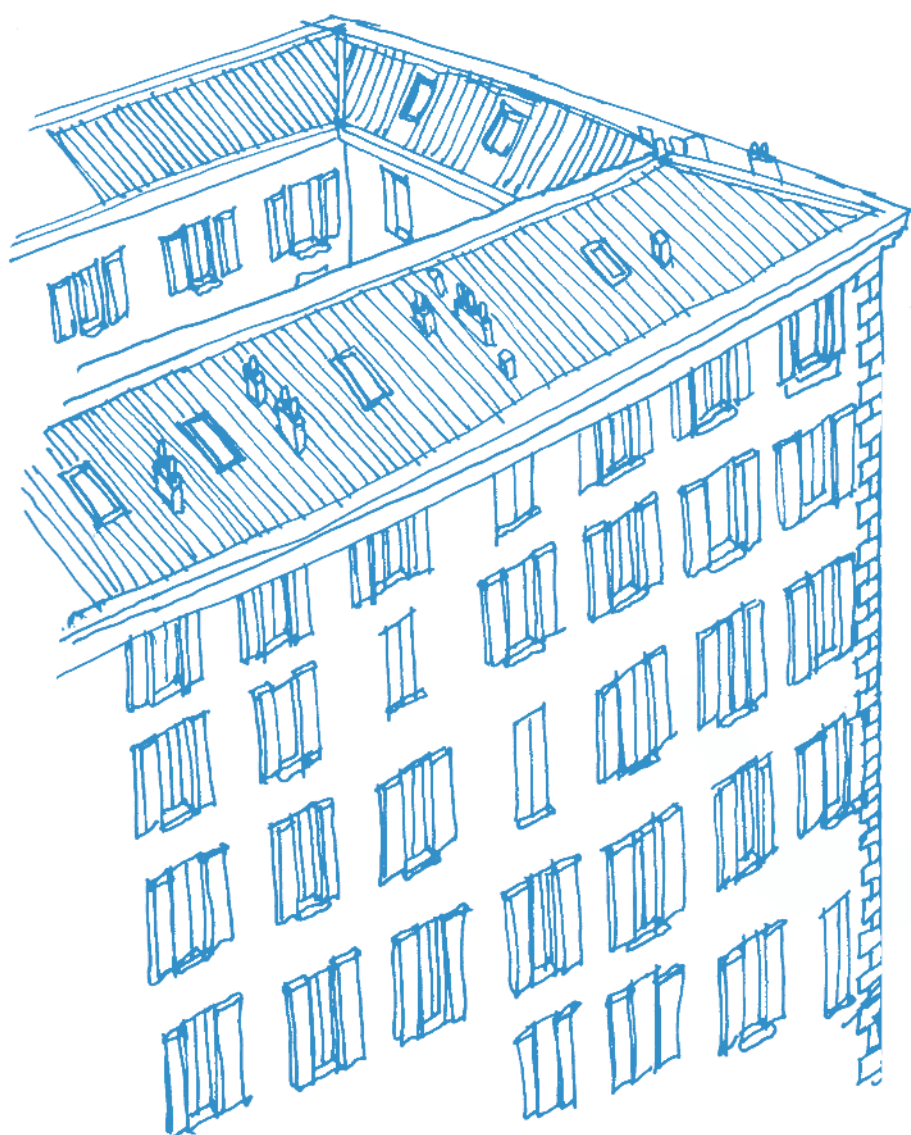


Mape-Antique

LIME-based products and systems for restoring masonry buildings

Consolidation, dehumidification, protection and decoration







Mape-Antique

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Eco-sustainable
solutions
for the quality
of life



Products and systems for restoring masonry buildings



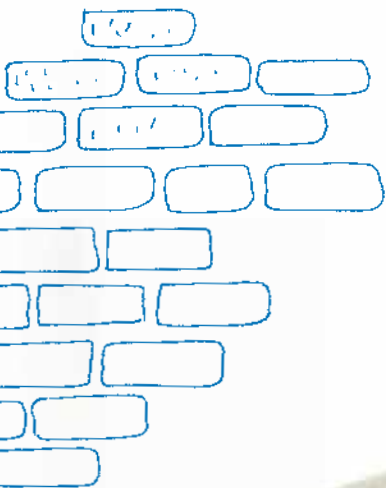
The restoration of masonries, buildings whether they are residential ones or of historical and artistic interest, must only be carried out after establishing the exact cause of the deterioration or the actual state of the structure by means of a thorough visual inspection and, where necessary, diagnostic analysis. The correct intervention techniques and the most suitable materials for each phase of the intervention must then be identified, based on the performance requirements and characteristics of the products employed.

Apart from a brief description of the characteristics and properties of the MAPE-ANTIQUE range, this brochure also presents the products from the range divided into categories, and identifies for each product its areas of use, main data and final performance characteristics. All this is done to help specifiers, designers and users identify the most suitable material for restoration and renovation work on buildings.

The categories identified in this brochure are as follows:

- Injection slurries
- Binders for making mortars
- Mortars for dehumidifying renders
- Mortars for transpirant and “structural” renders
- Masonry mortars
- Skimming mortars





Eco-sustainable
solutions: turn
every project
into a success





Rediscovering traditional binders: lime and pozzolan

Amongst the most antique components used to construct buildings, the first place without a doubt goes to lime in all its variations. The first documented evidence of the production and application of lime dates back to the Roman era. It is thanks to the publication of “De Architectura” by Vitruvius, around 13 B.C., that details have been passed down through the ages about not only the amount of lime and sand to be mixed together, but also on the preparation of hydraulic lime made by combining aerated lime with sand and purple-red volcanic tuffs; these ones have been taken from the Naples area, mainly Pozzuoli, from which the name “pozzolan” is derived (from its Latin name pulvis puteolana).

“Pozzolan is a type of sand which seems to come from crushed pumice and porous lava spewed out by Vesuvius and other volcanic eruptions, and then spread by the winds over a considerable distance. This material took its name from the city of Pozzuoli, from where it would seem the Romans took the first batches and used it for the first time.”

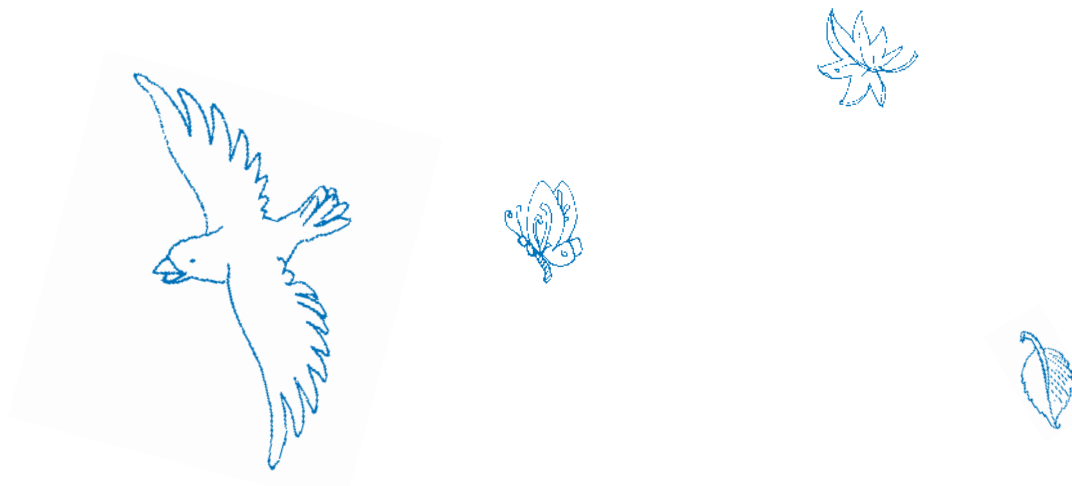
(Vitruvius, Book II, Chapter VI)

The preparation of mortar using aerated lime and volcanic sand, however, dates back to the Phoenicians, who were known as a highly advanced civilisation, and to which the melting and smelting of metals is attributed.

The knowledge about the production processes and use of lime binders was passed down to the Cretans and Etruscans and then to the Romans, who made wide use of it. It was the Romans who made improvements to the application phases and techniques of mortar, as well as to the various mixing ratios of the ingredients of mortar.

Today, apart from the different types of oven used and the way it is “slaked”, the production of lime is not different from the system used in the past by the Romans. In fact, the production of lime consists in breaking up selected limestone into rough chunks and then baking it at a high temperature (calcination takes place at around +900°C). This type of stone is extremely common and has a high calcium carbonate (CaCO_3) content, around 95%, and less than 5% of impurities (mainly clay, as well as smaller traces of silica, iron oxide, magnesium carbonate, etc.), in particular the clayey one.

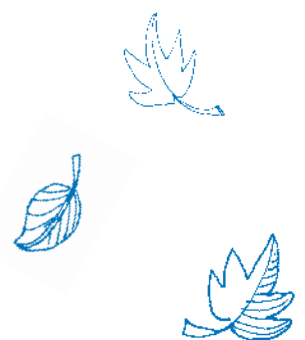
This process forms calcium oxide (CaO), also known as “quicklime”, and carbon dioxide. The “quicklime” is then made to react with water through a hydration process which generates a large amount of heat. This process is known as “slaking” the “quicklime”, and the material resulting from this process, known as “slaked lime”, is nothing more than hydrated lime [Ca(OH)_2 – calcium hydroxide]. Once it has been applied as masonry or render mortar, paint or a coating material,

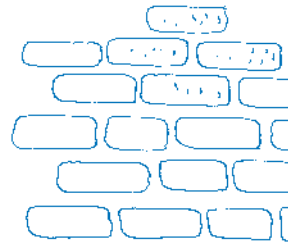


the hydrated lime reacts with the carbon dioxide present in the surrounding atmosphere to form calcium carbonate again. This process, known as lime “carbonation”, is an extremely slow process which causes the product to harden. From a chemical-physical point of view, a compound forms at the end of this reaction which is similar to the one at the start of the entire process, but with a considerable loss in volume due to the mixing water evaporating off.

When hydrated lime is mixed with volcanic sand, pumice, fossil fragments and tuff (natural pozzolan), or with roof tiles, hollow flat tiles, furnace refuses with metakaolin and terracotta in the form of fragments or dust from baked, ground bricks or pottery (artificial pozzolan) or flying ashes, silica fumes and blast furnace slags (synthetic pozzolan), it develops hydraulic properties and, therefore, it has the capacity to set and harden in water. This process consists of a chemical reaction between calcium hydroxide $\text{Ca}(\text{OH})_2$ and silica (SiO_2) or alumina (Al_2O_3), if required, which are present in the pozzolan, and with water, to form calcium silicate hydrates (C-S-H) and calcium alumina hydrates (C-A-H) which are stable in water. This reaction named pozzolanic activity or pozzolanic behaviour, is rather slow, and determines both the hardness of the mortar and higher mechanical strength, higher than the one of the lime itself.

The combined use of lime and pozzolan or terracotta guaranteed, therefore, that the mortar used in the past became particularly hard, so that today we can still admire imposing infrastructures which are still standing after so many centuries, such as roads, bridges and aqueducts, along with villas and monuments, all constructed during the period of the Roman Empire.





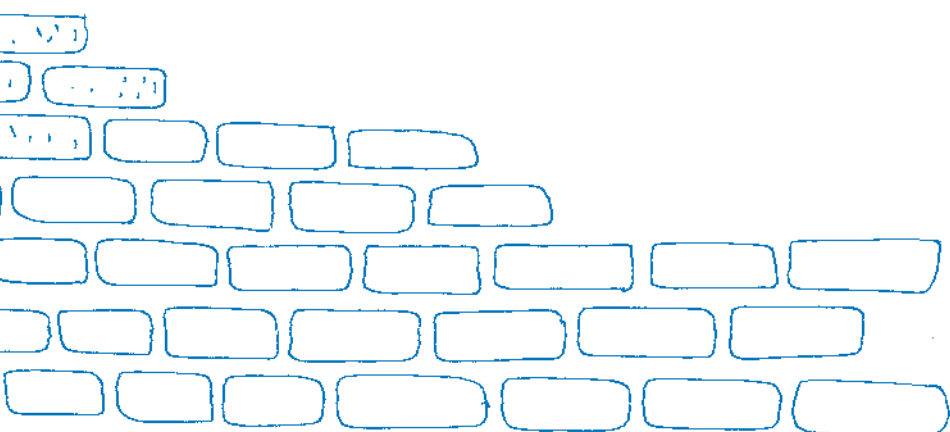
From traditional to modern pozzolan: Eco-Pozzolan

The rediscovery of the extraordinary chemical and mechanical performance characteristics of lime combined with natural pozzolan or terracotta has inspired the Mapei Research & Development laboratories into developing innovative products and systems for the restoration of buildings, including those of historical and artistic interest, using “modern” pozzolanic materials. The result of the research work carried out is the use of a special product with a pozzolanic reaction, Eco-Pozzolan; a very light coloured inorganic material particularly rich in amorphous silica, with a highly-reactive, large specific surface area.

