

# Properties

	ASTM TEST METHOD	UNITS/VALUE	SERIES 500/525 SHAPES	SERIES 625 SHAPES	SERIES 500/525 PLATE ⑤			SERIES 625 PLATE ⑤		
					1/8" 3.175mm	3/16" - 1/4" 4.76-6.35mm	3/8" - 1" 9.5-25.4mm	1/8" 3.175mm	3/16" - 1/4" 4.76-6.35mm	3/8" - 1" 9.5-25.4mm
<b>MECHANICAL</b>										
Tensile Stress, LW	D638	psi N/mm <sup>2</sup>	30,000 207	30,000 207	20,000 138	20,000 138	20,000 138	20,000 138	20,000 138	20,000 138
Tensile Stress, CW	D638	psi N/mm <sup>2</sup>	7,000 48.3	7,000 48.3	7,500 51.7	10,000 68.9	10,000 68.9	7,500 51.7	10,000 68.9	10,000 68.9
Tensile Modulus, LW	D638	10 <sup>6</sup> psi 10 <sup>9</sup> N/mm <sup>2</sup>	2.5 17.2	2.6 17.9	1.8 12.4	1.8 12.4	1.8 12.4	1.8 12.4	1.8 12.4	1.8 12.4
Tensile Modulus, CW	D638	10 <sup>6</sup> psi 10 <sup>9</sup> N/mm <sup>2</sup>	0.8 5.52	0.8 5.52	0.7 4.83	0.9 6.21	1.4 9.65	1.0 6.89	1.0 6.89	1.4 9.65
Compressive Stress, LW	D695	psi N/mm <sup>2</sup>	30,000 207	30,000 207	24,000 165	24,000 165	24,000 165	24,000 165	24,000 165	24,000 165
Compressive Stress, CW	D695	psi N/mm <sup>2</sup>	15,000 103	16,000 110	15,500 107	16,500 114	20,000 138	16,500 114	17,500 121	17,500 121
Compressive Modulus, LW	D695	10 <sup>6</sup> psi 10 <sup>9</sup> N/mm <sup>2</sup>	2.5 17.2	2.6 17.9	1.8 12.4	1.8 12.4	1.8 12.4	1.8 12.4	1.8 12.4	1.8 12.4
Compressive Modulus CW	D695	10 <sup>6</sup> psi 10 <sup>9</sup> N/mm <sup>2</sup>	1.0 6.89	1.0 6.89	1.0 6.89	1.0 6.89	1.0 6.89	1.0 6.89	1.0 6.89	1.0 6.89
Flexural Stress, LW	D790	psi N/mm <sup>2</sup>	30,000 207	30,000 207	35,000 241	35,000 241	30,000 207	35,000 241	35,000 241	30,000 207
Flexural Stress, CW	D790	psi N/mm <sup>2</sup>	10,000 68.9	10,000 68.9	13,000 89.6	15,000 103	18,000 124	13,000 89.6	15,000 103	18,000 124
Flexural Modulus, LW	D790	10 <sup>6</sup> psi 10 <sup>9</sup> N/mm <sup>2</sup>	1.6 11.0	1.6 11.0	1.8 12.4	2 13.8	2 13.8	1.8 12.4	2 13.8	2 13.8
Flexural Modulus, CW	D790	10 <sup>6</sup> psi 10 <sup>9</sup> N/mm <sup>2</sup>	0.8 5.52	0.8 5.52	0.9 6.21	1.1 7.58	1.4 9.65	1.0 6.89	1.1 7.58	1.4 9.65
Modulus of Elasticity ①	full section	10 <sup>6</sup> psi 10 <sup>9</sup> N/mm <sup>2</sup>	2.6 17.9	2.8 19.3						
Modulus of Elasticity: W & I shapes > 4" W & I shapes > 102mm	full section	10 <sup>6</sup> psi 10 <sup>9</sup> N/mm <sup>2</sup>	2.5 17.2	2.5 17.2						
Parallel Compressive Shear Stress, LW ② ④	D3846	psi N/mm <sup>2</sup>	3,000 20.7	3,000 20.7						
Shear Modulus, LW ③	—	10 <sup>6</sup> psi 10 <sup>9</sup> N/mm <sup>2</sup>	0.425 2.93	0.425 2.93						
Short Beam Shear, LW ⑧ ⑨	D2344	psi N/mm <sup>2</sup>	4,500 31.0	4,500 31.0						
Bearing Stress, LW	D953	psi N/mm <sup>2</sup>	30,000 207	30,000 207	32,000 220.6	32,000 221	32,000 221	32,000 221	32,000 221	32,000 221
Poisson's Ratio, LW ⑥	D3039	in/in mm/mm	0.33 .330	0.33 .330	0.31 .310	0.31 .310	0.31 .310	0.32 .320	0.32 .320	0.32 .320
Notched Izod Impact, LW	D256	ft-lbs/in J/mm	25 1.33	25 1.33	15 .988	10 1.07	10 1.07	15 .988	10 1.07	10 1.07
Notched Izod Impact, CW	D256	ft-lbs/in J/mm	4 .214	4 .214	5 .267	5 .267	5 .267	5 .267	5 .267	5 .267

