

# Realtà Mapei

## No need for **greenwashing**

To develop eco-sustainable products, you cannot wash them green. You have to invest in research and have your products certified by internationally recognized institutions.

**Mapei's long-lasting commitment to environment results in plenty of products which have been awarded international certifications and contribute to achieving eco-sustainable buildings.**

## The “green” challenge. Serious certification



If we take a look at all the research and statistics covering the last 20 years regarding the issue of eco-sustainability, we will soon realize that the chemicals industry has improved on all fronts. As an example of this, important international studies show that for every ton of carbon dioxide emitted by chemicals companies there is an average yearly saving of 2.7 tons of carbon dioxide further downstream. But what does that really mean? Let's take, for example, products used for thermal insulation of buildings: for every ton of carbon dioxide given off into the atmosphere to produce adhesives, insulating materials and paints there is a notable saving on energy (2.7 tons of carbon dioxide to be precise) for heating and cooling our homes. Nevertheless, the time has come to shed some light on an issue like eco-sustainability, which for some time now seems to have become the only important factor when talking about industrial development, the chemicals industry and the building sector in particular. In this way it is in danger of becoming a truly “fashionable” argument, fashionable in the sense that it is a social phenomenon indicating “one or more forms of collective behaviour with changing criteria”. The well-being of the environment and people is much too important an issue to be relegated into the transient and ever-changing world of customs and habits. And such a fundamental issue as this cannot be subjected to the aesthetic whims of a given period or lines of reasoning

based solely on strategies developed by corporate marketing departments.

To be truly “green” you need to work seriously, invest a lot in Research & Development and be aware of the fact that all solutions helping produce better and less harmful products to people and the environment inevitably come out of laboratories.

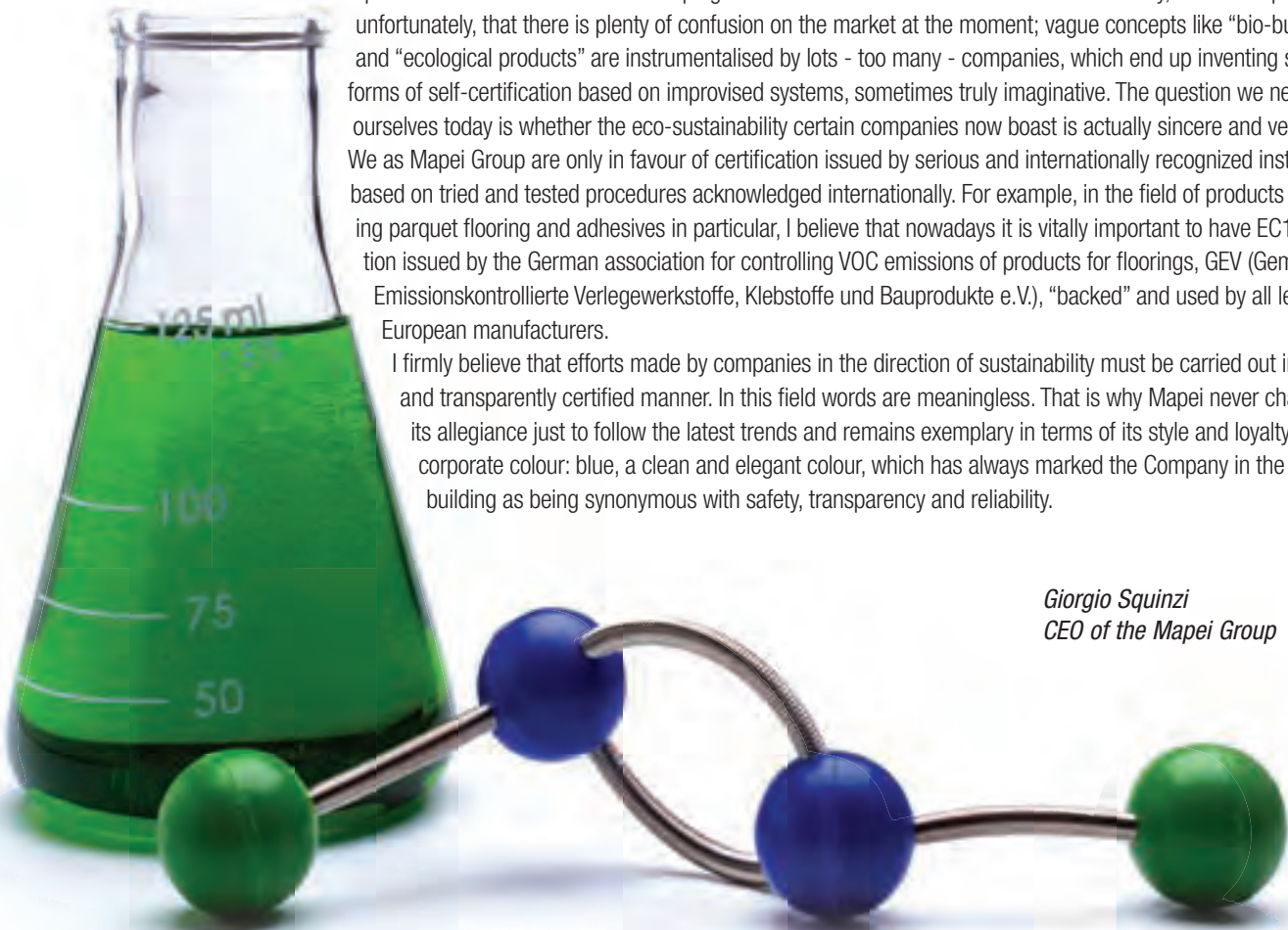
This is the case with Mapei as it constantly works with great determination in this direction, one step ahead of the guidelines set down by the Kyoto Protocol.

For Mapei working in this direction has always been a matter of style not fashion. This is shown by the fact that all the Group's manufacturing units are designed and constructed based on these principles. Just consider that approximately 2/3 of the Group's research – we are talking about approximately 60 million euros allocated each year - is invested in the research and development of products and systems increasingly compatible with people and the environment. One of the targets we have achieved is the almost total elimination of the use of toxic solvents: as well as being a matter of pride, it is also

a powerful stimulus for research. Keeping to the issue of the environment and sustainability, it must be pointed out, unfortunately, that there is plenty of confusion on the market at the moment; vague concepts like “bio-building” and “ecological products” are instrumentalised by lots - too many - companies, which end up inventing strange forms of self-certification based on improvised systems, sometimes truly imaginative. The question we need to ask ourselves today is whether the eco-sustainability certain companies now boast is actually sincere and verifiable. We as Mapei Group are only in favour of certification issued by serious and internationally recognized institutes based on tried and tested procedures acknowledged internationally. For example, in the field of products for installing parquet flooring and adhesives in particular, I believe that nowadays it is vitally important to have EC1 certification issued by the German association for controlling VOC emissions of products for floorings, GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.), “backed” and used by all leading European manufacturers.

I firmly believe that efforts made by companies in the direction of sustainability must be carried out in a serious and transparently certified manner. In this field words are meaningless. That is why Mapei never changes its allegiance just to follow the latest trends and remains exemplary in terms of its style and loyalty to its corporate colour: blue, a clean and elegant colour, which has always marked the Company in the world of building as being synonymous with safety, transparency and reliability.

*Giorgio Squinzi*  
*CEO of the Mapei Group*



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## Invitation to trade fairs

At the Autumn 2010 trade fairs Mapei will display the last and most interesting solutions for laying ceramic tiles and natural stones and for building works, from products for the substrate preparation to adhesives and grouts. We wait for you at Mapei stands!

### CERSAIE

Bologna - 28 September - 2 October 2010  
EXTERNAL AREA 45 - STAND 18

### MARMOMACC

Verona, 29 September - 2 October 2010  
HALL 7 - STAND E 2

### SAIE

Bologna - 27 - 30 October 2010  
EXTERNAL AREA 45 - STAND 18

INTERNATIONAL  
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#### COVER STORY:

Mapei's products and solutions are certified according to the strictest international standards: one more piece of evidence for the Company's excellence in the building field.

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# Internationalization according to Mapei

Growth strategies for being global and goals for the future

by Veronica Squinzi



**Above.** Veronica Squinzi, Global Development Director of the Mapei Group.

**W**hen we talk about internationalization and claim that Mapei makes it one of the keys to its success, we need to quote some current facts and figures: 57 plants, 63 subsidiaries and 7000 staff in 39 countries across five continents. Big numbers which tell us about a process which began back in the 1970s and which has never stopped. Just think that over the last 10 years, amidst various start-ups and acquisitions, the Group has grown by another 48 subsidiaries. Mapei's goals in terms of internationalization are to open up new markets, share its knowledge, experience (the so-called "know-how sharing") and deep understanding of the markets in each individual country by catering even more closely for local

requirements and reducing transport costs to a minimum. The growth strategy works on the assumption that Mapei is a global player, which is indeed run like a family business but always has an eye for the medium-and long-term future. Mapei wants to maximize its growth and efficiency, focusing on a mix encompassing products, manufacturing output and people. Heavy investments in products are based on specialization and a real commitment to Research & Development, in order to guarantee high-quality, innovative solutions and a wide range of offers. The need to become global through internationalization is closely tied to increasing manufacturing output, thanks to the setting up of manufacturing plants on the most important markets to keep costs under control and provide solu-

tions geared to local requirements. The aspect of human resources is a key factor in this approach. People need to be proactive in developing local growth strategies and, in order to really understand the requirements of each geographical area properly, management is local and Mapei's philosophy is spread by a team of people working in all its various corporate departments, who are always on the move. Moreover, the constant search for new talented people all over the world is another of the Company's constant commitments. Working on these assumptions, Mapei follows two operating guidelines: the opening of new subsidiaries and acquisition of companies already operational. One path does not necessarily exclude the other and, as always, the first step is to carefully study the market to pinpoint every available opportunity. When developing M&A operations (Merger & Acquisitions), one of the key points for Mapei is to treat finance as a means and not an end. Starting from this fundamental assumption, growth, which must be healthy and balanced, treats all financial investments as just a means of boosting industrial operations. Keeping in tune with reality without

ever allowing the will to compete to wane means that every target has to be realistic and achievable. This means that Mapei Group subsidiaries are expected to show a certain average growth based on the real potential of the market. Moreover, each subsidiary adopts a realistic approach to a specific strategy focusing on its core business and only using its own means and capacity. Each geographical area has specific requirements and developments, which always call for different types of operations and procedures. Nevertheless, one thing that Mapei always does when assessing whether and how to implement some purchasing operation (M&A) is to always try and find out whether there is any "value reserve". This means taking into account what the benefits might be in terms of products (range, quality, etc.), access to significant distribution channels/strategic customers, increase in product/process innovation, management, and manufacturing capacity not yet fully exploited. Some recent successful cases exemplify how this strategy is actually put into effect.

**A New Manufacturing Plant in Bulgaria**

Despite the rather precarious state of the economy at the moment, Mapei is continuing to bravely make long-term investments, focusing on companies which make excellence their strong point. At the end of last year the Group purchased a manufacturing plant in Ruse (Bulgaria) from Orgachim, a manufacturing company quoted on the Sofia stock exchange. The plant is devoted to manufacturing adhesives for installing ceramics and thermal insulation systems. Situated in a strategic location on the border between Bulgaria and Romania, the plant covers an area of 15,000 m<sup>2</sup>. This acquisition is aimed not only at boosting Mapei's presence on the Bulgarian market, but also at injecting fresh life into its plans to expand onto the Romania market, where, at the present moment, the Group operates through its subsidiary Mapei Romania Srl. This is a very care-



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fully gauged strategy focusing on countries in Eastern Europe as a further opportunity to grow and develop. A coherent line of action which, amongst other things, will see the forthcoming opening of a second manufacturing plant in Poland. Mapei has been operating in Bulgaria for some time already, thanks to a network of distributors. The acquisition of the new plant will guarantee ongoing operations in this area, as well as the development of a range of specific, specially designed products, backed up by a widespread network of on-site technical assistance to support sales as effectively as possible and respond as effectively and efficiently as possible to local market requirements.

**The Acquisition of Betontechnik in Austria**

The Mapei Group's corporate strategy has been further underlined as regards the Austrian market by the acquisition of the Austrian company Betontechnik, which is a leading manufacturer of admixtures for concrete. This acquisition

is not just aimed at helping Mapei grow structurally, but also at helping Betontechnik to expand further on the international market. Mapei first got to know Betontechnik in 2001, when it became one of its suppliers of raw materials. This was the start of a business partnership which allowed Mapei to come to appreciate its dynamism, expertise and reliability. Originally set up in 2001, Betontechnik expanded rapidly to reach an overall turnover of over 20 million Euros by 2008, making it the leading company in its industry in Austria. Following the acquisition, Betontechnik's headquarters in Langenwang, Austria, is destined to become a centre of excellence for concrete and admixtures for the Mapei Group. The turnover will be further increased by intensifying its expansion into new geographical areas. In other words, Betontechnik's aim is to develop its own line of admixtures for concrete, which already constitutes an important part of its own portfolio, thereby strengthening its leadership within the construction industry.

**Photo 1.** Mapei is always continuing its internationalization in new countries and on new markets.

**Photo 2.** The new Mapei manufacturing plants in Ruse, Bulgaria.

**Photo 3.** The headquarters of Betontechnik (Austrian subsidiary of the Mapei Group) in Langenwang.



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**Photo 4.** APAC's headquarters in Dalton, Georgia (USA).  
**Photo 5.** The new manufacturing plant of Mapei Hellas SA in Ritsona (Greece).

**The Acquisition of APAC in the USA, a Leading Manufacturer of Adhesives for Installing Textile and Resilient Materials**

Another important acquisition is the American company APAC (All Purpose Adhesive Company) - an industrial trademark of great excellence and reliability which can boast innovative technology, high-quality products and top-level performances - which became part of the Mapei Group over the first few months of last year. Thanks to the purchase of this American company - a leading manufacturer of technologically cutting-edge adhesives for installing textile and resilient materials - Mapei's and APAC's product lines complete each other to provide an extensive range of solutions for installing every kind of flooring (resilient and textile materials, ceramic tiles, natural stones, marble and wood). Thanks to the plant covering an area of approximately 15,000 m<sup>2</sup> in Dalton, Georgia (USA), in the very heart of the carpet manufacturing district, and a new Research & Development laboratory, Mapei has enhanced its know-how and


reinforced its position on this particular segment of the market, also extending its own manufacturing centres. This Mapei Corp's operation means that the Group now has 18 manufacturing sites in the Americas, 11 in the USA, 4 in Canada, 1 in Argentina, 1 in Venezuela and 1 in Puerto Rico, making a total of 1500 staff in the area.

**The Polyglass Group and the Market for Bitumen Waterproofing Membranes**

The acquisition of APAC came just after that of Polyglass (October 2008), a group specializing in the manufacture of insulating systems for the building industry, which has allowed Mapei to break onto the market of waterproofing bitumen membranes. First established in 1969 as a small family business in Ponte di Piave (Province of Treviso, Italy), still the home of its European headquarters, the Polyglass group has five plants around the world - Ponte di Piave and Bari in Italy and Fernley (Nevada), Hazleton (Pennsylvania) and Winter Haven (Florida) in the USA - and 400 staff; it exports to about forty different countries (accounting for 28% of its turnover) and over the last two years has opened two commercial offices in Great Britain and Romania.

This acquisition, which is also the result of a perfect understanding between the Mapei management team and Polyglass' own executive management, has made it possible to cover a segment of the market complementary to that traditionally taken up by Mapei. The benefits in terms of developing new products and new business opportunities are already being felt.

**A Constantly Evolving Process: Mapei Start-ups in the World**

Mapei pays careful attention to all markets around the world to grasp any opportunities for growth which might happen to present themselves. In conclusion, it is also worth mentioning certain emerging geographical areas, such as the United Arab Emirates, South Africa and Greece, all of which are particularly interesting. Mapei has been operating in these countries for years, marketing its products and following a step-by-step policy involving a prudent yet determined approach to continuing its expansion on a global level. An initial phase, which involves the distribution of products through local business facilities, is usually followed by the opening of independent business facilities after testing out the market and its real possibilities before finally making a purchase or constructing new manufacturing units. For example, in the United Arab Emirates and Dubai in particular, one of the parts of the world where, despite the economic crisis, the building industry is still growing, a second plant for manufacturing admixtures came into operation in March to backup the one opened in January 2009. This completed the process of breaking onto this market which first began in 2004. Mapei Hellas SA, on the other hand, was set up in 2001. Mapei's Greek subsidiary initially developed by mainly focusing on planning logistic and commercial aspects and is now consolidating with a new plant for manufacturing products for installing ceramics. Finally, there has been a trade company in South Africa since June 2009, and in the near future there is a real possibility of creating a manufacturing plant. Different stories but all sharing the same underlying strategy: Mapei is always constantly thrusting forward in its "obsession to grow". Grasping opportunities around a changing world and quickly managing to integrate successfully. This might seem to be some sort of slogan but in actual fact it is the reason why Mapei is global, much more global than anybody else. 



# Giorgio Squinzi for Europe

**Mapei' CEO has become part of Confindustria's Presidential Committee in the Technical Committee for Europe**

The 2010 General Assembly of Confindustria (the Italian Federation of Manufacturers and Service Companies) was held on 27<sup>th</sup> May in Rome. This was the chance to ratify the new team set up by the President, Emma Marcegaglia, for the two-year period 2010-2012, which had earlier been unanimously approved by the Federation's board on 25<sup>th</sup> March.

Let's not forget that Emma Marcegaglia, the first woman to lead the Federation, is the president to receive the highest approval rating upon being designated and elected and when presenting her programme and team, both for her first and second four-year terms as the head of Confindustria.

Giorgio Squinzi has also joined the Presidential Committee. Since he is not entitled to take on the formal role of Vice President for reasons of incompatibility with his role as President of Federchimica (the Italian National Federation of the Chemical Industry), Squinzi has been delegated to lead the Technical Committee for Europe. John Elkan, the President of Exor (one of Europe's leading investment companies) and Vice President of Fiat, the first member of the family after his grandfather Gianni Agnelli to be allocated a top-level position, has also joined the Presidential Committee. He will be in charge of the special project entitled "Developmental Opportunities in Major Emerging Nations".

Giuseppe Recchi, the President of General Electric company for Italy and Southeast Europe, will

also join the executive team as the President of the Technical Committee of Foreign Investors in Italy, while Emma Marcegaglia has placed herself in charge of Energy and will also retain control of the Study Centre. Antonio Costato, until now Vice President for Energy, will take on an important new position: Federalism and Devolution.

Vincenzo Boccia, the President for Small Enterprises, will also take control of SME (small and medium-sized enterprises) Credit and Finance, while Luca Garavoglia, President of the Technical Committee for Fiscal Affairs, will also be in charge of Corporate Governance.

The highly demanding institutional position which Giorgio Squinzi has been awarded is something which fills the whole of Mapei with pride, since it acknowledges that the Company's CEO has the ability to export his own vision of "doing business" even outside the national borders.

Specialization, internationalization and research: these are the targets for Italian companies planning to compete around the world and they are also the corporate principles guiding Mapei's operations as it constantly grows around the globe. This is a very important and demanding institutional task, yet another responsibility which Giorgio Squinzi has already started working on.

"My mission in Europe will be very simple - so he immediately stated - to make it loud and clear that Italian companies want industrial competitiveness to be once again at the focus of European attention



**Above.** Giorgio Squinzi, CEO of the Mapei Group, was lately appointed Head of the Confindustria's Technical Committee for Europe.

**Below.** The Berlaymont Palace hosting the European Commission in Brussels (Belgium) which in 2000 was renovated by using Mapei products (See *Realtà Mapei* n. 70).

as a priority". Talking on the fringe of the 2010 Federchimica assembly, Squinzi added that, as part of his new role at Confindustria, "I'm trying to work out the critical points with all associations in this industry and what it is they expect from Europe, so that I can direct operations based on the input I receive".

Mapei hopes that Squinzi manages to transfer to Europe all the passion he puts into the various corporate and institutional realms in which he is already a leading figure. DM





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# The driving force behind the Mapei Group

## Investment into Research & Development for more growth on the global market

by Marco Squinzi



**Above.** Marco Squinzi, Mapei Group's Research & Development Director. **Photo 1.** The staff of the Mapei Corporate Research Centre in Milan.

Since 1989 – the year in which the first edition of *Realtà Mapei* was issued (Mapei's corporate magazine in Italian, which was later joined in 1995 by *Realtà Mapei International* entirely in English) – up until today, the growth of the magazine has kept pace with the constant growth of Mapei.

The growth involved the entire Company and dealt with all the main departments including, obviously, the marketing and communications department.

It's more than natural, therefore, that *Realtà Mapei*, one of the most important tools in the Company's overall communications strategy, followed this process of excellence by highlighting the numerous projects carried out all over the world using Mapei products and giving in-depth information on the latest technical and scientific

issues. *Realtà Mapei's* objective has always been to illustrate the innovative aspects of these products, the problems for which Mapei has supplied efficient solutions and the undisputable advantages for those who use them day in and day out on site. Further confirmation that Research & Development is the real driving force behind the growth of Mapei.

In the Company strategy illustrated by the CEO of the Mapei Group Giorgio Squinzi, his view of the only way ahead for the Company to enjoy constant success particularly stood out. Success will only come through growth on the global market; to grow you have to be competitive; to be competitive you must invest in R&D; and to invest efficiently in R&D, you have to be open to the global scientific community. The latter objective is one which is pursued

by Mapei with enormous success, constantly feeding on the latest, innovative scientific know-how to maintain the efficiency and creativity of Company research.

Let's now take a closer look at the most significant indicators which illustrate to what degree Research & Development has been a part of the Company's growth.

Starting from the results presented in the most recent consolidated financial report for 2009 we can see that, out of a total turnover of 1.7 billion Euro and an average growth of 15% per year (considering the last 10 years), investment into R&D represents 6% of the turnover.

The three mainstays on which the Mapei strategy has been built are well represented. "Specialisation" has brought us to define 15 product ranges, "Internationalisation" means 63 companies and 57 pro-



duction facilities in 25 countries and 5 continents, while “Research & Development” now boasts 1 Corporate Research Centre and 10 research laboratories (3 in Italy, 3 in the United States and 1 each in Germany, France, Norway and Canada). As is well known, behind all Mapei products there is an impressive amount of scientific research in which more than 730 employees are dedicated.

### The Corporate Research Centre

The Corporate Research Centre in Milan (Italy) employs 170 research scientists and technicians, of which 50 with a degree and 10 with post-graduate education. Renowned for being one of the best-equipped laboratories in the world in the building sector, it absorbs approximately 50% of the Group’s total research budget. The centre is involved in numerous activities. The chart on this page outlines the main research, development and design areas into new technology for an enormous range

of products, including those for the installation of ceramics and resilient materials, the repair and protection of concrete, waterproofing and reclaiming operations of remediated land.

Attention to eco-sustainability is the main driving force. Elimination of solvents, progressive replacement of “PBT” (persistent, bio-accumulating and toxic) components, an increase in the use of recycled materials and durability (an increase in the service life of materials applied) are the main objectives of the Corporate Research Centre, which sees them in the front line when it comes to proposing technologically advanced solutions.

One of the strong points of the Centre’s approach to innovation is the use of specialised research teams based on their in-depth experience and knowledge and constant contact with those who use the products.

Specialisation is not unconnected to the multi-discipline nature of research, however, and includes



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### THE MAIN AREAS OF RESEARCH IN THE MAPEI CORPORATE RESEARCH CENTRE IN MILAN

#### RESEARCH, DEVELOPMENT AND DESIGN OF NEW TECHNOLOGY FOR:

- laying ceramic and natural stone with cementitious products;
- laying ceramic with products in water dispersion;
- grouting mosaic and ceramic joints with new epoxy products;
- dimensionally-stable, self-levelling smoothing and levelling compounds for floors;
- bonding resilient, textile and wooden coverings;
- building concrete structures and works;
- consolidation, repair and protection of concrete structures and masonry;
- thermal insulation and soundproofing of buildings with new materials and systems
- epoxy-based systems for the building industry;
- underground structures and works;
- new systems for waterproofing foundations, and for paths, walkways and roads;
- production and grinding of cement.

#### DEVELOPMENT OF INNOVATIVE TECHNOLOGY FOR RECLAIMING CONTAMINATED LAND, SLUDGE AND SEDIMENTS CHARACTERISED BY:

- efficiency against pollution by both heavy metals and organic products;
- possibility of reusing the treated material on site;
- eco-sustainability.



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the exchange of information and knowledge between the teams and the constant update of scientific knowledge through joint research projects with the scientific community. All of this obviously has a precise target, the global market, to offer quick answers to specific

**Photos 2, 3 and 4.** The Corporate Research Centre in Milan is equipped with the most up-to-date equipment.

requirements, to develop products and introduce them, where possible, into homogenous, integrated systems to offer customers specific solutions.

