

FSC300A

UNIDIRECTIONAL CARBON FIBRE FABRIC FOR STRUCTURAL STRENGTHENING

4,500 MPa
TENSILE STRENGTH

240 GPa
ELASTIC MODULUS

0.167 mm
NOMINAL THICKNESS

300 g/m²
AREAL WEIGHT

DESCRIPTION

FSC300A is a unidirectional carbon fibre fabric (300 g/m²) for externally bonded structural strengthening. Used with FIDSTRONG FSE-series epoxy systems (primer + saturating resin), it forms a high-performance FRP composite for upgrading concrete, masonry, and timber elements.

INTENDED USES

- Flexural and shear strengthening of reinforced concrete beams, slabs, and walls
- Column confinement for increased axial and seismic capacity
- Seismic retrofitting of existing structures to updated code requirements
- Repair and rehabilitation of ageing or damaged structural elements

CHARACTERISTICS

- High tensile strength-to-weight ratio — non-corrosive, alkali-resistant, chemically inert
- Flexible — conforms to complex geometries including circular columns and curved surfaces
- Negligible increase in section size — minimal aesthetic impact on the finished structure
- Rapid installation — no heavy equipment, no welding, no fire risk

STANDARDS COMPLIANCE

Testing per ASTM D3039 (≥ 25 specimens per property). Design methodology per ACI 440.2R. Fibre properties consistent with EN 2561.

PRODUCT INFORMATION

PROPERTY	VALUE
Fibre Type	Carbon fibre, PAN-based
Fibre Orientation	Unidirectional (0°)
Colour	Black
Areal Weight	300 ± 15 g/m ²
Available Widths	100 / 150 / 200 / 250 / 300 / 500 / 600 mm
Roll Length	100 m (standard)
Storage	Dry, no direct sunlight, -5 °C to +35 °C
Shelf Life	Unlimited in original, unopened packaging

MECHANICAL PROPERTIES

NET-FIBRE AREA BASIS — NOMINAL THICKNESS 0.167 MM

PROPERTY	MEAN VALUE	CHARACTERISTIC *
Tensile Strength	4,500 MPa	4,000 MPa
Tensile Elastic Modulus	240 GPa	240 GPa
Elongation at Break	1.8%	1.6%
Resistance per Unit Width	752 kN/m	668 kN/m
Stiffness per Unit Width	40.1 MN/m	40.1 MN/m

GROSS-LAMINATE AREA BASIS — CURED LAMINATE THICKNESS 0.50 MM

PROPERTY	MEAN VALUE	CHARACTERISTIC *
Tensile Strength	1,503 MPa	1,336 MPa
Tensile Elastic Modulus	80.2 GPa	80.2 GPa
Elongation at Break	1.8%	1.6%

* Characteristic values per ACI 440.2R §4.3.1 (referencing ACI 440.8): strength $f_{fu}^* = \text{mean} - 3\sigma$ from ≥ 20 specimens (ASTM D3039); modulus reported as mean value; elongation $\epsilon_{fu}^* = f_{fu}^* / E_f$. This statistical basis provides a 99.87 % probability that actual properties exceed the reported characteristic values.

APPLICATION INSTRUCTIONS

Step 1 — Surface Preparation

- Abrade or blast to remove laitance, dust, and grease. Minimum concrete surface tensile strength: 1.5 MPa.
- Fill irregularities > 0.5 mm with FSE502. Allow to cure fully before proceeding.
- Round all corners and edges to a minimum radius of 20 mm.
- Substrate must be dry: moisture content $\leq 4\%$ (ASTM D4263).

Step 2 — Primer Application

- Mix FSE302 at 2:1 by weight; blend for 3 minutes with a low-speed paddle mixer.
- Apply by brush, roller, or spray at 200–300 g/m². Allow to reach tacky state before proceeding.

Step 3 — Fabric Cutting

- Cut to required length using sharp, heavy-duty scissors or a rotary cutter.
- Dull tools damage fibres at cut edges and reduce lap-joint efficiency.

Step 4 — Saturation and Lay-Up

- Apply FSE322 saturating resin uniformly to the primed substrate at 500–700 g/m².
- Place pre-cut fabric onto the wet resin, aligning fibres with the intended load path.
- Consolidate with a laminating roller from centre outward to remove air and ensure full wet-out.
- Apply a top coat of FSE322 over the fabric layer. For multiple layers: apply wet-on-wet.

Step 5 — Protection and Curing

- Protect from disturbance and direct sunlight. Full cure: minimum 7 days at 20 °C.
- Exterior UV protection: broadcast silica sand (0.5–1.0 mm) into final wet resin, then apply a compatible protective top coat after curing.

WARNING

The cured FRP must not remain exposed to UV radiation. UV protection is mandatory for all exterior installations.

LIMITATIONS

- All structural design must be prepared and certified by a licensed professional engineer.

- Minimum corner radius: 20 mm. Minimum lap splice length (fibre direction): 100 mm.
- Not suitable for substrates with surface tensile strength below 1.5 MPa.
- Application temperature: +5 °C to +35 °C (substrate and ambient).

HEALTH & SAFETY

NOTE

Refer to the current Safety Data Sheet (SDS) for handling, storage, and disposal. Wear nitrile gloves, safety glasses, and a dust mask when cutting dry fabric. This TDS does not replace the SDS.

COMPATIBLE SYSTEM PRODUCTS

CODE	FUNCTION	NOTES
FSE302	Primer	Moisture-tolerant adhesion primer; 2:1 mix ratio
FSE322	Saturating resin	Standard wet lay-up impregnating resin
FSE323H / 323L	Saturating resin	High / low viscosity variants for specific substrate conditions
FSE502	Levelling adhesive	Substrate repair and surface regularisation
FX 50	Carbon fibre rope	FRP termination anchoring and edge wrapping

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.