## PHYSICAL

Barcol Hardness	D2583	—	45 ④	45 ④	40	40	40	40	40	40
24 hr Water Absorption ⑦	D570	% Max	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Density	D792	lbs/in <sup>3</sup> 10 <sup>-3</sup> g/mm <sup>3</sup>	.062-.070 1.72-1.94	.062-.070 1.72-1.94	.060-.068 1.66-1.88	.060-.068 1.66-1.88	.060-.068 1.66-1.88	.060-.068 1.66-1.88	.060-.068 1.66-1.88	.060-.068 1.66-1.88
Coefficient of Thermal Expansion, LW ⑧	D696	10 <sup>-6</sup> in/in/°F 10 <sup>-6</sup> in/in/°C	4.4 8.0	4.4 8.0	4.4 8.0	4.4 8.0	4.4 8.0	4.4 8.0	4.4 8.0	4.4 8.0
Thermal Conductivity ⑨	C177	BTU-in/ft <sup>2</sup> Hr/°F w/(m <sup>2</sup> *K)	4 .58	4 .58						

All values are minimum ultimate properties from coupon tests except as noted.

- ① This value is determined from full section simple beam bending of EXTREN® structural shapes.
- ② Th test configuration where the notches are machined parallel to the reinforcing mat. For notches machined perpendicular to the reinforcing mat, this value would be two to three times larger.
- ③ The Shear Modulus value has been determined from tests with full sections of EXTREN® structural shapes. (See Strongwell's Strongwell *Design Manual* for further information.)
- ④ Value would be 50 if the surfacing veil were not there.
- ⑤ Plate compressive stress/modulus measured edgewise and flexural stress/modulus measured flatwise.
- ⑥ Values apply to Series 525 and 625.
- ⑦ Measured as a percentage maximum by weight.
- ⑧ Span to depth ratio of 3:1; EXTREN® angles will have a minimum value of 4000 psi and the I/W shapes are tested in the web.
- ⑨ Typical values because these are shape and composite dependent tests.

LW — Lengthwise  
CW — Crosswise  
PF — Perpendicular to laminate face  
N.T. — Not Tested

PROPERTIES	ASTM TEST METHOD	UNITS/VALUE	SERIES 500/525 SHAPES	SERIES 625 SHAPES	SERIES 500/525 PLATE ⑤			SERIES 625 PLATE ⑤		
					1/8"	3/16" - 1/4"	3/8" - 1"	1/8"	3/16" - 1/4"	3/8" - 1"
					3.175mm	4.76-6.35mm	9.5-25.4mm	3.175mm	4.76-6.35mm	9.5-25.4mm

## ELECTRICAL

Arc Resistance, LW ④	D495	seconds	120	120						
Dielectric Strength, LW ④	D149	KV/in KV/mm	35 1.38	35 1.38	35 1.38	35 1.38	35 1.38	35 1.38	35 1.38	35 1.38
Dielectric Strength, PF ④	D149	volts/mil	200	200	200	N.T	N.T	250	N.T	N.T

## FLAMMABILITY ⑥

Flammability Classification (1/16")	UL 94	VO
Tunnel Test	E-84	25 Max
NBS Smoke Chamber	E-662	650-700 (Typical)
Flammability	D635	Self Extinguishing
UL Thermal Index	Generic	130°C
British Fire Test	BS 476-7	Class 1

## ASTM SPECIFICATIONS

- ASTM D3917 "Standard Specification for Dimensional Tolerance of Thermosetting Glass-Reinforced Plastic Pultruded Shapes".
- ASTM D3918 "Standard Definition of Terms Relating to Reinforced Plastic Pultruded Products".
- ASTM D3647 "Standard Practice for Classifying Reinforced Plastic Pultruded Shapes According to Composition".
- ASTM D4385 "Standard Practice for Classifying Visual Defects in Thermosetting Reinforced Plastic Pultruded Products".