Thanks to these characteristics, Eco-Pozzolan has the capacity to set off the hardening process of the lime after a very short time, unlike in the past when the process was extremely slow, so that restoration mortar and injection slurries are highly resistant to soluble salts just a few days after application.

*Pieve di San Donato
Polenta - Bertinoro
(Forlì-Cesena) - Italy*





What is Eco-Pozzolan?

With the term “ecological” we mean the branch of inter-disciplinary science which investigates environmental problems and possible ways of addressing imbalances. It is all to do with the relationship between living beings and organism and the surrounding environment. Other terminology is now commonly used too, such as ecological architecture, bio-architecture, bio-construction, sustainable building, etc. These terms are sometimes used improperly as synonyms, often as a support for advertising or commercial messages, yet they often have a precise meaning.

Amongst these terms, a particularly significant one is bio-construction. Used for the first time in Germany - *Baubiologie* – and then introduced in Italy at the beginning of the Nineties, it identifies a process whereby the attention is no longer on the building itself, but rather on its intended use. Bio-construction is based on the concept that man, buildings and the environment must live in perfect synergy and harmony. In fact, the suffix bio means “in favour of life” and, therefore, the term bio-construction in the everyday language means the use of technology and materials which respect people and their health, along with the environment in which new constructions are localised.

Two other words go hand in hand with bio-construction: eco-sustainability (which refers to the environment) and bio-compatibility (which refers to our health). It is precisely with their attention towards the environment on the one hand and the requirements of the modern building industry on the other, and particularly to improving living comfort, that the Mapei Research & Development laboratories have evaluated the characteristics of an eco-sustainable material: to construct by limiting the consumption of non-renewable resources, reduce its impact on

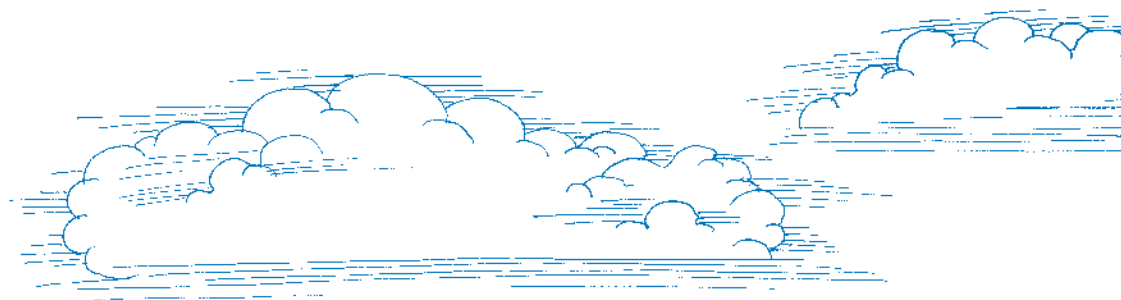
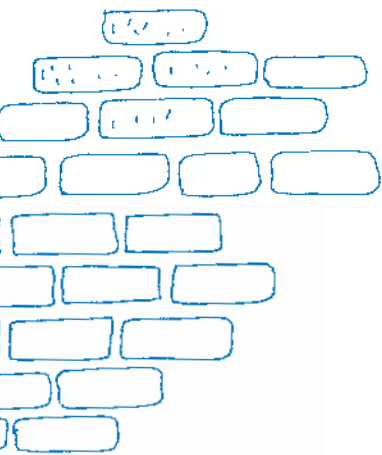
FEG environmental scanning electron microscope (ESEM), used in the Mapei R&D laboratories



the environment to a minimum and, at the same time, be bio-compatible by containing no volatile organic compounds (VOC). This product is Eco-Pozzolan. The aim of the latest directives is to considerably reduce emissions into the atmosphere, especially CO₂, and promote the use of alternative energy.

Eco-Pozzolan has all the characteristics to be defined as an eco-sustainable material, in that its sustainability is inversely proportional to the amount of energy consumed. In fact, it is a product which is already present on the market and is the result of previous processes. As a result, it may be used without consuming any more energy either to produce it or make it suitable for use.

Also, Eco-Pozzolan, as volcanic sand and terracotta, has all the right properties to make a system based on lime, which we know is an aerated binder, into a hydraulic system. If combined with lime, this light-coloured product, particularly rich in amorphous silica with a highly-reactive large specific surface area, has the capacity of setting off the hardening process of the material after a very short time, reacting with the “free” lime present and completely “consuming” it after just a few days. Apart from the hardness of the mortar, this reaction also makes the mortar stronger, homogenises its chemical and physical characteristics, makes it insensitive to the leaching action of rain and gives it high chemical resistance to both aggressive atmospheric agents and soluble salts.



Mape-Antique range: Technology that respects tradition

The combined use of lime and Eco-Pozzolan has led to Mapei formulating a specific range of dedicated products called MAPE-ANTIQUÉ for the consolidation and restoration of brick, stone, tuff and mixed masonries, including the masonries of buildings of historical or artistic interest.

The products in the MAPE-ANTIQUÉ range have physical and mechanical characteristics similar to masonry and render mortars used in the past and, as such, they are more compatible with any type of original structure. At the same time, they have high mechanical strength and resistance to the aggressive chemical action from both the environment, such as acid rain, freeze-thaw cycles and pollutant gases, and from within the masonries itself, such as soluble salts and damp. Thanks to their macroporous structure (photo 1) in the case of dehumidifying renders, most of the products in the MAPE-ANTIQUÉ range are highly transpirant and porous, with a much higher capacity to encourage the evaporation of water from the masonries compared with traditional cementitious or lime-cement render mortars. Whether humidity or damp is caused by weather conditions or rising damp, this process allows damp structures to dry off and provide healthier, more comfortable surroundings. Also, if soluble salts are present in the masonries, they crystallise in the macropores (photo 2) without generating stresses which could potentially deteriorate the renders. Unlike mortars normally used for repair work, such as those made from aerated lime, hydraulic lime



PHOTO 1 - Macropores in dehumidifying mortar from the MAPE-ANTIQUÉ range

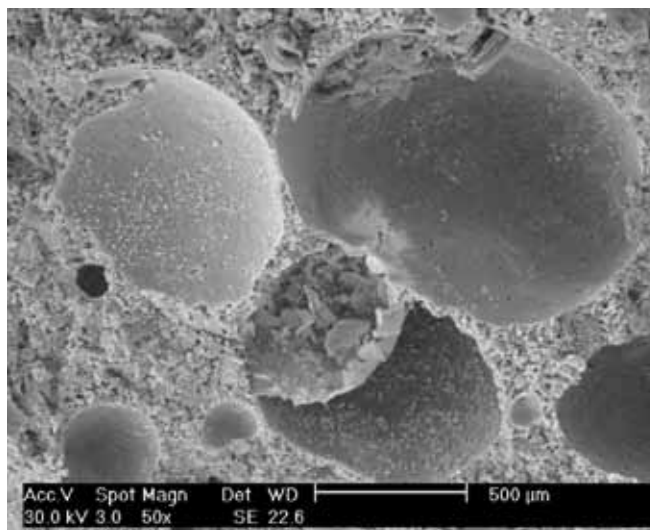


PHOTO 2 - Crystallisation of salts in the macropores of dehumidifying mortar from the MAPE-ANTIQUÉ range





and natural hydraulic lime which also harden through a process of carbonation (see EN 459-1), the reaction between lime and Eco-Pozzolan forms silica-alumina compounds whereby the “free” lime is completely “consumed” after just a few days, so that restoration mortar and injected slurries are completely resistant to soluble salts present in the masonries. The mortars mentioned previously, however, even if they are sufficiently porous and mechanically compatible with the materials originally used, are not immune to the risk of aggression from chemicals.

In fact, the “free” lime contained in these materials may chemically react with the sulphates in the masonries and with C-A-H (calcium alumina hydrates) and C-S-H (calcium silica hydrates) in the original mortar or in mortar used for repair, to produce compounds called *ettringite* and *thaumasite*, which then expand and cause the renders to crack and/or crumble.

With the products in the MAPE-ANTIQUE range, on the other hand, this phenomenon does not occur because there is absolutely no “free” lime after just a few days. From a morphological point of view, it is thanks to this particular characteristic that the structure of the products from the MAPE-ANTIQUE range is similar to that of “historical mortar” made from aerated lime and pozzolan, but which only forms after a number of years (photos 3 and 4).

PHOTO 3 - Micrograph of ancient mortar. Notice how the amorphous mass is completely carbonated

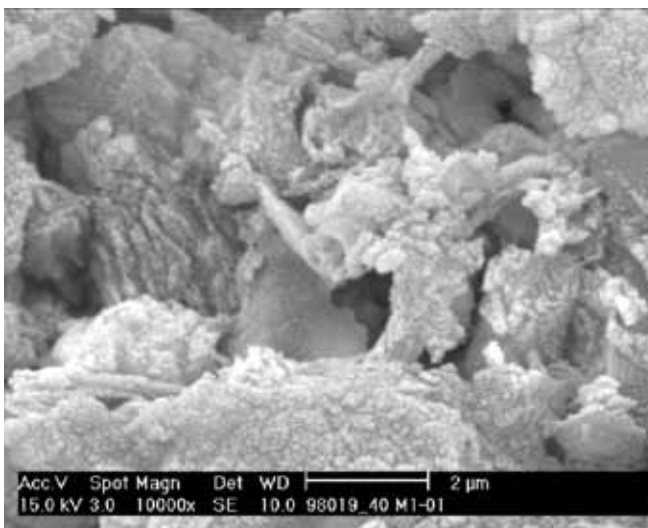
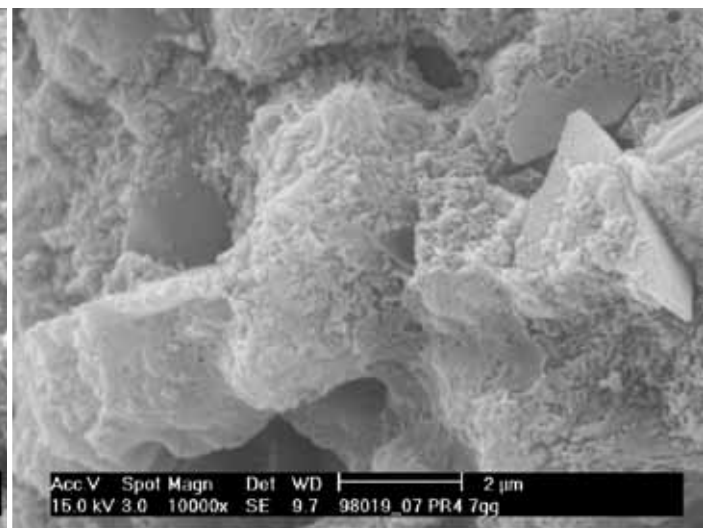


PHOTO 4 - Micrograph of MAPE-ANTIQUE mortar after 8 days of “ageing”. Notice the rounded structure typical of a stabilised system





Mape-Antique range: Properties

*Former Cerere pasta works
Rome - Italy*

- Mechanical strength similar to the one of traditional hydrated lime and hydraulic lime-based systems.
- Elastic and mechanical properties compatible with those of the materials originally used to construct buildings.
- Workability similar to the one of the highest quality hydrated lime-based systems.
- Highly transpirant and porous, with the capacity to eliminate the risk of condensation forming on the surface, meaning healthier, more comfortable surroundings.
- High resistance to soluble salts, thanks to the chemical reaction between the lime and the Eco-Pozzolan, which “consumes” all the “free” lime very quickly.
- No alkali-aggregate reaction.
- Negligible thermal conductivity due to the low level of “free” lime, which also eliminates the formation of efflorescence.
- It may be tinted on site with coloured powders or oxides.



