Fiberglass Structural Typical Properties

The tables below offer details on the typical porperties of Structural fiberglass profiles(in standard formulation, fire retardant and vinylester resin system) per ASTM test methods. Our stardard formulation includes synthetic veil and altraviolet inhibitors.

		ENGLISH		METRIC	
MECHANICAL PROPERTIES	ASTM	Value	Units	Value	Units
Tensile Stress, LW	D-638	41,000	psi	286.0	MPa
Tensile Stress, CW	D-638	7,400	psi	51.0	MPa
Tensile Modulus, LW	D-638	5.1	10^6 psi	35.2	GPa
Tensile Modulus, CW	D-638	1.1	10^6 psi	7.4	GPa
Compressive Stress , LW	D-695	33,000	psi	227.8	MPa
Compressive Stress , CW	D-695	16,000	psi	110.0	MPa
Compressive Modulus, LW	D-695	3.4	10^6 psi	23.5	GPa
Compressive Modulus, CW	D-695	1.5	10^6 psi	11.3	GPa
Flexural Stress, LW	D-790	55,000	psi	381.0	MPa
Flexural Stress, CW	D-790	11,000	psi	80.4	MPa
Flexural Modulus, LW	D-790	3.0	10^6 psi	20.7	GPa
Flexural Modulus, CW	D-790	1.4	10^6 psi	9.5	GPa
Modulus of Elasticity,E	Full Section	2.7	10^6 psi	19.3	GPa
Shear Modulus	— —	0.5	10^6 psi	3.1	GPa
Short Beam Shear	D-2344	4350	psi	30.0	MPa
Punch Shear	D-732	11,000	psi	91.7	MPa
Notched Izod Impact, LW	D-256	39	ft.-Ibs./in	3.12	J/mm
Notched Izod Impact, CW	D-256	6	ft.-Ibs./in	0.32	J/mm
PHYSICAL PROPERTIES	ASTM	Value	Units	Value	Units
Barcol Hardness	D-2533	55	— —	55	— —
24 Hour Water Absorbtion	D-570	0.3	% max	0.3	% max
Density	D-792	0.063-0.07	lbs./in.^{3}	1.74-1.95	g/cc
Coefficient of Thermal Expansion,LW	D-696	4.9	10^{-6}in./in./℉	8.4	10^{-6}mm/mm/℃
ELECTRICAL PROPERTIES	ASTM	Value	Units	Value	Units
Arc Resisitance,LW	D-495	132	seconds	132	seconds
Dielectric Strength,LW	D-149	35	kv./in	11.8	kv./mm
Dielectric Strength,PF	D-149	217	volts/mil.	217	volts/mil.
Dielectric Constant,PF	D-150	5	@60hz	5	@60hz
FLAMMABILITY PROPERTIES	ASTM		Units		Value
Tunnel Test	E-84		Flame Spread		15 max.
Flammalility	D-635		— —		Nonburing
UL	94				V0
NBS Smoke Chamber	E-662		Smoke Density		600-700

LW = Lengthwise CW = Crosswise PF = Perpendicular to Laminate Face

Fiberglass Structural Shapes Guide

WF-BEAM

SIZE (inch)	Lbs./Ft.
4×4×1/4	2.33
6×6×3/8	5.28
8×8×3/8	7.10

I-BEAM

SIZE (inch)	Lbs./Ft.
8×4×3/8	4.43
10×5×1/2	8.02
12×6×1/2&1/4	7.39

CHANNEL

SIZE (inch)	Lbs./Ft.
1 3/4×1 5/16×1/8	0.42
4×1 1/8×1/4	1.15
4×2×5/16	1.90
4 3/4×1 7/16×1/4	1.40
5 5/16×1 3/16×1/4	1.37
6×1 11/16×3/8	2.64
6 5/16×1 7/8×5/16	2.43
7 7/8×2 3/8×3/8	3.81
8×2 3/16×3/8	3.44
10×2 3/4×1/2	5.85

SQUARE TUBE

SIZE (inch)	Lbs./Ft.
1×1×1/8	0.35
1 1/2×1 1/2×1/8	0.53
1 1/2×1 1/2×1/4	0.97
2×2×1/8	0.72
2×2×1/4	1.36
5×5×3/8	5.51
2×1 1/4×1/4	1.01

FLAT SHEET

SIZE (inch)	Lbs./Ft.
4×1/8	0.39
4×1/4	0.76
4×3/8	1.15
4×1/2	1.53
6×1/4	1.24
6×1/2	2.25
9×1/4	1.86
10×1/4	2.02
11×1/4	2.26
12×1/4	4.01
24×1/4	4.87
36×1/4	7.49
48×1/8	1.30
48×3/16	1.88
48×1/4	2.49
48×3/8	3.51
48×1/2	4.87
48×5/8	5.86
48×3/4	6.72
48×1	8.65

ANGLE

SIZE (inch)	Lbs./Ft.
2×2×1/4	0.75
3×3×3/8	1.68
4×4×3/8	2.26
4×4×1/2	3.02

ROUND ROD

SIZE (inch)	Lbs./Ft.
1/4	0.04
3/8	0.10
3/4	0.38
1	0.68
1 1/2	1.53
2	2.56

ROUND TUBE

SIZE (inch)	Lbs./Ft
1×1/8	0.31
1 1/2×1/8	0.48
1 1/2×1/4	0.79
2×1/8	0.77
2×1/4	1.43

