

# TCS GLASS MR48

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TCS GLASS MR48 is an alkali-resistant composite mesh (Glass Fibre Reinforced Polymer). Specifically, the GFRP mesh is made from glass fibre and epoxy resin. The GFRP mesh guarantees excellent laying stability and workability on site, maintaining a perfect alignment of the fibres. The mesh is applicable with inorganic matrix, in particular with natural hydraulic lime matrix, for the realisation of the FORTIUS reinforcement system (CRM). The FORTIUS reinforcement system is qualified with ETA - 21/0524 according to EAD 340392-00-0104.



- Restoration
- Resistant
- Versatile
- Quick
- Light
- Reversible
- Easy
- Pollution Resistant
- Consolidating Treatment

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## Features

TCS GLASS MR48 mesh is ideal for the consolidation and reinforcement of structural elements made of masonry, stone, tuff and reinforced concrete for static or seismic improvement and adaptation. Concrete reinforcement and reinforced screeds.

**Versatile:** can be applied with different inorganic matrices of NHL 5 natural hydraulic lime or traditional.

**Restoration:** in combination with an inorganic matrix of natural hydraulic lime B-STRUCTURA makes it a reinforcement and consolidation system for structures subject to Superintendence restrictions where it is essential to use materials compatible with those of the period capable of reinforcing without altering the system's breathability and thermo-hygronomic balance.

**Reversibility:** systems that are easy to remove and thus restore the pre-consolidation conditions of existing structures.

**Resistant:** high technical performance of resistance and containment of loads.

**Easy:** extremely simple installation following a few simple steps.

**Durability:** high resistance to humid, alkaline and aggressive environments thanks to the use of epoxy matrix.

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## Fields of Application

Specifically for the consolidation and reinforcement in bending, compression and shear in-plane and out-of-plane of structural elements. Hooping and banding. In-plane reinforcement and innovative reinforced kerbs. Particular use for the extra-/intra-dovetail reinforcement of masonry and/or stone vaults and arches. Collaborating screeds and castings. Brick, stone, mixed stone masonry, tuff and reinforced concrete elements. Evaluation of the most suitable matrix depending on the type of substrate. Normally used with mortars from the B-STRUCTURA range and MATERICA.

## Application

Before proceeding with the application of the reinforcement system, the substrate must be cleaned and properly prepared.

### INSTALLATION INSTRUCTIONS ON MASONRY

Rough surfaces (solid bricks, hewn masonry, cobblestone, mixed masonry, stone and tuff):

1. Dry positioning of TCS GLASS MR48 mesh. Connectors or temporary devices may be used to simply hold the mesh in place;
2. Dry positioning of the TCS GLASS CORNER MR48/MR88 or double MR88 corner elements with suitable overlapping (total overlapping of the "L" element is recommended and in any case not less than 15 cm);
3. Creation of the 12 mm diameter holes for the installation of the connectors;
4. Cleaning of the holes;
5. Saturation of the drill hole with V-FIX chemical anchor or inorganic matrix;
6. Insertion of the TCS GLASS CONNECTOR with a special 45°-mounted mesh or FAZZOLETTO MR44 PA;
7. Application of the inorganic matrix to completely cover the mesh, gusset and connectors. B-STRUCTURA line for application with lime or MATERICA line for application with concrete repair mortars.

### INSTALLATION INSTRUCTIONS ON CONCRETE

Smooth surfaces (concrete, brickwork or very flat structural elements):

1. Application of a first coat of inorganic matrix rendering. B-STRUCTURA range for application with lime or MATERICA for application with concrete repair mortars;
2. Positioning of TCS GLASS MR48 mesh. Connectors or temporary devices may be used to simply hold the mesh in place;
3. Positioning of the TCS GLASS CORNER MR48/MR88 or double MR88 corner elements with suitable overlapping (total overlapping of the "L" element is recommended and in any case not less than 15 cm);
4. Creation of the 12 mm diameter holes for the installation of the connectors;
5. Cleaning of the holes;
6. Saturation of the drill hole with V-FIX chemical anchor or inorganic matrix;
7. Insertion of the TCS GLASS CONNECTOR with a special 45°-mounted mesh or FAZZOLETTO MR44 PA;
8. Application of the second coat of inorganic matrix to completely cover the mesh, gusset and connectors.

B-STRUCTURA range for application with lime or MATERICA for application with concrete repair mortars.  
The FORTIUS reinforcement system is composed of five types of mesh called TCS GLASS MR44, MR48, MR88, MR812 and MR1212, two types of TCS GLASS CORNER MR48 and MR88 and the TCS GLASS CONNECTOR.