Mape-Antique range: A system perfected and consolidated through more than 20 years of experience*

Rocca di San Floriano - San Floriano (Gorizia) Italy



Ancient apartment block in Pisa - Italy



Cathedral of Santa Margherita Montefiascone (Viterbo) Italy



Duchy of Canevaro Zoagli Castle (Genoa) - Italy



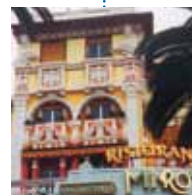
Balbanello Villa, Como - Italy



Ancient building in Florence - Italy



Hotel Mirò - Rapallo (Genoa) - Italy



National School of the Arts - Havana - Cuba



1992

1993

1994

1995

1996

1997

1998

1999

2000

2001

2002



Ancient building in Bagnacavallo (Ravenna) Italy



Church of Santa Giulia, Livorno - Italy



San Paternian Bridge, Venice - Italy



Basilica of San Francesco d'Assisi - Assisi - Italy



Spilberk Castle, Brno - Czech Republic



Palazzo Bonini, Massa Carrara - Italy



St. Apollinare, Ravenna - Italy



Acaya Castle - Venerole (Lecce) - Italy

* Reference projects carried out using products from the Mape-Antique range



Cambrai Railway Station - France



Palazzo dei Normanni - Palermo - Italy



Negova Castle - Slovenia



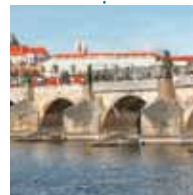
Corpus Christi Convent - Vila Nova de Gaia - Portugal



Le 5 Corti apartment complex, Varese - Italy



Carlo Bridge, Prague - Czech Republic



Pieve di San Donato a Polenta - Bertinoro (Forlì-Cesena) - Italy



Victoria Theatre Singapore



2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014



Oratory of the Passion, St. Ambrogio - Milan - Italy



Palazzo Zaccagna Carrara (Messina) - Italy



Tosi Residence, Sassuolo (Modena) - Italy



"Minuto Pesce" Town Square - Molfetta (Bari) - Italy



Jesuit Fathers Monastery - Poland



Incis residential complex - Campobasso - Italy

Mape-Antique range: A host of products and solutions for all your needs

Injecting
consolidating
slurry into a rubble
masonry

Re-establishing
the adhesion
of a render

Pointing between
brickwork

Macroporous
dehumidifying
render

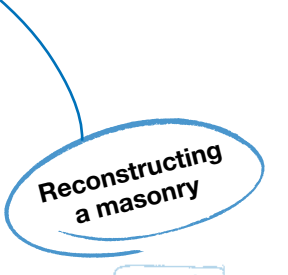
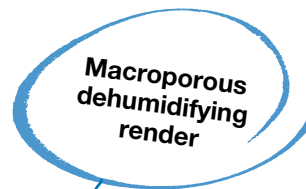
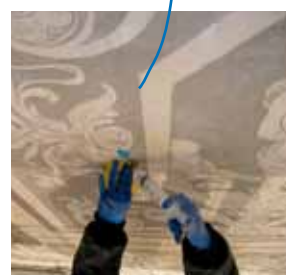
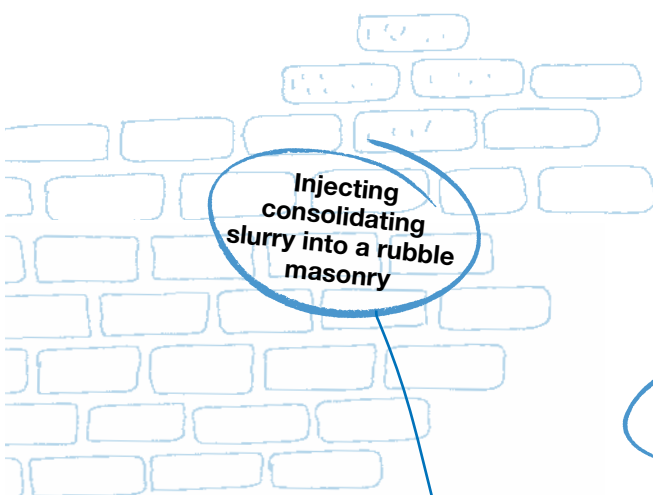
Application of
a transpirant
undercoat/
base coat

"Reinforced"
render

Application of a
"scratch-coat" layer

Spreading a
transpirant,
smooth texture
skim coat

Reconstructing
a masonry



Building a facing wall

Applying a scratch coat

Cladding work

Pointing "an exposed" masonry

Dehumidifying render mixed on site

Reconstructing a masonry

Restoring the adhesion between masonry and frescoed render

Injecting consolidating slurry into masonry

Pointing between brickwork





■ Ideal
■ Possible

PROBLEMS

Consolidating “rubble masonry” and masonry in general where there are internal cracks, gaps and cavities by injecting slurries

Reconditioning and consolidating “rubble masonry” and masonry in general by casting or pumping hi-flow mortars

Consolidating foundation elements, pillars, vaulted roofs and arches by injecting slurries

Reconditioning and consolidating foundations, pillars, vaults and arches by casting hi-flow mortars

Consolidating structures with frescoes or elements of particular historical and artistic interest by injecting slurries

Restoring the adhesion between masonry substrate and render, including the frescoed one by injecting slurries


























Consolidating cane-mesh vault injecting slurries

“Stitching” fractures, wall bays, angle joints, etc.

“Touching-up” and “plumbing” operations

Mape-Antique I Super-fluid injection slurry	■		■					■ (+ steel rods, MAPEROD or CARBOTUBE)	
Mape-Antique I-15 Super-fluid injection slurry	■		■					■ (+ steel rods, MAPEROD or CARBOTUBE)	
Mape-Antique F21 Super-fluid injection slurry	■		■		■	■	■	■ (+ steel rods, MAPEROD or CARBOTUBE)	
Mape-Antique LC Binder for mortar									■ (+ aggregates)
Mape-Antique Rinzafo Scratch-coat mortar									
Mape-Antique CC Dehumidifying render									■
Mape-Antique MC Dehumidifying render									■
Mape-Antique MC Macchina Dehumidifying render									
Mape-Antique Intonaco NHL Transpirant render									
Mape-Antique Strutturale NHL Structural render									■
Mape-Antique FC Ultrafine Ultra fine-grained texture plaster									
Mape-Antique FC Civile Fine-grained texture plaster									
Mape-Antique FC Grosso Coarse texture plaster									
Mape-Antique Hi-Flow Hi-flow masonry mortar		■		■					
Mape-Antique Allettamento Masonry and pointing mortar									■

Before applying dehumidifying render (made from **Mape-Antique LC** mixed with aggregates, **Mape-Antique CC**, **Mape-Antique MC** or **Mape-Antique MC Macchina**), always apply a layer of **Mape-Antique Rinzafo**, approx. 5 mm thick.

Scratch-coats on weak and/or porous masonry before applying transparent or structural render	Site-mixed dehumidifying render with locally-sourced aggregates	Application of dehumidifying render	Application of transparent render	Application of "reinforced" structural render	Skimming dehumidifying, transparent and structural render	Building and/or rebuilding facing walls with site-mixed masonry mortar with locally-sourced aggregates	Building and/or rebuilding facing walls with free-flowing masonry mortar	Building stone, brick tuff and mixed masonry	Pointing masonry joints on "exposed" masonry	Making "reinforced" joints or installation mortar	Evening out external faces of vaulted roofs	Making reinforced "caps" on the external face of vaulted roofs
	 (+ aggregates)					 (+ aggregates)			 (+ aggregates)			
												
												
												
												
												
				 (+ MAPENET EM 40 or zinc-plated mesh)						 (+ steel rod or MAPEROD)		 (+ MAPENET EM 40 or zinc-plated mesh)
												
												
												
												
												





Mape-Antique range: The products

The MAPE-ANTIQUE range includes super-fluid, volumetrically-stable, injectable fillerized slurries, binders to be mixed with assorted aggregates on site to make mortars, macroporous dehumidifying mortars, transpirant and “structural” mortars, masonry mortars and skimming mortars in various textures and colours. All the products in the range are **cement-free** and are based on **lime** and **Eco-Pozzolan**, and their transpiration capacity, porosity, thermal conductivity and very low emission of volatile organic compounds (VOC) meet today’s application requirements and the fundamental principles of eco-sustainability to protect the environment, and bio-compatibility to safeguard people’s health. Also, their elastic and mechanical properties are similar to those of existing masonries, including the ones of historical and artistic interest.

Injection slurries

Mape-Antique I	page	23
Mape-Antique I-15	page	25
Mape-Antique F21	page	27

Binder for making mortars

Mape-Antique LC	page	29
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Mortars for dehumidifying renders

Mape-Antique Rinzafo	page	33
Mape-Antique CC	page	35
Mape-Antique MC	page	37
Mape-Antique MC Macchina	page	39

Mortars for transpirant and structural renders

Mape-Antique Intonaco NHL	page	41
Mape-Antique Strutturale NHL	page	43

Masonry mortars

Mape-Antique Hi-Flow	page	45
Mape-Antique Allettamento	page	47
Mape-Antique Strutturale NHL	page	49

Skimming mortars

Mape-Antique FC Ultrafine	page	51
Mape-Antique FC Civile	page	53
Mape-Antique FC Grosso	page	55



Caen Castle - Caen - France

Intervention

Consolidation and safety work on the north-western section of the castle ramparts by injecting a super-fluid, cement-free, volumetrically-stable slurry to bring the structure back to its original state.



Mape-Antique I



Super-fluid, salt-resistant, fillerized hydraulic binder, based on lime and Eco-Pozzolan, for making injection slurries for consolidating masonry



Areas of use

Super-fluid, volumetrically-stable injection slurry with high resistance to soluble salts for consolidating:

- foundations, pillars, vaulted roofs and archways;
- “rubble masonries”;
- stone, brick, tuff and mixed masonries in general of existing buildings with cracks, voids and internal cavities, including buildings of historical or artistic interest and listed buildings;
- masonries with capillary rising damp and soluble salts.

Product details, application guide and final performance data

Maximum size of aggregate:	100 µm (EN 1015-1)
Bulk density of fresh mortar:	1,900 kg/m ³ (EN 1015-6)
Appearance of mix:	Super-fluid
Bleeding:	Absent (NorMaL M33-87)
Fluidity of mix:	< 30 s (initial) < 30 s (after 60 min.) (EN 445)
Compressive strength (after 28 days):	18 N/mm ² (EN 196-1)
Reaction to fire:	Class A1 (EN 13501-1)
Resistance to sulphates:	High (Anstett test method)
Saline efflorescence (after semi-immersion in water):	Absent



Packaging

20 kg bags

Colour

White

Consumption

approx. 1.40 kg/dm³
(of cavities to be filled)

Application

By injection or pouring



Consolidation of “rubble masonry” stone masonry



Consolidation of a brick parapet wall

Injection slurries

Binder for making mortars

Mortars for dehumidifying render

Mortars for transparent and structural renders

Masonry mortars

Skimming mortars



San Rocca di Botte – San Marco in Preturo (L'Aquila) - Italy

Intervention

Consolidation of masonry by injecting super-fluid, volumetrically-stable, guaranteed-performance bonding slurry.

New

Mape-Antique I-15



Salt-resistant, fillerized hydraulic binder, based on lime and Eco-Pozzolan, for making highly-fluid injection slurry for consolidating masonry



Areas of use

Super-fluid, volumetrically-stable injection slurry with high resistance to soluble salts for consolidating:

- foundations, pillars, vaulted roofs and archways;
- “rubble masonries”;
- masonry in general made from stone, bricks, tuff and mixed materials where present;
- cracks, gaps and internal cavities in existing buildings, including listed buildings and buildings of historical or artistic interest;
- masonry with capillary rising damp and/or contaminated by soluble salts.

Product details, application guide and final performance data

Maximum size of aggregate:	100 µm (EN 1015-1)
Bulk density of wet mortar:	1,950 kg/m ³ (EN 1015-6)
Consistency of mix:	Super-fluid
Bleeding:	Absent (NorMaL M33-87)
Fluidity of mix:	< 30 s (initial) < 30 s (after 60 min.) (EN 445)
Compressive strength (after 28 days):	15 N/mm ² (EN 196-1)
Reaction to fire:	Class A1 (EN 13501-1)
Resistance to sulphates:	High (Anstett test method)
Saline efflorescence (after semi-immersion in water):	Absent



Packaging
20 kg bags

Colour
White

Consumption
approx. 1.50 kg/dm³
(of cavities to be filled)

Application
By injection or pouring



Fastening the small rubber injection tubes in place



Injecting Mape-Antique I-15

Injection slurries

Binder for making mortars

Mortars for dehumidifying render

Mortars for transparent and structural renders

Masonry mortars

Skimming mortars



Basilica of St. Francesco and Holy Convent - Assisi - Italy

Intervention

Consolidation of the internal and external faces of the vaulted roofs with frescoes by Giotto and Cimabue in the Upper Basilica, by injecting a cement-free, super-fluid, volumetrically-stable slurry to fill the cracks and internal cavities and to re-establish the adhesion between portions of detached frescoed renders and the masonries. Other interventions included the repair and reconstruction of collapsed roofs and strengthening to the entire vaulted roof structure.