The main objectives of Mapei Research & Development include the identification and development of new ranges of products and systems, penetration into new market segments and, therefore, an increase in the business portfolio. Which all allows the Mapei Group to not only grow, but also to be, for example, less vulnerable to the unfavourable economic conditions which are currently hitting all economic and industrial sectors around the world. The Corporate Research Centre in Via Cafiero, Milan is the engine which produces Mapei's driving force. An engine which is not isolated, but open to the world and in close



contact with the international scientific community, a place to meet and exchange ideas in which the creativity of research is enriched day after day by contributions from the most important centres for scientific excellence.

**Photo 5.** Behind all the products made by Mapei there is an impressive amount of scientific research and long-term investment in human resources.

## Mapei and the Scientific Community

### Close contacts for a constant exchange of knowledge

by Amilcare Collina



**Above.** Prof. Amilcare Collina is responsible for public relations between Mapei and the scientific community in Italy and at an international level.

One of the tasks at Mapei Corporate Research Centre is to establish a solid relationship with the scientific community. This relationship is based on being aware that internal research applied to outdated and obsolete scientific knowledge does not lead to the protection of intellectual property or to achieving a long-lasting competitive advantage. It is fundamental, therefore, that there is a continuous supply of new, updated scientific knowledge to maintain the efficiency and creativity of Company research. And this is why Mapei has chosen to develop a systematic, long-lasting relationship with the scientific community, and in particular with universities. This task has been assigned to Corporate R&D, with a specific budget equal to 7% of the Group's total R&D budget.

Mapei invests in two main areas – training and research – where it can come across high-level scientific knowledge which could contribute to the development of the

Company.

The aim of Mapei's commitment to training is to identify talented young people who may then be employed and grow professionally within the Group.

The use of stage periods (10 per year), scholarships for degree theses (8-10 per year) and support during master degrees and doctorate research projects are the instruments used.

When specific areas of interest are not covered by local professors or research programmes, Mapei provides for new teaching staff and researchers as foreseen by current University regulations.

Mapei's commitment to research is also shown through joint-venture contracts stipulated for specific objectives which the Company would like to reach. Joint research projects, training of researchers in specific disciplines, scientific support to access large-scale equipment and the assessment of emerging technology with potential are the areas which Mapei is

involved in with its relationships with various universities and institutions in Italy and abroad.

The main joint projects currently being developed are as follows:

FEDERICO II UNIVERSITY – NAPLES (ITALY)

- The application of composite materials for structural strengthening of concrete and masonry structures.

- Calculation models and experimental stress and deformation measurements of cementitious adhesives in screed-adhesive-tile systems.

- Calculation models and experimental stress and deformation measurements of adhesives in thermal insulation systems.

UNIVERSITY OF L'AQUILA (ITALY)

- Damage phenomena and mechanisms and the protection of walls from damp caused by driving rain.

TURIN POLYTECHNIC (ITALY)

- Technology for underground works and projects.

CNR (ITALIAN NATIONAL RESEARCH COUNCIL)-INSTITUTE OF CONSTRUCTION

TECHNOLOGY (ITC)

- Assessment of the performance of photo-catalytic paints.

INSTITUTE FOR ENVIRONMENTAL PROTECTION AND RESEARCH (ISPRA) – (ITALY)

- Release mechanisms of micro-elements and contaminants in traces of cementitious matrixes.

UNIVERSITY OF BOLOGNA (ITALY)

- Consolidation of masonry in buildings of historical interest.

LEHIGH UNIVERSITY (U.S.A.)

- Polymerisation in emulsion.

CNR - TREES AND TIMBER INSTITUTE INSTITUTE (IVALSA) - (ITALY)

- Methods to assess the strength of wooden joints made using vinyl-acetate resin.

UNIVERSITY OF FLORENCE (ITALY)

- Research into the synthesis of new co-polymers for adhesives in the water phase.

**Nanotechnology: Mapei and the University of Padova**

A particular mention must go to the joint project with the University of Padova (Italy): the on-going “Nanotechnology” project which started in 2007 and is scheduled to last 10 years.

Mapei finances: 1 resident professor, 1 research scientist, 3 scholarships for post-graduate research



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**Photo 6. Technicians at work in the Mapei laboratories.**

projects; a programme for visiting professors; the running costs of the structure, participation in the project with two research professors and two graduates, resources in the Corporate Research Centre. The project also includes membership of the US National Institute of Standard and Technology “Virtual Cement & Concrete Testing Lab”. Total investment for the project is 10 million Euros.

Mapei’s approach to nanotechnology is focused on cementitious formulations, with reference to their structural characteristics – mechanical strength, rheological characteristics, durability – and

includes characterisation of the nanostructure with the use of highly advanced analytical techniques – X-ray diffraction, synchrotron, microtomography, atomic force microscopy – correlation between nanostructures and the properties of the product and the development of models for the hydration reaction of cement.

The main objective of the project is to acquire the capacity to design and construct new nanostructures to obtain better performances for Mapei formulations.

This will allow the Company to have a long-lasting advantage over its competitors and to protect intellectual property.

Other important objectives of the research include the training of young researchers leading potentially to employment within the Group, divulging a scientific culture of cement and further development of relationships between Mapei and the scientific community.

Amongst the factors which have led to the success of Mapei research, apart from those to be found in management guides and text-books (such as long-term vision, a clear and stable strategy, the backing of top management and the capacity to invest heavily with a return on investments on a long-term basis: these are factors which are all quite clearly present and implemented in the Mapei Group), there is also the solid relationship with the scientific community.

**R&D INVESTMENTS BENCHMARKING  
Italian & European Chemical Companies**

R&D Investments/sales turnover (%)	Italy	Europe Big4	Mapei Italy
Petrochemistry	1.0	2.7	} 6%
Crop protection products	1.2	2.1	
Paint, adhesives, inks	0.4	1.4	
Specialty chemicals	1.3	2.0	
Detergents and cosmetics	0.6	1.5	
Fibers	0.4	0.9	
<b>Chemical Industry Average</b>	<b>0.8</b>	<b>2.2</b>	

Note: Europe BIG4 = Germany, France, United Kingdom, Italy  
Source: Federchimica, Istat, Eurostat

If we compare the investments into R&D made by the Mapei Group with the average values made by manufacturers of each specific product, we will see that the Mapei Group’s contribution and commitment to innovation is extremely intense. As shown in the table, the percentage of turnover invested by Mapei is around four times that of the most important European countries and around eight times the average in Italy.

# The Challenge of Eco-sustainability

## Mapei's commitment to energy saving and protecting the environment

**A**s part of its Responsible Care Program, Mapei is heavily involved in Product Stewardship (a concept whereby environmental protection centers around the product itself, and everyone involved in the lifespan of the product is called upon to take up responsibility to reduce its environmental impact) and, in general, in reducing the environmental impact associated with the manufacture, packaging, distribution and use of its own products. It is also working on improving formulas and reducing manufacturing waste. Its main manufacturing plants have obtained ISO 14001 and/or EMAS environmental cer-

tifications and are now gradually being equipped with high-efficiency electric motors and lighting systems.

Growing attention to environmental issues in the building industry is encouraging Mapei to develop systems designed to improve building insulation and products certified as causing limited environmental impact. Even as regards long-distance goods transport, rail is favoured over road, making use of both inter-modal services for the products it sells and also rail tank cars for receiving raw materials.

Mapei has also started committing itself in terms of electricity generation. Two photovoltaic units

**Photo 1.** Mapei Inc.'s plant in Delta (Canada) was lately extended and awarded the LEED certification for its eco-sustainability and energy efficiency.

fitted on the roofs of the Mapei manufacturing plants in Mediglia (near Milan, in Northern Italy) and Latina (in the South of Italy) will be brought into operation for a total installed capacity of 2000 kWp. They will be capable of meeting up to 20 % of the combined electrical requirements of the two sites, simultaneously helping reduce greenhouse gas emissions into the air.

### **A New Cogeneration Plant at the Vinavil Unit in Villadossola**

An electricity cogeneration unit was brought into operation in December 2009 inside the Vinavil manufacturing plant in Villadossola (Province of Verbania, Northern Italy). Vinavil is one of the Mapei Group's subsidiaries and a supplier of polymers, emulsions and other materials used to manufacture Mapei products.

The new cogeneration unit actually reduces the site's overall energy costs by approximately 20%. The plant is composed of a natural gas-powered endothermic engine driving an alternator for generating electricity, while some heat exchangers allow almost all

1



the heat of the engine's cooling circuits and discharge fumes to be recovered. Electricity cogeneration, at manufacturing plants with a suitable consumption of heat, allows notable levels of efficiency to be attained, since this kind of unit can be geared to a site's actual thermal consumption thereby reducing the cost of self-generated electricity and eliminating the costs and losses associated with electricity transport on the external power grid.


The cogeneration plant is expected to produce approximately 11,000,000 kWh of electricity-a-year, equivalent to approximately two thirds of the Villadossola plant's electricity consumption, as well as covering approximately half of the heat requirements of the site. The system also has notable positive implications for the environment, allowing the emissions of greenhouse gases into the air to be reduced by approximately 2500 tons-a-year.

### It is the Same "Green" all the World Over

Beside the mother company Mapei SpA and Vinavil, many other subsidiaries of the Mapei Group are devoting efforts to guarantee that manufacturing processes are carried out causing as little environment impact as possible.

All Mapei plant are trying to reduce the waste resulting from production processes by reusing 4-10% by weight of waste materials in the composition of products. All packaging conforms to eco-sustainability guidelines.

Polyglass, a company which joined the Mapei Group in 2009, has had a cogeneration unit (similar to the Vinavil one in Villadossola) in operation for several years at its main manufacturing plant in Ponte di Piave in the province of Treviso (Northern Italy).

Mapei Inc. (the Canadian subsidiary of the Group)'s plant in Delta (near Vancouver, British Columbia) was also lately extended and obtained the LEED certification for high-performance, eco-sustainable and energy-efficient buildings. 



2

**Photo 2.** The Polyglass plant in Ponte di Piave (Treviso, Italy) encloses a cogeneration unit generating electricity and heat.

**Photo 3.** A picture of the biological wastewater treatment unit at the Vinavil plant in Villadossola (Italy). The plant has a natural gas-powered unit that generates electricity and heat exclusively for using on the site.



3

# Trade Fairs: a means of global communication

For creating new markets and continuing to grow

One of Mapei's main means of communication is taking part in various specialist trade fairs held every month of the year all over the world.

For Mapei trade fairs are one of its most important business-to-business type communication investments and also the most effective means of communication of all. Internationalization - one of the strong points underscoring Mapei's success on a day-to-day basis - can instantly be perceived when you look at all the places where the Company attends trade fairs shown on a planisphere. Mapei is present on every continent. It never misses such international trade fairs as Cersaie in Bologna (Italy) for the ceramics industry, Domotex in Hannover (Germany) for the resilient materials sector, and Saie and MADE expo in Bologna and Milan (Italy) respectively for the major building industry, but it also attends lots of

national or macro-regional exhibitions all over the world.

The main reason why Mapei prefers trade fairs as a means of communication is undoubtedly connected with the target groups (businesses or consumers) it is trying to get in contact with. Visitors to specialist trade fairs are usually selected customers, who are looking for solutions, products and suppliers capable of catering for their requirements most effectively because they have invested in this kind of research. Visitors, therefore, are expecting a wide range of information and solutions to meet their specific needs.

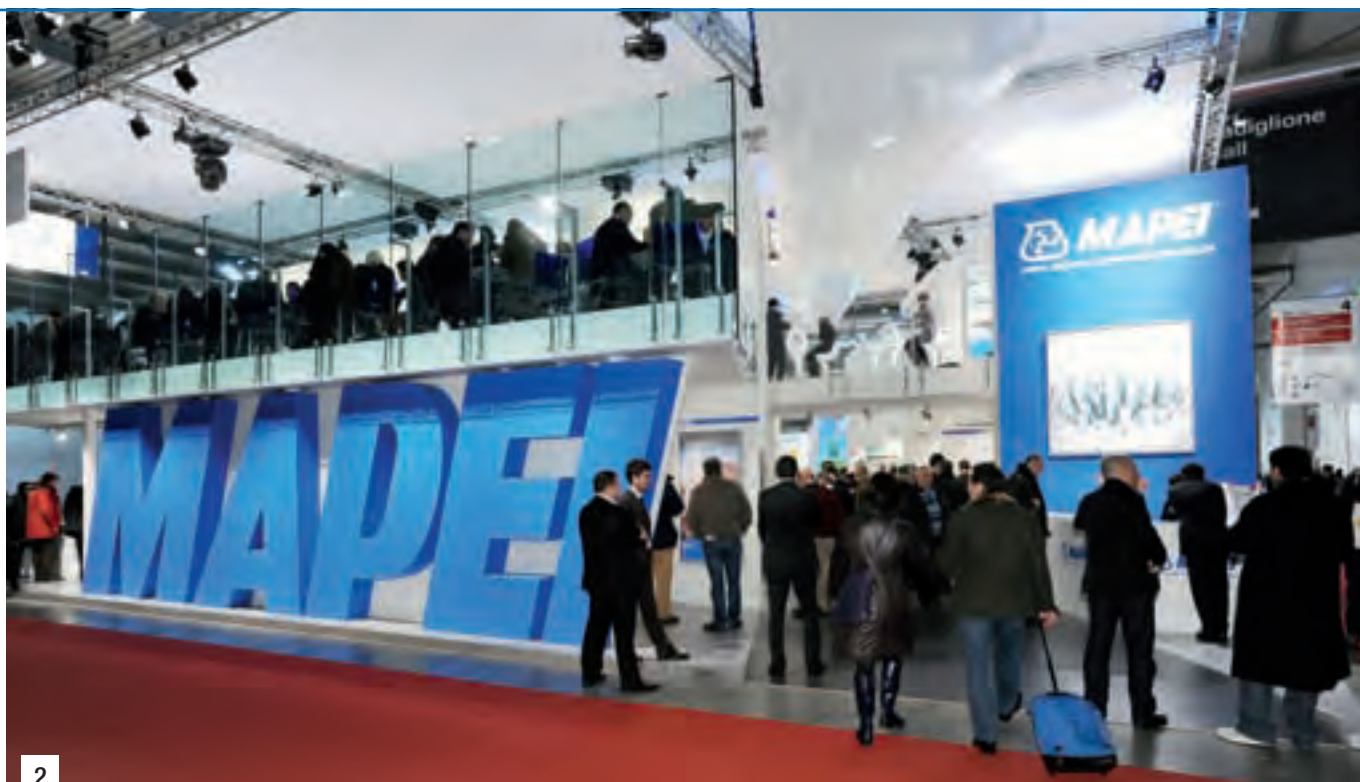
It should be pointed out that a trade fair provides exhibiting companies with opportunities to interact with potential buyers just at the moment when the latter are setting about their research process before buying. And it is now a marketing fact that trade fairs are the most effective tool during the central phases in the purchasing pro-

**Photo 1.** The Mapei stand at the 2010 edition of Cersaie (Bologna, 29 September – 2 October). The event will be fully described in the next issue of *Realtà Mapei International* (33).

cess (search for product solutions, search for suppliers, assessment and decision-making) compared to other tools such as advertising in the media and personal communication (the sales network).

Over time, trade fairs have become increasingly less sales opportunities and more means of communication aimed at achieving very definite goals and, hence, serving a very specific purpose in relation to other tools in the marketing mix. Mapei was quick to realize this, setting out to achieve the goal of providing visitors not just with the usual information about various purchasing alternatives (something which, for example, can be carried out on the web), but also everything conventional means of communication and information cannot offer: experimentation, socializing, entertainment. Interactive multimedia systems, presentation videos, "hands-on" demonstration slabs, objects created using various different product systems and demonstration areas where you can see and actually test out the concrete benefits which can be obtained using Mapei products. All this, plus the possibility of taking part in conventions, workshops, seminars and side events organized by the trade fairs themselves. While it may be true that a potential buyer can gain an extensive overview of alternative existing products just by consulting a directory or on the web using a customized search engine, the specialization offered by trade fairs goes even further. In this particular realm, even greater attention is being given to "the experiential approach", a recent marketing theory which - taking in to account the role that experiences play in consumer processes - considers it to be important to get visitors emotionally involved.





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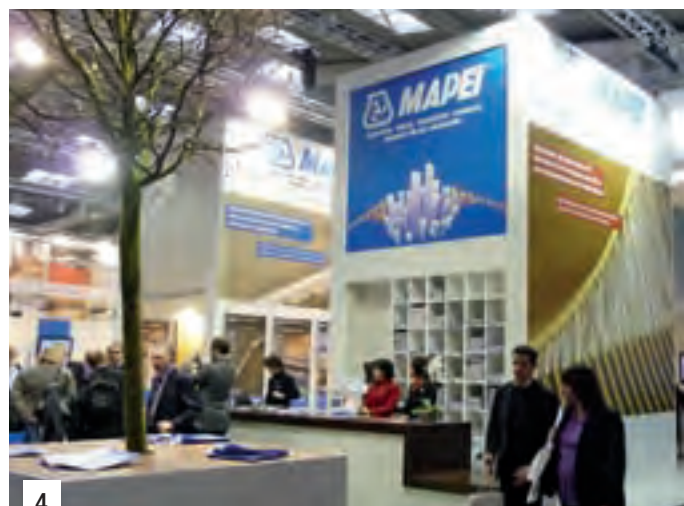
Mapei has been following this path for various years, getting businesses and visitors involved in exhibitions and allowing them to experience the real atmosphere of the Company by immediately answering any questions they may have. It focuses on sensorial, emotional, cognitive-creative and physical experiences and on experiences connected with lifestyles and social identity.

Mapei's trade fair-style approach is a reply to what Francesca Golfetto in the "Rapporto Fiere" (Trade Fair Report), a supplement to the Italian economics newspaper *Il Sole 24 Ore*, published on 30<sup>th</sup> January 2007, in which, emphasizing this trend, she stated that: "experiential proposals which work are more closely tied to the need to touch products, assess the skills of manufacturers, sense market trends and emerging innovations, carry out networking and acquire specific knowledge. [...] Socializing and sharing between fellow workers are also important (for example companies which invite their customers to open houses - in manufacturing units or corporate headquarters - or to meals with other customers and their own technicians), which meet the need to feel a sense of belonging and recognition on the part of industrial and professional communities and which help improve relations. A large part of the underlying moti-



3

**Photos 2 and 3.** Mapei stand at the 2010 edition of MADE expo held from 3<sup>rd</sup> to 6<sup>th</sup> February at Fieramilano Rho (Italy). **Photo 4.** Mapei's corporate image at Domotex 2010 in Hannover (Germany).



4

vation for trips to business fairs are actually connected with these goals".

Mapei realized this and every trade fair is prepared and experienced in a spirit aimed at stimulating visitors from every point of view, constantly striving to be close to the specific needs and tastes of visitors from every country. With this in mind, it ought to be pointed out that, in line with the growing globalization of markets, trade fairs are also becoming more internationalized. In other words, there is an increase in the number of events organized abroad by the trade fair associations of different nations and the emergence of new independent players. It is now widely believed that Western Europe is destined to lose its central role within the world exhibition

system in favour of emerging areas like China, India, South America, North America, Eastern Europe and the Mediterranean area.

A Eurocentric system is gradually being replaced by a polycentric system. Such an age-old trading and communication tool like a trade fair is rapidly evolving and new world scenarios will tell us how this will all pan out.

Well aware of this and moving in this direction, for Mapei a trade fair is not just a mirror of the market, it can also be a means of constructing the market itself. Mapei, which has always taken internationalization as one of the strong points behind its growth, is once again ready to take up this challenge and make the most of the opportunities which both new and old trade fairs will be able to offer.



# Mapei's showroom

A permanent space at Fieramilano Rho (Milan)

Ever since the beginning of 2010 Mapei now has a physical location inside Fieramilano Rho, the main trade fair district in Milan (Italy). Located centrally opposite the Congress Centre, Mapei's new permanent showroom officially opened to the public during the 2010 edition of MADE expo and is now open to the public at all scheduled trade fair exhibitions. The space, covering over 200 m<sup>2</sup> and set over two levels, is not just the ideal space for presenting Mapei's constantly evolving range of products, it is, above all, a place for ideas and workshop for projects. A space where the Company's technicians and expert staff can meet together

with architects and designers from all over the world to jointly envisage the ideal solutions for solving every imaginable problem connected with the world of building and also study sweeping, cutting-edge issues like eco-sustainability and energy saving in greater depth. Issues which see Mapei to the forefront in supplying specific high-tech systems and products.

## A Benchmark for Companies and Private Parties

The Mapei showroom is also designed to adapt to the different product categories which are gradually coming to the fore at trade fair events scheduled throughout the year at the big-



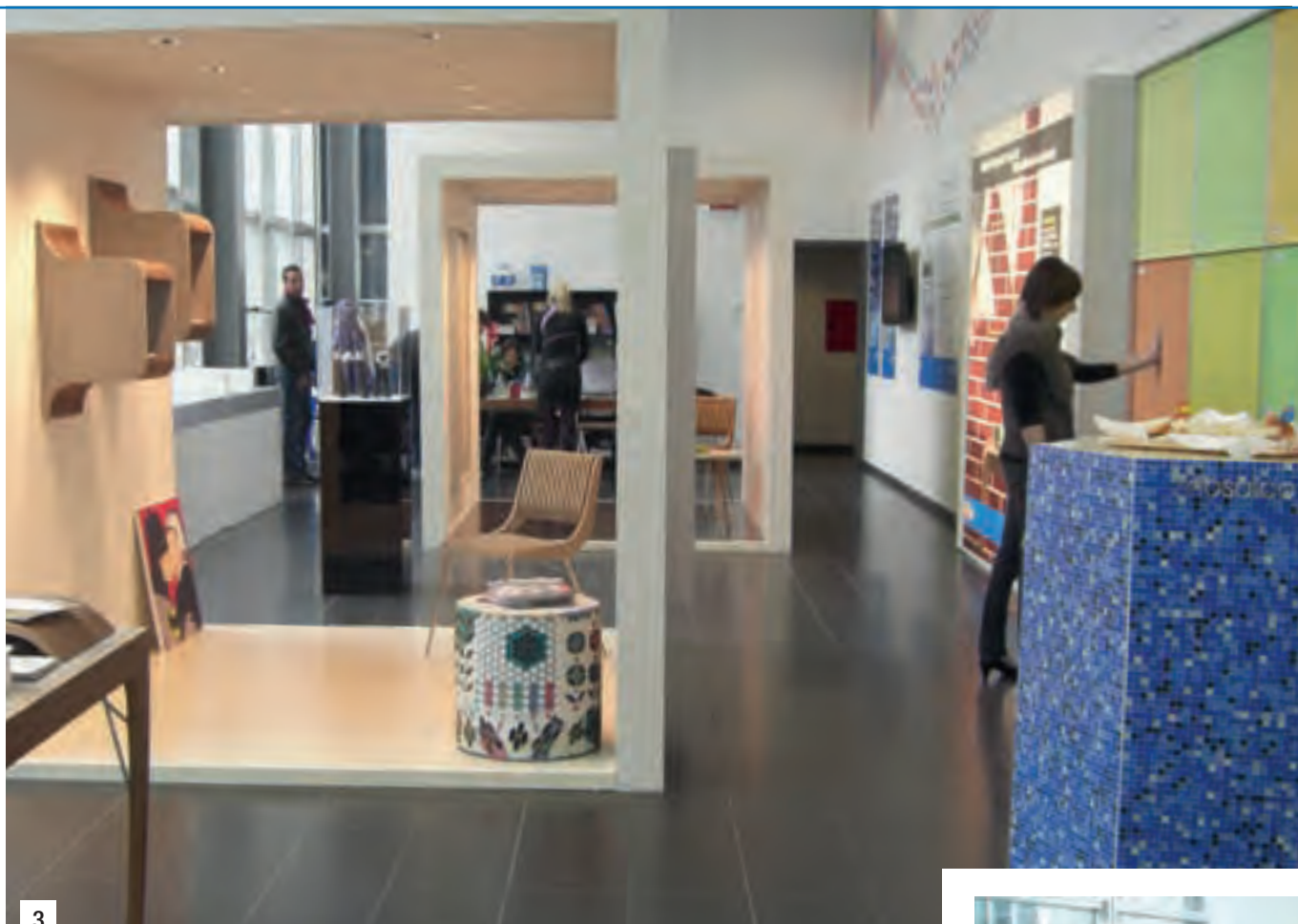
**Photo 1.** View from the outside of the Mapei's permanent showroom in Corso Italia Ovest 0.02, Ponte dei Mari Ovest 0.02 at Fieramilano Rho (Milan, Italy).

gest exhibition centre in Milan. Over eighty events will be taking place at Fieramilano Rho in 2010, and everybody in attendance, both exhibitors taking part in shows and the visitors flocking in to see them, will get the chance to see just why Mapei is genuinely "Technology you can build on". With its products and systems for the building industry, Mapei is found in homes and private and public companies all over the world. From the foundations to the roof, Mapei offers innovative solutions capable of satisfying every imaginable need. This is why it has such a vast number of potential customers.

