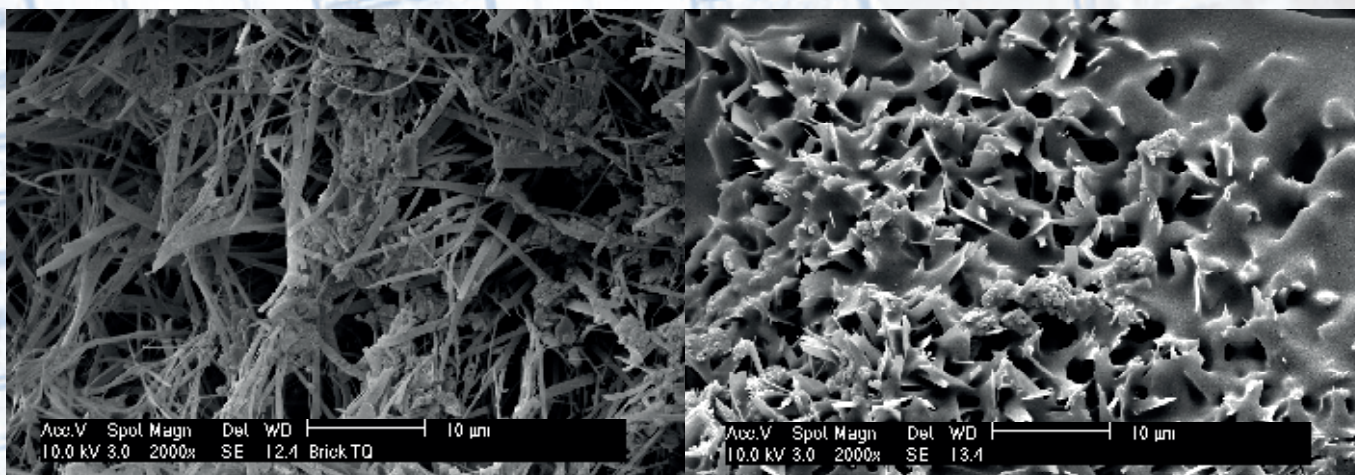


Fig. 8. Scanning Electron Microscope (SEM) photo of a very porous substrate before and after impregnation with nanolatex (Supplied by: Mapei Analysis Laboratory in Milan).

MOUNTAIN NOTHING LIKE

Epic 4th edition of Mapei Day

If one of the goals of the sports festival organised by Mapei was to strengthen bonds and friendships and create team spirit enabling every tricky situation imaginable to be successfully dealt with, then we can safely say that this year's awful weather conditions, combined with the widely acknowledged difficulty of the course from Bormio along Strada Imperiale up to Stelvio Pass, were the unforeseeable circumstances ensuring this objective was most definitely achieved. Following the lammergeyer and steinbock mountain goat, the mascot chosen for the fourth edition of Mapei Day was the marmot, the most friendly, quiet and cute animal in the Alps, which whistles mischievously out in the fields on sunny days. But this year there was no sign of sunshine in Bormio and on the Stelvio Pass, and the marmots, busy taking shelter in their underground dens, were nowhere to be seen along the roadside where

they usually watch the cyclists and runners climbing up the mountain.

The torrential rain over the days preceding the event actually threatened to force the organisers to start from an alternative route, as the road up the Stelvio was closed due to a landslide until late Saturday afternoon, caused by all the water pouring down from the heavens.

After being reopened thanks to the help of a huge number of volunteers from Bormio, who, like every other year, did their very best to ensure this event was organised to exceptionally high standards, just a few hours after the end of Mapei Day another landslide forced the road to be closed again. This was a sure sign that the most important event of Mapei Day had to take place whatever the cost and whatever the weather, so that all the brave people taking part could proudly say that "I was there that day!"

LIONS... MARMOTS!



Lots of companies and associations contributed to Mapei Day 2008 as well as Mapei and Mapei Sport: the Unione Sportiva Bormiese, which organised everything so exceptionally well despite the prohibitive conditions, the Banca Popolare di Sondrio and the Pirovano (the Ski University) staff. The event took place under the aegis of the Province of Sondrio and Bormio City Council.

