INTERNATIONAL

ISSUE 58

altà

LOCAL STORIES Dears Readers.

Globalisation, the use of new communication technology like 24-hour TV, online newspapers, emails, the web, Google and Facebook, just to mention a few, have turned us into citizens of the world. One simple click and we are immediately connected to the rest of the world. A world that no longer has borders, territorial boundaries or, above all, confines in terms of knowledge.

I feel quite at home in this environment.

Nevertheless, at the same time, local stories tie us even closer to our surroundings. This is the case of the wonderful story of Sassuolo. Most of you probably do not like football, many of you will definitely support other teams; you will certainly have other hobbies, but all that does not matter.

I am sure your thoughts go towards something close to home. Exactly the same applies to Sassuolo.

From being a very small neighbourhood team just a few years ago, which was ignored even by most people in its home city (despite being a symbol for a ceramics sector well known worldwide), the team is now a winning phenomenon representing an entire community epitomising hard work and a real desire to make progress; it has turned into a serious but highly enthralling project, a new venture that has already reached professional standards of the highest level, a tough commitment on a highly ambitious scale, local in terms of its setting but international is in scope.

Indeed, thanks to the latest means of communication, it has grown like some gigantic thread of affection that is moving



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

beyond national boundaries and attracting the attention of so many people (even from very distant countries) to Italy and the best of what Italy has to offer through this wonderful sporting story. It has even turned into a high-level means of communication in his own right, raising the profile of its sponsor brands that mainly come from the building industry, but also from the food and communications sectors.

This is Sassuolo. This certainly is not just some provincial story lacking in personality, dull and bland. This is a local story, like so many others, just like those you are all so fond of yourselves. It is a story I enjoy telling, because, at such a tricky moment in time when the uncertainties associated with the economic recession and political instability have captured our attention and drained our energy, even sport can bring us some momentary relief and enjoyment, making us feel closer to each other.

Of course this issue of Realtà Mapei International is not just about football and sporting achievements. It also contains articles about socially engaged projects, technological progress and innovations in our sector, the high-quality building industry, due to all our constant hard work. Ultimately these are all local stories.

And to finish, a light-hearted look at a very serious problem: damp. Years of experience, millions of square metres waterproofed and lots of satisfied clients... thanks to MAPELASTIC.













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COVER STORY Following their sixth place at the end of the 2015/2016 season, Sassuolo are now ready for new challenges in the Europa League. In the picture: superfans Giorgio Squinzi and his nephews. (Photo: Andrea Vignoli)

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PROUD OF OUR BUSINESSES

Vincenzo Boccia is the new President of Confindustria, the Federation of the Italian Manufacturing and Service Companies. He was elected by a closed Assembly of the association of the Italian industrialists held on 25th May. Boccia was elected with 87% of the Assembly's votes and will lead the Federation for the next four years.

This confirmed the designative vote cast on 31st March by Confindustria's General Council and his election was greeted by a very long applause by all the industrialists in the audience.

Boccia received even more support during the second and final "vote" - the yeses were 914 and the votes against were 132 - and he was elected in the Technical Auditorium (that reopened after full-scale renovation operations) at Confindustria's headquarters in Rome with all of its almost 1200 seats filled and lots of industrialists standing.

Giorgio Squinzi began his farewell speech by expressing his heartfelt thanks: "Here, today, first and foremost I would like to thank you all for your help, suggestions, criticism and even all the at times bitter confrontations we



GIORGIO SQUINZI BIDS FAREWELL TO CONFINDUSTRIA AFTER FOUR YEARS AS ITS LEADER

have had over the last few years". It also provided the opportunity to focus on the Federation's "unwritten rules": "This is an age in which leadership and the concentration of power tend to hold sway. In our case, though, we believe that there are not enough rules for internal democratic debate and so we need to protect those we already have as a non-negotiable asset".

"We business people are tough; they

have been wonderful years, we ought to be proud of our businesses", so the outgoing President of Confindustria claimed, reminiscing over his four years in office.

FROM RECESSION TO REVIVAL

His appointment coincided with one of the worst ever post-war recessions with Italy having to come to terms with a negative GNP and numerous companies being forced to close.

A tricky economic situation that Giorgio Squinzi had to deal with during the four years he was in office as leader of Confindustria after being elected President in May 2012, taking over from Emma Marcegaglia.

"The economic recession hit hard - so Squinzi pointed out during the closed Assembly of Confindustria - leaving deep wounds that still have not completely healed. Europe showed just how fragile its political system is. Along the way we have lost businesses, employment, manufacturing output and share capital that it will be hard to rebuild", so the President of the Mapei Group emphasised. Italian industry, so Squinzi explained "has gone through this tricky period with great courage and determination and it is now alive and kicking", pointing out some positive signs coming from such realms as exports and investments and indicating the various stepping stones and results of his four years in office as the leader of the Italian industrialists.

"Italy is Europe's second biggest manufacturer - so Squinzi proudly claimed our exports are, as usual, good, there are signs of a revival in investments and we are still global leaders in many different types of products. We are so despite everybody and everything! During both the good and bad times over recent years, Italian industry has always been able to draw, as ever, on the support of its own Federation".

AN EXTRAORDINARY EXPERI-ENCE

"Today I am completing what has been an extraordinary experience, including many wonderful moments when I got to know an Italy made up of companies we should rightly be proud of".

Squinzi then took stock of the results of his four years in office. He began by referring to the project for Italy and then mentioned what had been achieved on an international scale, negotiations over made-in-Italy products, counterfeiting, digital technology, intellectual property rights and some facts and figures: "42 missions, 2400 companies, over 12,000 business-to-business meetings".

He then mentioned the battle over the public administration's debts: "the most important element of law and civilisation is a Government that honours its debts" and on this issue he was keen to thank Giorgio Napolitano, former President of the Italian Republic, for all his hard work: "Since 2013 almost 39 billion Euros has been paid back to businesses and operations have been speeded up. We still have not achieved the 60 days referred to in the European Union directive, but we have speeded up".

On the credit front, he referred to the moratorium agreements that were signed "worth 25 billion Euros and affecting almost half-a-million businesses". Squinzi then reviewed all the



ABOVE. From left on: Marcella Panucci, General Director for Confindustria, Vincenzo Boccia, new President of Confindustria, Giorgio Squinzi, outgoing President of Confindustria and Antonella Mansi, Vice President of Confindustria for Organisation.

results in terms of tax measures, from the so-called tax wedge to de-taxation, corporate tax and economic growth incentives for businesses.

As regards the employment market he referred to the inter-confederal agreement about representation, "we had been waiting for it for 70 years".

IN THE NAME OF A CIVIL, SIM-PLE AND FAIR STATE

"The philosophy underlying our project over recent years has always been to work towards achieving the same operating and governance standards as the most innovative countries - so Mapei's leader went on to say – and, in accordance with this vision, I have always said that the most urgent and almost dramatic matter is to create a civil, agile, simple and fair State".

"We are only too well aware - so he continued - that all the layers of complication, antagonism and judicial monstrosities that have built up over 70 years cannot be removed in just one short period of time. This task calls for a cultural transformation, a change in the behavioral patterns of an entire nation, and not just its politicians".

Giorgio Squinzi was particularly keen to point out two things at the end of his speech. "The first is that if, in a country that has an historically anti-industrial background, industry has come much more to the fore and people are now more aware that only with a competitive industry, whose values are understood and shared, will Italy be able to achieve the international status and growth levels befitting it, the merit is mainly ours, this Federation's".

"The second thing - so he continued - is that results achieved during one presidency are always partly due to the seeds sown during previous terms in office and pave the way for the projects of the following presidency. The keywords mentioned above, lots of the reforms that have been carried out and all the projects and results completed in the last few years, are actually dossiers on which Confindustria has been working for years".

ASSOCIATION MAKES PEOPLE STRONGER

From tomorrow I will have the privilege - so Squinzi announced - to join those friends who have had the honour of holding this position".

Lastly, the outgoing President emphasised that if "industry now counts more, part of the credit for that goes to this association". Industry must be competitive if "Italy is to hit the growth targets it should be able to achieve".

Dedicating something the Italian author Italo Calvino once wrote to the new President, Vincenzo Boccia, and all the other members, Giorgio Squinzi attempted to sum up as neatly as possible what Confindustria means to him and what it felt like to be its President.

"Association renders men stronger and brings out each person's best gifts, and gives a joy which is rarely to be had by keeping to oneself, the joy of realizing how many honest, decent, capable people there are for whom it is worth giving one's best (while living just for oneself very often the opposite happens, of seeing people's other side, the side which makes one keep one's hand always on the hilt of one's sword)".

A clear message consistent with one of the slogans Squinzi constantly repeated during his time in office: "There can be no revival without business". He is, indeed, a firm believer in the central importance of associations and manufacturing.

A MORE UNITED EUROPE AND A BETTER ITALY

The General Assembly of Confindustria took place on 26th May at the Parco della Musica Auditorium in Rome, where Vincenzo Boccia gave his first public speech after being elected President of the Italian Manufacturing and Service Companies. Alongside a number of leading industrialists headed by Giorgio Squinzi, the audience included the President of the Italian Republic, Sergio Mattarella, a number of Ministers of the Italian Government and all the main Italian trade union leaders.

After Boccia's speech, Carlo Calenda, the new Italian Minister for Economic Development took the stage followed by Dario Franceschini, the Italian Minister of Cultural Heritage and Activities and Tourism.

After officially welcoming the President of the Italian Republic, Sergio Mattarella, Boccia began his speech by addressing Giorgio Squinzi: "Thank you Giorgio for all the work you have done over the last four years and for proving that leading this Association is a high and noble mission. Thank you, too, for keeping the

THE ANNUAL ASSEMBLY OF CONFINDUSTRIA AT THE PARCO DELLA MUSICA AUDITORIUM IN ROME

promise you made when you began your term in office that you would never stop being 'one of us'. You never did and I'm certain that the example you have set even in terms of personal sacrifice - has made a mark on all of us".

INVESTING IN INDUSTRY OF THE FUTURE

"Italian economy is certainly up and running again, but it is not really reviving", was how the new President of the Italian industrialists began addressing his first ever Assembly.

"It is only a modest and rather disappointing recovery, which will not take us back to pre-recession levels any time soon. The consequences of the dual drop in demand and manufacturing are still extremely profound".

Italy "must play a role befitting its history and the kind of Europe we dream about. This means we must continue along the path of reforms".

The President of the Italian industrialists warned that "there cannot be any modern kind of capitalism without a modern democracy and without modern institutions" and he emphasised that: "For us these reforms do not have a name just a purpose. It does not matter who implements them, what counts is how they are implemented".

"This is the only way - so he went on to say - we can once again be an authoritative nation capable of interacting on equal terms with the rest, both in Brussels and every other institution".

"Time is crucial", so he warned, calling for an end "to an Italy divided into separate realms that often refuse to address each other, while we want to engage in dialogue and we do not want any conflict between our institutions and businesses". This also "call for a modern country, a civil country".

ON THE ROAD TO REFORMS

"Confindustria has been battling to overcome the current two-house parliamentary system since 2010, proposing a reform to the 5th amendment of the Italian Constitution; with some satisfaction we can now see that this aim is now within our reach", so Boccia stated.

"Shifting the fiscal burden away from labour and business and onto other things and lowering tax quotas using the resources we got from revising tax rebates as well as from the fight against tax evasion". The new President of Confindustria described the decrease in corporate tax in 2017 as "excellent" but not enough.

"We need a fiscal policy in support of investments starting with those in research and development. The tax credit foreseen by the Italian Government needs to be increased moving beyond the notion of incremental rises".

Boccia appealed for the so-called "bonus for research" to be increased, renewing "super-depreciation" on investments while also respecting EU constraints, because any rule breaking "would be punished by the markets".

BECOMING MORE COMPETITIVE

"With profits at an all-time low, a salaryproductivity deal is the only way ahead" and "we believe that corporate bargaining is how it can be implemented". Then turning his attention to the unions he added: "we do not want this to turn into a game of one-upmanship". The national contract "will remain in place to provide the fundamental safeguards for labour"



and, in relation to the latest rules on contracts, he stated: "Now is not the time to interfere with the contractual renewals in the pipeline" and "when we renew negotiations, we will be able to work around this kind of deal".

"We are not asking for any favours, we want policies to help boost our competitiveness", so Boccia stated. "We are proposing a serious plan to be implemented over four years. Certainty and stability are of fundamental importance in creating positive expectations". We need to "review expenditure and income" and, so he went on to say, we need "quality plans, policies that balance the books but not at zero costs, we do not want to create more deficit".

SMALL IS NOT BEAUTIFUL

"If we are to get back on our feet we need to be ready to cope with a new economic paradigm". So we must "create a modern kind of capitalism based around the market, open to capital and investments in the industry of the future". Industry "needs to be on the right scale". In other words, small is no longer beautiful. "Those who have overcome the recession - so the President went on to point out - have done so because they have innovated, exported, modernised governance and worked hard to grow". "Small is not in itself beautiful - so Boccia stated - it is just a stepping stone in corporate life, you begin small and then become big, so growing must become our obsession".

THE FUTURE OF THE SOUTH OF ITALY

"Abroad we often get asked why over 150 years of unified history has not been enough to resolve the problems in the south of Italy. Answering this question is embarrassing". This is how Boccia, who

"THANK YOU GIORGIO FOR ALL THE WORK YOU HAVE DONE OVER THE LAST FOUR YEARS AND FOR PROVING THAT LEADING THIS ASSOCIATION IS A HIGH AND NOBLE MISSION."

is from Salerno (Southern Italy) touched on the issue of Southern Italy during the Annual Assembly of Italian industrialists after having first underlined that the nation's "infrastructural shortcomings mainly penalise the south of Italy". "The truth is that no special policies are required for the south, what are needed are more incisive policies that are the same as those required for the rest of Italy". And the European Union's structural funds need to be used "intelligently and in their entirety" so that they will also boost investments. "Thanks to these resources we will be able to create an extraordinary kind of testing ground in the south, where both private and public investments will help bridge those gaps that have been there for so long".

The new President of Italian industrialists drew his speech to a close with some words that were much appreciated and widely shared: "We believe that Confindustria is a great asset for the entire nation and we know we can do a lot for Italy and for change, well aware that our proposals could be improved on, because interaction is the very heart of democracy, both inside and outside our Federation".

Finally, quoting George Bernard Shaw, Vincenzo Boccia concluded his speech to great applause by saying: "Imagination is the beginning of creation: you imagine what you desire, then you want what you imagine and at last you create what you want". "We imagine and want a more united Europe and better Italy. And we will help create what we want".

GIORGIO SQUINZI IS THE PRESIDENT OF THE 24 ORE GROUP

Before finishing his term in office as the President of Confindustria (Confederation of the Italian Manufacturing and Service Companies), Giorgio Squinzi has now taken up another key position.

The President of the Mapei Group was appointed President of the 24 Ore Group on 29th April, whose various enterprises obviously include publishing the *II Sole* 24 Ore newspaper representing Confindustria.

The 24 Ore Group is the leading multimedia editorial group operating in the economic, financial, professional and cultural information sector in Italy.

More specifically, *II Sole 24 Ore*, (whose editor-in-chief is Roberto Napoletano) is responsible for the high profile of the brand handling all the Group's operations and the second most widely read newspaper in Italy, selling 390,465 copies daily, and the leading Italian digital

A PRESTIGIOUS APPOINTMENT AIMED AT REVIVING THE GROUP'S COMPETITIVENESS ON THE PUBLISHING MARKET

newspaper with an estimated 228,141 readers according to statistics dating back to February 2016.

The shareholders' meeting that was held in the Auditorium at the headquarters of *II Sole 24 Ore* in Milan (which was built with Mapei products a few years ago) also elected a new Board of Directors, which will remain in office for three years until the assembly approves the company financial statements on 31st December 2018. The people appointed as members of the Board were Luigi Abete (confirmed), Mauro Chiassarini (newly appointed), Maria Carmela Colaiacovo (confirmed), Nicolò Dubini (confirmed), Marcella Panucci (confirmed), Claudia Parzani (newly appointed), Carlo Pesenti (newly elected), Livia Pomodoro (newly appointed), Cesare Puccioni (confirmed), Carlo Robiglio (newly appointed), Giorgio Squinzi (newly appointed).

The assembly appointed Giorgio Squinzi as President of the Board of Directors, while Luigi Predieri was appointed as the Board's Secretary.

Squinzi decided to forego any payment as President and advisor and Marcella Panucci, who was also confirmed on the Board of Directors, did the same.

Answering journalists' questions, the newly appointed President talked about *II Sole 24 Ore* being an "extremely authoritative newspaper at the very top of the Italian publishing industry; nothing needs relaunching, we simply need to sort out the accounts". Significantly, the newspaper will not be getting involved in the M&A trend that is currently sweeping through the publishing industry: "Our grassroots supporters feel that we need to maintain our independence, so that is the direction in which I will be working". The assembly held on 29th April was the last under the Presidency of Benito Benedini, who thanked the editor-in-chief Roberto Napoletano: "he is a wonderful editor, who has shown great creativity and innovation in devising a multimedia system that is quite unique" and also the outgoing Managing Director, Donatella Treu "for her invaluable and highly qualified contribution", as well as "all the journalists and staff of the 24 Ore Group. "The Sole 24 Ore brand is unique, authoritative, powerful and inimitable: it is one of Italy's greatest assets and it deserves to be respected", so Benedini stated in his speech. "During my term in office the entire company has been reorganised. The mission associated with its real core business, our newspaper, has also been redefined", so the outgoing President stated, claiming he was pleased that "this management team has guided the Group back along the path to profitability. We have completed three quarters of the journey, we now need to complete the final mile, which, as everybody knows, is the shortest but also extremely crucial".

Giorgio Squinzi clearly outlined the path ahead: "There is no room for ditherers or opportunists on the global market", was one of the messages sent out in Squinzi's first speech as the Group's President at the end of the assembly: "We are clearly facing a tricky situation, but I believe that if our company focuses on its most important assets and adopts an open approach to the market, it should at least soon stop leaking money, become more competitive on the Italian publishing market and even be able to reward its shareholders with more satisfactory books. I accept the responsibility for all this", so the former President of Confindustria concluded.

The meeting of the shareholders then approved the holding group's balance sheet for 2015. Il Sole 24 Ore's unique paper-web multimedia system (*Il Sole 24*)

Ore newspaper, 12 specialized newspapers, and ItalyEurope24, the first paywall website to be set up in Italy) is most certainly the key factor in analysing how the 24 Ore Group performed in 2015: the digital information profits for // Sole 24 Ore and the other newspapers increased by 8.4 million Euros, corresponding to a rise of 45% compared to 2014, when there was also considerable growth; digital content profits are clearly higher than those from the printed paper (55% compared to 45%); the fact that the market has acknowledged the value of Il Sole 24 Ore's entire multimedia system has made it possible to increase advertising charges and thereby contribute to the 12.8 million Euros increase in income (+11.2%). EBITDA are once again positive one year ahead of schedule (0.9 million Euros) and the operating flow for 2015 has been inverted from a loss of 16.6 million Euros in 2014 to profits of 2.1 million Euros. The Group ended the year with consolidated net losses of 24 million (-21.3 million Euros for the holding). Overall consolidated profits, on the other hand, rose by 4% to 325 million Euros.

Everybody at Mapei would like to congratulate Giorgio Squinzi for this latest prestigious professional appointment, wishing him every success in achieving all the ambitious corporate goals he has set himself in this new field.

IL SOLE 24 ORE IS THE SECOND MOST WIDELY READ NEWSPAPER IN ITALY, SELLING **390,465** COPIES DAILY, AND THE LEADING ITALIAN DIGITAL NEWSPAPER WITH AN ESTIMATED **228,141** READERS

The Italian newspaper // Sole 24 Ore celebrated the 150th anniversary of its official founding on 3rd May at La Scala

Opera House in Milan.

TΗ

Oning and and out

The very first issue of *II Sole* was published on 1st August 1865. There were four pages about economic and political news with the slogan "it shines for everybody" as the main headline. The newspaper, which was first established thanks to the joint efforts of the cloth trader Gaetano Semenza, the Penocchio brothers, who were businessmen in the silk industry, and the publisher Francesco Vallardi, represented the innovative. liberal Italian middle classes with their very close ties to Giuseppe Mazzini's democratic, Republican ideals. 150 years later it has become II Sole 24 Ore and the original four pages have turned into a thick newspaper almost enclosing four separate journals in their own right.

The guest of honour was the President of the Italian Republic, Sergio Mattarella, who officially obliterated the commemorative stamp. The Italian national anthem

CELEBRATIONS AT LA SCALA OPERA HOUSE IN MILAN FOR THE NEWSPAPER THAT **INFORMS ITALIANS ABOUT** THE REAL STATE OF THE NATION ON A DAILY BASIS

rang out as the President was welcomed into the royal box accompanied by the President of the Lombardy Region, Roberto Maroni, the Mayor of Milan Giuliano Pisapia, the newly elected President of the 24 Ore Group, Giorgio Squinzi, the CEO and Artistic Director of the La Scala Opera House, Alexander Pereira and the editor-in-chief of Il Sole 24 Ore, Roberto Napoletano.

"My heartfelt thanks go to the President of the Italian Republic, Sergio Mattarella, for doing us the honour of being with us here today - so Napoletano announced

at the opening of the ceremony - and a very special thanks for what he had said to me: that this is a newspaper that provides information so that we know exactly what is going on in the country each day. That is the best compliment we could possibly receive".

Aware Parlow 10

ANNIVERSARY OF

IL SOLE 24 ORE

The guests in attendance were worthy of an opening night of the opera season. Under the foyer lights, the VIPs included the Italian Government Ministers Pier Carlo Padoan, Marianna Madia and Dario Franceschini, the CEO of Mediobanca, Alberto Nagel, and the Managing Director and CEO of Intesa Sanpaolo, Carlo Messina. Other managers in attendance included the CEO of the publishing group Mondadori, Ernesto Mauri, the President of the media company Mediaset, Fedele Confalonieri, the President of the multinational oil and gas company ENI, Emma Marcegaglia, the new President of Confindustria (Confederation of Italian Manufacturing and Service Companies), Vincenzo Boccia, and the CEO of the tyre manufacturing company

LEFT. Giorgio Squinzi and Dario Franceschini, Italian Minister of Cultural Heritage and Activities and Tourism, welcome the President of the Italian Republic, Sergio Mattarella, arriving at La Scala square on the 3rd of May, 2016. **BELOW.** From left on: Alexander Pereira (Artistic Director of the La Scala Opera House), Giorgio Squinzi, Roberto Napoletano (Editor-in-chief of *II Sole 24Ore*) and Roberto Maroni, President of the Lombardy Region.

Pirelli, Marco Tronchetti Provera. The extremely elegant ladies present included the business woman, Diana Bracco, and the former President of Milan Law Court, Livia Pomodoro.

"150 years is a long time - so Roberto Napoletano went on to say - and it means we have a great responsibility. Our priority must be to maintain the distinctive traits (updating them to the times) of this unique way of providing information that is based on expertise and precision". The editor-in-chief went on to mention the fact that some people believe that journalism has turned into a kind of smartphone: but that is not the case. "Brains are the most important thing, followed by good journalism and content, and then after that comes technology, which is a fabulous way of multiplying these assets". The anniversary celebrations were held in a Milanese landmark of culture and art, La Scala Opera House: "La Scala is the home of the very best of international culture in the economic capital of Italy, a place with which we have plenty in common, starting with those chromosomes that bring together economics, finance and cultural-civil engagement", so Napoletano claimed.

He then turned his attention to thanking "all those readers who have helped us

write such an important story, day by day, brick by brick" and to those editorin-chiefs who preceded him and who were in attendance on the evening (Mario Deaglio, Gianni Locatelli, Salvatore Carrubba, Ernesto Auci, Guido Gentili and Ferruccio de Bortoli). He singled out "the editors, because they have always ensured this newspaper enjoyed complete freedom" and also the publishing staff "for their great expertise and for loving a paper I have had the honour of editing for five years now".

