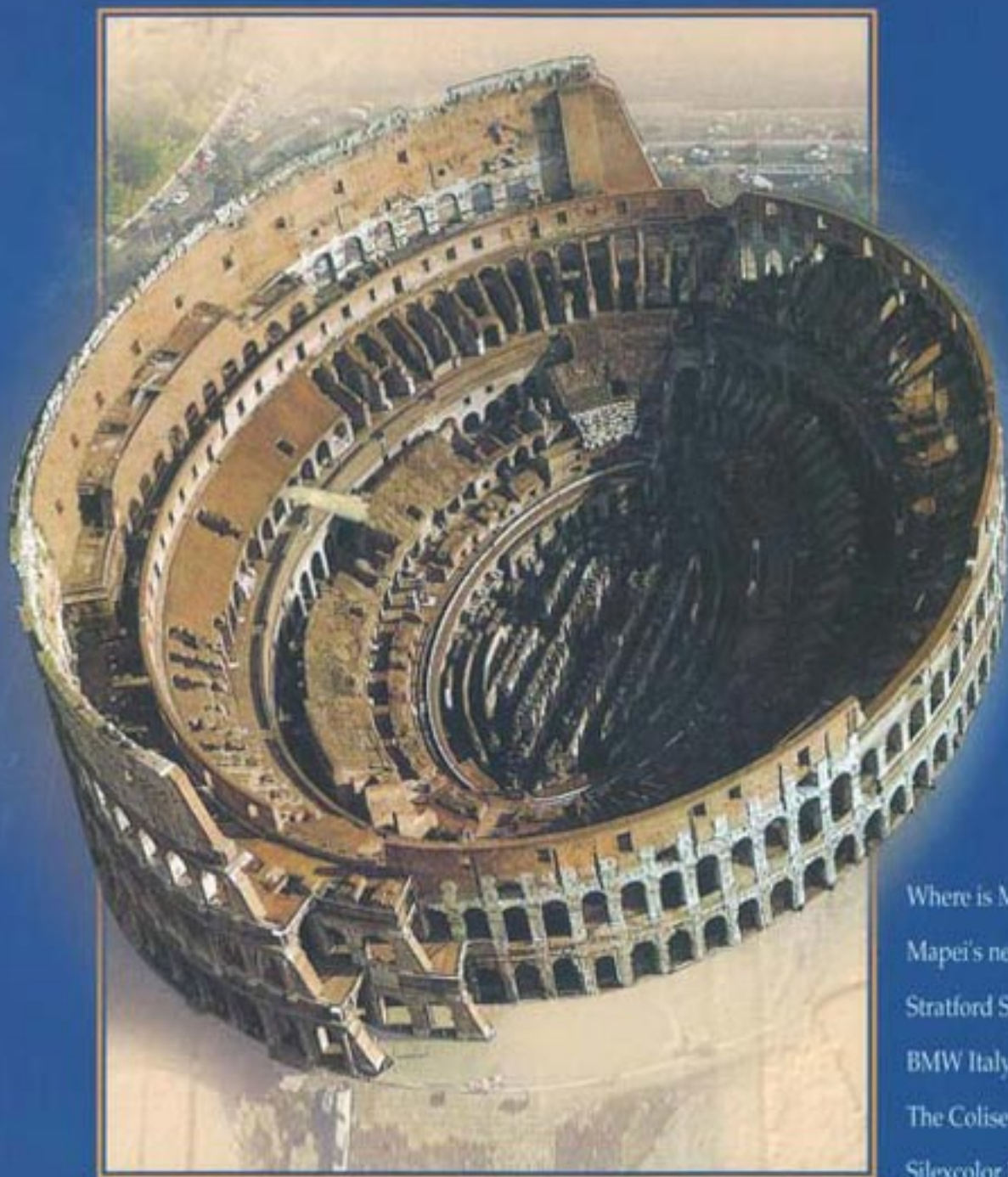


INTERNATIONAL

REALTÁ MAPEI



Where is Mapei going

Mapei's new clothes

Stratford Square Mall

BMW Italy

The Coliseum

Silexcolor Marmorino



10



THE WINDOWS ON THE WORLD

Windows on the World: This is the name of a beautiful restaurant until recently situated on the 107th floor of the North Tower of the World Trade Centre. It had been re-opened after a delicate and scrupulously-executed refurbishment distinguished by the use of Mapei products. *Windows on the World* had even been earmarked to appear as a Realtà Mapei project... before it perished.

On the 11th of September 2001 the *Windows on the World* were horrifyingly swept away with the lives of more than six thousand men, women and children; the most spectacular panorama on the planet is no more, and in its wake the optimism, ingenuity and fortitude of the generation with which America conquered the world also evaporated momentarily. Though threatened, the liberty which America values greater than any other commodity fills the void. Liberty of religion, races, languages and customs, that which distinguishes yet should also unite. Inspired by this principle we rally around the United States, around New York, and everyone touched by the tragedy, intent on rebuilding a world with even more solid foundations, in the name of a liberty even more profound. With windows which radiate light and energy over the world and over New York, just as they once did...

From the internet site:
Everlasting Memory -
celinegiselle@aol.com
Sept. 14, 2001

Those of us who had the opportunity to experience the magnificent delights of the Windows on the World will keep those everlasting memories with us forever...And maybe...one day...in time...after healing from this devastation with much needed strength, serenity and determination we will see our Towers raise again.

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Main cover photo: The Coliseum, Rome's most famous and most important archeological monument, has now become a venue "de luxe" for theatrical or musical events. This thanks to a delicate restoration project encompassing the reconstruction of the ancient flooring (article on page 18).

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MAPEI GROUP CERTIFIED MANAGEMENT SYSTEMS
(Quality, Environment and Safety)

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MAPEI AMERICA

ditorial



Ten years of *Realtà Mapei*



In June of this year *Realtà Mapei* celebrated its 10th birthday. The unabridged history of the magazine in reality dates back to 1984, when the concept was first devised and an inaugural four-page trial issue printed and published. Seven years later, issue number one of *Realtà Mapei* finally "hit" the news stand.

Published shortly before *Realtà Mapei International* went to press, the latest edition of our Italian language bi-monthly, *Realtà Mapei*, signaled another prestigious landmark at the end of the magazine's first decade. It was the fiftieth issue of *Realtà Mapei*. From the humble beginnings of a circulation of scarcely 5000, these days readership figures oscillate around the 120 000 mark, and

Realtà Mapei's rise has been both quantitative and qualitative. The magazine has matured to the extent that it can now be considered an authority within its own field, both on a national and an international level, this thanks largely to the innovation of *Realtà Mapei International* and its 30000 subscribers. It's frankly difficult to conceal our satisfaction at what has proved a rousing success. We've gambled and won. Our initial objective was two-fold: one was the "external" aim of supplying a learned publication to act as a reference point for the entire building industry; the second was to further consolidate the cohesive spirit within the Mapei Group, which over the years has become a true multinational, now employing over 2500 people. We're convinced that the first mission has been accomplished, as confirmed by the constant flow of written feedback and queries that we continue to receive from our readers. As for objective number two, we believe that we too have contributed to securing Mapei's world leadership in the field of adhesives and chemical products for the building industry. We've succeeded by constantly striving to give our readers what they ask for, and by resolving the complicated with the simple. We acknowledge that companies are embracing globalization, changing far more quickly than any government, and adapting image and strategy in response to competition and market forces. They're having to consolidate in existing markets, but also to establish new markets. In both instances communication is imperative and our commitment in this area is the driving force behind ambitious projects for the future: in 2002 we not only intend to increase the circulation and distribution of both Italian and English editions, but also to set in motion the "personalised" publication of German and French-language versions, to complement the Spanish "*Realidad Mapei*" set for launch before the end of 2001. The principle of information-exchange by *Realtà Mapei* is further evidenced by a facility which enables readers to view current editions of both *Realtà Mapei* and *Realtà Mapei International* on line, via our website (www.mapei.it). *Realtà Mapei's* success is the merit of a list of people too lengthy to thank individually. Praise should be scattered far and wide, from the "engine room" of the magazine, those who constitute the editorial team, to other contributors within Mapei. Not to forget the vital contribution of the readers. Certainly without them, without you and your encouragement *Realtà Mapei* wouldn't have enjoyed such a prosperous first ten years. I'd like to take this opportunity to express my appreciation personally. Thanks to you all.

Adriana Spazzoli



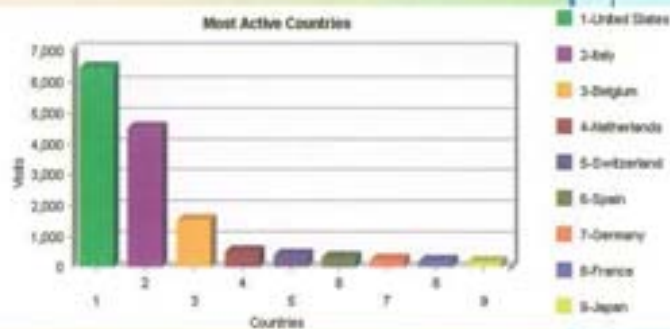
AND NOW ALSO ON INTERNET

Mapei's internet site is used primarily for professional reasons: that's the most obvious conclusion to draw from an analysis of statistics relating to the number of "hits" registered in the month of June.

The use of the site for professional purposes is clearly indicated by the elevated number of hits in the working week, (from Monday to Friday, peaking on Thursdays); furthermore, the time-window which sees most traffic on the Mapei site is between 09h00 and 20h00, and so corresponds roughly to the timetable of the working day. As regards the geographical breakdown of access, it's possible to make several important deductions from the statistics. The region which registered the most hits was Western Europe (almost 40%), with Italy the most prolific country, followed by North America (25%). The United States was the country responsible for most hits of all. Another interesting consideration is that the most visited area of the site, besides the sports pages, were the technical sections, including the product data sheets and other published material dealing with products and ranges; furthermore, MAPELASTIC data sheets, the building and ceramic line catalogues, and other brochures relating to specific lines and products were the most frequently downloaded files.

The **Realtà Mapei** and **Realtà Mapei International** pages were also well received in the period covered by the survey: 714 visits to the Italian part of the site were recorded, while the English version was accessed 512 times. Fifty users also took advantage of the on-line subscription form to assure their copy of **Realtà Mapei** for the next year.

As stated earlier, the logical conclusion to emerge from the data is that www.mapei.it is proving an invaluable professional, multimedia resource.



Realtà Mapei International

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Navigation: HOME, NEWS, PRODUCTS, REALITÀ MAPEI

Where is Mapei going?

In this interview Giorgio Squinzi outlines what were his and Mapei's strategies for 2001 on a world level. From the new production plant in Malaysia to those in the USA and Argentina. Plus the Mapei Group's latest acquisitions: one in Poland and one in Sassuolo, Italy.



It's that time of year again. Time to reflect, but also to look forward. It's time to think in terms of globalisation again, to weigh up the competition, to predict how certain markets will evolve in the future. Michael Hammer, one of the most widely renowned American management consultants in the 90s, used to say to his pupils "When companies think that they're doing things right, that's when they start to hit problems." A crude and perhaps slightly brutal way of stating a very simple concept: only companies which innovate consistently achieve any progress; he who seeks only to consolidate effectively loses ground and eventually falls by the wayside. Surely Giorgio Squinzi agrees. Here we ask the Mapei chief executive to explain his strategy for the challenge of the new Millennium: how will the multinational founded way back in 1937 and now the world market leader in construction adhesives adapt to the pressures inherent in preserving its supremacy in the third Millennium?

"Simple," Dr Squinzi replies, "we'll continue to grow."

Let's begin at the beginning, Dr Squinzi. Firstly, a look back to 2000: how did it go?

After a breakneck start in the first part of the year, there was a deceleration. Generally speaking, the markets seem to be at a cross-roads.

And more specifically?

If you want to go into detail, we can say with some certitude that the Far East still hasn't emerged from its recession,

although there is room for optimism.

Europe, on the other hand, and above all Germany, is at a delicate stage but the markets are still growing. Central Europe is maybe the most interesting region, with a collective re-alignment with European building standards taking place. Finally, North America is also still growing, albeit at a flatter rate than in recent times. So all in all, it was a positive year, with 15% growth in Italy and 20% as a group. Our aggregate turnover is close to 1200 billion lire, 20% more than in 1999, and this figure includes the contribution of a number of new acquisitions made during the course of the year. Our total number of employees has increased, too, and we've passed the 2500 barrier for the first time.

In a nutshell, you're satisfied...

Yes I am.

Let's switch our attention to 2001. What will be Mapei's strategy?

We'll reinforce our commitment to international growth, to remain competitive as markets continue to expand and extend on a global level. So we'll pursue the investment plan which has diffused the Mapei name through the 15 different countries, where we now own a total of 29 factories.

How many are in Italy and how many abroad?

We have 23 factories abroad and six in Italy: three for Mapei, one for Va.Ga and two for Vinavil. The Adesital production plant in Fiorano di Sassuolo is specialised in adhesives for tiles and completes the trio of Mapei plants, alongside the Robbiano di Mediglia and Latina factories which have long constituted the engine room of our production operations. Adesital was beginning to make a name for itself in the tile industry, and we've acquired the company with a view to improving our distribution network in Italy.

How about the international investments. Let's do a world tour...

The new Mapei plant in Malaysia started production early in 2001. In North America, by the end of the year we'll have started constructing two new plants to complement our existing ones in Phoenix, Garland, South River, Fort Lauderdale, Chicago and



Fredericksburg. The hub of our North and South American operations has now been moved to Deerfield Beach in Florida. A third plant will serve the Canadian market from Toronto, in addition to already-existing Mapei outposts in Laval and Vancouver. We also have pressing commitments in Hungary and Poland. In Poland, we've purchased a plot of land at Gliwice, in Slesia, where we're currently fine tuning a plan for a new production plant for adhesives and we've also acquired the Gorka Cement company, based in Tzerbinia, near Krakow. Gorka is a medium-sized company which manufactures a material which is an integral component of the group's productive strategy - alluminous cement. In Hungary, meanwhile, we're in the process of building a small 30 000 ton plant concerned mainly with the classic Mapei range products, while in the Czech Republic we're augmenting our commercial set-up with a bigger distribution centre in Olomouc.

While all this is going on we're also constructing new manufacturing units in Italy to increase the capacity of both Mapei and Vinavil. We're also evaluating joint ventures with local producers in countries in which we'd like to bolster our commitment. We'll see....

It's clearly a significant commercial and industrial commitment. And what about research?

Our growth philosophy is based on three basic principles: specialisation in niche markets, internationalisation and research. Research is the very engine which drives growth and development. Five percent of our annual turnover is invariably allotted to research and that's an unusually high percentage in a field like ours; furthermore, a rather large proportion of our total staff comes under the R & D category - 12% in total - and we have two specialist departments in Italy (for Mapei in Milan, for Vinavil at Villadossola), and three abroad (in Norway, Canada

and the United States). In the USA our research is currently carried out in Dallas, Chicago, and Fort Lauderdale but will soon be concentrated in Deerfield Beach, and similarly, in Milan, space restrictions have lead us to investigate the possibility of expansion. To sum up, we believe strongly in research because we recognise that it's the only solution for fast and consistent growth.

OK, and what are you expecting by the end of 2001?

The projections indicate that the world economy as a whole will grow at around or above 2%, which is below expectations. If this does transpire it'll be a case of what the economists call a "soft landing", that's to say of a progressive and, we hoped, a controlled slowing of the economy. In other words it's evidence of economies taking stock and opting for less rapid, more manageable rates of growth in an effort to control inflation.

And in Italy?

Among all Italy's many problems there are two, in my opinion, which require most urgent attention. The first is hyper-regulation and therefore the need to simplify public administration. In Italy you need to have the authorisation of 32 different bodies before plans to build a new factory get the go-ahead, and that, to my mind, is absurd. It leads to appalling delays especially since you can't be sure of actually obtaining the authorisations. The second major concern I have is the improvement of infrastructures, and here, too, we're losing ground to our European neighbours. But it's impossible to implement infrastructure if you don't simplify the bureaucratic protocol. That's why the first point raised - a political one - becomes paramount. Without it the competitive 'country system' collapses. For example, in Paris, a 15kms line on the underground network with driver-less trains - the 'Meteor' - was built in five years. In Milan, by contrast, five years have passed and we still haven't managed to extend the M.3 line by 700 metres, precisely for bureaucratic reasons. Not only has the extension not been completed but, because of the mish-mash of building sites and road-works, one of the nerve centres of the Milanese road system has been blocked apparently indefinitely.

by Alberto Mazzuca

FIRST PLACE
CERAMIC TILES
OF ITALY
DESIGN AWARD

SPECIAL MILLENNIUM
EDITION OF
DESIGN COMPETITION

STRATFORD

The rebuilding of the Illinois commercial complex, performed with one crucial necessity in mind: speed of work and minimum disturbance to customers.

by Diana Chiodi - Mapei Corp.

