

REALTÁ MAPEI



**LEED: Growing
the green-building
phenomenon**

MUSIC FOR EUROPE



To commemorate the fiftieth anniversary of the signing of the Treaties of Rome, which marked the birth of the European Community in 1957, the Symphonica Toscanini Orchestra, Maggio Musicale Fiorentino Choir and prestigious solo artists conducted by Maestro Lorin Maazel performed Beethoven's Ninth Symphony. This piece was chosen for a very good reason: the "Hymn to Joy" included in the fourth movement of the Symphony is also the official anthem of the European Union. The concert, performed in Rome on 7th May this year in the splendid setting of San Paolo Fuori le Mura Basilica, is part of the celebrations organised all over Europe to commemorate this special date. It is also part of the numerous events planned to be held in Italy within the framework of "Europa 2007", promoted by the Italian Prime Minister, Professor Romano Prodi.

Leading Italian and European dignitaries attended the Concert for Europe, as well as a big group of Mapei guests from Italy and the rest of the world. This was yet another musical event which saw the Company partnering the Orchestra. This partnership will continue throughout 2007, the year of the fiftieth anniversary of the death of the great Maestro and conductor Arturo Toscanini, which the Symphonica Toscanini Orchestra plans to commemorate by an international concert tour. 2007 is also the seventieth anniversary of the founding of Mapei, and the Concert for Europe provided yet another chance to underline not just Mapei's love of music and culture, but also (and most significantly) the great international spirit which has always been guiding its growth.

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Main cover photo:
"Growing the green-building phenomenon". Mapei has always been committed to environmental leadership.

This allowed the Company to develop environmentally friendly products which are also safe for the installer and the final user (see article on pag. 37).

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www.mapei.com

The Mapei web site contains all the information about the Group's products, its organisation in Italy and overseas, its involvement in the sector's main trade fairs and lots more.

GIORGIO SQUINZI RE-ELECTED

The chemical industry as an

Giorgio Squinzi was re-elected President of Federchimica (the Italian Federation of Chemical Industry) at a meeting of this Federation held in Milan on 4th June, 2007, in the presence of the Italian Minister for Economic Development, Pier Luigi Bersani, and the President of Confindustria (the Confederation of Italian Industry) Luca Cordero di Montezemolo. Squinzi, who has been holding this position for 7 years (with a

two-year interruption), was re-elected with 99.6% of the vote, which as Mr. Montezemolo quipped, was "A tight majority". The meeting, which took place in a serene atmosphere, was nevertheless the chance to take a much deeper look at both the present and future of Italy's economy and industry. Montezemolo pointed the finger at Italian politics, taxation and IRAP (regional tax on industrial operations); the Minister, Mr. Bersani, tried to mediate between the position of indu-

The Key Role of Chemicals

"It is time – so the President of Federchimica said – Italian Institutions give the Chemical Industry the role in the Italian economy it rightly deserves; our sector is best equipped to provide qualified job opportunities, it can guarantee vital support in innovating other related sectors (i.e. the design and manufacture of Italian products) and also make an increasing contribution to protecting the environment and quality of life".

"The Chemical Industry – Squinzi went on to say – has learnt from its mistakes in the past and can now boast important results in terms of the environment and the transparency of its operations. Due to its innovative force and complexity, the Chemical Industry is a sector worth betting on". Squinzi also emphasised that for this very reason "chemicals are a sector in which research and innovation are vital for its survival, a sector which is exemplary in terms of safeguarding health and well-being".

"By re-opening negotiations on the Italian Chemical Industry – Squinzi claimed, addressing Minister Bersani – we now know that there is a real will to support the Chemical Industry for its role as a driving force behind innovating the entire Italian industrial system. But we would like this will to be shared in every way by the Italian Executive, because creating an Industrial Policy for the Chemical Industry is a useful exercise for the nation's entire economy". During his speech Squinzi highlighted



the most critical aspects for Italy and for the chemical sector.

No to Costly and Complex Regulations

In order to tackle the emergencies facing the planet, we need to be clearly aware that Europe, if not the world, is the realm in which the rules are set. As Italy embraces them, it must not make the impact of these regulations any harsher on its businesses.

"Europe is already virtuous enough, and we cannot afford higher costs penalising us too severely in terms of growth and jobs", so Squinzi said. Then he added: "So far the pointless and demagogic harshening of directives

for blatantly electoral reasons have always passed off as "improvements". We forget that regulations have costs which are particularly burdensome on the structure of small and medium-size Italian companies. This is another reason why Italy is a less attractive prospect for foreign investors compared to neighbouring countries".

Squinzi called for the Italian Government to discuss taking a definite stance to protect industry: this is the only way the Public Administration will be truly simplified and reformed, so that it can genuinely serve the general public and businesses and not just itself and politicians. The President of Federchimica was almost launching an appeal: "We are asking for a Ministry of Industry who will stand by us in our battles, first and foremost our battle to adopt an Environmental Code compatible with Europe. Nothing more and nothing given priority over Europe.

We do not want laxer controls, just simpler regulations, more certain deadlines and more responsible people to deal with".

Reduce the Cost of Energy or Relocate

Another real priority is the cost of energy. The time has come to take action to reduce the unacceptable gap between the cost of energy in Italy compared to other European countries.

"We feel it is necessary – so Squinzi said – to identify sectors and businesses to be taken as "Conscientious

PRESIDENT OF FEDERCHIMICA example for the entire country

strialists and the stance adopted by his government colleague and Minister of Environment, Mr. Alfonso Pecoraro Scanio, particularly as regards the latter's attempt to strictly implement European regulations regardless of the peculiar situation in Italy.

Giorgio Squinzi went to make an elaborate speech asking the government to come up with an industrial policy on a par with the Italian business system and underlining how the

Chemical Industry can help deal with the country's major structural-environmental emergencies.

Squinzi's speech touched on various issues and, by providing a snapshot of the current state of the Italian Chemical Industry, even managed to focus on those fuzzy areas preventing this sector of industry from looking forward to the future with optimism. Here are some of the key points in his much applauded speech.



From left: the General Director of Federchimica Claudio Benedetti, the Italian Minister for Economic Development Pier Luigi Bersani, the President of Federchimica Giorgio Squinzi and the President of Confindustria Luca Cordero di Montezemolo.

Consumers" to be favoured, bearing in mind the higher costs of energy compared to foreign competitors. The fact that energy costs are 30% or more higher than in other European countries means we must relocate, not in India or China, but in France or Spain, as has already happened".

More Efficient Infrastructures for a More Modern Country

The failure on the part of Italian politicians to work in the country's real interests clearly emerges in the growing gap compared to other European nations when it comes to building

infrastructures.

"It takes a powerful country to handle powerful changes; powerful in sectors like chemicals, powerful in investments in immaterial goods too – education and research – and also in material matters – roads, bridges, aqueducts, waste dumps, railways – allowing businesses to be competitive and people to live better.

We can no longer accept to have the highest public expenditure and least efficient infrastructures.

In conditions like these, we cannot ask our people to make sacrifices and our businesses to make commitments".

Federchimica as a "Tool of Industrial Policy"


Squinzi then concluded by saying: "Federchimica is a 'Tool of Industrial Policy' for Italian businesses and the Institutions, with just the right mix of quality services and representing of interests through transparent lobbying, capable of proposing ideas even before they are requested.

Politicians in general must encourage people to have faith in the future. Industrial Policy must favour the kind of desire for change characterising business people.

I like to think of Confindustria as a valiant defender of this will for change in Industry with a capital "I", because there are too many people in Italy who think they can do without industry.

Finally, I like to think of the Chemical Industry as an example for the entire nation of how to grasp the opportunities offered by a global market, how to keep one step ahead and demonstrate to others the need to invest.

This is because nowadays a company's goal must be to try and be a leading player on the global market and thereby provide its own contribution to Italy's competitiveness".

The newly re-elected President made a speech full of concrete ideas and no frills, pointing out (as befits the man's style) how important it is to live company life on a daily basis so as to show the way ahead drawing on his own experience. 



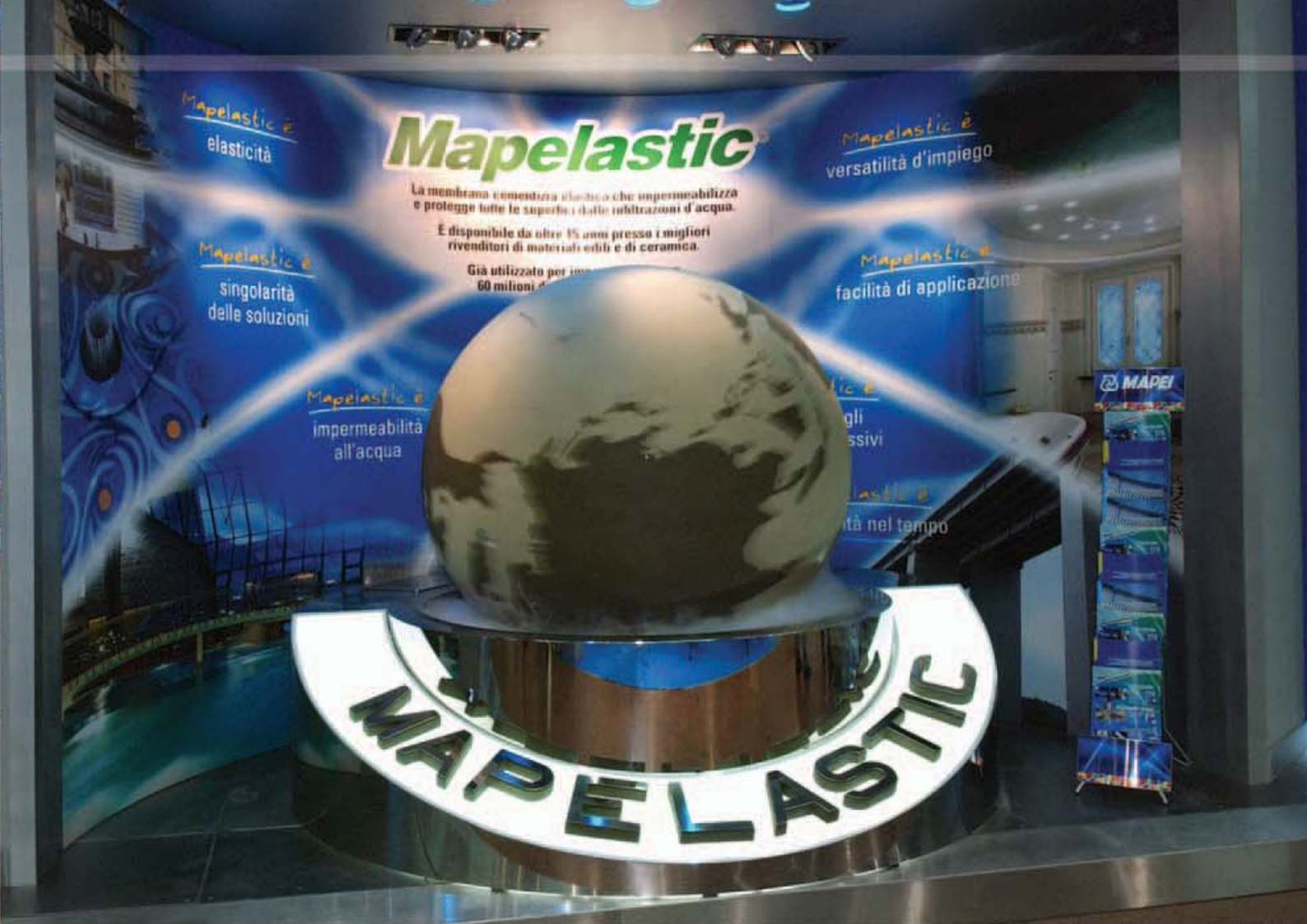
SaieDue

2007

The last edition of SaieDue Living, International Exhibitions of Architecture, Interior Finishing, Building Renewal and Technology, drew to a close on 17th March in Bologna.

After twenty-six years, SaieDue Living is drawing the curtains on its prestigious history at the BolognaFiere (Bologna Fairground), while a new trade fair project is being developed from its grassroots in Milan. The event, which will be called MADE Expo – Milano Architettura Design Edilizia (Milan Architecture, Design and Building) – will be hosted on the premises of the new Milan-Rho Trade Fair from 5th to 9th February 2008. In line with the positive trends emerging from the last few editions, once again this year the results were satisfactory: from 13th to 17th of March, 122,803 professional visitors (11,847 from abroad) attended the 26th edition of this event organized by Federlegno-Arredo (the Italian Federation of Wood, Cork, Furniture and Furnishing Manufacturers). These results, which were in line with expectations, emphasised the specific nature of this trade fair. Designers, interior designers, building contractors, window and door frame manufacturers, decorators, installers, distributors, building managers, surveyors and many of the people working in the building industry were able to explore the latest products for doors, windows, floors, coverings, stairs, safety and security products, home automation devices, automatisms, restoration and preservation technologies, machines for manufacturing doors and windows' frames and building softwares.

The event, which covered an exhibition area of 160,000 m², including 18 halls and two outside areas, displayed the products of 1,420 companies. As usual, over 40 fair side events provided a deeper insight into cutting-edge issues in architecture, interior finishing, building and renovation technology. Organized by SaieDue Living in conjunction with leading publishers, associations and big firms in the sector, the event's conference schedule focused heavily on energy-saving, the use of renewable sources and new energy and environmental certifications for building products. Two special events enhanced the commercial side of SaieDue



70^o
1937 - 2007

70 years of technological leadership: MAPEI has developed advanced technological systems for the resin and cementitious-based flooring sector, and always offers the best solution for all your projects.

Systems for resin and cementitious flooring

MAPEI





Living 2007, **Eden** and **The Intelligence of Walls**, devoted respectively to sustainable architecture and new building shell technology. Featuring an exhibition catalogue and a series of seminars, EDEN - Edilizia, Design, Energia e Natura (Building, Design, Energy and Nature) - organized with the technical and scientific support of the Best (Building, Environment, Science and Technology) Department at Milan Polytechnic, presented a selection of products and technology on display in Hall 35, directing architecture towards more conscientious use of energy - reducing energy consumption and polluting emissions - and "virtuous" building procedures, which, in other words, use manufacturing waste both as an energy source and also building material.

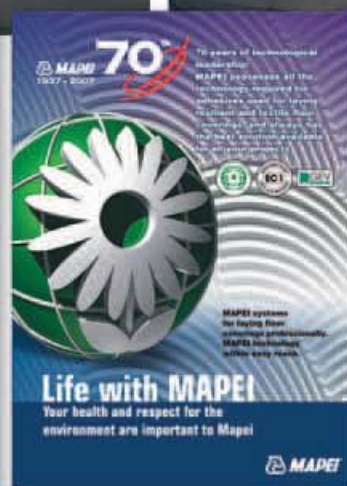
Mapei at SaieDue

Mapei, celebrating the 70th anniversary of its founding this year, wanted to take this opportunity to underline its technological leadership by presenting its "world of solutions" for the building industry at two separate stands (located respectively in Halls 34 and 35). Big panels divided up the stand and some wonderful pictures clearly illustrated the benefits and results that can be obtained using Mapei products. This resulted in an even more visually striking communication approach than usual. Indeed, Mapei is continuing with its commitment to research and development, and as usual this trade fair provided the chance to present new solutions and new product systems to all the well-informed visitors, who, year after year, are increasingly curious to see what sort of technological innovations the Company can keep coming up with.

