

FCM

BI-DIRECTIONAL CARBON FIBRE MESH FOR FRCM STRUCTURAL STRENGTHENING SYSTEMS

4,500 MPa

FIBRE TENSILE STRENGTH

240 GPa

FIBRE ELASTIC MODULUS

1.8 %

ELONGATION AT BREAK

0° + 90°

FIBRE ORIENTATION

DESCRIPTION

FCM is a bi-directional carbon fibre mesh constructed from high-strength PAN-based carbon fibres arranged in a stable 0°/90° grid geometry. Designed for use in Fabric-Reinforced Cementitious Matrix (FRCM) strengthening systems, FCM is embedded in an inorganic cementitious matrix to deliver efficient two-directional structural reinforcement. Its rigid grid geometry simplifies placement, eliminates fabric bunching, and ensures consistent fibre distribution across the strengthened area.

INTENDED USES

- Flexural, shear, and axial capacity enhancement of reinforced concrete beams, slabs, columns, and walls
- Masonry structure strengthening — repair and reinforcement of brickwork, stonework, and historical masonry for improved integrity and seismic performance
- Applications requiring inorganic-matrix (FRCM) systems where vapour permeability, fire resistance, or substrate breathability is required

CHARACTERISTICS

- High-strength carbon fibre (4,500 MPa) with rigid 0°/90° grid geometry — stable, easy to cut and place; no bunching or rolling during installation
- Bi-directional reinforcement — effectively mobilises carbon fibre strength in both primary reinforcement directions simultaneously
- Inorganic matrix compatibility — vapour-permeable FRCM system; no UV protection required; compatible with masonry and concrete substrates
- Corrosion-free and alkali-resistant — maintains long-term performance in alkaline cementitious environments
- Customisable grid opening size — 10 × 10, 20 × 20, or 30 × 30 mm to optimise mortar penetration and system performance

PRODUCT INFORMATION

PROPERTY	VALUE
Colour	Black
Fibre Orientation	Bidirectional (0° + 90°)
Grid Opening Size	10 × 10 / 20 × 20 / 30 × 30 mm, or customised
Available Width	1.0 m / 1.5 m
Roll Length	50 m / roll
Packaging	50 m / box
Storage	Dry, away from direct sunlight, -5 °C to +35 °C

TECHNICAL PROPERTIES

PROPERTY	VALUE
CARBON FIBRE (DRY)	
Tensile Strength	4,500 MPa
Tensile Elastic Modulus	240 GPa
Elongation at Break	1.8 %
Fibre Type	PAN-based carbon fibre, high-strength grade

COMPATIBLE SYSTEM PRODUCTS

CODE	FUNCTION	NOTES
FMM	Cementitious matrix	Inorganic fibre-reinforced mortar; compatible with carbon mesh FRCM applications
FCA 10/450	CFRP anchor	Pre-cured rod anchor for termination zones and corner details

APPLICATION INSTRUCTIONS

Step 1 — Substrate Preparation

- Remove surface laitance, grease, and dust by high-pressure water jetting, grinding, or sandblasting. Repair deeper cracks, voids, or spalled areas with FRCM-compatible repair mortar. Achieve a surface profile of CSP 3–5.
- For cementitious matrices, the substrate must be in a Saturated Surface Dry (SSD) condition — interior moist, surface free of standing water. Pre-wet if necessary.

Step 2 — Material Preparation

- Cut FCM to the required dimensions using specialist cutters or heavy-duty scissors, avoiding fibre damage. Reserve sufficient lap length as specified in the design. Handle cut edges carefully to prevent fraying.
- Mix the cementitious matrix strictly per the manufacturer's instructions using a low-speed mixer (< 500 rpm) until a smooth, lump-free consistency is achieved.

Step 3 — Base Matrix Layer and Grid Placement

- Apply the base matrix layer at 3–5 mm thickness using a trowel, ensuring even coverage without voids or accumulation. Immediately place the pre-cut FCM grid onto the fresh matrix, pressing firmly with a notched trowel or roller to allow mortar to penetrate the grid openings and encapsulate the fibre bundles. Grid must be flat, wrinkle-free, and fully embedded. Lap joints must meet design overlap requirements.

Step 4 — Top Matrix Layer

- Apply the top matrix layer immediately after grid placement, ensuring complete coverage and the total designed system thickness. For multi-layer systems, apply subsequent grid and matrix layers wet-on-wet; if the previous layer has hardened, carry out interface treatment before proceeding.

LIMITATIONS

- Installation must be carried out by trained specialists following FIDSTRONG application manuals and project specifications.
- Ensure substrate compressive strength meets the minimum requirements assumed in the engineering design. Verify before installation.
- Design and installation must comply with relevant standards (e.g., ACI 549.6R-20 or equivalent national guidelines).

HEALTH & SAFETY

NOTE

Wear nitrile gloves, safety goggles, and a dust mask when cutting and handling carbon fibre mesh. Carbon fibre fragments and dust are skin and respiratory irritants. Refer to the current SDS for full guidance. This TDS does not replace the SDS.

LEGAL NOTES

The information and recommendations in this document are given in good faith based on current knowledge and experience of the products when properly stored, handled, and applied under normal conditions. Differences in materials, substrates, and site conditions mean that no warranty in respect of merchantability or fitness for a particular purpose can be inferred from this information. The information does not relieve the user of the responsibility of testing products for their intended application. All orders are accepted subject to our current terms of sale and delivery. Refer to the most recent TDS at www.fidstrong.com.