The celebrations began with a short concert by the Soloists from the La Scala's Academy of Lyric Opera, who played "Chi mi frena in tal momento?" from Gaetano Donizetti's *Lucia di Lammermoor* and "Un dì, se ben rammentomi... Bella figlia dell'amore" from Giuseppe Verdi's *Rigoletto*.

This was followed by a showing of a documentary produced by Giffoni Experience-Giffoni Innovation Hub called "Lo ha detto il Sole" ("Sole 24 Ore" said so). The title of the documentary epitomises the newspaper's professionalism: providing an objective and informative overview of reality based on facts and figures and comparative-competitive journalism, always with plenty of "heart" and "history", as Napoletano put it. The facts and figures and quality-quantitative approach have allowed *II Sole 24 Ore* to provide investigative-informative journalism of

the highest quality. Serving businesses, professional enterprises, families and ordinary people, students and professional people. Serving everybody.

There was then a touching moment of particular significance for this publishing community that had recently lost one of its key figures: "On this day celebrations, somebody is not here, a person I miss every day. Hi, Fabrizio, you will always be here with us. 'Lo ha detto il Sole' is dedicated to you" so Napoletano said referring to Fabrizio Forquet, the Assistant Editor-in-Chief in charge of the Sole 24 Ore offices in Rome, who recently passed away at the age of 44 following a sudden illness. These comments were followed by a lengthy and heartfelt applause by everybody in the theatre. Fabrizio Forquet was an integral part of the Il Sole 24 Ore community, as was Marco Biagi, the Italian jurist and university professor who was killed by terrorists on 19th March 2002 in Bologna, who was remembered at La Scala Opera House both during the Editor-in-chief's speech and in the documentary that was shown.

"The next step forward - so the Editorin-chief announced - will be to update *II Sole 24 Ore* in real time, creating a digital paper that will, of course, charge a fee, because we believe that either information has a market value (and, hence, must be paid for) or otherwise it will simply no longer exist".

On 21st March 'Federchimica' - the Italian Federation for the chemical industry that Mapei also belongs to - celebrated the 100th anniversary of its founding. The event was celebrated during the Annual Assembly held at Dal Verme Theatre in Milan (Italy).

Science, industry and associationism in the chemical industry have grown hand-in-hand in Italy and their history is tightly interwoven with industrial, economic and social progress in the country. Together with the President, Cesare Puccioni, these matters were also discussed by Antonio Tajani, Vice-President of the European Parliament, David Sassoli, Vice-President of the European Parliament, Alberto Quadrio Curzio, President of the Accademia dei Lincei science academy, and Giulio Sapelli from Milan Statale University. The event drew to a close with speeches by Ivan Scalfarotto, Undersecretary of State for the Italian Ministry of Economic Development, and Giorgio Squinzi, President of Confindustria (Confederation of Italian manufacturing and service companies) at the time. A total of approximately 1400 companies currently belong to the Federation for a total of almost 90,000 employees. Federchimica is part of Confindustria, Cefic (European Chemical Industry Council) and ECEG (European Chemical Employers Group).

THE CHEMICAL INDUSTRY IS THE SECTOR OF THE FUTURE

"Over the last hundred years everything has changed, but not the chemical industry's ability to anticipate challenges that the whole of industry will eventually have to come to term with. Brave decisions in such strategic realms as research, sustainability and industrial relations", so Cesare Puccioni noted. "The chemical industry is synonymous with change: in materials, manufacturing processes, products and quality of life; it actually changes itself and makes others change, so it needs an Association that is ahead of the times".

The chemicals industry was the first to introduce innovations

RIGHT. During the Assembly, Federchimica was awarded by the President of the Italian Republic. From left on: Guido Venturini, Claudio Benedetti, Carlo Ferroni, Giorgio Squinzi, Cesare Puccioni, Diana Bracco, Benito Benedini and Giorgio Porta. **BELOW.** Cesare Puccioni, President of Federchimica, and Giorgio Squinzi.

capable of revolutionising entire manufacturing sectors, generating waves of change throughout society and stimulating progress (and not just in the economy). This happened in Italy with Giacomo Fauser and his method for producing synthetic ammonia and with Giulio Natta and polypropylene, which, together with other plastics, made it possible for a much broader spectrum of the population to have their own consumer goods and a more comfortable life in the post-war period.

A vocation for renewal, research and development that played a key part in overcoming the extremely serious crisis that hit the economy during the last few years.

Here is what Puccioni had to say about the current economic situation: "In 2015 Italian chemical industry saw a revival in production (+1.0% or approximately 52 billion Euros), even though the revival has struggled to take hold at a time when the international scene is full of risks and uncertainty reigns".

SUSTAINABLE GROWTH AND RESEARCH

"We have also been to the very fore of the great challenge of the future: sustainable growth", so Puccioni went on to say.

"Chemicals optimise manufacturing processes, constantly making better use of resources and minimising the employment of the most valuable resources by reusing or replacing them with others that are less rare and expensive (not to mention safer), even managing to make use of waste".

Due to competition from emerging countries, basing innovation on research is now an absolute must. The Italian chemical industry has been aware of this for some time, so there has been a boom of both small and medium-sized companies highly focused on research, specialising in specific groups of quality products and directed towards international markets: in everything from the car industry and housing to clothing, furniture and lots of other sectors, the chemical industry provides a decisive contribution to protecting Italian production against international competition and, hence, to securing a vast number of jobs.

Promoting research is one of the foundations of the chemical industry and calls for better interaction with schools, universities and also public research in the form of projects aimed at creating greater industrial awareness throughout the system. The President of the Mapei Group, Giorgio Squinzi, confirmed that "there are certainly some 'plus signs' but, in my opinion, they are not significant enough to be able to genuinely claim we are heading in the right direction to create new employment and well-being in Italy. Lots of these positives are, moreover, due to the endeavours of the chemical industry and fine chemicals in particular".

ABOVE. Giorgio Squinzi with Adriana Ceretelli (II Sole 24 Ore) and Benito Benedini (Cabefin SpA).

BUILDING WITH CHEMISTRY

The chemical industry is still one of the driving forces worldwide. Despite the crisis in 2008-09, worldwide chemicals sales are continuing to increase at very fast rates (+2.9% in 2000-2014). From a medium-and long-term perspective, the world demand for chemicals will keep on growing. On one hand consumption of chemicals in emerging nations will continue to escalate and, on the other, the drive towards sustainable growth will also boost chemical consumption in developed nations not just in terms of value (due to the increasing technological content of chemical products), but also in terms of volume (due to a boom in the use of chemical products in user industries).

It is now an established fact, well known to the general public and businesses, that sustainable chemicals will be decisive for the future of the planet in the battle against global warming, which was at the focus of proceedings at the 2015 Paris Conference on Climate Change (see *Realtà Mapei International* no. 56). Research and innovation in the chemical industry have definitely taken up the challenge to constrain and reduce the environmental impact being caused by products and processes and have already achieved satisfactory results.

The chemicals industry is a "diffused innovation" sector in which not only large businesses but also lots of small and medium-sized companies are engaged in research, setting up scientific partnerships with Research and University bodies. PHOTO 1. The Burj Khalifa Tower in Dubai (828 m tall, 163 floors, 330,000 m³ of concrete poured on site), made use of innovative products based on innovative chemicals.

THE CHEMICAL INDUSTRY AND SUSTAINABLE BUILDING

There are now thousands of chemical products used by the construction industry on a daily basis, all around the world.

Chemicals are essential for manufacturing paints, pigments, adhesives for natural stone, ceramic and resilient materials and for sealants and waterproofing products and systems. Even in cases where the main components are cement and aggregates (sand and gravel), such as in building mortars and concrete, chemicals (be it organic and inorganic) play a crucial role in giving the various cementitious mixes their specific performance characteristics, which would otherwise be impossible to achieve.

A perfect example of their importance is represented by the superplasticizers, made from water-soluble synthetic polymers, which when added in small percentages to fresh concrete mixes have a dramatic effect on their rheological properties, allowing concrete to be pumped over long distances and to high levels.

Also, with these types of admixture, the amount of mixing water required for the mixing and the placing of concrete is

considerably lower and, once hardened, concrete is characterised by far superior mechanical properties and durability. These admixtures brought on a real revolution in the large constructions sector and allowed such structures as the Burj Khalifa Tower in Dubai (UAE) to be built, which otherwise would never have been built (Photo 1). Sustainable development requires better performing materials, more rational use of natural resources, higher energy efficiency, a reduction in levels of exposure to toxic substances and well-qualified personnel with adequate buying power.

In the sector of chemical products for the construction industry, technological innovation is one of the tools used to achieve these objectives. Through innovation it is possible to improve the quality and "healthiness" of products and lower their cost. Innovative technology is used to reduce pollution, minimise the levels of waste and reduce the amount of energy required to extract materials and process them during industrial processes.

Lastly, it also makes it possible to reduce/eliminate the amount of harmful substances they contain, enabling them to be recycled or re-used. FIGURE 2. The EMICODE labels by GEV (right) and the environmental chamber used to measure the emissions of VOC in indoor environments at Mapei SpA R&D Laboratory in Milan (left).

INCREMENTAL AND RADICAL INNOVATION

There are various kinds of technological innovation. On the one hand we have incremental innovation, which aims at the progressive improvement and extension of existing technologies and products. On the other hand, we have a process called radical innovation, a discontinuous process which, very often, implies replacing, rather than transforming, well established technology with emerging technology. Radical innovation, however, is rarely the result of an "eureka moment" or sheer luck; it is usually the result of a long, arduous process, often involving technical and economic risks (will it work and how much will it cost?). Not only that, the first attempt at radical innovation is usually far from perfect. In the end, its success almost always depends on improving, perfecting, modifying and developing support technology, changing the structure of a company and, last but not least, people's consensus for the innovation itself. In view of this, radical innovation must be seen as a process rather than an event [1]. An intrinsic part of radical innovation is the concept of technological discontinuity, a process derived from emerging technology with the capacity to take value/performance to at least one order of magnitude higher than existing technology [2]. This is the reason why industrial research needs to interface closely with the scientific community: to identify, in advance, which scientific innovation could potentially be used to generate emerging technology with the ability to replace well-established technology and introduce radical innovations, providing the owners of such innovations a market advantage.

PHOTO 2. An example of the production of aggregates from returned concrete with Mapei RE-CON ZERO.

EXAMPLES OF INCREMENTAL INNOVATION

A lot of effort has been made, and is still being made, to remove harmful substances from chemical products used in the building industry. Many types of solvent have been completely eliminated from products and have been replaced by water without modifying their properties, and in many cases even improving their performances. This transformation has often been accelerated by the release of specific norms aimed at safeguarding the environment and people's health, which highlights the important role of regulations and environmental policies on the sustainability of products.

An example of such a change is represented by building products used indoor that might have an effect on the quality of the air in our homes. In recent years, numerous labels in Europe and around the world have been introduced to certify products with low emission levels that help guarantee good guality indoor air. In Europe, a voluntary classification system for products has been introduced (EMICODE) based on VOC (Volatile Organic Compounds) emissions, with specific markings issued by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.), a German body that checks emissions from flooring products, adhesives and building materials. The emission level of VOC for various products is evaluated using an environmental chamber that measures the concentration of VOC released into the surroundings (Figure 2).

The products evaluated include liquids (primers), powders (self-levelling products, mortars, cementitious grouts), pastes (adhesives for resilient and wooden floors, epoxy grouts), sealants and varnishes for parquet. A sample of the product with a known surface area is placed on a non-absorbent glass plate, weighed and then immediately transferred into the environmental simulation chamber. The ratio between the area of the sample and the volume of the chamber is very important, in that it simulates the real situation found in a room (floor/room volume ratio).

The temperature and the relative humidity in the chamber are tightly controlled (T=23 °C and R.H.=50%) and the test chamber itself is continuously ventilated with clean air. This allows the air in the chamber to be completely replaced every 2 hours.

After 3 and 28 days, special pumps extract a sample of the air from the chamber and direct it to special tubes that can retain all the VOC. They are then analysed by a High Resolution Gas Chromatography analyzer (HRGC/MS) to give a quality/quantity result measured in µg/m³ of VOC present in the air of the chamber.

Maximum allowed emission limits for VOCs are 1000 μ g/m³ after 3 days and 100 μ g/m³ after 28 days for EMICODE EC1 certification and 750 μ g/m³ after 3 days and 60 μ g/m³ after 28 days for EMICODE EC1 PLUS certification, respectively.

Most of Mapei products, including primers, self-levelling mortars, cementitious adhesives, adhesives for resilient materials, sealants and paints for parquet, comply with these standards and are EMICODE certificated by GEV.

EXAMPLES OF RADICAL INNOVATION

Concrete is manufactured at a rate of 10 billion m³ per year and is by far the most widely used material on the planet [3]. For various reasons, about 2% of the ready-mixed concrete produced is not used (about 200 million tonnes per year) and is returned to concrete manufacturing plants in truck mixers, which poses quite a serious problem. It is not always possible to recycle returned concrete and use it again to manufacture other products. As a result, returned concrete is often dumped to landfill which, apart from its cost implications, has a strong negative impact on the environment. RE-CON ZERO and RE-CON ZERO EVO [4], new additives developed by Mapei and based on superabsorbent polymers and reactive salts, allow unused, returned concrete to be transformed into aggregates (sand and gravel) in just a few minutes, that can be guickly recycled to make new concrete, without producing any waste or by-products (Photo 2). The "carbon footprint" with this new recycling technology is 100 times lower compared to the disposal to landfill. Moreover, returned concrete is completely recycled in the

FIGURE 4. Nano-dispersion of hydrated silicates of transition metals. The transition metal intercalates in the interlayer of the pseudo-tobermorite lattice and increases the specific surface area and reactivity of the nano-particle.

same production chain, thereby reducing the consumption of natural aggregates and the waste disposal costs, in line with the principles of "circular economy".

TECHNOLOGICAL DISCONTI-NUITY

The birth of nano-technology dates back to a famous speech given by Richard Feynman on the 29th of December, 1959, at the Californian Institute of Technology, titled "There's plenty of room at the bottom", in which he discussed the manipulation of materials at the atomic scale. Since then, nanotechnology has become a factor of discontinuity in many areas of industrial technology, thanks to the availability of new products and materials engineered at the atomic scale, characterised by new properties and higher performance levels.

An example of nano-technology applied to the construction industry is represented by new inorganic, silicate polymers which, when added to cementitious mixes, allow the speed of the cement's reaction with the water to be controlled, thereby directing the growth of cement hydration products towards the formation of a nano-structure that is much more compact and durable [5] (Figure 4). These polymers are the basis of MAPEFAST ULTRA, a new additive developed in Mapei R&D Laboratories, which considerably accelerates the development of mechanical strength of cementitious mixtures and eliminates steam curing in precast concrete plants, with considerable economic and environmental advantages. By applying the criteria of LCA (Life Cycle Assessment), it has been possible to calculate that, by using MAPEFAST ULTRA, the level of CO₂ emissions is 12% lower than for the same item manufactured using conventional technology and steam assisted curing.

Moreover, the homogeneous nucleation process of the cement hydration products induced by the new admixture takes place in the capillaries of the cementitious paste rather than on the surface of the cement grains as with normal mixes. This makes hardened concrete less permeable to water under pressure and increases the durability of the concrete elements.

FROM PRODUCTS TO SYSTEMS

A single product is not always able to reach the performance levels required, even when specifically formulated. For example, there are no materials or products which, when used singly, are able to efficiently solve the problem of thermal insulation of buildings. For this type of application, Mapei has developed MAPETHERM, a products system made up of different types of material applied in various thicknesses which work together to guarantee excellent, long-lasting results (Figure 3).

Besides this example, Mapei has de-

FIGURE 3. The MAPETHERM system is used to thermally insulate buildings. The end result is achieved by combining and interfacing 9 different components.

veloped systems to soundproof rooms (such as MAPESONIC CR and MAPESILENT), strengthen structures (MAPEWRAP) and upgrade buildings to provide protection in the event of seismic activity (MAPEWRAP EQ). Other systems have also been developed to repair masonry (MAPE-ANTIQUE), waterproof surfaces (MAPELASTIC) or finish off the surface of walls (SILANCO-LOR, SILEXCOLOR and QUARZOLI-TE). All these systems allow to provide the market with solutions to problems that include a guarantee for their clients.

CONCLUSIONS

The progress of the construction industry towards a sustainable future is tightly connected to innovations from the chemicals sector. Not only must the development of sustainable technology in this sector proceed step by step, by improving existing products and making them increasingly healthy. It must also develop by focusing on radical innovation based on scientific research and in-depth knowledge of emerging technology.

Marco Squinzi, Giorgio Ferrari and Amilcare Collina. Mapei SpA R&D Laboratories

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Deep down, the city of Milan has always taken the challenge of reaching further upwards very seriously, starting with the record-breaking 109,5 m of the topmost spire on the Duomo Cathedral, designed and completed in 1774 by Francesco Croce. Up until the 1950's, however, the city had always favoured its image as a rather flat city, with the only things really standing out being the spires of the Duomo cathedral. After the bombing attacks of the Second World War, Milan started an intense rebuilding process and began to build tall buildings, starting with the Tower in Piazza della Repubblica by Luigi Mattioni which, in 1954, inaugurated a series of tall buildings. Construction work started in 1956 on the Velasca Tower (106 m), designed by the BBPR architectural studio, which was followed by the Pirelli Skyscraper (127 m) designed by Giò Ponti (see Realtà Mapei International no. 19) and the Galfa Tower (109 m) by Melchiorre Bega.

After a long pause in the vertical development of Milan, over the last few years the city has been witnessing the birth of a new city skyline dominated by Palazzo Lombardia (161 m), and particularly by the former Exhibition area of the city with the Three Towers of the CityLife Project (see the dedicated article in this issue of the magazine) and the Garibaldi-Repubblica area with the Porta Nuova Project, where reaching towards the skies we have the Vertical Wood (112 m), the Diamond (140 m), the Unicredit Tower (218 m) and the Solea, Aria and Solaria Towers residential complex (143 m) (see Realtà Mapei International no. 51).

SKYSCRAPERS WERE UNDER THE SPOTLIGHT AT THE "TALL BUILDINGS" CONFERENCE WHICH INCLUDED MAPEI AMONG THE SPONSORS

MANAGING THE HEIGHT

The 6th edition of the "Tall Buildings" conference was held on the 19th of April and for the first time it took place outside Venice and was transferred to Milan. The organiser of the convention was Aldo Norsa, a professor at the luav University of Venice, and it was promoted by the University of Venice and the Polytechnic University of Milan, with the patronage of the Council on Tall Buildings and Hurban Habitat and the support of CityLife, with Mapei among the sponsors.

This year's conference was divided into a morning session, which focused on the construction of tall buildings and the logistical problems encountered in managing the flow of people and goods, infrastructures, public areas and parkland, and an afternoon session dedicated to the recovery of existing stock.

Even though only a few skyscrapers have been built here, Italy has shown to have accumulated a great deal of expertise and has completed exemplary projects to be shown to the world. One is the Allianz Tower by Isozaki and Maffei, the first of the three business towers from the CityLife project to have been completed (see *Realtà Mapei International* no. 52). The building is stunning for its lightness of form and glass architecture technology and hosted the Tall Buildings Convention.

During his welcoming message to the speakers Marco Beccati, Technical Director of CityLife and the host of the convention, examined the possibility of replicating the CityLife project. This project has led to the redevelopment of the city's former Exhibition area, where the future hub of the Milan business world will include parkland, pedestrian zones, ecosustainable homes and shopping areas. "It would be a dream to think we could repeat what we have achieved here but, because CityLife is an urban redevelopment project, I don't think it would be possible to repeat such a project here in Milan. Maybe it could be done in other parts of Italy, such as Rome or Turin, where there are still areas to be redeveloped". And he rounded off by mentioning "the fortune to have worked with three such high level architects: Zaha Hadid, Arata Isozaki and Daniel Libeskind. Their involvement was fundamental because, right from the very beginning, it gave the project an aura of architectural significance".

And this relationship between star architects and architecture and the importance of such important names being involved in a project were subjects addressed by Prof. Aldo Norsa during his introductory speech. Not only is Prof. Norsa convinced that skyscrapers are redesigning the panorama of the most important metropolises in the world, he is equally convinced that the scenario for Italy is somehow different. "Italy is a particularly complex nation; our cities have

a millennium of traditions and each and every one is different. In other countries skyscrapers are popular and emblematic, but they grow in cities that do not have the same intensity, stratification and history that our cities have, so they are not really a necessity from a cultural point of view. This position changes, however, if we take global competition into consideration. In that case, urban centres such as Milan in primis, Turin and maybe Verona, Bologna and Genoa are ready to be transformed".

Culture, identity and authenticity are perhaps the synthesis of this convention, as highlighted in the opening of the presentation by John Iorio, founder of J&A Consultants, the first Italian company specialised in project management in the construction sector. "Over the course of history, man has always tried to construct something tall to provide protection or to assert himself. Now more than ever the human scale is the new measure that defines spaces".

During the meeting the relationship that needs to be established between the horizontal city and the vertical city was also discussed. According to Andrea Rolando from the Department of Architecture and Urban Studies at the Polytechnic of Milan, "...it is essential that we have a clear picture of the scale of things; not just the perception we have of buildings from a street-level view, but also in a wider and more metropolitan dimension". As examples of this concept, Rolando illustrated the redevelopment plan for the Portello-Milan Exhibition area and the Spina area in Turin which is part of the Corridor 5 project to connect Turin

to Milan

The architect Patricia Viel from the Citterio & Viel design studio spent time discussing the design of tall buildings for the residential sector and talked about the latest generation of skyscrapers in New York. There was a particularly significant pre-sentation during the afternoon session about the renovation of a tall building by Maria Antonietta Crippa, Professor in the History of Architecture at the Polytechnic University of Milan, who showed a series of photographs to illustrate the renovation work carried out on the Pirelli Skyscraper. She gave a step-by-step account of the most important moments in history of the building, highlighting how the renovation work on the façade was one of the most important and difficult challenges. One of the details discussed were the new mosaic tiles for the covering, which were only found after a long search in Southeast

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ABOVE. Daniel Libeskind and Prof. Aldo Norsa at the "Tall Buildings" convention in Milan. LEFT. From the Duomo's spire through Palazzo Lombardia, up to Porta Nuova Towers and the CityLife district, Mylan's skyline blends modernity and history.

Asia. For this particular case Crippa said a special thank you to Mapei for supplying the best adhesive, a real help in solving the difficult problem of bonding the mosaic tiles to the façade of the Pirelli Skyscraper. There were also thanks from John lorio during the morning session, who wished to remind everyone about the skill of Italian companies in upgrading existing stock and also mentioned "the excellent and difficult intervention by Mapei in successfully bonding the mosaic tiles on the Pirelli Tower" (see Realtà Mapei International no. 17).

The day came to an end with a discussion by the renowned architect Daniel Libeskind who, when called to the stage by Prof. Aldo Norsa, declared that "Italy is pure inspiration! Today's young architects need to have the strength to express their ideas and to keep moving forward, thinking about the future, but without forgetting their traditions". Libeskind went through the stages of his career, underlining how tall buildings represent the cornerstone of his profession.

> THE RENOVATION **WORK ON THE FAÇADE OF** THE PIRELLI SKYSCRAPER WAS ONE OF THE MOST IMPORTANT AND DIFFICULT CHALLENGES **OF THE PROJECT**

IN THE FACING PAGE. A rendering of the Tower. LEFT. Daniel Libeskind signs the document mentioning all the people involved in the project of the Tower. BELOW. A sketch of the Tower designed by Daniel Libeskind.