This year there were again plenty of technical sponsors: Bormio Terme, Colnago, Enervit, Giussani Enrico e Figli, Limonta, Mic-Shimano and Santini.

Originally devised by Mapei to provide the chance to enjoy some wonderfully intense sporting moments with its customers and numerous friends, over four years the event has extended beyond corporate confines and now attracts an increasing number of sportsmen and women to the Alta Valtellina area from every corner of Europe.



È grande aiutare i più piccoli.

Right: "It is big to help little ones". This was the slogan of a draw for charity Mapei organized during the Mapei Day. Left: the cyclists' jersey and running vests for Mapei Day 2008 feature a marmot. Above: the flyer with the programme of Mapei Day sports events.



Saturday 12th July



Photo below: Marco and Veronica Squinzi award the trophy for the winning team to Carlo Alberto Rossi, the coach of "Sassolesi Mapei", the Company football team from Sassuolo.



SASSOLESI STAR IN THE 5-A-SIDE FOOTBALL TOURNAMENT

The 4th Mapei five-a-side tournament was held at the sports ground in via Manzoni (divided into three playing areas) and on a synthetic pitch specially set up for the event at Limonta Oratorio.

16 teams entered the tournament and, following the qualifying rounds and direct knockout stage, the Mapei team from Sassuolo (a city near Modena, Italy, where the Mapei Group has offices, plants and distribution centres), who were runners-up last year, beat the team from Limonta Sport late in the afternoon.

2008 seems to be a really lucky year for Sassuolo.

The local professional football team sponsored by Mapei

was actually promoted to the Italian second division (or serie B) this year and, while enjoying their summer training in Bormio, the players really spurred on and galvanised the 5-a-side football team from Sassuolo coached by Carlo Alberto Rossi, the son of the club chairman.

Vitaly important to the success of the Mapei 5-a-side football team from Sassuolo were the substitutions made during the game, with the assistant coach Roberto Bordin and, above all, the Sports Director Giovanni Rossi and General Manager Nereo Bonato coming on, who also won the awards for best player (Rossi) and best goalkeeper (Bonato) in the competition.

GOLF

Golf is another sport which has become a traditional part of Mapei Day. After all, it would be a real shame not to take advantage of the wonderful nine-hole course at Bormio Golf Club, designed by the architect Mario Verdieri from St. Moritz, which extends across 4,236 m just outside Bormio in a place called La Fornace. Completely immersed in greenery and perfectly set in the magnificent surrounding Alpine landscape, this

is where the Mapei Day Golf Trophy was held in accordance with the "Stableford" rules.

A break in the bad weather allowed a really exciting competition to take place, which saw the 60 entrants battle it out all day long. The less experienced golfers also had the chance to improve their swing on the practice ground with the help of the club professionals.

Among the Mapei guests, Roberto

de Lorenzi was the overall winner in Category 1 and Giovanni Piero Bertalli won the senior's group in this category; Marcello Zamboni and Edgardo Zagnoli were 1st and 2nd in the handicap event and Oriella Milandri won the women's event.

1st and 2nd overall and winners among the Mapei guests in Category 2 were Antonio Fulvi and Lucio Omiccioli; Lidia Frigo won the women's event and was 6th overall in this category.



Left: Laura Squinzi and Alessandro Locatelli award the prize to Oriella Milandri, the winner of the women's event.



PARTY AT THE PENTAGONO

The fear, which turned out to be well founded, that the appalling weather conditions might ruin Sunday's bike race up the Stelvio did not prevent Mapei's over 1300 guests from joining together at the big Pentagono sports facility in Bormio to celebrate.

