

FRCM ANTI-OVERTURN PROTECTION

PBO-MESH 10/10

FRCM anti-overturn protection consisting of 10 + 10 g/m² bidirectional PBO mesh and inorganic matrix

FIELDS OF APPLICATION

- Anti-overturn protection for internal partitions.
- Anti-overturn protection for external infill walls.
- Connecting non-structural elements with the reinforced concrete structure of beams and columns.
- Non-structural works to public buildings.

ADVANTAGES AND PROPERTIES OF THE SYSTEM

- Reduced risk of triggering local overturn mechanisms in internal partitions.
- Reduced risk of triggering local overturn and collapse mechanisms in external infill walls.
- Reduction of local collapse mechanisms in non-structural elements.
- No increase of the participating masses and no modification to the stiffness of the structure.
- The system is also resistant to high temperatures and freeze-thaw cycles.
- The inorganic matrix has very good ability to adhere to the support and very good chemical and physical compatibility with masonry.
- The inorganic matrix is easy and reliable to apply, in the same way as a traditional bagged premixed cementitious mortar.
- The system can also be applied to damp supports without any need for special protection.
- The mesh is easy to apply and manipulate.

METHOD OF USE

SUPPORT PREPARATION

The support must be reinstated and appropriately prepared in accordance with the following instructions, subject to prior approval by the Director of Works:

- The substrate must be clean, firm, and free of loose parts, dust, or mould.
- If necessary, clean the surfaces by sandblasting or low pressure water jetting.
- Ensure the substrate is sufficiently moist and has been correctly prepared to take the first layer of **MX-PBO MASONRY** mortar, followed by the subsequent phases for applying the FRCM system.
- Remove the existing plaster from the whole surface or along the perimeter strips to form a cut-

out section between the external wall/internal partition and the structural element (e.g., a protruding or flush reinforced concrete beam/ring beam).

- Remove all existing mortar residues, either mechanically or simply by raking out manually.
- Regularise the support and/or the mortar joints as necessary using **MX-RW High Performance**, **MX-CP Lime**, or **MX-PVA Fibre Reinforced** structural reinstatement mortar.
- Ensure the substrate is sufficiently moist and has been correctly prepared to take the first layer of **MX-PBO MASONRY** mortar, followed by the subsequent phases for applying the FRCM system.

PREPARATION OF THE MX-PBO MASONRY MATRIX

- A planetary mixer can be used but should not be loaded to more than 60% of its nominal capacity for the indicated mixing times.
- A rotary mixer can be used but should not be loaded to more than 60% of its nominal capacity for the indicated mixing times.
- If mixing manually, pour part of the bag contents into a bucket and use a drill fitted with a paddle mixer, adding water as required.
- Once a bag of pre-mixed **MX-PBO MASONRY** has been opened, all of its contents must be used.

➤ Preparation using a planetary mixer (or a rotary mixer, or a drill fitted with a mixer):

1. Open the 25 kg bag of mortar.
2. Pour the premixed **MX-PBO MASONRY** into the mixer and add about 90% of the prescribed amount (6.0-7.0 litres) of clean water.
3. Mix continuously (without stopping, to prevent clumping) for 2-3 minutes (3-4 minutes if using a rotary mixer). Then add the remaining 10% of clean water and finish by mixing continuously for about one more minute.
4. Leave the mix to stand for about 1-2 minutes before use.
5. Before applying the material give it a final mix if necessary.

APPLICATION OF THE FRCM SYSTEM

The protection system using **PBO-MESH 10/10** in combination with the special **MX-PBO MASONRY** matrix is carried out in the following phases:

- Apply a first layer of **MX-PBO MASONRY** matrix to a minimum thickness of 3 mm and a maximum thickness of 5 mm.
- Apply the **PBO-MESH 10/10** mesh, manually incorporating it into the first still-fresh matrix layer using a **smooth metal trowel and/or metal spatula** until the PBO-MESH takes on a → “semi-see through” appearance.
- Apply the second layer of **MX-PBO MASONRY** matrix to a thickness of at least 3 mm and not more than 5 mm on top of the first still-fresh matrix layer, applying sufficient pressure to push it through the openings of the mesh, to ensure optimal adhesion between the first and second matrix layers.
- Continue in the same way for any further layers of matrix, being sure to apply them whilst the previous layers are still fresh.
- Where mesh strips meet end to end, or if a strip needs to be extended in length, form an overlap of about 300 mm that follows the direction of the stress.
- To cut the **PBO-MESH 10/10** use an **angle grinder** or the special **Ruregold scissors**.
- For connecting the external wall/internal partitioning with structural elements such as r.c. beams and columns, use the appropriate **PBO-JOINT** connectors in combination with **MX-JOINT** inorganic matrix (refer to the technical data sheet for the **PBO-JOINT + MX-JOINT** connection system, downloadable from www.ruregold.com).