Belluschi and Associates is among the largest and most widely-renowned American architect's bureaus, based in Chicago, specialising in project planning and scheduling, but also offering a comprehensive service for commercial and residential undertakings, both for new buildings and refurbishments. Here we publish a description of one particular assignment carried out by Belluschi's, for one simple reason: this project - the Stratford Square Mall in Bloomington, Illinois - was acclaimed in the "Ceramic Tiles of Italy" special Millennium competition.

The prize giving took place at Coverings, the Orlando trade fair staged between the 2nd and 5th of May 2000 and the award, sponsored by "Assopiastrelle" in association with "Ice" (Italian Institute of Foreign Trade), offered a tempting cash reward of \$20 000 for the exceptional use of Italian ceramic tiles by North American architects. It just so happened that Stratford Square was adjudged the

winner in the category, for an excellent demonstration of the use of Italian ceramic tiles. Stratford Square is a commercial complex measuring 120 770 m² (1 300 000 sq.ft), of which 13 935 m² (150 000 sq.ft) were the subject of a landmark refurbishment project. The winds of change swept through the entire restaurant area (capacity of 400 seated diners) and a new lift installment, while a central meeting point based around an indoor garden was re-landscaped, along with a central courtyard dotted with water features and statues.

The owner of the venture, renowned as one of the USA's premier real estate owners, gave the go-ahead for a complete face-lift after twenty years of splendid but by now fading grandeur. Little of the existing structure was spared in the overhaul: the flooring, the lighting, the internal and external sign systems were to be rejected and re-invented. The flooring, in particular, was a priority, with the old surface unceremoniously torn up and a new covering of ceramic tiles swiftly installed in its place.

Faced with a choice of products for such a delicate and uniquely specific operation, for project planners, Mapei appeared a natural solution thanks to the reliability of its adhesive ranges. The owner, the planning team, the general contractor and the installation company were in agreement: Mapei would fit their bill, as it could supply high quality materials at competitive prices through its Central American distributor, for all that the working brief was an intricate one which had to be executed at speed.

Anthony Belluschi had sounded out numerous companies offering what appeared to be suitable materials, but project director Jim Kreps had insisted that Mapei's products best satisfied the



SQUARE MALL



demands of this particular project. As Bob Cohen, the vice president of the Urban Design, commented "It was the most smooth-moving and unproblematic job I've ever seen." He added "thanks also go to the teamwork of RD Roman and Mapei's technology." Let's now take a closer look at the products used in the refurbishment of the Stratford Square complex. The flexible PRP 315* and PRP M-19* were used as crack isolation membranes: the PRP 315* was perfect for the large, open spaces on every level, while the PRP M-19* was selected for the tenant spaces outside shop fronts for its rapid-drying properties. For the repair work on the concrete slabs planners opted for the ultrarapid PLANI/PATCH* levelling compound while ULTRA/PLAN*, a self-levelling



Stratford Square Mall – The prize-giving ceremony at Coverings 2000 in Orlando. From left to right, Angelo Borelli and Giorgio Squinzi award the commemorative plaque to architects from the Belluschi architectural study: Federico Vargas, vice president of the projection plan and Jim Kreps, project manager of the Stratford Square Mall.



compound, was used to finish off the levelling process. When it was time for the large-format tiles in porcelain to be installed, the GRANI/RAPID* fast-setting adhesive system was used. This is the product which really set Mapei apart, both in theory when the materials were selected, and in practice, in the installation process itself. With its high early compressive strength and medium bed capability the special hydraulic formulation of this Mapei thin-set enabled installation teams to work rapidly and efficiently throughout. Another example of advanced hydraulic binder technology was required for the grouting of over 18 580 m² (200 000 sq.ft). ULTRA/COLOR*, a fast-setting

polymer-modified grout, was selected for a number of important reasons: its high compressive strength, which effectively means that it can be exposed to pedestrian traffic after just three hours; the exceptional uniformity of joint colours which are a feature of this product; the lack of efflorescence thanks to ULTRA/COLOR*'s unique formulation, which also insures against the formation of unsightly cracks caused by hydrometric shrinkage. Thanks to Mapei and the versatility of its product range works could be carried out quickly and easily; when the project was completed, the restructuring of Stratford Square could rightly be considered an unqualified success.



The surface area covered by the restoration project totalled 13 935 m² (150 000 sq.ft) of the 120 770 m² (1 300 000 sq.ft) total surface area of the mall, laid out in two floors (A and C). Diagram B is an artist's impression of the fully restored mall.



TECHNICAL DATA

Stratford Square Mall - Bloomingdale, IL (USA)

Year of construction: 1980

Year of renovation: 2000

Total surface area concerned: 13 935 m² (150 000 sq.ft) of the 120 770 m² (1 300 000 sq.ft) total surface area of the mall

Customer: Heitman Capital Management Corp, Chicago, IL

Planning bureau: Anthony Bellaschi Architects Ltd, Chicago, IL

General contractor: Graycor Construction Company, Inc, Homewood, IL

Graphics and signs: Metro Urban Design, Bountiful, UT

Structural planning: Eskenazi, Farrell & Fodor, Chicago, IL

Installation contractor: RD Roman

Material fitted: Mirage porcelain tiles

Mapei products used: PRP 315, PRP M-19, PLANI/PATCH, ULTRA/PLAN, GRANI/RAPID, ULTRA/COLOR

Distributor: Mid America, Chicago, IL

Mapei co-ordinator: Steve Cameron

* These products are manufactured by Mapei Corp. (USA). For further information please log on to: www.mapei.com



BMW Italy

The brainchild of Kenzo Tange, the new headquarters of the German car manufacturer stands at the gates of Milan.

The new headquarters of BMW, conceived by the world-renowned architect Kenzo Tange, is situated in San Donato, at the gates of the city of Milan. Facing out into the Milanese hinterland, the impressive, distinctive structure is flanked by a wall which separates it from the via Emilia. Here it nestles in a small wedge of land delimited to the South by a curving motorway crossing which forms almost a template for the Tange-designed structure. The startling but simple façade is certainly destined to become an unmistakable landmark for commuters arriving in Milan from the South-East. So simple is it, indeed, that the design of the building may seem elementary, like a white sheet scored with black horizontal stripes, peculiarly flexed and tugged. In the spirit of such an innovative project, continuity of styles could be sacrificed, and this explains the large areas of transparent glass panelling on the exterior. At the rear of the building, looking out over the suburb, the building bares a different appearance, with a landscaped area

which is part-look-out part-piazza. Not just simple, the shape of the edifice is artistically original, too, evoking a sail buffeted in the wind. The remarkable aesthetics also conceal an excellent tenso-structural solution, used to install the glass panels in the showroom section. The high facade is eleven metres tall and required a system of three suspended perpendicular panels, inter-connected and again in glass, held together by

stainless steel link pieces affixed to the 12/15 mm glass purposely tempered to be drilled and appended. Mapei products were used inside the showroom for the preparation of the cement substrate and for the fitting of the 60x60 cm porcelain floor tiles. To satisfy the demands expressed by the client, who requested and insisted on a technical solution making use of products conforming to

The above photo is published with the kind permission of "L'Arca" magazine, having first appeared in issue number 134 of that publication in February 1999.

Photo 1: Roller-application of PRIMER G*

Photo 2: preparation of the ADESILEX P4* levelling compound.





Photo 3: straight-edging of the ADESILEX P4 levelling compound.*

Photo 4: spreading of the KERABOND+ISOLASTIC adhesive compound.*

Photo 5: positioning and tamping of the ceramic tiles.

Photo 6: checking the back of the tile for moisture.



1



2



3

DIN regulations, the following products were utilised: ADESILEX P4*, for the levelling of the substrate, and KERABOND+ISOLASTIC* for the installation of the porcelain tiles. The underlayment, on which the tiles were to be laid, was a cement-based screed with added fluidifier in which the heating pipes were embedded.



4



5



6

The compactness of a mortar-bed of this nature meant that adequate scarification through sand-papery was necessary before installation work could begin. This would ensure that the superficial pores on the screed could open. Once the scarified areas had been cleaned, the PRIMER G*, diluted to one part product, one part water, could be pasted on with a roller. The expansion joints in the screed were recreated according to the number of tiles to be laid, while those which could not be used were sealed with EPORIP*.

The executing company then proceeded to the levelling with ADESILEX P4*, whose excellent workability and plasticity properties permit the tile fitter to work with product widths of 2 to 20 mm with a single hand; this product can also be used beneath shafts (of up to 4-5 metres) without disturbing the coverage, and hence yielding a perfectly smooth, compact, resistant and quick-drying substrate.

The laying of the tiles was effectuated with KERABOND+ISOLASTIC*, a highly deformable adhesive product, with 10 mm joints grouted with KERACOLOR GG*. As in the showroom, KERABOND+ISOLASTIC* was again the preferred formula in the workshop, albeit here with a more resistant 20x20 deep-section porcelain tile for the flooring material.





"The technical Data Sheets of the products mentioned in this article are contained in Mapei binder No. 1 "Ceramic Line".

The adhesives and the Mapei grouts conform to the EN 12004 and prEN 13888 regulations.

Kerabond + Isolastic

(C2): Cement based powder for ceramic tiles (thicknesses of adhesive up to 5 mm) enhanced with flexible latex adhesive.

Adesilex P4: *Rapid-setting self-backbuttering adhesive with medium deformability for ceramic tiles.*

Primer G: *Synthetic-resin-based water dispersion primer.*

Eporip: *Two-component epoxy adhesive for bonding new on old concrete and for monolithic sealing of cracks in screeds.*

Keracolor GG (CG2): *Cement-based grout for 4 mm to 15 mm joints.*



TECHNICAL DATA

BMW Italia Headquarters - San Donato Milanese, Milan - Italy

Project: Kenzo Tange Associates, Tokyo

Year of construction: 1998

Installation contractor: Privedil Srl

Director of works: Mario Bonvicini

Material fitted: porcelain tiles (60x60) and deep-section porcelain tiles (20x20) by Mirage

Mapei products used: ADESILEX P4, KERABOND+ISOLASTIC, PRIMER G, EPORIP, KERACOLOR GG

Mapei co-ordinator: Paolo Giglio

ASSISI,

a new, old look

The floor of the Lower Piazza of the Basilica of San Francesco has been restored, with materials from Italy, Israel, China and Brasil.

by Renato Cucchiarini - Mapei S.p.A.



Assisi's Lower Piazza is one of the town's landmark visitor attractions for Christians and pilgrims. Finally now, after protracted research and tests before the operative stage, the

refurbishment project has been completed. The flooring of the Basilica of Assisi, performed in collaboration with the "Internazionale Marmi e Macchine" firm, was unveiled at Carrara 2000... and it contains Mapei products.

The planning and administration stages were indeed very drawn out. Since 1993, the planners - architects Paolo Leonelli and Mario Struzzi - had been suggesting that materials from throughout the world be used for the floor of the Piazza Inferiore (Lower Piazza) of the Basilica; as if to sanctify and pay homage to the religious significance of the site and the name of San Francesco, and to the mutual exchange of faith between the religions of the world, as acknowledged and endorsed by Pope John Paul II. The idea was immediately embraced by the "Franciscan" order.

Frustratingly, the necessary research and testing extended the project length. Once completed, the project had included the excavation of the asphalt, reconstruction of the out-buildings, the casting of a bed of concrete 20 cm thick and then the installation of tiles following the traditional method, given that significant differences in thickness had to be accounted for.


The refurbished area totals approximately 5000 m² in which a large number of





different floor materials were used in a pattern of "regular alternation". Several were of Italian origin: Trachite Zovonite from the Euganei hills in North East Italy, Gravina Stone from Grotte Marallo, the red stone of Assisi mined from the surrounding area. Others add the "international touch": the Stone of Jerusalem from the Hebron Cave; Yang Sang granite from the Chinese city of Nang An; Rosa Flamingo Quarzite from Brasil; yellow dune granite from Namibia. The total cost of the operation was 9 billion lire, subsidised from the Italian government's Jubilee culture fund. It was also from this budget that the restoration



Marble sheets of various dimensions but uniform thickness – 10 cm – were laid in an end-to-end configuration, with joints of 1.5 cm. Planners aimed to make the surface suitable for pedestrian traffic. 



of the porticos, of the double-ramped eighteenth century staircase, and the exterior perimeter walls was financed, plus, of course, the repair of the serious damage caused by the September 1997 earthquake. The work was completed in just 12 months. So what exactly was Mapei's role? The flooring, composed of marble sheets sourced from a number of different countries and fitted on a dry sand base, needed to be finished with mechanically strong grouting (above all under stress from traffic – the piazza would double as a car park) also guaranteeing strong adhesion of the marble. STABILCEM* was hence the natural choice, with added sand to make it less fluid and so to prevent the surface from "sliding" down the gradient sloping away from the piazza. This product also satisfied the supervising committee which preferred an opaque mortar finish to the glossy look inevitable with a resin.

"The technical Data Sheet of the product mentioned in this article is contained in Mapei binder No. 3 "Building Line".

Stabilcem: Expanding cement binder for injection slurries, mortars and concrete.



TECHNICAL DATA

Piazza Inferiore (Lower Piazza) of the Basilica di San Francesco – Assisi, Perugia - Italy

Year of renovation: 1999

Planners: architects Paolo Leonelli and Mario Struzzi

Mapei product used: STABILCEM

Mapei co-ordinator: Renato Cucchiari

NEW BARRIERS FOR THE

For the enclosure of one of ancient Rome's largest and most important triumphal arches, technicians opted for the wrought iron technique, still a familiar and widely practised, traditional method.

The 2000 Millennium gave the Italian capital the opportunity to undertake important restoration and repair on monuments and historical sites and to lend new impetus to various archaeological projects. In the Imperial Forums quarter the Constantine Arch is just one of the famous structures to have benefited from the initiative. Lying just a short distance from the Coliseum, the Arch has had its unique, historical setting enhanced with a new, wrought-iron border. Commissioned by Rome's archaeological supervisory committee for the Ministry of Cultural Patronage and Activities, the new gating was designed and installed according to the standards and classic style characteristics of the Boranga Artistic Forge of Treviso. This workshop has long been recognised for its stylistic versatility and domain-specific know-how in construction.

For the perimeter fence of the Arch, one hundred metres of metal barrier were prepared along with two iron gates: the iron spear-like bars were 25 mm wide, three metres high, finished off with outward facing spikes and held together by horizontal bars. These connecting rods were cut from iron of the same thickness as the vertical bars but wider at 40 mm. The framework bars were wider still at 50 mm, and they too were forged to 'point' away from the central Arch. All of the components for the fencing were assembled for maximum aesthetic appeal with linkages rather than



THE COSTANTINE ARCH

welding, according to the classical design principles of wrought-iron engineering. The fencing was then mounted upon a concrete wall and at the end of the fixing process technicians moved on to the refurbishment of the foundation bed. With Mapei's MAPEGROUT THIXOTROPIC* the repair team was able to rebuild areas which had been chipped

or cracked, mend sections in contact with the iron and square up corners and rough edges on the base wall (photos 1 and 2). MAPEGROUT THIXOTROPIC* is a ready-mix powder composed of high-strength cements, selected aggregates, special additives and synthetic fibres made according to a formula developed in the Mapei research laboratories. Thanks to its unique properties this is a product which lends itself to the repair of surfaces subject to heavy abrasions and it may also be applied to vertical surfaces without sagging even in great thicknesses and with no need for formwork. For the smoothing of superficial unevenness and the final polishing process, MAPEFINISH* was the chosen product (photo 3). MAPEFINISH* can be applied to a 2-3 mm depth.



"The technical Data Sheets of the products mentioned in this article are contained in Mapei binder No. 3 "Building Line".

Mapefinish:
Two-component cementitious mortar for finishing concrete surfaces repaired with Mapegrout and for smoothing uneven concrete surfaces.

Mapegrout Thixotropic:
Fibre reinforced thixotropic grout with controlled shrinkage for the repair of concrete.



TECHNICAL DATA

The Arch of Constantine, Rome - (Italy) 315 DC
Operation: preparation and installation of wrought-iron gate.

Year of renovation: 2000

Client: Archaeological supervisory committee - Ministry of Heritage and Culture, Roma.

Project/architect of gating: Boranga Artistic Forge, Montebelluna (TV)

Mapei products used:
MAPEGROUT THIXOTROPIC, MAPEFINISH

Mapei co-ordinators:
Renato Soffi and Pino Mancini



THE COLISEUM

Completed in only four months, this unique rehab project gave new life to Rome's most celebrated ancient monument: a performance stage for the third Millennium.



Photo 1 - The corridor leading to the amphitheatre before the construction of the platform and connecting runway.

Photo 2 - A protective covering was applied over the original stone blocks before placing the new concrete supports for the wooden beams over them.

Photo 3 - A sample cube of the concrete formulated by Mapei to have the same characteristics as the original stone blocks. The smaller photo illustrates the composition of the concrete.

Photo 4 - Pouring the specially designed concrete mix into the forms.