Mape-Antique F21



Super-fluid, salt-resistant, fillerized hydraulic binder, based on lime and Eco-Pozzolan, for making injection slurries for consolidating masonry and render, including the frescoed one



Areas of use

Super-fluid, volumetrically-stable injection slurry with high resistance to soluble salts for consolidating:

- foundations, pillars, vaulted roofs and archways;
- “rubble masonries” and stone, brick, tuff and mixed masonries in general of existing buildings with cracks, voids and internal cavities, including buildings of historical or artistic interest and listed buildings;
- masonries with capillary rising damp and soluble salts;
- structures with frescoes;
- renders detached from masonries, including renders with frescoes or of historical and artistic interest.

Product details, application guide and final performance data

Maximum size of aggregate:	100 µm (EN 1015-1)
Bulk density of fresh mortar:	1,650 kg/m ³ (EN 1015-6)
Appearance of mix:	Super-fluid
Bleeding:	Absent (NorMaL M33-87)
Fluidity of mix:	< 30 s (initial) < 30 s (after 60 min.) (EN 445)
Compressive strength (after 28 days):	10 N/mm ² (EN 196-1)
Reaction to fire:	Class A1 (EN 13501-1)
Resistance to sulphates:	High (Anstett test method)
Saline efflorescence (after semi-immersion in water):	Absent



Packaging

17 kg bags

Colour

White

Consumption

1.04 kg/dm³ (of cavities to be filled)

Application

By injection or pouring



Re-establishing the adhesion of decorated render



Consolidation of stone masonry

Injection slurries

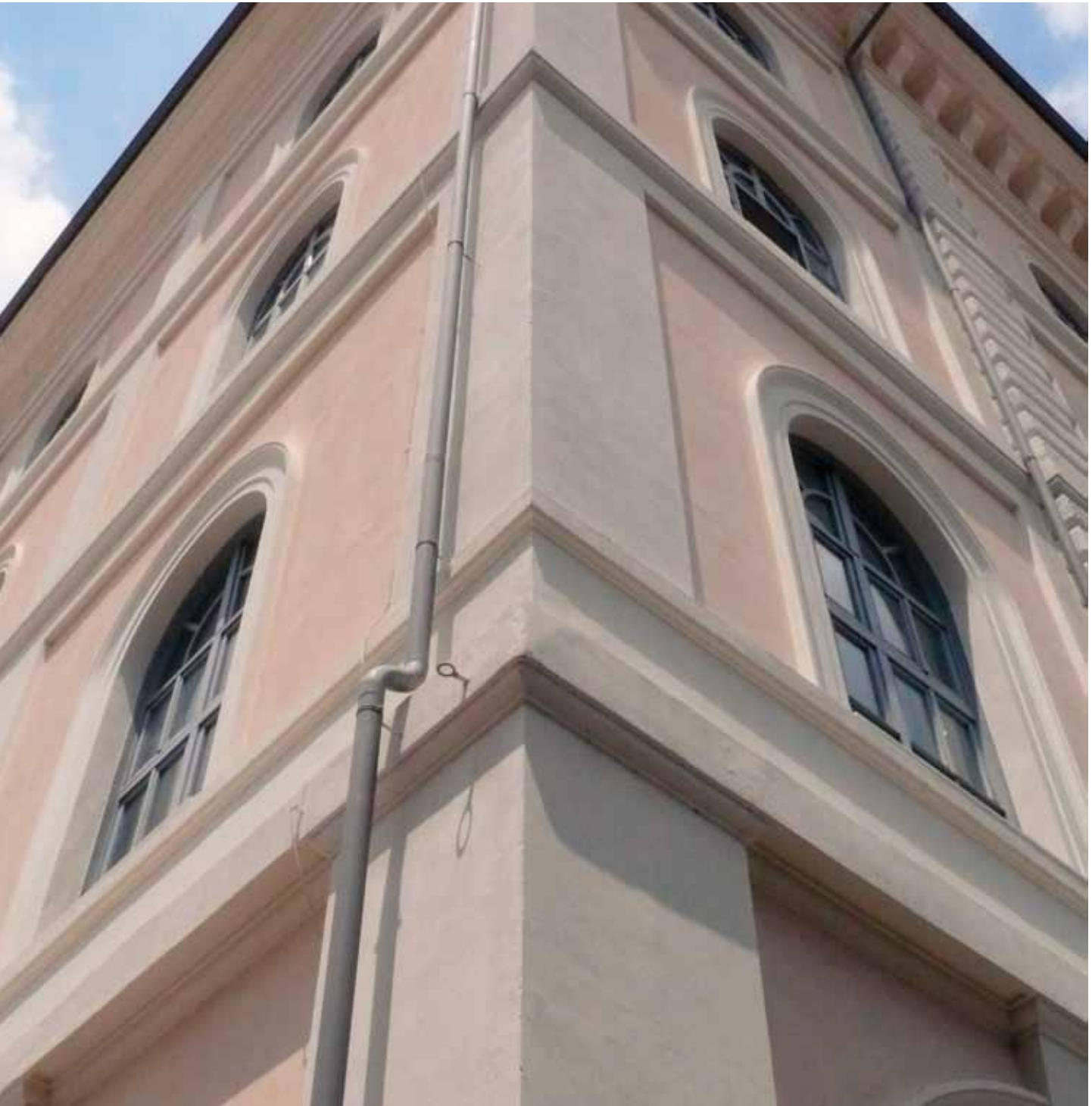
Binder for making mortars

Mortars for dehumidifying render

Mortars for transparent and structural renders

Masonry mortars

Skimming mortars



Ferdinando of Savoia barracks - Rome - Italy

Intervention

Interventions were carried out on F block which houses the administration offices, and comprised consolidation of the vaulted and wooden roofs and patching-up the walls and making them plumb. Other operations have been the installation of the new flooring.

Mape-Antique LC



Salt-resistant, hydraulic binder based on lime and Eco-Pozzolan, to be mixed with aggregates in various grain sizes to make dehumidifying renders and masonry mortars



Areas of use

- Macroporous, dehumidifying mortars for the restoration of masonries deteriorated by capillary rising damp and soluble salts on existing buildings, including buildings of historical or artistic interest and listed buildings.
- Constructing new dehumidifying renders or reconstructing existing lime-based renders on stone, brick, tuff and mixed masonries.
- Masonries mortars for building and/or reconstructing stone, brick, tuff and mixed facing walls.
- Masonries mortars for pointing between stone, brick, tuff and mixed “exposed” masonries on facing walls.
- Masonries mortar for touching-up and plumbing facing walls with gaps and/or uneven surfaces.

Product details, application guide and final performance data

Mix No. 1

MAPE-ANTIQUE LC	500 kg/m ³
Fine sand 0.5-2.5 mm	1,000 kg/m ³
Water	225 l/m ³
Bulk density of fresh mortar:	1,725 kg/m ³ (EN 1015-6)
Appearance of mix:	Plastic-thixotropic
Compressive strength (after 28 days):	4 N/mm ² (EN 1015-11)
Adhesion to substrate (brickwork):	> 0.3 Failure mode (FP) = B (EN 1015-12)
Thermal conductivity ($\lambda_{10,dry}$):	0.70 W/m·K (EN 1745)
Reaction to fire:	Class A1 (EN 13501-1)
Resistance to sulphates:	High (Anstett test method)
Saline efflorescence (after semi-immersion in water):	Absent



Packaging

20 kg bags

Colour

White

Consumption

According to the type of mortar to be prepared. Approximate consumption (per cm of thickness):

- 5.0 kg/m²
(with fine sand 0.5-2.5 mm)
- 4.5 kg/m²
(with coarse sand 0.5-5 mm)
- 4.0 kg/m²
(with gravel 0-8 mm)

Application

By trowel or by pouring into formwork



Application of dehumidifying render



Compacting the dehumidifying render with a straightedge

Injection slurries

Binder for making mortars

Mortars for dehumidifying render

Mortars for transparent and structural renders

Masonry mortars

Skimming mortars

Maape-Antique LC

Mix No. 2

MAPE-ANTIQUE LC	450 kg/m ³
Coarse sand 0.5-5 mm	1,150 kg/m ³
Water	210 l/m ³
Bulk density of fresh mortar:	1,810 kg/m ³ (EN 1015-6)
Appearance of mix:	Plastic-thixotropic
Compressive strength (after 28 days):	5 N/mm ² (EN 1015-11)
Adhesion to substrate (brickwork):	> 0.3 Failure mode (FP) = B (EN 1015-12)
Thermal conductivity ($\lambda_{10,dry}$):	0.77 W/m·K (EN 1745)
Reaction to fire:	Class A1 (EN 13501-1)
Resistance to sulphates:	High (Anstett test method)
Saline efflorescence (after semi-immersion in water):	Absent



Casting mortar into formwork



Reconstructing masonry



Pointing between brickwork



Carlo Bridge - Prague - Czech Republic

Intervention

Repositioning the original blocks of sandstone and new mortar and repairs to the mortar between the rows of stone using a masonry mortar mixed on site with locally-sourced aggregates. Repair work was also carried out around the pillars below the water line.

Mix No. 3

MAPE-ANTIQUE LC	400 kg/m ³
Gravel 0-8 mm	1,300 kg/m ³
Water	200 l/m ³
Density of mix:	1,900 kg/m ³ (EN 1015-6)
Appearance of mix:	Plastic-thixotropic
Compressive strength (after 28 days):	7 N/mm ² (EN 1015-11)
Adhesion to substrate (brickwork):	> 0.3 Failure mode (FP) = B (EN 1015-12)
Thermal conductivity ($\lambda_{10, dry}$):	0.83 W/m·K (EN 1745)
Reaction to fire:	Class A1 (EN 13501-1)
Resistance to sulphates:	High (Anstett test method)
Saline efflorescence (after semi-immersion in water):	Absent


Injection
slurries

Binder for
making mortars

Mortars for
dehumidifying render

Mortars for transparent
and structural renders

Masonry
mortars

Skimming
mortars



Jesuit Fathers Monastery – Stara Weis - Poland

Intervention

Installation of a horizontal chemical barrier to reduce the amount of damp in the masonries as much as possible. Reconstruction of the areas where the old renders had been removed and application of a new, macroporous dehumidifying renders. Application of a thin layer of coloured siloxane-based coating paste on all the surfaces.

Mape-Antique Rinzafo



Salt-resistant, transpirant scratch-coat mortar, based on lime and Eco-Pozzolan, used as first layer when applying dehumidifying, transpirant and “structural” renders



Areas of use

MAPE-ANTIQUE RINZAFFO must be used as the first layer for the following:

- internal and/or external macroporous, dehumidifying renders on existing masonries with capillary rising damp;
- internal and/or external macroporous, dehumidifying renders on stone, brick, tuff or mixed masonries with saline efflorescence;
- dehumidifying renders on masonries in lagoon areas or close to the sea;
- new dehumidifying renders or reconstruction of old lime-based renders on stone, brick, tuff and mixed masonries, including on buildings of historical and artistic interest and listed buildings;
- new transpirant and “structural” renders on particularly difficult masonries, such as in stone or mixed material, or on porous or weak masonries.

Product details, application guide and final performance data

Maximum size of aggregate:	2.5 mm (EN 1015-1)
Bulk density of fresh mortar:	1,850 kg/m ³ (EN 1015-6)
Appearance of mix:	Semi-fluid
Porosity of fresh mortar:	6% (EN 1015-7)
Compressive strength (after 28 days):	>10 N/mm ² (EN 1015-11) Category CS IV
Adhesion to substrate (brickwork):	≥ 0.7 N/mm ² Failure mode (FP) = B (EN 1015-12)
Capillary action water absorption:	Category W 1 (EN 1015-18)
Coefficient of permeability to water vapour:	≤ 30 μ (EN 1015-19)
Thermal conductivity (λ _{10, dry}):	0.73 W/m·K (EN 1745)
Reaction to fire:	Class E (EN 13501-1)
Resistance to sulphates:	High (Anstett test method)
Saline efflorescence (after semi-immersion in water):	Absent



Packaging

20 kg bags

Colour

White

Consumption

7.5 kg/m²
(for a 5 mm thick layer)

Application

By trowel or with a continuous-mixing rendering machine



Application of a scratch-coat layer by trowel



Application of a scratch-coat layer with a rendering machine

Injection
slurries

Binder for
making mortars

Mortars for
dehumidifying render

Mortars for transpirant
and structural renders

Masonry
mortars

Skimming
mortars



Palazzo Orsucci - Lucca - Italy

Intervention

Pointing between the rows of bricks of exposed masonries and treatment with a water-repellent product. Application of macroporous, dehumidifying renders and potassium silicate-based paint. Other interventions have been the installation of new screeds and of the flooring and waterproofing treatment for some of the concrete structures below ground level.