In a flexible space which can convert into an authentic global communication area, the Mapei showroom is a prestigious container inside which the Company plans not only to display and present its products to all kinds of visitors (companies but also consumers and, let's not forget, young people building their own homes), but also to inform people about the guidelines inspiring the Company's constant growth. For instance, during MADE expo 2010 - an international exhibition devoted







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to the world of construction and design held from 3<sup>rd</sup> to 6<sup>th</sup> February – the Mapei showroom was used for presenting to designers the entire range of products on offer for the building industry.

During the 2010 Saloni (the furniture and design shows held in Milan from 14<sup>th</sup> to 19<sup>th</sup> April) Mapei exhibited its range of wall coatings, coloured grouts for mosaics and tiles and cementitious and resin floors, interpreted in original combinations of various materi-

**Photos 2, 3, 4 and 5.** Grouts for ceramics, products for installing mosaics, wall coatings, cementitious and resin floors, and furnishing elements made in Bulgaria using ULTRATOP, were all presented at the 2010 Salone del Mobile furniture show at Mapei's permanent showroom.

als and colours for new furniture products. The facility also displayed high-tech systems like heated panel floors, soundproofing and thermal insulation systems, all in accordance with the strictest international standards.

A permanent creativity centre for concretely designing the future: this sums up what the Mapei showroom represents at Fieramilano Rho, an important and symbolic place for Milan and the whole of Italy.




4

#### Right in the Heart of the Territory

Mapei's new showroom can also boast an important location for the city's future. Expo 2015 will focus attention on the Fieramilano Rho complex, which has already seen Mapei products play a leading role in its actual construction. A period of transformation which, hopefully, will see the entire territory take on brand-new forms and directions.

Skills and technology resulting from Mapei research have helped breathe long life into some of the most important locations for arts and culture in Italy and other countries. International opera-

tions, nevertheless, have never distracted Mapei from focusing special attention on Milan, the place which has witnessed the Company grow and whose historical building heritage it has helped to restore. The physical centrality of the Mapei showroom inside Fieramilano symbolizes the very nature of Mapei, capable of being right in the heart of its own territory and, at the same time, at the centre of the international building market. Mapei knows it has a leading role to play in this entire process, so that it can once again underline the fact that it is at the focus of a changing world. 



5

# Helpful packaging

New solutions which makes all the difference on site

**K**nowing what the customer wants, always, and especially on the building sites where, apart from the quality of the products used, what also makes the difference is the wrapper around them, their packaging. Which is why Mapei – a world leading company in the field of adhesives, sealants and chemical products for the building industry – continuously upgrades the packaging for its products to meet the constantly changing requirements on site. Mapei's packaging features clear, simple instructions, and allows practical storage rationalisation; it is resistant to inclement weather, quick and easy to use. All this along with full attention to eco-sustainable disposal of used packaging. Continuous evolution of products, continuous evolution of their packaging to guarantee, for as long as possible, all the performance characteristics which are a hallmark of Mapei.



1

## 100% Recyclable, Low-density, Vacuum-packed Polyethylene Bags for Cementitious Mortars

All Mapei's main production facilities have innovative packaging lines dedicated to powdered cementitious mortars.

Up until now, cementitious mortars were packaged in traditional paper bags. They are now offered in special low-density polyethylene bags which are perfectly sealed, using special equipment developed by Mapei's technicians which forms a vacuum during the packaging operations. By eliminating the traditional operation where the plastic bag is perforated, common practice with other packaging normally found on the market, the new packaging remains perfectly waterproof. The advantages of the new, 100% recyclable packaging are indisputable:

- it is resistant to inclement weather;
- products may be stored outside, which makes transport and handling on site easier;
- it is vacuum-packed, hence products deteriorate less;
- it is easier to handle when stacking pallets and when loading and unloading.

The following products are currently available:

- MAPEGROUT EASY FLOW
- MAPEGROUT FAST-SET
- MAPEGROUT THIXOTROPIC
- MAPEGROUT T60
- MAPEGROUT HI-FLOW
- MAPEGROUT HI-FLOW TI 20
- MAPEGROUT EASY FLOW GF
- MAPEGROUT FMR
- MAPEGROUT GUNITE
- MAPEGROUT LM 2K
- MAPEGROUT T40
- MAPEGROUT T60 F
- MAPEGROUT BM
- MAPEGROUT 430



2



3

- PLANITOP FAST 330
- PLANITOP HDM
- PLANITOP HDM MAXI
- PLANITOP RASA E RIPARA

## Sealant Cartridges

A new type of packaging is also used for sealants which are available in metal and plastic cartridges, with simple, illustrated instructions explaining how to use them.

It is now easier to identify a product and its main characteristics (colour, type of application, how to use and where to use).

Clear, simple illustrated instructions make it easier to choose the most suitable product according to the specific technical requirements for use on the building site. The following sealants are available with new packaging:

- MAPEFLEX PU40
- MAPEFLEX PU45
- MAPESIL AC
- MAPESIL AC - P
- MAPESIL Z
- MAPESIL Z PLUS
- MAPESIL BM
- MAPESIL LM
- ULTRABOND SUPER GRIP



4

## Photos 1, 2 and 3.

Mapei cementitious mortars are now offered in low-density, polyethylene bags which remain perfectly waterproof.

Photo 4. A new type cartridges is now used for Mapei sealants, with illustrated instructions about the product's field of application and how to use it.



5

### Water-soluble Bags

Innovative packaging is a Mapei trademark, especially where innovative products are offered. Just such an example is MAPEPLAST LA, a liquid admixture with foaming action used to make light-weight concrete suitable for filling ground cuts in roadwork.

In fact, the powdered version of this product is now packaged in **water-soluble bags**.

### Packaging for Products for Protecting Wooden Floors

The products from the ULTRACOAT range for wood protection are now available in new, versatile packaging.

Apart from efficiently identifying the product and illustrating the most suitable tools and how to use them, it is also a practical tool for use on site.

In fact, the master carton which contains two nylon bags may be easily transformed into a handy tray used to mix and apply the product correctly, and may be then disposed of after use.

The advantages are clear:

- **sure identification of the product** required to carry out the work;
- **it is immediately clear which tools are required** to carry out the work correctly;
- **less space and time** is needed, no other container is required which would otherwise need to



**Photo 5.** MAPEPLAST LA liquid admixture is now available in new water-soluble bags.

**Photo 6.** With the new packaging of the ULTRACOAT line less space and time is needed.

**Right.** MAPELASTIC is now available in a new 16-kg packaging.



6

be transported, cleaned after use and then stored away.


Mapei is always one step ahead in technology and innovation applied to packaging.

### New Packaging for Mapelast

A new packaging has been lately devised for MAPELASTIC, the famous flexible cementitious mortar for waterproofing all surfaces (especially suitable for waterproofing balconies, terraces, swimming pools, bathrooms, etc.).

This product, which was originally

developed for protecting major civil engineering projects, has been the best-selling waterproofing mortar for over 18 years: more than 170,000,000 m<sup>2</sup> were successfully waterproofed worldwide using MAPELASTIC.

The product is now available in a new 16-kg packaging which ensures easier handling and allows perfect waterproofing of small areas (up to 4 m<sup>2</sup>), such as those on small-size terraces. 



# The 2010 European parquet congress

by Francesco Doria\*

An analysis of trends in the European parquet market presented during the parquet congress held in May in Rome

On the 28<sup>th</sup> of May 2010, the annual FEP (European Federation of the Parquet Industry) congress was held in Rome, which brought together the main operators in the wood industry: floor manufacturers, distributors and manufacturers of products for laying wooden floors. Mapei, which has been a member of FEP for a number of years, took part at the event and Giorgio Squinzi presented a report which was highly appreciated. The presence of the Mapei Group's CEO and of the Operational Marketing and Communication Director Adriana Spazzoli demonstrates the increasing attention Mapei pays to the world of parquet, and its desire to be a reference point for all those who operate in the sector of systems for the installation of wood. Angelo Giangiulio, Product Manager for the Mapei Products for the Installation of Wooden

Floors, and Francesco Doria, Mapei Market Research Manager, also attended the event.

## Statistics on the Parquet Industry

The opening speech was made by Lars Gunnar Andersen, Chairman of FEP, who started off by declaring that "In 2009 we have had to face up to enormous challenges: after years of constant growth, production in Europe fell by 20% and demand by around 15%". Andersen then went on to a more optimistic note, reminding everybody that in the last six months demand for wooden floors in certain countries had started to grow again, and then rounded off by highlighting how important it is that parquet manufacturers join forces "without fighting each other to offer the lowest prices" and that they must exploit their strong points: quality, creativity and innovation.

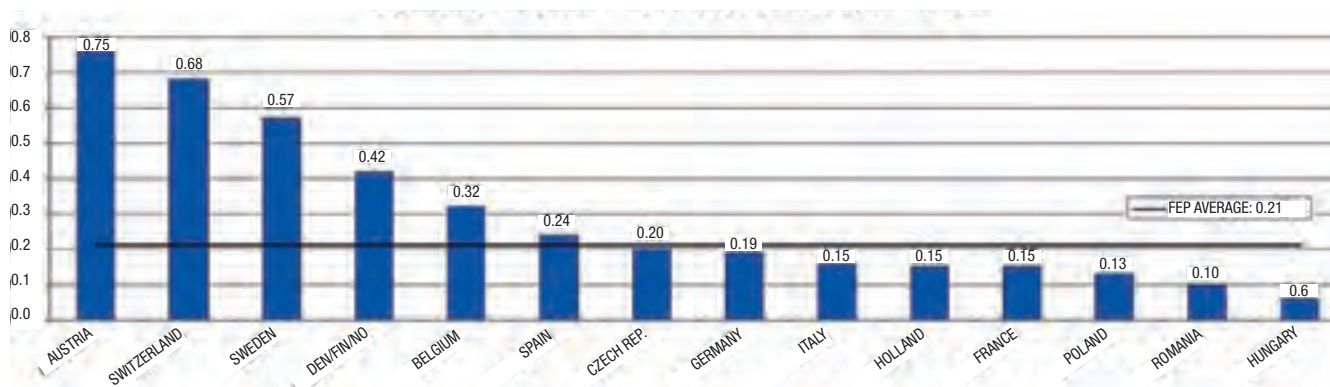
Andersen rounded off by reminding listeners about the importance of well-calibrated communication which successfully reaches the end user, "to increase their awareness and knowledge of our products".

The stage was then taken by the General Secretary Endre Varga, who also stressed the importance of the sensitivity of end users, an objective which has been the centre of numerous initiatives organised by FEP in recent years, such as Real Wood, with its own informative web-site for consumers, and the European Consumer Survey on Parquet, an inquest aimed at understanding how parquet is perceived by European consumers.

Lorenzo Onofri, special Advisor nominated by the Wooden Floor Group of Edilegno,



2009 CONSUMPTION PER CAPITA - m<sup>2</sup>



The graph highlights European per capita consumption of parquet by country. Parquet floors are especially appreciated in Northern countries, first of all Austria, Switzerland and Scandinavian countries. The consumption is still limited in East European countries. (Source: FEP statistics)



**Above.** Participants at the 2010 European Parquet Congress held on the 28<sup>th</sup> of May in Rome.

stressed the importance of defining exactly what it means to be a manufacturer, and to operate in a market with fair, positive competitors. He then used the example of the Italian Code of Transparency, a kind of passport for products which gives consumers all the information required to understand exactly what they are buying. "The time has come to move on from talking to doing, and to adopt different strategies than those used up until now" he declared, with clear reference to competitors such as China and Russia. These speeches indicate the stimulation for more cohesion and

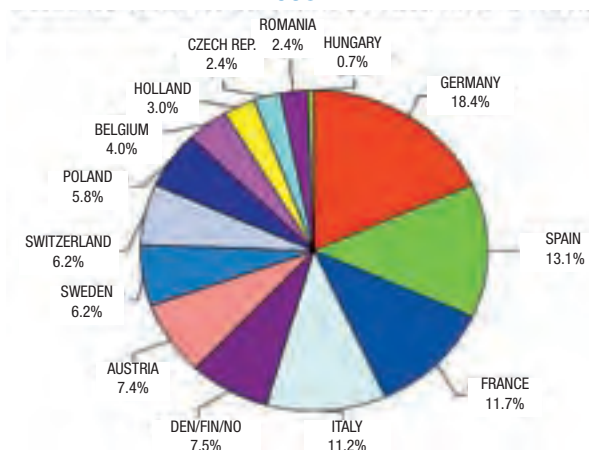
transparency, and also a certain optimism. They reported statistics on the consumption of parquet in Western Europe (except England) and 4 countries from Eastern Europe, namely Poland, the Czech Republic, Hungary and Rumania. The trend of the parquet market was analysed starting from a general macro-economic overview, which illustrated how Europe, and the countries in the Eurozone in particular, had paid a high price for the economic crisis. According to the latest estimates from the International Monetary Fund, the GNP of the countries which form the Eurozone fell by 4%, a much more intense fall than that recorded in the USA, around 2.4%. The European construction industry has been hit very hard by the crisis, and in particular the

residential building sector. FEP has estimated that the European parquet market suffered a fall in consumption of 15.3%, for a total of 86 million m<sup>2</sup> over the last year. The fall in the volumes produced was even more intense: from a level of 84.7 million m<sup>2</sup> in 2008 to an estimated figure of 67.5 m<sup>2</sup> in 2009, a drop of 20.3%. The wooden floor market had gone through a long period of growth (the only exception being in 2002) and reached its peak in 2007, a record year for the European residential construction industry. In the last two years, in correspondence with the crisis in the building industry, the production and consumption of parquet has fallen dramatically. Apart from a drop in market demand, the European parquet industry is suffering at the hands of competition from Asian manufacturers, which in recent years have increased their export levels to the European market, often proposing materials with a very low cost. The presentations made by the speakers discussed various issues: Frank Verschuere, CEO of LS Bedding Belgium, spoke about possible approaches to face up to the current economic conditions, while Prof. Helmut Resch from the University of Vienna presented new techniques for drying wood using micro-waves and radio-waves.

**Giorgio Squinzi's Speech**

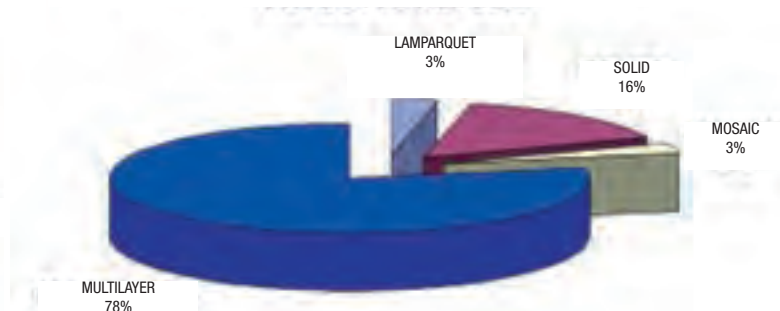
During his presentation, Giorgio Squinzi illustrated the latest provisions for the trends of the worldwide construction industry, underlining the fact the long-awaited

**2009 TOTAL CONSUMPTION IN THE FEP AREA BY COUNTRY**



Four countries account for 54% of total European consumption. Germany is leading the pack with over 18% of the total cake. Italy, France and Spain have similar consumption rates, ranging from 9.6 and 11.3 million m<sup>2</sup> and account for 11-13% of the total consumption. (Source: FEP statistics)

**2009 PRODUCTION PER PARQUET TYPE - PERCENTAGES**



According to FEP statistics total parquet consumption dropped in 2009 in all the analyzed European countries, with Italy, Spain and Scandinavian countries experiencing the worst falls, due to the crisis of the building sector. (Source: FEP statistics)

## TECHNICAL REQUIREMENTS FOR THE INSTALLATION OF WOOD FLOORINGS BOTH IN NEW AND RENOVATED BUILDINGS

- Reduction of installation time for inhabited homes that have to be finished quickly.
- Maintaining the existing floor level.
- Compatibility with new building solution that reduces impact sound transmission, heat dissipation or make renovation easier.
- Concern for the environmental impact and indoor pollution for installation materials (screeds, self-levelers, adhesives and coatings, etc.)

Source: Mapei

upturn in the construction industry will be led by the emerging Asian economies, and in particular China and India.

For the more advanced economies such as Western Europe, on the other hand, forecasts for the trend for the short and medium-term are for a more moderate growth. By offering a more detailed analysis of the construction industry in the major European countries, Giorgio Squinzi underlined that the Spanish market is destined to pay the highest price for the crisis in construction work market, and in particular that of residential buildings. Germany, on the other hand, which was not particularly involved in the boom in the housing sector in recent years, has suffered less than others during the crisis in the building sector, and will probably go through a period of moderate growth over the next two years.

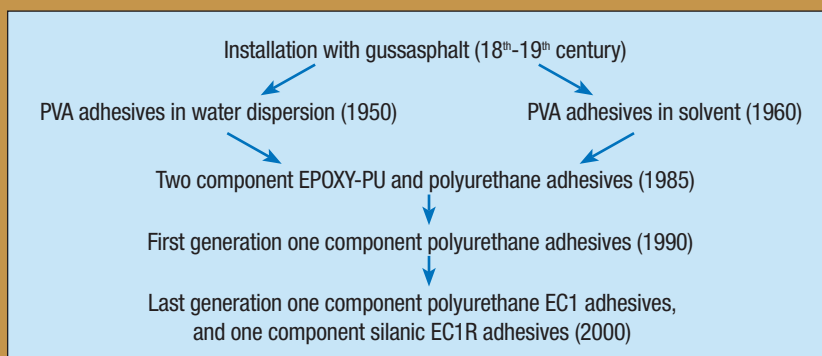
The Italian building industry, which has followed the average trend for Western Europe, should reach the low point of the recession in 2010, while investments in construction work over the next two years will either be relatively stationary or there may be a slight upturn. Squinzi confirmed the strong bond between the trend of the residential building sector and the parquet market, with the housing sector (and new constructions in particular) being their main area of use. The CEO of the Mapei Group traced out the evolution of the sector, remembering how materials for laying wooden floors have evolved over the years to meet the requirements of building contractors, floor-layers and final users. These changes have encouraged a more widespread use of parquet, both in new constructions and as a replacement for other types of floor coverings. In fact, screeds, smoothing and levelling compounds, primers, adhesives and finishing products have all been improved to guaranteed higher performances. Mapei has always been a leader in the technological evolution of materials

## SOLUTIONS FOR THE INSTALLATION OF PARQUET IN NEW RESIDENTIAL HOMES AND RENOVATION WITH VERY LOW EMISSION (EC1)

- Soundproofing systems for the reduction of surface and impact noises (e.g. Mapesonic and Mapesilent technologies).
- Realization of ready-mix screeds (5-8 cm thickness and less than 2% residual moisture):
  - 1) ultrafast setting and drying screeds that allow parquet installation within 24 hours (e.g. Mapecem technology).
  - 2) normal setting and fast drying screeds that allow parquet installation within 4-7 days (e.g. Topcem technology).
- Self-leveling compounds for substrates giving very high surface hardness, fully adequate for wooden floors (e.g. Ultraplan technology).
- Fast bonding, one component, solvent free reactive adhesives, with extremely low Volatile Organic Compounds (VOCs), EC1 certified and with high adhesion on every substrate, even on existing ceramic tiles.

A selection of the slides presented by Giorgio Squinzi at the FEP congress.

## PARQUET ADHESIVES EVOLUTION



## COMPONENT MOISTURE CURING ADHESIVE

Adhesive Type	Labelling	Emissions	Curing Speed	Cleanability	Specific Adhesion	Cost
PU (free MDI content ≥1%)	Xn R42/43 (and R40 and starting from 01/12/2010)	None (EC1 R)	Very fast	Poor	Very high	100
PU (free MDI content <1% and ≥0,1%)	Xn R42	None (EC1 R)	Fast	Average	Very high	100
PU (free MDI content <0,1%)	None	None (EC1)	Average	Average	High	140
MS/Hybrid	None	Methanol (EC1 R)	Very fast	Very good	High	140

and offers top-of-the-range systems for all segments of the market. For example, in the adhesives sector, Mapei has a complete range of products available: from adhesives in water dispersion to one- and two-component polyurethane adhesives and silanic polymer-based adhesives.

Giorgio Squinzi stressed how the Mapei Group is firmly committed to the development of eco-sustainable solutions, an activity which keeps the Company's research laboratories intensely engaged.

As a conclusion to the conference, the operators all agreed on the fact that the

development of the parquet industry relies heavily on the promotion of the quality of the materials and laying systems.

The main players on the market made a commitment, therefore, to ask the European Union to establish norms which regulate the sector and to promote transparency and correctness from competitors in the interest of those who operate on the market and the consumers.

The next FEP congress will be held in Dubrovnik (Croatia) in May 2011.

\*Mapei Market Research Manager



# Laying and finishing parquet

An ever more complete range of products for well-laid and protected parquet



pyrrolidone), have an extremely low emission level of volatile organic compounds (VOC), are easy to use and guarantee long-lasting protection.

### Ultracoat Oil and Ultracoat Oil Care

A warm, rustic effect on parquet floorings can be obtained in our homes using ULTRACOAT OIL, a natural solvent-free drying oil which brings out the natural beauty

of the veins in the wood. ULTRACOAT OIL can be applied in a single coat using ULTRACOAT ROLLER or ULTRACOAT STEEL SPATULA.

ULTRACOAT OIL CARE is a solvent-free, natural drying oil in water dispersion for final finishing treatments and routine maintenance of wooden floors treated with ULTRACOAT OIL. It is used for routine maintenance operations and helps maintain the original beauty of wooden floors as when they were originally laid, as it leaves the floor with a matt finish.

The products from the ULTRACOAT wood protection range are now available in new, versatile packaging (see page 17). Apart from efficiently identifying the product and illustrating the most suitable tools and how to use them, it is also a practical tool for use on site. In fact, the master carton which contains two nylon bags may be easily transformed into a handy tray used to mix and use the product correctly, and may be then disposed of after use.

To finish off, we must not forget the physical presence on the territory and the constant contact with all those who are involved in this market. In the Mapei organisation, there is an operations team headed by Angelo Giangiulio - Product Manager, Parquet Range - which is involved full time in promotional activities and technical and commercial assistance exclusively for the parquet sector.

**M**apei's expertise and technology in the field of products for the installation of parquet never stops to progress.

Even if global economic crisis also had negative effects on the wooden flooring market, Mapei nevertheless confirms its leading position in this sector.

The Company can offer complete products systems which are able to satisfy all the technical requirements for installing new parquet floor or renovating existing wooden floors.

It is just to offer its customers more and more innovative and integral solutions that, today, the wide range of products dedicated to parquet has been increased with new products and completed with specific new solutions for protection cycles.

Last year Mapei launched the ULTRACOAT range of water-based products to protect parquet. It includes stuccos, sealants, base coats, varnishes and oils, which respect both man and the environment.

Lately, the ULTRACOAT line was completed with the new ULTRACOAT P920 S-T (two-component water-base coat enhancing wood natural beauty and warmth), ULTRACOAT P 925 T and ULTRACOAT P 915 T (protective varnishes with glossy finishes), ULTRACOAT OIL and ULTRACOAT OIL CARE (oil-based resin finishes).

These products, just like all the other Mapei solutions previously available on the market, contains no NMP (N-methyl-

## THE CERTIFIED CHOICE

 		
ECO PRIM PU 1K	EC1 R	●
ECO PRIM PU 1K TURBO	EC1 R	●
ECO PRIM GRIP	EC1	●
ECO PRIM T	EC1	●
MAPESONIC CR	EC1	●
NIVORAPID	EC1 R	●
PRIMER G	EC1	●
PRIMER MF EC PLUS	EC1 R	●
SILWOOD	EC1	●
SILWOOD DECKING	EC1 R	●
TOPCEM PRONTO	EC1 R	●
ULTRABOND ECO P992 1K	EC1	●
ULTRABOND ECO S945 1K	EC1 R	●
ULTRABOND ECO S955 1K	EC1 R	●
ULTRABOND P990 1K	EC1 R	●
ULTRABOND S965 1K	EC1 R	●
ULTRACOAT P915	EC1	●
ULTRACOAT P920 2K	EC1 R	●
ULTRACOAT P920 S-T	EC1 R	●
ULTRAPLAN	EC1	●
ULTRAPLAN ECO	EC1	●
ULTRAPLAN MAXI	EC1	●

# A 16<sup>th</sup> - century castle in the North of France

An area renovated according to today's taste, which conjugates the old with the new

In the heart of the Hainaut region between France and Belgium, famous for the "blue stone" from which it takes its name, a 16<sup>th</sup> century castle has just been completely renovated. This impressive project included the laying of approximately 400 m<sup>2</sup> of parquet. The renovation was a complete success, with Mapei taking part in the work on the floor slab, preparation of the substrate, smoothing over of the surface and bonding of the parquet.

