

Nitowrap FRC

High performance high strength carbon fibre system for structural reinforcement

Uses

Nitowrap FRC is used for strengthening load carrying capacity of different structures specifically where improvement to flexural and shear strength, and resolve to de-formation properties is required.

Typical applications include loading increases, seismic strengthening, correcting strength deficiency due to damage of structural parts and changing in structural design for:

- Pier caps and columns.
- Beams and slabs.
- Railway and road bridges.
- Buildings and towers.

Advantages

- High tensile strength and elastic modulus.
- Improves flexural strength capacity.
- Corrosive resistance low maintenance to strength structure.
- Fast & easy installation: cost savings, time savings and giving quick return to service.
- Suitable in poor access locations.
- Low build system: giving minimal effect on structural dimensions and clearance.
- Simple detailing for application.
- Application without any usage of heavy machine or equivalent.
- Final coating can be applied without preparation.

Physical Properties

Grade	FRC 200	FRC 230	FRC 300	FRC 530	FRC 300HM
Fiber Area Weight (g/m ²)	200	230	300	530	300
Design thickness (mm)	0.111	0.131	0.167	0.293	0.165
Ultimate Elongation	2.1%				1.2%
Fiber Density	1.8 g/cm ³				1.82 g/cm ³
Tensile strength (kgf/cm:width)	390	450	590	1050	500
Tensile strength "design value" (kgf/cm ²)	35,500				30,000
Tensile E-modulus "design value" (kgf/cm ²)	2.35x10 ⁶				3.80x10 ⁶



Description

Nitowrap FRC is a 0° unidirectional, high strength and high elastic modulus carbon fibre sheet which when used in conjunction with a specially developed primer and encapsulation resins. Improves structural performance by strengthening and improving flexural and shear strength, and de-formation properties.

Design criteria

Nitowrap FRC high performance fibre is encapsulated in Nitowrap Encapsulation Resin to provide properties of high strength and high elastic modulus.

Its low-density properties, specific strength and modulus are extremely high compared with conventional materials such as steel and concrete.

Nitowrap FRC is extremely easy to handle and apply with no noise and minimal site equipment necessary allowing quick and easy reinforcement of structural members without major disruption.

Nitowrap FRC is lightweight, high impact resistance, excellent tensile strength, extremely stable at high and low temperatures and has excellent chemical resistance under a variety of exposure conditions.

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Nitowrap Primer

Specific gravity at 23°C	1.15
Pot life at 20°C	90 minutes
Drying Time at 20°C	10 hours
Adhesion to concrete (kgf/cm ²)	>27.0

Nitowrap Encapsulation Resin

Viscosity (cps @ 20°C)	>4000
Specific gravity @ 23°C	1.13
Pot life at 20°C	50 minutes
Drying Time at 20°C	10 hours
Shear strength (MPa)	>30
Compressive strength (MPa)	>60
Flexural E-modulus (MPa)	>3500
Flexural strength (MPa)	>40
Adhesive strength (MPa)	>2.0 (concrete failure)
Glass Transition Point (T _g)	>65°C

Note: for cases where elevated surface temperature is likely to be occurred, a specially formulated encapsulation resin is available "Nitowrap Encapsulation Resin HT". Please consult Fosroc office for more information.

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

Preparation

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

Thorough preparation of the substrate is vital with light grit blasting recommended to remove all deleterious substances and provide a suitable key. All dust and debris must be removed prior to proceeding. Blowholes or imperfections should be filled with Nitomortar TC2000 prior to application of Nitowrap Primer.

When encountering an area where a sharp corner occurs, the corner must be ground down to a radius in excess of 10mm.

Instruction for use

Nitowrap FRC should be applied in strict accordance with product method statement, a copy of which may be obtained from your nearest Fosroc office.

Finishing

After completing the application of the carbon sheet, apply the proper finish coating to the completely cured surface.

Several of Fosroc's Architectural or Protective Coating System may be applied to Nitowrap FRC after 24 hours following the strips application. Please consult Fosroc office for more information.

Estimating

Supply

Nitowrap FRC200, 230, 300 & 300HM	100 M roll (0.5 M wide)
Nitowrap FRC 530	50 M roll (0.5 M wide)
Nitowrap Primer	15 kg Pack
Nitowrap Encapsulation Resin	15 kg Pack

Coverage

Nitowrap Primer	0.25 - 0.3 kg/m ² *
Nitowrap Encapsulation Resin	0.60 – 1.0 kg/m ² **

* Depending on surface roughness.

** Please review product method statement for the consumption.

Limitations

Design calculations must be approved by licenced professional engineer.

DO NOT fold the carbon sheet and cut it into the appropriate lengths according to the installation plan.

In external applications, Nitowrap FRC should be over-coated with a UV resistant coating within 6 hours of application, The finished area should be covered with a weatherproof cover until the final coating is completed.

Storage

Nitowrap FRC should be stored in covered warehouse conditions out of direct sunlight.

Shelf life

Nitowrap FRC has an unlimited shelf life. Nitowrap Primer and Nitowrap Encapsulation Resin have a self-life of 12 months when stored in standard warehouse conditions.

Fire

Nitowrap FRC is non-flammable.

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Additional information

Fosroc manufactures a wide range of complementary products which include:

- Waterproofing membranes & waterstops
- Joint sealants & filler boards
- Cementitious & epoxy grouts
- Specialized flooring materials

Fosroc additionally offers a comprehensive package of products specifically designed for the repair and refurbishment of damaged concrete. Fosroc's 'Systematic Approach' to concrete repair features the following:

- Hand-placed repair mortars
- Spray grade repair mortars
- Fluid micro-concretes
- Chemically resistant epoxy mortars
- Anti-carbonation/anti-chloride protective coatings
- Chemical and abrasion resistant coatings

For further information on any of the above, please consult your local Fosroc office - as below.



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Important note:

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