Nitowrap® EP(HF)

constructive solutions

High performance high strength, hybrid fibre system for structural strengthening & seismic retrofitting.

Uses

Nitowrap EP(HF) is a hybrid fibre composite system for strengthening columns, beams and slabs of load bearing structures particularly where improvement to shear strength and deformation characteristics is required. It is ideal for retrofitting where enhancement of seismic resistance is required. Typical applications include piers, columns, beams, slabs, retaining walls, masonry bridges, pipes, chimneys, tunnels and other structures.

Advantages

- **Very high strength to thickness or weight ratio** - Appreciable increase in strength and load carrying capacity without significant increase in dead load
- **Enhanced stiffness, shear & tensile capacities** - Increased load carrying capacity and better resistance to seismic forces and deflection.
- **Chemical resistant** – Excellent resistance to acids and alkalis
- **Flexible**- Can be applied on any shape or contour of substrate
- **Thin sections** - Can be effectively used in space-constrained areas.
- **Creep & Fatigue resistance** - Ideal for conditions of sustained loading and repeated loading.
- **Excellent ductility -** helps in providing retrofitting properties & protection from natural hazards like Earthquakes & Tidal waves (Tsunami)
- **Blast mitigation -** Good material for antiblast properties.
- **Economical**- Easy to install, time & labour saving

Description

Nitowrap EP(HF) is a hybrid fibre composite wrapping system comprising of E-glass fibres in the primary direction and Aramid fibres in the secondary direction. This system is used in conjunction with an epoxy sealer cum primer, Nitowrap 30 and a high build epoxy saturant Nitowrap 410. The system is protected by a polyurethane top coat of Nitowrap 512 in case of atmospherically exposed structures.

Properties

Nitowrap HF

Fibre fabric type	-	Bi-directional fiber sheet
Fibre Areal Weight	-	900 g/m^2
Fabric Thickness	-	0.32 ~ 0.36 mm

Primary fibres

Fibre fabric type	-	E-glass fibres
Fibre Tensile Strength	-	3430 Mpa
Fibre Stiffness	-	73 Gpa
Elongation	-	4.8%

Secondary fibres

Fibre fabric type	-	Kevlar(Aramid)fibre
Fibre Tensile Strength	-	3200 Mpa
Fibre Stiffness	-	112 Gpa
Elongation	-	2.4%

Product	Color	Pot Life @ 30^{0}C	WFT (Microns)	DFT (Microns)	Indicative coverage Per coat/Ltr.
Nitowrap 30	Clear	20 min.	100	100	8.0-10.0 m^2
Niotwrap 410	Amber	120 min.	250	250	3.5-4.0 m^2
Nitowrap 512	Grey	60 min.	100	45	8.0-10.0 m^2

Nitowrap® EP(HF)

Nitowrap 30, Primer

Density	-	1.14 g/cc
Pot life	-	25 min. @ 27^{0}C
Full cure	-	7 days

Nitowrap 410, Saturant

Colour	-	Pale yellow to amber
Application temperature	-	15^{0}C - 40^{0}C
Viscosity	-	Thixotropic
Density	-	1.25 - 1.26 g/cc
Pot Life	-	2 hours at 30^{0}C
Cure time	-	5 days at 30^{0}C

Nitowrap 512 - UV resistant top coat

Pot life at 30^{0}C	-	min 1 hr
Recoat time at 30^{0}C	-	2 - 4 hrs
Initial time at 30^{0}C	-	16 hrs
Final time at 30^{0}C	-	5 days
Colour	-	Available in range of colours
Application thickness	-	90-100 microns DFT in 2 coats
Mixed density	-	1.30 g/cc
Mixed viscosity	-	2 - 4 poise

Application instructions

Surface preparation

Concrete surfaces to be treated shall be free from oil residues, demoulding agents, curing compounds, grout holes and protrusions. Incase of distressed structures, the concrete surface to be wrapped, shall be structurally repaired prior to treatment. Corrosion induced damages shall be repaired with Renderoc range of mortars and Galvashield XP shall be installed wherever necessary. Structural damages shall be repaired by using epoxy grouting/appropriate mortar from the Renderoc range.

All depressions, imperfections etc., shall be repaired by using Nitocote VF/ Nitomortar FC, epoxy putty.

Mixing

Before mixing, the contents of each can should be thoroughly stirred to disperse any settlement, which may have taken place during storage. The base and hardener are emptied into a suitable container and the material is thoroughly mixed for at least 3 minutes. Mechanical mixing using a heavy-duty slow speed (300 - 500 rpm), drill, fitted with a mixing paddle is recommended.