The castle was originally surrounded by a moat which had later been eliminated. Over the years, a chapel and a number of residences had been added. The new

owner of the property wanted to create a new environment, more open with more light. The interior designer Jean-Mark Vynckier thus designed an area with extremely clean lines, where stone (from Hainault, a very dark grey stone also known as "blue stone") is carefully mixed with steel and wood. The children's area is on the first floor, while on the ground floor we find the owners' living area, an entrance hall, the kitchen and a sitting room. "We wanted to create a special place, a loft open to nature – said Jean-Marc Vynckier – with an area which conjugates ultra-modern materials, such as stone and steel, with the warmth

of wood. And we are extremely pleased with the result".

## Preparation of Substrates and Surfaces

80% of the floor of the castle was made up from a concrete floor slab. A number of substrates were repaired, particularly between the kitchen and sitting room, by using MAPECEM PRONTO. This pre-bled, ready-to-use, quick-setting and drying, controlled-shrinkage mortar is used to make both floating and bonded screeds on new and old floor slabs. Its quick-drying property allows the screed to be available for foot traffic just 2 or 3 hours after laying and for laying the parquet after 24 hours.

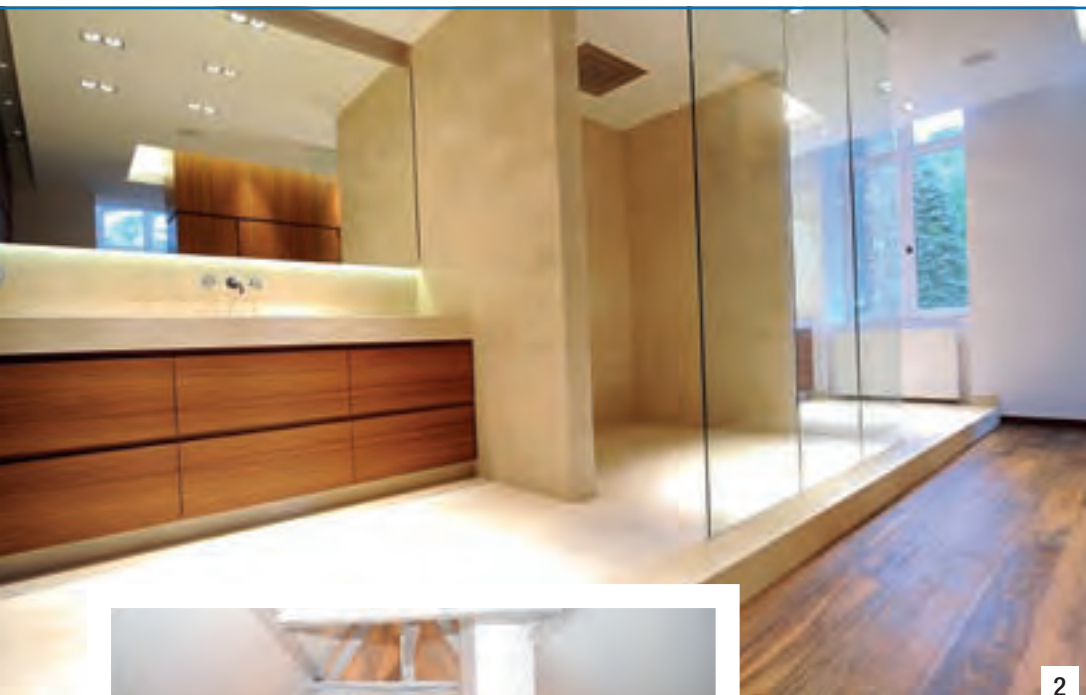
SYSTEME BARRIERE MF was laid in the entrance hall. This system is distributed on the French market by Mapei France, the French subsidiary of the Mapei Group, and is used to prevent rising damp and to quickly put the surfaces back into use.

SYSTEME BARRIERE MF comprises a primer (PRIMER MF) and

**Photo 1.** A view of the kitchen which offers a blend of wood and stone. Before laying the parquet, the surface was smoothed using PLANO 3.







sand (QUARTZ 1.2). It saturates the pores of the surface of the floor by impregnating them with resin, to form a barrier against the rising damp. The system is easy to apply, has high penetration and bonding properties and may be applied on both old and new substrates. PRIMER MF is a two-component primer which was here applied in two layers (400 g/m<sup>2</sup> + 300 g/m<sup>2</sup>) and is then sprinkled while still fresh with QUARTZ 1.2. A slope in the floor of the sitting room was evened out using ULTRAPLAN MAXI, a self-levelling smoothing and levelling compound for thicknesses of from 3 to 30 mm. This product sets quickly and may be stepped on after just 3 hours. ULTRAPLAN MAXI has been awarded the EMICODE EC1 mark by GEV, the association which checks emission levels of VOC in products used for laying floors, adhesives and various materials used in the building industry, of which Mapei is a member. This certifies that ULTRAPLAN MAXI is a substance with an extremely low emission level of volatile organic compounds (VOC). The flooring company Parqueterie de la Lys

**Photos 2 and 3.** The bathroom and a part of the first floor where parquet was bonded with ULTRABOND ECO S955 1K (the French counterpart of ULTRABOND ECO S965 1K).

**Photo 4.** ULTRABOND ECO S955 1K was used to bond the parquet in several rooms.



and Mapei chose PLANO 3 for smoothing and levelling the floor in the kitchen. This self-levelling, quick-hardening product has a particularly high yield and compensated shrinkage and may be applied on internal surfaces only at thicknesses of between 3 and 10 mm.

### Bonding 400 m<sup>2</sup> of Pre-finished Parquet

15 x 135 mm Muteny  parquet was laid on the stairs and ground floor, and was bonded to the

## IN THE SPOTLIGHT

### ULTRABOND ECO S965 1K

It is the counterpart of ULTRABOND ECO S955 1K, available on the French market. It is a one-component, isocyanate and solvent-free, sililated polymer-based adhesive with an extremely low emission level of volatile organic compounds (VOC).

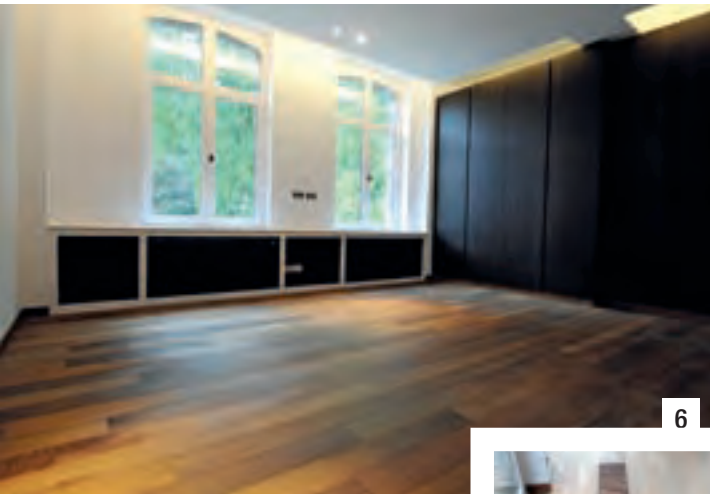
It is manufactured according to technology developed in Mapei's own research laboratories and has the following characteristics:

- one-component, ready-to-use product; no catalyser is required, therefore no mixing. If stored correctly, remaining quantities of the product may be used again at a later date;

- suitable for use by installers who are allergic to epoxy and epoxy-polyurethane products;
- **GEV** certified, as a product with a very low emission level of volatile organic compounds (**EMICODE EC1 R**);
- no hazard symbols on the packaging;
- easy to apply with excellent ridge holding;
- 20-30% more yield compared with conventional two-component adhesives, thanks to its low viscosity and free-flowing properties when applied by trowel;
- totally free of solvents and isocyanates;
- easy to remove from hands and pre-finished elements.



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substrate treated with SYSTÈME BARRIÈRE MF in the entrance hall. This wood of African origin comes in different shades of dark brown with almost black streaks. 15 x 135 mm Ipé parquet was used on the first floor. This wood comes from Central and South America and is a reddish-brown colour with shades varying from tobacco to dark brown.

ULTRABOND ECO S955 1K one-component, silicated polymer-based adhesive was used to bond both types of wood. This adhesive is easy to apply and remove from hands and is suitable for all types of parquet.

Thanks to its excellent ridge holding, ULTRABOND ECO S955 1K makes it much easier to register the parquet slats, even at high temperatures. This product respects the environment and the health for those who use it, in that:

- it is solvent-free, odourless and contains no isocyanates;
- it is certified as EMICODE EC1, that is, it has an extremely low



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**Photo 5.** The parquet was applied on the spiral stairway after treating the substrates with PLANO 3 self-levelling smoothing compound.

**Photo 6.** ULTRABOND ECO S955 1K was used for bonding parquet in several areas.

**Photo 7.** ULTRABOND ECO S955 1K was also used for installing parquet on heated floors in the entrance hall and bathrooms.

emission level of volatile organic compounds (VOC);

- it is hypo-allergenic and may even be used by installers who are allergic to epoxy-polyurethane products.

ULTRABOND ECO S955 is also suitable for heated floors, such as those laid in the entrance hall and bathrooms for this project.

“We work on a regular basis with Mapei - said Bruno Bouquillon, manager of the flooring company Parqueterie de la Lys - because of the quality of its products for laying parquet and the wide range of products available, so we can solve any problem we have when working on site.

We also appreciate the technical assistance which Mapei offers on

site, which has the aim of verifying the quality of substrates and to choose the products and check how they are installed together as a team”. In this case, the results were excellent and the photos speak for themselves.

*We are particularly grateful to Mr Bruno Bouquillon from the floor-laying company Parqueterie de la Lys and Jean-Marc Vynckier from the architectural design studio A propos de Lieu for their kind help in writing this article.*

*This article was taken from “Mapei & Vous”, issue n. 28, the in-house magazine edited by Mapei France, the French subsidiary of the Mapei Group, whom we kindly thank.*

## TECHNICAL DATA

Castle in the Hainaut region (France)

Period of Construction: 16<sup>th</sup> century

Year of the Intervention: 2009

**Intervention by Mapei:** supplying products for preparing the substrates, treating against rising damp, smoothing and levelling, bonding parquet

**Project Designer:** Jean-Marc Vynckier from A propos de Lieu

**Laying Company:** Parqueterie de la Lys

**Mapei Co-ordinator:** Vincent Lecomte, Mapei France SA

## MAPEI PRODUCTS

The products mentioned in the article belong to the “Products for the Installation of Resilient, Textile and Wood Floor and Wall Coverings” range. The technical data sheets are available at the web site: [www.mapei.com](http://www.mapei.com). Almost all the Mapei products for laying floors and walls are also GEV-certified and have been awarded the EMICODE EC1 (“very low emission level of volatile organic compounds”) mark, awarded by GEV. Mapei leveling and smoothing compounds and pre-blended mortars for screeds conform to EN 13813 standard and have been awarded the CE mark in compliance with annex ZA, standard EN 13813.

**Mapecem Pronto (CE EN 13813, CT-C60-F10-A1<sub>n</sub>):** pre-blended, ready-to-use, quick-setting and drying (24 hours), controlled-shrinkage mortar for screeds.

**Plano 3 (CE EN 13813, CT-C25-F7- A2<sub>n</sub>-s1):** fast-hardening, self-levelling smoothing compound for thicknesses from 3 to 10 mm.

**Primer MF:** solvent-free two-component epoxy primer to be used as an adhesion promoter of Mapefloor line products and to consolidate and waterproof, from residual damp, cementitious substrates. It is also used to impregnate surfaces of unsound concrete floors.

**Quartz 1.2:** quartz sand used for adding to epoxy systems.

**Ultrabond Eco S955 1K (EC1):** one-component, isocyanate and solvent-free, silicated polymer-based adhesive with an extremely low emission level of volatile organic compounds (VOC), for all types of parquet. N.B. This product is distributed on the French market by Mapei France. It is the French counterpart of Ultrabond Eco S965 1K.

**Ultraplan Maxi (CE EN 13813, CT-C35-F7- A2<sub>n</sub>-s1):** ultra-fast hardening self-levelling smoothing compound for thicknesses from 3 to 30 mm.

# Silence and comfort, who else but Mapei?

**Systems for laying radiant floors and for soundproofing against the noise of footsteps.**

Mapei offers cutting-edge technologies and innovative systems to construct any type of radiant and soundproof floor, guaranteeing stability, excellent flexibility and a long service life for the floor.

Photo by Miro Zagnoli



*Parquet treated with Ultracoat Oil®*

**Ultrabond Eco P992 1K®**

**Primer G - Ultraplan Eco®**

**Topcem Pronto®**

*Floor heating system*

**Mapesilent Roll®**

*Substrate*





# A City of Dreams in Macau

Mapei products and systems for a luxury resort

**M**acao is one of the two Special Administrative Regions in the People's Republic of China, the other being Hong Kong. It is located at the Southeast coast of China to the west of the Pearl River Delta and borders with Zhuhai River Delta and Guangdong Province, just 60 km far from Hong Kong. This small area of land covers just 29.5 km<sup>2</sup>

**Photo 1.** The Cotai strip in Macau.

**Photo 2.** Rendering picture of the City of Dreams complex, located in the Cotai strip linking Taipa and Coloane islands.

with a population of approximately 543,000. It was under Portuguese rule from the beginning of the 16<sup>th</sup> century until December 1999. That was the time when Macao was handed back over to China, maintaining a considerable degree of legal and monetary independence and its own police force, customs, foreign affairs and immigration control. Its land encompasses the peninsula and the two islands of



Taipa and Coloane. Located on a strip of reclaimed land that connects Macau's islands of Taipa and Coloane, Cotai Strip is a remarkable destination for premiere leisure, entertainment and luxury hotels. Full of prominent buildings and extraordinary establishments in such a small place, it is praised to be the



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**Photos 3 and 4.**

The building works lasted almost one year and a half and resulted in the construction of several buildings for premiere leisure, entertainment and luxury accommodation.

“China’s Las Vegas”.

City of Dreams, an urban integrated entertainment resort, was opened on 1<sup>st</sup> June 2009 at Cotai Strip. City of Dreams results from the passion of the developer, namely Melco Crown Entertainment, to set a new standard of gaming and entertainment experience in Asia. City of Dreams is an unprecedented resort in Macau, comprising distinctly branded casino floors, three separate world-class hotels, a unique shopping precinct “The



City of Dreams consists of three renowned hotels, a 420,000-m<sup>2</sup> casino, over 20 new restaurants and bars, an iconic dome-shaped theatre, and unique lifestyle-oriented retail precinct with the world’s most famous brands shops.



The Crown Towers hotel, with approximately 300 luxurious guest rooms, including 33 high roller villas, offers prime service.



The Hard Rock Hotel, with approximately 300 guest rooms, is its first theme hotel in Asia.



The Grand Hyatt Macau hotel offers around 800 high-end guest rooms.



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Boulevard" which wraps around the casino floors and links the three hotel towers, and an awe-inspiring multimedia show housed in a dome-shaped theatre called "The Bubble". Among the hotels Crown Towers, with approximately 300 luxurious guest rooms and 33 high roller villas, offers lavish style and prime service; the exciting, music-inspired Hard Rock Hotel, with approximately 300 guest rooms, is its first theme hotel in Asia; Grand Hyatt Macau offers around 800 high-end guest rooms.

**Photos 5 and 6.** TOPCEM PRONTO was used for the screeds of several fountains. **Photo 7.** Marble and natural stone slabs were laid in the fountains with ADESILEX P10+ ISOLASTIC; KERAPOXY was used for grouting the joints and MAPESIL AC for sealing the expansion joints.

#### Mapei Solutions

Being the flagship development of Melco Crown Entertainment Ltd in Macau, the whole project of City of Dreams has been seriously planned for nearly five years and carefully established to bring it to be the Asia's most desirable leisure and gaming destination. In fulfilling such enormous project with the objective of creating the most superb and luxurious resort, construction materials were chosen carefully to secure the stability and durability of all buildings. Possessing impressive and

## IN THE SPOTLIGHT

### MAPELASTIC

It is a two-component mortar based on cementitious binders, fine-grained selected aggregates, special additives and synthetic polymers dispersed in water, blended according to a formula developed in Mapei's own research laboratories. When the two components are mixed together, a free-flowing mix is obtained which may be easily



applied, even on vertical surfaces, at a thickness of up to 2 mm in one single coat. It is used for waterproofing concrete basins used for containing water; for bathrooms, showers, balconies, terraces, swimming pools, etc. before laying ceramic tile coverings; for waterproofing plasterboard, render or cementitious surfaces, lightweight cement blocks and marine-grade plywood. It also ensures protection of renders or concrete with cracks caused by shrinkage. MAPELASTIC has excellent bonding properties to all concrete, masonry, ceramic and marble surfaces, as long as they are sound and sufficiently clean. These properties mean that structures protected

and waterproofed with MAPELASTIC are hardwearing, even under particularly adverse climatic conditions, in coastal areas with a high salt content in the atmosphere or in industrial areas where the air is particularly polluted.

MAPELASTIC meets the requirements defined by EN 1504-9 ("Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - General principles for the use of products and systems") and the minimum requirements claimed by EN 1504-2 coating (c) according to the PI, MC and IR principles ("Protection systems for concrete surfaces").

well-recognized job references in Macau, Mapei's quality and reliable systems, including those for waterproofing, tile installation, rendering and floor screeding, became the prior choices. Works with Mapei products commenced in early 2008 and were completed within 3 years. Many of Mapei products (primers, levelling compounds, fibreglass mesh, adhesives for ceramics, latexes and mortars for grouting joints) have been adopted for appropriate applications in different buildings.

**External Landscape**

To bond the natural stone slabs on the long walking path to the main entrance of the shopping precinct KERAFLEX was used. This is a high-performance cementitious adhesive, with no vertical slip and extended open time, ideal for ceramic tiles and stone material. The joints were grouted with KERAPOXY high-performance two-component acid-resistant grout.

**Fountains and Water Displays**

For the fountains along both sides of the walking path to the main entrance of the shopping precinct, the fountains in front of the dome-shaped theatre, those in front of the casino entrance and in front of the Hard Rock Hotel, as well

as for the water display of the dragon ball next to the theatre representing the "Dragon's Treasure" (a famous topic in Chinese art) show, the following system was used to install stone and marble slabs: TOPCEM PRONTO special hydraulic binder for rendering and floor screeding; NIVOPLAN levelling mortar was mixed with PLANICRETE for improving bonding and mechanical strength before levelling the surfaces prior to installation; MAPELASTIC waterproofing membrane, reinforced with FIBREGLASS MESH (N.B this product was superseded on several markets by MAPENET), and MAPEBAND rubber tape for waterproofing the substrates; ADESILEX P10 high performance cementitious adhesive, mixed with

**Photo 8. KERAFLEX adhesive was chosen to bond the natural stone slabs on the walking path to the main entrance of the shopping precinct.**

Joints were grouted with KERAPOXY.

**Photos 9 and 10.**

The following Mapei products were used for the swimming pools: NIVOPLAN+PLANICRETE, TOPCEM PRONTO, MAPELASTIC, FIBREGLASS MESH, MAPEBAND, ADESILEX P10, KERAPOXY, MAPESIL AC, KERALASTIC, KERACRETE SYSTEM, KERAPOXY and ULTRACOLOR PLUS.

ISOLASTIC flexible latex additive, to bond the slabs; KERAPOXY for grouting the joints; MAPESIL AC acetic cross-linking silicone sealant for sealing the expansion joints.

**Swimming Pools**

The swimming pool area, which is to be shared by both guests of Crown Towers and Hard Rock hotels, includes a pool by the bar, the biggest pool with a fountain, a small Jacuzzi, a kid's pool, etc.

Just like in the above-mentioned case, NIVOPLAN+PLANICRETE, TOPCEM PRONTO were used for preparing the substrates; MAPELASTIC, FIBREGLASS MESH and MAPEBAND for waterproofing; ADESILEX P10+ ISOLASTIC for bonding the mosaic tiles; KERAPOXY for grouting the joints; MAPESIL AC for sealing the expansion joints. The same products were used for laying mosaics in the Grand Hyatt swimming pool area where it was necessary to mix PLANICRETE with cement and water to obtain a bonding slurry before preparing the screed. For grouting the joints ULTRACOLOR PLUS was chosen in this case. This is a fast-setting and drying, high performance, anti-efflorescence, water-repellent mortar grout with DropEffect® and anti-mould with BioBlock® technology. It is ideal for grouting joints from 2 to 20 mm.



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### Hard Rock Hotel

For the bathrooms floors and walls in VIP levels within the Hard Rock hotel PRIMER G was used as primer, MAPELASTIC as waterproofing treatment; KERALASTIC and KERACRETE SYSTEM (adhesive system including KERACRETE

and KERACRETE POWDER) for bonding marble slabs; KERAPOXY for grouting the joints. In the hotel lobby, in the washrooms and service areas KERACRETE SYSTEM was used for bonding the stone material slabs, while joints were grouted with ULTRACOLOR

**Photos 11, 12 and 13.** In the Hard Rock and Crown Towers lobby areas KERACRETE SYSTEM was used to bond natural stone slabs on walls and floors. KERAPOXY and ULTRACOLOR PLUS were used to grout the joints.

PLUS.

### Crown Towers Hotel

In this hotel natural stone slabs were laid on the floorings of the lobby, washrooms and service rooms with the KERACRETE SYSTEM as adhesive and KERAPOXY and ULTRACOLOR PLUS as grout for the joints.

### Casinos

To install natural stone wall and floor coverings in the City of Dreams Casino and Crown Towers Casino KERACRETE SYSTEM was used as adhesive, KERAPOXY and ULTRACOLOR PLUS as grouts for the joints.

## TECHNICAL DATA

**City of Dreams, Macau,** (People's Republic of China)

**Designer:** Melco Crown Entertainment Ltd

**Period of Construction:** 2007-2009

**Intervention by Mapei:** supplying products for preparing the substrates, waterproofing surfaces and installing stone materials and mosaic on walls and floors

**Period of the Intervention:** early 2008 – second half of 2009

**Customer:** Melco Crown Entertainment Ltd

**Contractor:** joint venture among Leighton, Chinese Government and John Holland

**Laying Company:** Pat Davie (Macau) Ltd, Themeworks International (Macau) Limited, iTop Construction Materials & Engineering Co Ltd, ASTEL (Macau) Ltd

**Laid Materials:** natural stone (marble, sandstone, etc.) slabs, mosaics.

**Mapei Co-ordinators:** Antony Lai and Roger Kwan, Mapei China (Hong Kong)

## MAPEI PRODUCTS

The products mentioned in the article belong to the "Products for Ceramic Tiles and Stone Materials" range. The technical data sheets are available at the web site [www.mapei.com](http://www.mapei.com). Mapei's adhesives for ceramics and stone materials conform to EN 12004 and have been awarded the CE mark in compliance with Annex ZA, standard EN 12004. Mapei grouts for ceramics and stone materials conform to EN 13888. Almost all the Mapei products for laying floors and walls are also GEV-certified and have been awarded the EMICODE EC1 ("very low emission level of volatile organic compounds") mark by GEV. Mapei levelling and smoothing compounds and pre-blended mortars for screeds conform to EN 13813 standard and have been awarded the CE mark in compliance with annex ZA, standard EN 13813. Mapei products for the protection and repair of concrete surfaces and structures have been awarded the CE mark in compliance with EN 1504 standards. Mapei mortars for renders conform to standard EN 998 and have been awarded the CE mark in compliance with standard EN 998. Mapei sealants comply with standard ISO 11600.

**Adesilex P10 (C2TE, CE EN 12004, mixed with Isolastic satisfies class S1 according to EN 12004, EC1 R):** white high performance cementitious adhesive with no vertical slip and extended open time for glass, ceramic and marble mosaic coverings.

**Fibreglass Mesh:** alkali-resistant fibreglass mesh in compliance with ETAG 004 guides for reinforcing waterproof protections, anti-fracture membranes and insulation coatings. N.B: this product has been superseded on several markets by Mapenet 150.

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

**Keracrete + Keracrete Powder (C2T, CE EN 12004, EC1 R):** high performance two-component adhesive with no vertical slip for ceramic tiles

and stone material.

**Keraflex (C2TE, CE EN 12004, EC1 R):** high performance cementitious adhesive, with no vertical slip and with extended open time for ceramic tiles and stone material.