TECHNICAL CHARACTERISTICS

PROPERTIES OF PBO FIBRE (polyparaphenylene benzobisoxazole)	
Tenacity	5.80 GPa
Young's modulus of elasticity	270 GPa
Ultimate elongation	2.5 %
Density	1.56 g/cm ³
Decomposition temperature	+ 650 °C
Regulatory reference for the fibres	ISO 16120 – 1/4

PROPERTIES OF PBO-MESH 10/10	
Weight of the PBO fibres only	20 g/m ²
Total weight of the mesh	approx. 104 g/m ²
Equivalent thickness of the balanced mesh 0/90 ° (warp)	0.0064 mm
Equivalent thickness of the balanced mesh 0/90 ° (weft)	0.0064 mm
Young's modulus of elasticity E _r of the dry mesh	50 cm / 100 cm
Coil width	15 metres
Coil length	In a dry place away from heat sources
Storage	15-metre coils, h 50/100 cm

PROPERTIES OF MX-PBO MASONRY INORGANIC MATRIX	
Density	approx. 1650 kg/m ³
Application time	After 10-15 minutes densification begins. Mix again and use within a maximum of approx. 45 minutes
Application temperature	from +5°C to +35°C
Compressive strength at 28 days	≥ 20 MPa
Flexural strength at 28 days	≥ 3.5 MPa
Young's modulus of elasticity at 28 days	≥ 7500 MPa
Consumption	1.3 kg/m ² per mm of application thickness 5.2 kg/m ² per 4 mm of application thickness
Reaction to fire (EN 13501-1)	Euroclass A2
Packaging	Disposable wooden pallets each with 40 no. 25 Kg bags, equivalent to 1000 kg of the loose product
Storage conditions	In original packaging, under cover, in a cool, dry, unventilated place
Shelf life (European Directive 2003/53/EC)	Not more than twenty-four (24) months from packing date
Safety data sheet	Available from www.ruregold.com
CE marking	EN 998 – 2

GENERAL NOTES/GUIDANCE

Implement **FRCM overturn protection** following the methods indicated by the Designer, to consist of **PBO-MESH 10/10 + MX-PBO MASONRY**, taking account of the mesh width and overlaps, and the positioning of any **PBO-JOINT + MX-JOINT** fibre connectors. Any support preparation work, if required, should be carried out with particular care.

Store the material under cover in a dry place well away from substances that could compromise the integrity and adhesion of the matrix. Appropriate site PPE must be worn when installing the FRCM system.

For further technical information, contact Ruregold Technical Support on +39 02.48011962 – info@ruregold.it.

SPECIFICATION ITEM

Supply and implement protection system consisting of Ruregold **PBO-MESH 10/10** balanced PBO fibre bidirectional mesh. The PBO fibre has a density of 1.56 g/cm³, tensile/tenacity strength of approxi-

mately 5.8 GPa, maximum Young's modulus of elasticity of 270 GPa, and elongation at break 2.5%. The system is coupled with Ruregold **MX-PBO MASONRY** inorganic matrix of compressive strength ≥ 20 MPa, bending strength ≥ 3.5 MPa and Young's modulus of elasticity ≥ 7.5 GPa. The dry mesh has a grammage (0/90 °) of 20 g/m² and an equivalent thickness (0/90 °) of 0.013 mm. The PBO fibre FRCM system enables the creation of anti-overturn protection for non-loadbearing vertical enclosing elements, whilst also protecting against the development of cracks in external panels that could ultimately cause the external wall to collapse or overturn. It can also be used to protect non-structural Catalan vaults or shallow vaults supporting a slab. The reaction to fire classification of the system meets the requirements of EN 13501-1: A2-s1, d0. Preparation of the surfaces and installation of the system must follow the manufacturer's instructions.

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This technical data sheet is not a specification.

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