The news announced late in the afternoon that the road up the Stelvio Pass had been reopened was greeted with great enthusiasm, proving that this extremely tough Alpine climb really is the hub around which Mapei Day revolves. This was a further proof that those values which Mapei expresses every day in its business operations are symbolised in a tough sports event like this. Moments of great fatigue and joy during which everybody's own individual effort and concentration merge together to be shared with friends and your own people. Prior to the big event to be held the following day and partly designed to relieve some of the inevitable prerace tension, as is now traditional, everybody went to the Mapei party held on Saturday evening. This was an important social event bringing together clients, partners and

Top: the "founding fathers" of Mapei Day, Giorgio Squinzi, CEO of the Mapei Group and Piero Melazzini, President of the Banca Popolare di Sondrio.

Right: from left, the Mayor of Bormio, Elisabetta Ferro Tradati, the Prefect of Sondrio, Chiara Marolla, the Mapei Group's Operational Marketing and Communication Director, Adriana Spazzoli, and the presenter Kay Rush.



friends of Mapei: an incredible piece of organisation, which is always paid back by everybody's great enthusiasm and excitement, proving that socialising is still an important part of sharing.

This year, along with music, film clips, important guests and a dinner featuring typical local dishes from Valtellina area, there was also a highly entertaining cabaret show. The evening's entertainment was introduced by Kay Rush, back working as a presenter for Mapei after a ten-year absence. Alongside her, doing the honours for the Company, was Adriana Spazzoli, the Mapei Group's Operational Marketing and Communication Director, who invited local authorities, special guests and other protagonists of Mapei Day to join her on stage. Special thanks went to

two people in particular: the Mayor of Bormio, Elisabetta Ferro Tradati, for all the help in organising the day's events provided by the entire community of Bormio, and the Prefect of Sondrio, Chiara Marolla, who did everything in her power to clear the road leading up to the Stelvio from the landslide and make it safe. The enthusiastic verve of Alessandro Brambilla - the journalist with an encyclopaedic knowledge and reporter of Mapei Day, who also reported on the Cycling World Championships 2008 in Varese (Italy) - was another outstanding contribution to the day's events, as he glossed over the biographies and exploits of so many sportsmen in the audience. They included a number of great cyclists such as Andrea Tafi, Gianni Bugno, Ivan



Basso and Giancarlo Cosio, the runner Vasy Matviychuck and the footballer Fabrizio Ravanelli.

After a film clip showing a quick sequence of some of the most exciting images from the past Italian football season, the entire Sassuolo professional football team took the stage. They were in Bormio for some altitude training ready for the forthcoming football season. The team sponsored by Mapei, which this year achieved its target of winning promotion to the Italian second division, received a rapturous welcome.

Andrea Mandorlini, who used to play for Inter Milan football team and is the team's new coach, talked about the team's future targets. Finally, the evening was brought to a close with almost a full hour's comedy with the Italian actor Enrico Bertolino, whose performance was full of sketches and jokes related to work and everyday life. The end of his show was truly exhilarating as he gave his own performance of a builder from the Bergamo area in northern Italy. An amusing allusion to the building industry and the clichés surrounding it.

Opposite: some of the numerous "special guests".

Below: the athletes of the Sassuolo Calcio professional football team toast to their recent successes together with the audience.





Who would have thought it? Everybody ready at the start despite the downpour



Simona Giorgetta's dog, Zara, out for victory in the rain.

Sunday 13th July

THE CLIMB, RAIN AND COLD

Thunder and lightning, wind and rain everywhere. And of course.....so much enthusiasm!

From the very early hours of the morning it was clear that Sunday 13th July would be a very tough day and there was no sign of any improvement in the weather.

Nevertheless, over 1000 brave runners and cyclists turned up at the start of the 24th "Re Stelvio" event, ready to take on the bad weather and cross the finish line at a height of 2,758 metres above sea level.

A number of famous cyclists also came along: together with Giorgio Squinzi, the CEO of the Mapei Group, and Aldo Sassi, the Director of Mapei Sport, there were leading figures from the world of Italian finance and industry, such as Carlo Pesenti, Lino Benassi and Fabio Innocenzi.