THE LIBESKIP

WORKS ARE GOING ON IN THE NEW CITYLIFE DISTRICT IN MILAN

Those who read *Realtà Mapei International* will already know: Mapei has always paid a lot of attention to the major changes that the city of Milan has had to tackle during the recent years of major urban design and development: the Group has been playing a leading, hands-on role in the construction of the city's new skyline. Proof of the Company's interest and involvement can be found in the articles dedicated to the Porta Nuova project (*Realtà Mapei International* no.49/2014), Expo Milano (*Realtà Mapei International* no. 53/2015) and the inauguration of the Allianz Tower (*Realtà Mapei International* no. 52/2015) that has been built in the CityLife area. This district represents one of the largest redevelopment projects in Europe and extends over an area of 366.000 m² with a complex combination of public and private developments for housing, business hubs, shopping centres, services and parkland.

And Milan's new CityLife district has always been Mapei's jewel in the crown since 2012, when a round-table was held entitled "The Building Industry: Innovation through Design", organised by Spazio CityLife Group (*Realtà Mapei International* no. 41/2012), which highlighted the importance, from a redevelopment and design point of view, of the Three Towers commissioned to three equally famous architects: Arata Isozaki, Zaha Hadid and Daniel Libeskind. At the time, Mapei had already become the first European company to patent a new family of acrylic-based, super-plasticising admixtures which allowed the entire ready-mixed and pre-cast concrete industry to make an important step forward in terms of quality, thanks to the possibility of producing fluid concrete mixes with very low water/cement ratios. This is a crucial characteristic for concrete mixes with long workability times, enabling concrete to be poured continuously, including in hot climates, without having to add more water. And it was the use of this new generation of acrylic super-plasticisers that enabled the enormous foundation slab on which CityLife has been built to be built and where, amongst other things, it was essential to keep hydration heat under control to prevent cracking.

THE DANIEL LIBESKIND TOWER

Daniel Libeskind himself admitted a few months ago, when he spoke at length about the tower he designed for CityLife, that "When I looked closely at the *Rondadini Pietà* sculpture by Michelangelo I realised that the curve in Maria's back was identical to the arch of the tower". He then continued by adding: "That's where the creative premises came from that led to the definition of the form of the tower, an urban intervention that dialogues with the other two towers and, in conjunction with

to

them, defines a new place in the city – the square – and for the city itself, an urban landmark represented by the skyline of the CityLife master plan".

Located at the centre of the composition formed by the three towers, thanks to its arched conformation (hence the nickname "The Curved One"), the function of the building designed by Libeskind is to act almost as a link between the other two.

Its foundations were built last November, while construction work got underway in the spring of this year. Building work is scheduled to continue until 2018 and, once completed, the skyscraper will have 31 floors for a total height of 175 m and a total commercial surface area of 33,000 m². Apart from this building, Daniel Libeskind has also designed a residential complex in nearby Via Spinola.

THE ARCHITECTONIC DESIGN

The Libeskind Tower will be linked directly to the CityLife Shopping District and the Three Towers square and will be served by a new station along the M5 line of the underground rail system, which was inaugurated last year. Vehicle access will be by means of a network of underground roads reserved for the Towers and the business units in the area. CityLife will be the largest pedestrian area in Milan, thanks to this choice of locating the roads and car-parks below ground level.

Inside the Tower the lobby will be arranged on two levels, while the shape of each floor of office space and the surface area of each office will vary, depending on which floor the offices are located with respect to the geometric development of the tower. The variation in shape for each floor, which is due to the particular volumetric layout of the tower, will be compensated for by the modulated support areas on each floor around the central nucleus. The structure of the tower is made from rein-

forced concrete up to the 29th floor, while from the 30th floor the structure is made from steel and glass and forms the crown at the summit of the tower. The building is supported by 20 pillars located around its perimeter and each pillar has a circular section ranging from 60 cm up to a maximum of 140 cm. The pillars are made from reinforced concrete, except for those used for the twin-level lobby which are made from steel profiles.

BELOW, LEFT. Daniel Libeskind place the roll with the signed document into the foundation slab of the Tower. **RIGHT.** Daniel Libeskind before the start of the concrete pouring. **BELOW.** Mapei Technical Services was always present on site with their Mobile Concrete Lab.

The summit of the building will be characterised by a glass section with metal blades, as if to complete the lines that "generate" the tower. The system of façades has been designed by taking into consideration the geometry of the building, and for this reason its shell is made from glass panels supported at their ends by a system of metal beams that blends in seamlessly with the network of pillars in the lower floors. Because the geometry of the building varies, the glass panels used for the façades will be in a different size on each floor. A twin-level conference hall will be built on the 27th and 28th floors. Just like the other two towers, this one has also been awarded LEED pre-certification with a Gold rating.

THE CONCRETE USED FOR THE TOWER

The base slab for the Libeskind Tower was cast at the end of November last year. This was a record-breaking operation with 5,890 m³ of concrete poured in little more than one day. The contractor Colombo Costruzioni and the concrete company Holcim (Italia) Italia divided the 30 hours of work that had been scheduled into three 10-hour shifts. For each shift there was one general logistics-production foreman, 45 drivers, each one with a 10 m³ concrete truck, three operators with pump-

CALCESTRUTT

about 30 hours. BELOW. Giorgio Squinzi was present on site last November when the concrete was poured. In the picture, he poses with Marco Squinzi (right) and Luigi Colombo (left).

ing equipment with a capacity of 200 m³/hour, at least three operators controlling and supervising the production and quality of

the mix, 5 operators working in the mixing units, a maintenance technician to look after the equipment, 18 trucks to transport the aggregates, 9 trucks to transport the cement and around one hundred workers on site to lay the concrete and support all the operations while the concrete was being poured. All those involved in this phase, from the contractor to the supplier of the concrete, made sure all the resources required were available to ensure that each step was carried out as scheduled to construct the base slab, which has an irregular hexagonal shape up to 66 m by 40 m and a thickness of 2.50 m.

After carrying out a series of site surveys, Holcim (Italia) designed a unique mix of C32/40 concrete with exposure class

XC4 and consistency class SCC/SF1 made from 32.5 R LH SR IV/A Pozzolan cement. This type of cement is specially designed and manufactured to reduce cracking, which often occurs when casting particularly large and thick foundation slabs. The mix design, therefore, included the use of 32.5 R IV/A LH SR Pozzolan cement by Holcim (Italia) to reduce hydration heat and the high thermal gradient, which leads to cracking from thermal shock. Special care was also taken to design the most appropriate granulometric curve for the structure and the method chosen to pour the concrete. Further attention was paid to guarantee its workability and limit cracking caused by hygrometric shrinkage.

A full scale trial of the mix was carried out and monitored with thermocouples before the planned casting date – scheduled and carried out on the 27th and 28th of November, 2015 – to verify its characteristics according to the weather conditions and temperature for that period. The data taken during the trial allowed the development of hydration heat in the conglomerate to be measured and to verify that it was suitable for use.

The base slab was cast in a series of layers, each one around 15-20 cm thick. The more critical areas of each layer were lightly compacted to help the concrete flow correctly, make sure even layers were formed and guarantee the homogeneity between consecutive layers. Samples were taken in a specially selected area during pouring to characterise the concrete, while other tests were carried out to check its consistency, water/cement ratio, density and air content while, at the same time, monitoring the temperature of the cast concrete. Because of the time of year the intervention was carried out, Holcim (Italia) also took special care to make sure the temperature of the fresh concrete was at least 5 °C when it was delivered to site.

PROJECTS ADMIXTURES FOR CONCRETE

IN THE SPOTLIGHT DYNAMON XTEND W300 R

It is a liquid admixture for high quality concrete, specially formulated to make concrete with a low water/cement ratio and a long maintenance of workability, including in warm climates and high temperatures. DYNAMON XTEND W300 R is a watery solution with modified acrylic polymers to produce technically and economically high-performance concrete.

THE MAPEI ADMIXTURE

All the mixing units were fed with CEM IV A 32.5 R LH SR Pozzolan cement manufactured by Holcim (Italia) in their facility in Merone (Northern Italy). They also supplied aggregates from their own quarries in Gorla, Pioltello and Segrate (Northern Italy).

As far as the admixtures were concerned, Holcim (Italia) worked closely with Mapei to identify the most appropriate product to comply with all the specifications. In this particular case, the acrylic-based super-plasticiser DYNAMON XTEND W300 R was tested and approved. This product is a watery solution of modified acrylic polymers, and is particularly recommended for the production of high quality ready-mixed concrete in compliance with the requirements of UNI 11104 - UNI EN 206 standard for high quality concrete in consistency class S4-S5 and self compacting concrete. Mapei Technical Services technicians were also present on site supporting Holcim (Italia) technicians, when the concrete was being poured, with experienced engineers from the Mobile Laboratory Unit to take samples of the concrete.

Around 12 hours after completing pouring the concrete, and once the level of the upper layer had been reached, polythene sheets were placed over the concrete to protect it and maintain the correct level of moisture and thermal gradients. The sheets were removed after around seven days. Thermocouples were placed in the concrete to measure the thermal gradient between the core and surface of the slab and the surrounding temperature near the slab. This data allowed the curing period of the slab to be established very accurately.

Giorgio Squinzi, President of the Mapei Group, also wanted

to be present on site last November when the concrete was poured, and afterwards he declared: "CityLife, and the companies that have been invited to play a part in this project such as Colombo, Holcim (Italia) and Mapei, are the symbol of an Italy that has never given up and that has always used their determination to remain on the market. So for me it is such a special pleasure to be here today. As a citizen of Milan I am proud of the new shape the city has been taking over the last few years and I am proud of what I am witnessing today: it is a spur to carry on believing in the future".

TECHNICAL DATA

Libeskind Tower, Milan (Italy) Period of Construction: 2015-2018 Year of the Mapei Intervention: 2015 Intervention by Mapei: supplying admixtures for concrete Project: Daniel Libeskind Client: CityLife SpA Works Direction: Claudio Guido, Studio INPRO Site Managers: Cesana, Bergamini and Mandaglio (Colombo Costruzioni) Concrete Producer: Holcim (Italia) Main Contractor: Colombo Costruzioni SpA Mapei Co-ordinators: Pietro Lattarulo, Andrea Siboni, Stefano Citton and Massimo Seregni, Mapei SpA (Italy)

MAPEI PRODUCT

Admixtures for concrete: Dynamon Xtend W300 R

For further information on products see <u>www.mapei.it</u> and <u>www.mapei.com</u>

THE THREE TOWERS

Milan, similarly to all the great European metropolises, is reaching for the skies with newly constructed buildings. The Three CityLife Towers stand out to characterise the redevelopment of the historic Exhibition area of the city. The CityLife Project, the subject of an international urban redevelopment contest launched in 2004, should have been completed for the start of Expo 2015, but due to various delays it is now scheduled to be finished in 2023. These three skyscrapers stand out the most and have, and will have, a strong visual impact in this area, not only for their sheer height, but also for their architectural form. It is not just a coincidence that they have been nicknamed The Straight One, The Twisted One and The Curved One.

The Allianz Tower was designed by the Japanese architect Arata Isozaki, the Generali

Tower by Zaha Hadid and the third tower by Daniel Libeskind.

The Tower designed by Arata Isozaki, in collaboration with the architect Andrea Maffei (see *Realtà Mapei International* no. 52), is 202 m high and has fifty floors and 50.000 m² of office space for more than 3,500 people. Characterised by its straight, slender form, it is currently the only one of the three Towers that has been completed to host the head office for the German insurance group Allianz.

The Tower designed by the Anglo-Iraqi architect Zaha Hadid is a striking building that catches the eye for its dynamic, twisting movement pointing upwards. It is 170 m high, has 44 floors and will become the Milan head office of the Generali insurance group. According to the latest schedule, will be completed next year.

ABOVE. A rendering of the Three Towers in the CityLife district. BELOW. The Allianz Tower designed by Arata isozaki.

Zaha Hadid

The first woman to be awarded not only the Pritzker Prize, the highest international accolade in the field of architecture, but also a Royal Gold Medal from the Royal Institute of British Architects, Zaha Hadid died suddenly on 31st March in Miami. Born in Baghdad 65 years ago but a British citizen for many years, Zaha Hadid, who also taught at Harvard in a chair that used to be held by the archistar Kenzo Tange, focused her design around sinuous and gently winding lines, further emphasised by the use of new technology and materials such as glass, steel and titanium. Among her numerous works worth mentioning, the Fire Station in Weil am Rhein (Germany), which first made her famous, the Contemporary Arts Center in Cincinnati (USA), which was the first US museum designed by a woman, the London Aquatics Centre for the 2012 Olympics in London, the Guangzhou Opera House in Canton (China), the MAXXI National Museum of Modern Arts in Rome, the Sheikh Zayed Bridge in Abu Dhabi, the Riverside Museum of Transport in Glasgow (UK) and other works under construction, such as the Generali Tower in Milan and the Napoli Afragola high-speed train station in Southern Italy.

THE EXPERT'S OPINION

SPECIAL FOCUS Hospitals

HOSPITALS TRULY COMPLEX STRUCTURES

THE CHALLENGES IN DESIGNING A HOSPITAL AND CHOOSING THE MOST SUITABLE PRODUCTS FOR THE COMFORT AND HEALTH OF STAFF AND PATIENTS

"One thing is to talk about building a hospital, but it is a completely different matter when you actually get round to its construction. On the one hand it must comply with and foresee a wide range of specific technical requirements, while on the other hand it must meet the demands of its specific geographical location, fulfil the needs and guidelines stipulated by national and local authorities and meet the requirements of the patients and health workers that will be working in the hospital". These were the opening words from the General Manager of the Lombardy Region Health Authority several years ago during a meeting to discuss the building of new hospitals in Northern Italy.

In fact, in order to build a successful hospital, you need to know and understand the local territory by analysing the catchment area and have the ability to combine technology, an attractive and functional design, hygiene, safety and human relations between the medical staff and patients. A hospital is usually made up of various areas: registration, patient wards, a technological area, surgeries, A & E and intensive care. Each of these sections must be designed and constructed so they are fit for purpose according to the condition and needs of the patients, bearing in mind that certain areas need to be readily accessible both on foot and with stretchers, medical movable beds or ambulances.

The areaa where hospitals are to be built must meet certain requirements regarding their planning, climatic and hygiene characteristics. When choosing an area of land suitable to build a new hospital, the distribution of the catchment area must also be taken into consideration by studying the area the hospital caters for and the layout of the local roads and public transport networks.

THE HOSPITAL AT WORK: STRUCTURE AND OR-GANISATION

Founded originally in Roman times as places of cure for the sick, up until medieval times European hospitals were like large halls divided into aisles with external cloisters similar to those found in monasteries. It was only in the 16th century that the traditional cross-shaped layout was first introduced, with wards running along the arms of the cross and the various services at the ends of each arm. From the 19th century onwards, the problems of hygiene and sanitation were studied, leading to the idea of dividing patients according to their condition or illness being first introduced, and the availability of good ventilation and lighting also became very important. At the end of the century hospitals started to be made up of separate wings to make

it easier to organise care for the patients. From the first half of the last century, the idea of designing hospitals in separate blocks took hold, with large multi-storey buildings with internal corridors running in both directions, specifically designed to ensure the functionality of the rooms and care service. This type of architecture is still the one mainly used in the design of hospital buildings.

TECHNICAL CHARACTERISTICS AND LAYOUTS

The major difficulty in designing and building hospitals is the complex logistics and energy requirements as well as the installation of control and access systems that need to be available 24 hours a day and 365 days every year. During the design stage, the plans for the layout need to create routes that prevent overlaps and interference between the various types of traffic so that connections can be made as efficiently as possible. Patient wards need to have good natural ventilation and lighting and must not be located below or partially below ground level.

The electrics in a hospital are made up of normal networks fed directly by external systems, emergency networks using energy from independent generators and safety networks fed by accumulators. As far as the gas distribution systems are concerned, they are made up of pipe-lines running in special housing that can be opened for inspection, so that any gas leaks are easier to control.

Hospitals must also have other services that are necessary to keep the structure running, such as a kitchen, pharmacy, laundry, plant equipment (boiler room, pumping station, power room, refrigeration room, telephone network,

air-conditioning, medical gas networks, pneumatic postal service, fire-prevention systems, etc.), storerooms, facilities for the public, a chapel and prayer room, mortuary, service areas for hospital personnel and an incinerator to destroy solid waste.

Apart from the services mentioned above, during the design phase areas must also be planned for hospital management, the administration department, the registration area, A & E and intensive care, surgeries, diagnostics, laboratories, heat therapy, blood tests, areas to conserve blood, organs and tissues, training areas for nurses and rooms and areas for conferences, libraries and archives. The wards are usually divided into sections with a minimum of 25 and a maximum of 30 beds. These divisions form a unit and are made up of two or more sections, with a minimum of 50 and a maximum of 100 beds.

SURFACES AND FLOORS IN HOSPITALS

In hospitals and health centres particular attention need to be paid on cleanliness and hygiene, special practices, the use of nonhazardous installation products, and elements with antistatic and electrical conductivity properties. Floor and wall coverings must be highly resistant end easy to clean, as well as featuring particular colours according to specific needs. This is why, in hospitals and health centres in general, resilient coverings are used, particularly PVC and linoleum, which create smooth surfaces with no porosity. The joints are heat welded to guarantee a perfectly sealed surface and they are particularly resistant to abrasion and cleaning cycles with aggressive cleaning products. Aluminium, steel and PVC cove bases are also required to fill in the edges between the floors and walls, absolutely essential to guarantee optimum hygiene and to eliminate sharp corners that are often a collection point for bacteria and dirt. Operating theatres and rooms where MRI scans are performed need to be protected against electrostatic discharge (ESD), which is achieved by installing static conductive or static-dissipative control floorings in compliance with specific standards.

MAPEI'S COMMITMENT TO "HEALTHY" HOSPI-TALS

Health and safety for patient and staff must be guaranteed in facilities used for medical purposes, such as operating theatres and intensive care or diagnostic units. The main problem, which derives from the use of organic chemical products for building purposes, lies in the possible emission of volatile organic compounds that pollute the environment and are, therefore, a risk to the health and comfort of patients, medical staff and paramedics.

In accordance with its policy for protecting the environment and the indoor air quality, some time ago Mapei developed a range of polymer-based products in water dispersion as a valid alternative to organic solvents, which make it possible to tackle and solve the problem of pollution deriving from chemical solvents used in building flooring products. This innovation highly reduced the amount of volatile organic compounds emitted both immediately - after the application of the adhesive - and on a longer-term basis.

The Mapei Group ships over 21,000 tons of finished products every day. Even back in the 1970s, the Company launched products in water dispersion with low solvent content onto all its markets: products that do not require fire prevention certification for inflammable substances. In the case of these products though, some kind of solvent is always present, although in a smaller percentage, and this issue is of great concern in countries keen to use increas-

SANT'ANNA hospital – Como – Italy

ingly safer chemical products. Furthermore, these solvents are very volatile and evaporate extremely quickly, so these products do not solve the problem of indoor pollution.

Mapei is committed to developing research programmes for solvent-free products with low emissions of volatile organic compounds. This has resulted in the creation of the Mapei Eco range. These products, tested and certified by qualified international institutes, have been labelled with the EMICODE, issued by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.): EC1 (low emissions of volatile organic compounds) and EC1 PLUS (very low emissions of volatile organic compounds-PLUS)

GEV is an association which controls emissions from flooring products, adhesives and building materials. Mapei has been a member of GEV since October 2005.

Some Mapei products also have Blauer Engel certification, another label guaranteeing good indoor air quality for both installers and end users.

GEV and Blauer Engel are both extremely stringent voluntary certifications aimed at assessing emissions of volatile organic compounds from building products, both in a short time after the product is applied (3 days) and in the longer term (28 days), using special environmental chambers. Both these certifications consider products to have lowemissions based on their Total VOC (the sum of all the volatile organic compounds emitted during a certain period of time from the application of the product) and the absence of carcinogenic compounds emissions, like for example benzene, acetaldehyde, formaldehyde, dioxin, etc.

Mapei also has other local certifications for eco-sustainability, in order to meet the varying demands of local markets. Eco-compatible Mapei products also contribute to green building protocols, like for example LEED. **MAPEI SYSTEMS**

WITH VERY LOW EMISSION LEVELS OF VOLATILE ORGANIC COMPOUNDS (VOC) FOR INSTALLING RESILIENT FLOORS AND WALLS IN HOSPITALS

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GEV

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MAPEI has a complete range of

EMICODE EC1 and **EC1 Plus certified** products available for installing all types of resilient materials on walls and floors, made up of:

- Adhesion promoting primers: Primer G, Eco Prim T, Eco Prim Grip
- Consolidating and waterproofing primers: Eco Prim PU 1K, Eco Prim PU 1K Turbo, Primer MF EC Plus
- Self-levelling smoothing compounds: Ultraplan Eco, Ultraplan, Ultraplan Maxi, Ultraplan Fast Track
- Thixotropic smoothing compounds: Planipatch, Nivorapid, Planiprep Fast Track
- Adhesives for laying rubber and vinyl floors: Ultrabond Eco V4 SP, Ultrabond Eco VS90, Ultrabond ECO VS90 Plus, Ultrabond Eco 380, Adesilex UP 71, Ultrabond Eco V4 Conductive, Ultrabond Eco Fast Track, Ultrabond Eco Contact, Mapecontact
- Adhesives for laying linoleum floors: Ultrabond Eco 520, Ultrabond Eco 530, Ultrabond Eco 540, Ultrabond Eco Contact, Mapecontact

PROJECTS

LOUDUN HOSPITAL FRANCE

The Théophraste Renaudot Hospital, in the French region of Vienne, has changed its skin: the building has been completely refurbished and a new geriatrics unit has been built. This highly successful project was designed by the architects Ivars and Ballet, who opted for low buildings (ground floor and first floor) to make it easier to get around and to give the hospital an almost residential feel. Another highly original choice was to build the walls in the new areas using "printed" concrete to make it look like bamboo and break up the horizontal lines of the façades. The site required around 3,600 m³ of traditional concrete for the foundations and floor slabs and a further 700 m³ of concrete for the walls. The specifications required XF1 C25/30 S4 class for the printed concrete and XC1 C25/30 S3 class for the traditional concrete. The contractor contacted Mapei to help find a specific concrete mix that would meet the client's requirements. After analysing the problem, the admixtures DYNAMON SR3 and MAPEPLAST R14 were chosen for the concrete. DYNAMON SR3 - which was used for the printed concrete - is a super-plasticizers based on a modified acrylic polymer for manufacturing ready-mix concrete with low water/cement ratio, extremely high mechanical strength and long slump retention. It is recommended whenever a considerable reduction in the amount of mixing water is required, coupled with excellent maintenance of workability in the various consistency classes.

MAPEPLAST R14, on the other hand, was used to make the traditional concrete. Produced and marketed by Mapei France, it is a plasticising admixture for concrete with a set-retarding effect that improves the workability of concrete and guarantees an increase in mechanical strengths.

Both types of concrete proved to be highly successful thanks to these admixtures. The concrete used to build the façades had a fluid consistency and adapted perfectly to the shape of the formwork, and when it hardened it had no air bubbles, which was particularly appreciated by the technicians working on this part of the project.

TECHNICAL DATA

Client: Théophraste Renaudot Hospital Intervention by Mapei: supplying admixtures for concrete Design and Works Direction: lvars et Ballet

Concrete Producer: ATB (Anjou Travaux Béton)

Main Contractor: Etablissements **Boutillet**

Mapei Co-ordinator: Stéphane Giraudeau, Mapei France Photos: Ets Boutillet, Ivars et Ballet, Sébastien Andréi

MAPEI PRODUCTS

Admixtures for concrete: Dynamon SR3, Mapeplast R14* *This product is manufactured and distributed in the French market by Mapei France

MISTELBACH HOSPITAL AUSTRIA

The public hospital in the Austrian town of Mistelbach extends over an area of 12,000 m² and is considered a centre of excellence in Austria for the quality of care it provides. Construction work on a new wing of the hospital started in June 2011 and was completed in 2014. For all those working on the site, it proved to be quite a challenge to carry out the work without interrupting the normal running of the hospital.