**Kerapoxy (R2T, RG, CE EN 12004):** high performance two-component acid-resistant grout and adhesive with no vertical slip for installing and grouting ceramic tiles and stone material.

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

**Mapelastix (CE EN 1504-2, coating (c) principles PI, MC and IR):** two-component flexible cementitious mortar for waterproofing balconies, terraces and bathrooms

**Mapesil AC (F-25-LM ISO 11600/DIN 18540, BS 5889/ASTM C920, TTS 00230C, TTS 001543A):** one-component mildew resistant acetic cross-linking silicone sealant.

**Nivoplan (EN 998-1):** levelling mortar for internal and external walls and ceilings for thicknesses from 2 to 30 mm.

**Planicrete:** synthetic-rubber latex for cementitious mortars used for improving bonding and mechanical strength.

**Primer G (EC1):** synthetic-resin-based water dispersion primer with very low VOC content.

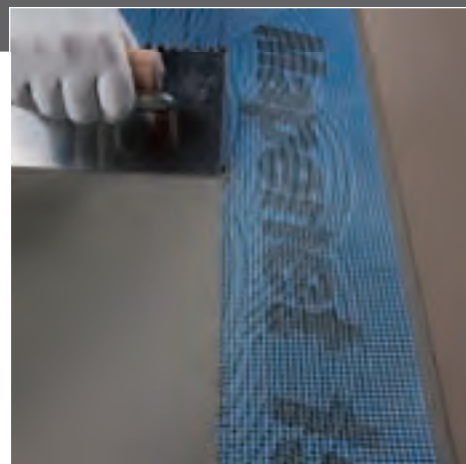
**Topcem Pronto (CT-C30-F6-A1, CE EN 13813, EC1 R):** ready-to-use, pre-blended, normal-setting mortar with controlled shrinkage for fast-drying screeds.

**Ultracolor Plus (CG2, EC1):** fast-setting and drying, high performance, anti-efflorescence, water-repellent grout for joints from 2 to 20 mm. With DropEffect® and anti-mould with BioBlock® technology.



# Mapelastic®

The waterproofer



Application

## The best-selling certified waterproofing system for over 18 years

- Developed for protecting major civil engineering projects
- Especially suitable for balconies, terraces, swimming-pools, bathrooms, etc.
- Easy to apply
- Suitable for use over existing ceramic tiles
- Protective, long-lasting and versatile

More than 180 million m<sup>2</sup> successfully waterproofed!

**NEW!**

Now also available in

**16 kg = 4 m<sup>2</sup>**

**MIXING BUCKET**



In compliance with EN 14891 standard

Traditional kit

**32 kg = 8 m<sup>2</sup>**



# The Burj Khalifa Tower in Dubai

Inside the tallest skyscraper in the world, the setting for the exclusive Armani Hotel

The official opening ceremony of the Burj Khalifa Tower in the United Arab Emirates capital of Dubai was held earlier this year on the 4<sup>th</sup> of January. In fact, in Arab "burj" means tower, and with its 162 floors and razor-edge spire which reaches 828 metres, it now holds the record as the tallest skyscraper in the world. The height of the tower was kept top secret right up to the inauguration to keep competitors in the dark, and its true height was only officially announced on the 4<sup>th</sup> of January. Designed by the Skidmore, Owings & Merrill LLP design studio from Chicago, whose signature is also on the Sears Tower in Chicago and the Freedom Tower in New York, construction work involved

12,000 site workers and 5,000 designers and consultants, and required 333,000 m<sup>3</sup> of concrete and 31,400 tonnes of steel for a total investment of 4.1 billion dollars. The tower is served by 58 ultra-fast elevators which reach speeds of up to four floors per second to distribute visitors and guests over the 344,000 m<sup>2</sup> of total floor area. The area is divided into 354 residential apartments, 237 suites, a series of exclusive hotel rooms, offices, and fitness centres and even a mosque, while the 124<sup>th</sup> floor is entirely dedicated to the highest observation terrace in the world.

Construction work on the Burj Khalifa Tower started in 2004. The skyscraper is part of a development currently under construc-

tion which covers around 2 km<sup>2</sup> called Downtown Burj Khalifa, and includes the second tallest hotel in the world, the biggest artificial marina in the world the biggest artificial islands in the world (the three Palm Islands and the World Islands) and the biggest shopping mall built until now, the Dubai Mall.

The plan of the building was inspired by the form of the hymenocallis, a flower which is particularly loved in Dubai, and the skyscraper is composed of three elements with a central nucleus.

## Mapei's "Signature" Inside

If the Burj Khalifa looks stunning from outside, the inside rooms are as interesting as its striking exterior.

Through its local subsidiary IBS (Innovative Building Solutions) LLC. Mapei played a key role in supplying the stunning Armani Hotel which is hosted in the skyscraper. It offers 160 guest rooms and suites. Guest rooms are located on levels five through eight of Burj Khalifa, with suites on floors 38 and 39. It also encloses 8 restaurants, luxury shops and one spa centre. The one- and two-

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## IN THE SPOTLIGHT

### GRANIRAPID

It is a high performance, deformable, fast setting and hydration, two-component cementitious adhesive for ceramic tiles and stone material. It is classified as **C2FS1** according to European standard **EN 12004** and has been awarded the **CE** mark in compliance with Annex ZA, standard **EN 12004**. It is

particularly suitable for the installation of stone material that is moderately unstable to moisture and requires a rapid drying of the adhesive. It is suitable for bonding floors subject to heavy traffic. Because of its extraordinary bonding and fast-setting characteristics, GRANIRAPID is particularly suitable for rapid re-tiling jobs and flooring that has to be in service within very short time (supermarkets, industries, hospitals, airports, swimming pools, etc.).

### ULTRABOND P990 1K

ULTRABOND P990 1K is used for bonding pre-finished elements, lamparquet, slats, planks and all types of wood on: cementitious screeds; screeds made using MAPECEM, MAPECEM PRONTO, TOPCEM, TOPCEM PRONTO and similar products; old wooden floors; ceramic, marble, etc.; anhydrite screeds. It is also

suitable for heated floors. It is easy to apply, even at low temperature and has a 30% higher yield compared with conventional two-component products, thanks to the low viscosity and free-flowing properties of the adhesive when applied by trowel, even at low temperatures. It has an excellent straight line hold and excellent buttering on the back of tiles. It has been awarded the **EMICODE EC1 R** certification by **GEV**, as it is a product with very low emission level of volatile organic compounds (VOC).





**Photo 1.** An image of the tallest skyscraper in the world, the Burj Khalifa Tower. Mapei products were used inside the tower to complete the exclusive flagship Armani Hotel.

**Photo 2.** The parquet was laid using ULTRABOND P990 1K adhesive.



Photo courtesy of Margaritelli SpA.

bedroom luxurious residences, located on levels 9 through 16 of Burj Khalifa, have been personally designed by Giorgio Armani himself.

As for the Armani Hotel, Mapei Technical Service supported the project's hotel interior fit-out contractors and recommended the use of KERAFLEX high performance cementitious adhesive, with no vertical slip and with extended open time, for the installation of ceramic tiles and stone material slabs on walls and floors in several areas (front of house, reception, apartments, residence, boutique offices, restaurant, etc.).

Substrate preparation was carried out to certain critical areas such as the ballroom and business centre using Mapei's rapid systems, such as MAPECEM pre-blended, ready-to-use, quick-setting and drying, controlled-shrinkage mortar for screeds, and ULTRAPLAN and ULTRAPLAN MAXI ultra-fast hardening self-levelling compounds for smoothing the surfaces.

These systems enable the substrates to receive all kinds of floorings after 24 hours and this was an important reason for selecting them due to the tight program of works and commitment to quality. Joints were grouted with KERACOLOR FF high performance, polymer-modified, water-repellent, cement-based grout. In the bathrooms, ULTRACOLOR PLUS high performance anti-efflorescence grout was used for the joints. Natural stone slabs were laid on the walls of the bathrooms within the Armani Nightclub with KERAFLEX high performance, deformable, two-component cementitious adhesive with

no vertical slip, with Dust Free technology and extended open time. GRANIRAPID high performance, deformable, two-component cementitious adhesive with rapid setting and hydration was also used to bond the slabs on the floors to other areas. Before installing the tiles the substrate's wet areas were waterproofed with MAPELASTIC, a highly flexible cementitious waterproofing membrane which ensures complete compatibility with the subsequent tile installation. Tile joints were grouted with ULTRACOLOR PLUS and KERACOLOR FF. KERAPOXY coloured epoxy grout was used for the joints in the bathrooms and in the kitchen.

The project also included some of the highest quality pre-engineered

wooden flooring ever installed on high level corridors and in the main lobby. To ensure the complete success and long term durability of such an application, ULTRABOND P990 1K was selected and provided problem-free, safe and efficient use. This is a specially formulated one-component polyurethane adhesive with very low emission level volatile organic compounds (VOC) for all types of wooden flooring. It complies with the stringent GEV standards as class EMICODE EC1 R.

Mapei's involvement in Burj Khalifa is typical of its work with prestigious projects where the objective is to blend style and quality, working to world class standards with different materials and substrates, often to meet tight dead-



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**Photo 3.** This rendering of the area illustrates the future development of Downtown Burj Khalifa, a vast area currently under construction characterised by the presence of the skyscraper.

lines. Mapei products consistently perform under such high pressure situations, serving as the systems of choice for professionals.

This just adds to the list of prestigious building projects which Mapei has contributed to complete in the Arab Emirates: among the Mapei references one also finds the development of Yas Island, the Atlantis Hotel on the Palm Jumeirah artificial island, the Emirates Palace Hotel in Abu Dhabi, the Burj Al Arab 6-star hotel and the terminals 1, 2 and 3 in the Dubai International Airport. 

## TECHNICAL DATA

**Burj Khalifa**, Dubai (United Arab Emirates)

**Designer:** Skidmore, Owings & Merrill LLP, Chicago (USA)

**Period of Construction:** 2004-2010

**Period of the Intervention:** 2008-2010

**Intervention by Mapei:** supplying products for waterproofing the substrates, installing ceramic tiles and natural stone slabs in the bathrooms at the nightclub of the hotel and for bonding parquet floorings on high level corridors and in the main lobby.

**Customer:** Emaar Properties

**Contractors:** Fino International Interiors,

**Laid Materials:** ceramic tiles, natural stone slabs and parquet (by Margaritelli)

**Mapei Co-ordinator:** Laith Haboubi, IBS (Innovative Building Solutions) LLC (United Arab Emirates)

## MAPEI PRODUCTS

The products mentioned in the article belong to the "Products for Ceramic Tiles and Stone Materials", "Building Speciality Line" and "Products for the Installation of Resilient, Textile and Wood Floor and Wall Coverings" ranges. The technical data sheets are available at the web site [www.mapei.com](http://www.mapei.com). Mapei adhesives for ceramics and stone materials conform to EN 12004 and have been awarded the CE mark in compliance with Annex ZA, standard EN 12004. Mapei grouts for ceramics and stone materials conform to EN 13888.

Almost all the Mapei products for laying floors and walls are also GEV-certified and have been awarded the EMICODE EC1 ("very low emission level of volatile organic compounds") mark by GEV. Mapei levelling and smoothing compounds and pre-blended mortars for screeds conform to EN 13813 standard and have been awarded the CE mark in compliance with annex ZA, standard EN 13813. Mapei products for the protection and repair of concrete surfaces and structures have been awarded the CE mark in compliance with EN 1504 standards.

Mapei mortars for renders conform to standard

EN 998 and have been awarded the CE mark in compliance with standard EN 998.

**Granirapid (C2F S1, CE EN 12004, EC1 R):** high performance, deformable, two-component cementitious adhesive with rapid setting and hydration for ceramic tiles and stone material.

**Keracolor FF (CG2, EC1 R):** high performance, polymer-modified, water-repellent, cementitious grout, with DropEffect® technology, for joints up to 6 mm.

**Keraflex (C2TE, CE EN 12004, EC1 R):** high performance cementitious adhesive, with no vertical slip and with extended open time for ceramic tiles and stone material.

**Keraflex Maxi S1 (C2TE S1, CE EN 12004, EC1 R):** high performance cementitious adhesive with no vertical slip, with Dust Free technology extended open time and deformable for ceramic tiles. It is particularly suitable for the installation of large sized porcelain tiles and natural stone slabs.

**Mapecem Pronto (CE EN 13813, CT-C60-F10 A1<sub>n</sub>):** pre-blended, ready-to-use, quick-setting and drying (24 hours), controlled-shrinkage mortar for screeds.

**Mapelastic (CE EN 1504-2, coating (c) principles PI, MC and IR, EN 14891):** two-component flexible cementitious mortar for waterproofing balconies, terraces and bathrooms.

**Ultrabond P990 1K (EC1 R):** ready-to-use polyurethane, one-component, solvent-free, elastic adhesive for all types of wooden flooring over Mapecem, Mapecem Pronto, Topcem and Topcem Pronto screeds, cementitious screeds, existing wooden flooring, ceramic tiles, marble, terrazzo tiles, etc.

**Ultracolor Plus (CG2, EC1):** fast-setting and drying, high performance, anti-efflorescence, water-repellent grout for joints from 2 to 20 mm. With DropEffect® and anti-mould with BioBlock® technology.

**Ultraplan (CE EN 13813, CT-C30-F7 A1<sub>n</sub>-s1, EC1):** ultra-fast hardening self-levelling smoothing compound for thicknesses from 1 to 10 mm.

**Ultraplan Maxi (CE EN 13813, CT-C35-F7 A2<sub>n</sub>-s1, EC1):** ultra-fast hardening self-levelling smoothing compound for thicknesses from 3 to 30 mm.

# Ultrabond Eco P992 1K



Application



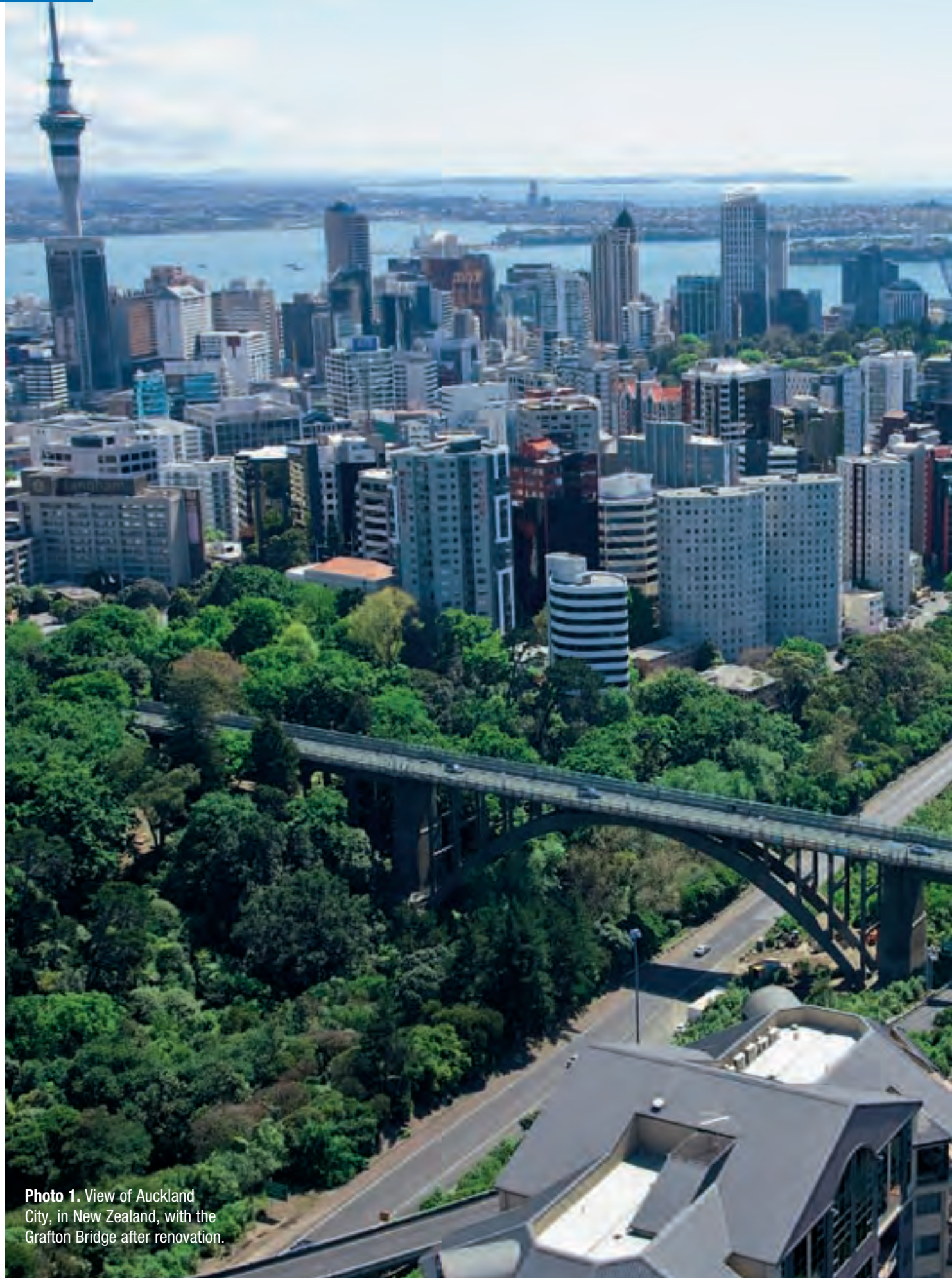
**The one component polyurethane adhesive which improves quality of work, safeguards health and protects the environment**

- Ideal for all kinds of wood
- Excellent bonding to all kinds of substrates
- Solvent-free
- Low environmental impact<sup>(\*)</sup>
- Without any hazard warning requirements



<sup>(\*)</sup>Certified by the GEV Institut (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.) as EC1 (extremely low emission level of volatile organic compounds).





**Photo 1.** View of Auckland City, in New Zealand, with the Grafton Bridge after renovation.



# Grafton Bridge in New Zealand

Mapei products were chosen  
for repairing the concrete structure

**G**rafton Bridge is a road bridge spanning Grafton Gully in Auckland City (New Zealand), connecting the city centre with the near-by suburbs. It was first opened in 1910 and today it is on the New Zealand Historic Places listing. Grafton Bridge spans about 98 metres and rises to a height of around 43 metres. Originally designed to cater for pedestrians and horse drawn traffic in 1906, the bridge had an 8 tonne vehicle weight limit imposed in 1970.

In 2008 a strengthening project was launched and was intended to expand the use and extend the life of this historical Auckland landmark. The strengthening project was designed to upgrade the structure to carry current and future traffic loadings to become a dedicated bus corridor as a major link in Auckland City Council's Central Connector Project.

This is an initiative to deliver 64,000 passenger journeys per weekday via public transport in and around Central Auckland. The original design did not cater for earthquake loading and these works include seismic retrofitting of the bridge columns. Surveys prior to commencement of works and subsequent inspections found numerous cracks, voids and spalled concrete as well as levels of carbonation requiring remedial action.

Interventions to solve these problems were implemented to preserve the integrity of this wonderful 100 year old example of architectural engineering. The Fletcher Construction Company, trading as Brian Perry Civil, was awarded the

contract for the restoration works at Grafton Bridge.

Strengthening works consisted of 750 m<sup>3</sup> of reinforced concrete to the base of the two main piers, column extensions and foundation piles.

The contractor requested that products for concrete repair, epoxy resin for injection and the anti-carbonation coating would be manufactured by a single supplier. Various manufacturers were invited to submit proposals and perform on site trials.

Mapei was selected as the preferred supplier of these materials after approval by the client, the Auckland City Council's Engineers and Heritage Architects appointed to assess the products' technical and aesthetic merits.

## The Schedule of Works

The sheer scale of required repairs was soon established and the final surveyed quantity included:

- concrete spalling repairs: 75 m<sup>2</sup> (364 identified areas)
- crack repairs: 805 lineal m (526 identified cracks).

For crack injection and ancillary works Mapei offered ADESILEX PG1, two-component thixotropic epoxy adhesive, EPOJET LV two-component epoxy resin with very low viscosity, and LAMPOSILEX ultra fast-setting and drying hydraulic binder. For the bridge's concrete repair Mapei supplied MAPEGROUT THIXOTROPIC shrinkage-compensated fibre-reinforced thixotropic mortar; PLANITOP 400 fast setting shrinkage-compensated thixotropic mortar ideal for cortical restoration and



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the finishing of reinforced concrete; PLANITOP 430 fine-grained, thixotropic, fibre-reinforced, controlled-shrinkage, medium-strength mortar; MAPEFER 1K one-component corrosion-inhibiting cementitious mortar for the protection of reinforcing rods and MAPEFILL GP general purpose shrinkage compensated grout (N.B. This product is manufactured by Mapei Far East, a subsidiary of the Mapei Group located in Singapore). Remedial repairs including resin injection of cracks were carried out by trained staff of Brian Perry Civil, New Zealand Industrial Absellers and Certified Concrete Repairs, a New Zealand professional company specializing in concrete repair.

### Application of the Anti-carbonation Coating

The largest extent of the project, in terms of material supply was the application of the anti-carbonation coating. In this case, MAPELASTIC was chosen as the most suitable product, due to its long term, successful track record and the fact the project required a cementitious coating as part of the restoration of the structure. MAPELASTIC is a two-component flexible cementitious mortar for waterproofing, which can be also used for protection against the penetration of carbon dioxide and other aggressive atmospheric elements. Shrinkage cracking in concrete columns, beams, road



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**Photo 2.** MAPEFER 1K was used for protecting the reinforcement rods.

**Photo 3.** Applying MAPEGROUT THIXOTROPIC on reinforcement rods treated with MAPEFER 1K.

and railway viaducts repaired with products from the MAPEGROUT range can also be protected by the application of MAPELASTIC. Application of the coating was a difficult process due to access, height constraints and other issues. The bridge crosses a 19<sup>th</sup> century cemetery and 8 lanes of a busy inner city motorway network.

## IN THE SPOTLIGHT

### PLANITOP 400

It is a fast-setting shrinkage compensated thixotropic mortar for cortical restoration of concrete by applying a single coat of mortar at a variable thickness between 1 and 40 mm. It is used for deep cortical restoration of vertical and horizontal concrete surfaces. PLANITOP 400 is a pre-mixed powder composed of special hydraulic binders, selected fine graded aggregates and special additives prepared according to a formula developed in the Mapei research laboratories. Mixed with water, PLANITOP 400 becomes an easily workable and thixotropic

mortar that can be applied on vertical surfaces in a thickness up to 4 cm per coat. It can be subjected to loads 4-5 hours after its application. Because of its very fine graded aggregates and high content of synthetic resins, PLANITOP 400 can be applied by trowel. Once PLANITOP 400 has hardened completely, it has the following characteristics: strong adhesion to the concrete; good resistance to wear; high mechanical strength. PLANITOP 400 meets the requirements defined by **EN 1504-9** ("Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - General principles for the use of products and systems") and the minimum requirements claimed by **EN 1504-3** ("Structural and non structural repair") for structural mortars of class **R3**.

### PLANITOP 430

It is a pre-blended mortar in powder form, made up of cementitious binders, fine-grained, graded aggregates, special additives and synthetic fibres. When PLANITOP 430 is mixed with water, it forms a thixotropic mortar which is easy to apply, even on vertical surfaces, at a thickness of from 5 to 35 mm without formwork. It is used to repair the concrete cover on deteriorated concrete structures following corrosion of the reinforcement rods. It meets the requirements defined by **EN 1504-9** and the minimum requirements claimed by **EN 1504-3** for structural mortars of class **R3**.







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This necessitated a major component of the coating programme to be carried out during night closures of the motorway between 11 p.m. and 5 a.m. The application of MAPELASTIC was carried out by Topcoat Specialist Coatings, a Mapei applicator experienced in these types of coatings. The product system encompassing MAPEFER 1K, MAPEGROUT

THIXOTROPIC and MAPELASTIC was chosen to meet the local current regulations which focus on the complete repair system rather than on single products. WALLGARD GRAFFITI BARRIER, a reversible graffiti-resistant protective barrier, was then employed as the means to protect the base of all piers and columns. By strengthening for increased



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**Photo 4.** Small cracks in the concrete were filled with EPOJET LV epoxy resin.

**Photos 5 and 6.** Preparing and applying MAPELASTIC for waterproofing and anti-carbonation protection.

**Photo 7.** View of Grafton Bridge after completion of the works.

road traffic demands, providing a robust and stable structure to resist seismic events, restoring the bridge's appearance and fabric, as well as installing an enhanced layer of durability to the bridge: these interventions have extended the working life of one of Auckland's most treasured landmarks. Thanks to Mapei, Grafton Bridge, which celebrated its 100<sup>th</sup> birthday in 2010, has now re-opened to traffic and enters a new role in Auckland's rapidly expanding transport network.