## Items Specification

### TCS GLASS MR48

GFRP (Glass Fiber Reinforced Polymer) AR mesh type TCS GLASS MR48 for structural reinforcement of masonry in brick, stone, tuff, limestone, flooring, floors, vaults and concrete elements. The mesh has a rectangular mesh size 40x80 mm, produced using Pullweaving technology, made of fibreglass and thermosetting epoxy resin, with twisted warp and flat weft inserted in the warp, having 25 bars per metre in the warp and 12.5 in the weft, tensile modulus of elasticity of the mesh. in weft, average tensile modulus in warp 40 GPa and in weft 58 GPa, characteristic tensile strength of single bar in weft 6,41 kN and in warp 5,46, elongation at break in weft 1,12% and in warp 1,15%, characteristic tensile stress of composite in weft 669 MPa and in warp 467 MPa, nominal section of single bar in weft  $\geq 9,60 \text{ mm}^2$  and in warp  $\geq 10,00 \text{ mm}^2$ , characteristic tensile strength at knot  $\geq 0,50 \text{ kN}$ . Decay of tensile strength  $< 10\%$  and of elastic modulus  $< 1\%$  for humid, alkaline and saline environment after conditioning tests at 3000 hours.

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## Warnings

- Product for professional use.
- Do not modify the product.
- Store the product in a dry place, in the original unopened packaging.
- Consult safety data sheet before using the product.
- The data given correspond to the technical and applicative knowledge in our possession for an appropriate use of the product. We therefore recommend carrying out a prior practical test in order to check the suitability of the product for its intended use and consumption.
- Protect surfaces from atmospheric phenomena, sun, wind, rain and frost.
- Since our company is not the executor of the works and cannot directly intervene on site conditions and the methods of execution of the works, the indications given are to be considered indicative and general, and therefore not binding for the same.
- The company reserves the right to make any changes it deems necessary at any time and without prior notice.
- For further information and practical product demonstrations, please consult our technical service.
- Always refer to the latest versions of the technical data sheets available at [www.tcs-srl.it](http://www.tcs-srl.it).

## Technical Data

**PRODUCT TYPE:** Glass fibre mesh with epoxy matrix for CRM systems. Component of the FORTIUS system.

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**QUALIFY** ETA - 21/0524 according to EAD 340392-00-0104

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### GEOMETRICAL AND PHYSICAL CHARACTERISTICS

**WARP NOMINAL DIAMETER:** 3,60 mm

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**NOMINAL WEFT SECTION:** 9,90 mm<sup>2</sup>

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**NOMINAL SECTION (graduated cylinder)** Grid: 9,60 mm<sup>2</sup> - Warp: 10,00 mm<sup>2</sup>

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**NOMINAL AREA REFERRED TO THE FIBRE** Grid: 7,20 mm<sup>2</sup> - Warp: 5,70 mm<sup>2</sup>

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**RODS PER METRE:** Grid: 12,5 - Warp: 25

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**MESH MESH:** 40 x 80 mm

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**GRAMMAGE** 780 g/m<sup>2</sup>

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**LIMIT TEMPERATURE OF USE** from -15°C to 70°C

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**FIBRE CONTENT IN WEIGHT (average warp weft):** 75%

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**FIBRE DENSITY** 2,50÷2,60 g/cm<sup>3</sup>

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**MATRIX DENSITY** 1,15÷1,25 g/cm<sup>3</sup>

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**GLASS TRANSITION TEMPERATURE OF THE COMPOSITE** 70°C

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**REACTION TO FIRE** CLASS F

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### MECHANICAL FEATURES

**SINGLE BAR TENSILE STRENGTH (AVERAGE)** Grid: 8,28 kN - Warp: 6,69 kN

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**SINGLE BAR TENSILE STRENGTH (CHARACTERISTIC)** Grid: 6,41 kN - Warp: 5,46 kN

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**SINGLE BAR PULL (MEDIUM)** Grid: 865 MPa - Warp: 635 MPa

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**SINGLE BAR PULL (CHARACTERISTIC)** Grid: 670 MPa - Warp: 525 MPa

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**PULL STRENGTH PER METRE (medium):** Grid: 103 kN - Warp: 167 kN

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**PULL STRENGTH PER METRE (characteristic):** Grid: 80 kN - Warp: 136 kN

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**ELASTIC MODULUS (CHARACTERISTIC)** Grid: 57 GPa - Warp: 40 GPa

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**DEFORMATION AT BREAK (CHARACTERISTIC)** Grid: 1,12 % - Warp: 1,15 %

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**NODE TEAR RESISTANCE (characteristic):** 0,50 kN

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**PACKAGING** 20 m roll height 2 m, 1 m sheet height 2 m. Pallet of 5 rolls