

Nitoplate CP

(Formerly known as Nitoplate FRC)

High Strength Pultruded Composite Laminate Structural Strengthening System for Concrete Structures.

Uses

Nitoplate CP is a system of high-quality carbon fibres, pre-laminated into dense, unidirectional plates. They are adhered using Nitoplate CPA30 thixotropic adhesive, making them ideal for overhead applications on beams and slabs.

Typical applications include, but are not limited to, dynamic and dead load increases, seismic strengthening and repairing structurally damaged concrete. Nitoplate CP may be used on civil structures and buildings.

Advantages

- Improves flexural strength capacity
- High tensile strength and elastic modulus
- Non-intrusive
- Corrosion resistance with high life expectancy
- Rapid installation provides cost savings, rapid return to service and minimal disruption to surrounding works
- Lightweight system reduces requirement for heavy supporting equipment and adds negligible additional load
- Pultrusion process increases density making strengthening of narrow sections possible
- Thixotropic resin adhesive makes overhead working easier.
- Typically low build reducing effects on structural dimensions and clearance
- No pre-fabrication required, can cut to size on site

Description

Nitoplate CP is a 0° unidirectional carbon fibre sheet with high tensile strength and high tensile modulus with 68% volumetric fibre content. It is used with specially developed resin 'Nitoplate CPA30' and externally applied to concrete or masonry. When correctly designed and applied, the Nitoplate CP system may improve structural load carrying capacity, flexural strength, and provide resistance to deformation.

Nitoplate CP is available in Standard tensile modulus (CPS), Medium Tensile Modulus (CPM)

Fosroc also provides the following materials for structural strengthening:

- Nitowrap CW : Carbon fabric materials
- Nitowrap AW : Aramid fabric materials
- Nitowrap GW : Glass fabric materials
- Nitorod CR : Carbon fibre pultruded rods

Aramid plates and rods are also available upon request.

Fosroc provides ancillary primers, adhesives and repair materials.

Technical Support

Fosroc offers a technical support service to specifiers, end users and contractors as well as unrivalled onsite technical assistance in locations all over the world.



Nitoplate CP

Properties

Table 1 : Nitoplate CP -Product dimensions and physical properties

Product Code	Thickness (mm)	Width (mm)	Cross Sectional Area (mm ²)	Fibre Density (g/cm ³)	Tensile Modulus (N/mm ²)	Tensile Strength (N/mm ²)	Tensile <i>strength at break</i> (x N/mm ²)	Flexural Strength (N/mm ²)	Ultimate Elongation (%)
Nitoplate CPS									
212	1.2	20	24	1.5	165,000	>3,000	3,050	1,670	1.7
512		50	60						
612		60	72						
812		80	96						
912		90	108						
1012		100	120						
1212		120	144						
214	1.4	20	28	1.5	165,000	>3,000	3,050	1,670	1.7
514		50	70						
614		60	84						
814		80	112						
914		90	126						
1014		100	140						
1214		120	168						
1514		150	210						
Nitoplate CPM									
514	1.4	50	70	1.6	>210,000	>2,800	2,900	1,470	1.2
614		60	84						
814		80	112						
914		90	126						
1014		100	140						
1214		120	168						
914		90	126						

Application Instructions

Fosroc recommends that application of any structural strengthening system should be undertaken by trained and experienced contractors.

Nitoplate products must be applied in strict accordance with the product method statement, a copy of which may be obtained from your nearest Fosroc technical office.

Surface Preparation

Concrete surfaces must be dry, smooth and free from debris or loose material. Surfaces must be fully cured and free from coatings, impregnations or contamination.

Thorough preparation of the substrate is vital. Light grit blasting is recommended to remove all deleterious substances and provide a suitable mechanical key. The surface should be vacuumed after mechanical preparation.

All defects, including cracks, loose concrete blowholes and surface imperfections should be made good with Nitomortar repair materials as advised by Fosroc.