## TECHNICAL DATA

**Grafton Bridge, Auckland (New Zealand)**

**Period of Construction:** 1906-1910

**Period of Intervention:** 2008-2009

**Intervention by Mapei:** supplying products for the bridge's repair and the application of an anti-carbonation coating

**Client:** Auckland City Council

**Design Engineer:** Will Pank from Beca

**Works Director:** Ashley Cooper

**Contractor:** Brian Perry Civil

**Mapei Co-ordinator:** Darren Smith, Mapei New Zealand

## MAPEI PRODUCTS

The products mentioned in this article belong to the "Building Speciality Line" range. The technical data sheets are available at the web site: [www.mapei.com](http://www.mapei.com). Mapei products for the protection and repair of concrete surfaces and structures have been awarded the CE mark in compliance with EN 1504.

**Adesilex PG1 (CE EN 1504-4):** two-component thixotropic epoxy adhesive for structural bonding.

**Epojet LV (CE EN 1504-5):** two-component epoxy resin with very low viscosity for injection.

**Lamosilex:** ultra fast setting and drying hydraulic binder for plugging water leaks.

**Mapefer 1K (CE EN 1504-7):** one-component corrosion-inhibiting cementitious mortar for the protection of reinforcing rods.

**Mapefill GP:** general purpose, shrinkage-compensated grout. N.B. This product is manufactured by Mapei Far East, subsidiary of the Mapei Group located in Singapore.

**Mapegrout Thixotropic (CE EN 1504-3, R4):** shrinkage-compensated fibre-reinforced thixotropic mortar for the repair of concrete.

**Mapelastac (CE EN 1504-2, coating (c), principles PI, MC and IR):** two-component flexible cementitious mortar for waterproofing balconies, terraces and bathrooms.

**Planitop 400 (CE EN 1504-3, R3):** fast-setting shrinkage-compensated thixotropic mortar for cortical restoration and the finishing of reinforced concrete.

**Planitop 430 (CE EN 1504-3, R3):** fine-grained, thixotropic, fibre-reinforced, controlled-shrinkage, medium-strength mortar for repairing concrete.

**Wallgard Graffiti Barrier:** reversible graffiti-resistant protective barrier for all surfaces.



## Mapei in South Africa

**AFTER TWO YEARS OF DISTRIBUTION AT A LOCAL LEVEL, THE GROUP'S FIRST AFRICAN SUBSIDIARY WAS FOUNDED**

In July 2009, the new company Mapei South Africa (Pty) Ltd was officially formed, Mapei Group's first subsidiary on the African continent, with headquarters in Johannesburg. This step is part of the internationalisation strategy which has always characterised the Company's development programme, which in this case exploits the possibilities offered by a nation, South Africa, with high potential for economic growth. The Mapei brand made its mark on the local market two years ago and its products have been available since then through an exclusive local distributor, and was awarded a contract to supply products which helped carry out prestigious projects, such as the renovation of Soccer City, described in the following article. The aim of the subsidiary is to become the reference point not only for the local market, but for the entire sub-Saharan zone of the African continent. To reach this objective, it can count on a staff of 20 people and a complex of around 2,700 m<sup>2</sup> located in the Jet Park industrial zone in Johannesburg, not far from the OR Tambo International Airport.

### Green in the African Continent

Mapei South Africa shares the Group's long lasting commitment for the environment. This commitment is more than a marketing trend, it is a sustainable way of doing business. Globally the Group has over 30 years experience in developing environmentally friendly products and offers over 150 products that comply with the U.S. Green Building Council's requirements. Mapei South Africa can already boast its membership of the South African Green Building Council's requirements, the Association which promotes the development of "green" building in South Africa, that is to say structures which have been designed, built or restored in an eco-sustainable way and that are energy efficient. With a trump card featuring innovation, environmental commitment and local and global experience, Mapei South Africa cannot but quickly progress towards successful consolidation of its presence in the African continent.

## 2010 FIFA World Cup

For the first time the World Football Championships were held in Africa

When sport becomes a true global event, be it cycling or football at the highest level, Mapei is always part of the game. With different instruments and in different forms, Mapei is always present and its contribution offers added value which is immediately appreciated.

The recent 2010 FIFA World Cup held in South Africa also witnessed the presence of Mapei, through its products being used in the restoration of one of the main stadiums where the most important matches in the tournament were played.

Football and cycling are the most popular and most followed sports, and these are sports with which Mapei has always had a particular bond.

And this is not for the amount of visibility which, in communications terms, offers a guaranteed return on investment, but for the very nature of these disciplines, with millions of people actively taking part all over the world.

The enthusiasm of supporting our favourite team or squad, or simply for the love of sports at an international level, is due to the fact that we can identify with the actions performed by our favourite champions, we personally know how difficult it is to be a champion, the ability required by an athlete or team if they want to get the better of their adversaries.

For Mapei it is quite natural that the bond with active sports – and the values of commitment and teamwork which are all part of the game – is expressed by promoting and supporting the most important sporting events which

are held periodically at an international level.

There are various ways of participating, all of which are equally



efficient, as displayed at the two most recent editions of the Road Cycling World Championships or, as for the previous FIFA World Cup held in Germany in 2006, by supporting the Italian team and acting as the official sponsor.

The third way – with maybe less visibility but certainly no less important, and also more in line with the Company's routine activities – is by contributing with its highly-technological products and experience in the construction of sports facilities where these large events are held.

And, as we will see in more detail

on the following pages, this is just the case with the Soccer City stadium in Johannesburg which was renovated using numerous high-technology Mapei products. South Africa represents an emerging market which Mapei is following very carefully, a geographical area which is developing quickly, where this event is considered the seal of approval for the growth process which started a number of years ago.

The World Cup held in June and July in South Africa is, in fact, the most important sporting and media event in the whole of

**Below.** The FNB Stadium (also called Soccer City) in Johannesburg (South Africa), which was renovated with Mapei products, and hosted the opening and final match.

2010.

This is the first time the World Cup has been awarded to an African nation, which confirms the growth in sports for the entire continent, while for South Africa it represents the consecration of the nation as a fully-fledged member of the group of the most economically developed and evolved nations. Indeed, this was an unrepeatable occasion for South Africa to show the rest of the world its organisational and administrative capacity and to promote the nation to all other countries.



# The FNB Stadium (Soccer City) in Johannesburg

The biggest sport facility in South Africa was renovated and extended with Mapei products

The First National Bank Stadium in Johannesburg, the economic capital and most populated city in South Africa – better known as the FNB Stadium and currently referred to as Soccer City – is the structure which hosted the opening match between South Africa and Mexico and the final between Spain and Holland during the 2010 World Cup, which took place from the 11<sup>th</sup> of June to the 11<sup>th</sup> of July. Built in 1986, it is one of the main stadiums of the South African Football Association.

The stadium was renovated and its capacity was increased for the occasion from 80,000 to 94,700 spectators divided into three levels, making it the largest stadium in Africa.

**Photo 1.** An external view of the Soccer City (FNB Stadium) with its characteristic “calabash” form, the multi-purpose pot typical of the African continent.

When the 2010 FIFA World Cup was awarded to South Africa, an enormous amount of work had to be carried out to modernise the stadiums and bring them up to the standards required by FIFA.

Ten stadiums were selected from around the country to hold the various matches, two of which are in Johannesburg: the Ellis Park Stadium and the FNB Stadium.

The FNB Stadium is in the suburb of Soweto, and the South African design studio Boogertman Urban Edge + Partners in collaboration with Populous designers were chosen to upgrade it to the required standards.

The designers came up with a plan to partially demolish the stadium and add various structural features, such as extending the struc-

ture’s upper tier and increasing the stadium’s capacity.

Also, the stadium now has a restaurant for 300 diners, two VIP suites, eight television studios, an underground car-park with a capacity of more than 4,000 vehicles, 32 turnstiles, 71 kiosks for beverages and souvenirs and a football museum.

Apart from the covered stand, the modernisation work included the construction of new offices and changing rooms and the installation of state-of-the-art electronic instrumentation. Not only was the capacity of the stadium increased, every spectator now has a better view of the action on the field, even those seated furthest away, while maintaining the correct maximum distance from the pitch.

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The characteristic of the stadium is the shell around the stand and playing field area, the idea of the designer being to create a structure which was similar in form and colour to a "calabash", the multi-purpose pot typical of the African continent. The structure is composed of reinforced concrete profiles which support the two levels of terraces and the gallery, connected together by steps. The external "shell" is characterised by a sinuous mosaic of cement with reinforced glass fibre panels in a range of eight different colours and two different textures. These are

**Photo 2.** An internal view of the stadium with its new covered stand.

**Photo 3.** A phase of the installation of the covering on the external structure. The "shell" is characterised by a sinuous mosaic of cement with reinforced glass fibre panels in a range of eight different colours and two different textures.

interspersed at irregular intervals by glass cut outs. A truss-supported roof surrounds the whole stadium.

Karrena Africa, a specialised contracting company, has been responsible for a considerable portion of the repair and enhancement work. Mapei products contributed to the works in and around the suites of the old stadium which over the years were subject to weather and water erosion. Areas which required strengthening were repaired with steel brackets using Mapei's ADESILEX PG1 and ADESILEX PG2 thixotropic epoxy adhesives for structural bonding. ADESILEX PG1 provides exceptional mechanical strength and



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bonding capacity and hardens into a shrinkage-free compounds within a few hours. On the other hand, ADESILEX PG2 features extended workability which makes it especially recommended for applications at temperatures above +20°C.

Concrete sections where corrosion and deterioration occurred were scoured out and cleaned with high pressure water. If any reinforcing steel was exposed as a result of this process, it was treated with MAPEFER 1K, a one-component anti-corrosion cementitious mortar applied with a brush. Thereafter MAPEGROUT FAST-SET (RAPIDO) shrinkage-compensated fibre-reinforced mortar was applied in

## IN THE SPOTLIGHT

### MAPEFLEX PU45

It is a single component, thixotropic, easy-to-apply polyurethane-based sealant and adhesive with a high modulus of elasticity, meeting the requirements of **ISO 11600** class **F20 HM**. MAPEFLEX

PU45 has been specially developed for sealing expansion and distribution joints in horizontal and vertical surfaces, including those which are subject to occasional chemical attack provoked by hydrocarbons. It is also recommended for

flexible bonds between similar and different materials and as a replacement or to integrate mechanical fasteners. Solvent-free, odourless with a low impact on the environment, MAPEFLEX PU45 is certified as **EC1 R** by **GEV** as a product with extremely low emission levels of VOC (volatile organic compounds).

### ADESILEX PG1

It is a two-component product based on epoxy resins, selected fine-grain aggregates and special additives, used for structural repair, bonding and reinforcement of concrete elements, natural stone, mortar

and brick.

It is especially suitable for applications in temperatures between +5° C and +23°C. ADESILEX PG1 meets the requirements defined by **EN 1504-9** ("Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - General principles for the use of products") and the minimum requirements claimed by **EN 1504-4** ("Structural bonding").





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layers ranging from 25 mm to 30 mm. Some damaged areas also required the use of MAPEGROUT HI-FLOW (COLABILE) shrinkage-compensated fibre-reinforced grout.

Blow holes in concrete surfaces were filled with PLANITOP 100 light grey and fine skimmed mortar, which was applied in layers up to 3 mm. Some of the vertical and horizontal joints were sealed with MAPEFLEX PU45 one component, thixotropic, rapid-hardening polyurethane sealant and adhesive with high modulus of elasticity.

MAPEBAND TPE tape was also used for flexible sealing and waterproofing of expansion joints and fissures in between sections of the stadium precast panels. The tape was bonded with ADESILEX PG4 two-component, thixotropic, epoxy adhesive.

EPOJET, super fluid epoxy resin, and EPOJET LV, low-viscosity

**Photo 4.** The adhesives ADESILEX PG1 and ADESILEX PG2 were used to bond and seal the steel brackets.

**Photo 5.** MAPEGROUT FAST-SET fibre-reinforced mortar was used to repair the concrete surfaces.

**Photo 6.** PLANITOP 100 mortar was applied to fill blow holes in the damaged concrete.

epoxy resin, were used for injection of cracks.

EPORIP wet-to-dry- epoxy adhesive was used to bond old and new concrete areas together.

PLANITOP 430, thixotropic, fibre-reinforced, controlled-shrinkage, medium strength mortar, was used to repair and level surfaces outside of the suites.

Paul Niemandt, a site agent of Karrena Africa, said he was impressed with Mapei's wide product range: "the products offer exceptional quality and our workers like using them because they are easy to apply. Moreover, Mapei technicians provides us with excellent assistance on the building site".

## TECHNICAL DATA

**Soccer City (FNB Stadium), Johannesburg (South Africa)**

**Period of Construction:** 1986-1989; renovation and new construction: 2007-2010

**Period of Intervention:** 2008-2010

**Intervention by Mapei:** supplying products for protecting the reinforcing rods, repairing internal and external damaged concrete surfaces, bonding metal structural strengthening elements, and sealing joints.

**Designers:** Boogertman Urban Edge + Partners, Populous

**Client:** City of Johannesburg

**Works Director:** Chris van Jaarsveldt

**Contractors:** Grinaker-LTA/Interbeton, Karrena Africa

**Mapei Co-ordinator:** Pieter Aucamp, Mapei South Africa (Pty) Ltd

## MAPEI PRODUCTS

The products mentioned in this article belong to the "Building Speciality Line" range. The technical data sheets are available at the web site: [www.mapei.com](http://www.mapei.com).

Mapei levelling and smoothing compounds and pre-blended mortars for screeds conform to EN 13813 standard and have been awarded the CE mark in compliance with annex ZA, standard EN 13813. Mapei products for the protection and repair of concrete surfaces and structures have been awarded the CE mark in compliance with EN 1504. Mapei sealants conform to ISO 11600 standard.

**Adesilex PG1 (CE EN 1504-4):** two-component thixotropic epoxy adhesive for structural bonding.

**Adesilex PG2 (CE EN 1504-4):** two-component thixotropic epoxy adhesive with extended open time for structural bonding.

**Epojet (CE EN 1504-5):** two-component superfluid epoxy resin for injection.

**Epojet LV (CE EN 1504-5):** two component very low viscosity epoxy resin for injection in micro cracks.

**Eporip (CE EN 1504-5):** two-component, solvent-free epoxy resin based adhesive for cold joints and monolithic sealing of cracks in screeds.

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

**Mapefer 1K (CE EN 1504-7):** one-component corrosion-inhibiting cementitious mortar for the protection of reinforcing rods.

**Mapeflex PU45 (EC1 R, ISO 11600, class F20 HM):** one component, thixotropic, rapid-hardening polyurethane sealant and adhesive with high modulus of elasticity.

**Mapegrout Hi-Flow (CE EN 1504-3, class R4):** shrinkage-compensated fibre-reinforced grout for concrete repair.

**Mapegrout Fast-Set (CE EN 1504-3, class R3):** shrinkage-compensated fibre-reinforced mortar, with rapid setting and hardening for the repair of concrete

**Planitop 100 (CE EN 1504-2, coating (c) principles MC-IR):** light grey, rapid setting, fine mortar for repairing and smoothing concrete and renders.

**Planitop 430:** thixotropic, fibre-reinforced, controlled-shrinkage, medium strength mortar that was used to repair and level surfaces outside of the suites.



# Mapei in the Czech Republic

In Moravia and Bohemia Mapei ensures an excellent service to its customers

**M**apei began writing its history in the Czech Republic shortly after the fall of the Iron Curtain. Mapei spol s r.o., the Czech subsidiary of the Group, was founded in 1991 in the town of Olomouc, in the Moravia region, where it still has its headquarters nowadays. Also in 1991, a branch (with offices and warehouse) was set up in Prague, the capital of the country and of the Bohemia region. The location of the Czech subsidiary's premises offer strategic advantages: even if Mapei is present in the Czech market solely via its business representation, the complete range of Mapei products is regularly distributed from two warehouses – in Olomouc and Prague – to all corners of the Czech Republic. Mapei spol s r.o. is able to respond with flexibility to any customer's requests, receiving products from other production facilities of the Group situated in Italy, Poland, Germany, Austria, and Hungary.

In the last 19 years Mapei spol s r.o.'s business volume never stopped to grow and a distribu-

tion network was constantly being extended. The Company's team of technical-sales staff and distributors cover the whole of Bohemia, Moravia, and Silesia in such a way that does not leave a spot on the map of the Czech Republic that would be at a distance of more than 50 km from a Mapei sales point. Mapei spol s r.o.'s success is proved by its contribution to prestigious building and restoration projects where it supplied innovative products, such as the O2 Arena in Prague, the historical Charles Bridge (see the following article), the Centrum Babylon Liberec, the Mrázovka tunnel, the Droždín water tank, the Palladium Praha shopping centre, etc.

The Czech subsidiary's unceasing growth has required a move of the Prague branch into new premises. Situated at the logistic site in Jažlovice on Prague's outskirts, close to the D1 highway to Brno, Mapei spol s r.o.'s new seat provides its employees with high working site standards, as well as good accessibility for all its business partners. The complex encloses offices, a warehouse

and a spacious training centre, the so-called "Mapei Academy" which is used for internal seminars and all other training activities organised by the Company for its customers. Mapei spol s r.o.'s growth is evident in several fields: its technicians regularly participate to conferences and seminars held in the Czech Republic; it organizes plenty of training activities (such as the successful Road Show which, thanks to the use of the Mapei Motor-home, allowed participants from several areas to test Mapei products) and marketing initiatives.

Mapei supports eco-sustainable building in the Czech Republic as it does in several countries, even if the Czech market is only slowly beginning to realise the significance of sustainable construction. Indeed, Mapei was among the first to apply for a membership in the Czech Green Building Council, the local counterpart of the US Green Building Council. Next year Mapei will celebrate 20 years of activity in the Czech Republic: this will be a chance to remember the success already obtained and to set new goals for the future growth. 

**Photo 1.**  
The entrance to Mapei spol s r.o.'s new offices in Prague, in the Bohemian region.

**Photo 2.**  
Mapei spol s r.o.'s headquarters are located in the Moravian region, in the town of Olomouc.





# The Charles Bridge in Prague

An ancient and picturesque monument withstanding damages and floods

**T**he Charles Bridge, one of the most visited touristic spots in Prague, links the city centre (Staré Mesto) with Malá Strana, a small district next to the Prague castle. It is the oldest standing bridge over the river Vltava in Prague and it is the second oldest preserved bridge in the Czech Republic. The Charles Bridge substituted the

**Photo 1.** View of the Charles Bridge during the restoration works. On the background, Prague's Castel and Cathedral.

**Photo 2.** The Old Tower Bridge, entrance gate to the Charles Bridge from Prague old town.

previous Judith bridge which was broken down during the spring thaw in 1342. The Charles Bridge construction was started, under the auspices of the Charles IV king of Bohemia and Holy Roman Emperor, by the foundation stone laying down in 1357. The construction of the bridge was finished in 1402. It was assumed for a long time that Petr Parléř was

the builder of the bridge. However, it was made clear in 2007, that the first builder of the bridge was a stonemason and Prague citizen Oto, called Otlin. The bridge was attacked by floods many times (the worst flood in the last 500 years was in 2002), but managed to withstand them. Until 1841 the bridge was the only connection over the river Vltava in Prague. Thanks to this bridge, Prague became an important way point on the European trade routes. The bridge was subsequently decorated with thirty statues and sculptural groups. It was originally called Stone or Prague Bridge. The name Charles Bridge has been used since 1870 at the instance of Karel Havlíček Borovský (1821-1856, an important politician, journalist, writer and literary critic).





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### The Repairing Interventions

The Charles bridge is 515.76 m long and 9.40 – 9.50 m wide. The height of the pavement is 13 m above the normal water level. It is created by 16 arches. Their span is 16.62 m – 23.38 m. Bridge pillars were not founded in the rock because it was too deep. Therefore the bridge was founded in the foundation pit on running stones which were supported by oak piles. The bridge is made of blocks from different types of sandstones which make the framework; most of the pillars are bricked. There are also three towers on the bridge.

Building investigation in 1966-1967 revealed that the bridge was endangered especially by small cracks which allowed ingress of rainwater with soluble salts used

for the winter pavement maintenance. It was decided that the bridge opening had to be blocked off by the framework of anchors. The reinforced concrete slab with a net of tow bars was inserted longwise. Temperature fluctuations and water ingress had to be reduced by insulation layers.

Damaged sandstone blocks were changed in the whole bridge cladding. The previous bituminous surface created in the 1920s was substituted by split granite strips. The bridge was intended for pedestrian traffic only after the repair.

Probably since 2001 specialists and also the public authorities and Prague citizens have been discussing about subsequent repairs of the bridge. The previous capital repair had some problems: the waterproofing treatment under the pavement did not perform very well and did not prevent the rainwater ingress into the construction. The reinforced concrete slab had to be restored to have a stability function of the bridge construction and reduce the possible span failure

during dangerous floods, join the enclosure walls and function as substrate for an insulation layer. An acrid dispute over the future of the slab (there were the following possibilities: to leave it as it was, to cut it into pieces or to remove it) was subdued by the flood in 2002 which the bridge underwent without visible damage.

### The Last Restoring Intervention

In 2004-2005 the last repair intervention schedule was set down. Finishing building investigation and gathering complete documentation had to be done in 2005 and 2006. In 2006 the first two pillars (the eighth and ninth from the Little Quarter side) were anchored to concrete sarcophaguses.

The bridge masonry repair is considered to be the most difficult phase of the whole repair. Every stone block was investigated by experts who decided whether it was to preserve, clean or substitute.

The upper construction repair started in August 2007 and took approximately 3 years. The bridge repair proceeded in parts and under working arrangements, with the four-meter corridor left for pedestrians. The spans will be repaired in the second phase and it will take from five to ten years.

One of the most important things before the beginning of the repair itself is to choose the adequate locality for the sandstone mining. The Charles Bridge repair is the reason of long standing disputes and discussions relating to too many substituted stone blocks, inappropriate use of materials, use of technologies insensitive to the historical monument, comments on the repair procedures, etc. It is interesting to note that the quality of the original sandstone is higher than the quality of the one used during the latest capital repair in the 1970s.

### Mapei Joins the Game

Mapei has been participating in this world famous historical monument repair since 2005. Long and inten-





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**Photo 3.** The Charles Bridge is made of blocks from different types of sandstones which make the framework and were carefully analysed. Damaged sandstone blocks were changed in the whole bridge cladding.

**Photos 4 e 5.** After careful analysis MAPE-ANTIQUE LC, cement-free, Eco-Pozzolan-based binder was used to repair the sandstone blocks.

**Photo 6.** A detail view of the bridge after completion of the repairs.



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sive negotiations among Mapei spol. s r.o. (the Group's subsidiary in Czech Republic) General Manager Zdeněk Runštuk, Mapei spol. s r.o. sales representative for Prague and Central Bohemia Pavel Jarolím and the experts from the Czech Authority for the Historical Monuments Preservation, the Faculty of Building of the Czech Technical University in Prague, the designers and involved building companies preceded Mapei's entering.



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Samples of the natural stone and the historical mortar from the existing masonry were taken in order to carry out tests in the R&D laboratories of Mapei S.p.A (mother company of the Group, located in Milan, Italy). Several analyses of the samples had been carried out and on their basis appropriate materials for the repair were recommended. The proposal of the products to be used was made by Giulio Morandini, Product Manager of the Mapei Structural Strengthening Materials Line, and Pasquale Zaffaroni, Product Manager of the Mapei Building Speciality Line.

*First working phase*

Two different aspects were solved in the first phase of the bridge pillars repair. The first one was the appropriate formula of the mortar to be used under water level (some pillars under water level), which would have met the requirements for the permanent contact with water and would feature higher abrasion resistance and sufficient strength.

The original intention of the repair under water level with proposal of a mixture made of MAPEPOXY epoxy adhesive or another kind of mixture with RESCON T admixture (both products are manufac-

of buildings affected by strong presence of chlorides. It can be applied as a dehumidifying render on masonries subject to rising capillary damp; as a dehumidifying render on structures built by lagoons or by the sea; as a dehumidifying mortar over stone (especially porous, such as those of lime nature) or bricks, including burnt bricks, walls, columns, vaulting, etc. and wherever saline efflorescence exists; for restoring stone, brick or tuff renders bond with mortars which were originally mechanically weak; for grouting between stones, bricks and tuff of quarry-faced masonry. It conforms to standard **EN 998-1** and has been awarded the **CE** mark in compliance with standard **EN 998**.