So the big stand in Hall 34 was devoted to all the different product lines proposing various systems mainly aimed at architects and designers looking for safe, certified, innovative and eco-compatible products and systems for both indoors and outdoors. In order to make Mapei's main slogan for this event ("70 Years of Solutions for the Well-Being of the Building Industry") more tangible, amongst other things this stand presented the systems the Company offers to promote "well-being in building".

Attention focused on MAPELASTIC, MAPE-ANTIQUE, SILEXCOLOR, SILANCOLOR PLUS AND MAPETHERM. All these cutting-edge products were the main highlights of Mapei's advertising policy over the first few months of this year, which began with the TV promotional adverts broadcast during the programme "Striscia la Notizia" (which always gets great viewing figures) shown on the Italian television channel Canale 5. Graphic panels and products samples illustrated how effective the numerous product systems really are. Special attention focused on products for protective and decorative wall coatings and most significantly on





the MAPETHERM thermal insulation system. As regards wall repairs, attention focused on products from the MAPE-ANTIQUE and POROMAP lines, while the technological innovation and validity of MAPE-GRID G 220, PLANITOP HDM and PLANITOP HDM MAXI was proposed as valid alternative of the FRP SYSTEM, for the structural reinforcement of masonry buildings. MAPE-ANTIQUE STRUTTURALE was presented as part of the Mapei range of Eco-Pozzolan-based mortars: this is a new mortar specially designed to be used in combination with zinc-coated mesh to repair old building masonry. It is, in fact, a pre-blended, light-coloured, cement-free mortar composed of lime, Eco-Pozzolan and natural sand, ideal for use as render or as "reinforced" installation layer on stone, brick and tuff

structures.

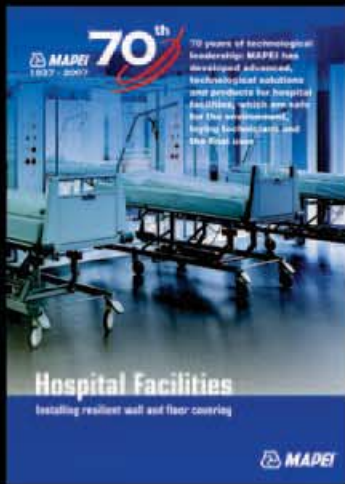
Resin and cementitious floors provided the chance to focus on two important product ranges: MAPEFLOOR SYSTEM and ULTRATOP SYSTEM. A spectacular large-size wall devoted to decorative resin floors inside the stand showed how leading designers have made creative use of these materials. In this same section of SaieDue, a new system of resin flooring with a particularly shiny coating and "mirror" effect called MAPEFLOOR I 320 SL CONCEPT was also clearly on display. This is a "new concept of industrial flooring", which can also be used in the civil sector and is actually a solvent-free self-levelling epoxy coating creating a granular effect, designed for constructing floors resistant to abrasion.

This product is available in various colour schemes.

Innovative products for installing tiles, such as the adhesives ULTRAFLEX S2 MONO, ULTRAFLEX S2 QUICK, ELASTORAPID and KERAFLEX MAXI, as well as coloured grouts like ULTRACOLOR PLUS, were also given the attention they deserve.

The communication concerning the installation of resilient materials, such as linoleum and PVC, followed two basic lines, focusing on Mapei solutions for sanitary facilities and on products from the ECO range. By concentrating its efforts on developing solvent-free products, the Company can rightly claim that it is focusing plenty of energy in the field of scientific research on





safeguarding the health and well-being of both installers and users.

On 16th March, as part of the SaieDue fair, Mapei organised a conference entitled "Resilient Floors and Coverings – That Something Extra in Design" mainly concerned with how materials like these are used as floors and coverings in designing and constructing hospital facilities (see the article on page 10, which describes this event).

Moreover, a big graphic panel and four different product samples illustrated the systems for laying artificial grass (this issue is studied in greater detail on page 12) and constructing sports facilities.

From synthetic grass playing fields to athletics tracks, gyms and sports centres, Mapei systems always ensure technologically cutting-edge and safe solutions.

For laying synthetic grass in particular, a full range of products forming the ULTRA-BOND TURF line was on display. Thanks to the technological features of these products, Mapei can provide the best solutions for every type of project, thereby allowing all sportsmen and women to "Win on Mapei".



Salone Legno

Hall 35



Sistema di ripristino e di posa rapida del parquet su vecchia pavimentazione in cemento

Sistema di ripristino e di posa rapida del parquet su vecchia pavimentazione



The second Mapei stand in **Hall 35** was part of the Salone Legno (an area entirely devoted to wood). It displayed innovative products and systems for installing parquet, mainly focusing on the ECO range of products, whose low emissions of volatile organic compounds make them eco-compatible.

“Life with Mapei” was the slogan chosen to sum up the Company’s corporate policy for operating in this field. It also provides an introduction to the full range of parquet installation products and the best possible solutions for every imaginable application.

For Mapei “Well-being in the Building Industry” means designing and creating solvent-free systems for the fast installation of parquet which are hypo-allergenic and safe for both the people installing them and those then living in the surroundings. Plus, thanks to the special formula of the adhesive and the products for the substrate preparation, the time required for installation can be notably reduced, so that the premises involved are not out-of-action for so long. A product very much to the fore this year at SaieDue was ECO PRIM PU 1K, the revolutionary one-component totally solvent-free polyurethane primer, safeguarding health and protecting the environment. Due to its exceptional technical features, it can be used for reinforcing and waterproofing cementitious screeds (even the heated screeds).

Mapei had plenty of products on display at this latest edition of SaieDue and the two stands attracted lots of visitors. This merely underlines the popularity of a Company which is still growing, due to its innate communication skills and, above all, because it draws on constant technological innovation. This is how Mapei can create systems of products concretely solving the widest possible variety of problems in the building industry.



Resilient Floor and Wall Coverings – Enhancing Design

THE CONFERENCE ORGANISED BY MAPEI IN CONJUNCTION WITH TURIN POLYTECHNIC

On 16th March Mapei organized a conference entitled “Resilient Floor and Wall Coatings – Enhancing Design” in conjunction with Turin Polytechnic as part of SaieDue. Resilient materials are now used in lots of spaces open to the public: ranging from hospitals and schools to gyms, libraries and all those places where attention to quality in the inside environment is most vital. This means that the designers and manufacturers of these materials now have even greater responsibilities. It also explains why Mapei decided to carry out a research program in conjunction with Turin Polytechnic to investigate the best possible use of resilient materials, studying their undoubted benefits in terms of elasticity and durability, as well as their impact on the environment, right through from manufacturing to recycling.

The conference focused on the use of this kind of materials for designing the floor and wall coverings for hospital facilities. It is certainly also news to hear that the leading companies in the sector, formed into a special Committee organised by Mapei, are striving to gauge the quality of their products in relation to respect for both the outside and inside environments, paying special attention to therapeutic spaces. Lots of authorita-

tive speakers tackled this issue from every point of view. There was a very interesting talk on the “Toxicological Environmental Aspects of Resilient Flooring Components in Confined Hospital Spaces” given by Professor G. Ugazio (who teaches General Pathology at the Experimental Oncology Department of Turin University), and another by the architect G. Laganà (who teaches Architectural Design in the 2nd Faculty of Architecture at Turin Polytechnic) entitled “Resilient Materials in Architectural Design for Hospitals”. The safety of both the patients and medical staff in those medical premises where human life is particularly at risk, such as areas used for surgery, intensive care and diagnostics, etc., requires special guarantees. The problem deriving from the use of organic chemical products in the building industry lies in

the possible emission of volatile organic compounds, which pollute the premises and hence are a real risk for the health and comfort of both patients and medical and paramedical staff. Angelo Nobili, Product Manager of the Resilient Materials line, and Stefania Boselli of the Technical Service Department, spoke on behalf of Mapei. Each (from his own viewpoint) emphasised Mapei’s concrete commitment to research programs aimed at developing solvent-free products with low emissions of volatile organic compounds (VOC), in order to improve the conditions in the buildings in which they are used. In line with its policy to protect the environment and quality of life, Mapei has developed a series of polymer-based products in water dispersion as an alternative to those in organic solvents, which can tackle and resolve the problem of pollution in indoor environments.

This innovation has notably reduced emissions of organic compounds both in the short term, right after the application of adhesives, and also in the long term. Finally, it was pointed out that Mapei’s commitment to the manufacture of adhesives with low emissions of VOC (belonging to Mapei’s ECO Line, tested and certified by highly qualified international institutes) has been recognised through the prize for “Protecting the Environment” awarded by INCA, the Italian Interuniversity Consortium “Chemistry for the Environment”.



An example of the use of resilient floorings in a hospital environment. This is Winterthur Hospital (Zurich, Switzerland), where the PVC floors have been installed using ULTRABOND ECO V4 SP and ULTRABOND ECO V4 CONDUCTIVE over substrates prepared using PRIMER MF, PRIMER G CONDUCTIVE, NIVORAPID and ULTRAPLAN ECO.

HOSPITAL FACILITIES

INSTALLING RESILIENT WALL AND FLOOR COVERINGS

Mapei has a wide range of systems for installing floor and wall coverings in hospital environments, where special attention needs to be paid to the effects of the materials on the health of both patients and medical and paramedical staff. Back in the 1970's the Company was already marketing products in water dispersion with low solvent contents, and its commitment to the environment continued through the development of solvent-free materials with low emission of volatile organic compounds (VOC): this led to the creation of the ECO line, featuring a distinctive green globe with a flower in the middle. ECO products are tested and certified by qualified international institutes, such as the German body TFI (Teppich-Forschungsinstitut) and the American CRI (Carpet and Rug Institute), and they all carry the EMICODE EC1 logo issued by the GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.), an association for controlling emission from installation products, adhesives and building products, to which Mapei also belongs. Mapei solutions for installing floor and wall coverings in hospital environments include:

- adhesion promoters like PRIMER G, a synthetic resin-based primer in water dispersion with a very low emission of volatile organic compounds, and ECO PRIM T, a solvent-free acrylic primer in water dispersion with very low emission of volatile organic compounds;
- consolidating and waterproofing primers like ECO PRIM PU 1K, a single-component solvent-free polyurethane primer with very low emission of volatile organic compounds for consolidating and waterproofing cementitious screeds;
- self-levelling compounds for treating substrates like ULTRAPLAN ECO, ultra-fast hardening (12 hours) self-levelling smoothing compound for thicknesses of 1-10 mm with very low emission of volatile organic compounds;
- adhesives for installing rubber and vinyl floors like ULTRABOND ECO V4SP, universal adhesive in water dispersion with extended open time and very low emission of volatile organic compounds for resilient flooring; ULTRA-



For more information about the products referred to, take a look at the technical data sheets at the website: www.mapei.com.



BOND ECO VS90, an acrylic adhesive in water dispersion with very low emission of volatile organic compounds, ideal for vinyl and rubber floors; ADESILEX UP 71, water and solvent-free two-component polyurethane adhesive for bonding rubber and PVC floors in interiors;

- adhesives for installing linoleum floors like ULTRABOND ECO 540, adhesive in water dispersion with very low emission of volatile organic compounds, specifically designed for linoleum flooring, and AQUACOL T, an adhesive in water dispersion with very low emission of volatile organic compounds.



Examples of installing resilient floor and wall coverings in hospital facilities:

Photo 1.
Paediatric Clinic at Padova University (Italy): the floor substrates were prepared using PLANO 3 and PRIMER G before bonding the linoleum using AQUACOL T.

Photos 2 and 3.
National Tumours Institute, Milan (Italy): after preparing the substrates using EPORIP, PIANOCEM F and PRIMER G, the PVC floors were installed with ADESILEX F57 and ADESILEX VS45; the resilient wall coverings were bonded with ADESILEX MT32.

Photo 4.
Broussais Hospital Centre, Saint-Malo (France): the linoleum floors in the operating rooms were installed using ULTRABOND ECO 540.

Synthetic grass an unstoppable trend



Synthetic grass rolls being acclimatised before laying

Laying the Ultrabond Turf Tape 100 jointing tape



In the last few years, soccer stadiums and sports grounds used for soccer matches have been turning more and more to the use of synthetic grass, to the detriment of pitches in natural grass. This is due to the undeniable advantages that synthetic grass offers for sports activities, such as more stable performance characteristics of the covering in particularly harsh climatic conditions, especially in winter. While pitches in natural grass tend to become harder when the temperature drops to around 0 °C or even lower, artificial grass pitches remain more or less stable, a characteristic which reduces stoppages of sport activity while, at the same time, cutting maintenance costs.

Up until recently, there were no in-depth studies regarding variations in the performance of soccer players due to the conditions of either natural or synthetic playing surfaces. However, there were certain prejudices and doubts regarding the use of synthetic grass pitches, because it was thought to be the cause of an increase in injuries compared with natural grass pitches.

Mapei has always stood out from the rest for its commitment to scientific research. Through the Sport Service Mapei centre (located in Castellanza, Varese, Italy) and working closely with leading companies in the production of synthetic grass, the Company took on the commitment of filling the gaps in scientific research by promoting a dedicated analysis on this issue. The research showed that, on the one hand, synthetic grass pitches, even at temperatures close to 0 °C, allow soccer players to perform even better during games and training sessions. On the other hand, research also showed that there is no scientific evidence to support the theory that synthetic grass pitches cause more injuries compared with those in natural grass.

In fact, passing on to this new type of playing surface for football pitches seems an obligatory step. Last March, the introduction of new FIFA and UEFA regulations allowed the use of synthetic pitches for official matches even at the highest level, whereas before its use was limited to only the minor categories. At the moment, the Italian National Amateur

League (Lega Nazionale Dilettanti or LND) is taking part in testing the use of synthetic grass pitches. It is the only organisation in Italy which has been delegated to authorise the use of these pitches and to issue certificates which permit competitive and amateur soccer matches to be played on this kind of surface.

CORRECT LAYING TECHNIQUES FOR SYNTHETIC GRASS

As with other types of material used in the building industry, synthetic grass also requires special laying techniques which guarantee that high performance of the pitch is obtained once it has been completed. When creating a surface using synthetic grass, the first step is to prepare a suitable substrate with special characteristics, such as perfect planarity, high drainage capacity and a particular slope so that water runs off, as foreseen by soccer's governing bodies (FIFA, UEFA and LND).

