



# Mapenet EM30 Mapenet EM40

**Pre-impregnated alkali-resistant A.R. glass fibre mesh (FRP) used to form “reinforced” structural render on concrete and masonry structures**



## WHERE TO USE

Pre-impregnated, alkali-resistant A.R. glass fibre mesh (FRP), fastened in position with **Mapenet EM Connector** fasteners, used to structurally strengthen stone, brick, tuff and mixed masonry structures in combination with **MapeWall Render & Strengthen** (natural hydraulic lime-based transpirant rendering and masonry mortar for making structural render) or **Mape-Antique Strutturale NHL** (ready-mixed, cement-free, natural hydraulic lime (NHL) and Eco-Pozzolan-based powdered mortar). When applied on concrete structures it must be used in combination with **Mapegrout MS** (microsilicate-based, thixotropic fibre-reinforced mortar) or **Mapegrout T60** (sulphate-resistant, compensated-shrinkage, thixotropic fibre-reinforced mortar). This system gives structures a high level of ductility, increases their load-bearing capacity and distributes stresses more evenly.

## Some application examples

- “Reinforced” render on concrete walls and bay walls.
- Increasing the compressive strength of bay walls.
- Strengthening vaulted roofs by “reinforced capping”.
- Systems to prevent the collapse of floor joists.

## TECHNICAL CHARACTERISTICS

**Mapenet EM30** and **Mapenet EM40** form a system of meshes made from high-strength, pre-impregnated, alkali-resistant A.R. glass fibre (FRP) with 16% zirconium dioxide which, thanks to their special weave

pattern, give structures strengthened with this system a high level of ductility and more even stress distribution. The mesh is fastened monolithically to the structure using **Mapenet EM Connector** fasteners. **Mapenet EM Connector** is a pre-formed “L” shaped fastener made from alkali-resistant glass fibre and thermo-setting vinylester-epoxy resin. The recommended number of connectors is 5/m<sup>2</sup>. The mesh is characterised by its high flexibility which makes it very easy to shape and bend around the edges and corners of structures, as long as they have been rounded off beforehand. The strengthening system comprising **Mapenet EM** structural mesh complies with the approach defined in the guidelines for the qualification of CRM (Composite Reinforced Mortar) that stress the importance of qualifying the complete strengthening package.

## ADVANTAGES

- Excellent tensile strength.
- Stable and resistant to chemical aggression from cement.
- Resistant to atmospheric agents.
- High dimensional stability.
- Does not rust.
- Light and easy to handle.
- Easy to cut and fold to suit the shape of the substrate.

**Mapenet EM30**  
**Mapenet EM40**



Drilling the holes



Removing dust from the holes



Application of the chemical anchor

## TECHNICAL DATA (typical values)

### PRODUCT IDENTITY

	Mapenet EM30	Mapenet EM40	Reference standard
Type of fibre:	A.R. glass fibre	A.R. glass fibre	ASTM C1666C-M-07 EN 15422
Zirconium dioxide content (ZrO <sub>2</sub> ) (%):	≥ 16	≥ 16	-
Weight (g/m <sup>2</sup> ):	420	270	ISO 3374:2000 (E)
Mesh size (mm):	30 x 30	40 x 40	CNR DT 200 R1/2013
Average thickness (mm):	2	0.75	CNR DT 200 R1/2013
Section of single bar (mm <sup>2</sup> ):	2.37	1.518	CNR DT 200 R1/2013
Nominal area of fibres (mm <sup>2</sup> ):	0.395	0.253	CNR DT 200 R1/2013
Resistant section (mm <sup>2</sup> /m):	55.92	35.82	CNR DT 200 R1/2013
Bars/metre (n°):	33	25	-

### APPLICATION DATA

Tensile strength of single bar (kN):	3.20	2.25	ISO 527-4,5:1997 (E)
Elongation at failure (%):	4	4	ISO 527-4,5:1997 (E)
Tensile modulus of elasticity (N/mm <sup>2</sup> ):	33,000	33,000	ISO 527-4,5:1997 (E)

### MAPENET EM CONNECTOR

	MAPENET EM CONNECTOR			Reference standard
Type of fibre:	alkali-resistant glass fibre			ASTM C1666C-M-07
Thermo-setting resin:	epoxy-vinylester			-
Density of fibre (g/cm <sup>3</sup> ):	2.55			ISO 1183
Density of resin (g/cm <sup>3</sup> ):	1.1			ISO 1183
Distortion temperature of resin (Tg) (°C):	> 100			ASTM - E - 1640
Length (mm):	100 x 200	100 x 500	100 x 700	-
Equivalent diameter of bar (mm):	7			App. B CNR DT 203/2006
Equivalent section area (mm <sup>2</sup> ):	38			App. B CNR DT 203/2006

### APPLICATION DATA

Tensile strength (kN):	> 32	CNR DT 203/2006
Elongation at failure (%):	> 1.5	App. B CNR DT 203/2006
Tensile modulus of elasticity (N/mm <sup>2</sup> ):	> 35,000	App. B CNR DT 203/2006



## APPLICATION TECHNIQUE

### Substrate preparation

Surfaces on which **Mapenet EM30** or **Mapenet EM40** are applied must be prepared according to specification. When strengthening facing walls and the inside face of vaulted roofs, the render must be completely removed. All the old render must be removed with hand or power tools. When strengthening the outer face of vaulted roofs we recommend removing the flooring and spandrels. This operation must expose the masonry under the render to form a clean, sound and compact substrate. While the render is being removed, if new stones, bricks and/or tuff are required to fill large gaps in the wall, use material with characteristics as similar as possible to the material originally used to build the wall. Remove all loose material and dust and clean the masonry with low pressure water jets. Excess water must be left to evaporate off so that the substrate is saturated and the surface is dry (s.s.d. condition). Compressed air may be used to speed up this process.

