MAPE-ANTIQUE NHL ECO STRUTTURALE

High-performance mortar for breathable render and masonry work, based on pure natural hydraulic lime and recycled material, particularly suitable for making CRM and installation mortar

CO_2 FULLY OFFSET PRODUCTS

Mape-Antique NHL Eco Strutturale is part of the *CO_2 Fully Offset in the Entire Life Cycle* line of products. CO_2 emissions measured throughout the life cycle of products from the Zero line in 2024 using Life Cycle Assessment (LCA) methodology, have been offset through the acquisition of certified carbon credits in support of forestry protection projects. A commitment to the planet, to people and to biodiversity. For more details on how emissions are calculated and on climate mitigation projects financed through certified carbon credits, visit the webpage zero.mapei.com.

WHERE TO USE

Rendering old stone, brick, tuff and mixed masonries, including ancient and decorative ones, with high-performance breathable mortar applied using a rendering machine or trowel.
"Reinforced" render with stainless steel or composite mesh and mortar joints for consolidating, strengthening and renovating weak masonry.
Pointing between elements on masonries, including those with a natural-finish.
Specifically, **Mape-Antique NHL Eco Strutturale** combined with **Mapenet EM 30**, **Mapenet EM 40** or **Mapenet EMR 33/66/99** pre-primed, alkali-resistant glass fibre mesh **may be used for the creation of CRM (Composite Reinforced Mortar) systems certified as CVT by CSLLPP (Italian Ministry of Public Works) in accordance with the reference Guidelines**.
For load-bearing and buffer walls or for rebuilding old masonries.

Some application examples

- New layers of internal and external high-performance breathable render on stone, brick, tuff and mixed masonries without capillary rising damp.
- Building and touching-up render on old masonries, including antique and artistic ones under the protection of the Fine Arts and Landscapes Authority.
- New render "reinforced" with galvanized or steel mesh or composite material (such as **Mapenet EM 30**, **Mapenet EM 40** or **Mapenet EMR 33/66/99**) on weak masonry with no capillary rising damp.
- Capping "reinforced" with stainless steel mesh or composite material (such as **Mapenet EM 30** and **Mapenet EM 40**) on the outer face of vaulted roofs.
- Levelling the outer face of vaulted roofs with uneven surfaces.
- Pointing between layers of stone, brick and tuff on natural-finish masonry.
- Making installation and "reinforced" joints using rebar or composites (such as **Maperod**), steel bows (such as **MapeWrap SG FIOCCO**) using the overlaying technique.

- Building facing walls with high-performance masonry mortar compliant with standards applied in seismic zones.
- Touching-up and plumbing facing walls with gaps and uneven surfaces.

TECHNICAL CHARACTERISTICS

Mape-Antique NHL Eco Strutturale is a pre-blended cement-free mortar in powder form for render and masonry work, made from pure natural hydraulic lime, recycled material, selected lime sands, special admixtures, micro-fibres and glass fibres according to a formulation developed in MAPEI's research laboratories.
This product is classified as GP according to EN 998-1 Standards: "*General purpose mortar for internal/external render*", guaranteed performance, Category CS IV.
It is also classified as G according to EN 998-2 Standards: "*Guaranteed performance, general-purpose masonry mortar for external use on elements with structural requirements*", Class M 15, with compressive strength > 15 N/mm².
When **Mape-Antique NHL Eco Strutturale** is mixed with water using a continuous mixing rendering machine or a cement mixer, it forms a breathable rendering and masonry mortar with a plastic-thixotropic consistency which is easy to apply by spraying or with a trowel. Thanks to its special composition, **Mape-Antique NHL Eco Strutturale** has an extremely low rate of hygrometric shrinkage which drastically reduces the risk of the formation of cracks in the mortar.
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 NHL Eco Strutturale** at both the fresh and hardened states.