Once the drainage operations have been completed and the various layers of the substrate have been prepared, the synthetic grass surface may then be laid. This step may only be carried out after the synthetic grass panels have been unrolled and left to acclimatise for a few hours, so that stresses created by the packaging are reduced.

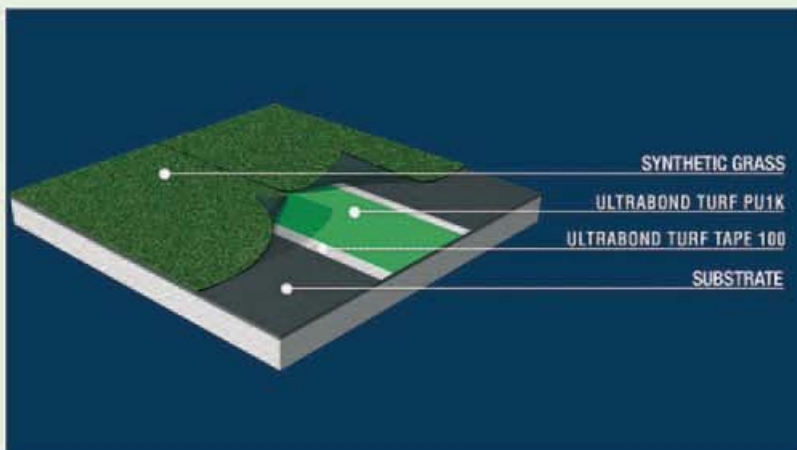
Mapei, which has always been in step with new trends in the building industry, has recently introduced a new range of products specially developed for creating synthetic grass fields. In particular, the Company offers a complete system, the ULTRABOND TURF SYSTEM, which includes ULTRABOND TURF TAPE 100 jointing tape and three different types of adhesive:

- ULTRABOND TURF EP 2K, two-component, epoxy-polyurethane adhesive
- ULTRABOND TURF PU 1K, one-component, polyurethane adhesive
- ULTRABOND TURF PU 2K, two-component, polyurethane adhesive

These products have undergone severe testing (as for their bonding strength, tensile strength, ageing, etc.) in the Mapei Research & Development laboratories. When they are used in combination with the right synthetic grass surface, systems suitable to meet the performance levels required for approval of the pitch may be obtained, with the main requirement of the pitch being its resistance to highly variable temperatures, from the biting cold (as low as -20 °C) of northern winters, to the torrid heat of Middle East summers (where the temperature reaches up to +40 °C).

When preparing the pitch, the 40cm-wide ULTRABOND TURF TAPE 100 jointing tape is laid on the substrate. One of the aforementioned adhesives is then applied on the tape using a notched trowel or other such suitable tool, according to the particular laying conditions and requirements of the installer.

For example, ULTRABOND TURF PU 2K and



Application of Ultrabond Turf PU 1K on the jointing tape by extrusion from its aluminium packaging



Applying the adhesive on the Ultrabond Turf Tape 100 using a notched trowel



Bonding the jointing strips between the synthetic grass panels



Checking the buttering on the back of the grass surface



ULTRABOND TURF PU 1K are particularly suitable for low-temperature applications, and for those installers who are subject to allergic reactions when using epoxy or epoxy-polyurethane products. Also, since ULTRABOND TURF PU 1K is an one-component, ready-to-use adhesive, it is particularly easy to apply, does not require a catalyser and, therefore, there is no risk of blending errors.

Whichever adhesive is used, the amount applied must be sufficient to guarantee complete buttering of the back of the synthetic grass panels in order to avoid detachment when in service.

The edges of the grass panels are then laid and bonded on the jointing tape previously spread with adhesive.

Some portions of the synthetic grass are then cut where the white lines which mark out the pitch are to be positioned. These are also available in rolls of artificial grass, and are inserted into the synthetic grass covering according to the dimensions foreseen by the regulations. Bonding of the lines is also carried out using the ULTRABOND TURF TAPE and ULTRABOND TURF EP 2K, ULTRABOND TURF PU 2K or ULTRABOND TURF PU 1K adhesives.

The avant-garde technology at Mapei's disposal allows the problems concerning the laying of synthetic grass to be successfully overcome, to guarantee that perfect soccer pitches regarding performance and safety for their final users may be created.

Let the match begin.....



FROM A QUALITY SUBSIDIARY VA.GA. SAND

To stabilise the grass surface and promote water drainage, soccer's governing bodies (FIFA, UEFA and LND) allow for a layer of sand to be inserted. To create this layer, synthetic grass surfaces laid using Mapei products may be sprinkled with Egyptian quartz (N° 412) with variable grain size of from 0.6 to 1 mm, supplied by the Va.Ga., a subsidiary of the Mapei Group producing fine silica sand. This type of quartz has been recently approved by the LND as a material suitable for sprinkling on approved synthetic grass soccer pitches (see below). Organic rubber granulate is added to cover the layer of quartz.



PRODUCTS FOR LAYING SYNTHETIC GRASS PITCHES



1

The photos show some sport facilities where Ultrabond Turf System was used to lay synthetic grass.

1. Sport Centre A.C. Milan, located in Milanello (Varese, Italy)



2

2. Cologno al Serio Stadium (Bergamo, Italy)

3. Sport Centre Longarina, (Ostia, Italy)

4. Vigorelli Velodrome (Milan, Italy)



3



4



Mapei recently launched a new range of products specially developed for installing synthetic grass playing fields. In particular, the Company offers a complete system, the ULTRABOND TURF SYSTEM, which includes a jointing tape and three different types of adhesive, to be chosen according to the particular laying conditions and requirements of the installer.

ULTRABOND TURF TAPE 100: jointing tape for joining panels of synthetic grass and for marking out the pitches for various sport activities.

ULTRABOND TURF EP 2K: two-component, epoxy-polyurethane adhesive for bonding indoor and outdoor synthetic grass surfaces. This product is easy to apply and has an excellent rib stability. When hardening, it forms a highly resistant film and ensures high adhesion to any kind of substrate.

ULTRABOND TURF PU 2K: two-component, solvent and water-free polyurethane adhesive for bonding indoor

and outdoor synthetic grass surfaces. It is easy to apply, has an excellent rib stability. It is particularly suitable for low-temperature applications, and for those installers who are subject to allergic reactions when using epoxy or epoxy-polyurethane products. When hardening, it forms a very resistant film.

ULTRABOND TURF PU 1K: one-component, epoxy-polyurethane adhesive for bonding indoor and outdoor synthetic grass surfaces. It is ready to use and does not require the use of a catalyser.

Therefore, blending errors can be avoided and the product can be used several times. It has an excellent rib stability, even at very high temperatures.

It is particularly suitable at low temperatures and for installers who are subject to allergic reactions when using epoxy or epoxy-polyurethane products.

For further information on these products, the technical data sheets are available at www.mapei.com.



designer PARQUET

HIGH-QUALITY INSTALLATIONS INSIDE THE NHOW HOTEL IN MILAN



*Photo 1.
The outside of the
hotel. The building,
which stands on a
former industrial area
in old Milan, used to
house a factory.*

Milan is the city where, by definition, new trends and fashions appear in Italy. Hotels are no exception and NHow Hotel, belonging to the NH Hotels chain, was a key player in the project to redevelop industrial buildings in the south of Milan, introducing a combination of comfort, technology, cutting-edge interior design, quality materials and carefully chosen coatings. The design layout of NHow Hotel is inspired by the idea of "fluid design", which is a clear departure from any static notion of a hotel in favour of a highly flexible and constantly evolving interior space. In actual fact, this is not just a hotel but also an exhibition space for art and design shows.

NHow Hotel is located in Via Tortona in a former industrial estate in old Milan, close to Porta Genova Railway Station, where the old workshop spaces have been converted into cutting-edge facilities for the services sector. Here again the structure converted into a hotel used to be a General Electric factory. The hotel, which was designed by the architects Matteo Thun and Daniele Beretta, has 249 guest rooms, including 52 executive suites and a 250 m² presidential suite. A work previously displayed at the exhibitions held cyclically at the Milan Triennial is displayed in the hall on a rota basis, while other interior spaces can easily be adapted to host special events, fashion shows and photographic studies. These areas also form a mixed space which is revamped every four months with special multifaceted animated areas for objects, books and art exhibitions.

NHow Hotel is an example of a very urbane and Milanese architectural

style, not very showy but full of surprises. The guest services and materials used for constructing this building are all of the highest quality.

Mapei's Work

Mapei was also involved in constructing NHow Hotel, supplying a range of products capable of meeting the designers' needs and guaranteeing reliability and quality-over-time in installing the various materials used.

Technicians working for Mapei's Technical Service Department recommended using a range of products for preparing the over 8,000 m² of screeds on the levels of the guests rooms and on the ground floors where other premises are located; for installing and grouting the porcelain tiles in the kitchens and the ceramic tiles in the service areas; for laying 6,000 m² of parquet in the guest rooms and a part of the main dining hall.

Preparing the substrates.

Approximately 6400 m² of screeds were installed using TOPCEM* special hydraulic binder and TOPCEM PRONTO* ready-to-use pre-packed mortar with controlled shrinkage. This product is ideal for preparing substrates for the installation of moisture-sensitive floorings and also recommended when fast drying (4 days) is required for quick installation, as in this case. Speed was also one of the main reasons for choosing MAPECEM* hydraulic binder and MAPECEM PRONTO* pre-packed mortar used for forming a further 2,000 m² of screeds for laying moisture-sensitive floors or any other kind of flooring where very fast drying was required (24 hours).

At NHow hotel the substrates were



2

Photo 2. The guestrooms and suites sport dark walnut oak parquet floors laid with Ultrabond P902 2K. A fancy, original feature: spotlights installed beneath the roof create striking lighting effects on the floor.

formed on the levels were the guest rooms are located and also in the hall and restaurant on the ground floor. Laying the parquet. The floorings in the guest rooms and suites were made of prefinished brushed oak parquet with a dark hazel-wood varnish (floorboard size: 10 mm thick, 145 mm wide and 1450 mm long). Another Mapei product was used for laying the parquet: ULTRABOND P902 2K* two-component epoxy-polyurethane adhesive. Its two components (an epoxy-polyurethane polymer and a hardener in paste form) are carefully

mixed together to produce a smooth coloured product, which is easy to apply with a notched trowel and has an excellent rib stability. The product is used for installing small and large-sized planks and all kind of wooden floorings onto cementitious screeds; on screeds made from MAPECEM*, MAPECEM PRONTO*, TOPCEM* and TOPCEM PRONTO* as in the case of NHow Hotel; and onto existing wooden, ceramic, marble or terrazzo tile floors, as well as on anhydrite screeds. The adhesive is also recommended for under floor heating systems.



3



4

Photos 3 and 4.
In the spacious presidential suite about 250 m² of clear-coloured oak parquet were laid using Ultrabond P902 2K.

Photo 5.
The dining hall can be divided into two separate areas by a panel curtain. One area sports brushed oak parquet laid with Ultrabond P902 2K.



ULTRABOND P902 2K* hardens in approximately 24 hours at room temperature and turns into a tough film which bonds tightly to any substrate.

Wooden floors are ready for light foot traffic 24 hours after being laid. The adhesive is available in two colours - beige and brown - with the darker shade being used for installing the floors in the bedrooms of NHow Hotel.

For the presidential suite brushed oak parquet (total of 250 m²) was again chosen, only this time it features a clear varnish; ULTRABOND P902 2K* was again used for installation purposes.

If required, the spacious dining hall can be divided into two separate areas by panelled curtains, and the functional separation is underlined by

two different types of flooring. One part has, in fact, a cementitious floor and the other, slightly raised above the concrete surface, is covered with brushed oak parquet with a clear varnish, again installed using ULTRABOND P902 2K*.

Laying the tiles. The designers decided to opt for ceramic tiles for the landings by the stairs and small utility rooms on the floors where the guest rooms are located.

The floors and walls of the hotel kitchens and utility rooms in the basement have been covered with porcelain tiles, again using Mapei products. KERAFLEX* cementitious adhesive with no vertical slip was used to lay the tiles in all these areas. The joints were grouted using KERACOLOR FF* high performance cementitious grout.

*Mapei Products:

the products referred to in this article belong to the "Products for Ceramic Tiles and Stone Materials" and "Products for the Installation of Resilient, Textile and Wood Floor and Wall Coverings" ranges. The technical data sheets are available from the "Mapei Global Infonet" DVD and the website: www.mapei.com.

Mapei adhesives and grouts conform to EN 12004 and EN 13888 standards.

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

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

Mapecem: special fast-setting hydraulic binder for the preparation of fast-setting and drying (24 hours) screeds, with controlled shrinkage.

Mapecem Pronto: pre-packed, ready-to-use mortar for fast-setting and drying (24 hours) screeds with controlled shrinkage.

Topcem: normal-setting, rapid-drying (4 days), special hydraulic binder for screeds.

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

Ultrabond P902 2K: two-component epoxy-polyurethane adhesive for wooden floorings.



TECHNICAL DATA

NHow Hotel, Milan (Italy)

Work: preparation of screeds; installation of parquet in the guest rooms, suites and part of the dining area; installation and grouting of ceramic and porcelain tiles in the kitchens and utility rooms

Year: 2006

Customer: NH Hotels

Project: Matteo Thun and Daniele Beretta

Installation Company: Piastrellando, Lecco (Italy)

Parquet Supplier: Cosmo, Sulmona (Aquila, Italy)

Mapei Distributor: Piastrellando

Mapei Co-ordinators: Angelo Giangiulio, Giuseppe Dal Mas and Marco Cantachin, Mapei SpA (Italy)

Systems for installing PARQUET

By Angelo Giangiulio – Product Manager of the Parquet Range, Mapei SpA

In recent years, the residential, commercial and public construction industry has been characterised by a growing demand for wooden floors. This has led Mapei to develop new specific product systems, able to ensure a perfect installation of this kind of floorings. Wood, indeed, features particular mechanical and physical characteristics which must be taken into account when choosing the installation products. Mapei product range for parquet comprises not just adhesives, but also primers, smoothing and levelling compounds for a proper preparation of the substrates. This is an essential operation to ensure the installed surfaces' excellent performance. Wood is indeed a very moisture-sensitive material which reacts to the humidity present in both the surrounding air and the screed.

Mapei products for installing parquet are solvent-free, hypo-allergenic and safe for both the installer and the final user. They also allow the times for the installation works to be reduced and the surfaces to be quickly brought back into operation.

Beside the product systems portrayed alongside this article, Mapei is able to offer many products for the installation of parquet. Among the most innovative ones there is ECO PRIM PU 1K, a polyurethane primer, especially suitable for consolidating and waterproofing cementitious screeds.

This product's features are described in the next page.



For further information, the catalogue "Products for the installation of wooden floors" can be requested by email at realtamapei@mapei.it; the products' technical data sheets are available at the website www.mapei.com.