Are they really setting off? While Adriana Spazzoli and Andrea Tafi have their doubts, Giorgio Squinzi seems to have already made up his mind.



Riding up to Stelvio Pass is always a real thrill for anybody who loves cycling and takes plenty of training and dogged determination; and it is just as testing for people who run or even just walk up it.

21,097 km of road with an average slope of 7.6% (14% where it is steepest) taking you up a height difference of 1,533 metres; these cold facts and figures describe one of the most wonderful bike climbs in Europe. What the figures do not say, but merely point towards rather menacingly, is the fatigue, sweat, suffering and inevita-

ble solitude associated with an exploit which you can only achieve drawing on your own inner strength.

If we add the cold and pouring rain to these basic difficulties, then this really does become a legendary exploit for anybody achieving it. And in the end 657 cyclists and 486 runners successfully climbed up the Strada Imperiale road to Stelvio Pass, the highest mountain road in Europe and one of the "classic" peaks in the history of cycling. The 4th edition of Mapei Day was a real success: exciting moments and satisfying achievements thanks to the harsh



Who can you make out among all these mountain lions?





A small delegation of Mapei Day staff looking happy in the pouring rain.



From the African highlands to the summit of Mount Stelvio

As usual the cyclists set off from Via al Forte (in front of the city spas) in Bormio, while the runners crossed their own start line just a few hundred yards further back along the road. Really put to the test by the poor weather, the organisation, now with three years' experience to draw on, ran like a well-oiled machine from a purely logistical viewpoint.

not feel like taking on the descent back down to Bormio.

THE RACES AND WINNERS

Everybody at Mapei was delighted with the result of the running race. The half marathon was, in fact, won by Tommaso Vaccina representing Co-Ver Mapei Running Team, in a time of 1h 35' 10", over 8 minutes ahead of Graziano Zugnoni (A.D.M. Melavi Ponte Valtellina), who came second, and Pietro Colnaghi (GS Corno Marco Italia) who crossed the line third. The women's race was won by Daniela Gilardi (SEV Valmadrera) in 2h 10' 42"; Lara Mustat (CUS Parma Salumificio Salese) came second in a time of 2h. 13' 16".

weather conditions which made this a truly legendary climb this year.

As is now customary, Sunday 13th July was "split in four":

1. the "Re Stelvio " competitive cycling race: the classic cycling race of the Valtellina area, which has now been staged 24 times;
2. the competitive road running race from Bormio to the Stelvio pass: a half marathon truly unique of its kind, combining a really tough climb, rarefied mountain air and, this year, cold and rain;
3. the Bormio-Stelvio bike ride: open to club members and fun riders, in the company of former Mapei cyclists and other sports personalities. The climb up to the famous Alpine summit, the Cima Coppi peak, is, let's not forget, something every cycling enthusiast must do at some stage in their career;
4. the running race open to anybody: held for the third time, lots and lots of fun runners tested out their legs on the legendary asphalt road soaked with rain. It is worth noting that the competitive running race has, since last year's event, been officially acknowledged as a half marathon and is now a key race on many runners' schedules.

When the athletes crossed the finish line at 2,758 metres above sea level up at Stelvio Pass, all chilled to the bone, they found everything they needed to recover: specially created changing facilities, bags holding clothes brought up from Bormio by the organisers, a storage place for bikes, and the chance to enjoy the usual free pasta-party or dine in one of the numerous restaurants at specially arranged prices, plus shuttle buses which, from 2 p.m. onwards, starting taking the runners and riders (with their bikes) who did





Who won the bet?



Above: Giorgio Squinzi and Aldo Sassi cross the line together at the top of Mount Stelvio. Right, two significant pictures: while Sassi's face shows the kind of fatigue once associated with this legendary climb, Squinzi has no time to waste and immediately reports his first "wet and cold" impressions over the phone.



The wet weather for the “Re Stelvio” event ended up making this a very successful Mapei Day and also...very romantic.

