FSL30

PULTRUDED CARBON FIBRE PLATE FOR STRUCTURAL STRENGTHENING

2,800 MPa	165 GPa	3.0 mm	50 / 100 mm
TENSILE STRENGTH	ELASTIC MODULUS	PLATE THICKNESS	AVAILABLE WIDTHS

DESCRIPTION

FSL30 is a pultruded carbon fibre reinforced polymer (CFRP) plate for externally bonded (EB) structural strengthening. The pre-cured laminate is bonded to the prepared substrate using FIDSTRONG FSE362 structural epoxy adhesive, forming a high-stiffness, non-corrosive composite system suitable for upgrading concrete, masonry, timber, and steel elements. At a 3.0 mm nominal thickness, FSL30 delivers a high tensile resistance per metre of width, reducing the number of plates required on high-demand strengthening applications.

INTENDED USES

- Flexural strengthening of reinforced concrete beams, slabs, and bridge decks
- High-demand strengthening where a thicker laminate reduces the number of plate runs
- Increasing the load-bearing capacity of structural elements without significant section increase
- Repair and rehabilitation of ageing, damaged, or understrength structures
- Correction of structural design deficiencies and construction defects

CHARACTERISTICS

- Pre-cured — consistent mechanical properties, no site curing monitoring required
- High tensile resistance per width — 3.0 mm thickness for demanding strengthening schemes
- High stiffness — superior post-crack stiffness versus wet lay-up fabric systems
- Non-corrosive, alkali-resistant, and chemically inert — negligible long-term maintenance
- Minimal section increase — low aesthetic impact on the finished structure

STANDARDS COMPLIANCE

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

PRODUCT INFORMATION

PROPERTY	VALUE
Fibre Type	Carbon fibre, PAN-based, unidirectional
Nominal Thickness	3.0 mm
Available Widths	50 / 100 mm (custom widths on request)
Cross-Sectional Area	150 mm² (50 mm width) / 300 mm² (100 mm width)
Packaging	50 m / roll
Fibre Content	≥ 65 % by volume (density 1.6 g/cm³)
Storage	Dry, no direct sunlight, −5 °C to +35 °C

PROPERTY	VALUE
Shelf Life	Unlimited in original, unopened packaging

MECHANICAL PROPERTIES

PRE-CURED LAMINATE — NOMINAL THICKNESS 3.0 MM

PROPERTY	MEAN VALUE	CHARACTERISTIC *
Tensile Strength	**2,800 MPa**	2,700 MPa
Tensile Elastic Modulus	165 GPa	165 GPa
Elongation at Break	1.7 %	1.6 %
Tensile Resistance / Width	8,400 kN/m	8,100 kN/m
Tensile Stiffness / Width	495 MN/m	495 MN/m
Dry Fibre Tensile Strength	5,800 MPa (reference only, not for design)	

** Characteristic values per ACI 440.2R §4.3.1 (referencing ACI 440.8): strength f^*_{fu} = mean − 3σ from ≥ 20 specimens (ASTM D3039); modulus reported as mean value; elongation $\varepsilon^*_{fu} = f^*_{fu}/E_f$. 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, oil, and loose particles. Minimum concrete surface tensile strength: 1.5 MPa.
- Fill surface irregularities > 0.5 mm with FSE502 levelling adhesive. Allow to cure fully before proceeding.
- Substrate must be dry: moisture content ≤ 4 % (ASTM D4263).

Step 2 — Plate Cutting

- Cut plate to required length with a diamond-blade saw or angle grinder with a cut-off disc. Ensure cut ends are square to the plate axis.
- Remove carbon dust from cut surfaces with a clean brush or compressed air before bonding.

Step 3 — Adhesive Preparation

- Mix FSE362 plate bonding adhesive at 2:1 by weight (Component A : Component B). Blend for 3 min with a low-speed paddle mixer until a uniform colour is achieved throughout.
- Pot life: approximately 30–40 min at 20 °C. Do not use adhesive that has exceeded its pot life.

Step 4 — Plate Bonding

- Apply FSE362 to the prepared substrate at 2 mm thickness and to the bonding face of the plate at 2–3 mm thickness, within the pot life.
- Press the plate onto the substrate with both adhesive layers in contact. Roll firmly along the plate centreline with a hard rubber roller until adhesive squeezes uniformly from both long edges — confirming full coverage and a void-free bond line.
- Remove surplus adhesive from plate edges. Final bond line thickness after compaction: 2–4 mm.

Step 5 — Protection and Curing

- Protect from traffic, impact, and direct sunlight until full adhesive cure: minimum 7 days at 20 °C.
- UV protection is mandatory: apply a fireproof or cementitious coating over the full surface of the cured system.

> **WARNING**
> The cured CFRP plate and adhesive must not remain exposed to UV radiation. A protective coating (fireproof or cementitious) is mandatory for all installations.

LIMITATIONS

- All structural design must be prepared and certified by a licensed professional engineer.
- Minimum plate end termination distance: verify against point of zero moment per ACI 440.2R.
- 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 respiratory protection when cutting or grinding. Carbon fibre dust is an irritant. This TDS does not replace the SDS.

COMPATIBLE SYSTEM PRODUCTS

CODE	FUNCTION	NOTES
FSE362	Plate bonding adhesive	High-modulus structural epoxy; 2:1 mix ratio by weight
FSE502	Levelling adhesive	Substrate repair and surface regularisation prior to bonding

LEGAL NOTES