FAST INSTALLATION OF PARQUET FLOORINGS



FAST INSTALLATION OF PARQUET FLOORINGS ON HEATED SCREEDS



FAST INSTALLATION OF PARQUET ON EXISTING FLOORINGS





Eco Prim PU 1K

Single component, solvent free, moisture-curing, polyurethane primer with extremely low emission of volatile organic compounds (V.O.C.), for consolidating and waterproofing cementitious screeds

Where to Use

Waterproofing cementitious screeds with a residual humidity content higher than the maximum level recommended for laying wooden and resilient floors.
Consolidating unstable and/or mechanically weak substrates.

Some Application Examples

- Consolidating cementitious screeds which are mechanically weak due to a lack of binders or insufficient curing.
- Waterproofing treatment before laying wooden flooring, to prevent rising damp due to excessive residual humidity in the screed.
- Anti-dust treatment for cementitious and anhydrite screeds with a friable surface.

Technical Characteristics

ECO PRIM PU 1K is a single component polyurethane resin which hardens due to the humidity present in the surrounding air and in the screed. It features low viscosity and, therefore, has a high capacity of penetrating into the porosity in the screeds.

Its formulation complies with Mapei's commitment to develop products that are safe for the environment, the installers and the final users. ECO PRIM PU 1K bears the EMICODE EC1 mark, awarded by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.), an association which controls the emission levels of products for floors. Beside having a very low emission level of volatile organic compounds (VOC), this product does not contain solvents and, therefore, is odourless and not inflammable.

Moreover, ECO PRIM PU 1K is

- ready-to-use and therefore mixing is not required
- easy to apply, even by brush
- hypo-allergenic and therefore it can be used by installers allergic to epoxy-based products.



SEISMIC CONSOLIDATION MASONRY

THIS ARTICLE SUMMARIZES THE PAPER PRESENTED BY THE STRUCTURAL ENGINEER GIULIO MORANDINI, A MEMBER OF MAPEI'S TECHNICAL SERVICE DEPARTMENT. IT WAS PRESENTED DURING A TECHNICAL WORKSHOP HELD IN MILAN DURING THE "BUILD UP EXPO" EXHIBITION AND ORGANISED BY ASSOCOMPOSITI, ALONG WITH THE COLLABORATION OF MAPEI AND A NUMBER OF ITALIAN UNIVERSITIES. THE MEETING WAS HELD ON THE 7TH OF FEBRUARY IN THE EXHIBITION AREA RESERVED FOR ASSOCOMPOSITI, THE ASSOCIATION WHICH GROUPS TOGETHER, SAFEGUARDS AND PROMOTES THE COMPOSITE MATERIALS INDUSTRY IN ITALY, WITH THE AIM OF FOSTERING DEVELOPMENT OF ALL THE TECHNICAL AND ECONOMIC POTENTIAL OF COMPOSITE MATERIALS.

by Giulio Morandini

The strengthening of masonry structures is a very complex subject. Not only, it is a very topical issue in Italy, since it is closely linked to the considerable amount of buildings of historical interest in this country. While analysing the new Italian legislation regarding improvement and seismic upgrading of existing buildings, it appears quite evident that a large majority of historical buildings in Italy show signs of structural weakness and/or deficits to such a degree that make the building vulnerable to seismic activity. A solution to this problem is offered by Mapei, with the composite materials from the FRP SYSTEM range. These materials demonstrate their efficiency by increasing the mechanical performance of strengthened elements. Moreover, this new frontier in methods for strengthening historical buildings allows to do away with the normally used organic matrices (epoxy resins), by proposing inorganic matrixes (hydraulic binders) which are more highly compatible from both a chemical and elastic-mechanical point of view. In order to better examine this subject, an analysis of the MAPEGRID G220 + PLANITOP HDM (or PLANITOP HDM MAXI) strengthening system will be presented. This system represents a valid alternative to the normal applications achieved using products from the FRP SYSTEM range.



Detail view of Mapegrid G220 fibreglass mesh.

The system is made up of structural fibreglass mesh (MAPEGRID G220) which is alkali-resistant, characterised by a high tensile strength (45 kN/m) and an excellent dimensional stability. The mesh is resistant to atmospheric agents, is completely immune to corrosion, is light and easy to handle and is also easy to cut and adapt to the conformation of the substrate's material. It is bonded to the substrate using a two-component, pozzolanic-reaction mortar with high ductility and a low modulus of elasticity (PLANITOP HDM for thicknesses of up to 6 mm, and PLANITOP HDM MAXI for thicknesses of up to 25 mm). The mortar has been formulated in Mapei's own Research & Development

Laboratories, and bonds so well to any masonry substrate material that it forms a single body. The presence of a high quantity of dispersed glass fibres also allows the product to achieve high flexural strength and a more ductile behaviour compared to the conventional hydraulic binders. The above-mentioned strengthening system (MAPEGRID G220 + PLANITOP HDM/PLANITOP HDM MAXI) is highly ductile, has a high capacity for dissipating stresses caused by seismic activity, is resistant to high temperatures and has good permeability to vapour. Unlike ordinary applications with the FRP SYSTEM, this system may also be applied on damp substrate material, while keep-

AND UPGRADING OF ELEMENTS



Detail view of Planitop HDM mortar.

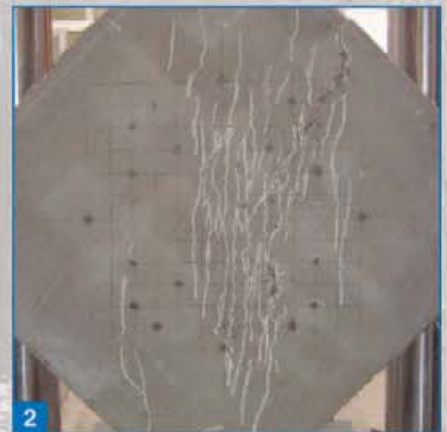


Photo 1.
Failure mode of a panel without strengthening.

Photos 2 and 3.
Failure mode of panels with strengthening on two sides. Notice the diffused cracking and the presence of localised cracks at the ends. No de-bonding phenomenon is present, in spite of the absence of mechanical anchoring. This is due to the system's high compatibility with the substrate.

Figure 1.
Mechanical behaviour of a strengthened panel subjected to a typical diagonal compression test. The tests show how the masonry has acquired high deformation capacity.



Figure 1

ing the final thickness of the operation low. Analysing the results of the laboratory tests carried out in the Department of Structural Engineering (DAPS) at the Federico II University of Naples on low walls made from Neapolitan tuff, the capacity for dissipating seismic energy is quite evident. By using this strengthening system, the stresses acting upon the facing wall are dispersed, thus obtaining a widely diffused cracking state, rather than the formation of concentrated macro-cracking. The tests also highlighted an increase of τ_{\max} (maximum tangential stress) to some 100%, compared to the stress in tuff panels without external strengthening.

What is of particular importance is the increase in ductility (μ) which the strengthened panel demonstrated, showing a high capacity of deformation without any loss in the supported load. These two properties (increase of τ and μ) meet all the requirements contained in the most recent Italian legislation regarding seismic activity (OPCM 3274 and later regulations), thus allowing a standard strengthening system to be obtained.

In addition, the technical characteristics of this innovative structural strengthening system proposed by Mapei allow for simple and quick application, the possibility of modelling and adapting the system to the most complex forms and shapes and guarantees high ductility.

The MAPEGRID G220 + PLANITOP HDM/PLANITOP HDM MAXI reinforced structural strengthening system has already been used successfully for numerous seismic strengthening and improvement operations, carried out on prestigious buildings of historical interest.

Its use has already been described in issue n° 77 of our in-house magazine Realtà Mapei (in Italian language), which portrayed the intervention carried out on the Basilica of the Santissima Annunziata in Ispica (in the Sicilian province of Ragusa), where all the domed roofs were strengthened.

To the side of this article, details of the strengthening operations on the San Vittore Martire Parish Church in Pieve Porto Morone (in the province of Pavia, in Northern Italy) are illustrated.


For further information on works carried out using the MAPEGRID G220 + PLANITOP HDM/PLANITOP HDM MAXI system, just enter the Mapei website at www.mapei.com and click on the "References" section, then search by typing the name of the product. 



Photo 4.
Application of
MapeWrap C Fiocco.



Photo 5.
Application of the first
layer of Planitop HDM.



Photos 6 and 7.
Positioning the
Mapegrid G220 mesh.



Photo 8.
Application of the
second layer of
Planitop HDM.



PRODUCT SPOTLIGHT

- Quick and easy to lay
- Strengthening may be modelled and adapted to even complex shapes
- May be used for both internal and external applications
- High durability

Structurally reinforced strengthening of masonry buildings

Mapegrid G220 and Planitop HDM system

PARTICULARLY RECOMMENDED FOR:

- Seismic strengthening of masonry structures (walls, vaults, arches, etc.)
- Increasing the shear strength of facing walls in stone, brick and tuff
- Creating "reinforced" renders in which the mesh acts as an anti-fracture component and redistributes stresses
- Protecting elements subject to cracking, such as the joints between an element in reinforced concrete and a buffer wall, or in correspondence with the corners of openings in walls

ADVANTAGES

- Physical-chemical compatibility
- High ductility, with the capacity of dissipating seismic energy
- Resistant to high temperatures
- May be applied on damp masonry
- Reduced application thickness
- Good vapour permeability

Mapegrid G220

Special alkali-resistant fibreglass mesh for reinforcement of stone, brick and tuff masonries

- High tensile strength (45kN/m)
- Excellent dimensional stability
- Does not rust
- Resistant to atmospheric agents
- Lightweight and easy handling
- Easy to cut and adapt to the conformation of the substrate



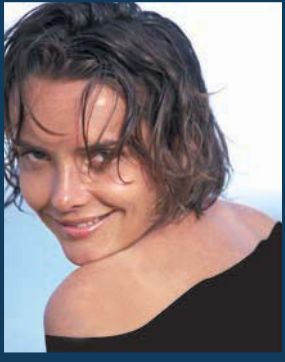
Planitop HDM

Two-component, high-ductility mortar for reinforced structural strengthening of masonry supports and for smoothing and levelling surfaces in concrete, stone, brickwork and tuff

- Excellent bonding
- Low modulus of elasticity
- Resistant to aggressive atmospheric agents
- Waterproof
- Does not crack
- Easy to apply



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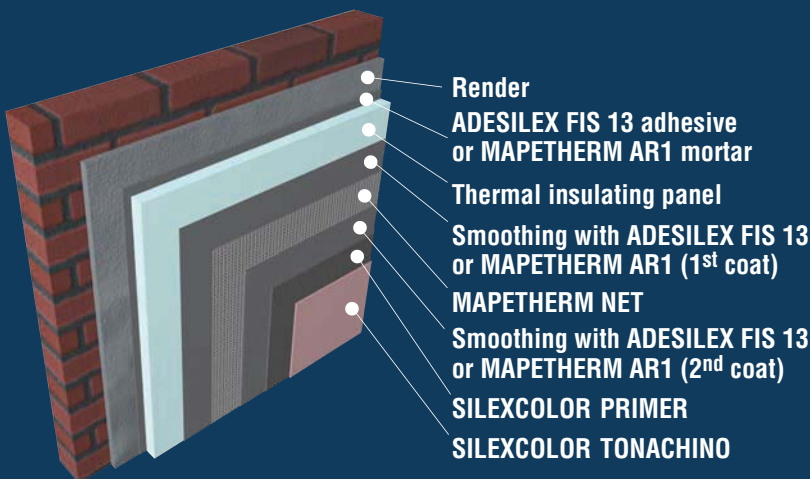


Mapetherm® Thermal Insulation System

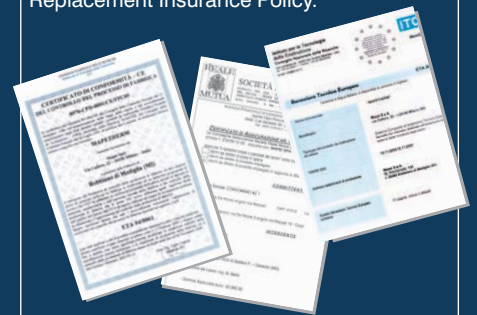


- ✓ Reduction in energy consumption
- ✓ Costs saving
- ✓ Increase in the value of the building
- ✓ Well-being and comfort are certified and ensured with MAPETHERM® system in any environmental condition

Mapei solves the problem of thermal losses and ensures insulation from both cold and heat.



The Mapetherm system has been awarded the ETA (European Technical Approval) certificate n. 04/0061 and is covered by a Replacement Insurance Policy.



TECHNOLOGY AND MATERIALS FOR THE CHANGING CITY

THE PAPER IN THIS ARTICLE WAS PRESENTED BY PROF. AMILCARE COLLINA, HEAD OF MAPEI'S PUBLIC RELATIONS WITH THE SCIENTIFIC COMMUNITY IN ITALY AND ABROAD, DURING THE "CHANGING CITY" CONVENTION WHICH TOOK PLACE IN MILAN DURING THE BUILD UP EXPOSITION. THE CONVENTION WAS ORGANISED BY FAST, FEDERAZIONE DELLE ASSOCIAZIONI SCIENTIFICHE E TECNICHE (FEDERATION OF SCIENTIFIC AND TECHNICAL ASSOCIATIONS), TOGETHER WITH SOME OF ITS MEMBER ASSOCIATIONS, TO ILLUSTRATE THE MOST

SIGNIFICANT CHANGES WHICH ARE PROMOTING URBAN TRANSFORMATION. WORK WAS DIVIDED INTO A NUMBER OF MEETINGS FROM THE 6TH TO THE 10TH OF FEBRUARY, AND WERE PROMOTED BY VARIOUS ASSOCIATIONS. IN PARTICULAR, THE PAPER PRESENTED BELOW WAS ILLUSTRATED DURING THE "TECHNOLOGY AND MATERIALS FOR THE CHANGING CITY" MEETING, WHICH WAS ORGANISED BY THE LOMBARDY SECTION OF THE ITALIAN CHEMICALS ASSOCIATION IN COLLABORATION WITH FAST.

WELLBEING, LIVING COMFORT AND ENERGY SAVINGS: THE MAPETHERM THERMAL INSULATION SYSTEM

by Amilcare Collina

The theme of energy saving is nowadays a recurring subject. Its importance in the building sector, where it has been generally overlooked, has become more and more important following the recent modifications to Italian legislation regarding this issue. On the 19th of August, 2005, Decree N° 192 was approved, which defines the performance in energy terms of a building and establishes that the said building must be certified.

Apart from the new legislation, environmental issues and the rising cost of energy all contribute in bringing the issue to everyone's attention, and forces us to behave more responsibly and more coherently.

The MAPETHERM thermal insulation system proposed by Mapei is an effective answer to the new requirements regarding lower energy consumption in buildings, and is also the only solution which may be easily applied on existing buildings to upgrade their energy requirements.