The cementitious screeds were prepared for the new resilient floor coverings by firstly treating them with PRIMER G, a synthetic resin primer in water dispersion with a very low emission level of volatile organic compounds (VOC). The surfaces were then levelled off with ULTRAPLAN 010 smoothing compound, produced and distributed in Austria by Mapei GmbH.

Around 8,200 m² of rubber flooring was bonded in place with ULTRABOND ECO V4 SP, a multi-purpose, acrylic adhesive in water dispersion with a long open time and very low emission level of VOC. 3600 m² of conductive floors by Nora were installed with ULTRABOND ECO V4 SP CONDUCTIVE. Around 4,300 m² of linoleum flooring, on the other hand, was bonded with ULTRABOND ECO 540 synthetic polymer adhesive in water dispersion with very low emission level of VOC. Lastly, around 15,000 m of resilient skirtings were bonded in place with MAPECONTACT reinforced adhesive strip.

These products, together with Mapei Technical Services' assistance, were used to the complete satisfaction of all the key players in this project, starting from representatives for the floor contractor, who said: "In Mapei we have found a highly reliable partner when it comes to floor installation. And together we have demonstrated how it is possible to approach the challenges of a large, complex site".

TECHNICAL DATA

Period of Construction: 2013-2014 Design: Moser Architekten ZTG/ Maurer & Partner ZT Client: Vamed Krankenhausanstalt Period of the Mapei Intervention: 2013-2014

Intervention by Mapei: supplying products for treating substrates and installing rubber and linoleum floor coverings and skirtings

Floor Contractor: Firma Vogl Mapei Co-ordinator: Paul Solczykiewicz, Mapei GmbH (Austria)

MAPEI PRODUCTS

Preparing the substrates: Primer G, Ultraplan 010* Installing rubber and linoleum floorings and skirtings: Mapecontact, Ultrabond ECO V4 SP, Ultrabond Eco 540, Ultrabond Eco V4 SP Conductive

* This product is manufactured and distributed in the Austrian market by Mapei GmbH (Austria)

VILA FRANCA DE XIRA HOSPITAL PORTUGAL

Operational since 2013, the new hospital in Vila Franca de Xira looks after the health needs of around 245,000 patients from the city and surrounding towns and villages. This modern building, with well organised wards and cutting-edge equipment, allows doctors and nurses to provide patients with high quality services. The complex covers an area of around 10,000 m², with hospital buildings accounting for 63,000 m² and providing 280 beds, 33 surgeries and 844 parking spaces.

Mapei also played an important part in the construction of the hospital by supplying MAPELASTIC and MAPEGUM WPS membranes to waterproof the cementitious and plasterboard substrates in the toilets.

Around 2,000 m² of porcelain floor tiles were bonded with ADESILEX P9 and joints were grouted with KERACOLOR FF.

Ceramic wall tiles were bonded to the cementitious substrates in the kitchens and bathrooms with MAPESET adhesive, only manufactured and distributed on the Portuguese market by Lusomapei, and on the plasterboard walls with ADE-SILEX P25, while porcelain floor tiles were installed with the adhesive KERASET. In the corridors and entrance areas, on the other hand, ELASTORAPID was used to bond large slabs of natural stone and marble. KERACOLOR FF mortar was then used to grout all the joints.

In the patient rooms and corridors in the wards, vinyl flooring was bonded with ULTRABOND ECO 375 after treating the substrates with PRIMER G and levelling them off with ULTRAPLAN ECO.

In the operating theatres, on the other hand, the vinyl flooring was bonded with ULTRABOND ECO V4 SP CONDUCTIVE.

TECHNICAL DATA

Period of Construction: 2011-2013 Design: BM Arquitectos Client: Nhxira Period of the Mapei Intervention:

2012-2013

Intervention by Mapei: supplying products for treating and waterproofing substrates, for bonding ceramic tiles and stone slabs, for installing vinyl floors **Contractors:** Somague, Edifer, M.S.F. **Installation Contractors:** Fap, Diviminho S.A.

Works Direction: Rui Barbosa and Marcio Pedro

Mapei Distributors: Macorelli & Cunha Gomes S.A, Diviminho S.A. Mapei Co-ordination: Lusomapei Technical Services and Sales Department (Portugal)

MAPEI PRODUCTS

<u>Preparing substrates:</u> Primer G, Ultraplan Eco <u>Waterproofing substrates</u>: Mapegum

WPS, Mapelastic

Installing ceramic tiles and natural stone: Elastorapid, Adesilex P25, Mapeset*, Adesilex P9

<u>Grouting joints:</u> Keraset, Keracolor FF <u>Installing vinyl floors:</u> Ultrabond Eco 375, Ultrabond Eco V4 SP Conductive

* This product is manufactured and distributed in the Portuguese market by Lusomapei

SIMCOE MUSKOKA REGIONAL CANCER CENTRE ONTARIO, CANADA

The Simcoe Muskoka Regional Cancer Centre in Barrie (Canada) is part of Royal Victoria Regional Health Centre's (RVRHC) expansion plan for patient treatment in central Ontario. The company in charge of installing the floorings in the new cancer center faced the challenge of moisture in concrete slabs. PLANISEAL EMB moisture barrier system was used for concrete slabs that exhibited high moisture vapor emission, after treating the substrates with PRIMER WE. PLANISEAL EASY acrylic polymer was applied on some above-grade areas where there was still some moisture, even though it was lower.

PLANIPATCH and PLANIPATCH PLUS were first applied over the surfaces to patch smaller voids in the floors, while MAPECEM PREMIX was used to re-fill troughs that were dug out for wiring or plumbing fixtures. ULTRAPLAN 1 PLUS flowable self-leveling underlayment was then applied to level the substrates.

Over 23,000 m² of linoleum floorings were installed using ULTRABOND ECO 390 adhesive in patient areas. In the diagnostic imaging rooms, the crews installed static dissipative vinyl flooring with ULTRABOND ECO 360.

In visitor areas and waiting rooms, limestone slabs were installed on the stairs and on the floors of some of the waiting rooms with the KERABOND+KERALASTIC system. The installers used ULTRAFLEX 2 for bonding ceramic tiles on the floors and walls in lobbies, entranceways, some bathrooms and nurses' stations, as well as in patient bathrooms and public restrooms. All the joints of the ceramic and stone floors were grouted with KERACOLOR S, while the joints on the walls were grouted with KERACOLOR U.

All the mentioned products are only manufactured and distributed in the Canadian market by Mapei Inc., except for PLANIPATCH and KERABOND, which are also available on the international market.

TECHNICAL DATA

Design: Perkins + Will, Parkin Architects Ltd.

Period of Construction: 2011 **Period of the Mapei Intervention:** February-December 2011

Intervention by Mapei: supplying products for moisture mitigation, self-leveling and surface preparation of substrates; installation of linoleum and static dissipative vinyl floorings; installation of ceramic tile and stone slabs

Client: Royal Victoria Regional Health Centre

Project Manager: Frank Belluz Main Contractor: Carillion Canada Flooring Contractor: The Belluz Group Ltd.

Mapei Distributor: Durox Floor Accessories

Mapei Co-ordinator: Jeff McCoppen, Mapei Inc. (Canada)

MAPEI PRODUCTS

<u>Moisture mitigation</u>: Primer WE*, Planiseal EMB*, Primer L*, Planiseal Easy*

Concrete repair and leveling substrates: Planipatch, Planipatch Plus*, Mapecem Premix*, Ultraplan 1 Plus* Installing resilient floorings: Ultrabond Eco 390* (for linoleum), Ultrabond Eco 360* (for static dissipative vinyl floors) Installing ceramic tiles and stone slabs: Kerabond+Keralastic*, Ultraflex 2*, Keracolor S*, Keracolor U*

* These products are manufactured and distributed in the Canadian market by Mapei Inc.

TOR VERGATA GENERAL HOSPITAL ROME (ITALY)

The "Tor Vergata" university campus was established in 1972 and includes the Faculty of Medicine of the Tor Vergata University of Rome annexed to the General Hospital. Construction work on the hospital began in 1997. Because work is still ongoing, the various choices made need to be verified on a regular basis to bring them in line with current financial constraints and the evolution of the healthcare programmes and needs of the patients. The hospital complex extends over an area of around 140,000 m² and comprises a central four-storey body, two eleven-storey tower blocks for patients and a further tower block for various assistance units. A few departments are close to being completed, one of which is the Psychiatry Unit.

The client and the designers have given a lot of thought to the wellbeing of the patients and medical staff, but also to the products applied inside the structure. For this reason they contacted Mapei Technical Services, who recommended a range of specific and eco-sustainable products to install the new PVC floorings. Apart from the psychiatry unit (with 5,000 m² of flooring installed), the intervention also involved a number of operating theatres that are now operational (3.000 m²). Before installing the floorings, the substrates were smoothed over with NIVORAPID quick-drying, thixotropic, cementitious smoothing compound and with PLANIPATCH fine-grained, ultra quick-drying, thixotropic cementitious smoothing compound. To improve their compressive strength and resistance to abrasion, LIVIGUM admixture for cementitious mortars and smoothing compounds was added to both products. ULTRABOND ECO V4 SP acrylic adhesive in water dispersion with a long open time and very low emission level of volatile organic compounds (VOC) was recommended to bond the PVC floor coverings.

TECHNICAL DATA Period of Construction: 2015-2016 Period of the Mapei Intervention: 2015-2016

Intervention by Mapei: supplying products for preparing substrates and installing PVC floors Design: Tor Vergata General Hospital Technical Department Client: Tor Vergata General Hospital Works Direction: Vannutelli Installation Company: MV Resilienti Mapei Distributor: MV Resilienti Mapei Co-ordinators: Emanuele Marchegiani and Nunzio Paratore, Mapei SpA (Italy)

MAPEI PRODUCTS

<u>Preparing the substrates</u>: Livigum, Nivorapid, Planipatch <u>Installing pvc:</u> Ultrabond Eco V4 SP

Building hospitals

Safe products and solutions for installing resilient coverings on walls and floors in hospital facilities.

In those areas employed for medical use, high safety levels must be guaranteed for both patients and medical personnel alike. Mapei offers a wide range of **EMICODE EC-1** certified products for bonding every kind of resilient material.

Very low emission level of volatile organic compounds (VOC)

Safe for the environment, floor layers and final users

The Mapei Eco line products contribute to obtain the LEED certification for the building

Product Info

Mapei is with you: let's take a closer look together at **www.mapei.com**

PROJECTS INSTALLING RESILIENT FLOORINGS

HIGH-TECH ON THE OFFENSIVE

FROM MAPEI, CUTTING-EDGE SUSTAINABLE PRODUCTS FOR RESILIENT FLOORS INSTALLED IN THE BIOMEDICINE CENTRE AT THE LUDWIG-MAXIMILIANS UNIVERSITY IN MUNICH

The Biomedicine Centre (BMC) at the Ludwig-Maximilians University in Munich provides excellent conditions for research work and teaching of biomedicine in its 18,000 m² unit. In this structure more than 500 experts analyse the relationship between genes, the environment and illnesses. This recently constructed complex has a number of laboratories, training areas, a library, a cafeteria and a so-called "Audimax" area, designed specifically to encourage discussions between researchers, students and the general public. The teaching areas, on the other hand, are in the southern part of the Campus.

Because it is so close to the Chemistry, Pharmacy and Biology faculties of the University of Munich, the Max Planck Institute of Biochemistry and Neurology, the Biotechnology Centre and the Großhadern Clinic, the Biomedicine Centre finds itself within a network of scientific excellence.

The complex is compact but, at the same time, has an air of lightness and transparency. To remain in line with the rest of the Campus, the wall façade was covered with ceramic tiles with a green glaze.

A great deal of attention was paid to the selection of ecosustainable materials. There were various challenges to face up to when installing the flooring due to the sheer size of the complex, the high performance characteristics of the surfaces specified by the client, the wide variety of materials that were laid and the very tight schedule to install the floorings. These problems were overcome thanks to the use of various flexible, high-performance, eco-sustainable Mapei systems.

For the floors in the laboratories, the choice went to "Symbioz" homogenous vinyl flooring by Gerflor for its high resistance to abrasion and the type of finish on the surface, which makes it easy to clean and maintain. A shade of red was chosen for around 13,500 m² of floors in the laboratories.

In the corridors on the other hand, which have a particularly intense flow of traffic, and in the offices, around 5,900 m² of sand and orange coloured linoleum floors made by the company DLW were laid, which has good non-slip properties, resistance

PROJECTS INSTALLING RESILIENT FLOORINGS



LEFT. In the corridors of the new Biomedicine Centre, which are subjected to intense traffic, linoleum flooring was bonded with AQUACOL T synthetic polymer-based adhesive in water dispersion.

RIGHT. In the laboratories, ULTRABOND ECO V4 SP was used to install the vinyl flooring and ULTRABOND ECO 380 was used to bond the linoleum skirtings.

large surface areas in the Biomedicine Centre at the University of Munich.

To overcome the problem of uneven surfaces on some of the substrates the choice went to PLANIPATCH and NIVORAPID smoothing compounds, particularly suitable for internal use. Thanks to their quick drying properties, floor coverings could be applied very quickly.

SPECIAL ADHESIVES

Linoleum and homogeneous vinyl flooring were chosen for the floors in the new University of Munich Biomedicine Centre. For this reason, adhesives had to be used that allowed the flooring to be laid perfectly over large surface areas within a very narrow time frame. Mapei had the right solution for this case too. ULTRABOND ECO V4 SP was used to install the vinyl flooring, a multi-purpose, acrylic adhesive in water dispersion with a long open time and very low emission level of VOC, for laying rubber, PVC, vinyl, polyolephinic, linoleum and textile floorings. To bond the linoleum, on the other hand, the adhesive chosen was AQUACOL T, a solvent-free, ultra quick-setting synthetic polymer adhesive in water dispersion with very low emission level of VOC, ideal for bonding textile and linoleum floorings. This product proved to be particularly suitable for installing linoleum flooring in areas such as offices, where chairs with wheels are often used.

To bond the skirting in the laboratories ULTRABOND ECO 380 was used, an adhesive in water dispersion, with a strong initial bond and a long open time, for vinyl coverings.

In a number of secondary areas, such as the corridors and hallways, the linoleum cove bases were bonded with ADESI-LEX LP polychloroprenic double-buttering adhesive in solvent, ideal for installing profiles, cove bases and resilient floor and wall coverings where immediate setting is required.

The floor coverings, as well as the materials used to install them, made an important contribution to the sustainability of the new Biomedicine Centre. And Mapei products, which are perfect for use with various types of flooring, are a guarantee that surfaces have the maximum functionality and give an attractive finish to the floors inside this new centre dedicated to research, teaching and the spread of scientific knowledge within the Ludwig-Maximilians University of Munich.

to abrasion and high durability, thanks to its special surface finish that also makes it easy to clean.

SUBSTRATE PREPARATION: SUSTAINABILITY AT ALL COSTS

The floor coverings had to be high quality, safe to apply, highly efficient and sustainable. The use of Mapei products made installation a simple, flexible task, while fulfilling the requirements for eco-sustainability.

The substrates were prepared by applying a coat of PRIMER G synthetic resin primer in water dispersion with a very low emission level of volatile organic compounds (VOC). To consolidate the surfaces, make them dust-repellent and overcome the problem of residual humidity, they were treated with ECO PRIM PU 1K TURBO one-component, solvent-free, moisture curing, rapid-drying polyurethane primer with a very low emission level of VOC and PRIMER MF two-component, solvent-free epoxy primer.

To promote adhesion of the floor covering on these surfaces, the product used ECO PRIM T solvent-free acrylic primer with a very low emission level of VOC.

PERFECTLY SMOOTH

To smooth over the surface of the substrates, Mapei proposed ULTRAPLAN ECO, a self-levelling, ultra quick-hardening smoothing compound with a very low emission level of VOC. This product is ideal for levelling off surfaces and removing differences in thickness of between 1 and 10 mm on new and old substrates, making them ideal for installing all types of floor covering in rooms and areas where excellent resistance to heavy loads and traffic is required, including wheeled traffic. ULTRAPLAN ECO is a grey coloured powder made from special rapid-hydrating and rapid-setting cement, graded silica sand, resin and special additives according to a formulation developed in the Mapei R&D laboratories. It is used to make surfaces flat in order to make floor coverings easier to install. Flooring can then be installed just 12 hours after applying ULTRAPLAN ECO, regardless of the thickness. This characteristic was highly appreciated when bonding floor covering over

This article has been taken from *Realtà Mapei Deutschland* no. 16, the in-house magazine of Mapei GmbH, whom we kindly thank.



TECHNICAL DATA

Biomedizinisches Zentrum (BMC), Munich (Germany) Period of Construction: 2012-2014

Design: K9 Architekten, Borgards.Lösch.Piribauer, Freiburg (Germany)

Period of the Mapei Intervention: 2012-2014 **Intervention by Mapei:** preparing substrates and installing vinyl and linoleum floorings

Works Direction: Ernst² Architekten GbR, Munich Client: Freistaat Bayern Staatsministerium für Wissenschaft, Forschung; Staatliche Bauamt München 2 Flooring Contractor: Harry Brost Raumausstatter, Herr Egert

Laid Materials: vinyl and linoleum floors Mapei Co-ordinators: Lothar Jacob, Harald Bott, Stefan Eimer and Günther Hermann, Mapei GmbH (Germany)

MAPEI PRODUCTS

Preparing the substrates: Primer G, Topcem Pronto, Planipatch, Nivorapid, Ultraplan Eco, Ultraplan Eco 380, Eco Prim PU 1K Turbo Installing vinyl floors: Ultrabond Eco V4 SP, Ultrabond Eco 380 Installing linoleum floors: Aquacol T Installing linoleum covings: Adesilex LP

For further information on Mapei products see <u>www.mapei.</u> <u>com</u> and <u>www.mapei.de</u>



IN THE SPOTLIGHT ULTRABOND ECO V4 SP

It is a solvent free, synthetic polymer-based adhesive in water dispersion.

Due to its formulation and extended open time, it can be used as wet-bed adhesive for all kind of floorings on absorbent substrates, as well as transitional pressuresensitive adhesive for bonding dimensionally stable floor coverings on non-absorbent substrates.

It features good initial tack,

excellent wetting, very high peel strength, and good dimensional stability. It is solvent free and **EMICODE EC1 Plus** (very low emission) and **Blauer Engel** certified.

It can contribute up to **4 points** to obtain the **LEED** certifications.



INTERING TO KEEP ON GROWING AND IMPROVING

NEVER STOP LEARNING IF YOU WANT TO "BUILD" RESULTS

When referring to training in a corporate setting, it is worth bearing in mind that, as well as the deployment of human and financial resources, a certain degree of organisation is required and sometimes the results are not immediately obvious in the short-term.

That has never been the case for Mapei, since the Company considers training to be one of the driving forces behind its worldwide growth.

Indeed, in the current economic climate, it is the ability to manage and make the most of human resources that really makes the significant difference when it comes to gaining an upper hand. That is because corporate resources are not just confined to the technology that has been developed but also (and above all) come from the know-how people have and their ability to keep on learning.

All this is not just talk or theorising, if we consider that a Company needs to be

organised in order to take on new competitive challenges and input coming from the market that must be responded to with dynamism in an efficient and concrete way.

EOMBARDIA

People are not just a tool but also assets that can be regenerated or, at least, potentially regenerated in rapidly changing contexts. That is why training has such an important role to play for Mapei, which promotes training courses and courses for perfecting application methods for all its products, all over the world.

>> OVER 160,000 PROFESSIONALS FROM ALL OVER THE WORLD TOOK PART IN COURSES ORGANISED BY MAPEI IN 2015



LATINA (ITALY)

Technical training also plays a decisive role, because Mapei products and systems can only perform to the very highest standards if they are used correctly. Investments are constantly being made in training and, in Italy alone, since April 2015 11 schools teaching how to install ceramics and waterproofing systems have been set up at the Company premises in Sassuolo (Central Italy), Latina (Central Italy) and Marcianise (Southern Italy).

Resources invested in training in Italy alone will exceed 1,200,000 Euros in 2016, while over 40,000 people will receive special training and over 600 training events are planned to be held just in Italy. On a global level, in 2015 Mapei organised over 6700 training events for more than 161.000 partecipants.

With a view to providing a deeper understanding of the Mapei products and the cutting-edge technology that makes them stand out from other similar solutions available on the market, the Company aims to set up even more installation schools all over Italy and abroad.

After the necessary theoretical part, training days usually involve an initial demonstration carried out by technicians before the audience get directly involved in actually implementing what they have learnt. Courses are given by Mapei Technical Services staff or Mapei Project Managers and include practical demonstrations, information material and audio-visual sys-

tems. Mapei also organises regular conventions for designers and building site managers working in conjunction with professional associations. All these events are held at the Company's training centres throughout Italy as well as at the Group's various subsidiaries in different countries, working in partnership with experts in this sector and specifically focusing on issues to the very fore in the building trade.

On-the-road training carried out by Mapei all over the world using specially equipped buses (the so-called "Motorhomes") and coaches also has a special role to play.

Let's not forget that Mapei is a member of leading Italian and international technical standards setting committees and has been actively involved in groups in charge of devising technical rules and regulations that have been issued regu-



SASSUOLO (ITALY)

>>MAPEI'S WORLDIWIDE TRAINING IN 2015:

OVER 6700 TRAINING EVENTS

OVER 161000 PARTICIPANTS

larly over the last few years. Like, for example, the UNI 11493 standard governing the installation of ceramic tiles published in Italy in 2003, which sets the quidelines for installers.

As an accredited training institute, Mapei arranges three different types of meetings awarding training credits to participants enrolled in professional sssociations: conventions, seminars and installation courses held at the Company's facilities and on clients' premises. Among all the various courses Mapei promotes as a technical partner, the Company also constantly supports Assoposa - the Italian national association of professional installers of ceramic tiles and stone materials - organising specialist training courses aimed at enhancing installers' expertise and professionalism.



DEERFIELD BEACH (USA)



DÜSSELDORF (GERMANY)



SAGSTUA (NORWAY)



ON THE ROAD TRAINING

SINGAPORE



LYON SAINT-VULBAS (FRANCE)

SWITZERLAND TEAMWORK

Anew mape subsection Anew mape subsection

opening of the new Mapei Suisse training centre, the Group's Suisse subsidiary, on 7th March in Sorens, in the Swiss region of Gruyère. They included leading politicians and local economic authorities, journalists, clients, business partners and members of the Group, such as Veronica Squinzi, Internationalisation and Global Development Director, and Jogi Müller, Mapei SpA's Export Manager for Switzerland, Francesco Stronati, Director of Mapei SpA's Technical Services, and Flavio Terrzzi, Mapei SpA's Export Department Director.

The Lord Mayor of Sorens and the Head of Development for the Gruyère district, who both attended the official opening, emphasised Mapei's importance to the local economy. Veronica Squinzi and Martin Schneider, General Manager of Mapei Suisse, pointed out that training operations are essential not just for informing people about the benefits and correct use of Mapei products, but also to strengthen business relations with clients and reinforce their trust in the Company. The training centre's official opening ceremony was followed by a guided tour of the manufacturing areas in the Mapei plant in Sorens.