RECOMMENDATIONS

- If it is difficult to thoroughly clean the masonry (internal walls for example) or if applied on mixed walls, wet the surface and apply a layer of **Mape-Antique Rinzaffo** before applying **Mape-Antique NHL Eco Strutturale** to guarantee a good bond of the plaster.
- **Mape-Antique NHL Eco Strutturale** must be applied in layers at least 10 mm thick.
- Do not use **Mape-Antique NHL Eco Strutturale** for casting into formwork (in such cases use **Mape-Antique Colabile** mixed with aggregates with a suitable grain size).
- Do not use to make consolidating slurry for injection into the structure (in such cases use **Mape-Antique I** or **Mape-Antique I-15** or **Mape-Antique F21**).
- Never add admixtures, cement or other binders (lime and gypsum) to **Mape-Antique NHL Eco Strutturale**.
- Wait until **Mape-Antique NHL Eco Strutturale** is completely cured before skimming the surface or applying a thin layer of coloured coating.
- Do not apply paint or coloured coatings with a low thickness, otherwise the breathable properties of **Mape-Antique NHL Eco Strutturale** could be compromised. Use products from the **Silexcolor** or **Silancolor** ranges; paint, lime, and water-repelling products such as **Antipluviol S** or **Antipluviol W**.
- For making "reinforced" mortars with a total thickness greater than 3 cm, apply one first coat minimum 1 cm thick and thoroughly press the mortar on the previously prepared substrate (also using a notched trowel), in order to create an adequate bonding layer.
- Do not apply **Mape-Antique NHL Eco Strutturale** if the temperature is lower than +5°C.

APPLICATION PROCEDURE

TECHNICAL INFORMATION FOR THE APPLICATION	
Composition of mix:	100 kg **Mape-Antique NHL Eco Strutturale** 16-17 kg water
Minimum application thickness:	10 mm
Maximum application thickness per layer:	40 mm
Application temperature range:	environmental and substrate temperature from +5°C to +35°C
Pot life of mix:	approx. 1h

Preparation of the substrate

Remove all loose and flaky parts, dust, mould and any other material either manually or mechanically until a clean, sound and compact surface is obtained to guarantee a good bonding surface for **Mape-Antique NHL Eco Strutturale**. When rebuilding the masonry installation joints remove all deteriorated and loose mortar. Then clean the wall with low-pressure water jets to remove any efflorescence or salts present on the surface. Repeat this operation several times if necessary.
If weak substrates need to be consolidated, apply a number of coats of **Consolidante 8020** or **Consolidante ETS** or **Primer 3296** (refer to the relevant Technical Data Sheets).
Voids and uneven areas in the masonry must be repaired by patching or tacking with **Mape-Antique NHL Eco Strutturale** or **Mape-Antique Allettamento** with pieces of stone, brick or tuff with similar characteristics to the original material.
If large surfaces need to be rendered, we recommend applying the product with a continuous-feed rendering machine and to place vertical shims on the walls to check that the render is even and flat.
Before applying **Mape-Antique NHL Eco Strutturale** the substrate must be partially saturated to avoid the substrate absorbing water from the mortar, compromising the final performance characteristics of the mortar. Excess water must be eliminated, so that the masonry is saturated and the surface is dry. Compressed air may be used to speed up this process.
When used to “strengthen” render or “reinforce” capping, put stainless steel mesh or composite material (such as **Mapenet EM 30**, **Mapenet EM 40** or **Mapenet EMR 33/66/99** pre-primed, alkali-resistant glass fibre mesh) on the existing masonry and fasten it in place after applying the first layer of render. When using a metal mesh, fasten it in place with nails or studs or with metal connectors. When using a composite mesh, fasten it in place with **Mapenet EM Connector**, special “L” shaped connectors made from A.R. glass fibre and thermosetting resin, such as vinylester-epoxy resin. Fasten the connectors to the masonry with **Mapefix VE SF**, styrene-free, vinylester resin-based chemical anchor. The recommended number of fasteners to use is 4-5/m^2.
Whatever type of strengthening mesh is used, it must be set at a certain distance from the substrate so that it is at the mid-point of the finished render. The two layers encapsulating the mesh must be laid using the “fresh on fresh” technique and maintaning a total thickness of maximum 3 cm.
If strengthening layers are applied using the reinforced installation technique with rebar or composite bars (such as **Maperod**), the reinforcement must be placed at a depth which guarantees that it is covered by a layer of mortar at least 2 cm thick.

Preparation of the product

Mape-Antique NHL Eco Strutturale must be prepared in a cement mixer if it is to be applied by trowel or in a continuous-feed rendering machine if mechanical application is preferred. Although the product is suitable for application using manual techniques, we recommend using a rendering machine to apply the product on large surfaces to obtain a better yield. Small amounts of the product may be prepared using a low-speed electric drill with a mixing attachment. Mixing by hand is not recommended.
Instructions for the preparation of mortar for Lab testing samples can be found in the TECHNICAL DATA section.

