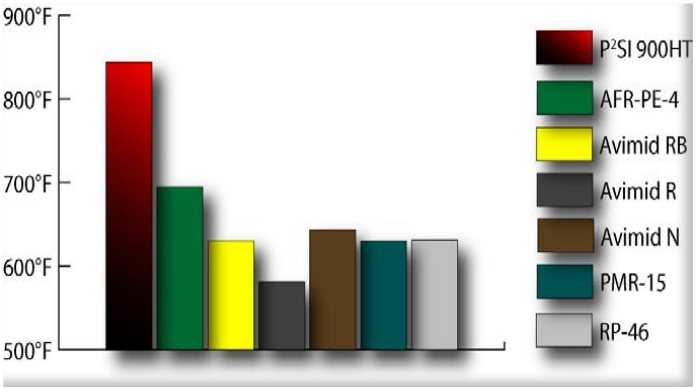
P²SI® 900HT

P²SI® 900HT is an easily processable, thermally stable, addition cure polymer exhibiting the highest glass transition temperature of commercially available structural matrices. This system displays exceptional toughness, superb dielectric properties, low toxicity, and maintains mechanical integrity even after exposures in excess of 1300°F (704°C). P²SI® 900HT was engineered for applications requiring mechanical integrity at temperatures above 1000°F (538°C) for limited times with good dielectric behavior. This system is available in a variety of product forms, including resin solution coated textiles and molding powder. P²SI® 900HT has been manufactured on carbon, quartz, and glass textiles. It has a robust cure cycle, low melt viscosity, and good toughness. Void and microcrack free composites are easily fabricated into structural components with cross-sectional thicknesses over 0.5 inches using a variety of reinforcements. P²SI® 900HT systems exhibit minor mechanical property knockdowns at elevated temperatures up to 1000°F (538°C).



Typical Glass Transition Temperatures of Commercially Available Polymers

Resin Properties

Property	Value	Test Method
Glass Transition Temperature, °F (°C)		ASTM D7028
Storage Modulus, E'	850 (454)	
Loss Modulus, E"	880 (471)	
tan δ	912 (489)	
Mass Density, g/cm^3	1.35	ASTM D792

Typical Thermal Properties for T300 / P²SI® 900HT (2x2 Twill, 370 gsm)

Property	Value at Temperature		Test Method
	75°F (23°C)	700°F (371°C)	
Heat Capacity (J/g·K)	0.425	1.649	ASTM E1269
Thermal Diffusivity (m^2/s) [x-y]	2.45 x 10^{-6}	—	ASTM E1461/C714
Thermal Diffusivity (m^2/s) [z]	4.50 x 10^{-7}	—	ASTM E1461/C714
Thermal Conductivity (W/m·K) [x-y]	1.62	6.27	ASTM E1461
Thermal Conductivity (W/m·K) [z]	0.297	1.152	ASTM E1461
Coefficient of Thermal Expansion (ppm/°C) [x-y]	2.540	2.540	ASTM E831
Coefficient of Thermal Expansion (ppm/C) [z]	35.17	35.17	ASTM E831
Specific Thermal Conductivity (W/m·K) [x-y]	1.04	4.04	ASTM E1461/C714
Specific Thermal Conductivity (W/m·K) [z]	0.191	0.742	ASTM E1461/C714

Performance Polymer Solutions Inc. 2711 Lance Drive, Moraine, OH 45409 Phone: 937-298-3713 Fax: 937-298-6615

P²SI® 900HT

Typical Mechanical Properties for Unidirectional Tape Laminates

Property	T650-35/6K	T40/800/6K	IM7®/6K	Test Method
Compression Strength, $[0°]_{48}$ ksi (MPa)				ASTM D695
75°F (23°C)	102 (707)			
600°F (316°C)	75 (521)			
Tensile Strength, $[0°]_{8}$, ksi (MPa)				ASTM D3039
75°F (23°C)	194 (1340)	268 (1850)	259 (1790)	
700°F (371°C)	199 (1370)	284 (1960)	258 (1780)	
800°F (427°C)	191 (1320)	287 (1980)	267 (1840)	
Tensile Modulus, $[0°]_{8}$, msi (GPa)				ASTM D3039
75°F (23°C)	17 (115)	20 (138)	21 (144)	
Tensile Strength, $[0°/\pm45°/90°]_{2s}$				ASTM D3039
75°F (23°C)	67 (465)	100 (688)	93 (639)	
700°F (371°C)	65 (451)	94 (652)	95 (657)	
800°F (427°C)	61 (418)	87 (597)	87 (598)	
Tensile Strength, $[\pm45°]_{2s}$ ksi (MPa)				ASTM D3518
75°F (23°C)	10 (72)	11 (75)	9.7 (67)	
700°F (371°C)	9.4 (65)	9.3 (64)	8.8 (61)	
800°F (427°C)	8.3 (57)	8.1 (56)	7.8 (54)	
Pin Bearing Strength, $[0°/\pm45°/90°]_{2s}$, ksi (MPa)				ASTM D5961
75°F (23°C)	134 (923)	138 (954)	137 (943)	
700°F (371°C)	93 (645)	99 (685)	96 (663)	
800°F (427°C)	86 (592)	95 (655)	89 (613)	
Three-Point Flexural Strength, $[0°/90°]_{6s}$, ksi (MPa)				ASTM D790
600°F (316°C)	199 (1371)	—	—	
650°F (343°C)	169 (1164)	—	—	
700°F (371°C)	159 (1095)	—	—	
Double Notch Shear Strength, $[0°]_{48}$, ksi (MPa)				ASTM D3846
75°F (23°C)	8.3 (57)	—	—	
600°F (316°C)	6.8 (47)	—	—	

Typical Mechanical Properties for Moisture Saturated Unidirectional Tape Laminates

Property	T650-35/6K	T40/800/6K	IM7®/6K	Test Method
Compression Strength, $[0°]_{48}$, ksi (MPa)				ASTM D695
75°F (23°C)	76 (528)	—	—	
550°F (288°C)	58 (404)	—	—	

P²SI® 900HT

Typical Mechanical Properties for Textile Composite Laminates

Property	16781 S-2 Glass	4581 AstroQuartz® III	Test Method
Interlaminar Shear Strength, $[0°]_{11}$, ksi (MPa)			ASTM D2344
75°F (23°C)	6.5 (45)	8.7 (60)	
500°F (260°C)	5.4 (37)	—	
600°F (316°C)	4.8 (33)	—	
700°F (371°C)	4.2 (29)	—	
Exposure: 1300°F (704°C) x 1 min	—	9.0 (62)	
Compression Strength, $[0°]_{12}$, ksi (MPa)			ASTM D695
75°F (23°F)	—	79 (545)	
Three-Point Flexural Strength, $[0°]_{12}$, ksi (MPa)			ASTM D790
75°F (23°C)	—	98 (676)	
Exposure: 1300°F (704°C) x 1 min	—	71 (492)	
Tensile Strength, $[0°]_{5}$, ksi (MPa)			ASTM D638
500°F (260°C)	38 (265)	—	
600°F (316°C)	47 (322)	—	
700°F (371°C)	38 (261)	—	
800°F (427°C)	35 (240)	—	
900°F (482°C)	34 (232)	—	
1000°F (538°C)	17 (117)	—	
Dielectric Properties			—
Loss Tangent	—	0.020	
Dielectric Constant	—	3.1	