HIGH QUALITY TRAINING

Building work on the new facility that Mapei Suisse has devoted to training began in October 2015. "Le Gibloux" room, allocated for more theoretical sessions, is located on the first floor and has been completely renovated. It is now equipped with a projector and screen and can accommodate up to 40 people. The room is served by an informal space or sort of "foyer", where guests can talk and exchange views while sipping a tions of products and systems is, on the other hand, located on the ground floor. It is called "La Berra" and has seating room for 50 people, as well as modern technical equipment that even allows live broadcasts of demonstrations carried out in the R&D laboratory devoted to concrete located in the same building. Since training is one of the main aims of the Company's business operations, Mapei Suisse has alreday planned almost 100 training sessions in 2016, including the ones in the new centre and those held at the clients' premises, as well as those devoted to employees and about 3-4 events focusing on each of the 15 Mapei product lines.

NOT JUST POLYMERS

Mapei has been operating in Switzerland since the 1960s, when it began supply-



ing cutting-edge technology and products to Swiss customers through exclusive agents. In 1994 Mapei AG was set up in Rotkreuz (in central Switzerland) followed by a business office in Bussigny (in western Switzerland). But the real turnaround in Mapei operations in Switzerland took place in 1999: that was when the manufacturing plant in Sorens was purchased in the Canton of Fribourg to the north of Lake Geneva and about 40 km from Berne. This acquisition was also a key strategic step in the Group's verticalisation process, allowing a speeding up of the self-manufacture of strategic raw materials. The plant was actually devoted to manufacturing redispersible powders for supplying some of the Group's production facilities in various European countries. Thanks to this acquisition and intensive research work in the Mapei R&D laboratories, the Company became the world's only manufacturer of cementitious adhesives created by incorporating re-dispersible powders.

In 1999 Mapei AG became Mapei Polymeres Suisse, which was turned into Mapei Suisse SA in 2000. Over subsequent years notable investments made by the Group enabled the plant in Sorens to boost its manufacturing output and adapt its systems to the highest international standards in terms of safety and safeguarde of the environment. The unit is now capable of manufacturing

training centre in Sorens.

PHOTO 3. The training centre's main hall has 50 seats and a modern technical equipment. PHOTO 4. The room for hosting theoretical sessions

PHOTO 5. The official opening of the new Mapei Suisse training centre was attended by leading politicians and local economic as Veronica Squinzi, Internationalisation and Global Development Director, and Francesco Stronati, Mapei SpA's Technical Services Director

PHOTO 6. Martin Schneider, General Manager of Mapei Suisse, pointed out that training is one of the main aims of the Company's business operations PHOTOS 7 and 8. The Mapei Suisse manufacturing plant in Sorens, which the Group purchased in 1999.







over 5000 tons-a-year of admixtures for concrete, as well as polymer powders sent off to Mapei plants in Italy, Germany, Great Britain, Austria, Bulgaria, Spain, France, Greece, Hungary, Norway, Poland, Portugal and Russia.



Mapei Suisse, based in Sorens, now has 90 staff, a distribution network for all of the Group's 15 product ranges in Switzerland, a well-established reputation for quality and reliability, and regular involvement in prestigious Swiss projects, such as those that led to the construction or renovation of structures such as the Poya bridge in Fribourg, the Milchbuck tunnel in Zurich, the Linth-Limmern power plant, the Arosa-Lenzerheide cable-car, the Olten and Wintherthur hospitals, the Gotthard Railway tunnel, the Dolder and Park Hyatt grand hotels in Zurich, the Philip Morris factory in Lausanne, the FIFA headquarters in Zurich, the Geneva Stadium and the Banque Cantonale Vaudoise headquarters.

GOTTHARD RAILWAY BASE TUNNEL

TUNNEL HAS BEEN INAUGURATED



FIGURES

NUMBER OF LENGTH OF THE TUNNEL NUMBER OF HOURS OF NON-STOP DEPTH WORKMEN USED TUNNELLING TRAINS PASSING WORK TO INSTALL FOR MORE THAN TEN MACHINE THROUGH THE THE CONCRETE YEARS OF WORK **TUNNEL EVERY PLATFORM** DAY 2,300 m 2,400 410 m 43,800

After 17 years of hard work, the Gotthard railway base tunnel was inaugurated on the 1st of June 2016. This 57 km-long twin tunnel – the longest in the world – will speed up rail services for goods and passengers travelling along the north-south axis of the Swiss Alps and will become an extremely important link for the entire European transport network.

The new stretch of high-speed railway line will enable trains to travel much more quickly: for example, it will now be possible to travel to Zurich from Milan in just 2 hours 40 minutes.

The tunnel will also considerably increase the competitiveness of goods and passenger services and encourage the transfer of traffic from the roads to the rails and help protect the Alpine region. The general public has shown a great deal of interest in this project: 160,000 people took part in a competition offering 500 tickets for the inaugural journey.

A BRIEF HISTORY OF THE TUNNEL

The first project for a double-use tunnel in this area was drafted as far back as 1947 by the Swiss engineer Carl Eduard Gruner. After various preliminary decisions had been taken by the Swiss Federal Council and two referendums had been held (in 1992 and 1998), work started on the construction of the tunnels in Amsteg (Central Switerland) on the 4^{th} of November 1999.

In 2006, just four years after starting work in the town of Bodio (Southern Switzerland), the tunnelling machine had already reached the intermediate station in Faido (Southern Switzerland).

The base tunnel was completed in October 2010 and four years later – in October 2014 – diesel trains started to use the tunnel. By the beggining of June, all the installations and safety systems have finally been tested and approved thanks to more than 5,000 individual tests.

The amount of work carried out on the Gotthard base tunnel was impressive: 2,400 workmen worked for more than 10 years, digging into the mountain and excavating 28.2 million tonnes of rock, most of which was recycled as aggregates for concrete and to create embankments.

This is not only the longest railway tunnel in the world, it is also the deepest: in fact, in certain points, there are more than 2,000 m of solid rock between the tunnel and the surface of the mountain. 325 trains currently pass through the tunnel on a daily basis (260 goods trains and 65 passenger trains), reach-



IN THESE PICTURES. 325 trains currently pass through the tunnel on a daily basis, reaching a top speed of between 160 km/h and 200 km/h, while in the future they will be able to reach a speed of 250 km/h.





PROJECTS ADMIXTURES FOR CONCRETE





ing a top speed of between 160 km/h and 200 km/h, while in the future they will be able to reach a speed of 250 km/h.

MAPEI'S INTERVENTION

Inside the tunnel, the tracks are anchored to the platform inside single blocks of concrete, with each block separated from the other blocks by concrete which was cast through rubber foundation slabs designed specifically for this use.

Mapei supplied mortars and admixtures for the concrete used to make the sleepers for the track. The products used included DYNAMON EASY 11 modified acrylic-based superplasticiser used for ready-mixed concrete, MAPETARD D retardant for concrete and mortar, STABILCEM T one-component pre-blended thixotropic mortar with controlled shrinkage for anchoring, by injection, anchor rods and bolts, MAPE-GROUT COSMETIC fine-textured, rapid-setting mortar, and MAPEGROUT STANDFEST rapid-setting, fibre-reinforced, compensated-shrinkage, thixotropic mortar.

MAPETARD D, MAPEGROUT COSMETIC and MAPEGROUT STANDFEST are only manufactured and distributed on the Swiss market by Mapei Suisse.



TECHNICAL DATA Gotthard Railway Base Tunnel, Switzerland Period of Construction: 1999-2016 Intervention by Mapei: supplying admixtures for concrete and mortars to make the sleepers for the tracks Client: AlpTransit Gotthard AG Main Contractor: ARGE Fahrbahn Transtec Gotthard Mapei Co-ordination: Mapei UTT Switzerland

MAPEI PRODUCTS

Dynamon Easy 11, Mapetard D*, Stabilcem T, Mapegrout Cosmetic*, Mapegrout Standfest*

* These products are only manufactured and distributed on the Swiss market by Mapei Suisse.

For further information on Mapei products see <u>www.mapei.ch</u> and <u>www.mapei.com</u>

IN THE SPOTLIGHT DYNAMON EASY 11

It is an acrylic-based admixture for ready-mixed concrete. Thanks to its high workability properties, concrete which is blended using DYNAMON EASY 11 is easy to lay when fresh, and has high performance characteristics when set. It is particularly suitable whenever the amount of water needs to be considerably reduced. DYNAMON EASY 11 guarantees excellent workability of the concrete in various consistency classes, without slowing down the development of its mechanical strength. The use of DYNAMON EASY 11 is particularly advantageous when concrete has to be poured in cold temperature, or whenever the concrete needs to be transported over long distances during cold weather.

THE STRATEGIC IMPORTANCE OF ALPINE PASSES

NEW, RAPID INFRASTRUCTURES TO MODERNISE EUROPE

Italy has an historic strategic role in commerce and trade due to its geographic position at the heart of the Mediterranean area. The economic development of the country is connected to its ability to handle the large flow of traffic from the Mediterranean area towards the rest of Europe.

Constructing and expanding adequate infrastructures could allow Italy to play a key role in the future of the European continent's economy. In this sense, the system of Alpine passes is of primary importance and allows Italy to remain connected to the rest of Europe, and vice versa, and is fundamental for transporting people and for handling goods traffic.

The current infrastructures run along the Alpine chain from southern France right up to south-eastern Austria and the range of goods that cross the Alps involve all types of transport running along a geographic line located just beyond the main Alpine peaks. This line is defined by three main regions:

• Alpine Region C running from Ventimiglia (Italy) to Wechsel (Austria), the most eastern Alpine thoroughfare;

• Alpine Region B follows the main ridge of the Alps from Ventimiglia to the Brenner Pass between Italy and Austria, then runs south to the Tarvisio pass (Italy);

• Alpine Region A encompasses parts of Region B and Region C and mainly includes the crossing for the Swiss Alps and extends from the Fréjus Rail Tunnel to the Brenner Pass.

It happens quite often that these important works are either slowed down or remain only on paper. For instance, the historic Tenda tunnel connects the Province of Cuneo in Northern Italy, the French coast and the Liguria coast in Northern Italy. The project to double the road tunnel was due to a pressing need to improve road safety inside the existing tunnel, inaugurated way back in 1882. The Italian highways authority, ANAS, handed over the area in 2013 and excavation work for the new tunnel started in 2015: the finished work is scheduled to be handed over in 2020, but just a few months after starting excavation work, figures released by ANAS show that work is already seriously delayed because of the technical problems encountered. There is now a very high risk that work will be delayed even more and, as a result, the cost of the project will also increase. And this represents a typical example of how the actual progress of construction work on infrastructures does not move forward at the same pace as the rapid and global transformation of the modern need to move from one place to another. And on top of that, in this specific case, there is considerable damage to numerous companies in the Province of Cuneo, which have economic ties with France and that, because of the extended closure of the international pass, run the risk of losing business opportunities.

In the Italy of the third millennium one could do so much more, also because ideas and cutting-edge technology applied all around the world by a number of companies, such as Mapei, are waiting to step in and help with the progress and development of the country.





Fréjus Tunnel

The new road tunnel that separates Italy and France was inaugurated in 2014. The second carriageway is scheduled to come into service in 2019.



Maddalena Pass Tunnel

It connects Italy to the industrial zone of Marseille (France). It is only open intermittently because of its high altitude and its exposure to the risk of avalanches.



New Colle di Tenda Tunnel

Excavation work on the new tunnel started in June 2015 but is progressing extremely slowly. At this rate, the tunnel will only be completed in 2027.



INDUSTRIAL WORKS IN ZOLA PREDOSA

NEW INSULATION AND WATERPROOFING USING MAPEPLAN SYNTHETIC MEMBRANE IN A MANUFACTURING FACILITY IN CENTRAL ITALY

Repair works on the roof of an industrial facility in Zola Predosa (Central Italy) were particularly complex. Although the condition of the roof was critical before the work began, the solution adopted, MAPEPLAN T M synthetic waterproofing membrane, proved to be highly effective and functional, allowing the roof to be repaired in complete safety.

The roof needed to be repaired because of two main problems:

• during the winter, when the outside temperature drops to below 0 °C, condensation would form on the ceiling in the production areas and water would drip into the areas below;

• when there was long, heavy rainfall or heavy snow, water would leak into the building around the guttering inside the building.

The client and designer decided that the repair work should eliminate the condensation and water seepage in order to guarantee that production could continue uninterrupted and in complete safety, as well as to reduce the amount of electrical energy and gas required to keep the facility warm in winter and cool in summer.

The specific aim of the work was to completely eliminate the formation of condensation in the following conditions: • external temperature +28 °C with 65% R.H.

 \bullet external temperature -10 °C with 95% R.H.

The shape of the roof itself presented another problem because the structure is in precast reinforced concrete members and is made up of a series of covering elements for roof with special wing-shape, connectors between the beams and a saw-tooth pitched sheds.

The old insulation and waterproofing systems were inadequate for the local weather conditions. Apart from the insulation being too light for these conditions, the situation was made worse by the numerous construction joints in the system that formed thermal bridges.

OVERCOMING THE PROBLEMS WITH THE MAPEPLAN T M SYS-TEM

A preliminary, in-depth survey was carried out with the waterproofing contractor to assess the condition of the roof, and a series of samples were taken from various parts of the roof to identify the origin of the problems so as to eliminate them once and for all.

The survey showed that the condensation was caused by the following reasons:

• insufficient thermal insulation;

• the lack of an efficient vapour barrier layer;

• thermal bridges at the interface between the covering elements and the beam connectors.

When the manufacturing facility was built in 2008, this type of structure was widely used for industrial buildings and warehouses in Italy without caring too much about the heating system or comfortable working conditions. The thickness of the insulating material was minimal and a proper vapour barrier was not included in the system.

The mineral bituminous waterproofing membrane was left in place on the covering elements so that it could act as a vapour barrier for the new roofing. New 130 mm thick EPS 150 kPa insulating panels were anchored to the substrate with mechanical fastening.

Over the insulating panels, MAPEPLAN T M FPO (flexible polyolefin) waterproofing membrane was then applied and left exposed, which was also anchored to the substrate using a mechanical fastening system.

The old wooden elements and mineral fibre insulation on the covering beam connectors and fibre-cement saw-tooth pitched roofs were removed and disposed of at an authorised waste disposal site, in line with the current legislation. A new POLYVAP RADONSHIELD bituminous membrane reinforced with aluminium strip was then applied, which acted as a vapour barrier and temporary waterproofing layer while the old system was removed. All work was carried out with the utmost care to make sure there was a water-tight seal between the new waterproofing and the old bitumen membrane and a constant air-tight and vapour-tight seal at the interfaces between the beams, connectors and saw-



APPLICATION OF POLYVAP RADONSHIELD VAPOUR BARRIER

APPLICATION OF EPS INSULATING PANELS

tooth roof.

New 175 mm thick EPS 150 kPa insulating panels were installed over the connectors and saw-tooth roof. Double layers were applied in these areas; the first layer was used to fill the areas between the ribs for the beam connectors and saw-tooth roof, the second layer to form a continuous cover over the connectors and saw-tooth roof and to eliminate any thermal bridges at the beam/ connector/roof interfaces. Both layers of panels were anchored to the substrate with a mechanical fastening system. In this case, MAPEPLAN T M FPO waterproofing membrane was applied over the insulating panels.

MAPEPLAN T M waterproofing membrane applied over the beams and saw-tooth roof was overlapped and heat-welded to the MAPEPLAN T M membrane applied on the beams, thereby forming a perfectly water-tight waterproofing layer and transforming the roofing into a "continuous" solution. The size and pitch of the mechanical fastening used to anchor the new system were calculated according to the specified conditions acting on the roof and according to the guidelines in Eurocode 1-4 and current applicable standards, taking into account the calculated wind uplift and the application of an adequate safety factor.

EFFECTIVENESS OF THE INTER-VENTION

To sum up, the special characteristics and advantages of the solution adopted using MAPEPLAN T M were:

- continuous, functional vapour barrier (eliminates condensation)

- significant increase in thermal insulation capacity (eliminates condensation and reduces energy consumption);
- elimination of thermal bridges (eliminates condensation);

• "continuous" heat-welded waterproofing system (eliminates leaks and infiltrations);

- "cool roof" waterproofing system with a high "Solar Reflectance Index" (to reduce energy consumption in hot weather);
- highly functional, highly durable insulating/waterproofing system;

• rationalised application sequence and schedule that prevented the risk of accidental leaks and seepage during installation and allowed production activities to continue while work was carried out.



THE ROOF AFTER COMPLETION OF THE WORKS

Mauro Redemagni. Poyglass SpA (Italy)

TECHNICAL DATA

Industrial works, Zola Predosa (Bologna, Italy) Year of Construction: 2008

Year of Polyglass' (Mapei Group) Intervention: 2015

Intervention by Polyglass: supplying products to waterproof the roof Designer: Politecnica Ingegneria e Architettura Main Contractors: MS Isolamenti SpA, Sforazzini Srl

Polyglass Co-ordinator: Mauro Redemagni, Polyglass SpA (Italy)

POLYGLASS PRODUCTS

Idroprimer, Polyvap Radonshield, Mapeplan T M

For further information on Polyglass products see <u>www.polyglass.com</u>

OPERA DEL DUOMO MUSEUM IN FLORENCE

RECENTLY RENOVATED, THE MUSEUM HOSTS THE LARGEST COLLECTION OF FLORENTINE MONUMENTAL SCULPTURES IN THE WORLD

Situated on the north-eastern side of the square that is also home to the Santa Maria del Fiore Cathedral, also known as the Duomo of Florence, this Museum is a must for anyone visiting the capital city of Tuscany, Central Italy. On the 29th of October last year, after two years of restoration work, the doors of the Museum were opened once again. It houses the largest concentration of Florentine monumental sculpture in the world including medieval and Renaissance statues and reliefs in marble, bronze and silver by the leading artists of the era such as Donatello, Andrea Pisano, Antonio del Pollaiolo, Luca della Robbia and Andrea del Verrocchio. Visitors from all around the world also have the chance to admire the more

than 200 works of art that were recently restored and that are now on display to the public for the first time, such as the *Maddalena* by Donatello, the North Door to the Baptistery by Lorenzo Ghiberti and the silk and gold-leaf panels designed by Andrea del Pollaiolo. A place has also been found in the new areas of the Museum for works of art that had previously been conserved for years in the museum vaults and never put on display.

THE GENESIS OF A MUSEUM

In the beginning the Opera del Duomo foundation, which attracted administrators, artists and labourers involved in the construction of the Cathedral of Santa Maria del Fiore, was located in a building dating back to the end of the 13th century. In the 15th century the Opera del Duomo moved to its current location which now hosts and the Museum. Santa Maria del Fiore Cathedral was completed in 1436 but the Opera del Duomo remained and had the task of taking care of its upkeep and maintenance, as well as that of the Bell-tower by Giotto and the Baptistery of Saint John.

During the first decades of the nineteenth century, all over Europe, including Florence, the first steps were being taken to reorganise the artistic heritage so that it could be enjoyed by a larger section of the general public and, amongst the museums founded during the second half of the last century, there was also the Opera del Duomo Museum. And so in 1891, the three rooms that hosted the Opera behind the Duomo Cathedral were inaugurated. During the 20th century, the number of rooms increased from the original three to almost twenty, but the size of almost all the rooms proved to be insufficient and hardly suitable to house works of art that, in some cases, were of monumental proportions. The management of the Opera then decided to buy the



IN THE SPOTLIGHT ULTRALITE S1 QUICK

It is a is a cementitious (C), improved (2), rapid-setting (F), slip-resistant (T), deformable (S1) C2FTS1 class adhesive according to EN 12004 standard. It is ideal for bonding all types and sizes of ceramic tiles (doublefired, single-fired, porcelain, klinker, terracotta, etc.) on uneven substrates, without having to even out the surface before laying; bonding stone on internal and external substrate; bonding all types of mosaic on internal and external substrates; bonding thin porcelain tiles on floors and walls, including on external façades.



space occupied by the Teatro degli Intrepidi. The theatre, which had been so strongly desired by Gran Duke of Tuscany Pietro Leopoldo in 1779, had been transformed into a warehouse and then a garage.

Opened to the general public in 1891, the Opera del Duomo Museum started to expand and look for new spaces through extension work, rebuilding work and new exhibitions. The last and certainly most ambitious of these transformations commenced in 2010, when the existing spaces were more than doubled by integrating them with a large property that had belonged to the Opera for centuries, but assigned to other uses during the 18th century. Repair work on the original complex involved upgrading the exhibition areas for the monuments under the care of the Museum, such as the large marble and bronze furnishings from Santa Maria del Fiore, the Bell-tower and the Baptistery.

LARGE SPACES, MINIMALISTIC STYLE

The renovation of the Opera Del Duomo Museum was quite a challenge for the client, the Opera di Santa Maria del Fiore, which invested 45 million Euros to carry out the work, and they opted for a complex project starting with architectural work by the Natalini Architetti and Guicciardini & Magni design studios, who toyed with minimalistic solutions whereby, thanks to the light, the materials used and the neutral colours chosen for the walls and floors, it became possible to present the works in a way that exalted them even more. The project also included an important work to extend the exhibition areas - from 2.500 m² to almost 6.000 m² - and a complete restoration of the historic buildings that form the complex, made up of the original nucleus of the old 19th century museum, and the 18th century Teatro degli Intrepidi. Lastly, there was the project for the museum itself, by the art historian and Director of the museum Timothy Verdon, who wished to highlight how the artists had conceived and created these works of art based on their faith, and not solely for their aesthetic value. The client also required that the new museum should be delivered within just 24 months of starting work so that it could be inaugurated before the convention of the Church of Italy, that is held every ten years and in



TOP, LEFT. The entrance to the Opera del Duomo Museum near the Santa Maria del Fiore Cathedral in Florence. ABOVE. Large slabs of Bedonia

stone were chosen for the floors and staircases in the museum.



this case scheduled to take place in Florence, along with a visit to the city by the Pope.

Inside the complex various methods and techniques were adopted to carry out the intervention, depending on the actual spaces where the work was carried out. For the renovation and consolidation work on the structures, the spaces occupied by the garage were upgraded first. New galleries, landings, floors and some rooms below ground level were created. Apart from doubling the display area available, the museum now has 25 exhibition rooms designed to house the works of art distributed over three storeys, amongst which there is the new, spectacular "Sala dell'antica Facciata" room with a full-scale model in resin and marble dust of the antique façade of the Duomo designed by Arnolfo di Cambio, but which was never actually built. Below the model, the most important sculptures sit on bases so they may be studied more easily from close up. The designers have exalted the sensation of great emptiness provided by the space occupied by the Teatro degli Intrepidi and the roof of the room has been completely rebuilt to leave the metal framework structure intact, with skylights to provide illumination for the exhibition area from above. The design also carved out new spaces between the theatre and the other buildings, with a new floor to create more regularity within the volumes, enabling them to create a gallery which is invisible from the outside. Two new stairways have been added to the historic monumental stairway to make it easier to follow the obligatory escape routes leading out of the museum. The space that connects the existing

museum and the imposing theatre hall has been rebuilt with a new lay-out to create a large, linear gallery. A new level has been created above the former

TECHNICAL DATA

Opera del Duomo Museum, Florence (Italy) **Year of the Opening:** 1891 with constant extension work until 2010-2015

Period of the Intervention: 2014-2015

Client: Opera of Santa Maria del Fiore

Design: Natalini Architetti and the Guicciardini & Magni Architetti

Museum Design: Timothy Verdon

Intervention by Mapei: supplying products for bonding stone slabs on floors, on the monumental stairway and two new stairways

Works Direction: Adolfo Natalini; architectural works and displays: Piero Guicciardini and Marco Magni

Main Contractor: C.M.B Soci Coop. Cooperativa Muratori e

Braccianti di Carpi

Flooring Contractor: Edilposa Srl Mapei Distributor: Ribo Ceramiche Srl Mapei Co-ordinators: Davide Demicheli, Carlo Alberto Rossi, Massimo Lombardi and Roberto Aiazzi, Mapei SpA (Italy)

MAPEI PRODUCTS

Bonding stone slabs: Keraflex Maxi S1, Ultralite S1 Quick Grouting joints: Keracolor GG Sealing joints: Mapefoam, Mapesil LM

For further information on these products visit <u>www.mapei.it</u> and <u>www.mapei.com</u>

Bonifacio VIII room and the areas running alongside the room formerly used as a garage. As far as the rest of the museum is concerned, work was limited to modifications to some of the finishes and to the display systems.