After surviving countless wars, sacks, and reconstructions down through the ages, the Flavian Amphitheatre, popularly known as the Coliseum, has rediscovered its ancient origins in a project that gives new life to this priceless archeological treasure. In July of 2000 the Coliseum inaugurated a new era in its history as a venue for high profile theatrical and musical events with a production of the Oedipus Rex of Sophocles, directed by Vassilis Papavessileiou. Although the Emperor Titus entertained 75,000 spectators at the original inaugural celebration in 80 A.D., the productions of the new Millennium will be performed before a more select audience of only 700. The reason for so

greatly restricting the number of seats was to protect the monument from the risks that building seating for a larger public would entail. A much wider audience will be reached by televising the new productions from the rehabilitated archeological site.

Only a quarter of the total surface of the floor of the arena was rebuilt, leaving the remains of the ingeniously constructed subterranean "backstage" areas exposed. In these vast labyrinths were penned the exotic animals imported from the conquered provinces as they waited to make their entrance "on stage", as did the gladiators. Also located here was the machinery used to create special effects, such as the lifts that raised the animals to the level of the arena into which they leapt on cue from hidden doors that suddenly sprang open for maximum dramatic effect.

The new stage was built at the Flavian level of the extreme western end of the arena along with a runway leading to the very spot where the gladiators once entered, near their



gymnasium, the "Ludus Magnus". The modern platform, like the ancient one, was built of boards of wood laid over a dense network of plywood beams that were reinforced with aramid fiber composite material and AISI 304 stainless steel. It took years of research, deliberation and delays before the platform and runway were finally completed. The lengthy process, however, delivered a finished product that was the better for the in-depth research conducted before the work began. This research pinpointed the criteria for a reconstruction that proved a success both technically and structurally, and one that was compatible from an artistic standpoint with the Coliseum's status as a historical monument.

The project was an interdisciplinary effort by the Rome Archeological Commission, as represented by architect Giangiacomo Martines and Drs. Iacopi, Rea, and Conte, along with architect Piero Meogrossi, the Project Manager, and the Structural Engineering Faculty of La Sapienza University of Rome, coordinated by Prof. Maurizio Cerone, the principal architect of the project, and his staff, engineer Alberto Viskovic and architect Fabio Fumagalli, with the assistance of the Germanic Archeological Institute.

The project was a very delicate piece of engineering that involved first identifying the points that could serve as supports for the new construction. New structural elements would then be positioned onto the ancient blocks of decayed tuff and



travertine, so that their original form and function would remain visible. In this way the restoration would respect the monument's history. The basic concept





Photos 5 and 6 - New concrete bases were placed over the original stone blocks. The wooden beams were then placed on top of the concrete.

Photo 7 - Some of the new concrete blocks were placed on top of ancient brick.

called for building a new structure of modern materials such as plywood reinforced with AISI 304 stainless steel and aramid fibers that could be combined with the archeological remains

without damaging them. The contrast between the old and the new materials would remain visible in the completed project. New supports for the stage were placed

Photo 8 - Wooden columns supporting the new platform and runway. The smaller photo illustrates a detail of the plywood used for the beams, reinforced with aramid fiber composite material that can be seen here by its contrasting color.



Photo 9 - A panoramic view of the construction site showing the dense network of wooden supports for the platform.

Photo 10 - Steel cables on the perimeter were anchored with Mapefill.

Photo 11 - When the work was completed sophisticated measuring systems were used to test the stability of the new stage.

Photo 12 - Laying the wood flooring over the platform.



onto three types of the Coliseum's structural and foundation elements, all of them made of tuff and travertine. These typical materials of Central Italy are ideal for construction because they are easily worked but have poor resistance when exposed to the air. Some tuff blocks that formed part of the walls underneath the platform (and thus had not suffered from exposure) were used as bases for the new concrete blocks. In other sections pieces of travertine, because of their position, were used as spans for new concrete bearing blocks. The curving perimeter of the arena was partially levelled to conform to the height of the new concrete border supporting the beams of the new platform. Mapei was asked to design high strength mortars and concretes that would be compatible with the original stone. The project required mortar used to consolidate the blocks of tuff and a durable concrete mix used to cast the supports for the new

stage. Materials were also needed to anchor the cables to the beams and bond the wood to its stone supports. MAPE-ANTIQUE F21* was used to consolidate and seal the cracks in the tuff blocks and columns. This product is a special non-cementitious hydraulic binder with a base of hydrated lime and pozzolanic materials that is compatible with the original stone. The mix remains fluid and can be easily poured into cavities before hardening gradually through a chemical reaction that does not interact with the tuff, so the stone is preserved. (The original stone was first sanded.) Research was conducted in the Mapei laboratories to determine a mix design for the concrete that could meet the criteria established by the Archeological Commission and the structural engineering team of the University of Rome. Not only did the mix have to be formulated for maximum durability and watertightness, it also had to reproduce the color of the tuff and travertine, even down to the subtle



variations of shade the stone had acquired over 2000 years of aging. After various trials it was determined that the cement needed a pozzolanic base mixed with fine black pozzolan, crushed lapillo and basalt, and local volcanic materials found just outside Rome in the Tocchi quarries. MAPEFLUID PZ 500* was added to the mix. This admixture is ideal for low cement content mixes and



increases resistance to saline attacks from humidity and salts in the soil. It is also a super-plasticiser that increases the workability of lean concretes such as this one while maintaining a high level of mechanical strength.

In this mix MAPEFLUID PZ 500* was dosed to maintain the required slump (S4) from preparation to pour.

The concrete mix was formulated to have an R_{ck} of 27 kg/mm². MAPEFILL* was selected for anchoring the cables in the perimeter beam of the platform. This product is a very fluid premixed mortar that can penetrate into even the narrowest spaces. It is composed of cements that are highly resistant and that more importantly can withstand even dynamic forces. EPOJET* was used to fix steel plates to the concrete blocks. This very fluid epoxy resin-based product forms a monolithic bond and is specifically made for sealing and reinforcing bearing structures. Multi-axial aramid fiber fabric was used to reinforce the plywood beams along with marine-grade mahogany plywood and uni-directional carbonium plates. The commitment to research and experimentation by the team of experts enabled the Sacen srl Construction Company of Naples to execute the project safely and successfully, to the unreserved satisfaction of Project Manager Meogrossi and the Archeological Commission. It took only four months to complete one of the

most important restoration and rehab projects undertaken as part of Rome's Jubilee 2000 celebration.



TECHNICAL DATA

Flavian Amphitheatre (The Coliseum)

Rome - Italy

Project: partial reconstruction of the floor of the arena and consolidation of the bearing elements

Financing: Banca di Roma

Date of project: initiated 2 Feb. 2000, completed 20 June 2000

Design: Archeological Commission of Rome

Project Manager: architect Giangiacomo Martines

Project Supervisor: architect Piero Meogrossi

Scientific Consultants: Dr. Livia Irene Iacopi, Dr. Rossella Rea

Construction Company: Sacen srl, Naples, Italy

Technical Director: Dr. Umberto Battista

Structural Project: Faculty of Structural and Geotechnical Engineering of La Sapienza University of Rome

Architect: Prof. Maurizio Cerone in collaboration with Alberto Viskovic and Fabio Fumagalli

Historical consultant: Germanic Archeological Institute

Mapei products used: MAPE-ANTIQUE F21, MAPEFLUID PZ 500, EPOJET, MAPEFILL

Mapei co-ordinators: Renato Soffi and Aurelio Rossetti

Mapei photography co-ordinator: Pino Mancini

**The technical Data Sheets for the products mentioned in this article are contained in Mapei binder No. 3 "Building Line".*

Epojet: Superfluid epoxy resin for injection

Mape-Antique F21: Superfluid fillerized hydraulic binder for injection and consolidation of stone, brick, and tuff structures

Mapefill: High-flow shrink-free grout for anchors

Mapefluid PZ 500: Superplasticising pozzolanic admixture for high quality concrete and mortar resistant to chemical attack



Between the 21st and 28th of April this year, under the auspices of the American Institute of Architects (AIA), sponsored by Mapei and Quarella, a group of around 150 American architects visited the great Italian cities of Rome and Verona.

The itinerary was divided into two themed programmes: Classicism and conservation overseen by the Committee of historical resources, and Modern sites on the banks of the Tever, co-ordinated by the design Committee.

The first programme was based entirely within the confines of the city of Rome. On the agenda were various conferences on classical architecture and its influence, its techniques, and also on the role of local government and administrative bodies in conservation projects and the preservation of works of architectural interest. A further group forum compared the preservation philosophy in the United States with that in Europe, giving rise to a suitably animated exchange of ideas between American and European architects. In between conferences, visits to classic monuments, Palazzo Pio, Tivoli and the Vatican, offered the perfect alibi for combining business with pleasure!

The second programme also began with a short stay in Rome – another happy marriage of education and diversion – with visits to many of the ancient city's architectural treasures and areas of historical significance: the Vatican Museum, the Portuguese mosque, the Olympic Village, the Foro Italico, the EUR building. The group then left the capital and headed north to Verona, where they would visit the historical centre of the city and the Quarella headquarter building.

Mapei's presence at the two programmes was a consultative and informative one, with both American and Italian company technicians supporting the AIA organisers on a daily basis. Participants thus had the benefit of expert



Americans IN ROME AND VERONA



commentary and insight on visits to the prestigious sites and monuments where Mapei products were in evidence. Furthermore, Mapei sponsored a guided visit to the Vatican's Sistine Chapel for those on the first programme, and a group dinner at the Ar Montarozzo restaurant for all participants. Between 140 and 150 architects attended the dinner, and all were clearly intrigued by the presentation of the Mapei Group and its references in prestigious sites all over the world, and received relevant documentation on each. More detailed case-studies and technical profiles on the Portuguese mosque, the consolidation of the Coliseum and the restoration of flooring in the Sistine rooms were also circulated.

A presentation dinner at the "Ar Montarozzo" restaurant, laid on courtesy of Mapei, was a fitting conclusion to the Americans' stay in Italy.



Now adhesives and grouts are certified for the installation of tiles

The new international classification.

Finally, we now have a new classification system for adhesives and grouts for tiles befitting of the dawn of a new Millennium and advances in technology. The old definitions for dispersion adhesives, cementitious adhesives and grouts once de rigueur no longer bore any relevance to the construction industry today: they were simply too complicated and, even worse, completely obsolete.

At last a new classification will guarantee tilers and specifiers utmost simplicity, safety and respect for quality. In October 2001, the EN 12004 for adhesives was definitively approved, while the equivalent standard for grouts, the prEN 13888, is currently in the process of ratification, subject to a deciding ballot. In addition, as of 2001 international ISO standards will be applied to all products.

Why new techniques?

The tiles available on the market have changed in format, in porosity and they have different substrates. They've evolved. We need new adhesive products, which testify to the advancements made.

A single system?

The new classification of installation products distinguishes them according to a single model and universal criteria Europe-wide. This system enables whoever uses the products to qualify them according to their range of application and their technical characteristics.

Why respect for quality?

A single and certified regulatory system guarantees the quality of the products for the users. Additionally, the materials are often already endorsed by virtue of their manufacturer, already certified according to the ISO 9001 quality system. Products which perform below required standards or which aren't bound

under the EN 12004 (adhesives) or prEN 13888 (grouts) quality normatives can't bear the CE conformity marking on their packaging.

What's changing?

The classification of products now becomes performance-dictated with additional functional characteristics denoted by a symbol on the packaging and on product documentation, (see pages 28 and 29).

In line with its ethos of innovation, transparency and clarity, Mapei has decided to put the new classification to work immediately and to identify all of its conforming products with a symbol on both packaging and all presentation documentation.

✓ All Mapei products possess the specific properties stipulated by the EN 12004 and prEN 13888 regulations (see tables 1 and 2), gauged with the approved methods by an internationally qualified institution (CEN).

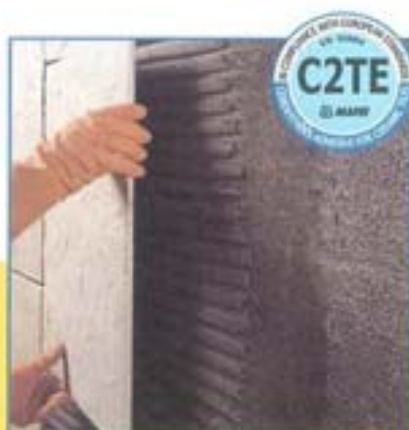
✓ The Quality System adopted by MAPEI is in compliance with the requirements of the aforementioned norm and has been certified in conformity with the ISO 9001 since 1995. This certification was renewed in 1998 and reconfirmed in 2001 in conformity with ISO 9001:2000.

✓ Mapei recognises and embraces the necessity for constant testing to assure consistent quality in production over time.

✓ Mapei publishes the information demanded by the above-cited regulations both on packaging and product documentation. These details are essential for the user to ensure safety and effective application.



KERASET

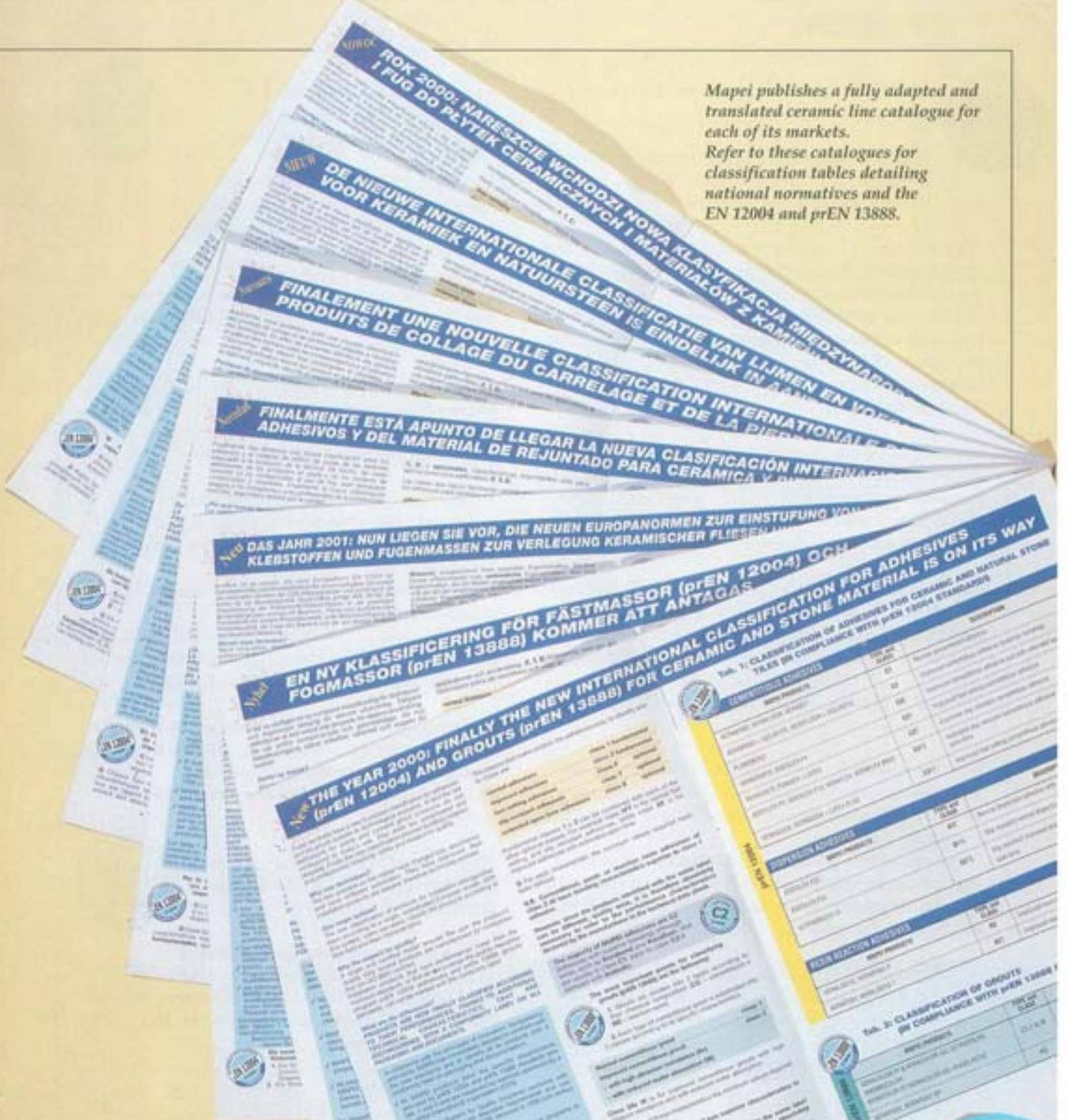


KERAFLEX MAXI



ADESILEX P4

Mapei publishes a fully adapted and translated ceramic line catalogue for each of its markets. Refer to these catalogues for classification tables detailing national normatives and the EN 12004 and prEN 13888.



ADESILEX P9



GRANIRAPID



KERAPOXY



EN 12004 for adhesives, the most important points are the following:

1) The adhesives are divided into three categories, according to their chemical composition (C = cementitious, D = dispersion, R = reactive resin)

2) Each category is subdivided into two classes according to their specific characteristics, which are in turn divided into the **fundamentals** - those which the adhesive absolutely must possess - and the **optionals**, which are important only for specific applications and procedures (F,T,E). The "classes" designed to make adhesives for ceramics easily identifiable and distinguishable are:

normal adhesives:	fundamental class 1
improved adhesives:	fundamental class 2
fast-setting adhesives:	optional class F
slip-resistant adhesives:	optional class T
adhesives with extended open time:	optional class E

Clearly classes 1 and 2 can be combined with each of the other three. So, for example, class 1FT is that of the normal fast setting, anti-slip adhesives, while 2E would refer to an improved adhesive with extended open time.