HANDRAIL CONNECTORS

SIZE (inch)	Lbs./Pc
1 1/2 90° fixed	1.32
1 1/2 adjustable	1.32

LADDER RUNG

SIZE (inch)	Lbs./Ft.
1 1/4×0.16	0.49
1 3/8×0.18	0.52

TOE PLATE

SIZE (inch)	Lbs./Ft.
4×1 1/2×1/8	0.49
6×1 1/2×1/8	0.74

SQUARE BAR

SIZE (inch)	Lbs./Ft.
1×1	0.81
1 1/2×1 1/2	1.87
2×2	3.32

EMBEDMENT ANGLE

SIZE (inch)	Lbs./Ft.
1×1 1/2×1/4	0.78
1 1/2×1 1/2×1/4	0.89
2×1 1/2×1/4	0.99

STAIR TREAD COVER

SIZE (inch)	Lbs./Ft.
1×6×1/8	0.76
1×9×1/8	1.08
1×12×1/8	1.42
1.5×9×1/8	1.10

Note: Other sizes are avilable on request.

Chemical Resistance Guide

Chemical Environment	Concentration %	Temp °F	Molded Grating			Pultruded Grating & Structural Shapes	
			VFR	IFR	GP	VFR	IFR
Acetic Acid	50	MAX	C	C	S	C	C
Aluminum Hydroxide	ALL	MAX	C	C	C	C	C
Ammonium Chloride	ALL	120	C	C	C	C	C
Ammonium Bicarbonate	15	120	C	C	S	C	S
Ammonium Bicarbonate	50	120	C	C	S	S	I
Aluminum Hydroxide	20	80	S	N	N	I	N
Ammonium Sulfate	ALL	120	C	C	C	C	S
Calcium Carbonate	ALL	MAX	C	C	S	C	C
Calcium Niterate	ALL	MAX	C	C	C	C	C
Carbon Tetrachloride	100	80	I	N	N	I	N
Chlorine,Dry Gas	ALL	MAX	C	C	S	C	S
Chlorine Water	SAT	120	C	I	N	I	N
Chromic Acid	50	150	I	N	N	I	N
Copper Chloride	ALL	MAX	C	C	C	C	C
Copper Cyanide	ALL	140	C	S	I	S	I
Copper Nitrate	ALL	MAX	C	C	C	C	C
Ethanol	10	120	C	S	S	C	S
Ethanol	50	120	C	I	I	C	I
Ethylene Glycol	ALL	ISO	C	C	S	C	S
Ferric Chloride	100	MAX	C	C	C	C	C
Forrous Chloride	ALL	MAX	C	C	C	C	C
Formaldehyde 0-50%	50	120	S	I	I	S	I
Gasoline	ALL	120	C	C	S	C	S
Glucose	ALL	120	C	C	C	C	C
Glycerin	100	MAX	C	C	S	C	S
Hydrobromic Acid	50	MAX	S	S	I	I	N
Hydrobromic Acid	10	MAX	C	S	S	S	S
Hydrobromic Acid	37	MAX	I	S	I	I	I
Hydrogen Peroxide	30	80	C	N	N	S	N
Nickel Sulfate	ALL	MAX	C	C	C	C	C
Nitric Acid	20	120	S	S	I	I	I
Oxalic Acid	ALL	150	C	C	S	C	S
Perchloric Acid	30	90	S	I	I	I	I
Phosphoric Acid	80	MAX	C	C	C	C	S
Potassium Chloride	ALL	MAX	C	C	C	C	C
Potassium Dichromate	ALL	MAX	C	C	C	C	C
Potassium Nitrate	ALL	MAX	C	C	C	C	C
Potassium Sulfate	ALL	MAX	C	C	C	C	C
Propylene Glycol	ALL	MAX	C	C	S	C	S
Sodium Acetate	ALL	MAX	C	C	C	C	C
Sodium Bisulfate	ALL	80	S	S	I	C	I
Sodium Bromide	ALL	80	C	C	C	C	C
Sodium Cyanide	ALL	80	C	I	I	S	I
Sodium Hydroxide	10	MAX	C	I	N	I	N
Sodium Hydroxide	50	MAX	S	N	N	N	N
Sodium Nitrate	ALL	MAX	C	C	C	C	C
Sodium Sulfate	ALL	MAX	C	C	C	C	C
Tartaric Acid	ALL	MAX	C	C	S	C	S
Vinegar	ALL	MAX	C	C	S	C	S
Water, Distilled	ALL	MAX	C	C	C	C	C

C = Continuous exposure of the grating to the chemical environment listed at the temperature listed.
S = Frequent exposure of the grating to splashes and spills from the chemical enviroment listed with that environment at the temperature listed.
I = Infrequent exposure of the gratin to splashes and spills from the chemical environment listed with that environment at the temperature listed and the spill immediately cleaned up or washed from the grating.
N = Not recommended for the concentrations and temperatures listed.