

FID-ASLAN 100 GFRP REBAR®
GLASS FIBER BARS
WITH IMPROVED SURFACE BOND FOR STRUCTURAL
STRENGTHENING AND NEW CONSTRUCTIONS



TECHNICAL GLOBAL SERVICES



Geometrical and Mechanical properties *

Bar Size Φ (mm)	Cross Sectional Area A_r (mm ²)	Nominal Diameter Φ (mm)	Ultimate Tensile Strength (MPa)	Shear Stress (MPa)	Tensile Modulus E_r (GPa)	Ultimate Strain ϵ (%)	Maximum Bond Stress (MPa)	Coefficient of Thermal Expansion (10 ⁻⁶ /°C)		Glass Fiber Content (%)	Specific Gravity (g/cm ³)	Barcol Hardness
								Transv.	Longit.			
6	33,23	6,35	825	N/A	40,80	0,20						
10	84,32	9,53	760	N/A	40,80	0,19						
13	144,85	12,70	690	N/A	40,80	0,17						
16	217,56	15,88	655	152	40,80	0,16						
19	295,50	19,05	620		40,80	0,15	11,60	33,70	6,58	70	1,90	min 60
22	382,73	22,23	586		40,80	0,14						
25	537,90	25,40	550		40,80	0,13						
29	645,00	28,65	517		40,80	0,13						
32	807,34	31,75	480		40,80	0,12						

*The properties of the rebars have been determined according to the UNI and ASTM standards as indicated in the CNR-DT 203/2006 guidelines "Instructions for Design, Construction and Monitoring of Reinforced Concrete Structures with FRP rebars" and also 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_{tk} is determined by calculating the average value and subtracting three times the standard deviation.



MATERIAL CHARACTERISTICS

Description

FID-ASLAN 100 GFRP BAR® are glass fiber reinforced bars, formed by strands of glass fiber, which, subject to tension, are impregnated with a thermosetting resin, so that the fibers are kept together and behaving, therefore, as a unique product (pultrusion process). The final product is totally inert, corrosion and alkalis resistant. In order to increase the superficial bond, the external part of the bars is deformed and covered with silica sand. GFRP bars are available in different diameters between 6 and 32 millimeters. They may be used as a valid alternative to inox-steel rods, epoxy coated or galvanically resistant bars.

Benefit for new construction (Reinforced concrete):

- Significant increase in the duration of civil engineering structures in hostile environments;
- No need of repair and/or maintenance;
- Almost no maintenance cost.

Benefit for retrofit-strengthening applications:

- Ideal for retrofit-strengthen masonry/timber structures;
- They can be bonded on the masonry/timber surface in cut slots with either epoxy or cement mortars;
- Great compatibility with the masonry/timber substrate.

In particular are:

- Perfectly resistant to corrosion and stable to ion chlorides;
- Transparent to magnetic fields and radio frequencies;
- Electrical and thermally non conductive;
- Good impact resistance;
- Excellence resistance to cyclic loads;
- Dimensionally stable when subject to thermal loads;
- High tensile strength;
- Enhanced sanded and corrugated bonding surface.

APPLICATION

Strengthening-Retrofit of existing structures (masonry-timber):

- To strengthen un-reinforced masonry subject to flexural (out of plane loads) and/or shear stresses (in plane loads).
- To increase axial compression of masonry and/or natural stone columns, and in general to improve cracking behavior of un-reinforced members.
- To increase the flexural strength of timber or wood members.

Bars are bonded on the substrate in slots cut and injected with either epoxy or mortar.

Construction of new RC-PC concrete structures in replacement of steel rebars:

- Any concrete member susceptible to corrosion of steel reinforcement by chloride ion or chemical corrosion or in alternative to epoxy, galvanized and stainless steel rebar.

Concrete exposed to de-icing salts:

- Bridge decks, Tersey barriers.
- Parking structures.

Concrete exposed to marine salts:

- Dams, wharfs, jetties, piers, offshore platforms, artificial reefs and water breaks;
- Buildings and structures near waterfronts, floating marine docks.

Concrete exposed to corrosive environment:

- Chemical and petrochemical industries, castings near pipelines, installations for treatment of water, cooling towers, tanks and wells for nuclear waste, tanks for electrolytic refining.
- Thin concrete sections where adequate cover is not possible and architectural precast and cast stone elements.

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AslanFRP

APPLICATION (continue)

- Any concrete members requiring non-ferrous reinforcement due to electro-magnetic considerations:
 - laboratories for electromagnetic resonance, buildings for tools calibration, radar installations and compasses, control towers, military installations, casting in the vicinity of high-voltage cables, processing stations;

Replacement of the steel reinforcement in RC members:

- SOFT-EYE, where the Tunnel Boring Machine (TBM) needs to pass through a diaphragm wall;
- temporary works.

Geotechnical applications:

- rock-bolts;
- rock nails.

PACKAGE-STORAGE

FID-ASLAN GFRP 100 bars are available in lengths of 6 meters, with diameters: 6, 8, 9, 12, 16, 19, 22, 25, 28 and 32 mm.

Standard curved elements available upon request: 90°, for the diameters: 6 mm (length 25 cm) and 8 mm (length 37 cm).

STIRRUPS, SHAPES AND BENDS

Bends are fabricated by shaping over a set of molds or mandrels prior curing of the resin matrix. Bends on site are not allowed.

It is recommended that designers work with the factory in the early stages of design, as not all standard bends and shapes are readily available. For example, a J-Hook at the end of a 10 meter length of rebar would be achieved by lap splicing (40 times the diameter for splice length) a J-hook piece to the 10 meter rebar.

- The narrowest inside stirrup width is 10", (38cm for #7 & #8 bar).
- Bends are limited to shapes that continue in the same circular direction. Otherwise lap splices are required.

LAP SPLICE LENGTH

Approximately 40 bar diameters for GFRP bars.

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.

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

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-ASLAN 100 GFRP bars 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.fidia-globalservice.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.

LEGAL NOTES

The technical advice that Fidia S. r.l. Technical Global Services provides, orally or in writing, as assistance to the customer or installer on the basis of its experiences, corresponding to current scientific knowledge and practices, are not binding and do not demonstrate any legal or contractual obligation accessory with contract of sale. They do not exempt from liability buyer feel our products as regards their suitability for use. For the rest are valid our commercial conditions. Discrepancies that original content and/or use not involve any responsibility by the company's Fidia S. r.l.. The Client is obliged to check that this report, and the values are valid for the consignment of product of its interest and not be overcome, as replaced by subsequent editions and/or new formulations of the product. In doubt, please contact advance our Technical Office.

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