

Nitoplate CPS

(Formerly Known as Nitowrap CFP)

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

Uses

Nitoplate CPS is a system of high-quality carbon fibres, pre-laminated into dense, unidirectional plates. They are adhered using Nitowrap 40 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 CPS 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
- Comes in varying strengths and thicknesses



Description

Nitoplate CPS is a 0° unidirectional carbon fibre sheet with high tensile strength and high tensile modulus. It is used with specially developed resin 'Nitowrap 40 and externally applied to concrete or masonry. When correctly designed and applied, the Nitoplate CPS system may improve structural load carrying capacity, flexural strength, and provide resistance to deformation.

Nitoplate CPS 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

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Table 1 : Nitoplate CPS - 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)	Ultimate Elongation (%)
Nitoplate CPS							
212	1.2	20	24	1.5	165,000	>3,000	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	1.7
514		50	70				
614		60	84				
814		80	112				
914		90	126				
1014		100	140				
1214		120	168				
1514	150	210					
530	3	50	150	1.6	165,000	>3000	1.7
1030	3	100	300	1.6	165,000	>3000	1.7
Nitoplate CPM							
514	1.4	50	70	1.6	>210,000	>2,800	1.2
614		60	84				
814		80	112				
914		90	126				
1014		100	140				
1214		120	168				
914		90	126				

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.



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.

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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

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 CPS 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 CPS 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, apply Nitowrap 40 adhesive at a consumption rate in accordance with Table 2.

Mix the base and hardener components of Nitowrap 40. 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.

Using a trowel apply a minimum of 1mm thickness of Nitowrap 40 adhesive to the substrate.

It must be applied to the cleaned surface of the Nitoplate CPS 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.

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

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.

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

Nitowrap 40 Adhesive should be removed from tools and equipment using Fosroc Solvent 102 immediately after use. Hardened material may be removed mechanically.

Estimating

Supply

Nitoplate CPS212 & CPS214	200m roll
All other Nitoplate sizes	100m roll
Nitowrap 40	3.7 litre

Table 2: Theoretical Coverage of Nitowrap 40 adhesive

Coverage of Epoxy Adhesive

Nitowrap 40	CFP 20	CFP50	CFP80	CFP100
Theoretical coverage* in m @ 2mm thickness per litre	25	10	6.25	5

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



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Limitations

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

Shelf Life

Nitoplate CPS 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

Nitoplate CPS is non-flammable.

In service, observe the Glass Transition Point



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