**IN THE SPOTLIGHT**

**MAPE-ANTIQUE LC**

It is a premixed cement-free light-coloured dehumidifying mortar for the restoration of damp stone, brick and tuff masonry. It can be used for the restoration of stone, brick or tuff buildings damaged by rising capillary damp (suitable for historical buildings) or the restoration of structures damaged by sulphate salts. Applied after MAPE-ANTIQUE RINZAFFO, MAPE-ANTIQUE MC is suitable for the restoration





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From the 7<sup>th</sup> of May to 15<sup>th</sup> of June 2010 a photograph exhibition was held along the Vltava river banks and was open day and night to all citizens in an open-air location. It showed the Charles Bridge's birth, historical ups and downs, and its importance for the city of Prague and its inhabitants. Mapei was also among the sponsors of the event.

tured by Rescon Mapei AS, the Group's subsidiary in Norway) was not accepted by the contracting authority. Finally, a wall made of steel casing was built up around the pillars in order to increase their protection and resistance and MAPEGROUT T60 sulphate-resistant shrinkage-compensated fibre-reinforced thixotropic mortar was used for the repairs.

The second aspect was to find the substitution of the original historical mortar for walling and grouting of the sandstone masonry above water level (only with random flooding during spring thaw). Cement-free, hydraulic binder MAPE-ANTIQUÉ LC for light-coloured dehumidifying lime and Eco-Pozzolan based mortars, was used in this case.

MAPE-ANTIQUÉ I Eco-Pozzolan-based, fillerized hydraulic binder was used for the repair by injection of some sections in the bridge pillars.

#### Second working phase

The second phase consisted of the complete removal of the original bridge deck, bridge drainage, mounting the electricity distribution cables for bridge lighting, casting of a new bridge deck construction including paving and enclosure wall repairs.

In 2008 the Czech association STOP (Association for the Historical Monuments Preservation Technology) asked for Mapei presentation at their conference in Prague. Giulio Morandini and Jiří Zadorožný, Head of Mapei spol. s r.o.'s Technical Service

**Photo 7.** Olga Menzelova Kelymanova, responsible for the organization of a photo exhibition on the Charles Bridge, Ondřej Ševců, an architect, the Head of the Czech Authority for the Historical Monuments Preservation, and the Mayor of Prague Pavel Bém.

**Photo 8.** Olga Menzelova Kelymanova, Adriana Spazzoli, Operational Marketing & Communication Director for the Mapei Group and Zdeněk Runštuk, Mapei spol. s r. o.'s General Manager.

**Photo 9.** From left on: Giulio Morandini, Product Manager of the Mapei Structural Strengthening Materials Line, Veronica Squinzi, Global Development Director for the Mapei Group, Adriana Spazzoli, Pasquale Zaffaroni, Product Manager of Mapei Building Speciality Line and Fabio Fenech, Mapei Area Manager for the Czech Republic.


Department performed the presentation together. It was very successful, the participants liked it and it definitely increased the credit of Mapei in the Czech Republic.

Construction is going on after the inevitable winter break because it is not possible to use the mortar based on hydraulic binders at low temperatures.

The repairs of the enclosure walls and bridge deck are also going on according to the schedule.

The repair of spans is expected to

be completed in late 2010.

It was a great honour for all Mapei Group employees participating in the bridge repair to help with such an important and famous national cultural monument restoration. The repair intervention was also further proof of Mapei's ability to supply high level technical assistance, solving numerous on-site problems. This was made possible by a highly efficient company structure which performs well in all building operations. 

## TECHNICAL DATA

**Charles Bridge,** Prague (Czech Republic)

**Period of Construction:** 1357-1402

**Period of the Intervention:** 2005-2010

**Intervention by Mapei:** supplying products for structural strengthening of the bridge pillars

**Client:** Prague City Council

**Contractors:** SMP CZ a. s. and AVERS spol. s r.o.

**Technical Survey:** Mott MacDonald

**Mapei Co-ordinators:** Zdeněk Runštuk, Jiří Zadorožný, Pavel Jarolim (Mapei spol. sr.o., Czech Republic), Giulio Morandini and Pasquale Zaffaroni (Mapei SpA, Italy)

## MAPEI PRODUCTS

The products mentioned in this article belong to the "Building Speciality Line" range. The technical data sheets are available at the web site: [www.mapei.com](http://www.mapei.com).

Mapei mortars for renders conform to standard EN 998 and have been awarded the CE mark in compliance with standard EN 998. Mapei products for the protection and repair of concrete surfaces and structures have been awarded the CE mark in compliance with EN 1504.

**Mape-Antique I:** Eco-Pozzolan based, fillerized hydraulic binder for the consolidation, by injection, of stone, brick and tuff structures.

**Mape-Antique LC (CE EN 998-1):** cement-free hydraulic binder for light-coloured dehumidifying lime and Eco-Pozzolan-based mortars for the restoration of damp stone, brick and tuff masonry.

**Mapegrout T60 (CE EN 1504-3, R4):** sulphate-resistant shrinkage-compensated fibre-reinforced thixotropic mortar for the repair of concrete.

# Ekofisk oil platform

## Structural strengthening of offshore installation in Norway

**E**kofisk is one of the main oil fields in the Norwegian sector of the North Sea about 280 km southwest of Stavanger. The black gold was discovered at Ekofisk field in Norwegian sector in 1969 which boosted the search for oil in the

**Photos 1 and 2.**  
Views of the Ekofisk 2/4 oil platform.

area. This turned out to be one of the biggest oil field encompassing 3.3 billion barrel oil and more than 180 billions m<sup>3</sup> of natural gas.

In 1971 the first platform was producing oil at that field and it still working today.

Ekofisk oil field is currently managed by Conoco Philips and has a total daily average oil production of 50,000 barrels of oil.

New technology and high oil prices have led to the decision to extend the lifetime of Ekofisk up to 2050. Structural strengthening of the sub-sea concrete structure is a part of this project. During summer of 2008 the Ekofisk 2/4 platform was reinforced. Conoco

Philips required a product with very high compressive strength, high modulus of elasticity, no shrinkage, anti-washout properties and a workability that allowed pumping in 5.08 cm flexible hose for minimum 280 m. At last or perhaps first, the product had to be approved according to the environmental regulations in the North Sea.

### Developing and Using a New Mapei Product System

Rescon Mapei AS, the Norwegian subsidiary of the Mapei Group, started developing and testing in laboratory scale in January 2008 a new formulation of MAPEFILL



N expanding mortar for anchoring, manufactured by Rescon Mapei AS and distributed in the Scandinavian countries. In April 2008 the first medium scale test was performed. The results from these tests were encouraging and next step was the full scale test at Killingøy offshore base near Haugesund. The product system for the operation was named MAPEFILL N/EG which is MAPEFILL N modified with a super-plasticiser (DYNAMON SP-3) and RESCON T, an anti-washout admixture manufactured

**Photo 3.** MAPEFILL N/EG expanding mortar, especially developed by Rescon Mapei AS for this project, is poured into the mixer. **Photo 4.** MAPEFILL N/EG and RESCON T are poured into the pumping machine after mixing.



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by Rescon Mapei AS. High compressive strength and high modulus of elasticity together with good pumpability characterize this product system. The mortar was pumped through a 250 m long 5.08 cm hose into a 66.04 cm steel pipe filled with water. A model of platform legs was mounted at the quay front. All sub sea operation were handled by ROV (Remotely Operated Vehicle) underwater robots. Drilling holes, handling hoses, connecting valves etc. were performed by the robots. During the offshore operation no divers was in sea. It was very satisfying to observe that the operation worked out as planned. After 3 days the grouted leg was lifted onshore, cut open for a visual inspection. The test identified crucial elements and

## IN THE SPOTLIGHT

### MAPEFILL

It is the international counterpart of MAPEFILL N/EG, specially developed by Rescon Mapei AS, the Norwegian subsidiary of the Mapei Group, for the Ekofisk strengthening project. MAPEFILL is a pre-blended powdered grout composed of high strength cement, graded

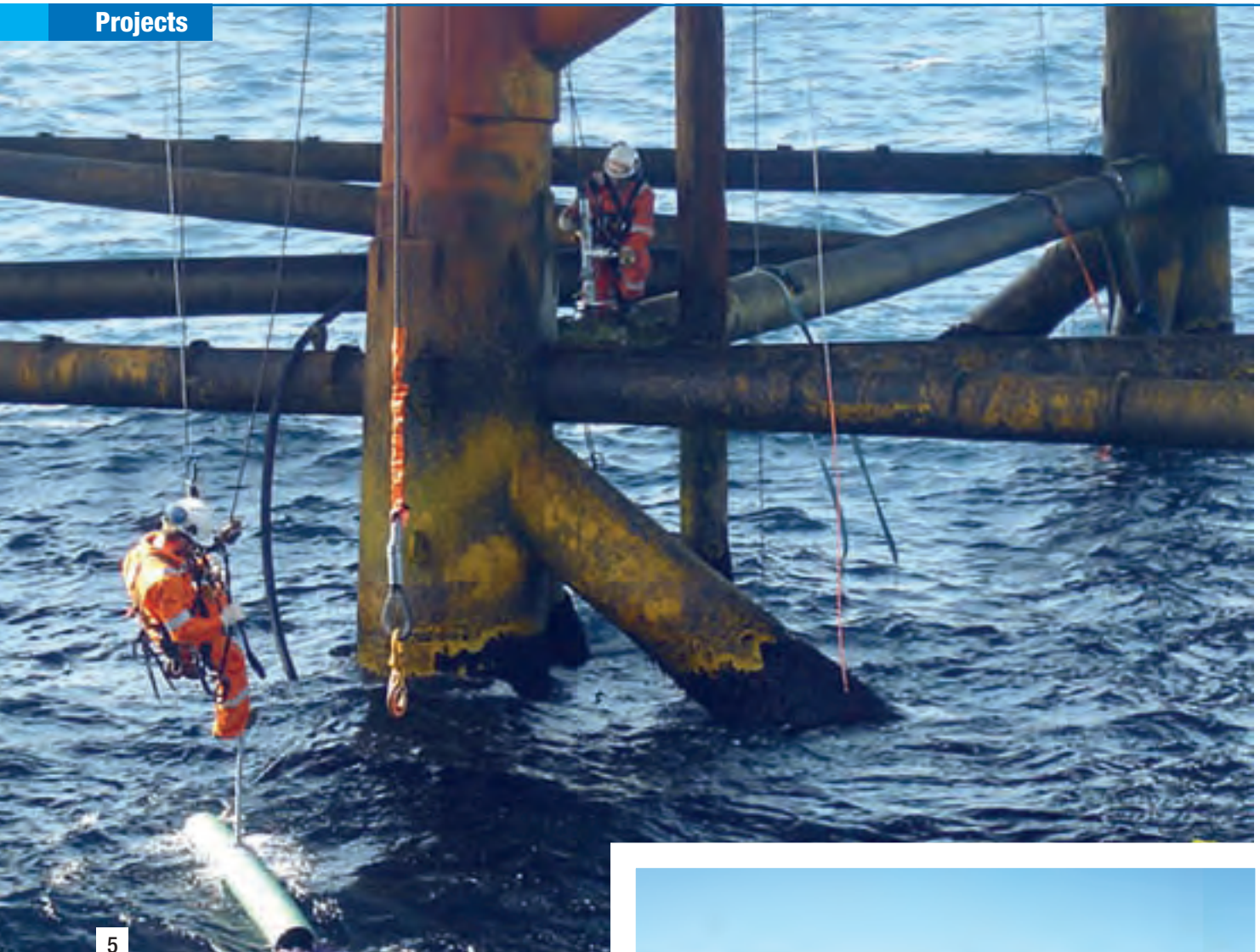


aggregates and special additives with an expansive agent formulated by the Mapei research laboratories. When mixed with water, it is transformed into a fluid grout without segregation that is able to fill intricate spaces.

MAPEFILL, due to its expansive agent, is characterized by a total absence of shrinkage in its plastic phase (ASTM norm 827) and its hardened phase (UNI norm 8147) and develops very high early flexural and compressive strength.

It also has the following qualities: excellent

impermeability to water; excellent adhesion to iron and concrete; excellent resistance to dynamic mechanical stress; modulus of elasticity and thermal expansion; coefficient similar to those of high quality concrete. MAPEFILL meets all the main requirements for **EN 1504-9** ("Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and conformity assessment - General principles for the use of products and systems") and the minimum requirements for **EN 1504-6** ("Anchoring steel reinforcement").



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## TECHNICAL DATA

**Ekofisk 2/4 platform, Ekofisk oil field, North Sea (Norway)**  
**Period of Construction:** 1970 - 2000

**Period of Intervention:** 2008

**Intervention by Mapei:** supplying products for structural strengthening of the subsea concrete structure

**Customer:** Conoco Phillips

**Contractor:** Deep Ocean (Norway)

**Mapei Co-ordinator:** Trond Helgedagsrud, Rescon Mapei AS (Norway)

## MAPEI PRODUCT

The product mentioned in this article belong to the Mapei "Admixture for concrete" range. The technical data sheets are available at the web site: [www.mapei.com](http://www.mapei.com). Mapei plasticizers and superplasticizers for mortars and concrete have been awarded the CE mark in compliance with standard EN 934-2 and EN 932-4.

**Dynamon SP-3 (CE EN 934-2, T11.1-11.2):** superplasticizer based on modified acrylic polymer for precast concrete with low water/cement ratio and very high mechanical strengths at early age in winter time, without steam curing.

**Rescon T** is manufactured by Rescon AS and distributed on the Scandinavian countries. **Mapefill N/EG** was specially devised by Rescon AS for this project.



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**Photo 5.** Checking the pipes before injecting the mixture.

**Photo 6.** The product is being tested onshore: the pipe results to be completely filled.

after minor adjustments were made, a new test was performed. This time the result was perfect and Conoco Phillips authorized the start of the operations.

The offshore operation was performed by the Deep Ocean company, while responsible for mixing and pumping was Found Ocean. During this campaign 1300 tons of MAPEFILL N/EG were pumped into selected members of the steel structure of Ekofisk 2/4.

Mapei actively contributed to the oil platform's renovation with its usual attention to its customers' needs.



# Dynamon NRG & Dynamon SP

Solutions specially designed for the pre-cast concrete industry

✓ Accelerated development of mechanical strength

✓ Optimisation of production cycles and strong reduction of maturing cycles

To solve specific problems encountered in the pre-cast concrete industry and to strongly contribute to the development of this sector, Mapei has developed the **DYNAMON NRG** and **DYNAMON SP** product ranges. These products are specifically intended for this type of application and are especially suitable for manufacturing self compacting concrete.



# The Basilica of Collemaggio

Application of carbon fibre to make the biggest Roman church in the city of L'Aquila safe

A year and a half on and L'Aquila is still showing its scars. An earthquake in Abruzzo region (in Southern Italy) caused enormous damage to the artistic and religious heritage of the region, destroying the most beautiful medieval monuments and most famous places of worship; antique churches, monuments, works of art and pieces of history. A heritage of mankind devastated by the earth's movements on the 6<sup>th</sup> of April 2009, and which is now propped up and stabilised just

waiting to return to its antique splendour.

Mapei was in Abruzzo just a few hours after the earthquake, and is still there today to advise and supply the most up-to-date products and the professionalism of its highly-qualified technicians to help with the reconstruction of L'Aquila.

The earthquake, which damaged the entire artistic heritage of the city, did not even save the "spiritual heart of the city", the Basilica of Saint Maria di Collemaggio, the imposing Roman church which

**Photo 1.** The inside of the Basilica ripped out after the earthquake on the 6<sup>th</sup> of April 2009 which caused the roof to collapse.

was particularly badly hit. Founded in 1287 thanks to the wishes of Brother Pietro da Morrone – named Pope Celestino V in 1294 and nominated by Dante in the 3<sup>rd</sup> Canto of his *Divine Comedy's* Hell as he who "due to cowardness", after just 5 tormented months in office, "refused" and resigned the post – the Basilica has a decisive Abruzzo Roman-gothic architectural style, especially on the façade.

The vaulted roof of the Basilica collapsed exactly in the spot where the mausoleum to Celestino V is





located. His remains, which were miraculously unscathed, were pulled out of the rubble a few days later.

The remains of Celestino V are the main attraction of the Basilica thanks to his fame as a performer of miracles and his extraordinary indulgence in the "Forgiveness" (plenary indulgence) celebration, founded by him and celebrated from the 28<sup>th</sup> to the 29<sup>th</sup> of August every year.

The two apses were fractured and in risk of collapsing while the main and lateral altars were completely destroyed. The "Forgiveness Charter", the document issued by Pope Celestino V in 1294 which institutes the first jubilee celebration in history, was also recovered. The Charter was conserved in a coffer in the Civic Tower and was found intact. The crutch made from an olive branch which



*How the monumental façade of the Basilica looked a few years ago.*

the cardinal uses to open the Holy Door of the Basilica at the start of the "Forgiveness" celebrations and the key for the same door were also recovered.

The Basilica of Collemaggio, whose façade is considered to be the most important work of Abruzzo art of all times, was founded in the second half of the 13<sup>th</sup> century, although most of it was built throughout the 14<sup>th</sup> century, and continued right up to modern times through various rebuilding, restoration and transformation projects following earthquakes, changes in taste and various other reasons. The result of such a complex and intricate process is an extraordinary weave of architecture and decorative arts with its maximum expression from the fundamental Roman and Gothic cornerstones, with sporadic hints of the Renaissance and Baroque eras, and even of the last two centuries.

#### **Carbon Fibres on Site**

The need for Mapei's most advanced products on site became necessary when the town council, together with the Civil Protection organisation, decided to open some of the churches to celebrate the 2009 Christmas mass to give the people a sense of hope and continuity.

And the Basilica of Collemaggio, which has always been a symbol of the Aquilian community, could certainly not be left out of this renovation operation, in spite of the

**Above.** A post-card of how the Basilica used to be.

**Photo 2.** The two main ribs left standing were made safe using a complex network of MAPEWRAP carbon fibre straps.

serious damage it had suffered.

The work was contracted out by the local Civil Protection service to a company specialised in the renovation of historic buildings and involved clearing up the rubble, cataloguing any residues of artistic interest which had collapsed with the roof, a temporary plexi-glass cover fixed to steel pylons where the roof had fallen through after the main pillars opposite the altar had collapsed and making safe the main ribs which remained standing, but without support, by means of an intricate design of carbon fibre straps.

The system to make the building safe was designed by Prof. Giorgio Croci from the Faculty of Engineering of the La Sapienza University of Rome, who decided to strap the masonry separating the naves with a network of fibres. Mapei technicians personally followed the application of the carbon fibre straps for the first few days to offer advice and technical



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support to the Visan restoration company. It was the first time the company had used Mapei products, and the Mapei technicians carried out weekly follow-up visits to the site to check the progress of the work and help solve minor logistics problems which had emerged.

Let's now take a closer look at the sequence of steps to apply the carbon fibres.

The first and essential starting point was to prepare the surfaces to be repaired using MAPEWRAP PRIMER 1, a solvent-free, two-component super-fluid primer based on epoxy resins and used for preparing surfaces strengthened with MAPEWRAP fabrics. To even out irregularities in the substrate as much as possible the surfaces were grouted with MAPEWRAP 12 slow-setting,

**Photo 3.** Spreading on a layer of MAPEWRAP 31 epoxy adhesive.

**Photo 4.** Detail view of laying the MAPEWRAP C UNI-AX uni-directional carbon fibre fabric.

**Photo 5.** Final phase of laying the MAPEWRAP C UNI-AX fabric.

**Photo 6.** The scaffolding which covered the façade of the Basilica during the works.

**Photo 7.** View of the Basilica after completion of the works.

two-component thixotropic mortar based on epoxy resins, selected fine inert materials and special additives. Some parts of the surface, where normal setting times were required, were smoothed over with MAPEWRAP 11.

MAPEWRAP 31 medium viscosity two-component, solvent-free paste adhesive based on epoxy resins, was used for applying and impregnating the MAPEWRAP C UNI-AX fabric using the "dry method".

MAPEWRAP C UNI-AX is a uni-directional carbon fibre fabric,

characterised by high modulus of elasticity and high tensile strength.

The product is suitable for repairing reinforced concrete structures damaged by physical-mechanical stresses, for confinement of axial loaded concrete elements or concrete elements subjected to compressive and bending stress, or for seismic strengthening of structures in high-risk areas, as in this case.

After applying the carbon fibre, in order to promote a quicker, stronger grip, the surface was



## IN THE SPOTLIGHT

### MAPEWRAP C UNI-AX

It is a uni-directional carbon fibre fabric characterised by a high (230,000 N/mm<sup>2</sup>) modulus of elasticity and high tensile strength. This product is suitable to repair reinforced concrete elements damaged by physical-mechanical action, for the confinement of axial loaded or bent concrete elements and for seismic strengthening of structures in earthquake zones. Some application examples:

- repair, maintenance and static upgrade of deteriorated structures,

where it is absolutely necessary to reinforce the tensile strength of the section;

- confinement of axially loaded or damaged concrete elements (columns, bridge piers, chimneys) in order to improve ductility and load bearing capacity;
- seismic strengthening and restoration of vaulted structures without the increase of seismic mass and without the danger of liquid percolation towards the internal surface of an archway;
- repair of structures damaged by fire;
- reinforcement of load bearing elements in buildings that have been restructured for architectural reasons or change of use.

It may be laid using either a wet system or a dry system.





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sprinkled with QUARTZ 1.9, a selected graded blend of grey, alluvium quartz with a trigonal crystalline structure and a maximum inert size of 1.9 mm.

Unlike work carried out using conventional techniques, thanks to their extremely low weight, fabrics from the MAPEWRAP C UNI-AX range may be put in place by a smaller team of workers. With the “dry system” or “damp system” (which only requires tools to make impregnation easier), application is carried out extremely quickly and often without having to interrupt the normal activities of the structure.

Compared with the plating technique using steel plates (beton plaqué), the use of MAPEWRAP C UNI-AX fabrics may be adapted to any shape of element requiring repair, they do not require temporary reinforcement during application and it removes any risk of corrosion of the applied reinforcement.

Mapei products were also used to carry out other applications: MAPEFILL grout was used to anchor the steel structure at the

base of the Basilica. MAPEFILL is made from cement binders, graded aggregates and special additives and is characterised by its high mechanical strength, even after short curing times (24 hours), and the high adhesion between steel and concrete.

Work progress was regularly checked personally by the head of the Italian Civil Protection national service organisation and special commissioner for the L'Aquila earthquake, Guido Bertolaso. He was also on site on the 23<sup>rd</sup> of December 2009 to make sure that all work had been completed, so the people of L'Aquila could take part in the Christmas holy mass.

Mapei technology was once again the star of the show, with its most technologically-advanced products and its decade-long experience. Solving difficult problems on site and a guarantee of completing the work in a reasonable length of time, in this case as many times before, made all the difference.

A place which is a symbol for the entire Abruzzo territory may be used once again.

## TECHNICAL DATA

**Basilica of Saint Maria di Collemaggio, L'Aquila (Italy)**

**Period of Construction:** late 13<sup>th</sup> century

**Period of Intervention:** 2009-2010

**Intervention by Mapei:** supplying products for static upgrade and seismic strengthening of masonry structures

**Client:** Italian Ministry of Cultural Heritage and Activities

**Designer:** Prof. Giorgio Croci, La Sapienza University of Rome

**Works Direction:** Italian Ministry of Cultural Heritage and Activities

**Contractor:** Visan Srl (L'Aquila)

**Mapei Distributor:** Innamorati Edilizia Srl (L'Aquila)

**Mapei Co-ordinators:** Giulio Morandini, Marc Taccone and Corrado Villa Presutti - Mapei SpA (Italy)

## MAPEI PRODUCTS

The products mentioned in this article belong to the “Building Speciality Line” range. The technical data sheets are available at the web site: [www.mapei.com](http://www.mapei.com). Mapei products for the protection and repair of concrete surfaces and structures have been awarded the CE mark in compliance with EN 1504 standards.

**Mapefill (CE EN 1504-6):** high-flow shrink-free grout for anchors.

**MapeWrap C UNI-AX:** high strength unidirectional carbon fibre fabric with high modulus of elasticity.

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

**MapeWrap 11:** two-component normal setting thixotropic epoxy putty for levelling concrete surfaces.

**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”.

**Quartz 1.9:** selected graded blend of grey, alluvium quartz with a trigonal crystalline structure and a maximum inert size of 1.9 mm.

# Mercedes Benz Center

7,000 m<sup>2</sup> of dream cars in Île-de-France

The building which houses the Mercedes Benz Center in Rueil Malmaison, a French city in the department of Hauts-de-Seine in the Île-de-France region, stands out particularly for the originality and the high-quality of the works carried out, a match for the high standards synonymous of Mercedes-

Benz.

Right from the design phase, the aim of the Mercedes Benz Center was to create a building to present various models and new ranges of cars to the clients and delivery of new cars in a luxurious, functional and, at the same time, comfortable setting.