Mape-Antique CC



Macroporous, salt-resistant dehumidifying render, based on lime and Eco-Pozzolan, for restoring old masonry, including on buildings of historical interest



Areas of use

- Internal and/or external macroporous, dehumidifying renders for existing masonries with capillary rising damp.
- Internal and/or external macroporous, dehumidifying renders on existing stone, brick, tuff or mixed masonries with saline efflorescence.
- Dehumidifying renders for masonries in lagoon areas or close to the sea.
- New dehumidifying renders or reconstructing existing lime-based renders for stone, brick, tuff and mixed masonries, including on buildings of historical and artistic interest and listed buildings.
- “Plumbing” and “touching up” facing walls with gaps and uneven surfaces.
- Pointing between rows of stone, brick and tuff on “exposed” masonries.

Product details, application guide and final performance data

Maximum size of aggregate:	2.5 mm (EN 1015-1)
Bulk density of fresh mortar:	1,700 kg/m ³ (EN 1015-6)
Appearance of mix:	Plastic-thixotropic
Porosity of fresh mortar:	> 20% (EN 1015-7)
Compressive strength (after 28 days):	Category CS II (EN 1015-11)
Adhesion to substrate:	≥ 0.4 N/mm ² Failure mode (FB) = B (EN 1015-12)
Capillary action water absorption:	3.5 kg/m ² (EN 1015-18)
Coefficient of permeability to water vapour:	≤ 10 μ (EN 1015-19)
Thermal conductivity (λ _{10,dry}):	0.61 W/m·K (EN 1745)
Reaction to fire:	Class A1
Resistance to sulphates:	High (Anstett test method)
Saline efflorescence (after semi-immersion in water):	Absent



Packaging

25 kg bags

Colour

Light pink

Consumption

15 kg/m²
(per cm of thickness)

Application

Trowel



Compacting the dehumidifying render with a straightedge



Pointing between brickwork

Injection
slurries

Binder for
making mortars

Mortars for
dehumidifying render

Mortars for transparent
and structural renders

Masonry
mortars

Skimming
mortars



Bard Fortress - Bard (Aosta) - Italy

Intervention

New macroporous, dehumidifying renders inside the fortress in the area known as Opera Ferdinando. Other operations have been the installation of new flooring.

Mape-Antique MC



Macroporous, salt-resistant dehumidifying render, based on lime and Eco-Pozzolan, for restoring old masonry, including on buildings of historical interest



Areas of use

- Internal and/or external macroporous, dehumidifying renders on existing masonries with capillary rising damp.
- Internal and/or external macroporous, dehumidifying renders on existing stone, brick, tuff or mixed masonries with saline efflorescence.
- Dehumidifying renders for masonries in lagoon areas or close to the sea.
- New dehumidifying renders or reconstructing old lime-based renders on stone, brick, tuff and mixed masonries, including on buildings of historical and artistic interest and listed buildings.
- “Plumbing” and “touching up” facing walls with gaps and uneven surfaces.
- Pointing between rows of stone, brick and tuff on “exposed” masonries.

Product details, application guide and final performance data

Maximum size of aggregate:	2.5 mm (EN 1015-1)
Bulk density of fresh mortar:	1,700 kg/m ³ (EN 1015-6)
Appearance of mix:	Plastic-thixotropic
Porosity of fresh mortar:	> 20% (EN 1015-7)
Compressive strength (after 28 days):	Category CS II (EN 1015-11)
Adhesion to substrate:	≥ 0.4 N/mm ² Failure mode (FB) = B (EN 1015-12)
Capillary action water absorption:	3.5 kg/m ² (EN 1015-18)
Coefficient of permeability to water vapour:	≤ 10 μ (EN 1015-19)
Thermal conductivity (λ _{10,dry}):	0.61 W/m·K (EN 1745)
Reaction to fire:	Class A1
Resistance to sulphates:	High (Anstett test method)
Saline efflorescence (after semi-immersion in water):	Absent



Packaging

25 kg bags

Colour

White

Consumption

15 kg/m²
(per cm of thickness)

Application

Trowel



Compacting the dehumidifying render with a straightedge



Levelling off the dehumidifying render

Injection
slurries

Binder for
making mortars

Mortars for
dehumidifying render

Mortars for transparent
and structural renders

Masonry
mortars

Skimming
mortars



Private farm - Robbiano di Mediglia (Milan) - Italy

Intervention

New macroporous, dehumidifying renders on the lower areas of the building with capillary rising damp and transpirant renders on all the other surfaces. The surfaces were then decorated with siloxane-based coating paste after applying a base layer of coloured filler.

Mape-Antique MC Macchina



Macroporous, salt-resistant dehumidifying render, based on lime and Eco-Pozzolan, for restoring old masonry, including on buildings of historical interest



Areas of use

- Internal and/or external macroporous, dehumidifying renders on existing masonries with capillary rising damp.
- Internal and/or external macroporous, dehumidifying renders on existing stone, brick, tuff or mixed masonries with saline efflorescence.
- Dehumidifying renders for masonries in lagoon areas or close to the sea.
- New dehumidifying renders or reconstructing existing lime-based renders on stone, brick, tuff and mixed masonries, including on buildings of historical and artistic interest and listed buildings.

Product details, application guide and final performance data

Maximum size of aggregate:	2.5 mm (EN 1015-1)
Bulk density of fresh mortar:	1,700 kg/m ³ (EN 1015-6)
Appearance of mix:	Plastic-thixotropic
Porosity of fresh mortar:	> 20% (EN 1015-7)
Compressive strength (after 28 days):	Category CS II (EN 1015-11)
Adhesion to substrate:	≥ 0.4 N/mm ² Failure mode (FB) = B (EN 1015-12)
Capillary action water absorption:	3.5 kg/m ² (EN 1015-18)
Coefficient of permeability to water vapour:	≤ 10 μ (EN 1015-19)
Thermal conductivity ($\lambda_{10, dry}$):	0.61 W/m·K (EN 1745)
Reaction to fire:	Class A1
Resistance to sulphates:	High (Anstett test method)
Saline efflorescence (after semi-immersion in water):	Absent



Packaging

25 kg bags

Colour

White

Consumption

16 kg/m²
(per cm of thickness)

Application

Continuous-mixing rendering machine



Compacting the dehumidifying render with a straightedge



Application of dehumidifying render

Injection slurries

Binder for making mortars

Mortars for dehumidifying render

Mortars for transparent and structural renders

Masonry mortars

Skimming mortars



“La Mattonaia” residential complex - Pietrasanta (Lucca) - Italy

Intervention

The intervention consisted of the construction of new residential units. Detailed work included the application of lime-based transpirant renders on the internal and external surfaces of each structure, skimming the surfaces with fine-texture skimming mortar to create a natural finish and decorating the surfaces with siloxane paint. Other interventions have been waterproofing the structures below ground level, the application of macroporous dehumidifying renders to prevent capillary rising damp, the installation of new screeds and the installation of floorings and parquet.

Mape-Antique Intonaco NHL



Transpirant base render based on natural hydraulic lime and Eco-Pozzolan, for application on existing masonry, including that of historical interest, and on new construction



Areas of use

- New internal and external transpirant renders applied with a machine or by trowel on stone, brick, tuff and mixed masonries without capillary rising damp.
- New renders or reconstructing existing lime-based and/or weak renders on stone, brick, tuff and mixed masonries, including on buildings of historical interest and listed buildings.
- “Plumbing” and “touching up” facing walls with gaps and uneven surfaces.
- Pointing between rows of stone, brick and tuff on “exposed” masonries.

Product details, application guide and final performance data

Maximum size of aggregate:	1.4 mm (EN 1015-1)
Bulk density of fresh mortar:	1,750 kg/m ³ (EN 1015-6)
Appearance of mix:	Thixotropic
Porosity of fresh mortar:	20% (EN 1015-7)
Compressive strength (after 28 days):	Category CS II (EN 1015-11)
Adhesion to substrate:	≥ 0.3 N/mm ² Failure mode (FP) = B (EN 1015-12)
Capillary action water absorption:	Category W 0 (EN 1015-18)
Coefficient of permeability to water vapour:	≤ 12 μ (EN 1015-19)
Thermal conductivity (λ _{10,dry}):	0.57 W/m·K (EN 1745)
Reaction to fire:	Class A1



Packaging

25 kg bags

Colour

Light hazel

Consumption

approx. 14.5 kg/m²
(per cm of thickness)

Application

Continuous-mixing rendering machine or trowel



Compacting the transpirant render with a straightedge



Levelling off the transpirant render

Injection slurries

Binder for making mortars

Mortars for dehumidifying render

Mortars for transpirant and structural renders

Masonry mortars

Skimming mortars



Duca degli Abruzzi Complex (IACP) - Bari - Italy

Intervention

The intervention consisted of re-doing all the external masonries with high-strength rendering mortar reinforced with glass fibres and then applying a thin layer of coloured siloxane-based coating paste to protect the new renders. Other interventions included repairing deteriorated concrete elements, work on some parts of the structure to increase its static load-bearing capacity and a waterproofing treatment for the flat roofs.

Mape-Antique Strutturale NHL



High-performance mortar for transpirant render and masonry work, based on natural hydraulic lime and Eco-Pozzolan, particularly suitable for making “reinforced” and installation mortar



Areas of use

- New internal and external high-performance transpirant renders on stone, brick, tuff and mixed masonries without capillary rising damp.
- New renders or rebuilding existing renders on masonries, including on buildings of historical and artistic interest and listed buildings.
- New mortar “reinforced” with electro-welded zinc-plated or composite mesh on weak masonries without capillary rising damp.
- “Reinforced capping” with strengthening metal or composite mesh on the outer face of vaulted roofs.

Product details, application guide and final performance data

Maximum size of aggregate:	2.5 mm (EN 1015-1)
Bulk density of fresh mortar:	2,000 kg/m ³ (EN 1015-6)
Appearance of mix:	Thixotropic
Porosity of fresh mortar:	7% (EN 1015-7)
Compressive strength (after 28 days):	> 15 N/mm ² Category CS IV (EN 1015-11) Class M 15
Adhesion to substrate:	≥ 0.7 N/mm ² Failure mode (FB) = A/C (EN 1015-12)
Initial shear strength (f _{vok}):	0.15 N/mm ² (EN 998-2 Appendix C)
Chloride content:	< 0.05% (EN 1015-17)
Capillary action water absorption:	< 0.2 [kg/(m ² ·min ^{0.5})] (EN 1015-18) Category W 2
Coefficient of permeability to water vapour:	60 μ (EN 1015-19)
Thermal conductivity (λ _{10,dry}):	1 W/m·K (EN 1745)
Reaction to fire:	Class E



Packaging

25 kg bags

Colour

Light hazel

Consumption

approx. 17 kg/m²
(per cm of thickness)

Application

Continuous-mixing rendering machine or trowel



Checking the gap between the mesh and substrate



Application of the “structural” render with a rendering machine

Injection slurries

Binder for making mortars

Mortars for dehumidifying render

Mortars for transpirant and structural renders

Masonry mortars

Skimming mortars



Church of San Bernardino - L'Aquila - Italy

Intervention

The intervention involved the consolidation of masonry, repairs to areas of deteriorated render, reconditioning the masonry for the bell tower and repairs and conservative renovation of all the internal surfaces.

New

Mape-Antique Hi-Flow



Shrinkage-compensated, fibre-reinforced mortar for concrete repair



Areas of use

Mixing free-flowing, volumetrically stable masonry mortar with high resistance to soluble salts for filling large internal cracks, gaps and cavities when reconditioning and consolidating structures such as:

- foundations, pillars, vaulted roofs and archways;
- “rubble masonries”;
- stone, brick, tuff and mixed masonry in general on existing buildings, including listed buildings and buildings of historical or artistic interest.

Product details, application guide and final performance data

Maximum size of aggregate:	2.5 mm (EN 1015-1)
Bulk density of wet mortar:	2,050 kg/m ³ (EN 1015-6)
Consistency of mix:	Fluid – free-flowing
Porosity of wet mortar:	7% (EN 1015-7)
Compressive strength (after 28 days):	Class M15 (EN 1015-11)
Adhesion to substrate:	1.0 N/mm ² Failure mode (FB) = B (EN 1015-12)
Slip-resistance of rebar (Ø 16 mm) Maximum adhesion stress:	8 N/mm ² (EN 1881 mod.)
Slip-resistance of glass rods: (Maperod G 40/10) Maximum adhesion stress:	8 N/mm ² (EN 1881 mod.)
Initial shear strength (f _{vok}):	0.15 N/mm ² (EN 998-2 Appendix C)
Chloride content:	< 0.05% (EN 1015-17)
Capillary action water absorption:	< 0.1 [kg/(m ² ·min ^{0.5})] (EN 1015-18)
Water vapour permeability coefficient:	15/35 µ (EN 1015-19)
Thermal conductivity (λ _{10,dry}):	1 (P=50%)
Modulus of elasticity:	10,000 N/mm ² (EN 13412)
Reaction to fire:	Class A1 (EN 13501-1)
Resistance to sulphates:	High (Anstett test method)
Saline efflorescence (after semi-immersion in water):	Absent



Packaging

25 kg bags

Colour

White

Consumption

approx. 1.83 kg/dm³
(of cavities to be filled)

Application

By pouring or pumping



Pouring the mortar made from Mape-Antique Hi-Flow and Gravel 6-10



An area of the masonry mortar after pouring

Injection slurries

Binder for making mortars

Mortars for dehumidifying render

Mortars for transparent and structural renders

Masonry mortars

Skimming mortars



Palazzo Vecchio (rear facade) - Florence - Italy

Intervention

"Exposed" pointing between the stone and structural strengthening of the balcony.