At least it certainly was for the couple from Alto Adige, Wolfgang Niederegger and Renate Pelsler, who won this 24th edition of the legendary “Re Stelvio” race, which, like in all proper fairy tales, had a stormy and romantic ending. The winners of the men’s and women’s races were indeed Wolfgang Niederegger and Renate Pelsler, or in other words the two “flying fiancés” from Prato Stelvio. Now let’s take a closer look at the results and overall standings.

The men’s “Re Stelvio” competitive cycling race was won by Wolfgang Niederegger from the RSV Vinschgau Raiffeisenin team in a time of 1h 5’ 49”.

Romeo Arrigoni (CS Corenova) came in second five minutes behind the winner in a time of 1h 10’ 48”; and, finally, Demetrio Bellò (ASD La Piazza) came third in 1h 10’ 49”. As we have already mentioned, the women’s race was



Once again this year lots of Mapei staff, friends and customers from all over the world were among those who completed the course. As usual, the CEO of the Mapei Group, Giorgio Squinzi, road up the mountain along with the Director of Mapei Sport Service, Aldo Sassi. A legendary climb which Squinzi will never forget and which, as a keen cycling fan, reminded him of and allowed him to relive Fausto Coppi’s epic exploit during the Stelvio stage of the 1953 Tour of Italy (when the race crossed the highest mountain pass in Italy for the first time), finishing 3 min-

cessful draw for charity.

“È grande aiutare i piccoli” (It is big to help little ones) was the slogan written on the striking sky-blue heart-shaped metal pin badges given to everybody who bought a ticket for the lottery.

The draw was then made during Saturday evening’s party at the Pentagono and the money collected was given to three associations which Mapei has been supporting for some time: Exodus run by the Italian priest Don Mazzi, Archè, and Piccola Opera di Traone per la Salvezza del Fanciullo.

A weekend in the name of Mapei and its ability to be a key player not just in its worldwide industrial enterprises but also in events where the qualities brought to the fore are its own simple and original grounding values: hard work, joy, sharing, never giving up, and always looking ahead with optimism and determination.

Mapei’s great strength is its passion. A passionate desire to grow and treat problems as a chance to constantly improve and never surrender.

That is why cycling provides the best and most relevant metaphor of all. And that is also why the emotions and enthusiasm experienced on this 4th edition of Mapei Day are perfectly in harmony with the style characterising the Company’s everyday operations.

And so, returning to the mascot for this edition of Mapei Day, we can smile while pointing out that all the sportsmen and women who got to the top of the Stelvio this year had a marmot on their cycling vests.

Inside, though, they were all lions. Mountain lions.... of course!



Left: the podium showing the winner Tommaso Vaccina from CO-VER Mapei Running Team.

Below: from left, Mario Pedranzini, Managing Director of the Banca Popolare di Sondrio, Giancarlo Pozzi, President of U.S. Bormiese, and the Mayor of Bormio, Elisabetta Ferro Tradati.

won by Renate Pelsler in a time of 1h 34’ 4”, ahead of Valeria Bradanini (US Bormiese Ediltrasporti) who finished in 1h 35’ 31”.

In a repeat of last year’s result, the team event was won by US Bormiese managed by Pozzi and Zangrando.

There was a huge points difference between the winners and the team that came second: 90 points for Bormiese against 43 for Club Lombardia Team ASD.

It was a memorable day’s sport which the Mayor of Bormio, Elisabetta Ferro Tradati, summed up as follows when addressing all the athletes who reached the top of Stelvio: “You are all winners and deserve a big round of applause”.

utes clear of his Belgian rival Koblet to win the Tour of Italy for the fifth time.

PRIZE-GIVING CEREMONIES

The beating rain, which never stopped all day, prevented the prize-giving ceremony from being held at its usual venue in Piazza Kuerc in Bormio.

A memorable day’s sport was, therefore, brought to a close at 4.30 p.m. in Bormio inside the Pentagono arena. The prize-giving ceremony took place in an autumn-like but highly festive and warm atmosphere.

This was a fitting end to an intense and unforgettable day’s sport with a capital “S”, completed by a particularly suc-



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