It consists in the application of the following elements to the perimeter walls of a building, through which more than 50% of energy losses is estimated to occur (see Fig. 1):

- a layer of adhesive;
- an extruded polystyrene insulating panel;
- a first layer of levelling mortar;
- a primed glass fibre net;
- a second layer of levelling mortar;
- a finishing cycle, preferably with an inorganic base.

Since the system is made up of various components, their compatibility is fundamental to guarantee the performance required from the overall system and to make sure that it is durable.

Unfortunately, it is common practice for installation companies to purchase and install the single components which make up the system from different suppliers. This kind of approach is not acceptable to Mapei, which highly recommend against adopting such a system. Compatibility between each single component may only be measured through severe testing in well-equipped laboratories, and testing must be carried out by highly experienced laboratory technicians. With this approach, what may seem to be a saving in initial costs, will expose the end client to risks which are impossible to estimate at the start of work. However, it would be reductive to represent the effects of the thermal insulation system by limiting them to a reduction in energy requirements. The benefits obtained are much more widespread, as we will see in the conclusions of this article.

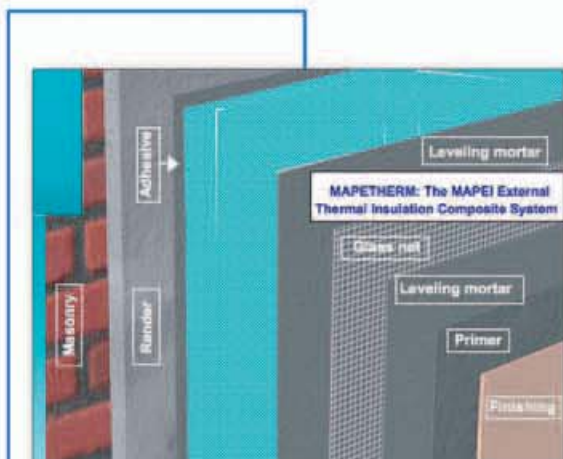


Figure 1. Stratigraphy of the thermal insulation system.

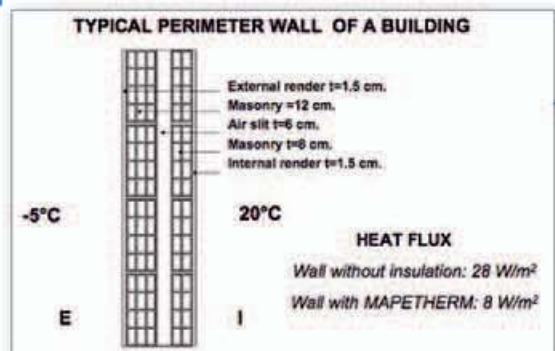


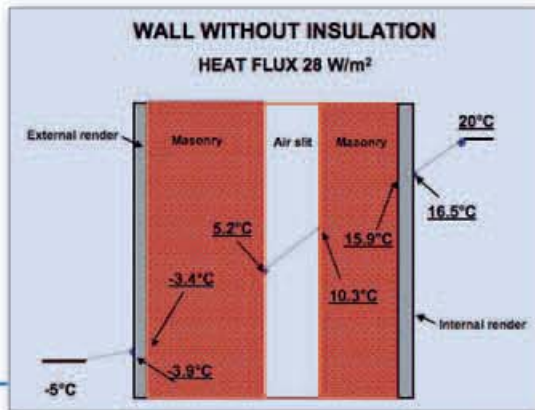
Figure 2. Stratigraphy of the wall.

Let us first analyse energy loss through a perimeter wall which separates an internal room, maintained at a constant temperature of 20 °C using a central heating system, from the outside environment at a temperature of -5 °C.

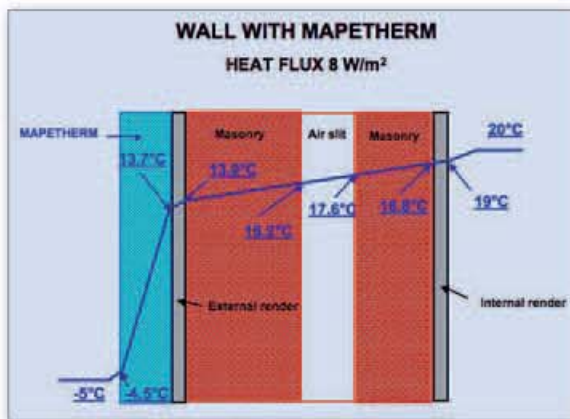
If we consider a perimeter wall with the stratigraphy reading as illustrated in Fig. 2, the thermal flow through the wall is equal to 28 W/m². If we apply a MAPETHERM thermal insulation

system with 8cm-thick insulating panels, with the same boundary conditions, the thermal flow is reduced to just 8 W/m².

With every transport phenomenon which may be observed in nature, in this case the transport of energy, we may associate a driving force. The driving force is clearly the difference in temperature between the two environments. The distribution of the driving force around and inside the wall, which is very different in these two cases, takes into account the large reduction in thermal flow due to the application of the thermal insulation system.



Figures 3 and 4. Temperature profiles.



Temperature distribution is in turn bound to the energy transport mechanisms around and inside the wall, and these mechanisms are:

- natural convection and radiation from the internal environment to the internal surface of the wall;
 - heat conduction within the wall;
 - convection and radiation from the external surface of the wall to the outside environment.
- If we observe the temperature profile in the case of a wall which is not insulated (Fig. 3), we may consider the following:

1. the temperature of the internal surface of the wall is 3.5 °C lower than the environmental temperature. This difference has a very important effect on living comfort;
2. the average temperature of the external facing masonry is approximately 15 °C lower than that of the internal facing masonry. The differential thermal elongation/shrinkage causes stress in the structure of the building;

3. the temperature of the external facing masonry is, on average, very low and reaches a minimum temperature which is below zero.

These conditions cause the interstitial vapour condensation, with a resulting degradation of the wall, which is further worsened by the formation of ice.

If we observe the temperature profile in the case of a wall insulated with the MAPETHERM thermal insulation system (Fig.4), we may notice the following differences:

1. the difference in temperature between the internal surface of the wall and the environmental temperature is reduced to 1°C, with a considerable improvement in living comfort;
2. the average temperatures of the external facing masonry and of the internal facing masonry are very similar to each other. This fact eliminates the conditions of stress caused by differential thermal shrinkage;
3. the temperature of the external wall facing masonry is such that it does not cause interstitial condensation of the humidity;
4. the large differences in temperature are localised in the insulation system, which nonetheless is perfectly capable of bearing such differences, given that it has been properly designed and installed complying with good practice rules.

From this latter consideration, it is clear how design and installation according to the concept of the system are important, as this is the only approach which guarantees performance and durability of the installation. The differences caused by the application of the insulation system are even more felt in the case where "thermal bridges" are present. These are localised areas characterised by large thermal losses, such as the joints between beams and columns or where the floor slabs intersect with bearing walls, situations which are always present in buildings.

Observing Figs. 5 and 6, we may notice how the presence of a thermal bridge, which lowers the local temperature of the internal surface of the wall to less than 14 °C, has little or no effect if the wall is insulated. This is because the reduction in temperature is limited to 0.1 °C, a difference which is not even noticeable. I would also like to point out that the presence of even a limited area of wall with a surface temperature of 14 °C, associated to the presence of damp and the growth of mould, leads to a situation which is unacceptable from a living comfort point of view and, what is worse, from a hygiene and sanitary point of view.

Finally, the localised thermal flow is almost double in the case of a wall without insulation, while the variation is within 10% if the wall is insulated.

I would now like to analyse more deeply the bond between the temperature of the internal surface of the wall and living comfort, which I briefly mentioned when commenting the temperature profiles established around and inside the perimeter wall. In our understanding of this bond, we are helped by Fanger's model, which is based on experimental data relative to subjective thermal sensations and on the thermal balance of the human body. According to Fanger's model, a person occupied in a sedentary activity loses 126 W through mechanisms such as breathing, transpiration, convection and radiation.

The model takes certain environmental parameters into consideration:

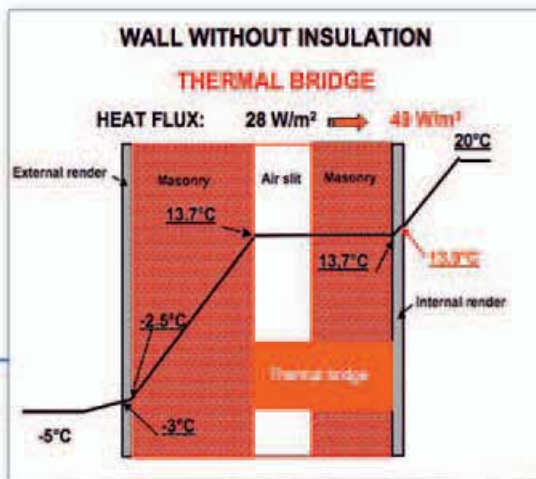
- air temperature;
- relative humidity;
- air speed;
- temperature of the wall.

The state of the person must also be taken into account and this is characterised by:

- level of activity
- clothing.

Regarding the temperature of the wall, the model highlights how a sensation of wellbeing or of discomfort is tied to the amount of energy radiated from the person towards the wall.

At the same environmental temperature of 20 °C, the amount of energy radiated – equal to 43 W with a wall temperature of 19 °C – rises to 58 W if the temperature of the wall is only 16.5 °C. A person's thermo-regula-



Figures 5 and 6. Temperature profiles.

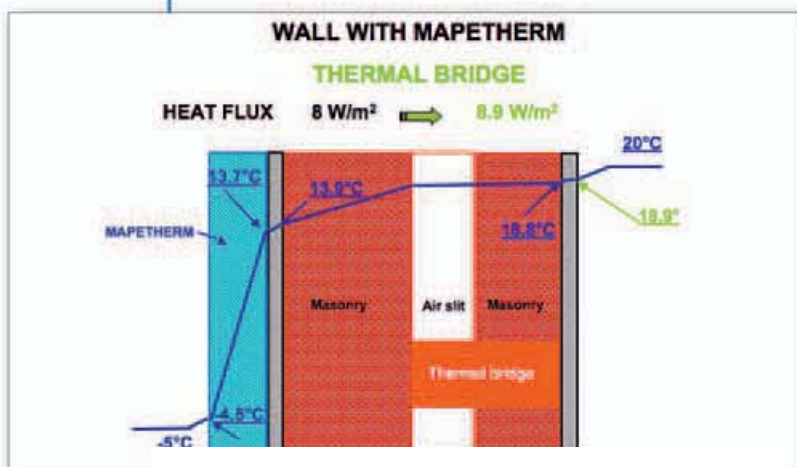
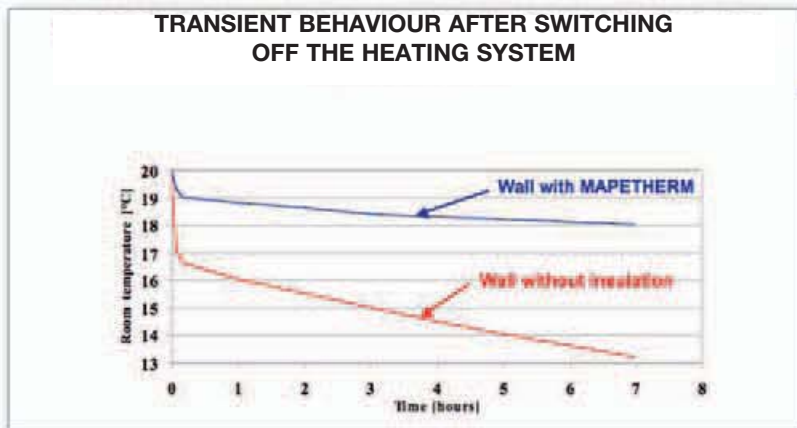


Figure 7. Variation over time of the room temperature.



tion mechanism compensates for the increase in heat loss, but the same person will feel cold, a warning that the conditions are not ideal. When the said person feels cold, he will tend to increase the environmental temperature to above the optimum value of 20 °C. In this way, however, the breathing, transpiration and convection mechanisms will also be influenced, to create a situation in which he will then feel warm.

In conclusion, we may state that the maximum level of living comfort is obtained when the temperature of the wall is as close as possible to the environmental temperature, a situation which may only be achieved with sufficient

thermal insulation. Situations in which there is a large difference between the temperature of the wall and the environmental temperature may be corrected by increasing the environmental temperature, but the same level of wellbeing will not be reached and energy costs will increase.

A further consideration to be made concerns the variations of the environmental temperature after the heating system has been switched off (see Fig. 7).

The variation over time of the environmental temperature is characterised by two distinctive phases:

- the first phase, which lasts for only a few dozens minutes, in which the temperature of the environment falls to the same temperature as the wall;
- a second phase, in which the drop in the temperature of the environment is proportional to the thermal flow through the wall.

From the graph illustrated, we may see how the presence of thermal insulation is the only method to guarantee a condition of comfort compatible with the sleeping period during the night after the heating system has been switched off.

The added value of the MAPETHERM thermal insulation system may be summarised as follows:

- living comfort tied to the presence of an optimum state of wellbeing, and of its constant stability, even after switching off the heating system during the night;
- preservation of the structure due to the elimination of conditions of stress in the wall, of the negative effects of thermal bridges and interstitial condensation phenomenon;
- reduction in energy consumption for heating during the winter and for air conditioning during the summer; savings may be calculated to be about 30%;
- increase in the value of a property located in a building with a higher energy classification rating;
- reduction in greenhouse-gas emissions, in line with current recommendations expressed by leading scientists.

These advantages, as previously stated, offer far more than a simple saving in energy requirements, which by itself is a very important factor. They also make an investment in MAPETHERM attractive from an economic-financial point of view. This becomes even more attractive in the case of an already planned maintenance work on perimeter walls: in this case, only the initial

marginal investment costs concerning the application of the thermal insulation system need to be considered.

Therefore Mapei, with MAPETHERM thermal insulation composite system, offers its clients a certified system which is at the top of the market from a quality point of view.

It is also a guarantee for a long-lasting, durable system supported by a 10-year Replacement Insurance Policy, and assistance in certifying the energy-saving standards of buildings where such systems have been applied.

For further information on the MAPETHERM thermal insulation system, a folder and a technical notebook are available and can be requested at Mapei SpA's Marketing Office (e-mail address: realtamapei@mapei.it - fax: +39 02 37673214). The technical data sheets of each product enclosed in the system are available from our website www.mapei.com.



MAPEI PRODUCTS WERE USED TO LAY VARIOUS TYPES OF FLOORS IN THE NEW HEADQUARTERS OF CSS INSURANCE COMPANY IN LUCERNE.

Installation INSURED

Thanks to over 1.2 million customers and 3 billion francs worth of premiums, CSS is one of the leading Swiss insurance companies employing about 2,000 staff, 600 of whom work at the headquarters in Lucerne. A new building has recently been constructed in the Tribschen neighbourhood of this city. It houses the Company's offices and commercial departments and also includes about 30 rented apartments.