Application of the product

Application with rendering machine

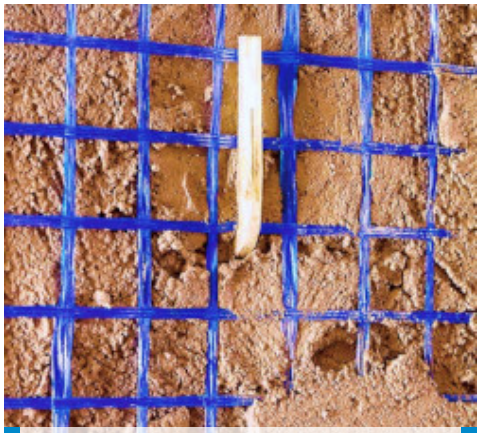
Pour the contents of the bags of **Mape-Antique NHL Eco Strutturale** into the hopper of a continuous-mix rendering machine and set the water flow-rate at 320-340 l/h, depending on the type of mixer (rotor/stator) used, until a “plastic”, consistency is obtained.
The render may be applied with single-phase or three-phase continuous rendering machines equipped with a mixer (rotor/stator) that is suitable to the maximum nominal diameter of the aggregates in the render, which is mentioned in the product's TDS.
Note: differences may arise compared to the figures in the TECHNICAL DATA (typical values) table included in this TDS, according to the conditions at the time of product application and the rendering machine used.
If the thickness to be applied is thicker than 40 mm, **Mape-Antique NHL Eco Strutturale** must be applied in several layers. Each layer must be applied without tamping the previous one.
We recommend rendering the wall from a distance of approximately 20 cm so that the product is applied uniformly. After applying the mortar, wait a few minutes and level off 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 shims which were previously attached to the wall and fill the spaces with the same mortar.

Finish the surface of **Mape-Antique NHL Eco Strutturale** with a plastic, wooden or sponge float a few hours after the application, according to the surrounding temperature and conditions.
Even though **Mape-Antique NHL Eco Strutturale** contains products which contrast 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 mortar, especially during the first 36-48 hours. Spray water on the surface or employ other systems to impede the mixing water evaporating too quickly.

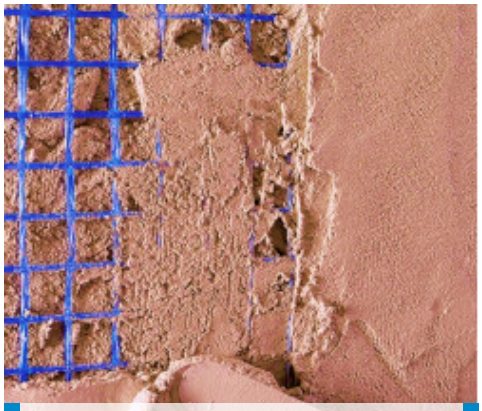
Application by trowel

After pouring a minimum amount of water in the mixer (approximately 4 litres per 25 kg bag of **Mape-Antique NHL Eco Strutturale**), slowly pour the powder in a continuous flow. Mix for approximately 3 minutes and check that the blend is well mixed, even and free of lumps and remove all the material which has stuck to the walls of the mixer.
Add more water if required up to a maximum total of 4.25 l per sack of product. Then mix **Mape-Antique NHL Eco Strutturale** again for a further 2-3 minutes to obtain an even, "plastic" and thixotropic blend. Apply **Mape-Antique NHL Eco Strutturale** in layers of up to 40 mm thick per layer, starting from the bottom of the wall.
If the product is used as masonry mortar on facing walls or for patching and tacking, form a laying surface beforehand and then apply the constructive elements by pressing them in with a light pressure until they are in the right position. Remove excess mortar with a trowel.
If the mortar is used for pointing, the product must be applied at a thickness of at least 2 cm. On natural-finish walls, remove any excess product and clean the facing wall with water and a sponge float.

Making holes for Mapenet EM Connector



Placing Mapenet EM 40



Applying a second layer of Mape-Antique NHL Eco Strutturale

Squarring Mape-Antique NHL Eco Strutturale

Levelling the render Mape-Antique NHL Eco Strutturale

Close-up of Mape-Antique NHL Eco Strutturale combined with stainless steel mesh

FINISHING

If a finer-textured finish than the normal floated finish of **Mape-Antique NHL Eco Strutturale** is required, apply a skim coat of one of the products from the **Mape-Antique NHL Eco Rasante** or **Mape-Antique FC** range of skimming mortars, which are available in various textured finishes. If required, **Mapenet 150** A.R. glass fibre mesh may also be embedded in the skimming mortar (please refer to the relative data sheet of the product used).