Nitoplate CP

Surface irregularities shall be made good to achieve flatness in accordance with the designer's specification. As a general guide this shall be approximately $< \pm 1\text{mm}$ in 1m.

Cut the Nitoplate CP strips to the required length using a sharp disc cutter or guillotine. Inspect the plate for damage including splits and splinters. Discard any damaged sections of plate.

Clean the matt surface of the Nitoplate CP with a clean cloth lightly dampened with Fosroc solvent 102. Allow any solvent residue to dissipate before applying adhesive.

Instruction for Use

After surface preparation is completed, clearly mark the location of the plates on the concrete substrate as per the Engineer's instructions. Apply masking tape on the borders of the plate location in order to achieve a clean cut edge of the adhesive.

Decant Nitoplate Adhesive into a clean mixing vessel at a ratio of 2 parts base to 1 part of hardener by weight. Mix well using a low speed powered mixer (300-500 RPM) for a minimum of 5 minutes. Ensure there are no visual streaks in the mixture.

The adhesive should be applied on both the concrete substrate and the matt surface of the plate.

Onto concrete surface: using a trowel apply a minimum of 1mm thickness of Nitoplate CPA30 adhesive to the substrate. Once the resin is applied to the concrete substrate, remove the masking tape.

Onto the plate: Nitoplate CPA30 must be applied to the matt cleaned surface of the Nitoplate CP strip creating a domed profile with the apex of the dome at a minimum of 3mm thick, tapering to 0.1mm at the edges.

Total minimum thickness should be no less than 2mm for the plate and total 3mm for substrate and plate. Refer to Table 2 for consumption rate of adhesive.

Apply the plate to the substrate while both resins are still wet. Use a wooden or rubber seam-roller to push the plate into the resin ensuring no voids and that resin is extruded from the sides of the plate. Remove any excess adhesive with a trowel before it sets.

Wait a minimum of 24 hours before applying any subsequent coatings.

Finishing

As Nitoplate CP is inert and corrosion resistant, the product may be left uncoated. If exposed to UV light

Fosroc recommends that the system is coated with Dekguard S or a similar protective system.

Other considerations may require the system to be covered over, by coatings or renders. These are permissible but should be selected in consultation with Fosroc's technical office.

Cleaning

Nitoplate CPA30 Adhesive should be removed from tools and equipment using Fosroc Solvent 102 immediately after use. Hardened material may be removed mechanically.

Table 2: Theoretical Coverage of Nitoplate CPA30 adhesive

Plate Width (mm)	Adhesive requirement (KG/linear metre)*
20	0.10
50	0.25
60	0.30
80	0.40
90	0.45
100	0.50
120	0.60
150	0.75

*Adhesive Requirement is theoretical and does not allow for concrete profile or wastage.

Estimating

Supply

Nitoplate CPS212 & CPS214	: 200m roll
All other Nitoplate sizes	: 100m roll
Nitoplate CPA30	: 15 kg pack

Nitoplate CP

Limitation

Design calculations must be approved by a licensed professional engineer in accordance with the prevailing design standards of the country where the material will be installed.

Fosroc recommends that application of any structural strengthening system should be undertaken by trained and experienced contractors.

Storage

Nitoplate CP should be stored in covered warehouse conditions, and kept clean and dry.

Shelf Life

Nitoplate CP has an unlimited shelf life when kept in appropriate storage conditions

Precautions

Health and Safety

For further information refer to the appropriate Product Safety Data Sheet.

Fire

Fosroc Solvent 102 is flammable.

Nitoplate CP is non-flammable.

In service, observe the Glass Transition Point



Important note

Fosroc products are guaranteed against defective materials and manufacture and are sold subject to its standard terms and conditions for the Supply of Goods and Services, copies of which may be obtained on request. Whilst Fosroc endeavours to ensure that any advice, recommendation, specification of information it may give is accurate and correct, it cannot, because it has no direct or continuous control over where or how its products are applied, accept any liability either directly or indirectly arising from the use of its products, whether or not in accordance with any advice, specification, recommendation of information given by it.

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