3) For each of these characteristics a qualifying criteria is stipulated.

N.B. Whether it be a cementitious adhesive, a paste adhesive or a reaction resin any product in category 2 must by definition have greater adhesive strength than a category 1 material.

However, as two products identified by the same symbol can be qualitatively different, it is essential to refer to the performance characteristics declared by the producer in the technical sheet.



The majority of Mapei's adhesive products fall under the class 2 heading (improved adhesives) even though some, for example Kerabond and Kerafloor, which usually appear in class C1, pass into class C2 if Isolastic (Keralastic in the USA) is added.



As regards the classification of grouts prEN 13888, the most important details are the following:

1. The grouts are divided into two categories, on the basis of their chemical composition (CG = cementitious and RG = reaction resin grout).

2. The cementitious grouts are subdivided into two classes according to the specific characteristics possessed.

Normal cementitious grout	class 1
Improved cementitious grout	class 2
- with high abrasion resistance (Ar)	
- with reduced water absorption (W)	

So, for example, the 2 Ar W class refers to improved cementitious grouts with high abrasion resistance and with reduced water absorption.

3. For each of these characteristics a qualifying criteria is stipulated.

N.B. A cementitious class 2 grout has superior technical characteristics to a class 1 product.

However, as two products identified by the same symbol can be qualitatively different, it is essential to refer to the performance characteristics declared by the producer in the technical sheet.



All of Mapei's cementitious grouts are in class 2 (grouts with improved characteristics).

To check the correspondence of Mapei products with the categories specified in both EN 12004 and prEN 13888 classifications, refer to the "Ceramics line" catalogue valid for the respective country.



ADESILEX P22



KERALASTIC



KERACOLOR FF

CEN TC 67/WG3 - ISO 189/WG3 - CERAMIC TILE ADHESIVES

The standards outlined in the preceding pages are the fruit of work carried out by the CEN TC 67/WG3 commission, and are currently being evaluated by the ISO 189/WG3.

by *Giorgio Roncan - Mapei S.p.A.*

CEN TC 67/WG3

On the 5th of September 2001 a further meeting of the CEN TC67/WG3 "Adhesives for ceramic tiles" was held in Paris, France, with the participation of the best qualified experts from industry and certification bodies of Switzerland, Germany, Austria, Finland, Sweden, UK, France, Spain and Italy. The secretariat of WG3 is held by Italy and Dr G. Squinzi is the president in situ of the normative group.

Before proceeding, we should briefly summarise what the body has achieved in the past ten years.

Most of the normative work has already been completed: all of the testing methods for the classification of adhesives are now established and in vigour, all of the testing methods for grout materials have also been determined, and soon the procedure for their officialization as an EU norm will be concluded. The EN 12004 standard for adhesives has been approved as an EU regulation, and many companies already package and brand their products with the prescribed symbols which indicate compliance with EU standards. Details of these regulations are available from national industry information boards. At the Paris meeting discussions focused on two issues of particular relevance to the laying of ceramic tiles. The first regards the definition of the deformability of ceramics, which is becoming an ever greater priority of project planners, fitters, and customers. Using the EN 12002 testing method "Transverse deformation" now it's possible to determine the deformability of adhesives with precision. The TC 67/WG3 decided unanimously, after a series of technical conferences and reports, to create two classes of deformability:

class S1 - for cementitious adhesives with a level of deformability (according to the EN 12002) equal or superior to 2.5 mm.

class S2 - for cementitious adhesives with deformability values (according to the EN 12002) superior to 5 mm.

The adhesives with a deformability level of less than 2.5 mm can not, according to the criteria laid down, be defined as deformable. The classification refers only to cementitious adhesives and is not applicable to products with properties deemed to be polymeric such as paste adhesives or reaction resin adhesives (polyurethane and epoxy). An important, courageous, and innovative decision was taken thanks in large part to the proactive approach of the Italian delegation. It was in fact the first time in the history of adhesives for ceramics that a decision was taken to eliminate all definitions inappropriately used on the market to define flexible, elastic, deformable etc. products which in reality don't possess these characteristics.

Professional and competent producers can display a European symbol on their products denoting the class to which the product belongs, both in terms of adhesive strength and deformability. Furthermore, at the Paris

meeting the CEN TC 67/WG3 looked at another very topical issue in many European countries; namely a move towards a more frequent use of ceramics in situations where inappropriate flooring materials can create serious durability deficiencies: eg. "the laying of tiles on waterproofing gaiter (not tar), applied directly to the mortar bed, in environments often exposed to water, such as showers, balconies, terraces and swimming pools etc." The European norm currently in the final stage of review before approval contains directives for the testing of the adherence of ceramic to waterproofing gaiter floor, of the waterproofing of the gaiter itself, of resistance to chemical agents and of flaws in the substrate.

ISO 189/WG3 - Adhesives for ceramics

The "International Organisation for Standardisation", ISO, invited the TC189/WG3 to prepare ISO norms for adhesives and products for the grouting of joints of ceramic tiles. This work group, currently administered by the United States of America, organised its first meetings in 1997 and has already held meetings in both the United States and Europe, attended by delegates from the United States, Australia, France, UK, Spain and Italy. Dr Giorgio Squinzi is president of the Italian delegation. The last meeting of 2000 was held in Rome in November. Ever since the inception of the committee, the group's work has consisted primarily in detailed analysis and cross referencing of the European norms, recently established by the CEN TC 67/WG3 body, with the ANSI standards currently in force in the United States.

For the definition of the ISO norms the TC189/WG3 naturally wanted to use recent experience of the T67/WG3, basing the new guidelines on this precedent, but also incorporating the demands of the American market which occasionally differ from those in Europe. For example, the laying of ceramic tiles on wooden floors is much more common in the United States than in Europe, as are ready-to-use paste adhesives, which there enjoy a much larger share of the market.

The Rome conference was typically productive: testing methods for adhesives (ISO 13007 part 2) and for grouts (ISO 13007 part 4) were revised.

Particularly important were the requirements of the ISO 13007 parts 1 and 3, regarding the minimum performance indexes of ceramic adhesives and grouting products.

These final two fundamental norms also embrace and adopt the demarcation and classification of adhesives stipulated in the EU guidelines, and so confirm that this norm remains valid and relevant.

The definitive approval of the ISO norms is due for 2002 for those regulations described above. Finally, it should be noted that the publication of the ISO norms will in no way provide a replacement for the EU regulations, which remain in vigour and unchanged.



MAPEI'S NEW

By the end of 2001, a significant proportion of the 500-product Mapei portfolio had already been treated to the packaging make-over set in motion at Cersaie 2000.

by Gianni Guidi

Mapei's changing it's skin. Or its clothes, at least. The new look was unveiled at the 2000 edition of the Cersaie trade extravaganza, with a re-styled packaging line introduced for the grout product line, and for several other all-new Mapei products. The entire range of around 500 Mapei products will soon be treated to the same makeover. From Australia to Canada, from Norway to Argentina. It's both a costly and a time-consuming operation, soon to be extended to our catalogues and our technical sheets.

"It's a corporate image project which is ongoing - Mapei group marketing manager Adriana Spazzoli affirms - and which we hope to conclude within a year or eighteen months."

The previous Mapei packaging design was a relative "relic" from the 1970s. It was natural therefore that the company should covet a product image befitting of



the new Millennium and a testimony to the rapid evolution of the Mapei group - "A fresher look, a strong image which immediately identifies the product with the Mapei brand",



NEW CLOTHES



This symbol indicates that KERACOLOR FF satisfies requirements for the CG2 class as an improved cementitious grout (high resistance to abrasion and reduced water absorption), according to the prEN 13888 normative.



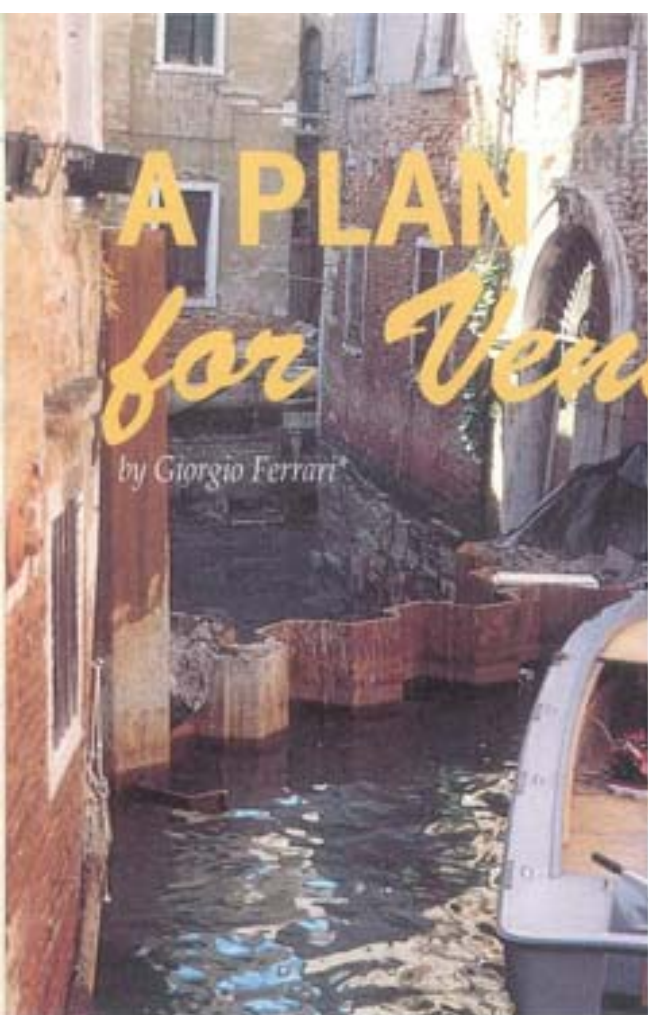
Spazzoli sums up. So the marketing department of the Italian brand leader set to work. The finished oeuvre revealed to the general public at the 2000 Cersaie fair was largely the fruit of their labour, with the considerable input of Enrico Orlandi, art director of long-term Mapei image consultants More Light, and Jakob Meisterhans, in-house engineer and packaging manager based at the company's Milan offices. Working in close collaboration, they hatched a solution which was perceptibly influenced by the firm's involvement in the world of professional cycling, or more specifically by Mapei's title sponsorship of the most prolific team currently active in the sport. "The new packaging essentially has three defining characteristics - says Meisterhans - of which the first is the colour, that's to say that "Mapei blue" which has long been the company's trademark. Then there's the graphics, or those cubes and arches which are

invariably associated with the Mapei name. Finally, we have the symbols which indicate that our products conform with new international normative standards." "It required a considerable effort on our part," Meisterhans concedes, "particularly as the new graphics are relatively complicated. It's not only an independent initiative which will encompass each of Mapei's products, but also a collective effort in which even our suppliers will want to engage, to respond to the exigencies placed upon them by the advent of the new Millennium." As issue no.10 of Realtà Mapei International went to press in November, the company's ranges of additives and screeds were the latest to enjoy a packaging face-lift. This takes the proportion of Mapei products already affected by the restyling operation to between one third and a half, Mapei group marketing manager Adriana Spazzoli estimates.



A PLAN for Venice

by Giorgio Ferrari*



The Venice lagoon extends over an area of about 550 km² and it is bounded by the mainland on the north and by sandy littorals on the south and communicates with the Adriatic sea by means of three openings

The Venetian lagoon was formed more than 6000 years ago, the result of the contrary thrust of the Adriatic tide and the flow of sedimentary material from the various rivers which discharged into it. It currently spans an area of around 550 km² and is hemmed in on one side by the terra ferma of the Italian peninsula, and to the south by a long sandy "key" which separates it from the Adriatic sea.

The average depth of the lagoon is unremarkable in itself, but thanks to a dense network of canals, it is almost entirely accessible by boat both in the central estuary and in the inhabited areas beyond.



The article published below is an extract of the report presented at the V International Conference on the durability of concrete, organised by Barcelona's CANMET/ACI from May 5 to May 9, 2000. Those interested in obtaining further details can request a complete transcript of the report from Mapei (fax. 00 39 02 37673214; e-mail: mapei@mapei.it)

*Giorgio Ferrari works in association with Mapei on the research and development of new superfluidifiers and admixtures for concrete. He lives in Venice, where he specialises in problems linked to the protection of the lagoon and water pollution.

Figure A. A diagram illustrating the expanse of the Venice lagoon.

Photo 1. The dredging works on the internal "rii" canals are carried out once the water has been drained. As a result, the sewer system of the residential buildings can be consolidated and restored.

Photo 2. The dredging of a lagoon canal. Depending on the level of contamination, the

dredged sediments can be re-used directly or disposed of according to codified procedures.

Figure B. Characteristics of the sediment used for the experiments
Photo 3. The "Isola (island) delle Trezze" spans 57 hectares and can accommodate around 2 000 000 m³ of deposits. Its base is composed of impermeable clay and the island is protected by deep-lying perimeter

barriers to prevent the contaminants from escaping back into the lagoon water.

Figure C. The reduction of the W/C ratio and the use of mineral additives reactive to lime transform the traditional concrete into high-performance concretes (HPC). With the same technique the inert sediments, which present an



3



2

environmental problem as they must be somehow be dumped, can be transformed into recyclable materials. Figure D. The addition of the acrylic superfluidifier MAPEFLUID X404 to the cement mixes containing the sediments allows a reduction in the water/cement ratio, thus increasing the resistance and the durability of the resulting cement conglomerates.

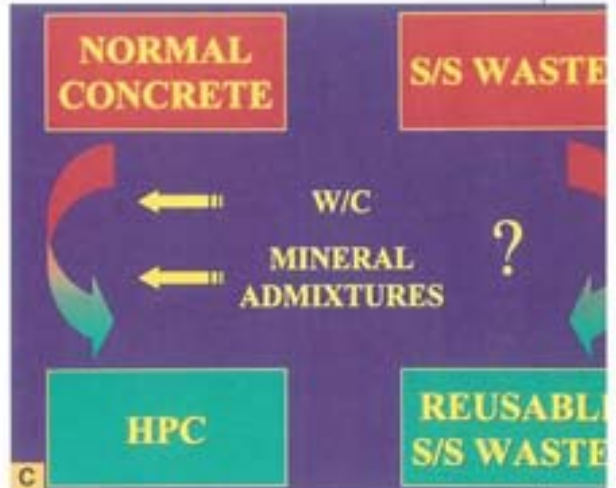
The tide flows and sea-bound traffic cause a resuspension of the sediment which in turn soils the canal water. Regular dredging of the canals

CHARACTERISTICS AND TOXIC METAL CONTAMINATION OF THE VENICE LAGOON SEDIMENT

PARAMETER	MEASURED VALUE
Solids content (%)	43.1
Mean particle size (µm)	13.28
Specific gravity (g/ml)	1.37
As (mg/kg of dry sediment)	335
Cd (mg/kg of dry sediment)	65
Cr (mg/kg of dry sediment)	149
Cu (mg/kg of dry sediment)	286
Hg (mg/kg of dry sediment)	46
Ni (mg/kg of dry sediment)	20
Pb (mg/kg of dry sediment)	626
Zn (mg/kg of dry sediment)	5415

B

consequently becomes essential. In the past, operations didn't present an environmental problem, since the sediments were re-used for the construction of embankments and the re-elevation of islands within the lagoon itself. Over the course of the last century, the development of a highly industrialized area around the lagoon and the changes in socio-economic conditions have brought about the progressive contamination of the lagoon sediments, in particular of those close to the Porto Marghera industrial zone, and of the "rii" canals which are the very quintessence of the world's most romantic city. In figure B the nature and the level of



contamination of a sediment removed from canals in the industrial quarter are illustrated. Here we see that the dredged sediments can no longer be recycled as they once were, but must now be expended according to codified procedures. To fulfill this need, an island in the middle of the lagoon has been created (Isola delle Trezze) in which the most heavily contaminated sediments can be deposited. (photo 3).

However, the volume of mud to be dredged (approx. 500 000 m³ of mud from the canals of the city and around 7 000 000 m³ from the industrial canals in Porto Marghera) clearly exceeds the deposit capacity on the Isola delle Trezze.

