FIBRE NET
composite engineering

RI-STRUTTURA

FLOOR REINFORCEMENT SYSTEM

TECHNICAL DATA SHEET

RI-STRUTTURA System (C.R.M.) is qualified with CE marking according to EAD 340392-00-0104 – CRM (Composite Reinforced Mortar) Systems for strengthening concrete and masonry structures.

RI-STRUTTURA is the reinforcement system by Fibre Net composed of preformed GFRP meshes and accessories made by alcali-resistant glass fibers and thermosetting resins, combined with structural mortars, also NHL lime based. This system guarantees important, uniform and widespread structural improvement of the mechanical and ductility properties with a low increase in terms of stiffness of the GFRP elements.
RI-STRUTTURA guarantees high durability thanks to the absence of corrosion. The system is reversible and improves the shear and flexural resistance of the walls.

CRM Accertamento di Equivalenza
n° 9946.17-12-2020

CE

RI-STRUTTURA
FLOOR REINFORCEMENT SYSTEM

APPLICATION FIELD

In the seismic behavior of masonry buildings, the floors play the fundamental role of transferring horizontal actions to the walls, also exercising a function of constraint and damping. Wooden, steel and brick floors, common in all historical buildings, often present structural limits related to the decay of materials, seismic action and changes in intended use that compromise the stiffness and therefore the ability to transmit seismic forces. The realization of a reinforced collaborating slab allows to overcome these problems, increasing the stiffness and the ability to redistribute loads.

RI-STRUTTURA intervention on the floors provides for the execution of an extrados slab reinforced with preformed GFRP meshes and properly connected to the underlying floor through the use of metal connectors. The use of systems with composite materials reduces the overall loads and, above all, ensures high durability and effectiveness of the system over time. **RI-STRUTTURA** System makes it possible to increase the resistance of the floor to both gravitational and horizontal actions such as seismic and wind action, making it possible to obtain a cooperating but sufficiently rigid floor, capable therefore of distributing the horizontal seismic actions and in which the reinforcement makes it possible to distribute the loads acting on the floor itself.

For a better seismic building performance it is necessary to connect the floor to the masonry through the use of preformed GFRP bars.

SYSTEM COMPONENTS

FBMESH – GFRP MESH

GFRP mesh produced with Textrusion™ technology, provided with CE marking, whose bars are made of long glass fibers, impregnated with epoxy-vinylester thermosetting resin.

Characteristics	FBMESH__T96	FBMESH__T192
Mesh dimension	33x33 / 66x66 / 99x99 mm	66x66 / 99x99 mm
Minimum wire section	8,9 mm²	14,1 mm²
Roll size (external)	Ø 50÷70 x 200 cm	Ø 50÷70 x 200 cm
Tensile resistance (wire)(characteristic) value (2)	4,3 kN	5,5 kN
Young's modulus (2)	25000 MPa	25500 MPa
Resistance at the mesh joint (characteristic) value (2)	0,25 kN	0,43 kN
Wire failure strain (2)	1,45 %	1,50 %
Wire tensile strength (characteristic) value (2)	365 MPa	395 MPa
Reaction to fire (3)	A2-s1, d0, Class B-s1, d0 Class	B-s1, d0 Class

PB-D_-G17/ PB-D_-G17AM Bars

GFRP (Glass Fiber Reinforced Polymer) smooth PB-DØ or improved adhesion PB-DØAM preformed bars.

Characteristics	PB-D_-G17	PB-D_-G17AM
Bar diameter (mm)	4 / 6 / 8 / 10 / 12 / 16 / 20 / 26	4 / 6 / 8 / 10 / 12 / 16 / 20 / 26
Bar section (mm²)	13 / 28 / 50 / 79 / 113 / 201 / 314 / 531	13 / 28 / 50 / 79 / 113 / 201 /314 / 531

Fibre Net SpA - Via Jacopo Stellini, 3 - 33050 - Z.I.U. Pavia di Udine (UD)- Italy
C.F. e P.IVA 02212620302 - Capitale Sociale € 1.000.000,00 i.v. - N. REA UD - 243635
T. +39.0432.600918 - F. +39.0432.526199 - info@fibrenet.it - www.fibrenet.it

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Characteristics	PB-D_-G17	PB-D_-G17AM
Weight	37 / 56 / 91 / 157 / 214 / 404 / 505 / 656	37 / 56 / 91 / 157 / 214 / 404 / 505 / 656
Bar surface	Smooth	Improved adhesion
Tensile strength mean value (MPa)	800	800
Tensile strength characteristic value (MPa)	560	560
Young's modulus (GPa)	350	350

INTEGRA FIXA - VINYL15 Resin

Two-component, vinylester, styrene-free chemical anchor in cartridges for heavy and structural loads, for fixing reinforcing bars and reinforcing irons on concrete, reinforced concrete, solid masonry, hollow bricks and wood substrates.

