MAPEI

IN COMPLIANCE WITH EUROPEAN STANDARD
EN 998-1
R-CS II
MAPEI
RENDERING AND PLASTERING MORTAR

Mape-Antique MC Macchina

CE
EN 998-1

GEV-EMICODE EC 1 PLUS very low emission

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

WHERE TO USE

Renovating old masonry deteriorated by capillary rising damp, including on buildings of historical and artistic interest.
Renovating masonry deteriorated by the crumbling 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 existing masonry with capillary rising damp.
- Internal and/or external macro-porous, de-humidifying render on existing stone, brick, tuff or mixed masonry with saline efflorescence.
- De-humidifying render on structures in lagoon areas or close to the sea.
- New de-humidifying render or reconstructing existing 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.

TECHNICAL CHARACTERISTICS

Mape-Antique MC Macchina is a pre-blended, cement-free, powdered mortar for macro-porous, de-humidifying render based on lime, Eco-Pozzolan, natural sand, special admixtures and micro-fibres with very low emission of volatile organic compounds (EMICODE EC1 R Plus) according to a formula developed in the MAPEI 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 continuous-mix rendering machine, **Mape-Antique MC Macchina** forms a salt-resistant, macro-porous, de-humidifying rendering mortar with a plastic-thixotropic consistency which is easy to apply with a rendering machine on vertical surfaces and ceilings.
The properties of mortar made using **Mape-Antique MC Macchina**, such as mechanical strength, modulus of elasticity and porosity, are very similar to those of lime, lime-pozzolan and hydraulic lime-based mortar originally used in the construction of old buildings.
Compared with these types of mortar, however, **Mape-Antique MC Macchina** also has properties which make the product resistant to various chemical-physical aggressive phenomena, such as soluble salts, freeze-thaw cycles, the leaching action of rainwater, alkali-aggregate reactions and the formation of cracks caused by plastic shrinkage.
When working on particularly damp internal walls or in cold weather, the setting and hardening times of **Mape-Antique MC Macchina** are considerably longer and much more time than usual must be allowed for the product to cure.
The product may give off a different odour for a while when curing under such conditions and may turn green in some areas. The odour and green colour will gradually disappear as the product and wall dry out until it takes on its characteristic light colour.
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 Macchina** at both the fresh and hardened states.

RECOMMENDATIONS

- If there are capillary rising damp and soluble salts, only apply **Mape-Antique MC Macchina** after applying a layer of **Mape-Antique Rinzaffo** approximately 5 mm thick.
- **Mape-Antique MC Macchina** must be applied in layers at least 20 mm thick.
- Do not use **Mape-Antique MC Macchina** for casting into formwork (use **Mape-Antique LC** mixed with appropriate aggregates).

Mape-Antique MC Macchina

Application of Mape-Antique Rinzaffo

Positioning a vertical guide

Application of Mape-Antique MC Macchina

- Do not use **Mape-Antique MC Macchina** to make consolidating slurry for injection into structures (use **Mape-Antique I** or **Mape-Antique F21**).
- Do not use **Mape-Antique MC Macchina** for "reinforced" render (use **Mape-Antique Strutturale NHL**).
- Do not use **Mape-Antique MC Macchina** for skimming surfaces (use **Mape-Antique FC Ultrafine**, **Mape-Antique FC Civile** or **Mape-Antique FC Grosso**).
- Do not add admixtures, cement or other binders (lime and gypsum) to **Mape-Antique MC Macchina**.
- Do not apply thin coats of paint or coloured coatings which could have a significant impact on the transpiration properties and porosity of **Mape-Antique MC Macchina** and, therefore, obstruct the evaporation of the moisture in the masonry. Use products from the **Silexcolor** or **Silancolor** ranges, lime-based paint or water-repelling products, such as **Antipluviol S** or **Antipluviol W**.
- If the structures to be renovated suffer from intense capillary rising damp and high concentrations of soluble salts, we recommend forming a horizontal chemical barrier (such as with **Mapestop**) before applying the de-humidifying render to reduce the ingress of damp into the masonry as much as possible.
- We recommend analysing the walls before applying the product to determine the concentration level of salts in the walls.
- Do not apply **Mape-Antique MC Macchina** at temperatures below +5°C.

