

# Nitoplate FRC

High strength carbon fibre composite plate system for structural reinforcement

## Uses

Nitoplate FRC is a structural reinforcement system for use on reinforced concrete, brickwork, steel & timber.

It can be used to strengthen beams, slabs & walls in the following structures:

- Bridges
- Commercial – high rise
- Car parks
- Industrial plants
- Culverts
- Chimneys
- Power stations
- Historic structures

## Advantages

- Very high strength to weight ratio
- Improves flexural strength capacity
- High chemical resistance
- Increases load carrying capacity of structure
- Low build system – minimal effect on structural dimensions
- Fast & easy installation – quick return to service
- No heavy equipment or temporary support during curing required - as compared to steel plate bonding
- Simple detailing – cut to length on site, no splicing
- Corrosion resistant – no maintenance costs

## Description

Nitoplate FRC is a high strength, high modulus, carbon fibre composite plate which, when used in conjunction with a specially developed epoxy adhesive, improves structural performance by strengthening and improving flexural and deformation properties.

Nitoplate FRC is very easy to handle and apply on-site with minimal equipment required, allowing quick & easy reinforcement of structural members without major disruption.

## Specification

Where indicated on the contract drawings, the carbon fibre reinforced plate, consisting of pultruded carbon fibres embedded in epoxy resin, providing tensile strength  $>2,800 \text{ N/mm}^2$  and modulus of elasticity  $>165,000 \text{ N/mm}^2$ , shall be Nitoplate FRC supplied by Fosroc.

## Properties

### Nitoplate FRC

**Fibre Volumetric Content:**  $>68\%$

Dimensions Product	Thickness (mm)	Width (mm)	X-Section Area (mm <sup>2</sup> )
Nitoplate FRC			
S-05	1.2	50	60
S-08		80	96
S-10		120	120

**Modulus of Elasticity:**  $>165,000 \text{ N/mm}^2$

**Tensile Strength of Fibers:**  $>2,800 \text{ N/mm}^2$

*(Mechanical values obtained from longitudinal direction of fibers)*

**Elongation at Break:**  $>1.7\%$

### Nitoplate FE-Z Epoxy Adhesive

#### Appearance:

<b>Comp. A</b>	White paste
<b>Comp. B</b>	Black paste
<b>Mixed A+B</b>	Light grey, creamy consistency

**Compressive Strength: (ASTM D695)**  $>90 \text{ N/mm}^2$

**Shear Strength: (JIS K 6850)**  $>10 \text{ N/mm}^2$

**Application Temperature:**  $+10^\circ\text{C}$  to  $+35^\circ\text{C}$

**Density:** 1.65 kg/litre (mixed)

**Pot Life:** 120 minutes ( $+10^\circ\text{C}$ )  
40 minutes ( $+35^\circ\text{C}$ )

**Open Time:** 30 minutes ( $+35^\circ\text{C}$ )

## Technical support

Fosroc offers a technical support package to specifiers, end users and contractors, as well as unrivalled on site technical assistance all over the world.

## Instructions for use

### Surface Preparation

Concrete surfaces must be dry, flat, sound and free from debris and loose material. Surfaces must be fully Cured

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and free from contamination. Blowholes or imperfections should be filled with Nitomortar FC.

Tolerance for flatness is 10mm maximum over a 2 m length, with no steps or formwork marks more than 0.5mm.

Surface preparation is preferably by sand/grit blasting to remove the surface laitance and expose the fine aggregate.

## Application

Ensure sufficient material, manpower & equipment to carry out the application within the pot-life of the resin.

## Mixing

Add Comp. B to Comp. A of the Nitoplate FE-Z Adhesive and mix for 3 minutes using a spiral paddle fitted to a low speed (<500 rpm) electric drill.

## Adhesive application

### To substrate

Apply the mixed Nitoplate FE-Z Adhesive to the substrate with a spatula/scrapper at a thickness of approx. 1mm.

### To Nitoplate FRC

Clean the side of the Nitoplate FRC to be applied to the concrete with Fosroc Solvent 102, using clean white rags.

Apply 1-2mm thickness of Nitoplate FE-Z Adhesive to the plate using a dome shaped spatula.

## Application of Nitoplate FRC to Substrate

Within the open time of the adhesive, place the Nitoplate FRC onto the prepared substrate and press the plate firmly into the epoxy using a hard rubber roller. Ensure excess material is forced out of both sides of the plate. Remove surplus epoxy.

In case of plate intersections, allow the 1<sup>st</sup> application to harden before applying the 2<sup>nd</sup> plate. Clean the overlapping plate surfaces with acetone before application of the adhesive.

## Limitations

Nitoplate FRC should not be exposed to direct sunlight – Fosroc has a range of UV resistant coatings suitable for overcoating Nitoplate/Nitowrap products.

## Estimating

### Supply

Nitoplate FRC	100 m rolls
Nitoplate FE-Z Adhesive	8 kg set (A+B)

### Coverage

Nitoplate FE-Z Adhesive	
50 mm wide plate	0.35 kg/ lin m
80 mm wide plate	0.55 kg/ lin m
100 mm wide plate	0.80 kg/ lin m

## Storage

Nitoplate FRC and Nitoplate FE-Z Adhesive should be stored in covered warehouse conditions and out of direct sunlight.

## Shelf life

Nitoplate FRC has a semi-permanent shelf life when properly stored.

Nitoplate FE-Z Adhesive has a shelf life of 12 months when stored in normal warehouse conditions.

## Precautions

### Health and safety

Nitoplate FRC is non-reactive. Protect against airborne carbon dust generated by the cutting procedure.

Nitoplate FE-Z Adhesive should not come in contact with skin or eyes or be swallowed. Ensure adequate ventilation. Wear suitable protective clothing, gloves and eye protection. In case of contact with skin, rinse with plenty of clean water, then clean with soap and water. Do not use solvent.

In case of contact with eyes, rinse immediately with clean water and seek medical advice. If swallowed, seek immediate medical attention – do not induce vomiting.

For further information refer to the Material Safety Data Sheet.



### Important note

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