



# 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**



## WHERE TO USE

Rendering old stone, brick, tuff and mixed walls, including ancient and decorative walls, with high-performance transpirant mortar applied using a rendering machine or trowel.

For making “reinforced” mortar and installation joints for consolidating and renovating weak walls.

Pointing between elements on walls, including walls with a natural-finish.

For load-bearing and buffer walls or for rebuilding old walls.

## Some application examples

- New layers of internal and external high-performance transpirant render on stone, brick, tuff and mixed walls without capillary rising damp.
- Building and touching-up render on old walls, including antique and artistic walls with National Trust and environmental protection orders.
- Applying new mortar “reinforced” with electro-welded zinc-plated mesh on weak walls without capillary rising damp.
- For “reinforced capping” with reinforcement mesh 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**).
- Building facing walls using mortar with higher mechanical characteristics than conventional lime mortar.
- Touching-up and plumbing facing walls with gaps and uneven surfaces.

## TECHNICAL CHARACTERISTICS

**Mape-Antique Strutturale NHL** is a pre-blended cement-free mortar in powder form for render and masonry work, made from natural hydraulic lime (NHL),

Eco-Pozzolan, natural sand, special additives, 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 of > 15 N/mm<sup>2</sup>.

When **Mape-Antique Strutturale NHL** is mixed with water using a continuous mixing rendering machine or a cement mixer, it forms a transpirant 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 Strutturale NHL** has an extremely low rate of hygrometric shrinkage which drastically reduces the risk of the formation of cracks in the mortar. It also has good resistance to a wide range of aggressive chemical and physical phenomena.

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 Strutturale NHL** 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 Rinzafo** before applying the **Mape-Antique Strutturale NHL** to guarantee a good bond of the plaster.
- **Mape-Antique Strutturale NHL** must be applied in layers of at least 10 mm.
- Do not use **Mape-Antique Strutturale NHL** for casting into formwork (in such cases use **Mape-Antique LC** mixed with aggregates with a suitable grain size).

# Mape-Antique Strutturale NHL



Fastening zinc-plated mesh to the masonry



Checking the gap between the mesh and substrate



Application of Mape-Antique Rinzafo on weak masonry

- Do not use to make consolidating slurry for injection into the structure (in such cases use **Mape-Antique I** or **Mape-Antique F21**).
- Never add additives, cement or other binders (lime and gypsum) to **Mape-Antique Strutturale NHL**.
- Do not apply paint or coloured coatings with a low thickness, otherwise the transpiration properties of **Mape-Antique Strutturale NHL** could be compromised. Use products from the **Silexcolor** or **Silancolor** ranges; paint, lime, and water-repelling products such as **Antipluviol S** or **Antipluviol W**.
- Do not apply **Mape-Antique Strutturale NHL** if the temperature is lower than +5°C.

## APPLICATION PROCEDURE

### 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 the **Mape-Antique Strutturale NHL**. 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 **Primer 3296** (refer to the relative Technical Data Sheets).

Voids and uneven areas in the masonry must be repaired by patching or tacking with **Mape-Antique Strutturale NHL** or **Mape-Antique Alettamento** with pieces of stone, brick or tuff with similar characteristics to the original material.

In the case of particularly difficult walls, such as those in stone and mixed or porous or mechanically weak materials, we recommend applying a starter layer approximately 5 mm thick of **Mape-Antique Strutturale NHL** with a semi-fluid consistency or **Mape-Antique Rinzafo** to even out the absorbency of the substrate and improve the bond of the plaster. 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 Strutturale NHL** the substrate must be partially saturated to avoid the substrate absorbing water from the mortar and compromise 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.

If reinforced render or capping is to be applied or if it is applied on mixed walls apply a layer of zinc-coated 5 x 5 cm x Ø 2 mm metal mesh. The mesh must be fixed in place to the wall with nails, chemical fixing (**Mapefix PE SF**) or plugs with a small gap between the wall so that it becomes embedded in the middle of the layer of render.

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 Strutturale NHL** 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.

## Application of the product

### Application with rendering machine

Pour the contents of the sacks of **Mape-Antique Strutturale NHL** into the hopper of a continuous-feed 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 machine used, until a "plastic" consistency is obtained. Tests to validate the product were carried out using a Putzmeister MP 25 with the following fittings:

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

If an initial 5 mm thick layer of **Mape-Antique Strutturale NHL** with a semi-fluid consistency or **Mape-Antique Rinzafo** have been applied, wait until this product starts to set and then apply a single layer of **Mape-Antique Strutturale NHL** (max 40 mm) starting from the lower part of the wall and working upwards. If the thickness to be applied is thicker than 40 mm, **Mape-Antique Strutturale NHL** 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 Strutturale NHL** with a plastic, wooden or sponge float a few hours after application, according to the surrounding temperature and conditions.