For both a correct and a modern waste disposal technique it therefore becomes necessary to reduce the quantity of muds for dredging and develop new,

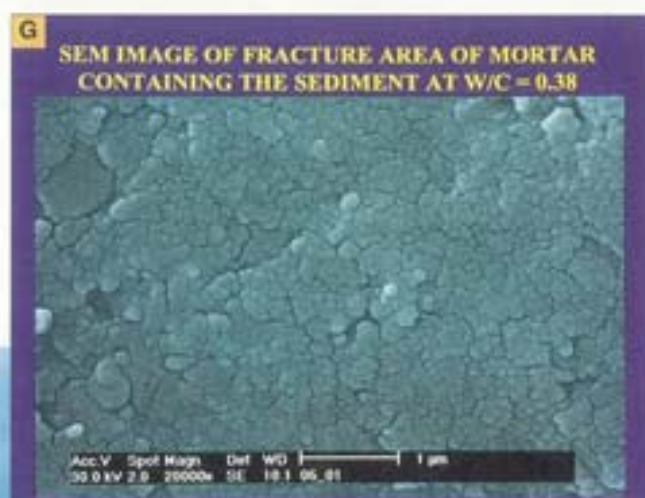
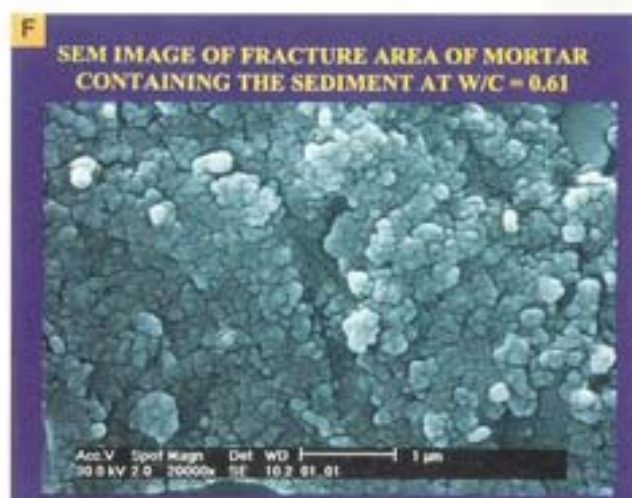
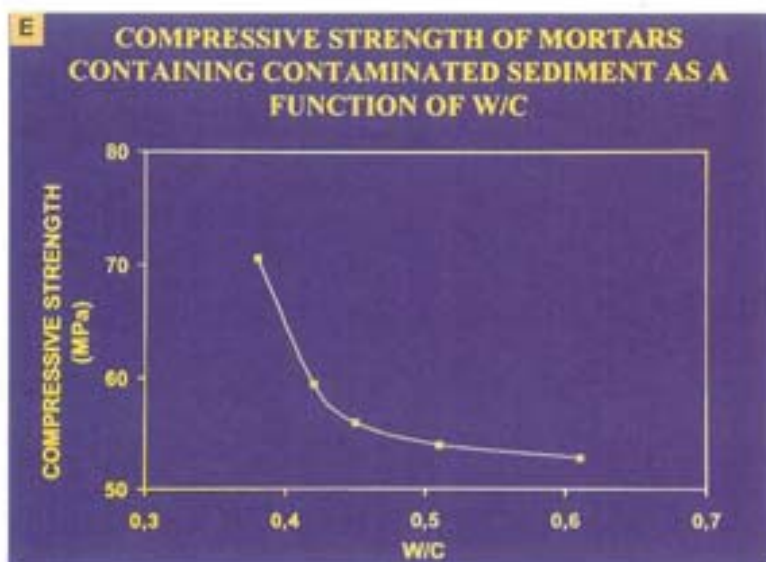
low-cost technology for re-use in safe ecological conditions.

COMPOSITION AND CHARACTERISTICS OF THE DIFFERENT MORTARS

MORTAR SAMPLE	DOSAGE OF SUPERPLASTICIZER (% by wt of cement)	W/C
1	0	0.61
2	1	0.51
3	2	0.45
4	4	0.42
5	6	0.38

Cement brand: Type V PTL cement
 Sand cement ratio: 1.1
 Sediment cement ratio (dry sediment): 0.25
 Type of superplasticizer: Acrylic, 30% soln.
 Flow of the fresh mortars: 67 +/- 7

Mapei has undertaken a research project to investigate the possible recycling of polluted sediments in the Venice lagoon in cementitious conglomerates noted for their high mechanical strength, high durability and environmental compatibility with traditional cementitious materials. The most innovative aspect of the research is the application of rules for the production of high-performance concretes (characterized by low water/cement ratio and the use of minerals reactive with calcium hydroxide which forms as a result of the cement hydrating) to the solidification/stabilization process of the waste products (fig. C).



The use of the acrylic superfluidifier MAPEFLUID X404 ensured that consistent aliquot mixtures of polluted sediment could be added (up to 25% in weight of dry sediment of the cement) without compromising the mechanical properties of the resulting concrete (fig. D and E). In addition the reduction of the W/C ratio in turn diminished the porosity of the cement mix containing traces of sediment, almost eliminating contaminants completely.

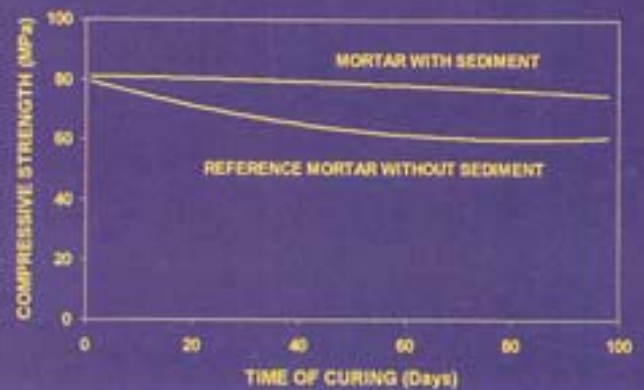
Furthermore, it was discovered that the polluted sediment, consisting of a predominantly clay-based inorganic matrix, is capable of improving the durability of the cement mixtures quite significantly. Such an improvement, most evident in the presence of substances deemed "aggressive" to concrete, such as the calcium chloride widely used as a de-icing agent on roads and viaducts, seems more readily attributable to the ability of the clay-based elements in the sediment to irrevocably absorb calcium hydroxide which forms when the cement is hydrated than to a pozzolanic reaction; this way the



H CUMULATIVE LEACHING OF MONOLITHIC SPECIMENS OF MORTARS AT DIFFERENT W/C AFTER 10 MONTHS IN WATER

METAL	SAMPLE							
	UNTREATED SEDIMENT	M1	M2	M3	M4	M5	REF	
		W/C						
		0.61	0.51	0.45	0.42	0.38	0.38	
		LEACHING (µg/l)						
As	64	3	<1	<1	<1	<1	<1	
Cd	8	<1	<1	<1	<1	<1	<1	
Cr	2	46	62	48	33	54	66	
Cu	21	21	21	21	12	9	7	
Hg	<1	<1	<1	<1	<1	<1	<1	
Ni	2	2	1	<1	<1	<1	<1	
Pb	37	<1	3	<1	7	3	8	
Zn	761	<1	<1	<1	<1	<1	<1	

I COMPRESSIVE STRENGTH OF MORTARS WITH AND WITHOUT SEDIMENTS OF THE VENICE LAGOON IN AGGRESSIVE ENVIRONMENT (30 % CaCl₂ soln.)



lime is no longer available to react with the aggressive composites present in the atmosphere (chlorides, sulphates) and consequently dissables the formation of by-products (plaster, ettringite, calcium chloride) which are the main cause of deterioration in concrete (fig. I). The discovery of the beneficial effect of the lagoon sediements on durability enabled Mapei to obtain a patent on the use of these waste materials for the improvement of the properties of cementitious materials.

The excellent results achieved and the exciting possibilities

revealed by such ground-breaking discovery encouraged the Administration of the city of Venice to support further research.

This with a view to proposing to the Ministry of the Environment a recycling scheme making use of the dredged muds in high-performance cementitious mixtures.



Figure E. Compressive strength of mortars containing contaminated sediment as a function of W/C. Through the use of the acrylic superfluidifier MAPEFLUID X404 excellent mechanical performances can be obtained even with a high concentration of sediment.

Figures F and G. SEM images of cement conglomerates containing the polluted sediments from the lagoon. The material displayed on the left is notable for its high W/C ratio (0.61) and its high porosity, while the sample examined in figure 10 with a far lower W/C ratio, is much more compact and less porous.

Figure H. Cumulative leaching of monolithic specimens of mortars at different W/C after 10 months in water, measured using the ANSI/ANS-16.1 method. MAPEFLUID X404 can reduce the leaching of toxic metals present in the cement mixtures containing the sediment to levels comparable with the control mortar (without sediment).

The untreated sediment (left-hand column) clearly shows the highest susceptibility to leaching.

Figure I. Concrete decay caused by calcium chloride (CaCl₂). The decrease in mechanical strength over time is attributable to the formation of by-products of the reaction between CaCl₂ and the lime normally present in cement mixtures. The addition of lagoon sediments to the mix increases the durability of the mixture as the sediment "consumes" the lime and prevents the formation of by-products which are the source of the decay (calcium chloride). For this reason the mixture containing the sediment shows no significant reduction in Rm over time.

Corrosion, prevention AND PROTECTION

IN REINFORCED CONCRETE

by Pietro Pedferri*



transforms into an 'aggressor' of the reinforcement. This scenario essentially arises for two reasons.

First: from the outer sections penetrating gradually further towards the centre, the alkalinity of the concrete can be neutralized by the carbon dioxide present in the atmosphere, and its aqueous phase hence falls from $\text{pH} > 13$ to a pH of around 9. Specialists call this process carbonation.

Second: the chlorides can penetrate into the concrete when they are present in the atmosphere, finally reaching the reinforcing bars. When, at the surface of the rods their alkaline content exceeds a critical level (about 0.4 – 1% by the weight of the cement) the protective film is locally destroyed.

The corrosive attack occurs only once the film has been dissolved and only if water and oxygen are present at the surface of the reinforcing rods. Corrosion by carbonation manifests itself uniformly across the surface of the reinforcing bars and is generally the result of relatively low-speed penetration (never above 100 microns per year but usually much lower than this). The corrosion through chloride formation occurs through localised and penetrative aggressions which form "pits", surrounded by uncorroded areas; the rate of penetration can be remarkably high with tips at 1 mm/year.

Prevention

The first step to prevent corrosion is to meet the requirements of the EN 206 (or the corresponding UNI 9858), or the Eurocode 2 relative to the durability of the reinforced concrete structures. In practice, these norms determine the level of environmental aggression subdividing it into various classes and establishing parameters such as maximum water/cement ratios, the cement factor, the workability and the methods for casting concrete, and the thickness of the cover as a function of aggression. Providing that these guidelines are observed, the problem of corrosion can be easily resolved in the vast majority of structures exposed to the atmosphere for a service life of 50-75 years. Instances of precocious deterioration, which remain unacceptably frequent, can usually be retraced to errors in the planning stage or in the construction or maintenance of the structure. Furthermore in relatively rare but nonetheless noteworthy cases of high aggressivity, the norms are inadequate. For example, concretes compliant with the quoted regulations can be subject to unacceptable levels of corrosion even in a timespan of under 50 years when structures are heavily contaminated with chlorides, like slabs or other elements of bridges which may come into contact with de-icing salts, or perhaps marine structures under

Corrosion in concrete

In alkaline solutions with a pH of > 11.5 and in the absence of chlorides, iron becomes covered by a very thin film of oxygen, just a few molecules thick. In these conditions iron is passive, i.e. it is corroded extremely slowly, if at all. A well-packed and well-used concrete effectively acts as an alkaline solution with a pH of 13 to 14 and so passivates the steel quite perfectly.

Unfortunately, over the course of time the concrete can lose its passivating properties and ceases to provide protection for the steel. Rather it

attack from sodium chloride. The surfaces of these constructions often come into contact with sea water, as can also happen in reservoirs, floating docks or garages. The aforementioned conditions of high environmental aggression excepted, corrosion can prove unavoidable in situations where it's impossible to guarantee the thickness of the reinforcing bars recommended by

E STRUCTURES



Photo 1. A skyscraper in Boston, showing signs of corrosion due to carbonization.

Photo 2. Marina Towers, Chicago; induced chlorides corrosion in the lower section, used as a multi-storey carpark.

2

guidelines. Refurbishment projects could be an example of this, or when the desired service life of the structure exceeds 50-75 years, as may be the case with bridges, tunnels, public buildings or monuments.

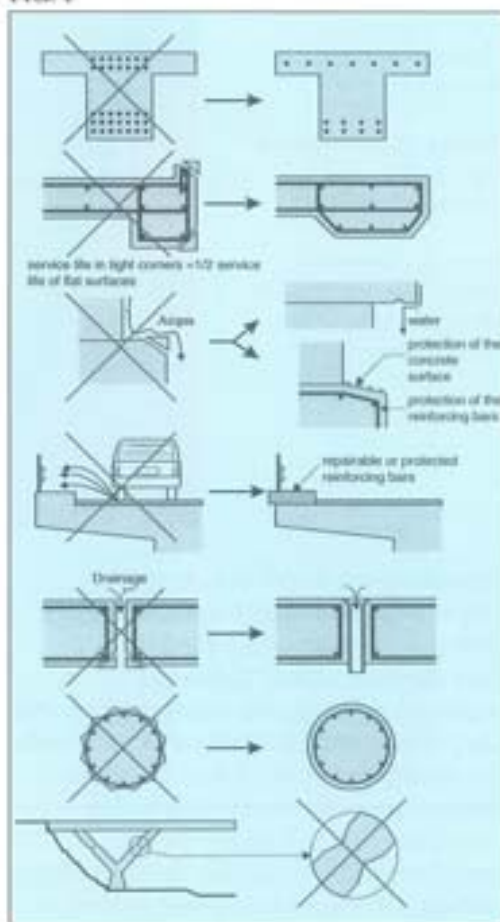
In these cases it's necessary to increase the durability of the structure, referring to specific, additional protection measures. At times these measures can be applied only in critical areas of the structure (joints, supports, anchorages or areas in which aggressivity is higher) or only to reinforcing bars

situated closer to the exterior ("skin" reinforcements).

Good practice

Resorting to additional protection isn't an alternative to respecting standard prevention measures. The combined procedure begins in the planning or design stage, as the dimensions and design of the structure are projected, the choice of materials defined and the optimal proportions of the materials finalised. Project planners next proceed to the realisation phase with the

FIG. 1



Examples of a correct and an incorrect design and a few pointers as to vulnerable areas in bridge structures or similar.

preparation, implementation, compaction and curing of the concrete. Systematic and periodic inspections and services then continue throughout the service life of the structure. In fact, where necessary to apply additional protection, the usual preventive measures must be effectuated under even more rigorous survey. Their importance must be continually re-emphasised although they should constitute standard practice in construction. Access should be granted for inspection and maintenance according to the circumstances of the project. The structural make-up must be such to limit flaws in the concrete. The construction plan should avoid complex geometries, tight corners, overlapping of reinforcing bars, according to how the operation is carried out; similarly, contraction joints, support beams and all areas where water could accumulate and stagnate are vulnerable areas in the structure and risk corrosion damage. The design and the use of plasticisers and superplasticisers should yield concretes with the necessary level of workability and concretes which, once set, satisfy minimum requirements for mechanical

Photo 3. Induced chlorides corrosion in a marine structure.



Photo 4. Corrosion due to carbonization and presence of chlorides.



Photo 5. "Piazza di Spagna", Seville (Spain); corrosion due to carbonization.



resistance and durability. As the implementation stage begins, necessary precautions must be adopted in order that: the paste doesn't undergo segregation during the transportation and the placement phases; vibration compacts the structure; the real thickness of the reinforcing rods corresponds to that stipulated in the project plan; the temperature and humidity levels are kept optimal for a sufficiently long period, to ensure an adequate hydration of the cement. Clearly in these phases all necessary tests must be carried out to ensure an end product which fulfils requisite, qualitative standards. With individuals in a number of different roles involved in both planning and application (the project planner, the producer of the concrete, the building company and the firm responsible for maintenance), and responsibility for checkups ambiguous, overlapping areas become paramount, where testing and quality assurance obligations pass from one group to another. Figure 1 illustrates several areas which, history would suggest, often lie at the root of problems, and the table also proposes a few suitable alternatives. The examples quoted prove that the origin of the corrosive processes is often linked to apparently trivial errors, which could easily be avoided, without any significant outlay. In fact, the costs necessarily incurred to guarantee adequate prevention prior to works commencing are minimal in the light of savings made on management and maintenance expenses and to the costs of emergency protective action and refurbishment later.

Additional protection
Additional protective measures

essentially modify the characteristics of the concrete, of the reinforcing bars and of the external environment. To understand the way in which they function, it's worth recalling the mechanics of the corrosive processes which affect concrete. We have established that this deterioration can be activated only after the concrete in contact with the reinforcing rods has been carbonated or contaminated with chlorides and if air and water are present. In this scenario, the

corrosion of the bars takes place according to the reaction: iron + oxygen + water = corrosion products. This electrochemical reaction consists of four partial processes which follow one after another, all at the same speed. To be precise, they are:

- the oxidation of the iron which makes electrons available in the reinforcing bars and gives off the products of corrosion (anodic process),
- the reduction of oxygen which takes electrons from the bar (cathodic process),
- the transportation of electrons within the reinforcing bars from the anodic, where they're made available, to the cathodic areas where they are consumed.
- finally, so that the circuit can be closed, the circulation of electricity within the concrete from the anodic to the cathodic regions (here transported by the ions because the concrete becomes an electrolyte in the presence of water).

Given that the speed at which these reactions take place must be equal, the rate of the corrosion process is defined by the slowest of these four. To prevent corrosion blocking one of the partial processes is

Figure 2. Classification of methods of additional protection which effectively modify the properties and composition of concrete, of reinforcements, of the external environment or of the structure itself.

Figure 3. How additional protection methods work.

FIG. 2

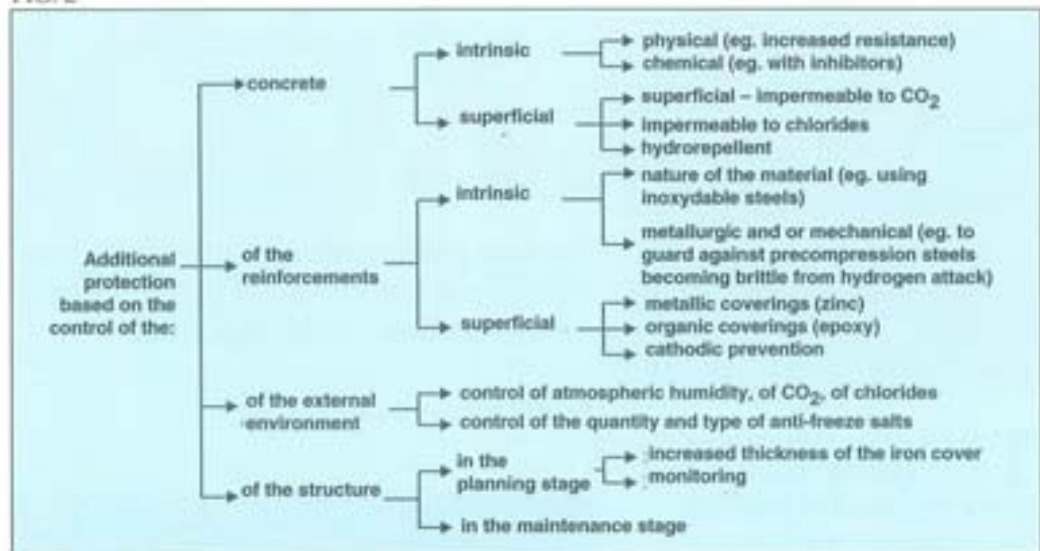
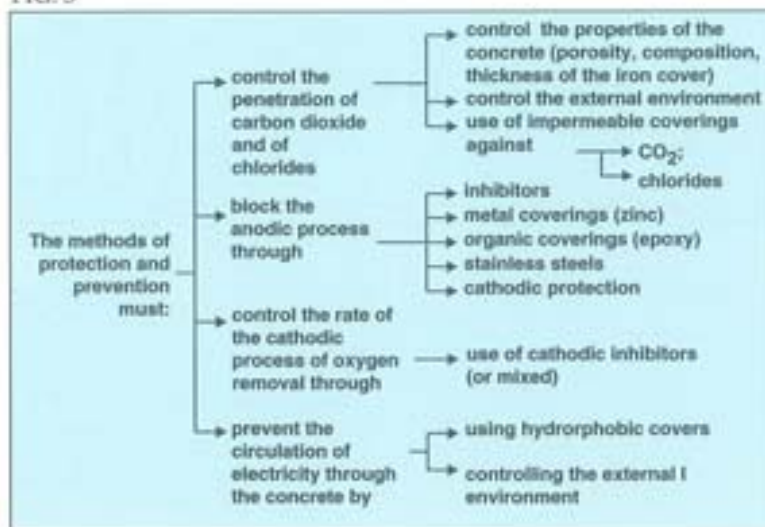


FIG. 3



sufficient. In practice two are easily controlled: the anodic process and the circulation of electricity within the concrete. More difficult to control is the cathodic process and it is in fact impossible to obstruct the current of electricity from the cathodic to the anodic zones inside the reinforcing rods. As a result, as illustrated in figure 3, the additional protection techniques to prevent corrosive attack must fulfil one of the following functions:

- prevent the carbonation phenomenon and the critical level of chlorides from reaching the concrete which is in contact with the reinforcing rods during the normal service life of the structure;
- maintain a block on the anodic process, or
- reduce the rate of the cathodic process, or
- nullify or limit the circulation of electricity within the concrete.

To slow the penetration of the CO_2 and of the chlorides, the concrete itself must be treated to improve its impenetrability characteristics (by lowering the permeability and/or increasing the cover thickness) or using coatings or waterproofing techniques on its surface.

Alternatively, to maintain the block or to curb the rate of the anodic process, inhibitors or covered bars (eg with epoxy resins) can be used, or galvanised or stainless steel bars, or cathodic protection. Should carbonation be detected, these techniques ensure that the reinforcements remain passive even when the concrete has lost its alkalinity. If chlorides are also present, these methods retard or prevent them from reaching their critical level during the service life of the structure, since they effectively raise this level. From 0.4 – 2%

of the cement weight, for example, inhibitors (depending on their type and concentration) can raise this ratio to between 1 and 3%, with galvanised reinforcements to 1 – 1.5%, with stainless steels from 3 – 5%, and with cathodic protection to even higher levels.

As regards the cathodic process, no technique currently available can cut off the supply of oxygen to the reinforcements in a practicably short space of time, unless they remain completely and permanently saturated with water. With absorption inhibitors composed principally of organic substances it is however possible to control the speed at which oxygen is reduced, at least at low chloride levels. These inhibitors are organic (for example etanolamine). They are known as "mixed" inhibitors, since they act simultaneously on both the cathodic and the anodic processes. Research in this sector is particularly active, as until now the performance of these inhibitors has been unpredictable, especially when the chloride concentration exceeds 1 – 1.5% of the weight of the cement. Finally, to reduce electronic currents to a negligible level, hydrophobic coverings are used. These reduce the quantity of water in the concrete and increase its resistance.

**Pietro Pedefferri is professor of Corrosion and protection of metallic materials at the Polytechnic of Milan, Italy.*

For more detailed information:

[1] P. Pedefferri, L. Bertolini, "La Durabilità del calcestruzzo armato", (Durability of reinforced concrete), McGraw-Hill Italia - Milan, 2000.

SILEXCOLOR

This new product belongs to the silicate finishing cycle. It is an exterior and interior mineral plaster which gives an attractive antique-imitation, marble-style finish.

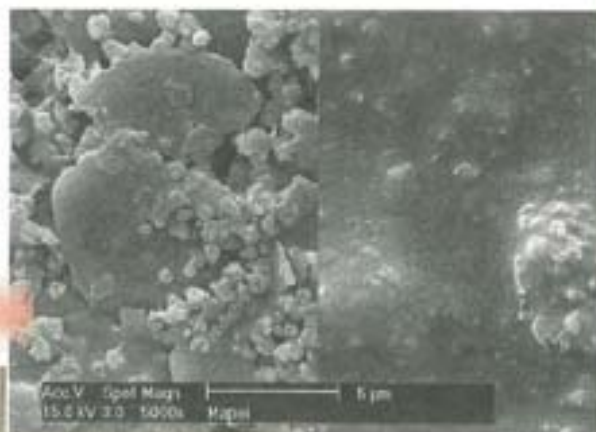
by Paolo Sala - Mapei S.p.A.

There's a long story behind SILEXCOLOR. In fact, back in 1949 when very few people in Italy even knew what silicates were, a company called Mapei, recently founded by Rodolfo Squinzi, was already using silicates under the name of SILEXCOLOR. The product was used that year on the Villa Reale (Royal Palace) in Milan (see photo opposite), obviously in the formulation that was available at that time. Since then, sloppy and unrefined building and continually deteriorating environmental conditions (acid rain is one notable example) have seen tried and tested formulas in the area of finishes make a miraculous comeback. Silicates, now better than ever thanks to technical advances and new regulations, are leading this resurgence. Take, for instance, the contribution of the DIN 52615 and DIN 52617 standards in determining vapour permeability and water impermeability respectively, as well as Kuenzle's "dry wall theory" whereby a wall can be considered "medium dry" if the product $S_d \times W$ (S_d = vapour permeability; W = water impermeability) is ≤ 0.1 (see article on silicates published in *Realtà Mapei* no. 39). Improvements in experimental investigation instruments are also making an increasingly important contribution both where theory verification and the construction of reliable models for the prediction of the behaviour of various materials over time are concerned. This is how modified silicate-based products (in compliance



1949 - Villa Reale, Monza - Milan (Italy)

The Mapei R&D laboratory's ESEM/FEG scanning electron microscope, which boasts a magnifying power of 300 000, is used to verify the behaviour of a finish in the base/product interface. In the close-up, we can see the behaviour of a silicate finish (left) compared to that of a modified lime-based product currently available on the market (right).



MARMORINO



The xenotest or weatherometer at the Mapei R&D laboratory helps to predict the behaviour of an exterior finish over time by artificially accelerating the ageing process. The close-up shows how a product not suited to exterior use (right) changes colour quite dramatically while a suitable product retains its colour over time (left).

with DIN 18363, which establishes the limit of organic substances present at $\leq 5\%$ of the total dry product) have become one of the best technological solutions in the area of renovation finishes.

But the façades of our increasingly colourful houses and cities now require more than just protection technology. A finish now has to go beyond protection

The benefits of Silexcolor Marmorino:

- excellent adhesion to the wall substrate with the typical silicification reaction.
- high vapour permeability in line with the theory that the outer layer must not obstruct the passage of vapour from the interior to the exterior of the brickwork.
- improved water-proofing of substrate due to the crystallisation of the potassium silicate in the voids.
- Imperviousness to the erosive action of acid rain which destroys lime-based finishes with a sulphatisation reaction.



Example with a Karsten tube. This method establishes the difference between the water absorbed over 24 hours by the substrate before and after treatment with SILEXCOLOR.

and must also perform a decorative function. This is why we created SILEXCOLOR TONACHINO as a complementary product to SILEXCOLOR PAINT. A mineral paste coating which can be applied using a spatula, it gives a textured, granulated finish and is available in 34 attractive colours. SILEXCOLOR TONACHINO is also indispensable for specific area dehumidification when used with the MAPE-ANTIQUÉ series to smooth out superficial irregularities between traditional plaster and the repaired area. A real winner as both a protective and a decorative product came next in the form of

Table 1 – Silication reaction

The silication reaction gives very good adhesion with the substrate via three different phases: crystallisation of the silica in the substrate voids (A); the reaction of the potassium silicate with atmospheric CO_2 (B) and the interaction with the calcium basicity of the substrate (C).

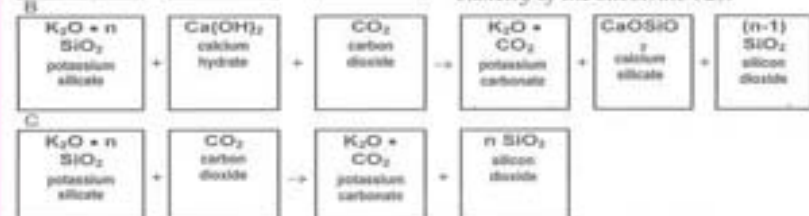
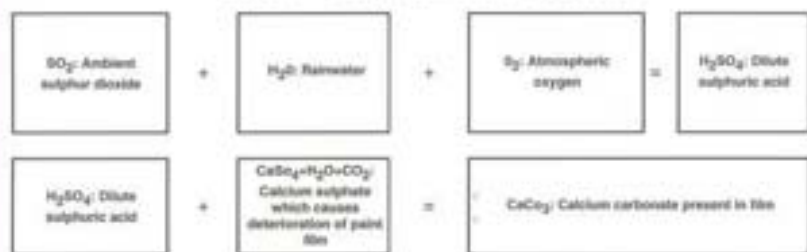


Table 2 – Resistance to vapour diffusion in some materials

Product/Values	Brick	Plaster	Silicates	Paints
Thickness (metres)	0.36	0.03	200÷1500x10 ⁻⁶	200÷4000x10 ⁻⁶
Resistance to vapour diffusion (μ)	15	8	25÷90	2500÷4200
Diffusion resistance of known thickness (Sd)	5.4	0.24	0.005÷0,135	0.50÷16.8

Practically speaking, the resistance of a finish to vapour diffusion defined as Sd, i.e. the product of the resistance to vapour diffusion μ and the thickness of the film (Sd = μ x S), must be less than that of the underlying layers. As can be seen, Sd silicates < Sd plaster meaning that the silicate finishes do not obstruct the natural flow of humidity.

Table 3 – Sulphatization reaction



The sulphuric acid contained in rainwater, as a result of hydration of the sulphur dioxide from exhaust gases, breaks down the calcium carbonate transforming it into calcium sulphate

Church in Merone (Como - Italy). Detail of a finish applied to the interior using SILEXCOLOR TONACHINO.



SILEXCOLOR MARMORINO, an interior/exterior modified potassium silicate mineral paste which can give the substrate an

purpose, however. Like most silicates, it transpires and bonds perfectly with the substrate, thus slotting perfectly into a treatment

cycle which ranges from substrate renovation using the MAPE-ANTIQUÉ line plus mortars and plasters from the Building Line,



attractive, antique-imitation, marble-style finish. Available in ten colours, SILEXCOLOR MARMORINO can be applied in several different ways to add a touch of personality and originality to any space. SILEXCOLOR MARMORINO serves more than just a aesthetic



Collegio Gentile, Fabriano (Ancona - Italy). The close-up shows the grain of the SILEXCOLOR TONACHINO used for the finish.



ELASTOCOLOR, SILEXCOLOR PAINT, SILEXCOLOR TONACHINO and SILANCOLOR PAINT high technology products are available in 34 colours. Mapei's revolutionary Automatic Colour System - ColorMap® is able to "read" a sample colour from any type of substrate or material and transform it into one of Mapei's finishing products. Each can be used to obtain special effects: aged, crossed, spogned and clouded.

to decoration and protection. This is a complete cycle which uses products and methods that are not merely mutually compatible but also capable of maximising each other's individual performance.

The technical Data Sheets for the products mentioned in this article are contained in Mapei binder No. 3 "Building Line".



Available in 10 colours, SILEXCOLOR MARMORINO offers three different effects: "classico", "encausto" and "veneziano".



A World Championship w A Freire Result for Oscar and MA

by Daniel Friebe

The cycling World Championships is the end-of-season showcase where, for one day only, national-team duties take precedence over club allegiances. So it was that followers of Mapei-Quick Step arrived at this year's race for the fabled rainbow jersey, to be staged in Lisbon, Portugal, contemplating a nagging but still enviable conflict of emotions: two Mapei riders, the Spaniard Oscar Friere, and Italy's Paolo Bettini, were among the favourites for victory, but today would ride as adversaries, representing their respective countries, rather than comrades in the name of Mapei. Unfortunately one of the two had to be content with a silver medal...

"Chiuso per Freire," – closed for Freire, not Ferie, summer holidays. So read the unashamedly immodest message to

customers discovering a deserted Mapei Sport Centre between the hours 13 and 14 on Monday, October 15.

The previous afternoon in Lisbon, Portugal, such subtleties had been forsaken by the onlooking missive of the Mapei-Quick Step cycling team, as Oscar Friere recaptured the rainbow jersey, and with it the fourth world championship gold in seven years for a Mapei-sponsored rider. As Freire collected his second world title at the age of just 25 – only the Belgian George Ronsse achieved the feat younger, in 1929 – euphoria soon gave way to a sense of liberation. No one had put the Spaniard's credentials in doubt, yet the relief remained for a victory deemed unlikely on a 254 km course thought too severe for a man erroneously branded "just a fast-finisher", whose build-up had been questioned, and in a race so sternly contested as the world championships. Then there was that naughty-but-nice afterglow known only to those with a penchant for upsetting the odds. Men like Oscar Freire and Paolo Bettini, another Mapei hero in second place. Set against the unforgiving precedent of previous years, not even Aldo Sassi or Giorgio Squinzi denied that Mapei's season had satisfied though not sparkled before Lisbon.

Above all the statistic of "only" 43 UCI victories, although still more than almost any other professional team, compared unfavourably with an average of 73 per season between 1994 and 2000. Freire's victory was not only timely therefore, but recompense for a strategy of investment in youth - 7 of 11 Mapei riders in Lisbon were aged 25 or under - not to mention a reward for a tireless, exasperating quest to solve a back problem which has limited Oscar to just 80 days competition since joining Mapei in 2000.

"His back is only limit," says team Mapei-Quick Step director Sassi of Freire's mystery ailment, still-undiagnosed after visits to 26 different specialists. "When we signed Oscar after his victory in Verona in 1999, we discovered that he's an athlete with extraordinary



Without frontiers MAPEI QUICK • STEP

capabilities. The most significant of these is his "trainability", his capacity to reach optimum condition after long periods of inactivity. To reach a level of preparation for which requires several months of training for other riders Oscar needs just eight weeks... This victory is one of the most satisfying ever for Mapei precisely because we've worked so hard with Oscar to overcome his problems. "At Lisbon Freire shrugged off doubts surrounding his competitive preparation, and overcame the finest field assembled in any single race this season. Race favourite Jan Ullrich, French chou-chou Richard Virenque and the star-studded Italian line-up all set out Freire's presumed vulnerability with attacks on the final two laps of the undulating 12 km circuit. On each occasion, however, they were closed down by exemplary Spanish national team, or by Freire himself. Most impressive was his killer-instinct in the closing 150 metres, allied to the guile needed to slither around Erik Zabel, an exercise in precision timing seemingly out of character for a self-confessed scatterbrain like Oscar.

"This morning I told the team that I felt really strong," said the man from Torrelevaga, already resplendent in the rainbow bands of World Road Race Champion. "So we decided to work towards a sprint finish. I could count on team-mates who could quite legitimately have designs on the world title themselves or at least a

place on the podium. Men like Angel Luis Casero (n.d.r. winner of the Tour of Spain) and Joseba Beloki (3rd at both the 2000 and 2001 Tour de France), but they worked for me. Our strength today was our cohesion. Shortly after a medal ceremony in which Freire was flanked by Bettini and the Slovenian Hauptman, the surprise of the race in third position, the ritual congratulatory telephone call from an elated Dr Giorgio Squinzi.

"That's the man who believed in me in 1999," declared Oscar, "when I had no team to go to." For Mapei-Quick Step, a classic case of all's well that ends well. "We've suffered this year," admits Aldo Sassi, "but this result, with Freire first and Bettini second, has made it all worthwhile. Mapei as sponsor and Mapei-Quick Step as a team are international in both composition and philosophy. The strategy is different when we ride as a team, for Mapei-Quick Step, to races like today, where our riders were competing in national representative teams. Oscar and the Spanish team served up a remarkable lesson in cohesion and teamwork. Much of the controversy whipped up around the Italian national team, however (over Lanfranchi's performance, for example), is in my opinion instrumental. Lanfranchi has been accused of having deliberately harmed Simoni's chances in the final few kilometres to favour Bettini, but to me there's no logic to this theory. Had his only aim been to help Bettini, he'd have lead-out the sprint, rather than worry about his own placement. Who can say whether Bettini wouldn't have reversed the first two podium positions with a little extra help from his Italian teammates?

"As is the case with all Mapei "products" handled in the correct manner though, changing the factors of multiplication wouldn't have changed the end "product": Mapei number one!"



BALLERINI, fr



Roubaix velodrome, 15th of April 2001, and a heart-rending, unforgettable chapter in the Mapei-Quick Step story has just been consigned to the history books. Or at least one of the lead characters has taken his final bow. Sporting a T-Shirt, of all things, upon which is emblazoned a poignant ode to a love affair spanning over a decade. "Merci Roubaix," is Franco Ballerini's parting message.

This is, or rather has been, Ballerini's thirteenth Paris-Roubaix, and it is to be his last. "Il Ballero", as he is affectionately known, has won the "Hell of the North" twice, in 1995 and 1998. He has inspired Mapei's domination of the brutal, treacherous cobbled Classic from that first victory in 1995, when Johan Museeuw was third, through to the famous Mapei 1-2-3 of 1998, and beyond. Afficionados also recall that the Tuscan finished fifth in 1996, arguably Mapei's finest hour, when the Museeuw, Bortolami, Tafi trio disdainfully swept aside all competition to seal the team's first Roubaix rout.

Roubaix 2001 was to have been the final chapter in the Ballerini-Mapei romance, and yet an abbreviated epilogue would keep him at Mapei for a further three months after the pre-meditated swansong in April. He was offered a role as public relations officer for the Mapei-Quick Step team. It was position in which gentleman Franco would distinguish himself before another, unexpected change of career brought an enforced, though not unwelcome, separation in August, when he accepted the position of technical director of the Italian National Cycling Federation. An offer, in short, which Franco couldn't refuse, and it was with the unreserved blessing and support of the Mapei team that he bade farewell to patron Dr Squinzi after six years gorged in success and cherished memories.

Shortly after exchanging lycra ensemble for shirt and tie, race-number for business card, Ballerini reflected on the origins of his special bond with Mapei:

"It was June 1993," recalls Franco, who lives in Cantagrillo, in North West Tuscany, with wife Sabrina and sons Gianmarco and Matteo "and patron Giorgio Squinzi, his wife Adriana Spazzoli, Rino Civardi and the former rider Ercole Baldini came to see me at my house. Mapei had been involved in cycling for 40 days. I sensed immediately that these were people of substance, and that they were committed to creating a formidable cycling team as a publicity vehicle for their business. And so I decided to become a Mapei rider for the '94 season. At the end of '93, with the help of the bike manufacturer Ernesto Colnago, who managed to bring riders across from the Clas team, a team of top-class riders was assembled."

Curiously, you stated that your second place at Paris Roubaix in 1993, before you joined Mapei, stood you in good stead for the future. Why?

Certain defeats – responds Franco, winner of 20 professional races, including the 1990 Paris Bruxelles and the GP of the Americas – help you to grow. You learn not to fear your opponents, but instead to respect and not to underestimate them: you've only won when you cross the finish line. That defeat, by a margin of just a few centimetres, made the win in 1995 even more special.

Which opponent would you have preferred never to have in your slipstream?

Definitely Andrei Tchmil, the Belgian rider. Even when I won at Roubaix I struggled to shake him off. He's one of those who never gives up.

Roubaix apart, tell us about some of your other memorable victories.

The first victory as a professional, the Tre Valli Varesine in 1987, gave

From the cobbles to the team car

me immense satisfaction. It was August and we raced in torrential rain. In the sprint in Varese, I beat some big-name riders. And then there was the 1995 Het Volk. My first victory as a Mapei rider. In Italy it's not a particularly well-known race, but for the Belgians it's sacred. It's the race which effectively opens their season. The route contains several of the famous "walls", like the "Grammont", which everyone knows from the Tour of Flanders. I could have had more success as a professional – continues Ballerini, who was born on the 11th of December 1964 – had it not been for my pollen allergy which affected my performances in the summer months.

What was your biggest regret as a rider?

I took part in 5 World Championships, once as a junior and four times as a professional. As a junior I finished fourth. When I rode as a professional I took part in four consecutive World Championships, between 1988 and 1991. I've always ridden well in the Italian team colours, working well for the team, but without ever making the podium. I could have done it in Japan in 1990, where I came close. The course that year was made for rouleurs – powerful riders on the flat – like me.

You never based your season around stage races. Is it not true, though, that once you came close to wearing the leader's pink jersey at the Tour of Italy?

Yes, I almost had it at the Giro d'Italia in 1991. That Giro began in Sardinia. In the first stage, won by the French rider Casado, I came second. Casado took the pink jersey. Then in Morbegno I won, beating Casado. My team-mate Franco Chioccioli won that Giro, before I joined Mapei.

A rider like yourself, a specialist in the Classics of the North, were you particularly fastidious about how your bike was set up?

I never tortured the people who prepared my bikes. I was always fortunate to have competent mechanics and bike-manufacturers. They have a vital role to play in cycling as it is today, where there's so much pressure, and a 0.2% fluctuation in performance can be the difference between a victory and a defeat.

Now you cycle for enjoyment only, correct?

Cycling is my life and now, although I've moved behind the scenes, I still can't forget about cycling. I'll ride for enjoyment, and I hope to take part in some amateur events – granfondo – to gain some



publicity for Mapei. But in the granfondo's I'll never aspire to great things. I'll be happy to ride without thinking about where I am in relation to the leaders, and I'll probably finish an hour or so after the winner.

What impressions do you have of your first experience as the Italian National Team Coach?

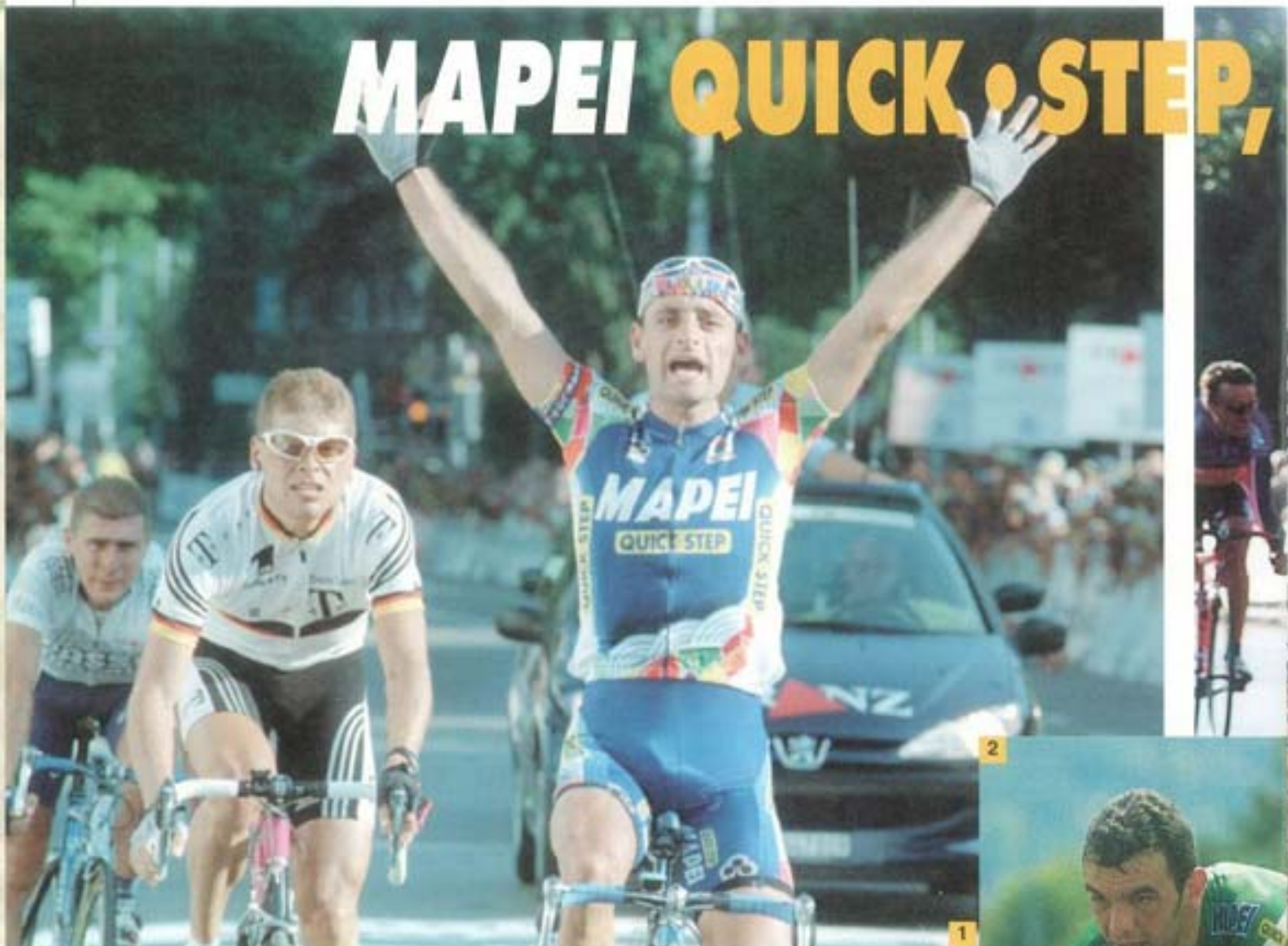
In my opinion Italy rode well. We were at the head of affairs whenever the race hotted up, and everyone carried out the task which I'd assigned to them. We could have won, but the race ended with Bettini beaten by Freire. It's true that we could have ridden differently, but I'm pleased that I put together a well-balanced team, with riders capable of attacking in long solo breakaways, and equally of competing in sprints. I assembled a team of Italian riders in a tactical battle with my old foreign colleagues and rivals, but without any ill-feeling or bitterness. At first I was slightly emotional, then concentration prevailed.

Ballerini's professional victories

- 1987: 1 – Tre Valli Varesine
- 1988: 4 – Premondiale di Saccolongo; three team time trials
- 1989: 2 – GP Camaiore; Fivizzano circuit race
- 1990: 4 – Giro di Campania; Paris-Bruxelles; GP of the Americas (World Cup); Giro del Piemonte
- 1991: 2 – 1 stage (Morbegno) Giro d'Italia; Giro di Romagna
- 1993: 1 – Tour de France team time trial
- 1995 (Mapei GB): 3 – Het Volk; Paris-Roubaix (World Cup); Graz Criterium
- 1996 (Mapei GB): 2 – GP Amsterdam dery; 1 stage Bank Austria Tour
- 1998 (Mapei-Bricobi): 1 – Paris-Roubaix



MAPEI QUICK-STEP,



2

Even in a transitional year such as this, as one classic vintage of riders ebbs while a new generation is ushered in, Mapei has somehow effected a harmonious marriage of youth with experience, and the synergy of cycling talent of 12 different nationalities. After the crowning glory of Oscar Freire's World Championship victory in Lisbon in October, Dr Squinzi's darlings had notched victories in 13 different countries. Paolo Bettini set the tone for a typically cosmopolitan success story in the early season. Bettini, nicknamed "the cricket", is fast establishing himself as one of the most feared competitors on the world stage, and the Tuscan wasted no time in opening his 2001 account with a stage victory at the Tour of Malaysia in February.

To this he would add the second World Cup race of his career at the Championship of Zurich in August, followed by another convincing win at San Marino's Coppa Placci two weeks

later. Then came the World Championships in Lisbon, where Paolino would distinguish himself, club and country, but miss out on the legendary rainbow jersey by the most slender of margins... to none other than Mapei teammate Oscar Freire. Long before that balmy, memorable evening in Portugal, however, the thoughts of Mapei-Quick Step turned to the Spring calendar. As ever Mapei's charge was spearheaded by the Varese connection – the two Stefano's Zanini and Garzelli, plus Mapei veteran of seven seasons Daniele Nardello. All scored prestigious victories in the early months of the season, including a Garzelli-Zanini double at the Tour of the Basque Country in May. Youngsters Cancellara, Bodrogi and Paolini were also winners in Greece, Italy and Switzerland respectively. Set against past domination of the monuments of the Spring calendar, there was no denying though that Mapei's had been an arid Spring campaign. Giorgio



marches on



3

Squinzi was the first to acknowledge what the press asserted, and he agreed, had been "a crisis of results." Patron Squinzi was nonetheless keen to lend a sense of perspective, pointing out that "had Freire and Steels been fit and in form, our team would never have suffered this crisis." He might have added

that, to compound the injury-scurge which had also afflicted Nardello, Andrea Tafi, Kevin Hulsmans and Petrov, Classics favourites Bettini and Bartoli had both under-performed due to health problems diagnosed only after the conclusion of the Spring season.

Mercifully, the fortune balance was about



1. Paolo Bettini, arms aloft, beats the cream of the international peloton at Zurich in August.

2. Italian road race champion Nardello in action at the Tour de France.

3. Rising star Bodrogi roars home at the Giro della Riviera Ligure di Ponente in February.

4. A poignant distinction for Mapei men Garzelli and Bartoli: the last interview ever performed by the "Voice of Italian cycling", the universally acclaimed Adriano de Zan, who died of leukemia in August.

to be redressed, first by the ever-dependable Zanini with a stage victory at the Giro d'Italia, then by the hitherto unfortunate Garzelli at the Tour of Switzerland. Garzelli's 136 km break-away at Grindelwald, in particular, was a true epic, worthy of a rider who triumphed at the Giro d'Italia in 2000, but was forced by a stomach virus to abort this time around.

After the disappointment of Garzelli's Giro d'Italia at the end of May, Mapei's season in fact proceeded sweetly along a gradual upward curve, to a mantra of quality, perhaps more than quantity. There were sparkling exploits from leading lights like Paolo Bettini and Daniele Nardello, at the Championship of Zurich and the Italian National Championship respectively, and the promise of more to come from men like Petrov, winner of a stage at the Tour de l'Ain, and mountain bike convertee Dario Cioni, who dominated the Volta ao Minho in July. There's no question, however, that of the 45 victories added to the family "reserve" now totalling over 550 since 1994, Mapei-Quick Step saved the best until last in 2001. Oscar Freire's sprint win over the demanding Monsanto course was his second World Championship win in three years, and Mapei-Quick Step's fourth successful rainbow jersey campaign since 1995. The bitter sweet silver medal of Paolo Bettini crowned an historic day for Mapei, to rank alongside the unforgettable one-two-three finishes of 1996, 1998 and 1999 on the cobbles of Paris-Roubaix.

Golden boy Freire savours his World Championship win in Lisbon.



MAPEI-QUICK STEP AND THE 2001 SEASON RESULTS

The 2001 season is now safely tucked away in the history books. Until May Mapei-Quick Step had preserved its leadership of the UCI World Team Classification, before illness and injury intervened, and the team slipped to fourth position. By the end of the season, Mapei-Quick Step had amassed 45 victories. Among the successes of note, Oscar Freire's first place at the World Championship Road Race in Lisbon, Daniele Nardello's Italian Championship, Laszlo Bodrgi's second successive Hungarian time trial title, and Paolo Bettini's fourth position overall in the season-long UCI World Cup. These established stars were ably assisted by youngsters like Petrov, Cioni and Paolini, all distinguished performers in both stage and single-day events.