Mape-Antique Allettamento



Salt-resistant masonry mortar, based on natural hydraulic lime and Eco-Pozzolan, for installation layers and pointing on “natural finish” masonry



Areas of use

- Building new masonries and restoration of existing masonries, including masonries of buildings of historical and artistic interest and listed buildings.
- Pointing between stone, brick and tuff on “exposed” masonries.
- Installation joints, including joints “reinforced” with rebar or composites (such as MAPEROD).
- Build facing walls using masonries mortar with guaranteed performance characteristics.
- “Plumbing” and “touching up” facing walls with gaps and uneven surfaces.

Product details, application guide and final performance data

Maximum size of aggregate:	1.5 mm (EN 1015-1)
Bulk density of fresh mortar:	1,950 kg/m ³ (EN 1015-6)
Appearance of mix:	Thixotropic
Porosity of fresh mortar:	6% (EN 1015-7)
Compressive strength (after 28 days):	Class M 5 (EN 1015-11)
Adhesion to substrate:	≥ 0.5 N/mm ² Failure mode (FB) = B (EN 1015-12)
Initial shear strength (f _{vok}):	0.15 N/mm ² (EN 1052-3)
Chloride content:	< 0.05% (EN 1015-17)
Capillary action water absorption:	< 0.3 [kg/(m ² ·min ^{0.5})] (EN 1015-18)
Coefficient of permeability to water vapour:	15/35 μ (EN 1015-19)
Thermal conductivity (λ _{10,dry}):	0.77 W/m·K (EN 1745)
Reaction to fire:	Class A1
Resistance to sulphates:	< 0.02% (ASTM C 1012 mod.)
Saline efflorescence (after semi-immersion in water):	Absent



Packaging

25 kg bags

Colour

Straw yellow

Consumption

16.5 kg/m²
(per cm of thickness)

Application

Trowel



Building stone masonry



Pointing “exposed” masonry

Injection
slurries

Binder for
making mortars

Mortars for
dehumidifying render

Mortars for transparent
and structural renders

Masonry
mortars

Skimming
mortars



“Minuto Pesce” town square - Molfetta (Bari) - Italy

Intervention

Renovation and conservative restoration work was carried out on the entire structure and included new macroporous dehumidifying renders, the application of transpirant renders and the reconstruction and consolidation of the facing walls and vaulted roofs using high-strength masonries mortars. The surfaces were then decorated with a thin layer of coloured siloxane-based coating.

Mape-Antique Strutturale NHL



High-performance mortar for transpirant render and masonry work, based on natural hydraulic lime and Eco-Pozzolan, particularly suitable for making “reinforced” and installation mortar



Areas of use

- Building new masonries and restoration of existing masonries, including masonries of buildings of historical and artistic interest and listed buildings.
- Levelling off the outer face of vaulted roofs with an uneven surface.
- Pointing between stone, brick and tuff on “exposed” masonries.
- Installation joints, including joints “reinforced” with rebar or composites (such as MAPEROD).
- Building facing walls using a mortar with better mechanical characteristics than conventional lime mortar.
- “Plumbing” and “touching up” facing walls with gaps and uneven surfaces.

Product details, application guide and final performance data

Maximum size of aggregate:	2.5 mm (EN 1015-1)
Bulk density of fresh mortar:	2,000 kg/m ³ (EN 1015-6)
Appearance of mix:	Thixotropic
Porosity of fresh mortar:	7% (EN 1015-7)
Compressive strength (after 28 days):	> 15 N/mm ² Category CS IV (EN 1015-11) Class M 15
Adhesion to substrate:	≥ 0.7 N/mm ² Failure mode (FB) = A/C (EN 1015-12)
Initial shear strength (f_{vok}):	0.15 N/mm ² (EN 998-2 Appendix C)
Chloride content:	< 0.05% (EN 1015-17)
Capillary action water absorption:	< 0.2 [kg/(m ² ·min ^{0.5})] (EN 1015-18)
Coefficient of permeability to water vapour:	60 μ (EN 1015-19)
Thermal conductivity ($\lambda_{10, dry}$):	1 W/m·K (EN 1745)
Reaction to fire:	Class E



Packaging

25 kg bags

Colour

Light hazel

Consumption

approx. 17 kg/m²
(per cm of thickness)

Application

Trowel



Reconstruction of a facing wall



Reconstruction of a stone facing wall

Injection
slurries

Binder for
making mortars

Mortars for
dehumidifying render

Mortars for transpirant
and structural renders

Masonry
mortars

Skimming
mortars



Villa Mazzanti - Rome - Italy

Intervention

Reconstruction of the removed renders using transpirant rendering mortar and skim coats on some of the surfaces using ultra-fine texture mortar to create a smooth finish. Skim coats on the remaining surfaces using smooth texture mortar to create a natural finish. The surfaces were then decorated with siloxane-based coating paste after applying a base layer of coloured filler.

Mape-Antique FC Ultrafine



Salt-resistant, transpirant ultrafine-texture skimming mortar, based on lime and Eco-Pozzolan, for a smooth finish on render



Areas of use

- Smooth finish for internal/external coarse texture, dehumidifying, macroporous renders when repairing masonries deteriorated by capillary rising damp and soluble salts.
- Smooth finish for coarse texture dehumidifying renders on masonries in lagoon areas or close to the sea.
- Smooth finish for new dehumidifying renders or existing lime-based renders on stone, brick, tuff and mixed masonries, including on buildings of historical and artistic interest and listed buildings.
- Smooth finish for coarse texture transpirant or “structural” base renders.

Product details, application guide and final performance data

Maximum size of aggregate:	100 µm (EN 1015-1)
Bulk density of fresh mortar:	1,700 kg/m ³ (EN 1015-6)
Appearance of mix:	Plastic
Compressive strength (after 28 days):	2.5 N/mm ² Category CS II (EN 1015-11)
Adhesion to substrate:	≥ 0.8 N/mm ² Failure mode (FB) = B (EN 1015-12)
Capillary action water absorption:	Category W 0 (EN 1015-18)
Coefficient of permeability to water vapour:	≤ 20 µ (EN 1015-19)
Thermal conductivity (λ _{10,dry}):	0.39 W/m·K (EN 1745)
Reaction to fire:	Class E
Resistance to sulphates:	High (Anstett test method)
Saline efflorescence (after semi-immersion in water):	Absent



Packaging
20 kg bags

Colour
White

Consumption
approx. 1.3 kg/m²
(per mm of thickness)

Application
Flat metal trowel



Application of the second layer of ultra-smooth texture skimming mortar



Smoothing over the surface with a flat metal trowel

Injection
slurries

Binder for
making mortars

Mortars for
dehumidifying render

Mortars for transpirant
and structural renders

Masonry
mortars

Skimming
mortars



Private farm - Lucca - Italy

Intervention

New “structural” renders using high-strength mortars reinforced with glass fibres. Skimming of the surfaces with a fine texture skimming mortar to create a natural finish. Application of a siloxane paint after applying a base layer of coloured filler.

Mape-Antique FC Civile



Salt-resistant, transpirant fine-texture skimming mortar, based on lime and Eco-Pozzolan, for a natural finish on render



Areas of use

- Natural finish on internal/external coarse texture, dehumidifying, macroporous renders when repairing masonries deteriorated by capillary rising damp and soluble salts.
- Natural finish on coarse texture dehumidifying renders on masonries in lagoon areas or close to the sea.
- Natural finish on new dehumidifying renders or existing lime-based renders on stone, brick, tuff and mixed masonries, including on buildings of historical and artistic interest and listed buildings.
- Natural finish on coarse texture transpirant or “structural” base renders.

Product details, application guide and final performance data

Maximum size of aggregate:	400 µm (EN 1015-1)
Bulk density of fresh mortar:	1,800 kg/m ³ (EN 1015-6)
Appearance of mix:	Plastic
Compressive strength (after 28 days):	10 N/mm ² Category CS IV (EN 1015-11)
Adhesion to substrate:	≥ 0.6 N/mm ² Failure mode (FB) = B (EN 1015-12)
Capillary action water absorption:	Category W 2 (EN 1015-18)
Coefficient of permeability to water vapour:	≤ 15 µ (EN 1015-19)
Thermal conductivity (λ _{10,dry}):	0.67 W/m·K (EN 1745)
Reaction to fire:	Class E
Resistance to sulphates:	High (Anstett test method)
Saline efflorescence (after semi-immersion in water):	Absent



Packaging

25 kg bags

Colour

White
Light pink

Consumption

approx. 1.4 kg/m²
(per mm of thickness)

Application

Flat metal trowel



Application of fine texture skimming mortar



Finishing off the surface with a sponge float

Injection
slurries

Binder for
making mortars

Mortars for
dehumidifying render

Mortars for transpirant
and structural renders

Masonry
mortars

Skimming
mortars



Post Office - Cesenatico (Forlì-Cesena) - Italy

Intervention

New macroporous, dehumidifying render followed by skimming the surfaces with large texture mortar. Application of a siloxane paint after applying a base layer of coloured filler.

Mape-Antique FC Grosso



Salt-resistant, transpirant large-texture skimming mortar, based on lime and Eco-Pozzolan, for a rough finish on render



Areas of use

- Rough finishing for internal/external macroporous, dehumidifying renders when repairing masonries deteriorated by capillary rising damp and soluble salts.
- Rough finishing for dehumidifying renders on masonries in lagoon areas or close to the sea.
- Rough finishing on new dehumidifying renders or existing lime-based renders on stone, brick, tuff and mixed masonries, including on buildings of historical and artistic interest and listed buildings.
- Rough finishing for transpirant or “structural” base renders.

Product details, application guide and final performance data

Maximum size of aggregate:	600 µm (EN 1015-1)
Bulk density of fresh mortar:	1,700 kg/m ³ (EN 1015-6)
Appearance of mix:	Plastic
Compressive strength (after 28 days):	6 N/mm ² Category CS IV (EN 1015-11)
Adhesion to substrate:	≥ 0.5 N/mm ² Failure mode (FB) = B (EN 1015-12)
Capillary action water absorption:	Category W 2 (EN 1015-18)
Coefficient of permeability to water vapour:	≤ 15 µ (EN 1015-19)
Thermal conductivity ($\lambda_{10, dry}$):	0.45 W/m·K (EN 1745)
Reaction to fire:	Class E
Resistance to sulphates:	High (Anstett test method)
Saline efflorescence (after semi-immersion in water):	Absent



Packaging

25 kg bags

Colour

White

Consumption

approx. 1.4 kg/m²
(per mm of thickness)