SPEED AND PRECISION TO IN-STALL THE STONE MATERIALS

For the company that was awarded the contract to carry out the renovation work it was further proof of their ability and consolidated experience in the renovation sector and renovation of listed buildings. The final result was to present a harmonious blend of modifications to the existing construction, a far from simple operation for a structure located in such a delicate historical and urban context.

The works also required precision and skill, as well as speed to meet the dead-

line, without overlooking the quality of the work.

Bedonia natural stone (also known as Carniglia stone) from the Emilia region (Central Italy) was chosen to cover the floors. It has a uniform grey colour and is suitable for both internal and external use. In this case, the designers opted for large slabs of stone (80x120cm) between 2 and 3 cm thick to cover 2,000 m² of floors. The floor contractor proposed using Mapei products and, because of the delicacy of the operation, asked for the work to be supervised on site by Mapei Technical Services. After carrying out a series of site surveys. Mapei technicians recommended using ULTRALITE S1 QUICK one-component, high-performance, deformable, lightweight, rapid-setting and hydrating cementitious adhesive with no vertical slip, good trowelability, high wetting ca-





pacity and very high yield, for ceramic tiles, stone and porcelain tiles.

KERACOLOR GG pre-blended, highperformance polymer-modified cementitious mortar was then used to grout the joints. The expansion joints were sealed by inserting MAPEFOAM closed-cell, extruded foam polyethylene cord before applying MAPESIL LM neutral silicone mould-resistant sealant with BioBlock® technology for stone. To install the same size slabs of Bedonia stone on the stairways, including the monumental stairway, the preference for Mapei Technical Services was **KERAFLEX MAXI S1 high-performance** deformable cementitious adhesive with no vertical slip, extended open time and Low Dust technology for ceramic tiles, particularly recommended for laying large porcelain and natural stone tiles. The results achieved certainly lived up to the expectations of the designers, the client and the flooring contractor, which managed to hand over the finished work according to schedule.

PHOTOS 1 and 2. Various phases of bonding the slabs of stone with ULTRALITE S1 QUICK lightweight cementitious adhesive. PHOTO 3. The joints were grouted with KERACOLOR GG.

PHOTO 4. The last phase of the floor installation operation was to seal the expansion joints with MAPEFOAM cord and MAPESIL LM.

PHOTO 5. The staircases were also covered with Bedonia stone bonded with KERAFLEX MAXI S1 and grouted with KERACOLOR GG. **PHOTO 6.** This is how the Sala dell'Antica Facciata room looked once work had been completed, with a life-size model of the façade of the Duomo by Arnolfo di Cambio.



TEAMWORK

C-ADD & MAPER CEMENT ADDITIVES DIVISION

CEMENT ADDITIVES

THE C-ADD LINE OF CEMENT ADDITIVES USED IN THE MOST IMPORTANT CEMENT PLANTS OF THE WORLD IS EXPANDING ALONGSIDE THE LINE OF ADMIXTURES FOR CONCRETE (DYNAMON LINE)

THE LOGO HAS CHANGED! A drop of additive that improves the grinding of cement manufacturing. This is the new symbol of the C-ADD line



Mapei is considered to be one of the leading suppliers of the cement industry worldwide. Backed by huge problemsolving experience and knowledge of the cement manufacturing processes and related problems, Mapei has been able to grow over the past decade in order to become a highly appreciated technical solution provider.

ECO-SUSTAINABILITY

Mapei liquid cement additives form a system of innovative solutions for cement works; they allow a reduction of clinker while offering the same mechanical performance of cement, thus guaranteeing a reduction of 5-10% in CO₂ emissions and a saving in non-renewable raw materials.

THE CEMENT ADDITIVES DIVISION (C-ADD)

Founded in 2000, Mapei C-ADD (Cement Additives Divisions) has grown every year in terms of turnover and volume, thanks to innovative and highquality products combined with technical support and dedicated Research and Development. Today, supported by the Group's structure and expertise, C-ADD is supplying all major cement groups worldwide, offering new technologies and local technical assistance. By combining high quality raw materials, fully computer-based production facilities and specific expertise in terms of product chemistry, industrial employment and grinding plant technology, C-ADD is able to guarantee high levels of customer assistance and product quality.

R&D

By investing over 5% of its turnover and 12% of its Human Resources in Research and Development, the Mapei Group has become market leader in terms of innovation. The dedicated C-ADD experts at Mapei's Research Centres not only develop new raw materials and grinding aids, but are also active in customer support. In fact, Mapei's state of the art laboratories allow C-ADD to perform specific and in-depth clinker and cement analysis in order to optimise the use of cement additives and to offer customized solutions for cement performance enhancement and production improvement.

TAG (TECHNICAL ASSISTANCE GROUP)

A team of experienced process engineers from the cement industry joined C-ADD in order to provide specific technical assistance to C-ADD customers. By performing complete plant audits and by analyzing the grinding circuit's performance, they are able to assist customers with the implementation of cement additives and to optimise the grinding process in all its aspects.

DUST ISSUES IN CEMENT MANU-FACTURING

Dust is becoming an ever bigger topic in the cement industry; it causes many different problems in areas such as:

• Relationship with the surrounding community: dust formation and pollution of the cement unit surroundings is often a subject of discussion and a risk for the wellbeing of the people living near the cement plant.

• Internal Health & Safety discussions: dust is an important H&S subject in cement units. Even though a lot has been done to reduce dust formation, emission and dispersion, a cement unit is rarely completely dust free. This creates possible long-term H&S risks for the people working in the plant. Problems may occur if people inhale dust particles, when particles are blown into people's eyes or, for example, when dust creates slippery surfaces.

• Maintenance issues: dust particles may cause problems to vehicles and



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TEAMWORK

OUR PRODUCTS

PRODUCT GROUP	DESCRIPTION
MA.G.A./C	Highly concentrated, high performance grinding aids, suitable for grinding all cements.
MA.G.A./M	Highly concentrated, high performance grinding aids, particularly suitable for grinding minerals.
MA.P.E./S	Grinding aids, strength improvers, specifically formulated for grinding blended cements (pozzolanic, blast-furnace slag and fly-ash cements).
MA.P.E./W	Grinding aids, strengths and workability (flow) improvers, specifically formulated for grinding blended cements (pozzolanic, blast-furnace slag and fly- ash cements).
MA.P.E./A	Additives formulated for grinding masonry cements
MA.P.E./Cr	Specific additives for Cr(VI) reduction.





machinery, thus reducing their performance and life-time and increasing their operational costs.

Dust-related problems may be caused by many different factors such as:

• Windblown particles coming from areas of the cement plant where dust deposits have formed.

• Dust leaking during the cement grinding operation: dust formation in the milling area;

• Dust emission during the transport of (fine) materials: dust coming from conveyor belts, trucks or other material transport systems, thus polluting surfaces like roads and floors.

Because the cement industry inevitably has to deal with dust-related problems (the final product in the end is a fine powder), the management of dust issues is becoming more and more important. Even though the cement industry invests a lot in the best available dust-reducing technology, it is impossible to avoid dust at 100%.

Dust problems can be divided in two groups: surface dust deposits (such as roads, buildings, machinery, stockpiles) and continuous dust puff generation (for example when material falls from a hopper onto a belt conveyor). The best available technology for the above described problems is to create a "film" or "coating" on top of the material in case of dust deposits, or make sure dust puff particles are not blown into the air by making them heavier, agglomerate the particles and therewith "immobilize" them. The solutions provided by Mapei use polymers which, once sprayed, dry and/or utilized, provide either a rigid film, suitable for flat surfaces and stock piles; an elastic film, suitable for stock piles and coarse materials; a non filming consolidation agent for surface dust deposits; or else capturing, allow the incorporation of small particles among water drops in case of dust puffs.











54 RM International 58/2016

C-ADD INTERNATIONAL MEETING 2016

A TEAM OF TECHNICAL PARTNERS SERVING THE GLOBAL CEMENT INDUSTRY

From 20th to 22th March 2016, the annual conference of the Mapei Cement Additives Division led by Davide Padovani, the C-ADD Meeting, took place at the Mapei SpA Auditorium in Milan. Like every year, the event brought together the entire team of our Division, made up of 35 colleagues from 20 countries and operating in over 70 countries worldwide. This year, the team spirit has been one of the highlights of the C-ADD Meeting: in fact, the event opened on Sunday 30th March with a visit to the Mapei Stadium to watch the Sassuolo-Udinese football match. The entire C-ADD team was proud to wear the Sassuolo shirts, and our team was cheered in sixteen languages! The C-ADD team is constantly growing, and the green-and-black football players transmitted to the Division the right adrenaline to face the numerous new challenges that the 2016 has in store for them. The programme went on with two days of intensive work on commercial, technical and safety issues, with speeches by representatives of the Mapei Group's Marketing and Human Resources departments and by each member of the C-ADD team. The Marketing Department presented in detail the new image of the Division, illustrating the new logo, the Technical Data Sheets, the Packaging and the new website. The speech by the Human Resources focused on the Mapei Code of Ethics and the new C-ADD organization chart. Regarding safety, Davide Padovani showed the updated version

of some important documents: the Document of Risk Assessment, the Security Manual of Industrial Tests and Outdoor Activities and Security Operating Procedures for Laboratory Activities. The speeches by the Area Managers were focused on comparing specific technical issues experienced in cement plants located in different areas of the world, as well as on market trends in each area. The most important part of this C-ADD Meeting edition was the presentation of the innovations in Research & Development.

The R&D C-ADD team has shown its work based on the main goal to become a long term technical partner for the cement industry. The main present and future targets have been summarized in the following points:

 Process optimization: energy savings in clinker and cement production, introduction of alternative fuels, reducing the environmental impact;

• Reduction of CO₂ emissions thanks to the production of low clinker cements and a consequent increased use of additive materials (limestone, slag, fly ash, etc.) and the development of alternative hydraulic binders (aluminous or sulfo-aluminous cements, geopolymers, etc.);

• Improved understanding of the cement hydration mechanism.

During the meeting it was underlined that the C-ADD R&D team provides an important



support for the innovation and optimization processes, as well as for a better understanding of current technologies, offering a high level of specialization. This has been possible thanks to the development of partnership projects with different subjects, belonging to both the industrial and the academic field, aimed at the development of new technologies. The last part of the conference focused on some R&D projects currently on going, following these guidelines:

• Development of cement additives designed for blended cements: additives that can improve the performance drop occurring when the clinker content in the cement composition is reduced. In particular, we are actively working on products for limestone and fly ash cements.

• Carbonation control in concrete: in collaboration with Norcem (Heidelberg Cement Group), we are evaluating chemical and chemicalphysical parameters influencing the resistance to carbonation of some types of low CO₂ emission cements, with the aim to develop targeted cement additives.

 Development of new products for eliminating hexavalent chromium from cement. For several years, according to a specific European Union directive, cements produced or imported into Europe must contain a low concentration of soluble hexavalent chrome. Mapei is highly specialized in this field, as demonstrated by some newly granted patents as well as by a number of scientific publications. During the event, the new Mapei products for hexavalent chromium (VI) reduction and elimination were shown. Finally, the R&D team presented the work in progress on the Technical Data Sheets of the products, elaborated in a new and consistent format for all the C-ADD products gualified all over the world. These documents have been conceived as an instrument to provide the customers with the information they need, including those related to the Safety Data Sheets. This meeting was an important training and updating session for the entire C-ADD team. It allowed a lively exchange of ideas and opinions on very specific but widely shared subjects, and reinforced the sense of belonging to this little great team.

Muriel Costi. Mapei C-ADD Division

TEAMWORK



C-ADD **CEMENT ADDITIVES DIVISION LANDS IN NORTH AMERICA**

PRODUCTION OF CEMENT GRINDING ADDITIVES FOR NORTH AMERICAN MARKET HAS JUST STARTED AT MAPEI AND **GRT FACILITIES**

The constant increase recorded over the last two years in the production levels of cement in the United States is a sure sign of the excellent state of health and growth of the American economy in general, and of the construction market in particular.

With the acquisition of General Resources Technology (GRT) in May 2014, cement additives are now also part of the portfolio of products marketed by Mapei Corporation (the Group's US subsidiary), in the United States and Canada.

GRT is based in Minneapolis, Minnesota, in the Midwestern United States, and specialises in the production and marketing of admixtures for concrete. Because of their affinity with C-ADD additives, the company has also been given the task of developing the cement grinding additives business.

Thanks to the excellent integration of GRT with a company as widely renowned for its quality and reliability as Mapei Corporation, the approach to the

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THE USE OF HIGH PERFORMANCE ADDITIVES IN THE CEMENT PRODUCTION CYCLE COULD LEAD TO A REDUCTION OF AROUND 3 MILLION TONS OF CO₂ PER YEAR IN THE USA

ABOVE. The plant based in Logan Township (New Jersey, USA) will soon became operational. It will provide an excellent logistics service to cement works long the East Coast and in Eastern Canada. **RIGHT.** In September 2015 liquids production started in the existing plant in Garland, Texas.



cement additives market has been relatively straightforward.

The existing production units of both GRT and Mapei have been used for the production of the C-ADD line, which was started in April 2015 at the Madison facility, in the state of Illinois, to improve their service to clients from the Midwest. Following this start-up, a liquids production unit began to operate in September 2015 in the existing plant in Garland, in the state of Texas, which will help make the company's service to their clients in the Gulf and Southern states more competitive. A third facility will be commissioned shortly in Logan Township, New Jersey, and it will allow the company to provide an excellent logistics service to cement works long the East Coast and in Eastern Canada.

And lastly, a Technical Services laboratory, complete with equipment and instruments in compliance with ASTM (American Society for Testing and Materials International) standards to measure the chemical-physical properties of cement and the effect additives have on cement, is currently being established at the facility in Garland. It will prove to be an extremely useful centre, in terms of both choosing the best products for the market and supplying Mapei's highly renowned and qualified technical support to cement works.

GRT will invoice US clients directly.

QUALITY AND ENVIRONMENTAL CONTRIBUTION OF THE C-ADD LINE TO THE AMERICAN CEMENT MARKET

The additives from the C-ADD line are now part of the North American production scenario as essential elements to tackle the increasing demand for cement in the region. In fact, for cement grinding mills, these additives increase production by around 10-15%, reduce the grinding power consumption by 8-12%, improve some quality characteristics such as mechanical strength and pack set index, reduce wearing of equipment in the grinding plant and, as a result, reduce maintenance costs. In addition, the trend of the American cement market is to lean towards marketing cement with a lower klinker content which, apart from reducing production costs for cement works, considerably helps in reducing CO₂ emissions into the atmosphere.

The use of strength enhancers plays a key role in achieving these objectives, so much so that we can even quantify the contribution of products from the C-ADD line in reducing CO_2 emissions. For example, if we estimate that, for the same cement quality, the additive allows the amount of clinker to be reduced by an average of 4%, we can calculate that, for the American market, this could lead to a reduction of around 3 million tons of CO_2 per year by using high performance additives in the production cycle.

Potito D'Arcangelo. C-ADD Division, Mapei Group

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Taking it to H IN THE MIDDLE. Visitors of WOC 2016

could see Mapei products at work during product demonstrations carried out by the Mapei Demo Team.

ABOVE. In the outdoor display area, Mapei partnered with WerkMaster to demonstrate the beautiful polished concrete finish that can be achieved with ULTRATOP PC.

WORLD OF CONCRETE

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A MAPE

MAPE

LOTS OF NEW MAPEI PRODUCTS FOR CONCRETE ON THE STAGE FOR THE ENTIRE SHOW

Ccording to Informa Exhibitions, "World of Concrete 2016 exceeded expectations across the board. This signature event for the concrete industry drew 60,110 registered professionals, up from 55,770 in 2015, and featured more than 1,532 companies exhibiting across more than 69,000 m² of space, an increase of more than 6000 m² from 2015. This was the largest World of Concrete show in seven years." Mapei exhibited the Company's growth in the Americas during the show, which was held in Las Vegas on February 2-5. In the main booth within the Las Vegas Convention Center's South Hall, Mapei Corp., the Group's US subsidiary, displayed and gave demonstrations of its ELASTOCOLOR protective and decorative coatings, as well as its MAPEWRAP products for structural strengthening of buildings and infrastructure. The Company also introduced to the US market the MAPE-PROOF and MAPETHENE lines of below-grade waterproofing products, which generated strong interest from booth visitors.

In the North Hall, MAPEI/GRT promoted its concrete admixtures with the support of the sales and marketing team for this line of products that were introduced into the Americas with the acquisition of General Resource Technology, Inc. in 2014. Many GRT customers came by the booth to talk about current business and to discuss the new concrete admixtures that Mapei is adding from its European product offerinas.

In the outdoor display area, Mapei partnered with WerkMaster, a leading manufacturer of grinding and polishing machines, to demonstrate the beautiful polished concrete finish that can be achieved with ULTRATOP PC, a self-leveling, cementitious covering which is only manufactured and distributed in the American market by Mapei Corp.

Mapei demo team demonstrations, the Mapei VIP hospitality event and individual media meetings were also highlights of this show.

THE WORLD OF COMADE



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ABOVE. At TISE Mapei received six Clear Seas Research awards as preferred brand for six different kinds of products.

TISE E IBS

CERAMIC TILES AND FLOOR COVERING SOLUTIONS EXHIBITED AND INDUSTRY REWARDS RECEIVED

Mapei, through its subsidiary Mapei Corporation, hosted booths at both The International Surface Event (TISE) and the NAHB International Builders' Show (IBS) during the third annual Design & Construction Week. This mega event was held in Las Vegas from 19th to 22nd of January and included four partner trade shows: TISE, IBS, Kitchen & Bath Industry Show (KBIS) and the International Window Coverings Expo (IWCE). The shows recorded an increase in attendance of 10% over 2015. Mapei business managers and sales representatives spoke with customers at the Company's booth about new and popular Mapei products designed to make work easier for installers. New introductions included MAPESIL T sealant; ULTRALITE S1 QUICK lightweight adhesive for ceramic tiles, ULTRAFLEX LHT adhesive for large and heavy tiles, and three new special-purpose self-leveling underlayments: UL-TRAPLAN LITE, ULTRAPLAN LSC and ULTRAPLAN QUICKTRAFFIC. All these products are only manufactured and distributed in the American market by Mapei Corp, except for ULTRALITE S1 QUICK, which is also available on the international market. At the IBS show, Mapei exhibited floor-covering, ceramic tile and stone installation system solutions for residential builders and remodelers. Individual kiosks representing the kitchen, bedroom, bathroom, home office, patio and workshop displayed the combinations of products that builders could use to create a warranted single-source system for their flooring-installation needs. Attendees could see at a glance that Mapei was at work everywhere in the home.

At TISE Mapei received six Clear Seas Research awards for preferred brand of cementitious grout; cement-based medium-bed mortars; single-component grouts; cement-based thin-set mortars; organic-based adhesives; and self-leveling and patching underlayments. Clear Seas, a market research company, surveys the members of the USA National Tile Contractors Association every two years, asking for their preferred manufacturer in several categories. Winning in six of the categories was a testament to Mapei's continuous efforts to be customers' supplier of choice. TISE attendees enjoyed demonstrations of new products by the Mapei Demo Team, and many turned out for the traditional Mapei's VIP hospitality event.



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On the 18th of April Coverings, the largest gathering of exponents from the ceramics and stone materials industry in North America, made a return in great style to Chicago, the city where the event was last held eight years ago. Over the course of four days, the latest trends in the sector were put on show by more than 1,100 exhibitors from more than 40 countries over an area of almost 40.000 m². The trade fair also had an intense schedule of educational events with 77 meetings. Distributors, retailers, manufacturers, construction companies, designers, architects, interior decorators and real estate representatives welcomed the feeling of optimism that was in the air on and around the stands, which was also due to the positive trend the United States market is currently going through and to the strong traditional ties the city of Chicago has with the architecture industry.

LATEST RELEASES ON SHOW

Mapei was also represented at the event through their US subsidiary, Mapei Corporation, with a stand dedicated to the latest products for installing ceramic tiles and stone. The products showcased this year included ULTRACOLOR PLUS FA rapid-setting grout for joints, ULTRALITE S1 QUICK rapid-setting lightweight adhesive, MAPESIL T ultra-flexible silicone sealant for expansion joints and substrates exposed to intense traffic, three new special purpose self-levelling products (ULTRAPLAN LSC, ULTRAPLAN LITE and ULTRAPLAN QUICKTRAFFIC), and ULTRAFLEX LHT thixotropic adhesive for large, heavy tiles and slabs. All these products are manufactured and distributed on the American market by Mapei Corp., except for ULTRALITE S1 QUICK, which is also available on



the international market. The event was also an ideal opportunity to present to the public Mapei Corp.'s new range of grouts, available in 40 different colours divided into five collections to help clients select the most suitable shade for their needs. The technology at the base of this range of colours was illustrated to the general public by Phil Kenyon, a colour consultant who has worked closely with Mapei Corp. in the development of this new range, during a series of practical demonstrations held on the Mapei stand. The demonstrations were highly appreciated by the public and highlighted the advantages of using MAPESIL T, ULTRA-COLOR PLUS FA and Mapei thixotropic adhesives for the installation of large tiles. Apart from the demonstrations on the corporate stand, technicians from the Mapei Demo Team carried out a series of demonstrations on the Coverings Instal-

ABOVE. Mapei's stand at Coverings 2016 highlighted the various solutions the Company has on offer for treating substrates and installing ceramic and stone, with each one suitable for specific surroundings. BELOW. Showcased at Coverings this year was the selection of 40 different colours chosen by Mapei Corp. for grouting joints.



lation Demonstration Stage, a dedicated area created at the trade fair for this type of activity.

Beside, Mapei technical staff members were an integral part of the conference program. They presented on a number of topics for the tile and stone industry, including "Ready to use grouts", Evolution of Membranes for Tile Installation", "The Key to Successful Installations: Substrates", and "New Directions for Thin Tile Panels".

AWARDS AND INITIATIVES

Coverings 2016 also saw Mapei Corp. receive an important award: the Company was selected as "Supplier of the Year" by the Ceramic Tile Distributors of



LEFT. The demonstrations of Mapei products by the Mapei Demo Team proved to be highly popular again this year.

ABOVE. During this year's Coverings, Luigi di Geso, CEO of Mapei Corp., accepted the "CTDA Supplier of the Year" award presented by Tom Kotel, President of CTDA. **RIGHT.** Mapei sponsored and awarded prizes for several projects in the "Tiled Bench Exhibit" competition for young students from the School of Art Institute of Chicago.

America (CTDA). The CDTA is an association that brings together distributors, manufacturers and professionals from the ceramics and stone materials sector. After a careful assessment of several parameters (innovation, technical assistance, marketing, client service and logistics) the CDTA presented the award to Mapei for the first time. The President of CDTA, Tom Kotel, presented the award to Luigi di Geso, CEO of Mapei Corp., who said "Receiving this award at Coverings, following the six "Most Preferred

TRADE FAIRS USA



Manufacturer" awards we received at Surfaces, has made us aware of how highly the industry values our products and services."

It was then Mapei's turn to award the winners of the "Tiled Bench Exhibit" competition that put students from the School of Art Institute of Chicago to the test by asking them to create a bench decorated with ceramic and mosaics. Mapei Corp. sponsored seven of the benches created and exhibited at Coverings 2016.

