

Rogers Corporation RT/duroid® 5870 Glass Microfiber Reinforced PTFE High Frequency Laminate

Category : Polymer , Thermoplastic , Fluoropolymer , PTFE , Polytetrafluoroethylene (PTFE), Glass Filled, Molded

Material Notes:

RT/duroid® 5870 and 5880 glass microfiber reinforced PTFE composites are designed for exacting stripline and microstrip circuit applications. Glass reinforcing microfibers are randomly oriented to maximize benefits of fiber reinforcement in the directions most valuable to circuit producers and in the final circuit applications. The dielectric constant of RT/duroid laminates is uniform from panel to panel and is constant over a wide frequency range. Its low dissipation factor extends the usefulness of RT/duroid 5870 and 5880 laminates to Ku-band and above. RT/duroid 5870 and 5880 laminates are easily cut, sheared and machined to shape. They are resistant to all solvents and reagents, hot or cold, normally used in etching printed circuits or in plating edges and holes. Available with a range of copper cladding options. Features: Lowest electrical loss for reinforced PTFE material Low moisture absorption Isotropic Uniform electrical properties over frequency Excellent chemical resistance Lead free process compatible Typical Applications: Commercial Airline Telephones Microstrip and Stripline Circuits Millimeter Wave Applications Military Radar Systems Missile Guidance Systems Point to Point Digital Radio Antennas Information provided by Rogers Corporation.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Rogers-Corporation-RTduroid-5870-Glass-Microfiber-Reinforced-PTFE-High-Frequency-Laminate.php

Physical Properties	Metric	English	Comments
Density	2.20 g/cc	0.0795 lb/in ³	ASTM D792
Moisture Absorption at Equilibrium	0.020 % @Thickness 1.57 mm	0.020 % @Thickness 0.0620 in	D48/50; ASTM D570
Thickness	127 - 3180 microns	5.00 - 125 mil	Range of Thicknesses Available

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	34.0 MPa @Temperature 100 °C	4930 psi @Temperature 212 °F	X direction, Condition A; ASTM D638
	34.0 MPa @Temperature 100 °C	4930 psi @Temperature 212 °F	Y direction, Condition A; ASTM D638
	42.0 MPa @Temperature 23.0 °C	6090 psi @Temperature 73.4 °F	Y direction, Condition A; ASTM D638
	50.0 MPa @Temperature 23.0 °C	7250 psi @Temperature 73.4 °F	X direction, Condition A; ASTM D638
Elongation at Break	8.6 % @Temperature 100 °C	8.6 % @Temperature 212 °F	Y direction, Condition A; ASTM D638

Mechanical Properties	^{8.7%} Metric	^{8.7%} English	Comments
	@Temperature 100 °C	@Temperature 212 °F	X direction, Condition A; ASTM D638
	9.8 %	9.8 %	X direction, Condition A; ASTM D638
	@Temperature 23.0 °C	@Temperature 73.4 °F	
	9.8 %	9.8 %	Y direction, Condition A; ASTM D638
	@Temperature 23.0 °C	@Temperature 73.4 °F	
Tensile Modulus	0.434 GPa	63.0 ksi	Y direction; ASTM D638
	@Temperature 100 °C	@Temperature 212 °F	
	0.490 GPa	71.0 ksi	X direction; ASTM D638
	@Temperature 100 °C	@Temperature 212 °F	
	1.28 GPa	185 ksi	Y direction; ASTM D638
	@Temperature 23.0 °C	@Temperature 73.4 °F	
	1.30 GPa	189 ksi	X direction; ASTM D638
	@Temperature 23.0 °C	@Temperature 73.4 °F	
Compressive Strength	23.0 MPa	3340 psi	X direction, Condition A; ASTM D695
	@Strain 4.30 %, Temperature 100 °C	@Strain 4.30 %, Temperature 212 °F	
	25.0 MPa	3630 psi	Y direction, