



# Mapegrid B 250

**Primed alkali-resistant basalt fibre mesh for structural “reinforced” strengthening of concrete and masonry structures**

## WHERE TO USE

Primed alkali-resistant basalt fibre mesh used in combination with **Planitop HDM** or **Planitop HDM Maxi** (two-component ready-mixed high ductility pozzolan-reaction fibre-reinforced cementitious mortar for structural “reinforced” strengthening of masonry structures) or **Planitop HDM Restauro** (two-component ready-mixed high-ductility fibre reinforced natural hydraulic lime (NHL) and Eco-pozzolan based mortar for structural “reinforced” strengthening of masonry structures) to strengthen reinforced concrete and masonry structures in order to improve their mechanical characteristics and overall ductility.

**Mapegrid B 250** mesh is part of the MAPEI FRG System, a complete range of composite materials that use an inorganic matrix to guarantee excellent chemical-physical and elastic-mechanical compatibility with masonry substrates. This type of system offers several important advantages when used on buildings of historical or artistic interest. Rather than replace existing structures, the system works in parallel with them to help improve without altering the way the masses and rigidity within the structures are distributed. The latter is a very important factor, particularly in seismic areas where stresses are proportional to the masses involved. The use of **Mapegrid B 250** in particular allows for better distribution of strains caused by cyclic loads.

**The system, made up of special mesh and mortar, follows the approach defined by the guidelines for the approval of FRCM (Fibre Reinforced Cementitious Matrix) systems which stress the**

**importance of obtaining approval for the entire strengthening package.**

## Some application examples

- Shear/tensile strengthening of bay walls through application to the internal and/or external face.
- Structural strengthening of masonry arches and vaulted roofs through application to both the external and internal faces.
- Reinforced strengthening for more even distribution of stresses induced by seismic activity.

## TECHNICAL CHARACTERISTICS

**Mapegrid B 250** is a special square mesh made from primed, alkali-resistant basalt fibres which, thanks to its special weave, increases the mechanical characteristics and ductility of the reinforced masonry and distributes stresses more evenly. As a result, in the event of movements in the structure, the strengthening package has the ability to distribute stresses and strains over the entire surface of the members and elements strengthened with the mesh so that its failure mode is transformed from brittle type to ductile type. The system adheres perfectly to the substrate and the mechanical properties of the bond formed are such that localised stresses always provoke a failure in the substrate rather than at the substrate/strengthening system interface. In the case of strengthening applied to arched or vaulted elements, the masonry acquires the ability



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Application of the first layer of Planitop HDM Restauoro



Positioning of Mapegrid B 250

## TECHNICAL DATA (typical values)

### PRODUCT IDENTITY

Type of fibre:	basalt
Weight (g/m <sup>2</sup> ):	250
Mesh size (mm):	6 x 6
Density of fibre (g/cm <sup>3</sup> ):	2.75

### APPLICATION DATA

Tensile strength (kN/m):	60
Modulus of elasticity (GPa):	89
Load-resistant area per unit of width (mm <sup>2</sup> /m):	38.91
Equivalent thickness of dry fabric (mm):	0.039
Elongation at failure (%):	1.8

to resist tensile loads and inhibit the formation of plastic hinge points on the side opposite to where the strengthening package is applied. There is also a lower consumption of energy during the production process of **Mapegrid B 250**, thereby guaranteeing less impact on the environment due to the limited amount of CO<sub>2</sub> emissions. In combination with **Planitop HDM Restauoro** mortar to strengthen historical buildings it represents a particularly “eco-compatible” system.

### ADVANTAGES

- Excellent tensile strength.
- Excellent resistance to cyclical loads.
- 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 adapt the shape of the substrate.
- Resistant to wear.
- Limited amount of CO<sub>2</sub> emissions during the production process.

### APPLICATION TECHNIQUE

#### Preparation of the substrate

Surfaces on which **Mapegrid B 250** is to

be applied must be prepared according to the specification. When used to strengthen bay walls or the internal face of arched or vaulted members and elements, the render must be completely removed either manually or with suitable power tools, along with any deteriorated or detached areas until the substrate is sound, compact and strong so that the strengthening package itself does not detach. This operation must be carried out until the underlying masonry is exposed. When the render has been removed, if new stones, bricks and/or tuff are required to fill large gaps in the wall, use a material with characteristics as similar as possible to the material originally used to build the wall. When used to strengthen the external face of masonry vaulted members and elements, remove all the flooring and spandrels and any deteriorated or detached areas until the substrate is sound, compact and strong ensuring the strengthening package itself does not detach.

Wet the substrate to be strengthened and leave any excess water to evaporate off so that the masonry is saturated and the surface is dry (s.s.d. condition). Compressed air may be used to speed up this process. When applying materials with an epoxy matrix from the **MapeWrap** line the surface must be dry.

#### Application procedure for Mapegrid B 250 with an inorganic matrix (FRG)

1. Prepare **Planitop HDM**, **Planitop HDM Maxi** or **Planitop HDM Restauoro** (see the relevant Technical Data Sheet).
2. Apply an even layer of **Planitop HDM**, **Planitop HDM Maxi** or **Planitop HDM**

**Restauro** around 5-6 mm thick with a flat metal trowel or by spray.

3. After applying the first layer of mortar and while it is still "wet", place **Mapegrid B 250** mesh all over the surface and press down lightly with a flat trowel so that it adheres perfectly to the mortar. Overlap adjacent pieces of **Mapegrid B 250** by at least 15 cm both lengthways and widthways.
4. Apply a second even layer of **Planitop HDM**, **Planitop HDM Maxi** or **Planitop HDM Restauro** around 5-6 mm thick so that it completely covers the mesh.

We recommend folding the strengthening package over the imposts by at least 40 cm, especially when working on the internal or external face of arched and vaulted elements and members.

### Protecting the strengthening system

In order to improve the anchoring mechanism of the strengthening system, strategically placed connectors made from **MapeWrap Fiocco** may also be applied (see relative Technical data Sheet) on the facing wall or on the imposts, keystones and around the springers of arched or vaulted members. The connectors eliminate any "debonding" phenomenon and increases the static efficiency of the strengthening package applied. The number and pitch of the connectors is defined during the design phase.

### Application procedure for Mapegrid B 250 with an epoxy matrix (FRP)

Application procedure for **Mapegrid B 250** using the "dry system".

#### Application phases

1. Preparation of **MapeWrap Primer 1**.
2. Application of **MapeWrap Primer 1**.
3. Preparation of the first layer of **MapeWrap 11** or **MapeWrap 12**.
4. Placing the **Mapegrid B 250** mesh.
5. Application of the second layer of **MapeWrap 11**.

#### 1. Preparation of MapeWrap Primer 1

The two components which make up **MapeWrap Primer 1** must be mixed together. Pour component B into component A and mix with a low-speed drill with a mixing attachment until the resin is completely blended. Mixing ratio: 3 parts in weight of component A with 1 part in weight of component B. To avoid dosage errors, use the entire contents of the two components. If only partial quantities are required, use high-precision electronic scales to weigh out the components (this procedure must also be adopted for the other products). Once prepared, the workability time of **MapeWrap Primer 1** is around 90 minutes at +23°C.

#### 2. Application of MapeWrap Primer 1

Apply an even coat of **MapeWrap Primer 1** with a brush or roller on the clean, dry surface of the concrete.

If the surface is particularly absorbent, apply

a second coat of **MapeWrap Primer 1** once the first coat has been completely absorbed. Skim the surface using **MapeWrap 11** or **MapeWrap 12** while the product underneath is still "wet".

#### 3. Preparation of MapeWrap 11 or MapeWrap 12

Choose whether to use **MapeWrap 11** or **MapeWrap 12** according to the surrounding temperature and workability times (the workability time of **MapeWrap 12** is higher than for **MapeWrap 11**). Pour component B into component A and mix with a low-speed drill with a mixing attachment until a uniform, grey blend is obtained. Mixing ratio for both products: 3 parts in weight of component A with 1 part in weight of component B. At +23°C **MapeWrap 11** remains workable for approximately 40 minutes after mixing, while **MapeWrap 12** remains workable for approximately 60 minutes.

#### 4. Application of the first layer of MapeWrap 11 or MapeWrap 12

On concrete surfaces which have previously been treated with **MapeWrap Primer 1**, and while the primer is still "wet", apply a 1 cm-thick layer of **MapeWrap 11** or **MapeWrap 12** using a notched trowel, then smooth over the product using a flat trowel to completely remove even the smallest surface defects. Using the same product, fill and round off the corners to form a "fillet" with a radius of at least 2 cm.

#### 5. Application of Mapegrid B 250

Immediately position **Mapegrid B 250** on the layer of **MapeWrap 11** or **MapeWrap 12** while it is still "wet", making sure there are no creases or folds.

After flattening it out with your hands (wear protective gloves for this operation), apply a second coat of **MapeWrap 11** or **MapeWrap 12** over the **Mapegrid B 250** mesh placed on the first layer so that it is completely covered. Pass over the surface of the impregnated fabric with a **MapeWrap** roller to eliminate any air bubbles trapped in the system during the previous phases.

Overlap adjacent pieces of **Mapegrid B 250** by at least 15 cm both lengthways and widthways.

#### PACKAGING

**Mapegrid B 250** is supplied in 100 cm wide by 50 m long rolls packed in cardboard boxes.

#### STORAGE

Store in a covered dry area.

#### SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

**Mapegrid B 250** is an article and referring to the current European regulations (Reg. 1906/2007/CE - REACH) does not require the preparation of the material safety data sheet. During use it is recommended to wear gloves and goggles and follow the safety requirements of the workplace.

PRODUCT FOR PROFESSIONAL USE.



Application of the second layer of **Planitop HDM Restauro**

**Mapegrid  
B 250**

**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  
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