APPLICATION PROCEDURE

Preparation of the substrate

On masonry with capillary rising damp and soluble salts, completely remove the deteriorated render either manually or mechanically to a height of approximately 50 centimetres above the deteriorated area, and in all cases to a height of at least twice the thickness of the wall. Also, remove all traces of loose or crumbly material, dust, mould and any other element which could compromise adhesion of the de-humidifying cycle of **Mape-Antique Rinzaffo** and **Mape-Antique MC Macchina** until the substrate is clean, sound and compact.
Then clean the masonry with low-pressure water jets to remove any efflorescence or soluble salts present on the surface. Repeat this operation several times if necessary.
Voids and uneven areas in the masonry must be repaired by patching or tacking with **Mape-Antique MC Macchina**, **Mape-Antique Allettamento** or **Mape-Antique Strutturale NHL** with pieces of stone, brick or tuff with characteristics as similar as possible to the original material.
Saturate the substrate with water to prevent it drawing off water from the mortar and compromising its final performance characteristics. Excess water must be left to evaporate off, so that the masonry is saturated and the surface is dry (s.s.d. state). Compressed air may be used to speed up this process. If the substrate cannot be saturated with water, we recommend that it is at least wetted to allow the mortar to adhere correctly.
If there is capillary rising damp, before spreading on the **Mape-Antique MC Macchina**, apply a layer of **Mape-Antique Rinzaffo** approximately 5 mm thick to completely cover the substrate and improve adhesion of the render, even out the absorption of the substrate and slow down the transfer of salts.
On mixed masonry or masonry out of plumb by more than 4-5 cm, which would lead to the layer of render having an irregular thickness, we recommend inserting Ø 2 mm zinc-plated metallic mesh with a mesh size of 5 x 5 cm before applying the **Mape-Antique Rinzaffo**. Fasten the mesh to the masonry with nails, plugs or chemical anchors (such as **Mapefix PE Wall** or **Mapefix PE SF**) with a small gap between the mesh and the substrate so that it becomes embedded in the middle of the layer of render.
Form levelling strips with **Mape-Antique MC Macchina** or place vertical guides in position to define the correct planarity and thickness of the render.

Preparation of the product

Pour the contents of the bags of **Mape-Antique MC Macchina** into the hopper of a continuous-mix rendering machine (such as a PFT G4 or G5, Putzmeister MP 25, Turbosol or similar) and set the flow-rate at 320-340 l/h, according to the type of equipment used, until a "plastic", thixotropic consistency is obtained. Tests to validate the product were carried out using a Putzmeister MP 25 with the following set-up:

Stator - Rotor	Mixer	Tube	Lance
D6 Power	*Standard*	Ø 25 mm, length 15 m	*Standard*, 14 mm nozzle
D6 - 3			

N.B.: *the figures in this Technical Data Sheet may vary according to the surrounding conditions when the product is applied and the type of rendering machine used.*

Application of the product

If a layer of **Mape-Antique Rinzaffo** has been applied, for example on masonry with capillary rising damp and soluble salts, wait until this layer has "thickened" and then apply a layer of **Mape-Antique MC Macchina** at least 20 mm thick starting from the bottom of the masonry. If the thickness to be built up is more than 30 mm, **Mape-Antique MC Macchina** must be applied in several layers. Each layer must be applied without tamping the previous layer.
After applying the render, wait a few minutes and level off the surface using an aluminium H-type or blade-type straight edge by passing over the surface horizontally and vertically until it is flat. Remove the vertical guides, if they have been used, and fill the gaps with **Mape-Antique MC Macchina**.
Finish off the surface of the render with a plastic, wooden or sponge float a few hours after application, according to the surrounding temperature and conditions.
Never press down on the surface of the **Mape-Antique MC Macchina**, otherwise the porosity of the render would be reduced and, as a result, evaporation of the moisture in the masonry would be obstructed.
Even though **Mape-Antique MC Macchina** contains products which impede the formation of micro-cracks, it is good practice to apply the mortar when the wall is not exposed to direct sunlight and/or wind. In such cases, such as during hot and/or particularly windy weather, take special care when curing the render, especially during the first 36-48 hours. Spray water on the surface or employ other systems to prevent the mixing water evaporating off too quickly.