Even though **Mape-Antique Strutturale NHL** 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 sack of **Mape-Antique Strutturale NHL**), 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 Strutturale NHL** again for a further 2-3 minutes to obtain an even, "plastic" and thixotropic blend. Apply **Mape-Antique Strutturale NHL** 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

## TECHNICAL DATA (typical values)

### PRODUCT DETAILS

Type of mortar (EN 998-1):	GP - General purpose mortar for internal/external render		
Type of mortar (EN 998-2):	G - Guaranteed performance, general-purpose masonry mortar for external use on elements with structural requirements		
Appearance:	powder		
Colour:	light hazel		
Type of hydraulic binder (EN 459-1):	NHL 3.5 and NHL 5		
Maximum size of aggregate (EN 1015-1) (mm):	2.5		
Apparent volume mass (kg/m <sup>3</sup> ):	1,400		
Chloride content (EN 1015-17) (%):	Requirements EN 998-1	Requirements EN 998-2	Performance of product
	not required	< 0.1	< 0.05
Hazard classification according to Directive 1999/45/CE:	none. Before using the product, refer to the "Safety guidelines for preparation and application" section and the information contained on the packaging and Safety Data Sheet		

### APPLICATION DATA (at +20°C - 50% R.H.)

Mixing ratio:	100 parts of <b>Mape-Antique Strutturale NHL</b> with 16-17 parts of water (4-4.25 litres of water per 25 kg bag of the product)
Appearance of blend:	thixotropic
Consistency of fresh mortar (EN 1015-3) (mm):	175
Bulk density of fresh mortar (EN 1015-6) (kg/m <sup>3</sup> ):	2,000
Porosity of the mortar while fresh (EN 1015/7) (%):	7
Application temperature range:	from +5°C to +35°C
Workability time of fresh mortar (EN 1015-9):	approx. 60 minutes
Minimum applicable thickness (mm):	10
Maximum applicable thickness (mm):	40

### FINAL PERFORMANCE (17% mixing water)

Performance characteristic	Test method	Requirements according to EN 998-1	Requirements according to EN 998-2	Performance of product
Compressive strength after 28 days (N/mm <sup>2</sup> ):	EN 1015-11	CS I (from 0.4 to 2.5)	from class M 1 (> 1 N/mm <sup>2</sup> ) to class M d (> 25 N/mm <sup>2</sup> )	> 15 (Category CS IV) (Class M 15)
		CS II (from 1.5 to 5.0)		
		CS III (from 3.5 to 7.5)		
		CS IV (≥ 6)		
Bond strength to substrate (brickwork) (N/mm <sup>2</sup> ):	EN 1015-12	declared value and failure type (FP)	not required	≥ 0.7 Failure mode (FP) = A/C
Initial shear strength (f <sub>voik</sub> ) (N/mm <sup>2</sup> ):	EN 998-2 Appendix C	not required	declared value	0.15
Static modulus of elasticity after 28 days (N/mm <sup>2</sup> ):	EN 13412	not required	not required	10,000
Capillary action water absorption [kg/(m <sup>2</sup> ·min <sup>0.5</sup> )]:	EN 1015-18	from category W 0 to category W 2	declared value	< 0.2 Category W 2
Coefficient of permeability to water vapour (μ):	EN 1015-19	declared value	declared value	60
Thermal conductivity (λ <sub>10,dry</sub> ) (W/m·K):	EN 1745	tabulated value	tabulated value	1
Reaction to fire:	EN 13501-1	value declared by manufacturer	value declared by manufacturer	Class E



Spray-application of Mape-Antique Strutturale NHL



Squaring the render



Levelling the render

# Mape-Antique Strutturale NHL



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.

## FINISHING

If a finer-grained surface finish than the normal tamped finish of **Mape-Antique Strutturale NHL** is required, apply a layer of **Mape-Antique FC Ultrafine**, or **Mape-Antique FC Civile** or **Mape-Antique FC Grosso** fine-grained smoothing and levelling mortars made with lime and Eco-Pozzolan with different granulometries. If the surface of the render is to be smoothed off and then decorated or protected, use thin layers of a coloured finish such as **Silexcolor Tonachino** silicate finish or **Silancolor Tonachino** silixane finish after priming the surface with a primer from the corresponding ranges of products (**Silexcolor Primer** or **Silancolor Primer**). As an alternative to the products mentioned above, if the surface of the render is to be painted, use **Silexcolor Paint** or **Silancolor Paint** after applying their corresponding primers. 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 transpirant product such as **Antipluviol S** transparent, transpirant, siloxane resin impregnator in solvent or **Antipluviol W** transparent, transpirant, siloxane resin impregnator in water dispersion.

## Cleaning

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.

## PACKAGING

25 kg bags.

## CONSUMPTION

approx. 17 kg/m<sup>2</sup> per cm of thickness.

## STORAGE

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

## SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

**Mape-Antique Strutturale NHL** it is not considered a dangerous substance according to current standards and regulations regarding to the classification of mixtures. Use protective gloves and clothing. Use protective gloves and goggles.

For further and complete information about a safety use of our product please refer to our latest version of the 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](http://www.mapei.com)



**All relevant references  
for the product are available  
upon request and from  
[www.mapei.com](http://www.mapei.com)**



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