

# MATERIAL PROPERTIES

## Pultex<sup>®</sup> Fiber Reinforced Polymer Structural Profiles Rectangular Tubes, Channels, Angles, Square Tubes, Round Tubes

*Includes all angles except 4" x 1/4", 4" x 3/8", 6" x 3/8" and 6" x 1/2", which are **SuperStructurals**.  
Please consult the Pultex<sup>®</sup> Fiber Reinforced Polymer **SuperStructural** Profiles Angles Material Properties*

- 1500 Series - Thermoset Polyester – Olive Green
- 1525 Series - Thermoset Polyester Class 1 FR – Slate Gray (Dark Gray)
- 1625 Series - Thermoset Vinyl Ester Class 1 FR – Beige

**The following data was derived from ASTM coupon and full section testing.** The results are average values based on random sampling and testing of production lots. Composite materials are not homogeneous; and therefore, the location of the coupon extraction can cause variances in the coupon test results. Creative Pultrusions publishes an average value of random samples from production lots.

Property (coupon values)	ASTM Test	Units	1500/1525 Series	1625 Series
<b>Mechanical</b>				
Tensile Strength (LW)	D638	psi	33,000	37,500
Tensile Strength (CW)	D638	psi	7,500	8,000
Tensile Modulus (LW)	D638	10 <sup>6</sup> psi	2.5	3.0
Tensile Modulus (CW)	D638	10 <sup>6</sup> psi	0.8	1.0
Compressive Strength (LW)	D695	psi	33,000	37,500
Compressive Strength (CW)	D695	psi	16,500	20,000
Compressive Modulus (LW)	D695	10 <sup>6</sup> psi	3.0	3.0
Compressive Modulus (CW)	D695	10 <sup>6</sup> psi	1.0	1.2
Flexural Strength (LW)	D790	psi	33,000	37,500
Flexural Strength (CW)	D790	psi	11,000	12,500
Flexural Modulus (LW)	D790	10 <sup>6</sup> psi	1.6	2.0
Flexural Modulus (CW)	D790	10 <sup>6</sup> psi	0.8	1.0
Modulus of Elasticity	Full Section <sup>2</sup>	10 <sup>6</sup> psi	2.8-3.2	2.8-3.2
(Channels)	Full Section <sup>2</sup>	10 <sup>6</sup> psi	2.8	2.8
(Square and Rectangular Tubes)	Full Section <sup>2</sup>	10 <sup>6</sup> psi	3.2	3.2
Shear Modulus	Full Section <sup>2</sup>	10 <sup>6</sup> psi	0.42	0.42
Interlaminar Shear (LW) <sup>3</sup>	D2344	psi	4,500	4,500
Shear Strength By Punch (PF)	D732	psi	5,500	6,000
Notched Izod Impact (LW)	D256	ft-lbs/in	28	30
Notched Izod Impact (CW)	D256	ft-lbs/in	4	5
Maximum Bearing Strength (LW)	D953	psi	30,000	30,000
Maximum Bearing Strength (CW)	D953	psi	18,000	18,000
Poisson's Ratio (LW)	D3039	in/in	0.35	0.35
Poisson's Ratio (CW)	D3039	in/in	0.15	0.15
In-plane Shear (LW)	Modified D2344 <sup>4</sup>	psi	7,000	7,000

LW = lengthwise

CW = crosswise

PF = perpendicular to laminate face

Additional properties located on back

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## Pultex<sup>®</sup> Fiber Reinforced Polymer Structural Profiles Rectangular Tubes, Channels, Angles, Square Tubes, Round Tubes (cont'd)

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<u>Property</u> (coupon values)	ASTM Test	Units	1500/1525 Series	1625 Series
<b>Physical</b>				
Barcol Hardness <sup>1</sup>	D2583		45	45
Water Absorption	D570	% Max	0.6	0.6
Density	D792	lbs/in <sup>3</sup>	0.060-0.070	0.060-0.070
Specific Gravity	D792		1.66-1.93	1.66-1.93
Coefficient of Thermal Expansion (LW)	D696	10 <sup>-6</sup> in/in/°F	4.4	4.4
Thermal Conductivity (PF)	C177	BTU-in/ft <sup>2</sup> /hr/°F	4	4
<b>Electrical</b>				
Arc Resistance (LW)	D495	seconds	120	120
Dielectric Strength (LW)	D149	KV/in	40	40
Dielectric Strength (PF)	D149	volts/mil	200	200
Dielectric Constant (PF)	D150	@60Hz	5.2	5.2

<sup>1</sup> Pultex<sup>®</sup> uses a synthetic surface veil that reduces the Barcol Hardness, but does not reflect lack of cure.

<sup>2</sup> Full section testing based on a 3-point bend with simply supported end conditions (Reference The New and Improved Pultex<sup>®</sup> Pultrusion Global Design Manual, Appendix B, for details).

<sup>3</sup> Tested on a 3:1, span to depth ratio.

<sup>4</sup> Follow ASTM D2344, but rotate coupon 90° (cut section of coupon length faces up).

<sup>5</sup> In-plane Shear (CW) values for square tubes and rectangular tubes = 2,500psi; angles = 3,800psi.

<b>Property</b>	<b>ASTM Test</b>	<b>Value</b>	
		<b>1525</b>	<b>1625</b>
Flammability Classification	UL94	(VO)	(VO)
Tunnel Test	ASTM E-84	25 Max	25 Max
Flammability Extinguishing	ASTM D635	Self extinguishing	Self extinguishing
NBS Smoke Chamber	ASTM E662	650	650

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