

# Foreva

## TFC 75

- Bidirectional fabric
- High tensile strength
- Flexible, follow the profile of the surface
- Convenient even for surfaces with planarity defects
- Reinforcements can be overlaid
- Excellent weather resistance
- Rot-proof material, non corrosive

### Foreva® TFC strengthening solution: carbon fibre fabric reinforced composite, in situ stratified

The **Foreva® TFC 75, 150, 200** and **300** reinforcements are used to strengthen reinforced or prestressed concrete structural elements. The composite is fabricated by manually stratifying a carbon fibre fabric with an epoxy resin directly on the concrete surface. Thus, the resin achieves also the adhesion to the substrate.

#### Component characteristics

- **Foreva® TFC 75, 150, 200** and **300** fabric:  
Torayca carbon fibre fabric:
  - > Nominal widths: 75, 150, 200 or 300 mm
  - > Color: black
  - > Weave: satin n°4
  - > Weight: 500 gr/m<sup>2</sup>
  - > Warp/weft: 70/30
- Foreva® Epx TFC resin:
  - > Bi-component epoxy resin
  - > Resin component A: white
  - > Hardener Component B: dark
  - > Mixture: light grey
  - > Mixing ratio in weight = 100 / 100
  - > Mixing ratio in volume = 2 / 1
  - > Pot life at 23°C: ~ 2h30
  - > Complete hardening at 23°C: ~ 2 days
  - > Shore D hardness: maximum 83
  - > Tensile strength at 20°C: 29.3 ± 1.2 MPa

#### Fields of application

The **Foreva® TFC 75, 150, 200** and **300** reinforcements must be used on sound and bonded concrete surfaces.

- Applicable to new or existing structures, on buildings and usually on all types of concrete structures.
- Also suitable for steel, wood or masonry structures.
- Strengthen the elements in tension, flexion and pure or torsional shear at SLS and ULS, including seismic and blast effects.

- Allows to confine elements
- Temperature resistance:
  - > Continuous, in service: 60°C maximum
  - > Accidental or for designing a fire protection: 80°C

#### Design of Foreva® TFC 75, 150, 200 and 300 reinforcements

- **Nominal widths:** 75, 150, 200 or 300 mm
- **Nominal thickness:** 0.48 mm
- **Garanteed tensile strength:** 1400 MPa
- **Interlaminar shear strength:** 40 MPa

Threshold values of resistance to be taken into account in calculations (for combinations of factored loads according to Eurocode 2):

- **Maximum tensile strength at ULS:** 913 MPa.
- **Maximum tensile strength at SLS:** 550 MPa.
- **Minimum adhesion strength to concrete at ULS:** 2.0 MPa.
- **Minimum adhesion strength to concrete a SLS:** 1.5 MPa.
- **Modulus of Elasticity:** 105 GPa.

Refer to the notice Foreva®TFC 3/07-540

#### Defects of the substrate

The fabrics **Foreva® TFC 75, 150, 200** and **300** are flexible products which can match a wide variety of profiles; the tolerances of planarity of the substrate are not a hindrance. However tension stresses generated by push-out effects shall be taken into account in the calculations.

- For a concave radius > 40 cm, no special provisions must be taken.
- For a concave radius ≤ 40 cm, the push-out effects can be withstand by buried anchors designed by Freyssinet and made of carbon fibre filaments.



## Summary of the application procedure

Do not apply without precautions for temperatures < 5°C or > 35°C.

- Mark the locations of the reinforcements on the surface;
- Prepare the substrate (sandblasting, grinding or planing...);
- Remove carefully the dust;
- Carry out convenience assessment of the substrate adhesion strength by direct pull-out tests. The measured stress shall be greater than or equal to 2 MPa (If not, special provisions shall be taken);
- Cut to length the fabric (cissors, cutter).
- Mix Foreva® Epx TFC resin and hardener in compliance with product data sheet;
- Apply one layer of Foreva® Epx TFC resin (700g/m<sup>2</sup>) on the substrate;
- Apply the fabric;
- Press the fabric against the substrate with a rigid roller (purpose is to push the resin through the fabric to build the matrix of the composite);
- Apply one layer of Foreva® Epx TFC resin (700g/m<sup>2</sup>) to complete the composite;
- Finish: as an option the composite can be sanded or painted.

## Packaging

- **Foreva® TFC 75, 150, 200 and 300** fabric:
  - > In rolls of standard length: de 50 m.
  - > Special order: up to 500 m roll.
- Foreva® Epx TFC resin: refer to the technical data sheet.



## Storage

- **Foreva® TFC 75, 150, 200 and 300** fabric:
  - > Shelf life: no time limitation.
  - > Store in dry place (< 90% relative humidity).
  - > Avoid shocks and torsions.
- Foreva® Epx TFC resin: refer to the technical data sheet.

## Safety

Wear personal protective equipment conforming to the MSDS sheets.

Wear an anti-dust mask and protection glasses when cutting carbon fibres.