FID-ASLAN 200 CFRP REBAR®

CARBON FIBER BARS WITH CIRCULAR SECTIONS AND IMPROVED SURFACE BOND FOR STRUCTURAL STRENGTHENING

TECHNICAL GLOBAL SERVICES

AslanFRP

Geometrical and Mechanical properties *

Bar Size Φ (mm)	Cross Sectional Area Af (mm^2)	Ultimate Tensile Strength ffk (MPa)	Tensile Modulus Ef (GPa)	Ultimate Strain ε (%)	Maximun Bond Stress (MPa)	Coefficient of Thermal Expansion (10^-6/°C) Transv.	Longit.	Carbon fiber content (%)	Specific Gravity (g/cm^3)	Barcol Hardness
6 9 12	29,9 65,2 108,3	2068	124	1,70	8,45	74-104	-9-0	70	1,90	48-55

** 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-ASLAN 200 CFRP REBAR® are carbon fiber reinforced bars with circular section, formed by strands of carbon fibers, which, subject to tension, are impregnated with a thermosetting resin, so that the fibers are kept together and to behave , therefore, as a unique product (pultrusion process). CFRP bars are available in three different diameters (ø6,9,12 mm). The final product is totally inert, corrosion and alkalis resistant, with a very high tensile strength (almost five times more resistant than a standard steel bar) thanks to use TORAY T700 carbon fiber. In order to increase the superficial bond, the external part of the bars is deformed, ensuring a excellent surface bond both with epoxies and with mortars.

Ideal:

- To increase flexural and shear strength of RC and PC members.
- To increase compression, flexural and shear strength of masonry walls both made with natural stones or bricks;
- To increase flexural and shear strength of timber or glulam members;
- To seam columns and walls;
- To reduce deformations induced by service loads in conjunction with pre-cambering of the element to induce active retrofit (mostly used on timber-glulam beams).

Benefit:

- Ultra ligthness;
- Ultra high tensile strength;
- Excellent durability and resistance to chemical attack;
- Excellent bond to cementitious mortars and epoxy resins for structural retrofit.

APPLICATION INSTRUCTIONS

The use of FID-ASLAN 200 CFRP REBAR® is particularly indicated for three different types of applications:

1. Strengthening of RC-PC-Masonry-Timber using the NSM Technology, or better known as **N**ear **S**urface **M**ount Bars. This technology consist to injecting a groove cut in the substrate with epoxy/mortar and then inserting the FRP bar.
   The procedure consists of:

A) 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 cracks. Where is needed the substrate shall be restored with tixotropic mortars.

B) Groove cutting

Cut the grooves having care to protect the substrate around them. Perform the cut of groove on the substrate using milling machine (the cut must be widen 3 times the bars thickness and deep 1,5 times), removing of material left in the groove and cleaning with compressed air.

C) Groove injection with epoxy

Injection of ¾ of the groove with epoxy resin or cementitious mortar.

D) Bar installation into the groove

E) Final epoxy injection

Total resin or mortar injection paying attention to eliminate eventual air bubbles that can prejudice the bond of the bar and also the stress transmitted between substrate and the FRP rebars.

F) Finishing

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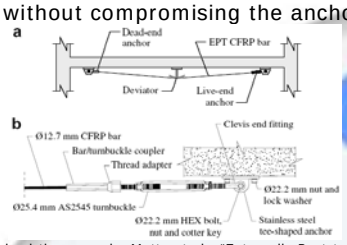
APPLICATION INSTRUCTIONS (Continue)

2. Structural strengthening through the post-tensioning technique, or through pre-tensioning of rebars installed at the intrados of member to recover deformability and also increase flexural strength. Thanks to special anchorages, developed in the Miami University Labs under request of by Hughes Brothers, we are able to use the maximum tensile strength of the rebar without compromising the anchorage.



For more info download the paper by Matta et al., "Externally Post-tensioned carbon FRP bar system for deflection control", in the *Document* section of our website www.fidiaglobalservice.com.

3. To realize PC members reinforced with post-tensioned CFRP bars inside of injected ducts. The use of pre-tensioned carbon bars allows to optimize better the use of such material, reaching much higher applied load, compared to those reached with traditional strands in harmonic steel. The use of carbon tendons allows also to avoid problems caused by corrosion, commonly faced in traditional post-tensioned structures.

PACKAGE-STORAGE

FID-ASLAN 200 CFRP REBAR® are available in lengths of 3 and 6 meters or in a special spool 900m long.

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

QUALITY & CERTIFICATION

The 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-ASLAN 200 CFRP bars are produced according to a unique and patented manufacturing system, that guarantees constant dimensions thanks to a system of continuous quality control during the all production phases.

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.

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 partner Hughes Brothers Inc. at www.hughesbros.com section ASLAN FRP, and download examples of applications around the world.

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