Primer

The mixed material of Nitowrap 30 epoxy primer is applied over the prepared and cleaned surface. The application shall be carried out using a brush and allowed for drying for about 24 hours before application of saturant.

Saturant

The mixed material of Nitowrap 410 saturant is applied over the tack free primer. The wet film thickness shall be maintained @ 250 microns.

Nitowrap HF

The Nitowrap HF fabric shall be cut to required size and then pressed first by gloved hand on to the saturant applied area and then with a stiff spatula or a surface roller to remove air bubbles.

One more coat of Nitowrap 410 saturant is applied over the carbon fabric at 250 microns WFT after a minimum time lapse of 30 minutes.

The same procedure shall be followed for multiple layer fibre strengthening.

Note: Care shall be taken to ensure that the fibre orientation is not disturbed while applying the second coat of saturant.

Top protective coat

If UV resistance is required then two additional coats of two component aliphatic polyurethane coating Nitowrap 512 shall be applied as topcoat. The WFT shall be 100 microns per coat.

Curing

The coatings will become tack free in approximately 4 - 6 hours and be fully cured in 7 days.

Cleaning

Tools and equipments should be cleaned with Nitoflor Sol, solvent immediately after use. Hands and skin shall be washed with soap, or an industrial hand cleaner.

Limitations

Nitowrap EP(HF) is only recommended for uses as described in the uses section of this datasheet. The performance of Nitowrap EP(HF) is limited to the specifications and recommendations as described in this datasheet.

Estimating

Packaging

Nitowrap Carbon Fibres is supplied in rolls of length 100m & width 0.5m (Area of 50m^2).

Nitowrap 30, Primer	-	3.5 L
Nitowrap 410, Saturant	-	4 L
Nitowrap 512, Topcoat	-	4 L
Nitoflor Sol, Solvent	-	5 & 20 L

Coverage

Please refer to the table given under 'Properties' for individual product coverage. However, the practical coverage may vary depending on the surface conditions.

Storage

Shelf life

Fibres

Though the fibres have unlimited shelf life, a maximum storage life of 2 years is recommended.

Epoxies

The epoxies have a shelf life of 12 months from the date of manufacture if stored in unopened containers below 35^{0}C.

Precautions

Health and Safety instructions

Some people are sensitive to epoxy resin systems and may develop dermatitis on skin contact.

Rubber gloves and/or barrier creams, protective clothing, goggles and respirator shall be worn while handling the materials. Sufficient mechanical and/or local exhaust ventilation shall be provided to maintain easy working conditions. If contact with skin or eyes occurs, washing with plenty of water is suggested. SOLVENT SHALL NOT BE USED. If irritation persists, seek immediate medical advice shall be sought. Smoking and naked flame should be avoided while using the materials.

Flash Point

Nitowrap 30, Primer	-	25^{0}C
Nitowrap 410, Saturant	-	33^{0}C
Nitowrap 512, Topcoat	-	65^{0}C
Nitoflor Sol, Solvent	-	33^{0}C

Additional Information

The Fosroc range of associated products includes admixtures, curing compounds, flooring systems, precision grouts, repair mortars, protective coating, joint sealants, waterproofing systems and e-chem solutions.

Separate datasheets are available on these range of products.

Important note :
Fosroc products are guaranteed against defective materials and manufacture and are sold subject to its standard terms and conditions of sale, copies of which may be obtained on request. Whilst Fosroc endeavours to ensure that any advice, recommendation specification or 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 or information given by it.

Fosroc Chemicals (India) Pvt. Ltd.

Head Office
"Sapthagiri Palace", No.38,
II & III Floor, 12th Cross,
CBI Road, Ganganagar North,
Bangalore 560 032

telephone	fax	e-mail
++91 80-23551500	++91 80-23551510	enquiryindia@fosroc.com

Regional Offices

Bangalore
"Sapthagiri Palace", No. 38
II & III Floor, 12th Cross,
CBI Road, Ganganagar North,
Bangalore 560 032.
Ph:080-23551500
Fax : 080-23551510

Mumbai
1401/1402, 14floor,
A-Wing'The Great Eastern Summit'
Sector-15, CBD, Belapur
Navi Mumbai 400 614
Ph: 022 -43406800-04

Delhi
D-166 Sector 10
Noida,
UP 201 301
Ph:0120-4270620
Fax: 033-2499-0280

Kolkata
304, Jodhpur Park
Kolkata 700 068
Ph:033-65343188

www.fosroc.com