ASLAN™ 100
FIBERGLASS REBAR

FOR INFRASTRUCTURE SOLUTIONS

SETTING THE BAR IN CONCRETE REINFORCEMENT

Physical and Mechanical Properties

Meets ASTM D7957 material standards and requirements

NOMINAL DIAMETER			NOMINAL AREA		UNIT WEIGHT/ LENGTH		ASTM D7205-06 GUARANTEED TENSILE STRENGTH		ULTIMATE TENSILE LOAD STRENGTH		ASTM D7205-06 TENSILE MODULUS OF ELASTICITY		ULTIMATE STRAIN
Size	mm	in	mm2	in2	kg/m	lbs/ft	MPa	ksi	kN	kips	GPa	psi 10^6	%
2	6	1/4	31.67	0.049	0.0774	0.052	896	130	28.34	6.37	46	6.7	1.94%
3	10	3/8	71.26	0.11	0.1590	0.107	827	120	58.72	13.2	46	6.7	1.79%
4	13	1/2	126.7	0.196	0.2813	0.189	758	110	95.9	21.56	46	6.7	1.64%
5	16	5/8	197.9	0.307	0.4271	0.287	724	105	143.41	32.24	46	6.7	1.57%
6	19	3/4	285	0.442	0.6072	0.408	690	100	196.6	44.2	46	6.7	1.49%
7	22	7/8	387.9	0.601	0.8096	0.544	655	95	254	57.1	46	6.7	1.42%
8	25	1	506.7	0.785	1.0462	0.73	620	90	314.27	70.65	46	6.7	1.34%
9	29	1-1/8	641.3	0.994	1.4137	0.95	586	85	375.83	84.49	46	6.7	1.27%
10	32	1-1/4	791.7	1.227	1.7114	1.15	551	80	436.6	98.16	46	6.7	1.19%
11*	35	1-3/8	958.1	1.485	1.9346	1.3	482	70	462.4	104*	46	6.7	1.04%
12*	38	1-1/2	1160	1.8	2.4554	1.65	448	65	520.4	117*	46	6.7	0.97%
13*	41	1-5/8	1338	2.074	2.8721	1.93	413	60	553.5	124*	46	6.7	0.90%

*Tensile properties of #11, #12 & #13 bar are NOT guaranteed due to the inability to achieve a valid bar break per ASTM D7205.
We reserve the right to make improvements in the product and/or process which may result in benefits or changes to some physical-mechanical characteristics. The data contained herein is considered representative of current production and is believed to be reliable and to represent the best available characterization of the product as of July 2011. Tensile tests per ASTM D7205.

Design Tensile and Modulus Properties per ASTM D7205-06: The area used in calculating the tensile strength is the nominal cross sectional area. The "Guaranteed Tensile Strength", f^*_{fu} is as defined by ACI 440.1R as the mean tensile strength of a given production lot, minus three times the standard deviation or $f^*_{fu} = f_{u,ave} - 3\sigma$. The "Design or Guaranteed Modulus of Elasticity is as defined by ACI 440.1R as the mean modulus of a production lot or $E_f = E_{f,ave}$.

Bond Dependent Coefficient: kb = 0.9 per ASTM draft test method. As used in ACI equation 8-9.

Glass Fiber Content: > 70% by weight per ASTM D2584

Moisture Absorption: 24 hour absorption at 122°F (50°C) ≤ 0.25%, per ASTM D570

Applications

Corrosion of internal reinforcing steel is one of the chief causes of failure of concrete structures. Inevitable concrete will crack, creating a direct avenue for chlorides to begin oxidizing the steel rebar. Fiberglass Rebar is a proven and successful alternative reinforcement that will give structures a longer service life in many types of applications such as:

Bridge Decks I Marine Structures — Sea Walls I Balconies I Tunneling & Mining — Soft Eye I High Voltage & Electromagnetic Fields — Light & Heavy Rail I Civil Roadways I Masonry strengthening & Historic Preservation

Bent Bars & Stirrups

Must be made at the factory, field bending not permitted. Industry standard bent shapes are available, standard shape codes are used.

Some limitations include:

- Max leg length of a stirrup is 60" (152cm)
- Redirection of bends, such as Z-shapes or gull-wings types are not very economical. Bent shapes should continue in the same circular direction
- Closed square shapes are best furnished as pairs of U-bars or continuous spirals
- A 90-degree bend with 12db, bar diameter, pigtail used to shorten development length is equally as effective as a J-shape as per ACI 440.1R
- The radius on all bends is fixed as per the table shown. Some U-shaped stirrups fall in between the range of these two bend radiuses and are not possible

We advise that you work closely with the factory to implement the most economical detailing of bent bars and stirrups.

Field Forming of Large Radius Curves

Permitted when the radius is larger than in the following table. The table gives the minimum allowable radius for induced bending stresses without any consideration for additional sustained structural loads.

Bend Radius of Factory Formed Bent Bar

NOMINAL DIAMETER			INSIDE BEND RADIUS	
Size	mm	in	mm	in
2	6	1/4	38	1.5
3	10	3/8	54	2.125
4	13	1/2	54	2.125
5	16	5/8	57	2.25
6	19	3/4	57	2.25
7	22	7/8	76	3.0
8	25	1	76	3.0

Field Forming of Large Radius Curves

NOMINAL DIAMETER			INSIDE BEND RADIUS		EXTERIOR USE C=0.7MIN RADIUS	
Size	mm	in	mm	in	cm	in
2	6	1/4	107	42	122	48
3	10	3/8	170	67	196	77
4	13	1/2	246	97	282	111
5	16	5/8	323	127	368	145
6	19	3/4	404	159	462	182
7	22	7/8	495	195	566	223
8	25	1	597	235	678	267
9	29	1 1/8	597	280	813	320
10	32	1 1/4	711	343	996	392
11*	35	1 3/8	871	414	1204	474
12*	38	1 1/2	1052	487	1412	556
13*	41	1 5/8	1237	570	1656	652

Handling and Placement

Follow guidelines in ACI440.5-08 “Specification for Construction with FRP Bars”. In general, field handling and placement is the same as for epoxy or galvanized steel bars. Do NOT shear FRP bars. When field cutting of FRP bars is necessary, use a fine blade saw, grinder, carborundum or diamond blade. Sealing the ends of FRP bars is not necessary. Support chairs are required at two-thirds the spacing of steel rebar. Plastic coated tie wire is the preferred option for most projects. When completely non-ferrous reinforcing, i.e., no steel is required in the concrete, nylon zip ties (available from local building materials centers) or plastic bar clips are recommended. (Don’t forget to use non-metallic form ties in formwork.) It is possible, especially in precast applications, for FRP bars to “float” during vibrating. Care should be exercised to adequately secure FRP in the formwork.

Material Certs, Traceability and Storage

Available for any production lot of Aslan™ 100 bar, traceable by bar marks imprinted on the bar in intervals showing the bar diameter, stock order and production date.

For storage Fiberglass Rebar should remain covered and protected from UV exposure until ready for use and placement.

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