The building work on the CSS headquarters took about two years and required the use of various chemical products supplied by the Mapei

Group's Swiss subsidiary, Mapei Suisse SA.

The Company's wide range of products and continuous on-site assistance provided by its expert technicians meant that all the technical problems emerging on the building site were handled in the appropriate way. Mapei proved its worth as an active partner throughout all the different stages in the work: from building the foundations to constructing the roof.

Over 20,000 m³ of concrete were needed to construct the entire building. Since the building's foundations are actually constructed on the water

table, special waterproof concrete had to be prepared with DYNAMON SX* admixture. The concrete surfaces in the underground garage, prepared using DYNAMON SX 18* accelerating superplasticizer, were treated with MAPETOP N* (a product only available on the Swiss and Austrian markets) for producing abrasion-resistant monolithic concrete. The cellars and rest of the structure's concrete parts were made from concrete formulated with DYNAMON SR 31* admixture.

The various types of floors laid inside the building were installed with the following Mapei adhesives: AQUACOL T*





5



6

Mapei Products:

the products referred to in this article belong to the "Products for Ceramic Tiles and Stone Materials"; "Products for the Installation of Resilient, Textile and Wood Floor and Wall Coverings" and "Admixtures for Concrete" ranges.

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

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

Adesilex V4 SP: universal adhesive in water dispersion with extended open time and very low emission of volatile organic compounds (VOC) for resilient flooring.

N.B. This product is now called **Ultrabond ECO V4 SP**.

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

Dynamon SX: superplasticizer based on modified acrylic polymer for concrete with low water/cement ratio for traditional and self compacting concrete.

Dynamon SX 18: accelerating superplasticizer based on modified acrylic polymer for concrete with good retention of workability.

Dynamon SR 31: modified acrylic-based superplasticizer for ready-mixed concrete with a low water/cement ratio and a long maintenance of its workability.

Mapestone 1 (C2F): fast hardening and drying mortar for small and medium laying beds.

N.B. This product is distributed on the Austrian and Swiss markets by Mapei's local subsidiaries.

Mapetop N: ready-to-use mineral dry-shake surface hardener.

N.B. This product is distributed on the Austrian and Swiss markets by Mapei's local subsidiaries.

Ultrabond P990 1K: ready-to-use polyurethane one-component, solvent-free, elastic adhesive for all types of wooden and laminate flooring.

Ultrabond P902 2K: two-component epoxy-polyurethane adhesive for wooden flooring.

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



Our thanks go to "Realta Mapei", no. 4, the in-house magazine published by Mapei's German, Austrian and Swiss subsidiaries, from which this article was taken.

Photos 1, 2, 3 and 4.

The various types of floors installed required the use of specific adhesives: from left, Aquacol T for the textile floors; Adesilex V4 SP (now called Ultrabond Eco V4 SP) for the PVC; Ultrabond P990 1K and Ultrabond P902 2K for laying the wooden floors.

Photos 5 and 6.

Some views of the corridors with their travertine floors bonded with Mapestone 1.

TECHNICAL DATA

CSS Headquarters, Lucerne (Switzerland)

Work: formulating the concrete for the building's foundations, structure and several elements of the cellars and the garage; hardening treatment of the concrete surfaces in the garage; laying travertine, textile, PVC and wooden inside floorings

Years: 2003-2005

Customer: CSS Versicherung, Lucerne

Project: Andrea Roost, Bern

Work Management: Bruno Schubiger

Contractor: Anliker AG, Emmenbrücke (Switzerland)

Installation Companies: Marcel Bernasconi, Rotkreuz (Switzerland) for the textile, PVC and wooden floors; Catenazzi AG, Kriens (Switzerland) for the travertine floors.

Mapei Co-ordinators: Marco Ballidoro and Martin Schneider, Mapei Suisse SA

for the approximately 6,000 m² of textile coverings in some of the offices; ULTRABOND P990 1K* for the approximately 3,500 m² of maple floors in the apartments and other offices; ULTRABOND P902 2K* for laying the parquet on the stairs; ADESILEX V4 SP* (this product is now called ULTRABOND ECO V4 SP*) for the approximately 2,000 m² of PVC installed in other interior premises; MAPESTONE 1* (a product only available on the Swiss and Austrian markets, ideal for installing stone slabs with high thickness tolerances) for approximately 6,000 m² of travertine installed in the corridors and on the stairs.

The joints of this latter type of covering were grouted using ULTRACOLOR PLUS* high-performance grout; the product was chosen from the wide range of colours available in a vanilla shade which matched the colour of the slabs of travertine.

Thanks to the help of everybody involved, the work was completed on schedule and the floors were installed to perfection.



Ready to set off again

THANKS TO MAPEI PRODUCTS, THE FLOORS IN FRANKFURT CENTRAL RAILWAY STATION WERE QUICKLY INSTALLED WITHOUT CAUSING PASSENGERS TOO MUCH DISTURBANCE



The walkways leading to the platforms before the redevelopment work. The main entrance to Frankfurt Central Station.



Frankfurt Central Station is the most important crossroads of people and goods in the Rhine and Main area and also, along with Leipzig and Hamburg stations, one of the busiest railway complexes in Europe ever since it first opened on 18th August 1888.

700 long-distance trains and a further 1000 serving the city transport network arrive at and depart from the station's 25 platforms (24 main and 1 secondary platform) every day, serving a total of 350,00 passengers.

The outside of the station complex stands out for its neo-Renaissance style façade with three entrances separated by two huge columns. Up

above them there is a clock decorated with statues representing the day and night, and the logo of Deutsche Bahn, the German company which runs the national rail network.

There are two main areas inside the station: the lobby or, in other words, the area designed to welcome passengers, and the area over by the platforms providing access to the trains. There are four lateral wings to the north and south combining with the central lobby, where the ticket office and supermarket are located plus other services; the top floor, on the other hand, accommodates the lounge for VIP passengers on the German railways. The area leading to the 24

platforms extends just beyond the lobby over towards the west. Right below this area, a network of tunnels caters for the underground and local transport service lines serving the city and surrounding areas.

Cutting-edge Facilities and Maximum Comfort

Over recent years a series of building projects have involved this station and really boosted the image of both the city of Frankfurt and the German Railways Company.

Railway stations are nowadays expected to take on some real challenges in terms of facilities and safety, particularly in order to withstand rising com-



Photo 1.
Preparing the concrete substrate reinforced with metal meshing.

Photo 2.
The bonded screeds made from Mapecem were treated using Eporip epoxy adhesive.

Photo 3.
All the screeds were prepared with Mapecem special hydraulic binder.

Photos 4, 5 and 6.
Mapestone 1 adhesive was used for laying the granite floors and pre-cast concrete square blocks for the guided pathway for the blind.

Photo 7.
The granite surfaces after the installation operations had been carried out.

petition from German airports, many of which (i.e. those in Munich, Hamburg, Düsseldorf and Stuttgart) have been given genuine makeovers over the last few years. As well as expecting the station facilities to be as functional as possible, German railway passengers are also looking for top-class services in an extremely pleasant environment. This is why the building works also included targeted projects designed to make the station look extremely modern and up-to-date.

New Floors for a Revamped Station

The project to redevelop Frankfurt Central Station involved a number of areas, such as the shops, ticket office, general offices, etc.

Notable among all the key works were the restructuring of the vaulted roof (protected by law as part of the national architectural heritage) carried out from November 2002 to September 2005, and repair work on the floors, which began in 2006 and was completed in January 2007.

The laying of the 10,000 m² of flooring was divided into two stages, the first regarding an area of 3,000 m² and the second involving the remaining 7,000 m².

The client, Deutsche Bahn AG, chose a dark grey-coloured G 654 Chinese granite, highly resistant to foot, goods and luggage traffic, as well as to the effects of cleaning and maintenance operations.

Because the works had to be carried





out without interfering with the smooth running of the station, the installation materials used had to have very specific properties such as, for example, fast setting and drying and high resistance to compression attainable in a very short lapse of time.

It was, therefore, decided to choose an installation system capable of meeting these needs, which, down the years, has risen brilliantly to the challenges posed by numerous building site projects.

To ensure all the flooring could withstand heavy loads, repair work began by preparing a new concrete substrate reinforced with metal mesh. The screed on top of it was formed in two ways: bonded screeds were formed for thicknesses of less than 65 mm (with EPORIP* epoxy adhesive then applied to help adhesion) and unbonded screeds were formed for thicknesses equal to or over 65 mm.

In both cases the screed was prepared using MAPECEM* special fast setting and drying hydraulic binder.

Once the substrates had been completed, the slabs of granites were installed using the improved MAPESTONE 1* mortar (a product which is only available on the Austrian and Swiss markets).

MAPESTONE 1* was used for installing about 350 m² of pre-cast concrete square blocks with straight grooves creating a guided pathway for the blind.

As regards the flooring located beyond the platforms, on the other side of the railway bumpers, installation was carried out over a highly deformable and flexible steel substrate.

This metal structure is designed to absorb any bumps and bangs from trains in case of brake failure.

The granite slabs were bonded to the steel substrate with KERALASTIC* high-performance polyurethane adhesive.

The floor joints were grouted using KERACOLOR FUGENSCHLÄMMMÖRTEL* cementitious mortar (a product only available on the Austrian and German markets).

The joints in those sections which needed to be laid particularly quickly, because pedestrian traffic could not be blocked for long, were, on the other hand, grouted using ULTRACOLOR PLUS* high-performance grout. This product, guaranteeing fast setting and drying, allows grouted slabs to be cleaned and brought back into operation without blocking pedestrian traffic for too long.



Our thanks go to "Realta Mapei", no. 5, the in-house magazine published by Mapei's German, Austrian and Swiss subsidiaries, from which this article was taken.

*Mapei Products:

the products referred to in this article belong to the "Products for Ceramic Tiles and Stone Materials" range. The technical data sheets are available on the "Mapei Global Infonet" DVD or at the web site: www.mapei.com. Mapei's adhesives and grouts conform to EN 12004 and EN 13888 standards.

Eporip: two-component epoxy based adhesive for cold joints and monolithic sealing of cracks in screeds.

Keracolor Fugenschlämmörtel (CG2): cementitious grout for joints from 4 to 14 mm of inside and outside floorings. N.B. This product is distributed on the German and Austrian markets by Mapei's local subsidiaries.

Keralastic (R2): high performance two-component polyurethane adhesive for ceramic tiles and stone material.

Mapecem: special fast setting hydraulic binder for the preparation of fast-drying screeds (24 hours) with controlled shrinkage.

Mapestone 1 (C2F): fast hardening and drying mortar for small and medium laying beds.

N.B. This product is distributed in the Austrian and Swiss markets by Mapei's local subsidiaries.

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

TECHNICAL DATA

Frankfurt Central Railway Station,

Frankfurt on the Main (Germany)

Work: preparing the substrates and laying natural stone floorings and pre-cast concrete blocks

Years: 2006-2007

Customer: Deutsche Bahn Station & Service

Project: Deutsche Bahn Projektbau, Frankfurt

Work Management: Roland Kraft of Zeidler & Wimmel, Würzburg (Germany)

Contractor: Zeidler & Wimmel

Installation Company: KLK Estrich- und Fußbodenbau, Wiesbaden (Germany)

Installed Materials: G 654 Chinese granite slabs supplied by Zeidler & Wimmel; pre-cast concrete square blocks with straight grooves supplied by ÖBS GmbH, Ahrensburg (Germany).

Mapei Co-ordinators: Andreas Poitz, Peter Kriegel, Richard Nüßler, Klaus Held, Walter Mauer – Mapei GmbH (Germany)

ECO LEED(ER)

Products that are leaders on the market for the LEED Certification

L EED – which stands for Leadership in Energy and Environmental Design – is a voluntary, consensus-based nationally accepted standard for developing high-performance, sustainable or “green” buildings in the U.S.A and Canada. Developed by the U.S. Green Building Council (USGBC), LEED provides a complete framework for assessing building performance and meeting sustainability goals. LEED certifies state-of-the-art strategies that emphasize benefits for the environment, economy, health and community through sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.

This new certification is well likely to transform the building market, raising consumers’ awareness of green-building benefits and having them opt for environmentally friendly products as,

for instance, those supplied by Mapei. LEED certification applies only to building projects. Products cannot be LEED-certified but they can contribute points towards earning “green-building” status for a building and Mapei has more than 100 products that do so.

Mapei has demonstrated environmental leadership in the flooring industry by adopting green-building practices since the 1980s. Mapei succeeded in developing environmentally friendly products which were launched on the U.S market already in the 1990’s. The Company currently offers more than 100 low-VOC, green products to the industry. Using them can earn up to 8 points towards a LEED-certified project in 2 performance areas: Materials and Resources, and Indoor Environmental Quality.

Among these products one finds adhesives for the installation of different kinds of floor and wall coverings (such as cera-

mics, natural stones, wood, PVC, textile and resilient materials, etc.), as well as systems for the preparation of the substrates and for concrete repair (such as primers, self-levelling and smoothing compounds, mortars, etc.).

Mapei products’ excellent performances and environmentally friendly nature are well known and appreciated on the North-American market and they are used on many prestigious building projects throughout the U.S.A. and Canada. The article on pages 40-41 provides an example of the application of Mapei products for the installation of PVC and textile floorings. The job was accomplished in the British Columbia Cancer Agency Research Centre (BCCRC) in Vancouver, which was the first healthcare building in Canada to achieve LEED NC Gold certification for its environmentally friendly design and operation performances. 



✓ This logo denotes products containing Mapei's **BioBlock®** technology. For further information on this technology, please visit the website www.mapei.com.



LEED is a registered trademark of the U.S. Green Building Council.

Life with Mapei

Health and wellbeing are ensured when using Mapei ECO line products.

By Francesco Stronati, Mapei SpA Technical Service Department

For many years, Mapei has been pointing their research in the direction of developing products which are safe for the environment, installers and end users.

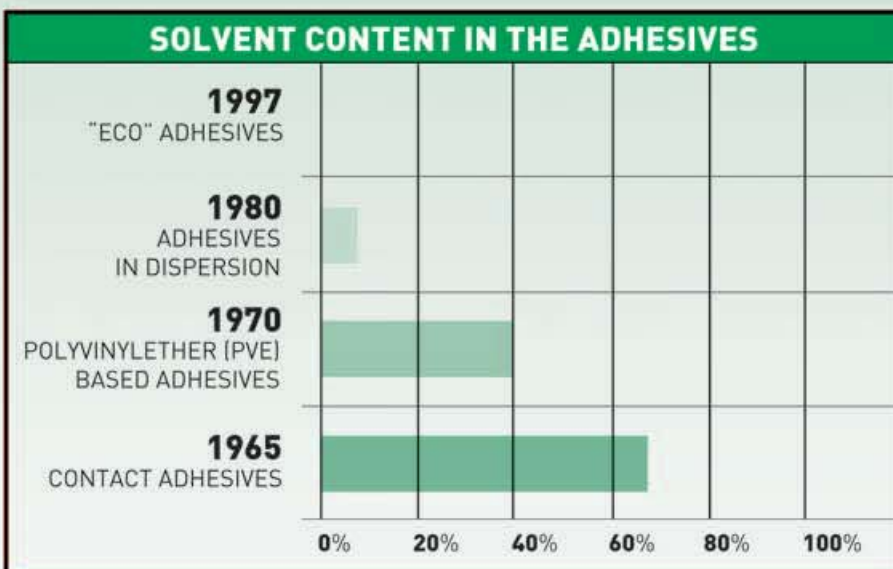
Unfortunately, in many countries there are no specific norms and standards for correctly and commercially identifying "ecological" products. Often, installers and contractors are misled by friendly, catchy slogans and tend to choose products which do not respect the environment and our health.

