

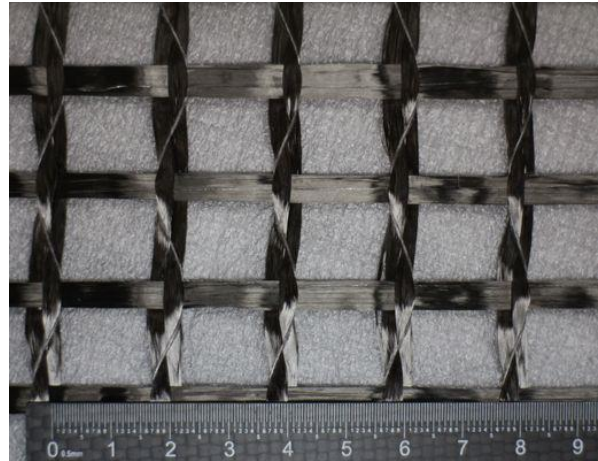
## Technical Data Sheet

Code No: **CF-M2020**

High-strength carbon fiber mesh

### Description:

Carbon fiber mesh is woven by carbon fiber yarn in mesh which is a high strength mesh uses with epoxy resin for reinforced structural strengthening of masonry and concrete structures.



### Technical data:

Mesh size: 20mm x 20mm

Warp yarn: 12K carbon fiber yarn

Weft yarn: 24K carbon fiber yarn

Weight: 160+/-5 g/m<sup>2</sup>

Tensile strength: 1800~1900 MPA

### WHERE TO USE

High-strength carbon fiber mesh used in combination with mortar to strengthen masonry and concrete structures in order to increase the strength and overall ductility.

CF-M2020 is part of the 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 replacing existing structures, the system works in parallel to help improve the mechanical characteristics and overall ductility without altering the way the masses and rigidity within the structures are distributed. The latter is a very important aspect, particularly in the field of seismic design, where stresses are proportional to the masses involved.

**The system follows the approach defined by the guidelines for the approval of FRCM (Fiber**



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**Reinforced Cementitious Matrix) systems which stress the importance of obtaining approval for the entire strengthening package.**

## **Some application examples**

- Structural/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**

CF-M2020 is a special fabric with a square mesh made of high-strength carbon fibers which, thanks to its special weave, when applied on masonry structures makes up for their lack of tensile strength and increases their overall ductility so that stresses are distributed more evenly. As a result, in the event of movements in the structure, the strengthening system 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 fragile type to ductile type. The system adheres perfectly to the substrate and its mechanical properties are such that localized stresses always provoke a failure in the substrate rather than at the substrate/strengthening system interface. In the case of strengthening packages applied to arched or vaulted elements, the masonry acquires the ability to resist tensile loads and inhibit the formation of plastic hinge points on the side opposite to where the strengthening package is applied.

## **ADVANTAGES**

- Excellent tensile strength.
- Stable and resistant to chemical aggression from cement.
- Resistant to atmospheric agents.
- High dimensional stability.
- High durability and stability within the inorganic matrix.
- Limited intrusiveness concerning the aesthetical appearance of the existing structure.
- Effect on the appearance of the structure.
- Does not rust.
- Light and easy to handle.



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- Easy to cut and adapt to the shape of the substrate.

## APPLICATION PROCEDURE

### Preparation of the substrate

Surfaces on which CF-M2020 is to be applied must be prepared according to 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. 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.

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 so that the strengthening package itself does not detach.

We recommend hydro-cleaning surfaces with low pressure water jets. Leave surface 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.

### Application of the first layer of mortar

Prepare mortar.

Apply an even layer around 5-6 mm thick of mortar with a flat metal trowel or by spray.

Level off the surface of the wall to form a sufficiently flat surface.

### Application of CF-M2020

After applying the first layer of mortar and while it is still wet, place CF-M2020 mesh over the surface and press down lightly with a flat trowel so that it adheres perfectly to the mortar. Impregnate the mesh with component B of the mortar so that it keys better in the mortar. Overlap adjacent pieces of CF-M2020 by at least 15 cm both lengthways and widthways.

### Application of the second layer of mortar

Apply a second even layer of mortar approx. 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,



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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 on the facing wall or on the imposts, keystones and around the springers of arched or vaulted members. The connectors eliminate any “de-bonding” phenomenon and increases the static efficiency of the strengthening package applied. The number and pitch of the connectors is defined during the design phase.

## PACKAGING

CF-M2020 is supplied in 1 m wide by 100 m long rolls packed in cardboard boxes.

## STORAGE

Store in a covered dry area.

## SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

CF-M2020 is an article and referring to the current European regulations (Reg. 1906/2007/CE - REACH) does 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.

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.