This year, too, there was a special event dedicated to Mapei Corp.'s VIP guests; various contractors were invited for a cruise along the Chicago River for a waterside tour of discovery of the architectural marvels of the city.

INSTALLATION DESIGN SHOWCASE

Mapei, a founding supporter of the Installation Design Showcase event, again supplied installation materials for two of the four vignettes NTCA (the **US National Tile Contractor** Association) 5-Star contractors assembled during Coverings 2016. Over the first three days of the show, visitors could watch the crews from four contractors install tiles of any type on floors, walls and other surfaces. Watching the work in progress educated viewers on how important the installation process is to a successful retail/ commercial setting. The vignette designed by Healing Environments embodied a spa lobby that appeals to the senses. The installers used

ADESILEX P10 for bonding all

the glass tiles while ULTRALITE

S2 was used for the installation

of the large, thin ceramic tiles on the walls as well as for the large, thin tile panels installed on the ceiling. For other tiles, including the metal tiles on the wall surrounding the fireplace, the installers used ULTRAFLEX LFT. ULTRACOLOR PLUS FA was chosen to grout the joints of all the tiles.

The boutique retail shop vignette was sponsored by Ceramics of Italy and used tiles from a variety of Italian manufacturers. Designer Alena Capra incorporated 3-D effects, shades of aqua, bold prints and fabric looks, to create a chic retail boutique environment. Capra's design featured one statement wall in a mosaic peacock print, while white 3-D tile, blue glass tiles and aqua and gray porcelain tiles covered the remaining wall surfaces.



The installers used ADESILEX P10 mortar for the cobalt blue glass tiles on the two sides of the boutique and on the large table in the middle of the vignette and ADESILEX P10 to bond the large peacockfeather-themed wall tile mural. Nine different color shades of ULTRACOLOR PLUS FA were

used for grouting the joints, including two custom colors of green and aqua. Once again, the Installation Design Showcase was an opportunity to illustrate the importance of proper methods and standards in tile installation and show how they play such a vital role in tile design.



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2016 CERAMICS **OF ITALY TILE COMPETITION WINNERS**

This awards program sponsored by Confindustria Ceramica (the Association of Italian Ceramic Tiles and Refractory Materials manufacturers) promotes the excellence in the use of Italian ceramic tiles within projects by US designers. This page shows the winners of the Design Awards 2016.



INSTITUTIONAL ARCHITECTURE

🔁 Winner

Project: UJA Federation Community Complex (Vaughan, Canada) **Designer:** ARK

THE NORTH AMERICAN DISTRIBUTOR AWARD IS AWARDED BY CONFINDUSTRIA CERAMICA TO A NORTH-AMERICAN IN RECOGNITION OF A CONSOLIDATED ACTIVITY IN DISTRIBUTING ITALIAN TILES IN NORTH AMERICA. THIS YEAR THE PRIZE WENT TO CERAMIC TECHNICS LTD, WHICH ALSO DISTRIBUTES MAPEI SOLUTIONS



Gerry King and Matt Houser owners of Ceramic Technics Ltd, were awarded the North American Distributor Award 2016



RESIDENTIAL ARCHITECTURE

🚺 Winner **Project:** Turnberry Residence

(Rosslyn-Arlington, VA, USA) Designer: Shinberg.Levinas Architects

Honorable Mentions

Project: Bridgehampton Private Pool (Bridgehampton, NY, USA) Designer: Geoffrey A. Blatt, Inc.

Mapei contributed to the completion of Turnberry Residence, Through House (right) and UJA Federation Community Complex projects by supplying solutions to install ceramics and stone.

Project: Through House (Toronto, Canada)

Designer: Dubbeldam Architecture + Design





COMMERCIAL ARCHITECTURE

🔁 Winner Project: Kaye Scholer Headquarters (New York, USA) **Designer: GENSLER**

Honorable Mention Project: Viking Star (Bergen, Norway) Designer: Rottet Studio (Houston, TX, USA)

Awardees received 4000 US dollars and a trip to Bologna (Italy) to attend the Cersaie trade fair on September 2016 as part of a VIP delegation of top consumer and design journalists.

62 RM International 58/2016

THE EXPERTS FROM GROSSER & ASSOCIATES CONSULTING STUDIO PROVIDE AN OVERVIEW OF THE CURRENT SITUATION OF THE USA HOUSING MARKET



THE HOUSING MARKET IN THE UNITED STATES

NEW HOUSING

In April 2016 the number of Building Permits issued in the USA was running at a seasonally adjusted annual rate of 1,116,000, an increase of 3.6% compared to the previous month, but 5.3% lower than April 2015. The number of Housing Starts in April 2016 rose by 6.6% compared to March 2016, to a seasonally adjusted annual rate of 1,172,000 units (-7.4% less than the same period in 2015). Housing Completions fell by 11% compared to March 2016, and by 7.5% compared to April 2015.

The US housing sector still hasn't returned to its "normal" level. In fact, the number of Housing Starts is still running at 1.1 million units on an annual basis, whereas during the "boom" period ten years ago, this figure had risen to 2.3 million units. The normal annual level of Housing Starts should be around 1.5 million. Furthermore, the fact that we still haven't reached that "optimal" level depends on the insufficient income for most families to cover monthly mortgage repayments, even





with current interest rates for a thirty-year mortgage at just 3.75%. The best news is that sales of new houses in April 2016 rose to 619,000 units on a seasonally adjusted annual basis, an increase of 16.6% compared to March 2016 and of 23.8% compared to April 2015.

EXISTING HOUSING

According to the U.S. National Association of Realtors (NAR), the seasonally adjusted annual rate of sales of existing houses in April 2016 rose by 1.7% compared to March 2016 (5.45 million units) and is 6% higher than one year ago. The number of single family houses sold in April 2016 rose by 0.6% to a seasonally adjusted annual rate of 4.81 million units.

HOUSING PRICES

In 2015 average family income was higher than in 2014 and 2013, at a rate similar to the increase in average of housing prices. Interest rate for thirty-year mortgages fell compared to 2014, but the ratio "average family income to income needed for a mortgage" dropped compared to 2013. This means that the income required to be eligible for a mortgage increased at a faster rate than average family income.

THE CERAMIC TILES MARKET

The U.S. ceramic tiles market follows closely the trends in the new building construction market (see graph on the left). With the progress made in this sector and projecting sales figures for existing houses in 2016, forecasters are pointing to an increase in the ceramic tiles wholesale volume of around 10% and, if the situation doesn't change dramatically because of unforeseen circumstances, this increase could be even greater in 2017.

Manuel Rimini and Donato Grosser. D. Grosser and Associates, Ltd., New York (USA)

USA PROJECTS



THE DUSIT THANI GUAM RESORT ON THE ISLAND OF GUAM WAS COMPLETED WITH NUMEROUS MAPEL SOLUTIONS

Located in the heart of the Pacific and just a short plane ride away from some of Asia's main cities. Guam is an unincorporated and organized territory of the United States and a captivating tropical island paradise. The Dusit Thani Guam Resort, situated on the island's magnificent Tumon Bay, features panoramic views from its 419 guest rooms, suites and villas, which are all finished with distinctive touches of Thai design throughout. The island's newest 5-star resort is surrounded by sparkling clear waters, pristine beaches and lush tropical gardens. Guests enjoy a full range of modern amenities and facilities designed to make each guest's stay a unique and personalized experience.

During the initial phases of resort construction, the contractors were running into some difficulties. Representatives from Mapei made a proposal that helped solve several challenges. Mapei products were then chosen as a single-source system from concrete repairs to substrate preparation, waterproofing and soundproofing treatment, and ceramic tile and floorcovering installations.

DIFFERENT PRODUCTS FOR DIFFERENT AREAS

A wide variety of Mapei solutions were used to give the owner of the resort a long-lasting installation and to solve some very difficult problems.

ULTRAPLAN M20 PLUS underlayment was colored mocha and used as a wear layer in back-of-house operations areas. ULTRATOP gray concrete covering was also applied on the floors in these areas. Both ULTRAPLAN M20 PLUS and ULTRATOP gray were applied over a layer of PLANIBOND EBA bonding agent with a sand broadcast.

NOVOPLAN 710 SL self-levelling underlayment was used in all of the promenades, restaurants, common areas penthouses, the lanai and the convention center for the remainder of the self-leveling. NOVOPLAN 710 SL was applied over a layer of PRIMER L used as an adhesion promoter.

ECO PRIM GRIP was used as a problem-solver all over the project, increasing bonding strength wherever needed, on approximately 1,900 m² of surfaces. It was also used extensively under a layer of NOVOPLAN 710 SL where there were nonporous slabs. In addition, ECO PRIM GRIP was used under a layer of ULTRAPLAN 1 PLUS on nonporous slabs in the areas where ULTRAPLAN 1 PLUS was poured.

PLANIPATCH patching compound and PLANIPATCH PLUS additive were used to fix transitions and make small repairs wherever needed throughout the project, covering over 4 650 m².

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MAPECEM QUICKPATCH concrete patch was used to slope all the substrates of the balconies.

INSTALLING CERAMIC TILES AND TEXTILE FLOOR-INGS

Plank tiles by Daltile were installed on the floors of the balconies with ULTRAFLEX LFT adhesive and joints were grouted with ULTRACOLOR PLUS anti-efflorescence, quick-setting and drying polymer-modified mortar with water-repellent DropEffect[®] and mould-resistant BioBlock[®] technology.

In all of the hotel guest rooms DAL-CIM 500 EX (a version of MAPEGUARD 2 sheet membrane that is manufactured for Daltile) was used for soundproofing the substrates, after treating them with SM PRIMER.

MAPELASTIC AQUADEFENSE membrane was used in all guest rooms to waterproof the substrates of the shower areas, both on floors and on walls.

All of the porcelain tiles in the guest bathrooms were installed with ULTRAFLEX LFT, which was also used for quarry-tile installations in the restaurants.

ULTRALITE MORTAR PRO was used to install travertine slabs and porcelain tiles on 22 columns throughout the resort, as well as on the floors of the lobby and promenades. Because it is a lightweight product, when the installers were working on scissor lifts high up in the air on the columns, this adhesive helped reduce weight on the lifts and made for easier installation at those heights.







IN THE SPOTLIGHT ECO PRIM GRIP

It is a multi-purpose, readyto-use primer for internal and external floors and walls. ECO PRIM GRIP may be used to improve the bond of all types of cement, gypsum and limebased plasters on substrates made from concrete, brickwork, vibro-compressed concrete blocks, lightweight blocks and gypsum. It is also suitable for improving the bond of adhesives for ceramics, smoothing and levelling compounds on nonabsorbent surfaces, such as ceramic, terrazzo and natural stone floors indoor. ECO PRIM GRIP is a solvent-free primer composed of synthetic

resin in water dispersion

and selected inert materials with excellent bond strength, resistance to water and ageing. It guarantees a rough keying surface ideal for renders, smoothing and levelling compounds, thus ensuring an excellent bond on smooth substrates and substrates with low absorbency, reducing and evening out absorption of water of absorbent surfaces. It can contribute up to **3 points** to obtain the **LEED** certification.



ABOVE. In many areas of the Dusit Thani Guam Resort ECO PRIM GRIP and PRIMER L were used to treat the substrates and promote the adhesion of the following layers.
LEFT. ULTRALITE MORTAR PRO was used to install travertine slabs and porcelain tiles on 22 columns throughout the resort, as well as on the floors of the lobby and promenades.
BELOW. ULTRACOLOR PLUS was used to grout all tile and stone joints in guest rooms, the lobby, common areas, promenades and the 22 columns.



USA PROJECTS

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RIGHT. Textile floors in the guest rooms were bonded with ULTRABOND ECO 810 and ULTRABOND ECO 120 adhesives.

BELOW. The porcelain tile floors were installed in the dining area with ULTRALITE PRO MORTAR, while jointt were grouted with ULTRACOLOR PLUS.





ULTRACOLOR PLUS was used to grout all tile and stone joints in guest rooms, the lobby, common areas, promenades and the 22 columns. KERAPOXY CQ two-component epoxy grout, with a bacteriostatic agent and BioBlock[®] technology, was used in the kitchens of the six signature restaurants to grout the joints of the quarry tile.

In all the guest room baths joints around the tubs and showers were sealed with MAPESIL sealant in an ivory color.

ULTRABOND ECO 810 adhesive was used to bond textile floor coverings in all guest rooms, and walkways and common areas. This adhesive was also used to install about 4,500 m² of textile floor covering over the padding in entryways and other parts of the building.

In the guest rooms, on the other hand, the wool flooring was bonded to the padding with ULTRABOND ECO 120 adhesive.

A LUXURIOUS WELCOME

The owner's representative decided that the bus lane where guests are dropped off from the airport should have an inviting look. Therefore, PLANISEAL TRAFFIC COAT epoxy overlay was applied on the substrates, and green aggregate was broadcasted into it before applying again PLANISEAL TRAFFIC COAT. The resulting drop-off area now has a nonslip surface for guests and a great wear layer for the bus traffic. The Mapei Technical Services teams all supported the project throughout its construction.

All the mentioned products are only manufactured and distributed in the American market by Mapei Corp, except for ULTRATOP, ECO PRIM GRIP, PLANIPATCH, ULTRACOLOR PLUS, KERAPOXY CQ and MAPELASTIC AQUADEFENSE, which are also available on the international market.

TECHNICAL DATA

Dusit Thani Guam Resort, Guam (USA) **Period of Construction:** 2014-2015 Design: O.A. Coloma P.C. Architects **Client:** Tanota Development IIC Period of the Mapei Intervention: 2014-2015 Intervention by Mapei: supplying products for preparing and waterproofing substrates, installing ceramic tiles and stone slabs, installing textile floors, sealing expansion joints, grouting tile and stone joints, building cementitious floorings Main Contractor: Pacific

Rim Land Development, Inc. **Tile and Stone Installation Contractor:** Addison Global Interiors Inc.

Works Direction: Tony Costa

Mapei Co-ordinator: Chris Anderson, Mapei Corp. (USA) Foto: J.T. Delfin Studios

MAPEI PRODUCTS

Preparing substrates: Primer L*, Eco Prim Grip, Ultraplan M20 Plus*, Ultratop, Novoplan 710 SL*, Mapecem Quickpatch*, Ultraplan 1 Plus*, Planipatch, Planipatch Plus*, Primer SM* Soundproofing substrates: Dal Cim 500 EX* Waterproofing substrates: Mapelastic AquaDefense Installing ceramic tiles and stone materials: Ultralite Mortar Pro*, Ultraflex LFT* Grouting joints: Ultracolor Plus, Kerapoxy CQ Sealing expansion joints: Mapesil* Building cementitious floors: Planiseal Traffic Coat* Bonding textile floors: Ultrabond ECO 810*, Ultrabond ECO 120* * These products are manufactured and distributed in the American market by Mapei Corp.

For further information on the products see <u>www.mapei.com</u> and <u>www.mapei.us</u>

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The **bacteriostatic**, high-performance, multifunctional, easy-to-use epoxy grout.



Easy-to-use, anti-acid, easy-to-clean, with a **bacteriostatic** agent, two-component **epoxy filler**, ideal for grouting the joints of ceramic tiles and mosaics. The **BioBlock**[®] **technology** blocks the formation and growth of micro-organism in damp environments.



A MAPEI

Product Info





Mapei is with you: let's take a closer look together at www.mapei.com **USA** PROJECTS

FOR SMART BRAINS

MAPEI SOLUTIONS FOR SUBSTRATES WERE USED TO COMPLETE THE MODERN BUILDING HOSTING FLORIDA POLYTECHNIC UNIVERSITY

Florida Polytechnic University, started as a university of engineering and technology, is designed to be different so that graduates possess the talent and job-ready skills to stand out from the crowd. While other top engineering universities have centers of innovation, Florida Polytechnic University was established on April 20, 2012, as a wholly innovative university dedicated to the principle that innovation occurs when research and creativity are applied to real-world challenges. Florida's only public university for engineering and technology dedicated to science, technology, engineering and mathematics (STEM) was created to be both a rigorous academic institution and a powerful resource for high-tech industries.

The Innovation, Science and Technology Building at the university was designed by famed architect Santiago Calatrava. Christopher Hawthorne wrote about the design in Architect magazine, October 2014: "In plan, the building is straightforward and elegant. Two double-loaded corridors lined in polished concrete, one at ground level and another on the second floor, curve in a gentle oval arc around the building. The lower one opens onto classrooms on its outer edge and to studio space, labs, and an auditorium in the center of the building. Upstairs, the corridor has faculty and administrative offices on the outside and, to the inside, some small conference rooms and study rooms as well as the building's functional and architectural heart: a multipurpose library and study space with a soaring ceiling that is known as "the Commons". Two grand staircases, one on each end of the oval, lead to the upper floor."

An array of 94 robotic louvers on the roof move to accommodate changing sunlight patterns, providing light to both levels.

FLAT AND RESISTANT SUBSTRATES

Prior to installation of a floor covering in the center of the second floor space, a program was undertaken to establish a quality control process for moisture reduction and surface leveling on concrete slabs. The Florida Polytechnic project served as a benchmark of the process. Tensile and flatness testing of the second floor concrete deck were carried out in order to evaluate the performance characteristics of a few Mapei products for substrate preparation: PLANISEAL VS for moisture mitigation, PRIMER T as an adhesion promoter and ULTRAPLAN 1 PLUS for leveling. These products are only manufactured and distributed on the American market by Mapei Corp.

Tensile testing was performed prior to slab treatment to evaluate the tensile strength of the concrete substrate. Existing floor flatness and floor levelness values were also obtained at this

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time. After the moisture mitigation and leveling treatments, the same tests were performed to evaluate the moisture mitigation component for bonding strength as well as improvements in floor flatness and levelness.

The use of ULTRAPLAN 1 PLUS showed an improvement of 39% in flatness and 16.5% in levelness of the substrate. The field test results of the bond strength demonstrated that the bond strength of PLANISEAL VS was greater on diamond ground concrete than on shot blasted concrete.

Therefore, PLANISEAL VS was used for the moisture reduction treatment of the substrates while PRIMER T was used to promote the adhesion of ULTRAPLAN 1 PLUS, applied thereafter. Mapei solutions contributed to complete this creative building designed by a famous archistar and intended to host smart brains at work. LEFT. Tensile and flatness testing of the second floor concrete deck were carried out to select the proper products for substrate preparation. RIGHT. Substrates were treated with PLANISEL VS for moisture mitigation and with PRIMER T to improve the bond of the self-levelling compound ULTRAPLAN 1 pLUS.

TECHNICAL DATA Florida Polytechnic University, Lakeland (USA)

Period of Construction: 2012-2015 Design: Santiago Calatrava, Alfonso Architects Client: Florida Polytechnic University Year of the Mapei Intervention: 2014 Intervention by Mapei:

supplying products for treating concrete substrates **Main Contractor:** Skanska

Substrate Preparation Contractor: Specialty

Solutions

Works Direction: Bill Green, Specialty Solutions Mapei Co-ordinators: Darin Weisemiller, Mapei Corp.

MAPEI PRODUCTS

Preparing substrates: Planiseal VS*, Primer T*, Ultraplan 1 Plus* * These products are only manufactured and distributed in the USA by Mapei Corp.

For further information see <u>www.mapei.com</u> and <u>www.mapei.us</u>





MADEISPORT

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MAPEI SPORT: 20 YEARS' RESEARCH, SUPPORT AND CULTURE FOR SPORT

6TH MAPEI SPORT RESEARCH CENTRE CONVENTION AND 5TH "ALDO SASSI" RESEARCH GRANT

Sober, elegant, sporty, friendly and cultured. In a nutshell, extremely interesting. We are not talking about George Clooney, neither are we describing a character from a novel by William Somerset Maugham. These are the best adjectives for describing the 6th Mapei Sport Convention entitled: "Mapei Sport: 20 years' research, support and culture for sport", a prestigious and extremely significant event for the world of specialist scientific research into sport that took place on 21st May in Varese (Northern Italy).



An event that also coincided with the 20th anniversary celebrations for the founding of the Mapei Sport Research Centre, the brainchild of Giorgio Squinzi and Aldo Sassi, the former head of the Mapei Sport Centre, who passed away prematurely.

Mapei Sport's 20 year history confirms the Centre's long-term and ever-increasing attention to the realm of university research and sport that is inspired by ethical values.

With a view to financing new research projects in the sports sciences, Mapei has, at the same time, continued to focus on young researchers; the "Aldo Sassi" research grant, which has now been awarded five times, was specially devised to be presented annually to a young graduate in the motor sciences. This research grant worth 10,000 Euros is awarded based on a public tender publicised through communication channels set up between the Mapei Sport Research Centre and Giuseppina Mai Foundation. The Giuseppina Mai Foundation, established by Confindustria (Confederation of Italian Manufacturing and Service Companies), promotes scientific research in the field of medicine, health and quality of life, encouraging partnerships between universities, public research institutes and the business world. The working partnership between Mapei and the Giuseppina Mai Foundation sets out to encourage young people to get involved in research projects in the sports sciences.

CYCLING, BASKETBALL, ALPINE SKIING AND FOOTBALL

The morning's proceedings began with an official welcome from Claudio Pecci, the General Manager and Medical Director of Mapei Sport, Gaela Bernini representing the Giuseppina Mai Foundation, and Maria Ida Piazza, Varese City Council's Sports Councillor.

Giorgio Squinzi, the CEO of the Mapei Group, and Adriana Spazzoli, the Mapei Group's Operational Marketing and Communication Director, introduced the
ALPINE SKIING - First Session

LEFT. From right on: Herbert Schoenhuber (Italian Winter Sports Federation), Alberto Passi (University of Insubria), Andrea Bosio (Mapei Sport Research Centre) and Roberto Manzoni (Italian Winter Sports Federation).











main topics on the agenda reminding everybody why the Mapei Sport Centre was originally set up and the values that lie at its foundations.

After first presenting the results of last year's "Aldo Sassi" Research Project, researchers from the Mapei Sport Centre and other professionals operating in the sector outlined their own studies and results. After a quick greeting from Cadel Evans – whose career developed in close conjunction with the Mapei Sport Centre - and a brief outline of his own sports career as a champion cyclist, there was a particularly interesting lecture given by Nicola Maffiuletti from Neuromuscular Research Lab, Schulthess Clinic, Zurich, entitled "The acute effects of physical exercise: fatigue vs "potentiation".

Numerous important issues and topics related to a variety of sports were examined during the day's proceedings,

 IN THE MIDDLE. Andrea Morelli (Mapei Sport Research Centre) with Josu
Larrazabal (Trek Segafredo Cycling Team) and Cadel Evans (right).
BELOW. Antonio La Torre (University of Milan) and, at the bottom, Franco
Impellizzeri (Neuromuscolar Research Lab, Schulthess Klinik, Zurich).









with special sessions on Alpine skiing, cycling with some significant ideas about optimising mountain bike training, basketball and, finally, football, during which emphasis focused on methodological aspects regarding perceived effort and Brain Endurance Training, as a new strategy for limiting mental fatigue and improving performances.

BASKETBALL - Third Session

ABOVE. From left on: Matteo Panichi (Italian National Basketball Federation), Davide Ferioli (University of Milan), Ermanno Rampinini (Mapei Sport Research Centre) and Giampietro Alberti (University of Milan).

ROUNDTABLE: TRAINING TAL-ENTED YOUNGSTERS

The convention drew to a close with a well-attended roundtable featuring some notable guests. Paolo Ghisoni from Sky Sport TV channel drew all the guests into a discussion about "Developing young elite athletes: do we need to be patient or brave?"

As well as Giorgio Squinzi, others taking part in the debate included such notable sports technicians as Luca Guercilena, Roberto Sassi, Andrea Menozzi and Eusebio Di Francesco, athletes like Francesco Acerbi and Fabian Cancellara, members of the Italian National Alpine Skiing team, and the Trek-Segafredo Cycling Team.