Application

Flat metal trowel



Application of coarse texture skimming mortar



Finishing off the surface with a sponge float

Injection slurries

Binder for making mortars

Mortars for dehumidifying render

Mortars for transpirant and structural renders

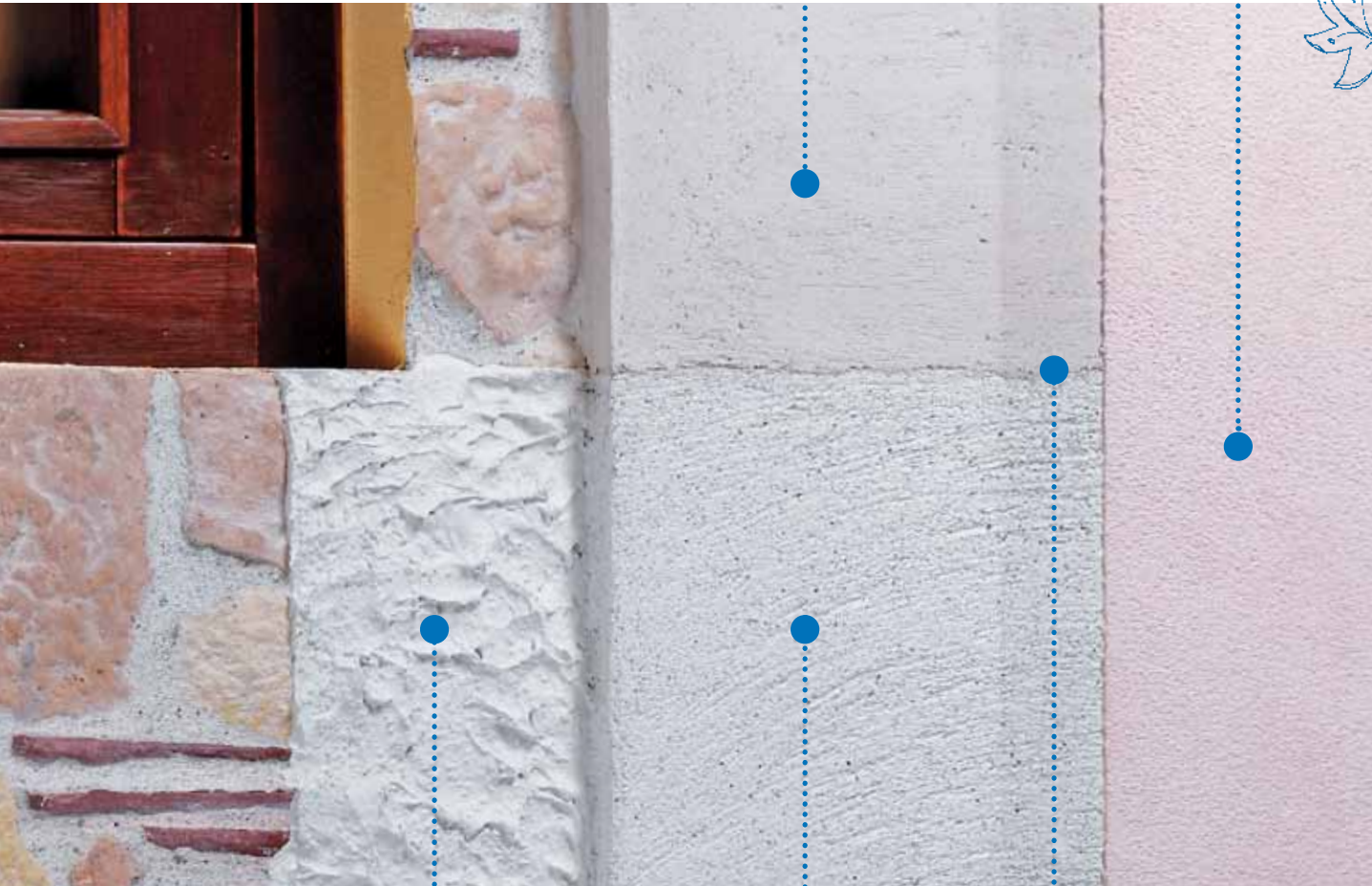
Masonry mortars

Skimming mortars



**Mape-Antique
Intonaco NHL**

**Silexcolor
Tonachino**



**Mape-Antique
Rinzaffo**

**Mape-Antique
MC**

**Silexcolor
Primer**



Colour and decoration

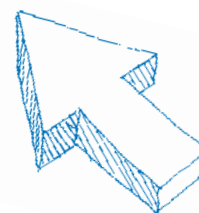
The high water vapour transpiration capacity of thin layers of coloured paints and coatings, along with their resistance to the leaching action of rain and their perfect adhesion to the substrate, are fundamental requirements of any type of finishing product used in renovation and restoration work of the buildings which make up the rich historical and artistic heritage of our cities, especially when this type of work is carried out using cement-free, lime-based products, characteristics common to all the products from the MAPE-ANTIQUE range.

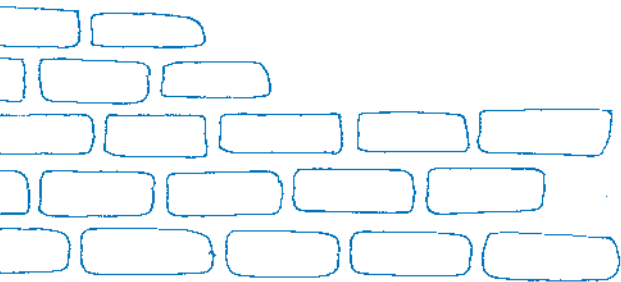
The solution recommended for these types of intervention contemplates the use of finishing products from the SILEXCOLOR range, potassium silicate-based products which conform to DIN 18363 standards. These finishing products have the capacity to form a “single body” with the renders by means of a “silicatisation” reaction, which consists in the transformation of the potassium silicate into calcium silicate due to the content of lime in the underlying mortar. Unlike traditional paints and renders, even though the products from the SILEXCOLOR range contain pigments and fillers, they do not block the passage of water vapour and, therefore, allow the characteristics and properties of the mortar made using products from the MAPE-ANTIQUE range to remain unchanged.

Also, crystallisation of the potassium silicate in the pores of the mortar gives the substrate a certain degree of waterproofness, and thus protect the mortar against the leaching action of rainwater. And lastly, unlike finishing products made entirely from lime, that is, without any added latex component, the mineral products from the SILEXCOLOR range resist against the aggressive chemical action of acid rain and are insensitive to the disintegrating action of sulphuric acid which, through a “sulfidation” reaction, attacks the protective film containing calcium carbonate.

Note:

As an alternative to the products from the SILEXCOLOR range, if a coloured finishing product with a higher degree of water repellence is required, thin layers of paint or coating from the SILANCOLOR range may be used, siloxane-based systems which combine the advantages of traditional mineral products, such as their transpiration capacity, with the advantages of “synthetic” materials, such as water repellence.





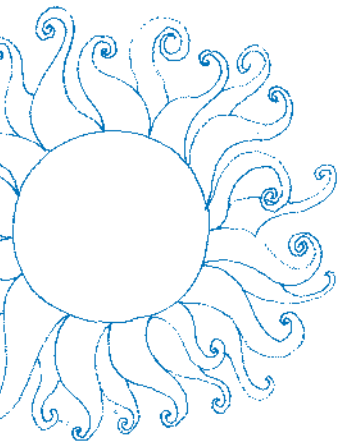
Silexcolor range: Properties

- Perfect adhesion of the products to the substrate, with which they react chemically by means of a “silicatisation” reaction, differently from the traditional finishing products.
- High transpiration of water vapour, thus encouraging the evaporation of water contained in the masonries.
- It increases the capacity of the renders to “repel” rainwater, due to crystallisation of the potassium silicate in the pores of the mortar.
- Insensitive to the disintegrating action of acid rain.
- Numerous aesthetic and decorative effects may be obtained by combining products and colours.

Silexcolor range: The products

The SILEXCOLOR range includes a series of materials which meet all the various aesthetic and functional requirements for “colouring” the products mortars from the MAPE-ANTIQUE range used in renovation and restoration work on buildings. The products in the range include smooth texture paints applied by brush, roller or spray such as SILEXCOLOR PAINT, coloured coating products in various textures applied in thin layers such as SILEXCOLOR TONACHINO and SILEXCOLOR GRAFFIATO, and ultra-fine texture skimming mortars such as SILEXCOLOR MARMORINO. All the products mentioned above must only be used after applying SILEXCOLOR PRIMER transparent primer or SILEXCOLOR BASE COAT undercoat, which have the capacity to even out the absorption of the substrate and encourage adhesion of the paint or coloured textured coating.





Mape-Antique range on the web: Information, references and solutions

All the information about the MAPE-ANTIQUE range is available at the Mapei website www.mapei.it in the **Products** section, by selecting **Products for restoring masonries from the drop-down Menu**.

Inside this section you will find **Main areas of use of the products according to the most common problems**, for example:

- Consolidating masonries and renders by injecting slurries
- Dehumidifying masonries with binders and mortars for renders
- Lime-based transpirant renders
- “Reinforced” renders and masonries mortars
- Skimming transpirant and/or dehumidifying renders

Once you have selected the problem you are interested in, go to the menu where you will find a list of all the products in alphabetical order and all the information about the product selected, such as its **Technical Data Sheet**, **Safety Data Sheet**, etc.



www.mapei.it

Selected
Product Range

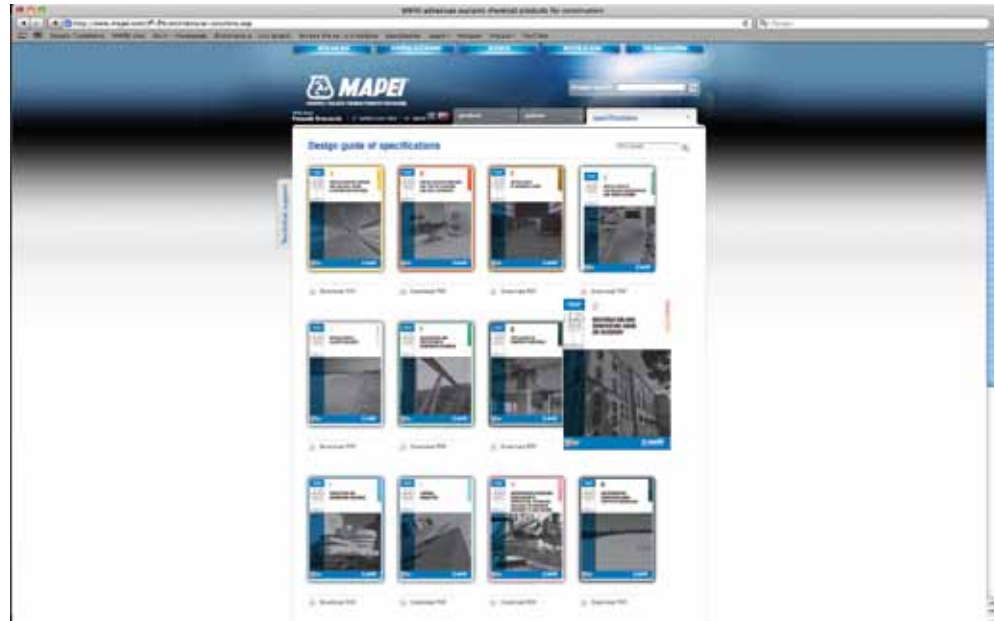
The screenshot displays the Mapei website's 'Products for the Repair of the Masonry' section. The page features a navigation bar at the top with links: 'who we are', 'training and events', 'projects', 'technical area', and 'job opportunities'. A search bar is located in the top right corner. The main content area is titled 'Products for the Repair of the Masonry' and includes a 'Product Information' section with links to 'Selection Charts' and 'Leaflets'. Below this, a list of repair techniques is provided, such as 'Consolidating masonry and render by injecting slurry', 'Consolidating the cortex of various types of "weak" and/or "crumbling" substrate', 'De-humidifying masonry using binders and mortar for render', 'Formation and pointing of masonry of bricks, stones, tuff and mixed', 'Formation of horizontal chemical barriers against capillary rising damp', 'Formation of lime-based transparent render', 'Formation of lime-cement based render', 'Formation of structural "reinforced" and installation lime-based render', 'Protecting and decorating transparent and/or de-humidifying render (lime-cement and/or cementitious render)', 'Protecting and decorating transparent, de-humidifying and structural render', 'Restoring wooden structures', 'Rigenerazione e consolidamento di murature, mediante collaggio o pompaggio di malte fluide', 'Smoothing and levelling traditional, lime-cement and/or cementitious-based render', 'Smoothing and levelling transparent, de-humidifying and structural render', and 'Water-repellent protective treatment of "natural finish" masonry and render'. A sidebar on the right lists product categories: 'Products for Ceramics and Stone Materials', 'Products for Resilient and Textile Materials', 'Products for Wooden Floors', 'Cementitious and Resin Floor Coverings', 'Products for Acoustic Insulations', 'Products for Building', 'Admixtures for Concrete', 'Products for Structural Strengthening', 'Products for the Repair of the Masonry', 'Products for Thermal Insulations', 'Wall Protective and Decorative Coatings', 'Products for Waterproofing', 'Products for Underground Construction', 'Elastic Sealants and Adhesives', and 'Grinding Aids'. Below the main content, there are links for 'news/save the date' and 'Realta Mapei Magazine', and a 'GENERAL CATALOGUE 2014' download link.

