

FIDCARBON UNIDIR 300 HM390®

HIGH MODULUS CARBON FIBER SHEET FOR STRUCTURAL STRENGTHENING



FIDIA srl
Technical Global Services



Geometrical and Mechanical properties of the FRP composite *

Dry Fibre (yarn properties)

Ultimate tensile strength, σ_{fibra}	4200 MPa
Young's Modulus, E_{fibra}	390 GPa
Ultimate tensile strain, ϵ_{fibra}	1,10 %
Density	1,80 g/cm ³

Fabric impregnated with resin (calculation values)

Title of woven	600 Tex
n° yarn/cm	5,00 yarn/cm
weight (including thermo-welding)	300 g/m ²
Equivalent thickness of FRP, t_f	0,165 mm
Characteristic strength of FRP, f_{fk}	3000 MPa
Young's modulus of FRP, E_f	370 GPa
Characteristic ultimate tensile strain of FRP, ϵ_f	0,81 %

Updated 08 march 2010

* The properties of the composite have been determined according to the UNI and ASTM standards as indicated in the CNR-DT 200/2004 guidelines " Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Existing Structures". The characteristics strength and deformation are calculated as the average two times the standard deviation.

MATERIAL CHARACTERISTICS

Description

FIDCARBON UNI 300 HM390 is a sheet composed of unidirectional high modulus carbon fibers, realized by thermo-welding, process which stops the unwinding of the fibers and which make the installation in-situ easier. It can be used on RC, PC, masonry, timber and steel members for shear and flexural strengthening, and column confinement.

Ideal for:

- Strengthening for shear or/and flexural solicitation beams and systems-floor;
- Confining columns and piers to increase the compression strength;
- Strengthening due to load increase;
- Seismic mitigation;
- Mitigate design or post-construction defects;
- Strengthening structures which have been modified for architectural or configuration use;
- Control crack propagation and reduce deformations.

Advantages:

- Strengthening system highly is resistant to corrosion;
- High fatigue resistance;
- Lightweight and durable;
- Adaptable to complex shapes;
- Adaptable for confinement, shear and flexural strengthening;
- No increase in section of structural elements strengthened;
- Easy to install, after adequate surface preparation;
- High modulus carbon fibers for projects where is important reducing ultimate deformations and increase stiffness.

PACKAGES

Each job size, sheets can be supplied to meet design requirements in different widths and lengths. Standard widths available in stock are 100, 200, 300, 400, 500 mm and different lengths.

RECOMMENDATIONS

When managing the sheet, protective clothing and glasses must be worn and instructions regarding the installation of the materials must be followed carefully.

Inhalation: breath fresh air and rinse out your mouth.

Skin contact: no special measures are needed.

Contact with eyes: rinse for at least 15 minutes; in case of use of contact lenses they must be removed and rinsed for at least another 5/10 minutes; If still painful seek medical care.

Ingestion: rinse the mouth by drinking water and inducing vomit. Seek medical care.

Yard storage: Keep in a dry covered area which is far from sub-

APPLICATION EXAMPLES

To learn about structural projects using unidirectional carbon fiber sheet visit the "Application" area at FIDIA website:

QUALITY & CERTIFICATION

Material supply is accompanied by a certificate of origin of the material from the producer and the certificate of characterization of the mechanical properties issued by an Italian laboratory approved by the Ministry of Infrastructure and Transport according to Art. 59 of D. P. R. 380/2001 construction material sector following the law .1086/71, with Decree n.38194 of 14/01/1992 and followings.

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APPLICATION

1. Surface preparation

Clean the surface from dust, grease and other particles by brushing and sand blasting. Clean the reinforcements from eventual traces of rust and seal possible crevices.

2. Leveling surface

Leveling the surface in order to eliminate eventual roughness and incoherent materials.

3. Primer application

Apply to the surface, with a brush or a roller, a layer of primer and wait until it cured. Level the surface with putty.

4. Application of the first layer of saturant resin

Apply a first layer of epoxy to impregnate the sheet.

5. Sheet installation

Till the epoxy layer is still "fresh", install the sheet previously cut of the required dimension paying attention to not form any bubble by manually smoothing or by passing with a roller.

6. Sheet impregnation

Roll several times the sheet ensuring a good level of impregnation eliminating any excess of resin.

7. Finishing

Apply a second layer of epoxy and finish by applying silica sand; proceed with the application of polyuretan paint or polyurea for protecting the reinforcement.

NOTE LEGALI

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