FINISHING LAYER

If a finer surface finish than the normal tamped finish of **Mape-Antique MC Macchina** is required, apply a layer of **Mape-Antique FC Ultrafine**, **Mape-Antique FC Civile** or **Mape-Antique FC Grosso** skimming mortar with different grain sizes. Even though **Mape-Antique FC Ultrafine** and **Mape-Antique**

TECHNICAL DATA (typical values)

PRODUCT IDENTITY	
Type of mortar (EN 998-1):	R: “Renovation mortar. Mortar designed for internal/ external render applied on damp masonry walls containing water-soluble salts”
Consistency:	powder
Colour:	white
Maximum size of aggregate (EN 1015-1) (mm):	2.5
Bulk density (kg/m^3):	1,500
EMICODE:	EC1 R Plus - very low emission level
APPLICATION DATA OF PRODUCT (at +20°C – 50% R.H. - EN 1015-2)	
Mixing ratio:	100 parts of **Mape-Antique MC Macchina** with 19-21 parts of water (4.75-5.25 litres of water per 25 kg bag of product)
Consistency of mix:	plastic-thixotropic
Consistency of fresh mortar (EN 1015-3) (mm):	175
Bulk density of fresh mortar (EN 1015-6) (kg/m^3):	1,700
Porosity of fresh mortar (EN 1015-7) (%):	> 20
Application temperature range:	from +5°C to +35°C
Workability time of fresh mortar (EN 1015-9):	approx. 60 min.
Minimum applicable thickness (mm):	20
Maximum applicable thickness per layer (mm):	30

FINAL PERFORMANCE (15% mixing water)

Performance characteristic	Test method	Requirements according to EN 998-1	Performance of product
Compressive strength after 28 days (N/mm^2):	EN 1015-11	CS I (from 0.4 to 2.5)	Category CS II
		CS II (from 1.5 to 5.0)	
		CS III (from 3.5 to 7.5)	
		CS IV (≥ 6)	
Adhesion to substrate (N/mm^2):	EN 1015-12	declared value and failure mode (FP)	≥ 0.4 Failure mode (FP) = B
Capillary action water absorption (kg/m^2):	EN 1015-18	≥ 0.3 (after 24 h)	3.5
Coefficient of permeability to water vapour (μ):	EN 1015-19	≤ 15	≤ 10
Thermal conductivity ($\lambda_{10,dry}$) (W/m·K):	EN 1745	chart value	0.61
Reaction to fire:	EN 13501-1	value declared by manufacturer	Class A1
Resistance to sulphates:	Anstett test	not required	high
Saline efflorescence (after semi-immersion in water):	/	not required	absent

Levelling off Mape-Antique MC Macchina with a straight edge

Removal of the vertical guide

Planing the surface of Mape-Antique MC Macchina

Mape-Antique MC Macchina

FC Civile may be applied on any type of lime-based render, including macro-porous de-humidifying render, their fine or ultra-fine finish tend to slightly reduce the vapour permeability of the render. In such cases, it is better to use **Mape-Antique FC Grosso**, which is slightly coarser, or a thin coat of silicate-based **Silexcolor Tonachino** or siloxane-based **Silancolor Tonachino** coloured coating products after applying their corresponding primers (**Silexcolor Primer** and **Silancolor Primer**). Always wait until the render and skimming layer, if applied, are completely cured before painting the surface or applying any other type of finishing product. If the surface requires painting, use **Silexcolor Paint** or **Silancolor Paint** after applying their aforementioned corresponding primers.
If the render is not going to be decorated, especially on constructions particularly exposed to rain, it may be protected with a transparent, transpirant, water-repellent product such as **Antipluviol S** siloxane resin-based impregnator in solvent or **Antipluviol W** siloxane resin-based impregnator in water dispersion.

Cleaning
Remove the mortar from tools with water before it hardens. Once hardened, cleaning is more difficult and must be carried out mechanically.

PACKAGING
25 kg bags.

COLOUR
White.

CONSUMPTION
16 kg/m^2 (per cm of thickness).

STORAGE
Store **Mape-Antique MC Macchina** up to 12 months in a dry, covered area in its original, unopened packaging.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION
Mape-Antique MC Macchina contains special hydraulic binders, that when in contact with sweat or other body fluids cause corrosion and damage to eyes. It is recommended to wear protective gloves and goggles and to take the usual precautions for handling of chemicals. If the product comes in contact with the eyes or the skin wash immediately with plenty of water and seek medical attention.
For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

WARNING
Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

GEV-EMICODE EC 1 PLUS very low emission

This symbol is used to identify Mapei products which give off a low level of volatile organic compounds (VOC) as certified by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.), an international organisation for controlling the level of emissions from products used for floors.

GREEN INNOVATION

Our Commitment To The Environment
MAPEI products assist Project Designers and Contractors create innovative LEED (The Leadership in Energy and Environmental Design) certified projects, in compliance with the U.S. Green Building Council.

All relevant references for the product are available upon request and from www.mapei.com

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