The main problem when using these products is the emission of volatile organic compounds, such as solvents, biocides and plasticisers, which may cause considerable pollution problems to the air in living areas, the so-called indoor pollution. In the 1970's Mapei brought products in water dispersion and with low solvent levels onto all the markets, products which do not require fire-protection certificates for inflammable substances.

In these products, even if the percentage is low, there is still a certain amount of solvent present, and this problem is particularly felt in countries which are highly committed to the use of safer chemical products.

Mapei's commitment was further enhanced, therefore, by research programmes for developing products with an extremely low emission level of volatile organic substances (VOC) to improve wellbeing in the buildings where they are employed. Thus, the Mapei "ECO" range was born, easily recognisable by the green flower symbol.

The products in the ECO range were initially launched by Mapei on the American market in the 1990's. They were then introduced to the European market, and in





only a short time they replaced most products with a conventional dispersion base.

Since October 2005, the products in the ECO range, which had already been tested and certified by internationally recognised institutions such as the German TFI (Teppich-Forschungsinstitut) and by the American CRI (Carpet and Rug Institute), bear the "EMICODE EC1 – very low emission level of volatile organic compounds" mark, awarded by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe Klebstoffe und Bauprodukte e.V.), an association which controls the emission levels of products for floors, and of which Mapei is now a member.

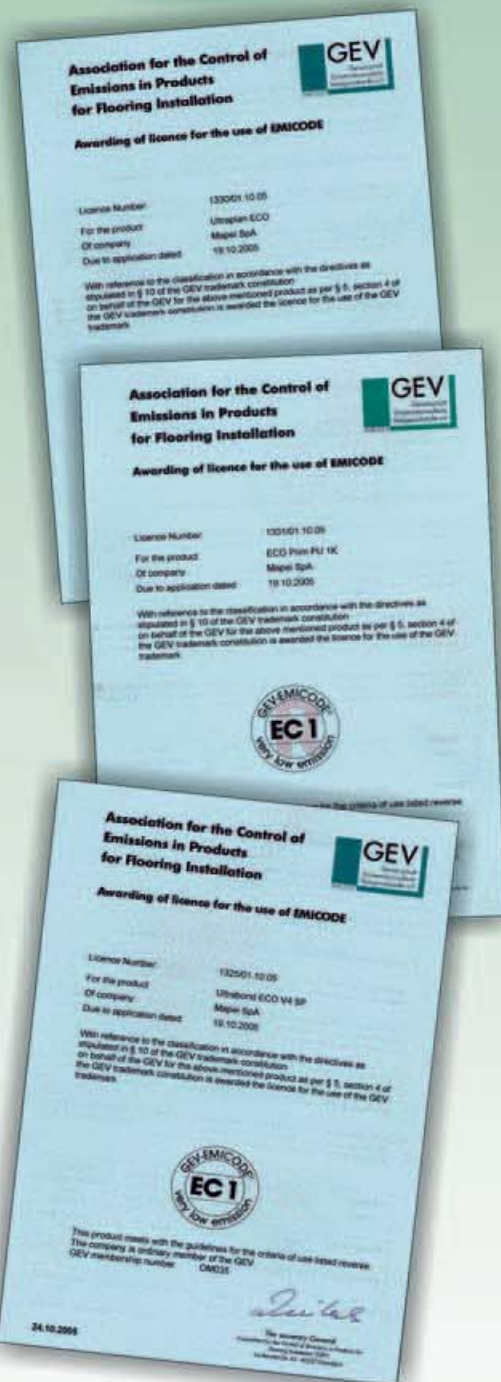
In order to apply the EMICODE EC1 mark on adhesives, the residual emission level of organic compounds given off by the said adhesives, measured 10 days after laying, must be less than 500 µg/m³ of air.

The EMICODE EC1 mark is also applied on primers (residual emission level after 10 days < 100 µg/m³ of air) and on smoothing and levelling compounds (residual emission level after 10 days < 200 µg/m³ of air).

Every product has been awarded the GEV certificate, and they are available for our clients upon request.

To solve even the most diverse laying problems, therefore, complete "ECO" systems made up of EMICODE EC1 certified products may be employed.

For further information on these products see the technical data sheets at www.mapei.com.



VOLATILE ORGANIC COMPOUND EMISSION			
	Solvent-based Adhesives	Water-based Adhesives	EMICODE EC1 Adhesives
RESIDUAL EMISSIONS AFTER 10 DAYS AFTER THE LAYING	500-10000 µg/m ³	4000-5000 µg/m ³	< 500 µg/m ³



ECO PRODUCTS FOR THE PREPARATION OF SUBSTRATES

BONDING PROMOTION PRIMERS

PRIMER G: synthetic resin-based primer in water dispersion.
ECO PRIM T: solvent-free acrylic primer in water dispersion.

CONSOLIDATING AND WATERPROOFING PRIMERS

ECO PRIM PU 1K: single component, hydro-hardening polyurethane primer.

SMOOTHING COMPOUNDS

ULTRAPLAN ECO: self-levelling, ultra-quick-hardening smoothing compound, for thicknesses of from 1 to 10 mm.

ECO ADHESIVES FOR LAYING RESILIENT AND TEXTILE FLOORING AND COATINGS

RUBBER FLOORS

ULTRABOND ECO V4SP: multi-purpose adhesive in water dispersion with extended open time, for absorbent and non-absorbent substrates.

ULTRABOND ECO VS90: multi-purpose acrylic adhesive in water dispersion, with high initial bond.

ADESILEX UP71: two-component polyurethane adhesive for laying resilient materials internally and externally on both absorbent and non-absorbent substrates.

LINOLEUM FLOORS

AQUACOL T: acrylic adhesive in water dispersion to improve dimensional stability of floor coverings.

ULTRABOND ECO 540: acrylic adhesive in water dispersion, good buttering of the back of the dressing material and high initial bond.

VINYL FLOORS

MAPECRYL ECO: rapid-setting acrylic adhesive in water dispersion.

ULTRABOND ECO 350: multi-purpose adhesive in water dispersion with extended open time, for absorbent substrates.

ULTRABOND ECO V4SP: multi-purpose adhesive in water dispersion with extended open time, for absorbent and non-absorbent substrates.

ULTRABOND ECO VS90: multi-purpose acrylic adhesive in water dispersion, with high initial bond.

ADESILEX UP71: two-component polyurethane adhesive for laying resilient materials internally and externally on both absorbent and non-absorbent substrates.

TEXTILE FLOORS

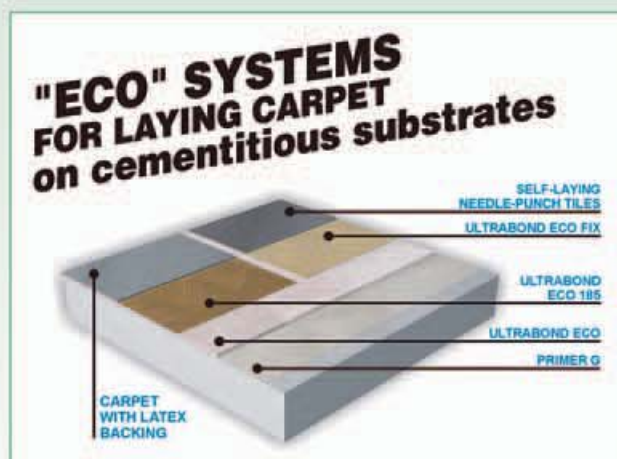
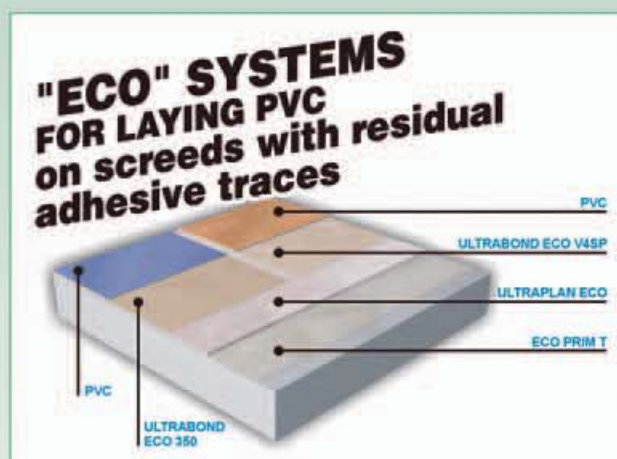
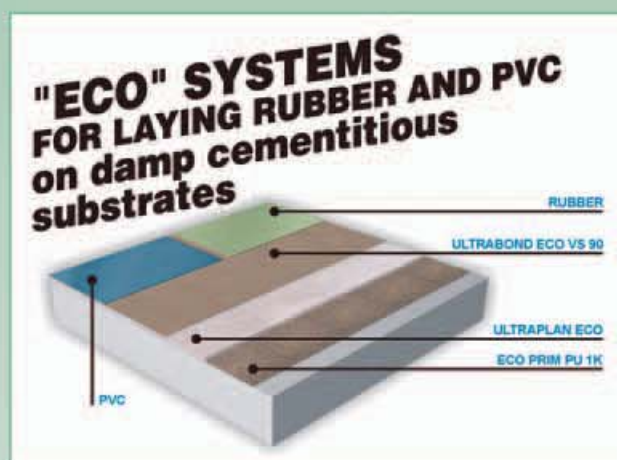
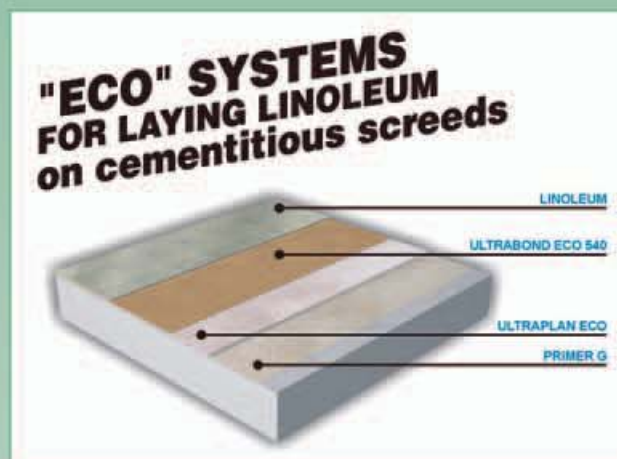
AQUACOL T: acrylic adhesive in water dispersion, to improve dimensional stability of floor coverings.

MAPECRYL ECO: rapid-setting acrylic adhesive in water dispersion.

ULTRABOND ECO 185: acrylic adhesive in water dispersion, with high initial bond.

SELF-LAYING TILES

ULTRABOND ECO FIX: adhesive in water dispersion, permanent tack.



Winning gold by going green

Environmentally friendly products were used to build an unique cancer centre

The British Columbia Cancer Research Centre (BCCRC) in Vancouver is the largest Canadian freestanding facility of its kind. It encompasses eight specialized departments housing 60 leading scientists that will study 200 known types of cancer. The BCCRC was also the first healthcare building in Canada to achieve LEED NC GOLD certification for its environmentally friendly design and operation. Awarded by the Canada and United States Green Building Councils, the Leadership in Energy and Environmental Design (LEED) designation goes to cutting-edge buildings that incorporate sustainable design, construction and operational features promoting environmental responsibility and energy efficiency (see the article on page 36). By utilizing innovative design approaches, the highly adaptable, functional and cost-effective 21,554-m² BCCRC was completed in the spring of 2005. A variety of green strategies were used to significantly reduce energy consumption, promoting water conservation while optimizing indoor environmental quality. Mapei contributed by having several of its LEED-compliant products specified and installed in this research centre. When it came to the PVC floors in the labs and the textile floors in the offices and in the auditorium, the project team relied on Mapei to ensure that only environmentally friendly, low-VOC, LEED-compliant interior materials were installed over 18,581 m² of the building's floors.

To prime, level and repair 11,613 m² of concrete substrate before the installation of carpet in offices and of PVC sheet vinyl in laboratories, solvent-free PRIMER L* acrylic, latex primer was used. ULTRAPLAN 1* self-leveling compound was then applied on the surfaces. To smooth over random holes, voids and depressions in concrete, PLANIPATCH PLUS* fast-setting patching system was utilized. In the facility laboratories PVC vinyl flooring was installed using ULTRABOND ECO 350*, solvent-free, low-VOC adhesive. To set the rubber cove that trimmed the homogenous PVC, ULTRABOND ECO 575* was used. This adhesive offers exceptional wet grab and provides a tough



bond to rubber, vinyl and carpet, even on challenging corners. Several thousand square meter textile floors were installed in the offices and lecture auditorium using ULTRABOND ECO 185* solvent-free, high-performance adhesive. The use of Mapei environmentally friendly products definitely contributed to the successful implementation of sustainable design strategies in the BCCRC, which resulted in remarkable achievements: energy usage was reduced 42% and potable water consumption was reduced 42% when compared with a standard facility, according to the local Model National Energy Code for Buildings. Furthermore, the building utilizes 24% recycled construction and finishing materials. After the completion of the BCCRC, Vancouver can boast a prestigious record: in 2005 the city logged 5 LEED-registered projects, more than any city in Canada.

This article was taken from "Realtá Mapei Americas", no. 04, the in-house magazine edited by Mapei Americas, which we would like to thank.



TECHNICAL DATA

BCCRC (British Columbia Cancer Research Centre), Vancouver (Canada)
Work: laying PVC floorings in the offices and textile floorings in the offices and in the lecture auditorium
Year: 2005
Customer: British Cancer Foundation, Vancouver
Project: Henriquez Partners and IBI Group, Vancouver
Installation Company: Maxwell Floors, Surrey, Canada
Mapei Distributor: Pacific Rim Flooring, Surrey
Mapei Co-ordinator: Dave Hamilton, Mapei Corp.

***Mapei Products:** Primer L, Planipatch Plus, Ultrabond ECO 185, Ultrabond ECO 350, Ultrabond ECO 575, Ultraplan 1. The products referred to in this article are manufactured and distributed in America by Mapei Corp. (USA) and Mapei Inc. (Canada). For further information, see the web site www.mapei.com.