If, on the other hand, you would rather skim, decorate and protect the surface of the render at the same time, use a coloured coating product, such as **Silexcolor Tonachino** silicate-based finish or **Silancolor Tonachino** siloxane-based finish, after priming the surface with their corresponding primer (**Silexcolor Base Coat** or **Silancolor Base Coat**). As an alternative to the products mentioned above, if you would rather paint the surface of the render, use **Silexcolor Paint** or **Silancolor Paint** after priming the surface with their corresponding primer (**Silexcolor Primer** or **Silancolor Primer**).
Always wait until the render is completely cured, usually approximately 7 days per cm of thickness, before applying any type of thin-layered coloured dressing product or paint.
For constructions particularly exposed to rain, if the render does not require any coating, it may be protected with a breathable product such as **Antipluviol S** transparent, breathable, siloxane resin impregnator in solvent or **Antipluviol W** transparent, breathable, siloxane resin impregnator in water dispersion.

CLEANING

The mortar which has not yet hardened may be washed from tools using water. Once hardened, cleaning is much more difficult and must be carried out mechanically.

CONSUMPTION

Approx. 17 kg/m² per cm of thickness.

PACKAGING

25 kg bags.

STORAGE

12 months in a dry, covered environment in its original, unopened packaging.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Instructions for the safe use of our products can be found on the latest version of the Safety Data Sheet, available from our website www.mapei.com.
PRODUCT FOR PROFESSIONAL USE.

TECHNICAL DATA (typical values)

PRODUCT IDENTITY	
Type of mortar according to EN 998-1:	GP
Type of mortar according to EN 998-2:	G
Consistency:	powder
Colour:	light hazel
Type of binder (EN 459-1):	natural hydraulic lime
Maximum size of aggregate:	2.5 mm
Ion chloride content according to EN 1015-17: (minimum requirement according to EN 998-2 ≤ 0.10%)	< 0.05 %

TECHNICAL INFORMATION FOR THE PREPARATION OF THE PRODUCT	
Mixing ratio:	100 parts by weight of **Mape-Antique NHL Eco Strutturale** with 17% water
Preparation of mix:	product mixing according to EN 1015-2

CHARACTERISTICS OF FRESH MIX (at +20°C - 50% R.H.)	
Colour of mix:	light hazel
Consistency of mix:	thixotropic
Density of mix:	2000 kg/m³

FINAL PERFORMANCE
According to curing defined in test methods

Performance characteristic	Test method	Requirements EN 998-1 GP – CS IV	Requirements EN 998-2 G – M15	Product performance
Compressive strength:	EN 1015-11	CS I (from 0.4 to 2.5 MPa) CS II (from 1.5 to 5.0 MPa) CS III (from 3.5 to 7.5 MPa) CS IV (≥ 6 MPa)	from class M1 (≥ 1 N/mm²) to class M d (d ≥ 25 N/mm²) or multiples of 5	**> 15 N/mm² Category CS IV Class M 15**
Adhesion to substrate:	EN 1015-12	declared value and failure pattern (FP)	not required	**≥ 0.7 MPa Failure pattern (FP) = A/C**
Initial shear strength:	EN 998-2 Appendix C	not required	chart value	**0.15 N/mm²**
Static modulus of elasticity after 28 days:	EN 13412	not required	not required	**10 GPa**
Capillary water absorption:	EN 1015-18	W_C 0 not specified W_C 1 ≤ 0.40 kg/(m²·min$^{0.5}$) W_C 2 ≤ 0.20 kg/(m²·min$^{0.5}$)	declared value	**< 0.20 kg/(m²·min$^{0.5}$) W_C 2**
Permeability coefficient to water absorption (μ):	EN 1015-19	declared value	declared value	**μ ≤ 60**
Thermal conductivity ($\lambda_{10,dry}$):	EN 1745	chart value	chart value	**0.82 W/m·K (P = 50%)**
Reaction to fire:	EN 13501-1	Euroclass	Euroclass	**B-s1, d0**

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.
The values declared in the TECHNICAL DATA table (typical values) were obtained in compliance with test methods and curing cycles defined in the technical standards referenced therein. Therefore, please note that the use of test procedures or methods other than those indicated in the table could lead to different values and that, in such cases, any liability of our company is excluded.
Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

LEGAL NOTICE

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