### Making the holes

Drill a series of 16 mm diameter holes (5/m<sup>2</sup>) and remove all traces of dust from inside the holes.

### Attaching the connectors

For concrete structures, fasten the "L" - shaped **Mapenet EM Connector** in place with **Mapefix EP 385-585** or **Mapefix VE SF**, epoxy chemical anchor for structural loads. For masonry structures, fasten them in place with **Mapefix PE Wall** polyester chemical anchor, supplied in handy cartridges.

### Application of the first layer of mortar

Depending on the type of structure to be strengthened and the type of mortar chosen for the job (**MapeWall Render & Strengthen**, **Mape-Antique Strutturale NHL**, **Mapegrout MS** or **Mapegrout T60**) prepare the mortar by following the instructions on the relevant Technical Data Sheet. Apply an even layer around 20 mm thick of **MapeWall Render & Strengthen**, **Mape-Antique Strutturale NHL**, **Mapegrout MS** or **Mapegrout T60** with a flat metal trowel or by spray. Level off the entire wall to form an even, flat layer.

### Positioning the MapeNet EM mesh

After applying the first layer of mortar, place the **Mapenet EM30** or **Mapenet EM40** mesh all over the surface and press it down lightly with a flat trowel so that it adheres to the mortar and is positioned correctly against the fasteners applied previously. Overlap adjacent pieces of **Mapenet EM** by at least 15 cm both lengthways and widthways. When reinforcing vaulted roofs we recommend hemming the strengthening fabric over the mix by at least 40 cm.

### Application of the second layer of mortar

Apply a second even layer around 20 mm thick of **MapeWall Render & Strengthen**, **Mape-Antique Strutturale NHL**, **Mapegrout**

**MS** or **Mapegrout T60** so that it completely covers the mesh and fasteners.

## PACKAGING

**Mapenet EM30** is supplied in 1 metre wide by 25 m long rolls packed in cardboard boxes.

**Mapenet EM40** is supplied in 1 metre wide by 50 m long rolls packed in cardboard boxes.

**Mapenet EM Connector** is available in three different sizes and is supplied in boxes of 100 pieces.

## STORAGE

Store in a covered dry area.

## SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

**Mapenet EM30** and **Mapenet EM40** are articles and referring to the current European regulations (Reg. 1906/2007/CE - REACH) do not require the preparation of the Safety Data Sheet. During use it is recommended to wear gloves and goggles and follow the safety requirements of the workplace in which work is carried out.

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)

## LEGAL NOTICE

*The contents of this Technical Data Sheet ("TDS") may be copied into another project-related document, but the resulting document shall not supplement or replace requirements per the TDS in force at the time of the MAPEI product installation.*

*The most up-to-date TDS can be downloaded from our website [www.mapei.com](http://www.mapei.com).*

**ANY ALTERATION TO THE WORDING OR REQUIREMENTS CONTAINED OR DERIVED FROM THIS TDS EXCLUDES THE RESPONSIBILITY OF MAPEI.**

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



Inserting a MapeNet EM Connector



Application of the first layer of MapeWall Render & Strengthen

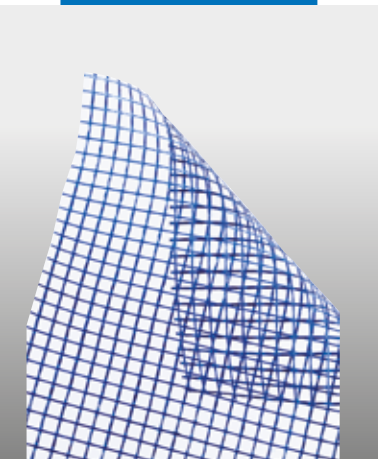


Mapenet EM placed in position

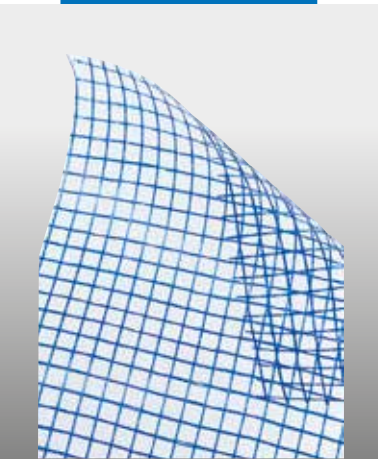
**Mapenet EM30**  
**Mapenet EM40**



*Application of the second layer of MapeWall Render & Strengthen*



*Mapenet EM30*



*Mapenet EM40*