UCI TEAM CLASSIFICATION

	points
1) Fassa Bartolo	7,676
2) Deutsche Telekom	7,162
3) Rabobank	6,794
4) Mapei-Quick Step	6,583
5) Lotto-Adesso	6,339
6) iBanesto.com	6,096

Last updated 14th of October 2001.

2001 UCI TEAM WORLD CUP RANKINGS

	points
1) Rabobank	73
2) Domo-Farm Frites	64
3) Mapei-Quick Step	55
4) Fassa Bartolo	45
5) Lampre-Deakin	41

2001 UCI INDIVIDUAL WORLD CUP RANKINGS

	points
1) Erik Dekker (Rabobank)	331
2) Erik Zabel (Deutsche Telekom)	250
3) Romans Vainsteins (Domo-Farm Frites)	229
4) Paolo Bettini (Mapei-Quick Step)	201
5) Davide Rebellin (Liquigas-Pata)	170

MAPEI TROPHY 2001

Once again this year journalists, camera-men, photographers and commentators have been battling it out for the honour of international cycling's top tipster in the Mapei Trophy. In a 2001 season coloured by familiar names like Freire, Zabel and Armstrong on the road, king of the predictions is Davide Mazzocco of Sport's.com, whose rich vein of visionary form saw him gallop ahead of the field to finish as clear winner of the Trophy on 82 points. Second in the contest based on results forecasts for cycling's blue ribbon events was the Spaniard Miguel Chico, who amassed 73 points, closely followed by former champion Pier Augusto Stagi of Tuttobici on 64. As ever, the Trophy winner's efforts will be rewarded with a holiday to a destination of his choice. Mazzocco will be officially presented with his prize at the media presentation of the 2002 Mapei-Quick Step line-up, scheduled for early next year.

1) Davide Mazzocco	- Sports.com	82
2) Miguel Chico	- Bicisport Espana	73
3) Pier Augusto Stagi	- Tuttobici	64
4) Maria Batrice Ajraghi	- Tuttobici	63
5) Nicola Casanova	- Corriere del Ticino	60
6) Valerio Zecato	- Giornale di Merate	59
7) Moreno Luchi	- Rete 37	59
8) Marek Cegliski	- Rzeczpospolita	58
9) Mariano Botta	- Giornale del popolo	57
10) Alessandro Turci	- Ciclismo	56



Mapei Sport Service

There's scarcely ever a quiet moment around the elegant little structure which houses the Mapei Sport Service in Castellanza, a prospering little suburb between Milan and Varese. Cars bejewelled with sparkling team bikes and stashed full of high-performance componentry arrive and leave; others ferry top-class international athletes to and from training and competition.

The Mapei-Quick Step multinational cycling team is the first and at present the only professional outfit to have custom-built a centre for athletic testing and preparation of training programs. The general philosophy of the Mapei Group is epitomized by the Mapei Sport Service, especially that same commitment to investing in human resources. The headquarters of the team which has for years been the dominant force in professional cycling is on the first floor, next to a conference room and a small cluster of offices. In the basement and in a warehouse next to the building, store rooms contain the race clothing and machinery - the tools of the Mapei riders trade. Next to the reception desk, a wall is strikingly adorned with the official logo and colours of team: the familiar Mapei blue, set off against turquoise background, with a generous sprinkling of the ubiquitous multicoloured blocks. Professor Aldo Sassi is co-ordinator of the Mapei Sport Service's activities. Doctor Enrico Arcelli, meanwhile is in charge of healthcare. Sports doctors Massimo Testa and Giovanni Ruffi also carry out much of their work in Castellanza, as do qualified coaches Luca

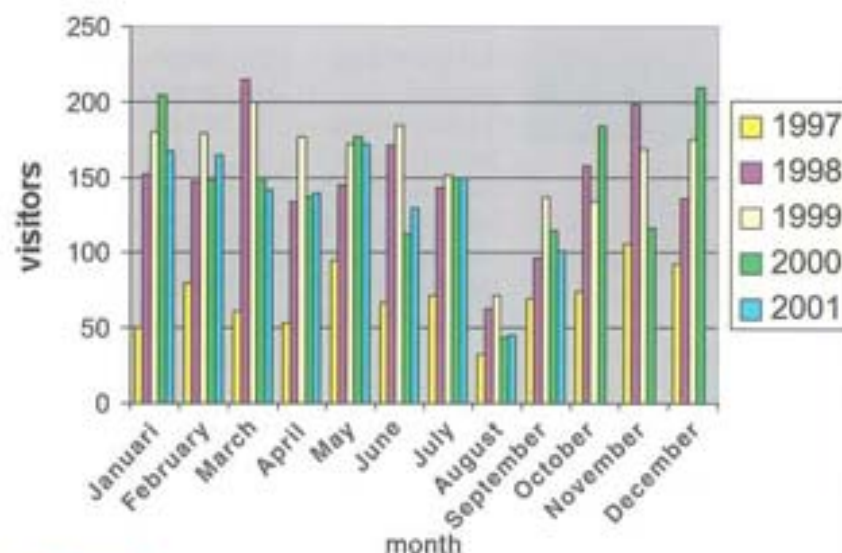


Guercilena, Franco Impellizzeri, Andrea Morelli, Ermanno Rampinini and technician Massimo Coppini. Rita Ferioli holds court as secretary. The Sport Service also consults various research specialists, among them physiologist

Piero Mogoni.

In the office adjacent to the reception, ex-rider turned Isef-graduate Luca Guercilena busily juggles computer-programmed training schedules for young riders. "Over six hundred competitive cyclists - Guercilena explains - came to undergo tests or have training programmes drawn up in the first seven months of 2001. Obviously there were also some extremely young riders, and over 250 leisure cyclists also came for a consultation. Other riders who don't belong to sports clubs or associations also come to learn about how to live the life of an athlete, to maintain

Total visitors 1997-2001



general fitness and a fully-functional cardiovascular system. In total over 1400 tests had been carried out in the year by August 2001."

"These numbers - Franco Impellizeri clarifies - are only relative to cycling. The Sport Service welcomes people from other disciplines too. In the past we've worked with professionals and amateurs in triathlon, duathlon, track and field, tennis, volley ball, basketball, football and fencing. It's a facility open to all-comers, and we cater for strength, speed and endurance disciplines. And among the non-cyclists there are athletes, especially joggers, who simply want to stay fit." He who stumbles upon the biomechanic laboratory will today find a young athlete striving to engineer the perfect riding position on a stationary bike. He uses sensors positioned on reference points all over his body. The apparatus is called "Elite". This device permits an athlete to find an optimal posture in the saddle, and also to determine the ideal dimensions of his bike frame.

"This is one of our junior riders - says Morelli - who's a member of one of the Mapei Group's satellite teams. Twenty-five percent of our time is devoted to the Mapei-Quick Step professionals, and 50% to these affiliate teams.

So who are the more demanding, the competitive athletes or the amateurs, in whichever discipline they practice?

"The difference - Sassi interjects - is non-existent. Our brief is to give the same attention to top professionals and he who trains

only for enjoyment."

How many times will a professional cyclist typically visit the Sport Service in the course of a season?

"Between 5 and 12 times - Sassi continues - for mountain bikers as well as road riders."



Does the Mapei-Quick Step professional submit himself to a full cycle of tests on every visit: muscle mass, oxygen capacity or endurance tests, a full medical and a consultation on his position in the saddle?

"There are reduced series of tests - says Sassi - It depends on the time of the year and the individual demands of the subject. Our centre is open from Monday to Friday."

A working alliance binds the Italian Cycling Federation to the Mapei Sport Centre. Italian national teams in all age-groups and specialities undergo tests at Castellanza. Among the celebrated names from other disciplines Ivano Brugnetti is one illustrious, satisfied customer. In Seville, at the 1999 World Athletics Championships Brugnetti earned a silver medal in the 50kms walk. Up-and-coming Yugoslav tennis stars Uros Vico and Ivan Ljubicic also sign in for tests and training consultations at the Sport Centre. The duo has recently underlined its considerable potential by beating world top-five ranked players in international ranking events. "Vico and Ljubicic - Impellizeri reveals - come to Castellanza five times per year. In future we'll also work with them at top-level international tournaments."

The staff of the Mapei Sport Service has organised workshops and refresher courses on both cycling and walking, with professional stars acting as guest speakers. Whatever your discipline, whether you're laying siege to the hour record or simply venturing out for an occasional week-end spin, Mapei's Sport Service really does cater for all tastes and necessities. Whether you'll settle for a leisurely twice-weekly knock-up or you're gunning for the Davis Cup. The Sport Service is open to everyone.

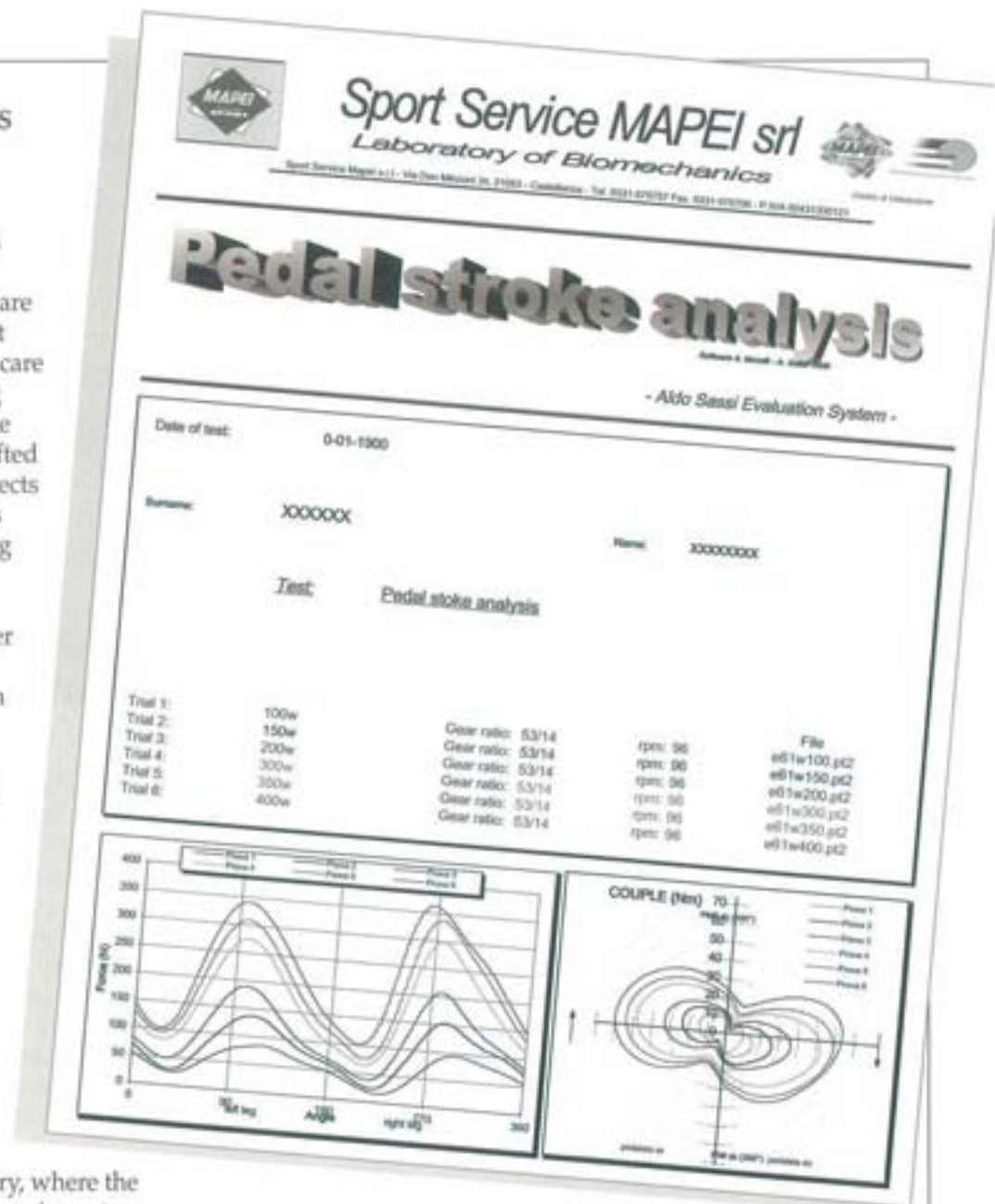


Uros Vico



THE FOUR DEPARTMENTS OF THE MAPEI SPORT SERVICE

The Mapei Sport Service was inaugurated on the 9th of December 1996. Its activities are channelled into four different areas. Luca Guercilena takes care of the department of training methodology. It's in this niche that training regimes are drafted and advice offered on all aspects of training, and Guercilena is also responsible for managing links with Mapei's satellite teams. In the functional evaluation unit, presided over by Franco Impellizeri, tests measuring maximum oxygen consumption, anaerobic threshold, endurance and blood lactate are carried out. The third department is the Andrea Morelli's biomechanic section. Here riding position is refined, a perfectly balanced, symmetrical pedalling technique honed, and pressure on the insides of cycling shoes gauged in an effort to guarantee maximum power output. The final department is the general sports medical surgery, where the athletes submit themselves to spirometer medical examinations, and advice is given on diet and electrocardiogram effort tests.



A specimen data sheet from a test performed in the biomechanic department of the Mapei Sport Service.



For further pictures and detailed information on the Mapei Sport Service please log on to www.mapei.it

Welcome in the official web - site MAPEI - Quick Step 2001

TEAM HISTORY

RESULTS AND PHOTOS CALENDAR 2001

HIGHLIGHTS FAN CLUB

SPONSORS AND SUPPLIERS PHOTO ALBUM

HIGHLIGHTS
Fabien De Waele signs for MAPEI - Quick Step
02.11 - The 26th Fabien De Waele from Oudegrande (Belgium), has sign...

PRESS RELEASES
MAPEI-Quick Step: 2 teams for the 2002 season
31.10 - For the 2002 season the MAPEI-Quick Step professional cycling team ...

OUR STAFF ANSWERS

NEWS FROM SATELLITE TEAMS

COLNAGO with the Italian cycling team and the new FERRARI



"Every epoque has its champion, and every champion has his Colnago." This slogan, coined to promote arguably the world's most famous racing bicycles, and certainly the most prolific in terms of prestigious victories, is a rare example of marketing spin meeting reality. If Italian bike manufacturers have become world leaders in their field, Ernesto Colnago deserves much of the credit.

The bike and frame wizard from the Milanese hinterland is the self-made entrepreneur par excellence. The unmistakable family motif, an Italian take on the three-leaf clover, has graced Mapei star's bikes since the team's inauguration in 1994, and the crest now also occupies pride of place on the Colnago-sponsored Italian national team jersey. The partnership with the Italian Cycling Federation, sealed in September this year, will in fact see the Colnago insignia adorn the azzurro-blue jerseys of Italy at all levels and in all categories in international competition.

The official presentation of both jersey and, more importantly, an association with the accent on youth development was attended by luminaries from throughout the world of cycling. One distinguished name on the guest list was that of Giorgio Squinzi, president of the Mapei Group.

For Ernesto Colnago, a man who first offered his services to the Italian national team as a humble mechanic, this was both the proud and poignant rekindling of a dream:

"Behind my collaboration with the Italian team," affirmed the Cambiago maestro "lie emotional, more than strictly promotional reasons. I've treated myself to this reward for my own career, but at the same time invested in support of

youth in cycling". Since 1987, Colnago and Ferrari have combined their enviable brand image and technical savoir in a number of different projects. That year, fourteen years ago, the first Colnago-Ferrari model racing bike was unveiled, distinguished by a then unique gear-mechanism.

The glorious history of Ferrari has been founded upon the manufacture of formula one speed machines, prototypes and the inimitable scarlet-red sports car. All have of course been strictly reserved for race-track or road use. It took Ernesto Colnago's vision to lure Ferrari off the well-beaten track...or off-road. At the recent international bike and motorbike trade fair in Milan, Colnago and Ferrari undraped the remarkable CF2 model, the first ever mountain bike produced by Colnago in collaboration with Ferrari.

The presentation of the all-terrain special-edition with the galloping-horse Ferrari emblem took place in the Africa hall at the Milan exhibition centre, and again attracted an impressive array of VIPs. Among the familiar faces was Roberto Formigoni, president of the Region of Lombardy.

"Since I've been riding a Colnago-Ferrari bike - jested patron Squinzi - on my training rides in Brianza my performance has improved markedly compared to when there was no three-leaf clover and galloping horse on the frame!"

The full-suspension CF2 is a natural evolution of the CF1 road bike, and adopts the same scarlet and black carbon colour scheme.

The new CF2 will be distributed through existing Ferrari and Colnago retail outlets, and a limited production run of just 1000 mountain bikes is scheduled.



World Road Race Championship

14-10-2000
Lisbon-Portugal

1° Oscar Freire
2° Paolo Bettini



Winning together!

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MAPEI GROUP

29

Plants

Here the Plant
in Robbiano di Mediglia
Milan - Italy



year 2001
projected turnover

725

Million Euros

more than

500

Adhesives • Sealants
Chemical products
for building



2520

Employees
in 2001



more than

8000

Tons of
products
a day

more than

25000

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