Characteristics	INTEGRA FIXA - VINYL15								
Design adhesion tensions according to EN 1992-1-1 [MPa]	C16/20	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
To Φ8 from Φ14	1.60	2.00	2.30	2.70	3.00	3.40	3,70	4.00	4.30
To Φ16 from Φ20	1.60	2.00	2.30	2.70	3.00	3.40	3,70	4.00	4.00
Φ25	1.60	2.00	2.30	2.70	3.00	3.40	3.40	3.40	3.40
Φ28	1.60	2.00	2.30	2.70	3.00	3.40	3.40	3.40	3.40
Φ32	1.60	2.00	2.30	2.70	2.70	2.70	2.70	2.70	2.70

CHARACTERISTICS

- Excellent mechanical characteristics
- Lightness e low thickness
- High corrosion resistence
- Different mortars compatibility
- Non-magnetic, radiotransparent, dielectric

ADVANTAGES

- Durability
- Widespread and homogeneous mechanical improvement
- Masonry breathability
- Ease and speed of application, worksite safety
- Reversibility
- Reduction of costs and time for handling and installation
- Reduction in overall intervention costs
- Reduction of heat bridges at connection points

INSTALLATION PROCEDURE

1. Study of the floor, analysis of materials and determination of the type and arrangement of metal connectors necessary to make the slab collaborative.

2. Drilling of holes to make connections and reinforcement of the reinforced plaster using PB_-G17 or PB_-G17AM preformed bars in GFRP in the number required by the project. Drilling shall be performed with dry rotary tools. Drill a hole equal to twice the diameter of the bar in case of solidification with lime grout injection. Drill a hole equal to the diameter of the bar increased of 5 mm in case of grouting with epoxy/vinylester resin.

3. Positioning and fixing of the metal connectors described in the first point according to the indications of the relative manufacturer or designer.

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4. Positioning of FBMESH on the extrados of the floor, overlapping the sheets of mesh side by side for at least 15 cm.

5. Inserting the preformed PB_-G17 or PB_-G17AM GFRP bars in the connection holes, making a slight rotation to allow a perfect distribution and adhesion of the binder around the bar.

6. Concrete casting with limited thickness (approx. 20-40 mm).

SPECIFICATION ITEM

RI-STRUTTURA is qualified with CE marking according to EAD 340392-00-0104 – CRM (Composite Reinforced Mortar) Systems for strengthening concrete and masonry structures.

RI-STRUTTURA System allows to increase the resistance of the wooden, steel and concrete floor to both gravitational and horizontal actions such as seismic and wind action, with the installation on the entire surface of a preformed mesh in G.F.R.P. (Glass Fiber Reinforced Polymer) composite material. (Glass Fiber Reinforced Polymer) mesh _____ mm, FBMESH_____ Fibre Net, or equivalent, CE marked, consisting of glass fiber and vinylester-epoxy thermosetting resin, tensile strength characteristic of each bar ≥ _____ kN, minimum section _____ mm^2 and having n° _____ bars / meter / side, average tensile modulus N/mm^2 _____, elongation at break _____, average axial stiffness EA _____ kN, characteristic knot tearing strength ≥ _____ kN, provided with durability certificate in alkaline environment PH 12 for 1000 hours attesting a residual strength ≥85%. The execution of holes and the supply and insertion of preformed bars PB_-G17 or PB_-G17AM of Fibre Net, or equivalent, consisting of glass fiber and thermosetting resin of vinylester-epoxy type, characteristic tensile strength _____ kN, average axial stiffness _____ kN, with diameter _____ mm and length equal to _____ and solidified by chemical anchor vinylester VINYL15, styrene-free, or lime grout to make connections and recovery of reinforced coating counted in number of _____/sqm compared to the total area to be reinforced.

Recyclable material in accordance with CSI protocols. Also included: casting of _____ for the formation of the slab, with a thickness of about cm _____ and surface smoothing. Excluded are: collaborating connections, scraps, overlaps and any other material or workmanship not specified.

Note 1: Where applicable.
Note 2: The values of mechanical properties refer to the minimum value in the direction of weft (transverse flat yarns) and warp (longitudinal twisted yarns).
Note 3: The reaction-to-fire rating is determined according to EN 13501-1:2007 + A1 2009. The minimum fire response according to this classification depends on the type of mesh:

Mesh	Fire reaction class
FBMESH33x33T96AR	B-s1, d0
FBMESH66x66T96AR	A2-s1, d0
FBMESH99x99T96AR	A2-s1, d0
FBMESH66x66T192AR	B-s1, d0
FBMESH99x99T192AR	B-s1, d0

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