FID-FORTIUS 150-200 CFRP LAMINATE®

PULTRUDED CARBON FIBER LAMINATES WITH IMPROVED SURFACE BOND FOR STRUCTURAL STRENGTHENING

TECHNICAL GLOBAL SERVICES

FORTIUS

Geometrical and Mechanical properties of the FRP composite*

Typology	Laminate width bf (mm)	Laminate thickness sf (mm)	Cross Sectional Af (mm^2)	Ultimate Tensile Strength ffk (MPa)	Tensile Modulus Ef (GPa)	Ultimate Strain ε (%)	Carbon fiber (%)
FID-FORTIUS 150 low modulus	50	1,2/1,4	60/70	2500	165	1,60	70
	80	1,2/1,4	96/112	2500	165	1,60	70
	100	1,2/1,4	120/140	2500	165	1,60	70
FID-FORTIUS 200 high modulus	10	1,4	14	2500	205	1,30	70
	50	1,4	70	2500	205	1,30	70
	80	1,4	112	2500	205	1,30	70
	100	1,4	140	2500	205	1,30	70
	120	1,4	168	2500	205	1,30	70

** The properties of the composite have been determined according to the UNI and ASTM standards as indicated into the CNR-DT 200/2004 guidelines " Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Existing Structures ". The ultimate tensile strength f_{fk} is determined by calculating the average value and subtracting three times the standard deviation.*

MATERIAL CHARACTERISTICS

Description

FID-FORTIUS 150-200 CFRP LAMINATE® can be used as externally bonded structural strengthening for reinforced-prestressed concrete, and steel structures.
The rectangular lamina (available in different widths and E module manufactured using the pultrusion process) are bonded onto the surface using epoxy resin. The final product is totally inert, corrosion and alkalis resistant and is also very strong (more or less 5 times stronger than a standard steel bar) thanks using a TORAY T700 carbon fiber . In order to enhance the bond between the lamina and the substrate, one face of the pultruded section is rugged by sandblasting in a controlled process.

Ideal for:

- Increase the flexural strength of RC and PC members (civil and industrial structures and viaduct), systems floor, due to loading increase or changing load configuration;
- Earthquake mitigation;
- Repair of damaged structures from fire and/or earthquake;
- Strengthening and retrofit of bidimentional structures such as slab, vaults and tank with high radius of curvature (>3m).

Advantages:

- Ligthweigth and durabilità;
- High strength;
- Excellent bond with concrete, and steel;
- Easy to install and quicker if compared with sheets using manual lay-up process, but the surface has to be perfectly flat and even.

APPLICATION INSTRUCTIONS

The use of externally bonded FID-FORTIUS 150-200 CFRP LAMINA® is derived from the practice of steel plate bonding. The lighter weight and greater tensile strength of the CFRP pultruded laminate greatly reduce the overall installation costs compared to steel plate bonding techniques.

1. Surface preparation

Clean the surface from dust, grease and other particles by brushing or sand blasting. Clean the reinforcements from eventual traces of rust and inject possible cracks. The substrate pull-out strength must beo f at least > 1,5 MPa.

2. Preparetion of the laminate

Remove the film, on the side that will go to contact with the epoxy. Clean, ensuring that is free of dust or other substances that might jeopardize bond.

3. Primer application

Apply to the surface, with a roller, a layer of primer and wait enough time until it sets. Level (if necessary) the surface with putty.

4. Laminate bonding

Apply to the laminate a layer of adhesive and put it on a substrate surface, taking care of exercise a constant pressure on all its extension. Roll the laminate from the center to the end to remove any excess of resin and ensure that all the surface is in contact with the resin and substrate.

To bond onto curvilinear surfaces, clamps or other means of support will be needed to maintain the laminate in the correct position till the resin cure (depending type of resin and environmental conditions) while bonding few hours are usually sufficient for the resin to start curing.

5. Laminate protection

Protect the laminate by intumescent and anti-UV paintings.

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PACKAGE-STORAGE

FID-FORTIUS 150-200 CFRP LAMINATE® are available in special spool 75-90-150m long, easy to use and keep in a deposit quite similar to a rollable meter.

Yard-storage: Keep covered and in a sheltered dry place. Avoid prolonged exposure to the sun, and possibly stored on pallets.

RECOMMENDATIONS

When handling the bar , always wear protective clothing and goggles and follow the instructions concerning the application of the material.

Skin-contact: is not required any special care except the use of proper gloves.

Eyes-contact: rinse abundantly for at least 15 minutes; in case of contact lenses use, remove and rinse for other 5/10 minutes. If there is still discomfort rely to medical care.

Ingestion: rinse your mouth with drinking water and induce the rejection. Then rely to medical care.

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.

FID-FORTIUS 150-200 CFRP LAMINATES are produced according to a unique and patented manufacturing system, that guarantees constant dimensions thanks to a system of continuous quality control during all production phases.

EXAMPLES OF APPLICATIONS

To learn about structural projects using fiber glass bars visit the "Application" area at the following website: www.fidiaglobalservice.com.

Or visit the website of our European partner FORTIUS at www.fortius.be.

LEGAL NOTES

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