And for a more complete service,

**Photo 1.**

The Mercedes-Benz Center has a bar and restaurant available for their clients.

there is also a bar and restaurant available for potential buyers.

The construction covers an area of 25,000 m<sup>2</sup> and has more than 450 underground parking spaces available. The design concept of the showroom, particularly luminous yet light thanks to the glass roof and walls, offers a certain continuity between the inside and outside.

Edi Ingénierie was responsible for the project and guaranteed that work on the complex would be completed according to the particularly tight schedule, but without overlooking the high



quality standards typical of the Mercedes-Benz brand.

**Prestigious Laying and Grouting**

In order to complete such a prestigious job, the design studio contacted the French company France Sols from the SPR Group, which laid the floor carpets and the tiles on the walls and floors.

The various laying phases, divided into different environments for a total of 7,000 m<sup>2</sup>, had a very tight schedule to follow. Since the materials had to be laid in a very short space of time and a particu-



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larly high quality final result was required, the choice of products to be used was fundamentally important. And so, they turned to Mapei.

The floors in the showroom and sales areas were covered with ceramic tiles in two different sizes (60x30 cm and 30x30 cm).

KERAFLEX cementitious adhesive was recommended for bonding, since it is ideal for all kinds of ceramic tiles, mosaic and natural stone on internal and external walls and floors (as long as the materials are moisture stable).

KERAFLEX has particularly good workability. Thanks to its high thixotropy, it may be applied on vertical surfaces without the tiles slipping. It bonds perfectly to all

**Photo 2.** The large showroom area is completely surrounded by glass.

types of substrates, hardens without noticeable shrinkage and has an extended open time.

The joints were grouted with ULTRACOLOR PLUS (colour n° 120 black) 24 hours after laying the tiles. ULTRACOLOR PLUS is a high-performance, anti-efflorescence, quick setting and drying polymer-modified grout for joints from 2 to 20 mm wide. It also has BioBlock® technology which reduces the formation of mould in damp environments and DropEffect® technology which makes it water-repellent.

This product is available in 26 dif-

2





ferent colours.

On the walls, the porcelain tiles (size 30x30 cm) were again bonded using KERAFLEX adhesive.

Mapei products were also selected for the bathroom walls. In this particular case, glazed porcelain tiles (size 10x10 cm) were bonded using ADESILEX P24 PLUS. This adhesive is ready-to-use and slip-resistant. It is distributed on the French market by Mapei France, the French subsidiary of the Mapei Group.

The joints were grouted with KERAPOXY two-component acid-resistant epoxy mortar, available in 26 different colours for grouting joints at least 3 mm wide.

#### Laying the Floor Carpet

The floors in the meeting rooms were laid with carpet.

Supplied by Desso DLW, the "Mercedes Benz W11893-29"

model of carpet was designed ad hoc for the Mercedes-Benz Center. The carpet was laid using ULTRABOND ECO 350 non-flammable adhesive in water disper-

sion with a very low emission level of volatile organic compounds (VOC), which makes it safer for carpet-layers' health.

The adhesive was tested in

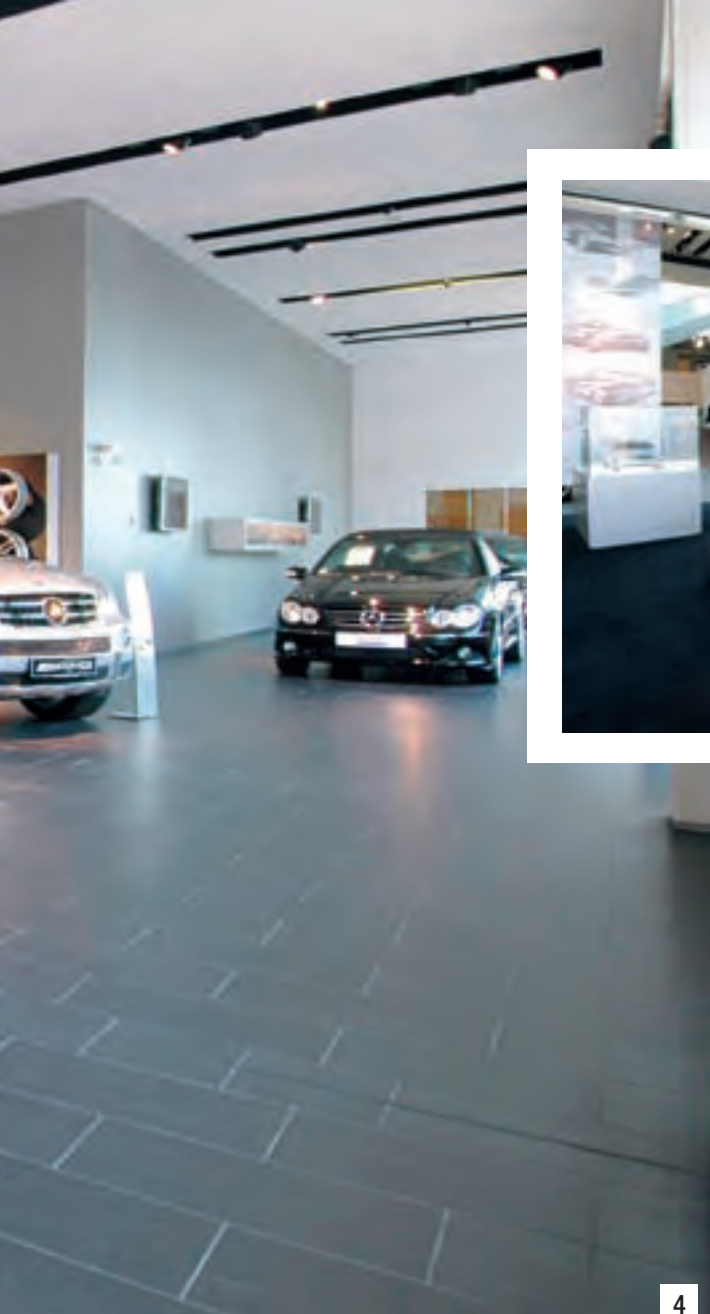
### IN THE SPOTLIGHT

#### KERAFLEX

It is an improved **(2)**, slip resistant **(T)** cementitious adhesive **(C)**, with extended open time **(E)** of class **C2TE** according to **EN 12004**. It has obtained the **EMICODE EC1 R** ("very low emission level of volatile organic compounds") certification awarded by **GEV**. It features high bonding strength and low viscosity, therefore it is easily workable. It is



highly thixotropic and recommended for interior and exterior bonding of ceramic tiles porcelain, stone materials and mosaics of every type on floors, walls and ceilings. It is also suitable for spot bonding of insulating materials such as expanded polystyrene, rock and glass wool, Eraclit® (wood-cement panels), sound-deadening/reduction panels, etc. It is easily workable and highly thixotropic. KERAFLEX can be applied on a vertical surface without dripping or letting the tiles slip, even for heavy tiles. Tiles can be installed from the top towards the bottom without using spacer pegs. It has a perfect adherence to all materials normally used in building; it hardens without appreciable shrinkage.




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Mapei's Research & Development laboratories to apply resilient flooring materials. It has a rapid initial grab and an excellent bond over long periods of time. Floors laid with ULTRABOND ECO 350 can be set to foot traffic after 24 hours and may be put in service after 72 hours.

It may also be used for heated floors, floors subject to heavy pedestrian use and the passage of wheelchairs, as in this case. In the other areas, rubber floor sheets were laid and bonded using ADESILEX LP double coat polychloroprene adhesive in solvent solution for textile, rubber, PVC, linoleum and cork coverings. 

*This article was taken from "Mapei & Vous", issue n. 8, the in-house magazine published Mapei France, the French subsidiary of the Mapei Group, whom we kindly thank.*

**Photos 3, 4 and 5.** The floorings in the showroom and sales areas are covered with porcelain tiles bonded with KERAFLEX. Joints were grouted with ULTRACOLOR PLUS.

**Mercedes Benz Center, Centre de Vente, de Découverte e d'Essais,**  
Rueil Malmaison (France)  
**Period of Construction:** 2004-2005

**Intervention by Mapei:** supplying products for installing porcelain tiles and carpet floorings on walls and floors in the showroom areas, in the meeting rooms and in the bathrooms; supplying products for laying rubber floorings in the service areas.

**Project:** Scau

**Works Direction:** Veritas

**Customer:** Daimler Chrysler France

**Works Direction:** Edi Ingénierie

**Laying Company:** France Sols Groupe SPR

**Material Laid:** porcelain tiles, carpet, rubber

**Mapei Co-ordination:** Mapei France

## MAPEI PRODUCTS

The products mentioned in this article belong to the "Products for Ceramic Tiles and Stone Materials" and the "Products for the Installation of Resilient, Textile and Wood Floor and Wall Coverings" ranges. The technical data sheets are available at the web site [www.mapei.com](http://www.mapei.com). Mapei's adhesives for ceramics and stone materials conform to EN 12004 standard and have been awarded the CE mark in compliance with Annex ZA, standard EN 12004. Mapei grouts for ceramics and stone materials conform to EN 13888 standard. Mapei levelling and smoothing compounds and pre-blended mortars for screeds conform to EN 13813 standard and have been awarded the CE mark in compliance with annex ZA, standard EN 13813. Almost all the Mapei products for laying floors and walls have been awarded the EMICODE EC1 ("very low emission level of volatile organic compounds") mark awarded by GEV.

**Adesilex LP (C2TE, EC1 R):** double coat polychloroprene adhesive in solvent solution.

**Adesilex P24 Plus:** ready-to-use, slip-resistant adhesive. N.B. This product is distributed by Mapei France on the French market.

**Keraflex (C2TE, EC1 R, EN 12004):** high performance cementitious adhesive, with no vertical slip and with extended open time for ceramic tiles and stone material.

**Ultrabond Eco 350 (EC1):** solvent-free acrylic adhesive with high bonding strength, even after extended open time and with very low VOC content for the installation of rubber, PVC, vinyl, polyolefine, linoleum and carpet floorings.

**Ultracolor Plus (CG2, EC1):** fast-setting and drying, high performance, anti-efflorescence, water-repellent grout for joints from 2 to 20 mm with DropEffect® and anti-mould with BioBlock® technology.

# The Minsk Ice Palace

A joint-free rink in the sports complex dedicated to ice-hockey, ice-skating and curling

The Ice Palace in Minsk, the capital of Belarus, was inaugurated this year on the 30<sup>th</sup> of January and is considered by many to be the largest ice-skating arena on the European mainland. An Italian construction company called B. Nord Pavi 2000 was awarded the contract for the complex, after having previously constructing the skating rink in the Palavela and Palahockey complexes for the 2006 Winter Olympics in Turin (Italy).

The total surface of the ice rinks

**Photo 1.** A view of the Minsk Ice Palace. Some Italian companies were contacted to carry out the project, including Mapei.



is more than 13,000 m<sup>2</sup>, divided over two structures, the stadium and the arena. The rink in the arena has a surface area of 1,860 m<sup>2</sup> with space for around 15,000 spectators, while the surface area in the stadium is 11,517 m<sup>2</sup> and may hold 3,000 people.

The structure is used for speed-skating races and curling and ice-hockey matches and, when necessary, may be transformed into two regulation-size ice-hockey rinks for training sessions and warm-ups before matches.

The flooring of the rinks covers

approximately 25 km of pipe-work for cooling in the arena and 140 km in the stadium.

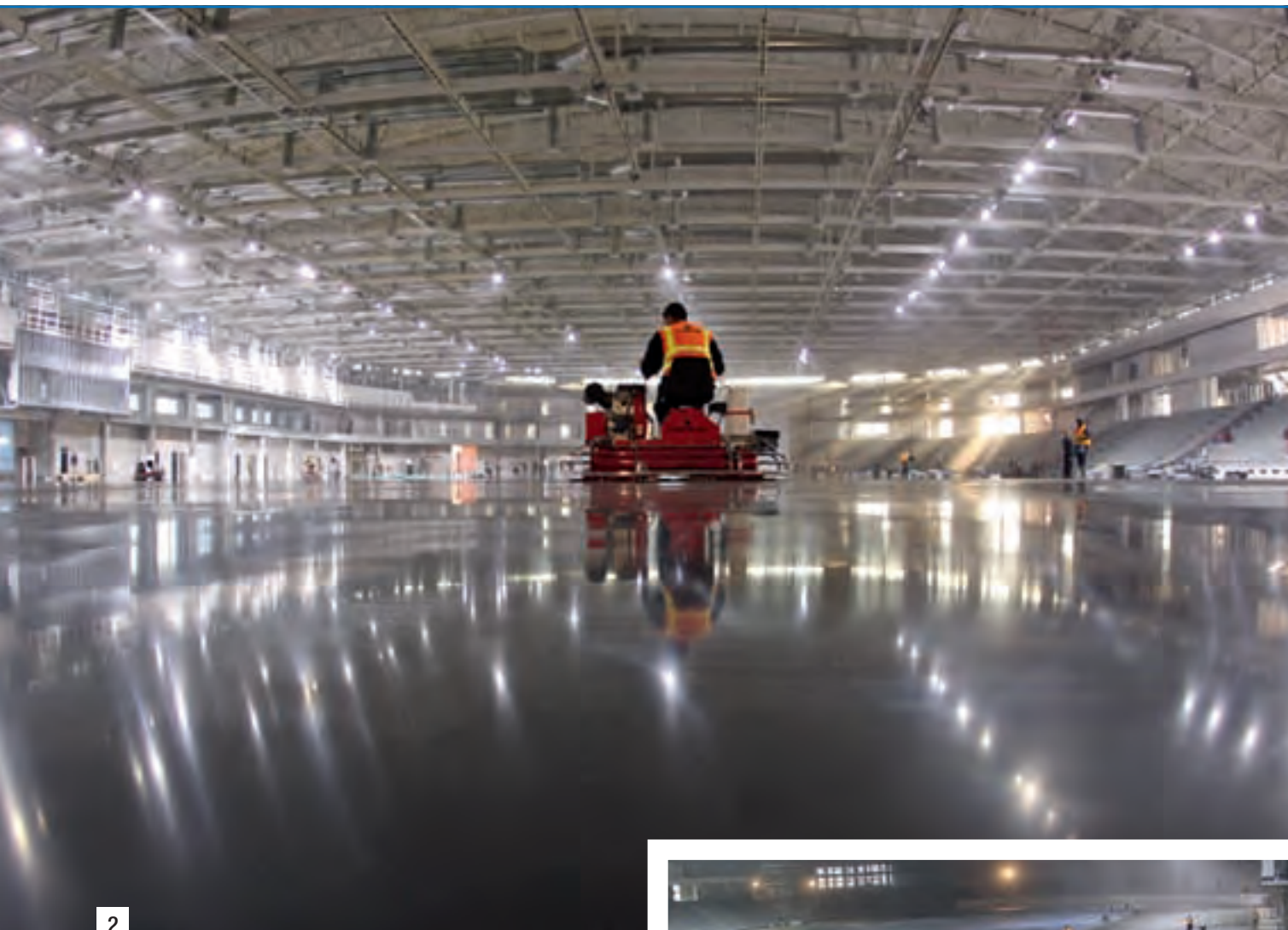
### Construction of an Ice-rink

The special techniques and problems encountered when installing this type of flooring surface are mainly due to the fact that this type of surface must be free of joints and concrete cast to form the floor must neither shrinkage nor expand. The floor must also be monolithic and be made from a single concrete casting.

The concrete used in the Minsk







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Ice Palace had to be technologically advanced and was specially developed by B. Nord Pavi 2000, Matassina (a company from Vicenza, Italy, which produces fibres used for structural strengthening) and Mapei, which proved to be yet another example of what makes it a world's leading company in a production of admixtures. After carefully study-

**Photos 2 and 3.**

The mix design for the concrete included the use of EXPANCRETE and MAPECURE SRA 25 admixtures which are part of the MAPECRETE SYSTEM.



3

**IN THE SPOTLIGHT**

**MAPECRETE SYSTEM**

It is an advanced system for large concrete structures with no shrinkage joints. It includes super-plasticising admixtures from the DYNAMON SYSTEM range, EXPANCRETE expansive agent and MAPECURE SRA, an

additive which promotes expansion even under non-humid conditions. MAPECRETE SYSTEM may be used to build any kind of structure, from large paved areas and foundation slabs to long walls, as well as for repairing concrete. It is extremely versatile: it is possible to regulate the fluidity, workability and development of the strength of the concrete, without effecting its expansion and crack control characteristics.

ing the intervention to be carried out, Mapei proposed the use of the MAPECRETE SYSTEM, an advanced system for large concrete structures with no shrinkage joints. Concrete mixed for the MAPECRETE SYSTEM (which includes superplasticising admixtures from the DYNAMON SYSTEM range, EXPANCRETE expansive agent and MAPECURE SRA, an additive which promotes expansion even under non-humid conditions when damp-curing is not carried out) develops a level of expansion which compensates for plastic shrinkage, even if cur-





4

ing conditions are not ideal. Before casting the substrate with the cooling system pipe-work, it was reinforced with electro-welded mesh. The casting of the concrete lasted 13 hours non-stop, and was finished off by smoothing over the floor 20 hours after work had been started.

A total of 18 floor-laying specialists and four technicians were sent to the Belarus capital to carry out the work using double tamping machines with 120 cm diameter disks.

The concrete mix was made using EXPANCRETE, a powder admixture added to the rck 35 S5 concrete and fibres to compensate for hygrometric shrinkage, and MAPECURE SRA 25, a liquid additive especially formulated to reduce the formation of cracking from hygrometric shrinkage in standard and self-compacting concrete.

MAPECURE SRA 25 works by reducing the surface tension of the water in the capillary porosity. This process reduces the intensity

of the forces which act upon the walls of the pores to guarantee better dimensional stability and, therefore, a drastic reduction of cracks caused by this phenomenon.

Because of the particular climatic stresses and temperature changes to which the surface is exposed, the high level of deterioration of the concrete also had to be taken into consideration.

Therefore, the surface of the flooring was “reinforced” and smoothed over with a special mix developed for this project using pure quartz, cement and microfibres.

The Minsk Arena project represents an important milestone, above all for the future project for seven ice-rinks for the next Winter Olympics to be held in Sochi in Russia in 2014 (when Mapei will again be present as a supplier of products for building or restoring sport facilities), and the other 30 ice-rinks stadiums which the President of Belarus has programmed over the next 12 years.

**Photo 4.** The surface was smoothed over with a special mix of quartz, cement and microfibres.

#### TECHNICAL DATA

**Minsk Ice Palace,** Minsk (Belarus)

**Period of Construction:** 2007-2009

**Year of the Intervention:** 2009

**Intervention by Mapei:** supplying admixtures for concrete

**Customer:** Republic of Belarus Government

**Contractor:** B. Nord Pavi 2000 from Mel (Province of Belluno, Italy)

**Mapei Co-ordinators:** Stefano Dussin, Ettore Menegaldo, Gianluca Bianchin - Mapei SpA (Italy)

#### MAPEI PRODUCTS

The products mentioned in this article belong to the “Building Speciality Line” range. The technical data sheets are available at the web site: [www.mapei.com](http://www.mapei.com).

**Expancrete:** powder expansive agent for preparing shrinkage-compensating, crack-free, waterproof and highly durable concrete and mortars.

**Mapecure SRA 25:** curing additive for cementitious mortar and concrete, which has the property of reducing hydraulic shrinkage and micro-cracking.

# Mapecrete System

Mapei technology for shrinkage-free concrete

- ✓ Extremely low final shrinkage of the conglomerates
- ✓ Control and elimination of cracking due to hygrometric shrinkage
- ✓ Reduction of damp curing
- ✓ Easier on-site organization and management

Mapei's laboratories have developed a system which allows the natural shrinkage of concrete to be compensated for by using special admixtures, which allow all the chemical-physical processes which transform the mix from a fresh state to a solid state to be controlled.

Therefore, it is possible to **reduce the number of joints** so that they correspond with the construction joints which, in turn, may be carried out by inserting suitable reinforcement, thus eliminating all the weak points in the floors.

When a large surface is required for carrying heavy, continuous traffic, and which is also hardwearing over the years, the **MAPECRETE SYSTEM** is the best solution.



# www.mapei.it

# www.mapei.com



## New on-line portals for Mapei

Since the middle of June 2010, Mapei Group has been on the web with its new portal [www.mapei.it](http://www.mapei.it). The contents of the site are also available in English, and the aim is to satisfy the requirements of users from all around the world and offer an image of the Group and its products, a promotional tool for all technical and commercial issues. The [www.mapei.com](http://www.mapei.com) portal has also been refreshed, and offers access to the various sites of Mapei Group's subsidiaries located around the world, and which will also be overhauled during the Autumn of 2010.

The Company's presence on the web has become fundamental in creating and maintaining a channel of communication between general headquarters, local offices located around the world, its customers and the building world in general. The number of visits to the site are proof of this (see box below), with numbers which are increasing year after year.

The aim of the new portals is to offer a well-structured, organisable information system associated to single products or products lines. This helps Mapei to present the Company not only as a supplier of solutions and products for solutions, but also as a trusted, reliable interface for design and building issues. The choice of offering products by surfing through "systems" allows visitors to quickly and simply single out all the products required according to personal requirements. And lastly, the site highlights Mapei's commitment to research into eco-sustainable products with an area of the site dedicated to "green" products and issues. Happy surfing!



**About Mapei.** In this section you can read the story of the Company, find out more about our research activities and commitment to certified quality and locate Mapei's various facilities around the world.



### THE WEBSITE FIGURES

#### WWW.MAPEI.COM

Visits to Mapei websites/month	1,618,983
Pages viewed/month	13,190,543
Most visited range	Building speciality line
Most clicked products	MAPELASTIC, MAPEFER



**Homepage.** A large area of the homepage is dedicated to new products and important initiatives which are either imminent or already under way. And from this page it is easy to access all the other areas.



**Projects.** The site also contains an ample selection of reference applications which may be selected by specifying the product, type of application or the country where the building site was located.



**Products.** The dedicated products sections are laid out with an immediately functional logic so you can quickly find products or groups of products. There are also instructive videos linked to the products which illustrate various ways of using them.



For each product there is a technical data sheet, a product specification section and a series of reference applications.



**www.mapei.com**

This portal offers access to the various sites of the Mapei Group's subsidiaries.



**Realtà Mapei Magazine.** In this section, it is possible to look up past issues or articles of particular interest from *Realtà Mapei* (in Italian) and *Realtà Mapei International* (in English) and read them directly on line.

# Dynamon NRG & Dynamon SP

Solutions specially designed for the pre-cast concrete industry

✓ Accelerated development of mechanical strength

✓ Optimisation of production cycles and strong reduction of maturing cycles

To solve specific problems encountered in the pre-cast concrete industry and to strongly contribute to the development of this sector, Mapei has developed the **DYNAMON NRG** and **DYNAMON SP** product ranges. These products are specifically intended for this type of application and are especially suitable for manufacturing self compacting concrete.



# Certification-proof

We don't just say **green**, we live it.

You have to believe, invest in research and have your products certified by official, internationally-recognised organisations to make eco-sustainable projects.  
**Mapei does not invent certification; it is awarded to Mapei all over the world.**

## Products containing recycled, ultra-light materials

(LEED USGBC rating: **MR Credit 4**)

The maximum use of recycled materials in the composition and packaging of Mapei products

## Products with a very low VOC content

(LEED USGBC rating: **EQ Credit 4.1, 4.2 and 4.3**)

Mapei adhesives are certified Green Label Plus, EC1

## Special care for the air you breathe

(LEED USGBC rating: **EQ Credit 3.2**)

Compared with conventional Mapei cementitious adhesives, our products with Low Dust technology reduce the amount of dust given off into the air in closed environments during mixing and application by up to 90%

## Local production sites

(LEED USGBC rating: **MR Credit 5**)

Reduce impact on the environment by reducing the need for road transport

## Products developed to reduce energy consumption

Mapei offers numerous solutions to reduce energy consumption and systems specially designed for soundproofing against the noise of footsteps

## R&D focused on the environment

More than 70% of Mapei's research budget (around 60 million Euro per year) is invested in the development and formulation of eco-sustainable products

Choose **MAPEI** for your **eco-sustainable projects**

Mapei is a member of the GBC in the following countries:

USA, Canada, Italy, Spain, Germany, the United Arab Emirates, South Africa, Australia and New Zealand



### \*LEED The Leadership in Energy and Environmental Design

is the most widely known international reference norm for sustainable building in the world. The LEED standards indicate the requirements for constructing eco-compatible buildings.

The classification of sustainable buildings is by means of a rating system. The total of the credits obtained enable the final performance of a building to be evaluated for a LEED platinum, gold, silver or certified award.



Mapei is a member of the Green Building Council, an association which promotes the LEED certification system



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ADHESIVES • SEALANTS • CHEMICAL PRODUCTS FOR BUILDING

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