



# Expanplate\* CFRP

## High strength carbon fiber strip for structural strengthening

### Uses

Expanplate CFRP system can be used to strengthen reinforced concrete structures due to:

- Damaged to structural members
- Change in structural design
- Increase loading
- Design or construction defects
- Suitable for the structural strengthening of:
  - Beams & Columns
  - Walls & Slabs
  - Culverts.
  - Circular, curved and complicated details

### Advantages

- Light weight easy to apply
- Fast installation giving quick return to service
- Non-corroding, can be used in a variety of chemical / corrosive environment
- High strength to weight ratio
- Improve flexural and shear strengths
- Outstanding fatigue resistance
- High modulus of elasticity

### Properties

<b>Carbon fiber content</b>	:	<b>&gt; 68%</b>
<b>Nett thickness</b>	:	<b>1.20 mm</b>
<b>Plate width</b>	:	<b>50 mm</b>
<b>Roll length</b>	:	<b>100 mt.</b>
<b>Modulus of elasticity</b>	:	<b>&gt; 165 GPa</b>
<b>Tensile strength</b>	:	<b>&gt; 3000 MPa</b>

### Specification

Where indicated on the contract drawing, the carbon fiber reinforced plates consisting of unidirectional carbon fiber sheet dipped in epoxy resin and cured to form high strength carbon fiber plates, providing tensile strength higher than 3000 MPa and tensile elasticity greater than 165 GPa, shall be Expanplate CFRP supplied by Fospak.

### Technical support

Fospak provides a technical advisory service for on-site assistance and advice on installation of CFRP, designing facility is also available for large project.

### Installation guideline

#### Surface preparation

The substrate to be treated should be cleaned and prepared by sand or grit blasting, or grinding or similar to remove all contamination such as dust, oil, grease, surface coating etc., and provide a mechanical key. The prepared surface should then be checked for variation in levels using 300 mm straight edge, the maximum permissible deviation being 1 mm over a distance of 300 mm in any direction. Any structural element which contains sharp arises must be ground to give a radius of at least 20 mm.

Since the main purpose of installing Expanplate CFRP is to upgrade a structural element, the condition of the substrate must be established to ensure that it is capable of transferring load to the wrapping sheet. Therefore adhesion tests should be carries on a trial area before commencing with the installation.

#### Installation

Apply 1 mm thick layer of Expanplate Adhesive to the concrete surface, and then remove the peel ply from the surface to be bonded and apply the Expanplate Adhesive to the plate at 1 – 2 mm thick, with approximate 3 mm at the centre of plate.

2 mm plastic spacers can also be used between the plate and concrete surface to maintain a minimum adhesive thickness.

Position the plate against the structure surface, and apply sufficient pressure not only to hold the plate in place but also to expel all air and any excess resin from the glue line. Finally, dress the edges by removing the surplus adhesive.

The sequence of operations shall be planned to ensure that the adhesive can be applied and the plate positioned within the pot life of the Expanplate Adhesive. It is essential to ensure full contact of the adhesive to the two surfaces being bonded is achieved.

Allow to fully cure prior to any application of decorative/protective coating.



CONSTRUCTION CHEMISTRY

## Limitation

Do not apply Expanplate Adhesive on surface within standing water or if the concrete moisture contents >10%.

Mix full pack of Expanplate Adhesive to avoid mix ratio error, part mixing is not allow in any case, and do not dilute any solvent or thinner in Expanplate Adhesive, this will effect on result of product.

Constant exposure to service temperature > 50 °C may affect the performance of the product.

Expanplate CFRP system is not UV resistant, in case or UV exposure Expanplate CFRP system should be over-coated with UV resistant coating within 6 – 8 hours of application, such as Expancote PU.

## Cleaning

All tools should be cleaned immediately after use using an Expanchem Solvent 102; if the resin is allowed to set it can only be removed by mechanical means.

## Health and safety

Avoid contact with skin, eyes and avoid breathing vapors of Expanplate Adhesive and Expanchem Solvent 102.

Wear protective gloves, goggles and mask while mixing of epoxy resin and application.

If swallowed, do not induce vomiting.

If skin contact occurs, remove contaminated clothing and wash skin thoroughly.

If contact with eyes, hold eyes open flood with water for 15 minutes and seek medical attention immediately.

For further information consult the Material Safety Data Sheet available for this product.

## Storage

Expanplate Adhesive has a minimum shelf life of 12 months provided the temperature is kept within the range of 2°C to 50°C. Should the temperature of the product fall outside this range then contact your local Fospak office for advice.

## Fire

Expanplate Adhesive is flammable, avoid contact with fire.

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