Giorgio Squinzi claimed that to reach the very highest levels you need to begin when you are young: "Fabian Cancellara and Berardi are our examples: to reach the very top, sportsmen and women must begin working on and perfecting their own special skills when they are very young, making sure they adopt a responsible approach and keep focused, because the only way they will become real champions is if they have clear sporting goals based around healthy principles in general".

Fabian Cancellara, a professional cyclist, took this concept further claiming that: "it is not enough to just get off to a good start when you are young, you need to find just the right support to help you develop". "I have Mapei to thank - so Cancellara went on to say - for giving me what I could not get in Switzerland at the beginning of my career, support that really helped me step up a level".

The general manager of Trek-Segafredo Cycling Team, Luca Guercilena, continued along these lines by pointing out that "managing athletes and technicians is difficult and the most important thing is to focus on helping them grew as people before developing the athlete". "We need to invest heavily in the youth sector – so Guercilena went on to say - making sure young people are not put under too much pressure and providing them with all the tools they require for the future".

The team manager of Sassuolo, Eusebio Di Francesco, gave his own views in relation to the football world, stating that "sometimes the press does not help our youngsters develop, because it puts too

"ALDO SASSI" RESEARCH GRANT - Fourth Session

BELOW. Left: Luca Mondazzi (Mapei Sport Research Center) with Amilcare Collina (Mapei SpA). Right: Claudio Pecci, General Manager of Mapei Sport, with Gaela Bernini, representing the Giuseppina Mai Foundation established by Confindustria.



SABATO 21 MAGGIO 2016 - ore 9,00-17,0 Centro Congressi Ville Panti, Villa Napoleonica Piazza Litta 2 - Varese

Presentazione 5' assegno di ricerca "Aldo Sassi" per Laureati in Scienze Motoria





much pressure on them; we need to be patient with young players and help them develop. It is important to teach them how to reach their goals". "A coach must be able to recognise talent and help it progress: my job is to try and take some of the responsibility off the shoulders of youngsters like Berardi".

Roberto Sassi, Juventus' Training Check and Sport Science Manager, then talked about his own experience, claiming that Juventus is a club that looks to the future and helps young players develop. Nevertheless, generally speaking, it is true that "the media system and expectations in terms of quick results do not help talented youngsters".

The head coach of the Italian National Alpine skiing team, Massimo Carca, also said he has great faith in "products of the Italian system", as does his own athlete, Matteo Marsaglia, who focused on the importance of family support in a young sportsperson's development.





LEFT. Top of the page: Marica Bizzi (Mapei Sport Research Centre), winner of the 4th "Aldo Sassi" research grant, and Maurizio Fanchini (Sassuolo). In the middle: Claudio Pecci with Giorgio Squinzi and Ferretto Ferretti (Italian Football Federation)

The subject of basketball was then tackled by Andrea Menozzi, who is in charge of the young players section of Pallacanestro Reggiana: "in some respects basketball shares the same workings as football and you need to be brave to play youngsters; and, as well as being brave,

BELOW. The convention drew to a close with a roundtable attended by Luca Guercilena (Trek Segafredo Cycling Team), Roberto Sassi (Juventus' Training Check and Sport Science Manager), Paolo Ghisoni (Sky Sport), Eusebio Di Francesco (Sassuolo), and Alessandro Frosini (Pallacanestro Reggiana).

ROUNDTABLE - Sixth Session



you also need to be patient, because it is really challenging for young players to meet expectations and that is why we need to be patient and supportive". Talk on this subject was drawn to a close by the Sassuolo football player Francesco Acerbi: "The important thing for a young sportsperson is to have a support system of facilities and people in place that can help them get through tricky periods. Here at Sassuolo we are privileged because we get plenty of support from the Mapei Sport Centre: these are important aspects in helping players develop and keep fit and healthy all year long". The convention then drew to a close with a long applause by everybody taking part and some friendly banter between the owner of Sassuolo, Giorgio Squinzi, and the team manager, Eusebio Di Francesco, about the team's targets for next season.

A study day during which plenty of useful ideas were exchanged, all to the benefit of the numerous university students in attendance. An event which would certainly have met with the approval of Aldo Sassi, who will never be forgotten either as a researcher or man of sport.





TAKING STOCK AT THE END OF A HIGHLY SUCCESSFUL SEASON

The dream has come true: Sassuolo has qualified for Europa League. At the end of its third season in Italy's Serie A, the team sponsored by the Mapei Group has qualified 3rd for the preliminary round of the Europa League; it has done so by deservedly finishing sixth in this year's Championship that was dominated by Juventus. The preliminary round to be played in July and August will be the start of an intriguing and difficult campaign for ambitious Sassuolo. The fans are already used to the team managed by Eusebio Di Francesco beating big-name clubs based in major cities. Sassuolo managed to qualify for the Europa League in a sprint finish over the last five games of the season and after A.C Milan was beaten by Juventus on 21st May in the TIM CUP final.

ITALIAN PLAYERS TO THE FORE

"We managed to do it with a team made up of almost entirely Italian players", so the owner, Giorgio Squinzi, President of the Mapei Group, is quick to point out. As a matter of fact Sassuolo played almost all its matches with at least nine Italian players in the starting line-up. Qualification for Europa League came at the end of a tough battle with A.C. Milan. "We have to qualify for the Europa League at all costs - so the President of A.C. Milan, Silvio Berlusconi, kept on telling his players - we cannot miss out on qualification for an international competition for the third year running". But in the end Sassuolo finished with 61 points and the red-and-blacks from



A.C Milan with 57. A.C. Milan under its new team manager, Cristian Brocchi, won the 33rd game of the season against Sampdoria in Genoa, while Sassuolo lost 3-1 away to Fiorentina. The only mistake of the season by the goalkeeper, Andrea Consigli, made it an even heavier defeat. But then the Mapei Group-sponsored team managed to get 13 points from the last five games, whereas Berlusconi's team only managed to get 5.

Sassuolo drew 0-0 against Sampdoria at home in Reggio Emilia with Carpi managing to hold AC Milan to exactly the same score at Meazza Stadium in Milan. Di Francesco's team changed gear in the fourth to last game of the season. Proving it is ready to play at an even higher level, Sassuolo won 3-1 away to Torino in Turin. In the end it was the tactical clear-thinking and freshness of Di Francesco's boys that won the day. Bruno Peres equalised for Torino after Sassuolo had taken the lead with a goal by Nicola Sansone, a striker who originally learnt his trade playing for Bayern Munich. In the second half Federico Peluso and newcomer Marcello Trotta scored to give Sassuolo a well-



ABOVE. From left on: Carlo Rossi, President and Managing Director of Sassuolo Calcio, Giorgio Squinzi, owner of Sassuolo, and Giovanni Carnevali, Managing and General Director of Sassuolo Calcio.

deserved win.

Here's Di Francesco's post-match analysis: "Torino forces you play slowly, but I had no intention of adapting to their playing style. I know all about their tactics: they play deep, ready to counterattack, they are great at slowing the game down and then punishing you. We did well not to fall into their trap, speeding up our play when necessary. I am delighted with how we played, a real improvement after a tough period. We won comfortably despite all the difficulties we have had. We conceded a soft equaliser, but we never gave up and we won by playing like a great team".

A.C. Milan's 2-1 defeat at Bentegodi Stadium made it a particularly happy day for the Sassuolo fans. On the third to last day of the season, Lorenzo Pellegrini's goal gave Sassuolo a home win against Verona at the Mapei Stadium. A.C. Milan's hopes of making up ground floundered against a determined Frosinone team: the game at Meazza Stadium finished 3-3. In the second to last game of the season, the up-andcoming youngster Matteo Politano scored Sassuolo's match winner in the game against Frosinone. Meanwhile Berlusconi's European hopes were reignited by A.C. Milan's victory against Bologna by the same score.

Sassuolo were now in sixth position with 58 points, A.C. Milan were seventh with 57 as the final game of the season came round. The green-and-blacks



took on Inter Milan at the Mapei Stadium determined to avoid being overtaken by A.C. Milan on the last day of the season, who were playing at home against Roma. The match at Mapei Stadium got off to an electrifying start with the home team taking the lead in the sixth minute, thanks to a left-foot shot from outside the area by Politano.

In pouring rain the Sassuolo players went all out on the attack and scored a second goal in the 26th minute thanks to Pellegrini, who tapped in a fine pass from the excellent midfield player from Ghana, Alfred Duncan. Inter Milan fought back to momentarily make it a closer game at 2-1. But Inter's fightback ended there and Sassuolo scored a third goal by Politano.

At the start of the second half D'Ambrosio scored for Inter, but the referee disallowed it after the lineman ruled that the defender was offside. Sassuolo reacted strongly to Inter's attempt to make a comeback and had the best of all the remaining chances.

Inter Milan made it even more difficult for themselves when, after first being booked, Murillo was shown a second yellow card for arguing with the referee and sent off. In the end this prestigious 3-1 win against Inter Milan made no difference in qualifying for Europe: A.C. Milan lost 3-1 against Roma.

DI FRANCESCO BEATS MANCINI

"Finishing with 61 points - so the manager Eusebio Di Francesco announced with a big smile on his face - is an important result. We were wonderful. Even though they had some first-team players missing, Inter Milan came to Reggio Emilia to play an important game and they gave nothing away".

When Sassuolo first began playing in Serie A, it lost all of its first three matches against Inter Milan, managed by Walter Mazzarri at the time. Strangely, ever since Roberto Mancini has been on the Inter Milan bench, the games have always ended in Di Francesco's favour: three wins out of three. One of the reasons why Sassuolo qualified for the Europa League this seasons is because the team managed to beat Juventus, Napoli, Inter Milan, A.C. Milan and Torino. Sassuolo only gave away a number of points against the so-called weaker teams.

"The teams at the bottom of the table – so Di Francesco noted - do not allow us any room to play. But teams with Inter Milan's potential and prestige always go on attack and make it easier for us by allowing us plenty of space. With our mentality it is easier to play against the top teams".

A SQUAD OF YOUNG PLAYERS TO PICK FROM

Having young and highly motivated players in the squad is one of the keys to Sassuolo's success. Defrel, Sansone and Berardi were the club's leading scorers with 7 goals. But being able to bring in such key players as Politano, aged 22, 5 goals and a great end to the season, the nineteen-year-old Lorenzo Pellegrini, 3 goals, Diego Falcinelli, aged 25, 2 goals, and Marcello Trotta, 23, who, even though he only joined the club at the end of January, kept on scoring, ensured Sassuolo always fielded a strong team whoever was playing. The forward Domenico Berardi scored 16 goals in the 2013-14 season and 14 the following season. Berardi scored 7 goals in the 2015-16 season and is being targeted by leading Italian and Spanish teams.

The Berardi-Zaza partnership up front

FROM LEFT ON. Berardi in action in the match against Frosinone. Sassuolo's Falcinelli being tackled by Inter Milan's Melo. Giorgio Squinzi, owner of Sassuolo, celebrating at the end of the Sassuolo-Inter Milan match.





IIN THE FACING PAGE. Eusebio Di Francesco. RIGHT. Trophies on display at the Sassuolo-Inter Milan match: the women's UEFA Champions League Cup (left) and the Italian Youth Championship trophy (right).

together scored 25 goals in the 2014-2015 season, but Sassuolo had to settle for 12th place in the league. Strangely the team scored exactly the same number of goals this season: 49 both seasons. Only this time the team is celebrating finishing sixth and there is a reason why: Sassuolo conceded 17 goals less than in the 2014-2015 Championship. The team only conceded 40 goals this season.

The defence has enabled Sassuolo to progress from being an entertaining and promising squad into a real team capable of beating even the very best opposition. Sassuolo only conceded more than two goals twice, losing 3-1 away in Naples and Florence. Consigli's great saves throughout the nine-month season also helped make the difference.

THE GOAL-SCORING DEFENDER

The defenders who have scored most goals in one season in the history of Italian football are the Argentinian Daniel Passarella and Giacinto Facchetti. Passarella scored 11 goals and Facchetti scored 10 during their record-breaking seasons in Italy. But both players had the freedom to push forward to help their strikers.

The four goals scored by the central defender Francesco Acerbi playing for Sassuolo in the 2015-2016 season are highly significant. Acerbi is often expected to mark the opposition's most dangerous strikers and has few opportunities to push forward. Acerbi also

took part in training camps with Antonio Conte's Italian National Team.

The Croatian full-back Sime Vrsaliko, the centre-back Paolo Cannavaro, and all the other defenders and midfielders, made sure the entire team worked smoothly.

THE MANAGERS' DREAMS

"Every single player, without exception, deserves applause - so Eusebio Di Francesco was quick to point out - because we played wonderfully".

Lots of clubs have come knocking at Eusebio's door, but he has extended his contract with Sassuolo. He is now a true Sassuolo man: "I have progressed with Sassuolo and Sassuolo has progressed with me, and that is why I have extended my contract. Here I have the backing of a club that lets me work how I want. It is not the players who decide where they play in this team, it is we who allow them to play to the best of their ability".

Every team manager has his own dreams when it comes to the transfer market. As Eusebio was quick to note, "I was born in 1969 and as somebody who played for Empoli, Roma, Piacenza and the Italian national team, I am delighted with the players the club has given me over the last few years. Who else would I like in my team? Lapadula and Caprari; they play for Pescara and come from where I was born".

Due to the great performances by Sansone and Co., the owner of Sassuolo, Giorgio Squinzi, will support the team even more: "We need to perform well in Europe: I will strengthen the squad".

Leicester City won the Premier League in England this year. So will Sassuolo be able to do the same as Leicester in the 2016-17 season? "I hold Claudio Ranieri, the Leicester team manager, in very high regard. I expect my Sassuolo team to get at least eight points more next season. I think we should be capable of reaching 69 points. We are probably not able to attract many more fans locally, but more and more supporters are coming from outside the Emilia region. We need to earn our fans' support. In any case, the important thing is to keep on progressing".

Comparisons are bound to be made with Mapei's record in cycling. The Mapei Professional Cycling Team is famous for its 654 victories. "My team finished at the top of the international rankings 8 times in 9 years. For the time being cycling is still the sport that has brought Mapei most success, but football is catching up. And now I have Eusebio Di Francesco, who is an excellent team manager".





WOMEN'S CHAMPIONS LEAGUE

THIS IS THE FRENCH TEAM'S THIRD EUROPEAN CUP WIN

UEFA WOMEN'S CHAMPIONS LEAGUE: LYONS CELEBRATES AFTER BEATING WOLFSBURG

"A dazzling success": that was the headline of the leading French sports daily L'Equipe with most of the front page dedicated to Olympique Lyonnais women's football team that won the final of the UEFA Champions League after beating the German side Wolfsburg 5-4 on penalties. The final of the Women's European Cup was held at the "Città del Tricolore" Stadium in Reggio Emilia (Central Italy). After regulation playing time the game ended in a 1-1 draw. Nothing changed during extra time. This was the third UEFA Women's Champions League trophy to be won by Olympique Lyonnais, one more than the other finalist, Wolfsburg, two-time winners of this prestigious trophy.

The best that women's football (particularly European) currently has to offer was on display at the magnificent "Città del Tricolore" Stadium, which was lately upgraded to meet the UEFA standards. The woman-of-thematch award actually went to the Japanese

player Saki Kumagai. She scored the winning penalty that gave Lyonnais a memorable victory.

GERMANY AND FRANCE

The stadium was packed with 15,000 fans for the final in Reggio Emilia. "The Città del Tricolore Stadium - so Adriana Spazzoli noted, Mapei Group's Operational Marketing and Communication Director - is intended to be a stadium for everybody, men and women". And so it was, with both male and female fans coming from Germany, France and Italy. The flypast by the "Frecce Tricolori" aerobatic flying squadron was quite a sight and then the teams entered the pitch accompanied by young children: a wonderful and unique setting of its kind for a women's football match in Italy. It was a rather surreal atmosphere for football with no whistling or booing between rival supporters.

Even though the match ended in a draw after 90 minutes, Olympique Lyonnais was certainly the better team and deserved more. Football is like life: one silly mistake out of the blue can ruin everything. And that is what happened when the match seemed to have been decided by Hegerberg's goal for the French team, but then Alexandra Popp produced a moment of magic for the green-and-whites from Wolfsburg. Just two minutes from the end of regulation time, Popp's goal changed the entire game.

Popp almost scored a second goal in the 92nd minute of extra time and then Schelin missed two golden opportunities at the other end

It inevitably all came down to penalties and Olympique began badly: Hegerberg missed her penalty but then Bouhaddi, who also plays as goalkeeper for the French national team, made two saves from Fischer and Elise Bussaglia. The Japanese player Kumagai then slotted home the winning penalty to send the Lyon team and its supporters into raptures.

VIPS IN THE STANDS

Patrizia Panico, the most capped player ever in the history of Italian women's football and also a UEFA ambassador carried the European Cup out on the pitch. The afternoon began with entertainment on the pitch and ended with rapturous applause from the fans, much to the delight of the various members of the Italian Football Federation present, including General Manager Michele Uva. "It is an honour and a great opportunity to have been chosen to host the final of the Champions League in

hosted the match.

Italy for the first time", so the President of the Italian Football Federation, Carlo Tavecchio, announced. "We are great supporters of women's football and the number of fans who turned up for the match shows we are on the right path. This is a perfect way of injecting fresh life into our development plan for women's football".

Antonio Cabrini, the manager of the women's Italian national team, was also in the stands, along with other members of the team's coaching staff.

The temporary President of UEFA, Angel Maria Villar, and the UEFA General Secretary, Theodor Theodoris, were equally present. The UEFA executives also wished all the best to the Sassuolo men's football team with a lovely gesture, pinning a note on the door of the Citta Del Tricolore Stadium management offices that said: "Congratulations on qualifying for the Europa League, we will see you in Solna". Solna is the Swedish city that will be hosting the final of the men's Europa League in May 2017.

MILAN AND THE MEN'S CHAMPIONS LEAGUE FINAL

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Forty-eight hours after the women's Champions League final in Reggio Emilia, the men's final between Real Madrid and Atletico Madrid was held at the Meazza Stadium in Milan. Real won the Madrid derby, the 11th time it has lifted the European Cup. Just like the women's final, the match was decided on penalties with Real Madrid winning 6-4. The score was 1-1 at the end of regulation time: Sergio Ramos opened the scoring for Real in the 15th minute with Carrasco equalising in the 34th minute of the second half. Nothing changed during extra time. In the end Juanfran (Atletico) hit the post during the penalty shootout, allowing Cristiano Ronaldo to step up and score the winning goal for Real.



ABOVE. The flypast by the "Frecce Tricolori" aeroba tic flying squadron over the Stadium. LEFT. Saki Kumagai was the woman-of-the-match as she scored the winning penalty.







Stelvio2Africa

One in eight kids are dying before their 5th birthday in East Africa, two-thirds from treatable/preventable diseases and 80% will never see a healthcare provider. Public health for kids should be a birth right, but sadly that is not the case in this part of the world.

Fortunately there are foundations like "shoe4africa" who are committed to helping those with the misfortune of being born into poverty.

REALTÀ MAPEI INTERNATIONAL'S TRANSLATOR WILL BE TAKING ON THE STELVIO TWICE WITH THE HELP OF MAPEI SPORT TO AID AFRICAN CHILDREN Shoe4africa was set up by Toby Tanser and relies on the generosity of ordinary people to carry out its work in one of the poorest regions of the world. After initially simply collecting running shoes to help out the vast number of talented athletes in Kenya, who could not afford them, the Foundation is now in the process of building a children's hospital and providing health and education where it is desperately needed. For more information visit their website at: <u>www.shoe4africa.com</u>.

On a personal note, I have decided to try and raise as much money as possible for the "shoe4africa" foundation through a sponsored double climb of Stelvio Pass in Italy (first by bike and then running). The climb is exactly a half



Martyn Anderson. translator of *Realtà Mapei International* and keen amateur sportsman

Sible for the shoedanica foundation through a sponsored double climb of Stelvio Pass in Italy (first by bike and then running). The climb is exactly a half marathon at an average gradient of 7.2% and my aim is to complete the 42.2 km challenge as quickly as possible, which, I think, might set a record since nobody else seems to have been stupid enough to try it!

However, after deciding to call my project "stelvio2africa", I soon realised that I would definitely need expert advice with my training, if I was to have any chance of completing the challenge. I immediately thought of Mapei and Mapei Sport, who have been training both champions and ordinary amateur athletes like me for decades. Luckily for me they were only too happy to help me train for my challenge. Thanks to tests carried out at their cutting-edge sports lab in Olgiate Olona, near Milan, and a training plan carefully customised to my own ability and limitations, I now have no excuse for failing!

On 10th July I will line up with thousands of other cycling-running enthusiasts in Bormio for the legendary Mapei-sponsored "Re Stelvio" race. Of course all my efforts will count for nothing unless I manage to raise some money for such a worthy cause as "shoe4africa", so, if you can, please make a contribution through the website: <u>www.stelvio2africa.com</u>.

Every penny/Euro/dollar etc. will go directly to the Foundation, so even the smallest donation is welcome and will make a difference in East Africa.

A NEW QUESTION&ANSWER COLUMN STARTS IN THIS ISSUE OF THE MAGAZINE!



SCREEDS: WHY WAIT?

How long after laying a cementitious screed can you start installing ceramic, natural stone or wooden flooring? After laying a cementitious screed, how long should you wait before applying a waterproofing layer or a smoothing and levelling layer? A lot of people would say: it depends. But on what? Maybe on the type of cement or the admixtures, or on the thickness of the screed? Let's answer these questions together.

According to UNI EN11493, section 3.26, a screed is "a layer of cementitious mortar installed directly on a substrate. It may be bonded or isolated (by interposing an intermediate or isolating layer) and is used to reach a predetermined specified level and/or to form a support layer and to distribute loads".

A screed is made up of cement (cementitious matrix), a stone-derived portion (sand/aggregates) and water. The cement requires a certain amount of water so that it may be hydrated and then harden. While it is drying out part of the water evaporates, the screed shrinks and reduces in volume and a physiological phenomenon known as "hygrometric shrinkage" takes place within the screed.

When more water than necessary is used, maybe to increase the mix's workability and make it quicker to pour, the rate of "hygrometric shrinkage" in-



creases. The higher the amount of mixing water in the mix, the higher the rate of shrinkage. If we try to bond floor covering to the screed before the excess water has evaporated off, or before the shrinkage phase has terminated, stresses and tension in the substrate will be transferred to the flooring and there is a concrete risk of the flooring becoming detached.

Also, the higher the amount of water in the mix, the longer it will take to dry out. While the water evaporates, it will seep through the joints between the tiles in the form of vapour, and in a best case scenario unsightly saline efflorescence will form. An even greater risk is that the vapour could stagnate under the flooring, especially in the case of materials that are particularly sensitive or even impermeable (wood, PVC), and cause the flooring to detach. A reminder also that excess water in cementitious systems has a negative effect on mechanical strengths and leads to technical defects, such as segregation of the components in the mix or the formation of surface bleeding (a thin crust poorly attached to the base).

So let's answer the first question. How long does it take for a screed to dry? Even though numerous factors play a part in the final result, a correctly mixed and applied cementitious screed may be considered dimensionally stable



and reasonably dry after 28 days and floor coverings not particularly sensitive to moisture may be installed. This curing time, however, may be reduced by using special binders or readymixed products (such as TOPCEM or MAPECEM by Mapei) or by using admixtures to reduce the water/cement ratio in the mix (such as admixtures from the Mapescreed line by Mapei).

Marco Albelice. Mapei Technical Services Department.

> In the next issues we will look at an issue connected to the preparation of screeds and hygrometric shrinkage: joints.

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