SALON DU M

A new perspective on the materials

Again this year, the Salon du Meuble, a real showcase of the latest proposals of the furniture and interior design market, took place in Paris, Porte de Versailles, from 20th to 25th January. This appointment was attended by 1,000 exhibitors, coming from over 50 countries, with stands covering a total surface of 120,000 m². The 2007 edition of this fair saw 40,000 visitors (mostly buyers, architects and interior designers) meeting the international producers.



EUBLE 2007

The organization of the fair amazed the visitors for both the space arrangement and the mounting; the new solutions of the interior design market were exposed in four halls, targeting a professional public. Each hall was devoted to a specific field: classic furniture; contemporary furniture; chairs and bedding; miscellany of solutions.

The organizers chose to leave Hall 4 open to the public for the whole period of the fair. The visitor entering this huge exhibition space, especially dedicated to original and creative solutions, was transported into a luminous world which combined objects of daily use with avant-garde solutions, the interior with the exterior, the ancient with the contemporary. He would explore a new space, where the walls became transparent and the vegetation entered the home.

The Italian presence was particularly eye-catching, due to the amazing home projected by the designer Paola Navone and titled: "Low-cost luxury: bohemian bourgeoisie".

This featured an interior space mixing handcraft and high technology, trash pieces and design objects, contemporary art and rusty tools. There were rough materials as well as refined decorations in the kitchen; huge white canapés in the sitting room; a shower just in the middle of the sleeping room....

The designers of this fascinating universe were able to combine the materials and the human being, softening the walls that separate people from their natural environment. Furthermore, they discovered a new aesthetic function in the building materials. Mapei products played a major role in this job and were used on the house's external (Photo 1) and internal walls (Photo 4), as well as on the fridge's outside surfaces (Photo 2) and on the floorings of the sitting room.

The floors were made with MAPEFLOOR I 300 SL (Photo 3), two-component epoxy treatment used to obtain self-levelling multi-layer and non-slip floor coverings; PLANITOP 200, one-component cementitious mortar, was used for smoothing and finishing the external and internal walls (Photo 4). Ceramic tiles were laid with the adhesive ADESILEX P22 PLUS (a product only manufactured and distributed in France by Mapei France) while the tile joints were grouted with ULTRACOLOR PLUS high-performance grout. The grey shade of ELASTORAPID (Photo 1 and 2), high-performance two-component cementitious adhesive, was used for creating original rib-shaped decorating patterns on the external surfaces of the fridge. White KERAPOXY, two-component acid-resistant epoxy adhesive (which can also be used as a grout), was used for bonding the mosaics coverings and grouting the joints on a table (Photo 5).



Our thanks go to "Mapei and Vous", n. 19, published by Mapei France, from which this article was taken.



Photo: Omega Telecronache

ONE OF THE MOST FAMOUS STADIUMS IN THE WORLD OFFICIALLY REOPENED THIS YEAR

A BRAND-NEW W



Wembley Stadium is one of the most famous football grounds in the world. The original construction was built for the 1924 British Empire Expo, opened by King George Vth in 1923 and therefore named the "Empire Stadium". The FA Cup (the English national football cup) final was held on the same day the stadium opened and 126,945 spectators packed into the ground to watch the game, still the stadium's record crowd. Back then the stadium was a cutting edge structure composed of one single ring of terraces capable of accommodating 100,000 spectators, 45,000 of whom were seated. Part of the main stand was roofed over where the royal box was located. Wembley was (and the new construction still is) one of only a few English stadiums with an athletics track running around it; the 1948 Olympic Games were actually held at the stadium. The old stadium was knocked down in 2003 and has now been replaced by the new Wembley Stadium, which officially opened on the 24th of May with an international friendly between England and Italy Under 21's. Then,



WEMBLEY STADIUM

after being held elsewhere for a number of years, the stadium hosted a hard-fought FA Cup final between Manchester United and Chelsea on 19th May, with Chelsea winning its first FA Cup. The new Wembley Stadium is the most expensive ever built - £ 798,000,000 - and is designed in the form of a bowl capable of accommodating 90,000 spectators, all seated (it has the second highest capacity in Europe after the Camp Nou in Barcelona).

Even though it is designed for hosting football matches, the new stadium - like its predecessor - can also be used for holding international athletics meetings. In these cases, to ensure everybody gets a good view, the athletics track will only be installed when required, covering part of the playing field and seating area (the capacity will be reduced to 60,000), and then removed after the event.

The new stadium, designed by Foster & Partners, has a striking steel arch built on top of the North Stand, which is 133 m high and 315 m long, holding up the stadium roof; the roof is divided into three sections which, in the case of rain, can be closed in approxi-

mately 40 minutes. It took 90,000 m³ of concrete and 23,000 tons of steel to build the new sports facility; at times over 3,500 builders were involved in the construction work.

Mapei products were used on various parts of the overall structure, both for preparing the substrates and installing tiles on floors and walls.

Floors. ULTRAPLAN ECO* self-levelling smoothing compound was used for preparing the floor substrates in the main lobbies, all the restaurants, the toilets for 2,618 spectators and locker rooms for the athletes. This product has a very low content of volatile organic compounds and is ideal for floors subject to heavy foot traffic and other loads.

To improve the compound's adhesion to the concrete surface, a layer of ECO PRIM R* primer in water dispersion (N.B: this product has now been superseded by ECO PRIM T), also with a very low emission of volatile organic compounds, was applied. MAPETEX SYSTEM* was used to create an anti-fracture and removable membrane before laying the tiles in these areas: MAPETEX* non-woven fabric was bonded to the substrate using KERA-

QUICK* adhesive mixed with LATEX PLUS* latex admixture.

KERAQUICK*+LATEX PLUS* was also used to install 60x60 cm and 60x40 cm ceramic tiles on the floors in the lobbies, restaurants, toilets, athletes' locker rooms and 1.4 mx20 mm wide curved porcelain tiles on the stairs .

LATEX PLUS* improves deformability in order to meet the requirements of S2 class (highly deformable adhesive) according to EN 12002 standard. The tile joints were grouted using KERA-COLOR GG* cementitious mortar in anthracite. The expansion joints were sealed using MAPESIL AC* silicone sealant in the same colour.

Walls. KERAQUICK* mixed with LATEX PLUS* was again used in the athletes' locker rooms for installing the 20x20 mm porcelain tiles on the walls; the grouting was carried out using KERA-COLOR FF*, again anthracite-coloured, and the expansion joints were sealed using MAPESIL AC*.

The same products were used for installing the 50x50x5 mm porcelain tiles in the toilets for the spectators. Thanks to Mapei's wide colour range, the tile and expansion joints could be made in the same shades as the tiles.



***Mapei Products:**

the products referred to in this article belong to the "Building Speciality Line," "Products for Ceramic Tiles and Stone Materials" and "Products for the Installation of Resilient, Textile and Wood Floor and Wall Coverings" ranges. The technical data sheets are available from the "Mapei Global Infonet" DVD and at the website: www.mapei.com. Mapei adhesives and grouts conform to EN 12004 and EN 13888 standards.

Eco Prim R: solvent-free neoprene primer in water dispersion with very low emission of volatile organic compounds (VOC). N.B: this product has now been substituted by Eco Prim T.

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

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

Keraquick (C2FT): high performance, deformable, rapid-setting cementitious adhesive, with no vertical slip, for ceramic tiles and stone material.

Latex Plus: latex admixture inducing elasticity to be mixed with Keraquick.

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

Mapetex System: completely removable installation system for ceramic tiles and stone material. Can also be used as an anti-fracture and removable membrane.

Ultraplan Eco: ultra-fast hardening self-levelling smoothing compound for thicknesses of 1-10 mm, with very low emission of volatile organic compounds.

Photos 1, 2 and 3 by courtesy of Foster & Partners, whom we would like to thank.

TECHNICAL DATA

Wembley Stadium, London (UK)

Work: preparation of substrates, installation and grouting of ceramic and porcelain tiles in the main lobbies, locker rooms, toilets, restaurants and stairs

Years: 2005-2006

Customer: Wembley National Stadium Ltd – concession to The Football Association

Project: Foster & Partners, HOK Sport, London

Contractor: Multiplex, Australia

Installation Company: WB Simpson & Sons Ltd, Surrey (UK)

Mapei Distributor: Domus Tiles, London

Mapei Co-ordinator: Phil Breakspear, Mapei UK

TAKING THE TUBE TO THE STADIUM



RENOVATION OF ONE OF THE TUBE STATIONS SERVING WEMBLEY STADIUM

The new Wembley Stadium is served by three London tube stations: Wembley Central, Wembley Stadium and Wembley Park. The latter first opened in 1894 and was then renovated in 1947 ready for the Olympic Games, which were held at the old Wembley Stadium the following year. Recent renovation work on the station was required not only to modernize the existing spaces, enhancing them with other brand new premises, but also because the TFL – Transport for London company - was expecting average passenger flows for football matches and concerts of 37,500 passengers an hour. The average flow in the past was only 22,000 an hour. The station redevelopment project involved modernizing the platforms and waiting rooms, extending the stairways leading to Olympic Way and the ticket office for season ticket holders, upgrading some of the canopies, and the construction of five new lifts, fire escapes and a new ticket office for special events. This latter space, located by the ticket office for season ticket holders, involved the use of various Mapei products recommended by both the project designers and installation company.

Installing the coverings. 20x10 cm ceramic tiles were laid on the walls of the new ticket office for special events, while 20x20 cm tiles were chosen for the floors. In both cases the tiles were bonded using KERABOND* cementitious adhesive mixed with ISOLASTIC* flexible latex additive instead of a water, in order to meet C2 class standards (improved cementitious adhesive), in accordance with EN 12004, and also S2 class standards (highly deformable adhesive), in accordance with EN 12002. The tile joints were grouted with fast setting and drying ULTRACOLOR* mortar (this product has now been substituted by ULTRACOLOR PLUS), which does not produce efflorescence as time passes by. The expansion joints were sealed using MAPESIL AC*.

***Mapei Products:** the products referred to in this article belong to the "Products for Ceramic Tiles and Stone Materials" range. The technical data sheets are available from the "Mapei Global Infonet" DVD and the website: www.mapei.com.

Mapei adhesives and grouts conform to EN 12004 and EN 13888 standards.

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

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

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

Ultracolor (CG2): fast setting and drying, high-performance, anti-efflorescence grout for joints of 2-20 mm. N.B.: this product has been substituted by Ultracolor Plus.

TECHNICAL DATA

Wembley Park Station, London Underground (UK)

Works: re-tiling of the floors and walls of the ticket office for special events inside the underground station

Year: 2006

Customer: TFL – Transport for London

Project: Pascall & Watson Architects, London

Installation Company: Strata Tiles, London

Mapei Distributor: Strata Tiles

Mapei Co-ordinator: Simon Pashley, Mapei UK

PRODUCT SPOTLIGHT

One-component, fluid, polyurethane sealant with a high modulus of elasticity, for sealing joints subject to movements up to 7.5%

Mapeflex PU55 SL



MAPEFLEX PU55 SL is ideal for sealing cracks and fraction joints subject to limited movements on:

INDUSTRIAL FLOORINGS SUBJECT TO MEDIUM AND STRONG VEHICULAR TRAFFIC

INDOOR CAR PARKS, SUPERMARKETS, COMMERCIAL GALLERIES

OLD CONCRETE FLOORINGS WHERE **MAPEFLOOR SYSTEM** HAS TO BE APPLIED

✓ **Ideal for Interiors**

✓ **High Elasticity Modulus up to 7.5%**

One-component, fluid, polyurethane sealant, with a low modulus of elasticity, for sealing joints subject to movements up to 25%

Mapectflex PU50 SL

MAPEFLEX PU50 SL is ideal for sealing cracks, fraction and expansion joints subject to high movements on:

INDOOR AND OUTDOOR CAR PARKS

FLOORINGS IN SERVICE AREAS, CAR-WASHES, LARGE SQUARES AND AIRSTRIPS

TERRACES TREATED WITH CERAMIC TILES AND NATURAL STONE

FLOORINGS MADE WITH **MAPEFLOOR SYSTEM**

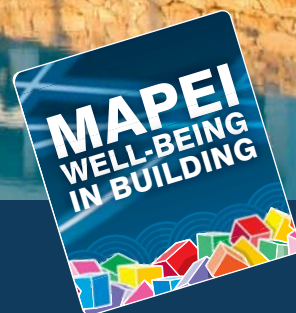
FLOORINGS MADE WITH **ULTRATOP SYSTEM**

✓ **Ideal for
Exteriors
and Interiors**

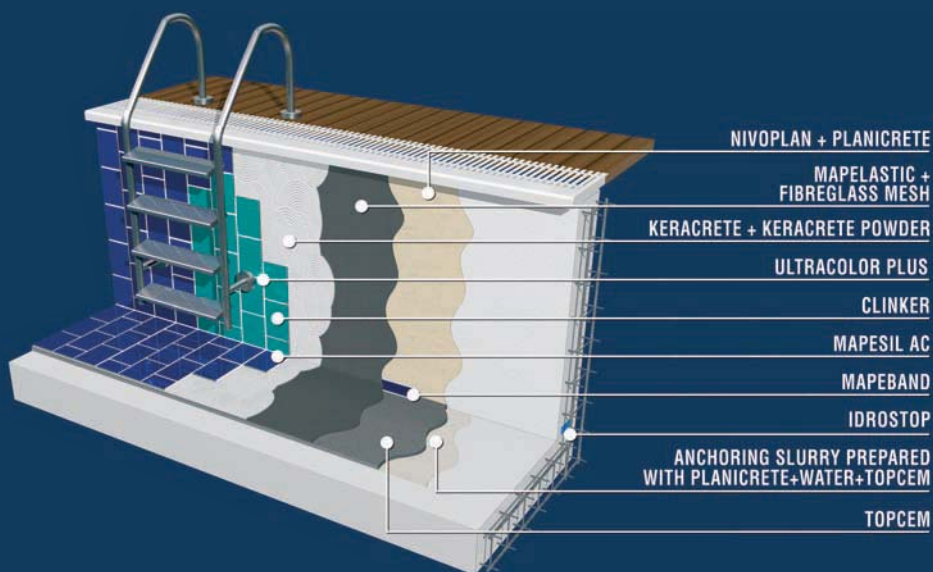
✓ **Low Elasticity
Modulus
up to 25%**



“This weekend we will stay at home”



Systems for Building and Waterproofing Swimming-pools



It is wonderful to dive into the well-being Mapei can provide. When building new swimming-pools or renovating existing ones, you can rely on the Mapei System for Waterproofing Swimming-pools. This is a complete range including products for building and waterproofing reinforced concrete structures, adhesives for laying ceramics and glass mosaics, grouts for tile joints and sealants for expansion joints. Do you love your home? Mapei, sweet Mapei!

