FSE322

FIBRE-SATURATING EPOXY RESIN FOR CARBON FIBRE FABRIC STRENGTHENING SYSTEMS

55 MPa	3.1 GPa	2 : 1	70 min
TENSILE STRENGTH	ELASTIC MODULUS	MIX RATIO (BY WEIGHT)	POT LIFE (23 °C)

DESCRIPTION

FSE322 is a two-component, solvent-free epoxy resin engineered for saturating and bonding carbon fibre fabrics to concrete, masonry, steel, and timber substrates. The formulation ensures thorough fibre wet-out and intimate contact with the substrate, producing a dense, void-free composite laminate with optimum load transfer between fibres and the strengthened member.

INTENDED USES

- Impregnation and bonding of FIDSTRONG FSC-series carbon fibre fabrics in wet lay-up strengthening systems
- Flexural, shear, and confinement strengthening of reinforced concrete and masonry elements
- Seismic retrofit and structural rehabilitation of columns, beams, walls, and slabs
- Multi-layer laminate build-up for high-demand flexural or confinement applications

CHARACTERISTICS

- High mechanical properties — 55 MPa tensile strength, 3.1 GPa modulus for effective stress transfer
- Moisture tolerant before, during, and after curing — bonds reliably on damp (not wet) substrates
- Thixotropic consistency (index ≥ 3.0) — suitable for vertical and overhead application without sagging
- Long pot life (70 min at 23 °C) — ample working time for large-area applications
- Solvent-free, VOC-compliant — suitable for enclosed and occupied spaces
- Colour-coded components for reliable mix-ratio verification

PRODUCT INFORMATION

PROPERTY	VALUE
Appearance	Component A + B mixed: light yellow
Mix Ratio	A : B = 2 : 1 by weight
Packaging	20 kg (A) + 10 kg (B) per kit, or customised packaging
Storage	Dry, away from direct sunlight, +5 °C to +35 °C
Shelf Life	18 months in original, unopened packaging

TECHNICAL PROPERTIES

MIXED / CURED RESIN — TESTED AT 23 °C / 50 % RH UNLESS STATED

PROPERTY	TEST METHOD	VALUE
HANDLING (MIXED RESIN)		

PROPERTY	TEST METHOD	VALUE
Pot Life (500 g mass)	—	70 min
Touch-Dry Time	—	1.5 h
Full Cure	—	7 days
Service Temperature	—	−5 °C to +40 °C
Thixotropic Index	—	≥ 3.0
Non-volatile Content	—	≥ 99.5 %
MECHANICAL (CURED, 7 DAYS)		
Tensile Strength	ASTM D638	**55 MPa**
Tensile Elastic Modulus	ASTM D638	3.1 GPa
Elongation at Break	ASTM D638	2.3 %
Flexural Strength	ASTM D790	80 MPa
Compressive Strength	ASTM D695	90 MPa
ADHESION (CURED)		
Steel-to-Steel Tensile	—	≥ 40 MPa
Steel-to-Steel Shear	ASTM D1002	≥ 14 MPa
Bond to Concrete (pull-off)	ASTM C882	≥ 2.5 MPa (concrete failure)

CONSUMPTION

FABRIC WEIGHT	PRIMER COAT (FSE302)	SATURATING COAT / LAYER
200 g/m²	0.3–0.4 kg/m²	0.5–0.7 kg/m²
300 g/m²	0.3–0.4 kg/m²	0.6–0.9 kg/m²
600 g/m²	0.3–0.4 kg/m²	1.0–1.2 kg/m²

Actual consumption depends on substrate porosity and surface profile. A trial application is recommended.

COMPATIBLE SYSTEM PRODUCTS

CODE	FUNCTION	NOTES
FSE302	Substrate primer	Adhesion-promoting epoxy primer; 2 : 1 mix ratio by weight
FSE502	Levelling adhesive	Substrate repair and surface regularisation before priming
FSC series	Carbon fibre fabrics	200 / 300 / 600 g/m² unidirectional; multiple strength grades

APPLICATION INSTRUCTIONS

Step 1 — Surface Preparation

- Remove laitance, loose particles, oil, and coatings by abrasive blasting or grinding. Minimum concrete pull-off strength: 1.5 MPa.
- Fill cavities and surface irregularities > 1 mm with FSE502 levelling adhesive; allow full cure before proceeding.

Step 2 — Priming

- Apply FSE302 primer by brush or roller; ensure uniform coverage and full absorption into the substrate pore structure.
- Over-coat once primer is tack-free (typically 2–4 h at 23 °C) but before full cure.

Step 3 — Mixing

- Combine A : B at 2 : 1 by weight; mix with a low-speed paddle mixer for 3 min until a uniform colour is achieved. Use within the pot life.

Step 4 — Fabric Saturation and Bonding

- Apply a base coat to the primed substrate (0.3–0.4 kg/m²). Place pre-cut FSC fabric onto the wet resin.
- Roll firmly with a ribbed roller from centre outward to eliminate air and ensure full fibre wet-out. Apply saturating coat through the fabric until all fibres are encapsulated.
- For multi-layer applications, repeat the lay-up while the previous layer is still tacky.

Step 5 — Curing and Protection

- Protect from traffic and direct sunlight during cure (7 days at 23 °C). Apply a UV-protective top-coat or cementitious render after full cure.

LIMITATIONS

- Application temperature: +5 °C to +35 °C (substrate and ambient). Do not apply to standing-water surfaces.
- Substrate moisture content ≤ 4 % (ASTM D4263).
- All structural design must be prepared and certified by a licensed professional engineer (ACI 440.2R or equivalent).

HEALTH & SAFETY

> **NOTE**
> Refer to the current Safety Data Sheet (SDS) for handling, storage, and disposal. Wear chemical-resistant gloves, safety goggles, and respiratory protection in poorly ventilated areas. This TDS does not replace the SDS.

LEGAL NOTES