

FSA400

ARAMID FIBER FABRIC FOR STRUCTURAL STRENGTHENING SYSTEMS

2,400 MPa

TENSILE STRENGTH

110 GPa

ELASTIC MODULUS

400 g/m²

AREAL WEIGHT

0.276 mm

DESIGN THICKNESS

DESCRIPTION

FSA400 is a unidirectional aramid fiber fabric with an areal weight of 400 g/m², designed for structural strengthening of reinforced concrete, masonry, and timber members. Aramid fibre provides high tensile strength (2,400 MPa), excellent impact and blast resistance, and non-conductive/non-magnetic properties — making it the preferred choice where electrical insulation or impact protection is required alongside structural capacity.

INTENDED USES

- Flexural, shear, and confinement strengthening of reinforced concrete and masonry elements
- Seismic retrofitting of columns, beams, walls, and joints
- Blast and impact resistance upgrade of structural elements
- Strengthening in environments requiring non-conductive or non-magnetic reinforcement
- Heritage structure rehabilitation where carbon fiber's black colour is undesirable

CHARACTERISTICS

- High tensile strength (2,400 MPa mean) — effective structural reinforcement at low laminate thickness
- Non-conductive and non-magnetic — safe for use near electrical systems and MRI equipment
- Excellent impact and blast resistance — superior energy absorption compared to carbon fibre
- Yellow colour — visually distinct from carbon fibre for identification in multi-material systems
- Available in 10/15/20/25/30/50/60 cm widths — full range for any application geometry
- Compatible with FSE322 saturating resin (same wet lay-up process as carbon fibre fabric)

STANDARDS COMPLIANCE

Testing per ASTM D3039 (≥ 25 specimens per property). Design methodology per ACI 440.2R.

PRODUCT INFORMATION

FIBRE PROPERTIES

PROPERTY	VALUE
Fibre Type	Aramid (para-aramid)
Colour	Yellow
Fibre Orientation	Unidirectional (0°)
Density	1.45 g/cm ³

FABRIC PROPERTIES

PROPERTY	VALUE
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PROPERTY	VALUE
Areal Weight	400 g/m ²
Design Thickness	0.276 mm
Available Widths	10 / 15 / 20 / 25 / 30 / 50 / 60 cm
Roll Length	100 m

MECHANICAL PROPERTIES

MECHANICAL PROPERTIES (ASTM D3039, MIN 25 SPECIMENS)

PROPERTY	TEST STANDARD	VALUE
Tensile Strength (Mean)	ASTM D3039	2,400 MPa
Tensile Strength (5% Fractile)	ASTM D3039	2,100 MPa
Elastic Modulus	ASTM D3039	110 GPa
Elongation at Break	ASTM D3039	2.2 %

DESIGN VALUES (PER UNIT WIDTH)

PROPERTY	TEST STANDARD	VALUE
Tensile Resistance	—	661 kN/m
Tensile Stiffness	—	30.3 MN/m

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 ≤ 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).

DESIGN NOTES

- Minimum corner radius: 20 mm
- Overlap in fibre direction: ≥ 100 mm
- Uses same wet lay-up installation process as carbon fibre fabric system

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 epoxy primer (tensile 50 MPa, mix 2:1)
FSE322	Saturating resin	Fibre-saturating epoxy resin (tensile 55 MPa, modulus 3.1 GPa, mix 2:1)
FSE323H	Saturating resin	High-thixotropy saturating resin (for overhead/vertical, mix 3:1)
FSE323L	Saturating resin	Low-viscosity saturating resin (for heavy fabrics, mix 3:1)
FSE502	Levelling adhesive	Levelling and surface repair adhesive (tensile 35 MPa, mix 2:1)

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.