Documentation available
for download

Main areas of use of the products
according to the most common
problems

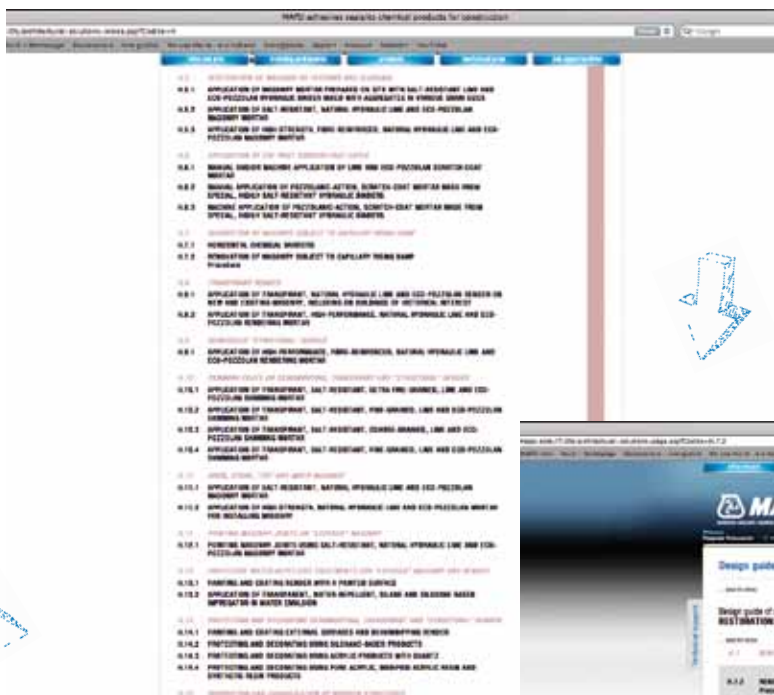
Product
Ranges menu

Design centre



The **Mapei Design Guide** represents a new, key element in the relationship between Mapei and the world of design, a fundamental relationship which will become even more solid thanks to this initiative. The **Mapei Design Guide** is a technical “community” just a click away, enabling technicians from the design sector to interact directly with Mapei specialists through a dedicated e-mail address (grandiprogetti@mapei.it), and construct their project *step-by-step*. The **Mapei Design Guide** currently comprises 17 sections which discuss 17 different design themes, including section **H** entitled “**Restoration and Renovation Work on Masonries**”. It is an interactive manual created in such a way that each user can identify the best solution for a design problem from within an ample range of proposals, based on the experience gained over the years directly on site by the Gruppo Mapei organisation. Knowing that a durable, sustainable intervention may only be achieved by thinking in terms of Systems rather than Products, has led us to preface each Technical Specification with detailed **Procedures** which, if followed correctly, will enable you to design and carry out your work to perfection.

The rule to construct correctly dictates that a complete, detailed cycle must be supplied, starting from substrate preparation, followed by a description of the various application phases of each different material and its specific function, to enable work completed to perfection to be delivered. By following the various **Procedures**, developed and perfected for the most complex, articulated work cycles, it is possible to consult each single **Technical Specification** and execute a project in its entirety. You can also easily and immediately consult and attach the **Technical Data Sheet** for each single product, along with drawings of certain operations which are easier to represent through images.



Macroporous, salt-resistant dehumidifying render, based on lime and Eco-Pozzolan, for restoring old masonry, including on buildings of historical interest

WHERE TO USE

Repairs to old masonry deteriorated by the presence of capillary rising damp, including on buildings of historical and artistic interest.
Repairs to masonry deteriorated by the disintegrating action of concentrated salts.
Rebuilding lime-based render deteriorated by the action of atmospheric agents and environmental conditions or by ageing.

Some application examples

- Internal and/or external macro-porous, de-humidifying render on old walls with capillary rising damp.
- Internal and/or external macro-porous, de-humidifying render on old stone, brick, tuff or mixed masonry with saline efflorescence.
- De-humidifying render on masonry in lagoon areas or close to the sea.
- New de-humidifying render or reconstructing old lime-based render on stone, brick, tuff and mixed masonry, including on buildings of historical and artistic interest with a conservation order or under the protection of the National Trust.
- Touching-up and plumbing facing walls with gaps and uneven surfaces.
- Pointing between layers of stone, brick and tuff on masonry with a "natural finish".

TECHNICAL CHARACTERISTICS

Mape-Antique MC is a pre-blended, cement-free mortar in powder form for de-humidifying render made from lime, Eco-Pozzolan, natural sand, special additives and micro-fibres with very low emission level of volatile organic compounds (EMICODE EC1 Plus), according

to a formulation developed in Mapei's research laboratories. This product is classified as R according to EN 998-1 Standards: "Renovation mortar. Mortar designed for internal/external render applied on damp masonry walls containing water-soluble salts", Category CS II.
When mixed with water in a cement mixer, Mape-Antique MC forms a salt-resistant, macroporous, de-humidifying rendering mortar with a plastic-thixotropic consistency which is easy to apply by trowel on both vertical surfaces and on ceilings.
The properties of mortar made using Mape-Antique MC, such as mechanical strength, modulus of elasticity and porosity, are very similar to mortar made using lime, lime-pozzolan or hydraulic lime originally used in the construction of old buildings.
Compared with these types of mortar, however, Mape-Antique MC also has properties which make the product resistant to various chemical-physical aggressive phenomena, such as the presence of soluble salts, freeze-thaw cycles, the leaching action of rainwater, alkali-aggregate reactions and the formation of cracks caused by plastic shrinkage.
Typical values are shown in the Technical Data table (see Application Data and Final Performance sections) which refer to the main characteristics of Mape-Antique MC at both fresh and hardened states.

RECOMMENDATIONS

- In the presence of capillary rising damp and soluble salts, only apply Mape-Antique MC after applying a layer of Mape-Antique Rinzaffo approximately 5 mm thick.



*Antonino Salinas
Archaeological Museum
- Palermo - Italy*

References

The following references represent the most significant projects where renovation and restoration work has been carried out on existing masonries, including the masonries of buildings of historical and artistic interest, to testify the use of products from the MAPE-ANTIQUE range.

More references are available at the Mapei website at the following address:
www.mapei.it

In alphabetical order:

99-spout Fountain - L'Aquila - Italy

Acaya Castle - Venerole (Lecce) - Italy

Ancient building in Via Orsanmichele - Florence - Italy

Ancient City Walls of Florence - Florence - Italy

Ancient masonries building - Bagnacavallo (Ravenna) - Italy

Ancient residential building - Nepi (Viterbo) - Italy

Antonino Salinas Archaeological Museum - Palermo - Italy

Banks of the Navigli - Milan - Italy

Basilica of St. Francesco and Holy Convent of Assisi - Assisi - Italy



Bell tower of the Parish Church of St. Martino - Novara - Italy

Building alongside Villa Asnaghi - Paderno Dugnano (Milan) - Italy

Caen Castle - Caen - France

Cappuccini Convent - Savona - Italy

Carlo Bridge - Prague - Czech Republic

Cathedral of St. Margherita - Montefiascone (Viterbo) - Italy

Church and Monastery of the Perpetual Worshippers of the Most Holy Sacrament

- Church of Montesion - Palma di Majorca - Spain

Church of San Pedro of Versailles - Mattanza - Cuba

Church of Santa Chiara of the Pantheon - Rome - Italy

Church of St. Costanzo - Naples - Italy

Church of St. Nicola - Ostrava - Czech Republic

Church of St. Pancrazio - Vedano Olona (Varese) - Italy

Church of the Most Holy Annunziata - Ispica (Reggio Emilia) - Italy

Domus Aurea - Rome - Italy

Duca degli Abruzzi Complex (IACP) - Bari - Italy

Duchy of Canevaro Zoagli Castle (Genoa) - Italy

*Revenue authority
of Florence - Italy*



Villa della Porta Bozzolo
- Casalzuigno (Varese)
- Italy

- Ferdinando of Savoia barracks - Rome - Italy
- Flavio Amphitheatre - Rome - Italy
- Forlì art gallery - Forlì (Forlì-Cesena) - Italy
- Former Cerere pasta works - Rome - Italy
- Fortress of Bard - Bard (Aosta) - Italy
- Gentile College - Fabriano (Ancona) - Italy
- “Incis” Residential Complex - Campobasso - Italy
- Jesuit Fathers Monastery - Stara Weis - Poland
- “La Mattonaia” residential complex - Pietrasanta (Lucca) - Italy
- “Le 5 Corti” residential complex - Caronno Pertusella (Varese) - Italy
- Malay Heritage Centre Museum - Singapore
- “Minuto Pesce” Town Square - Molfetta (Bari) - Italy
- Oratory of the Passion in St. Ambrogio - Milan - Italy
- Peggy Guggenheim Museum - Venice - Italy
- Palace of the Asturian Centre - Havana - Cuba
- Palazzo Arrivabene - Mantova - Italy
- Palazzo dei Normanni - Palermo - Italy



Palazzo della Carovana: High School in Pisa - Italy

Palazzo Ducale - Sassuolo (Modena) - Italy

Palazzo Ferro - Trapani - Italy

Palazzo Gradari - Pesaro (Pesaro-Urbino) - Italy

Palazzo Orsucci - Lucca - Italy

Palazzo Pretorio - Peccioli (Pisa) - Italy

Palazzo Vecchio (rear facade) - Florence - Italy

Pieve di San Donato in Polenta - Bertinoro (Forlì-Cesena) - Italy

Pieve di St. Stefano di Sorano - Filattiera (Messina) - Italy

Post Office - Cesenatico (Forlì-Cesena) - Italy

Private farm - Lucca - Italy

Revenue authority of Florence - Italy

Rocca di S Floriano (Treviso) - Italy

Roof terrace in Vicolo Savelli - Rome - Italy

Sant'Apollinare Nuovo - Ravenna - Italy

Senate of the Republic - Rome - Italy

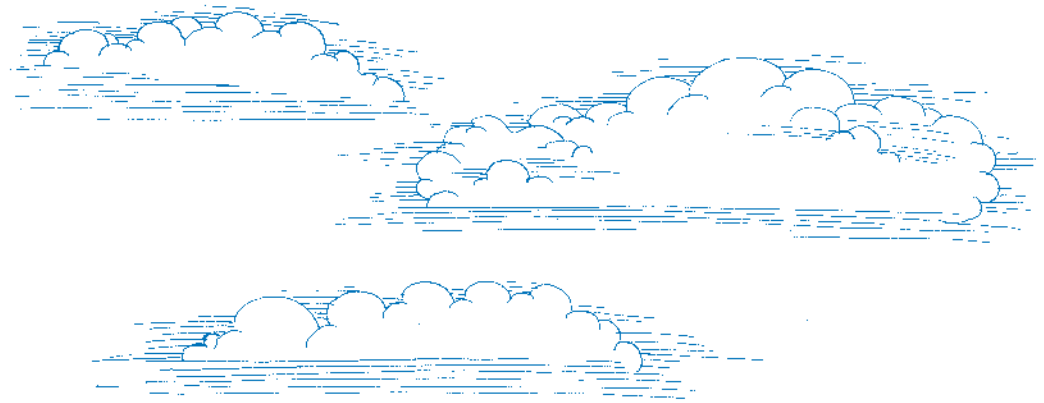
Spielberk Castle - Brno - Czech Republic

*Oratory of the Passion
in St. Ambrogio
Milan - Italy*



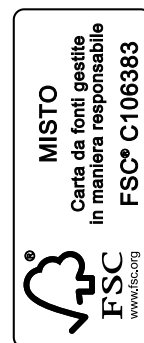
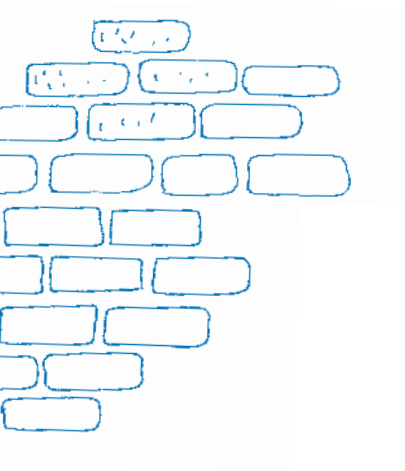
*"Minuto Pesce" Town
Square - Molfetta (Bari)
- Italy*

- St. Felice Dam - Venice - Italy
- St. Maria of Tiglieto Abbey - Genoa - Italy
- St. Paternian Bridge - Venice - Italy
- Teatro alla Scala - Milan - Italy
- The Artists' House - Budapest - Hungary
- The Friars' bell-tower of the St. Ambrogio Basilica - Milan - Italy
- Venere Castle - Trapani - Italy
- Vigevano (Pavia) - Italy
- Villa Asnaghi - Paderno Dugnano (Milano) - Italia
- Villa Brancati - Marzamemi (Syracuse) - Italy
- Villa del Balbaniello - Lenno (Como) - Italy
- Villa della Porta Bozzolo - Casalzuigno (Varese) - Italy
- Villa Ghirlanda - Cinisello Balsamo (Milano) - Italy
- Villa Mazzanti - Rome - Italy
- Villa Medici - Florence - Italy
- Walls of Jericho - Jericho - Israel



For more than 75 years we've been helping to build large and small dreams.

For more than 75 years, Mapei products have been improving the quality of work on large and small sites. A commitment which has become a concrete reality, with 64 production facilities in all 5 continents, 18 main Research & Development centres, more than 800 researchers, a range of more than 1,500 products and more than 200 new products every year. These are the "numbers" which make Mapei the leading international industrial Group for chemical products for the building Industry. **Step into our world: www.mapei.it**



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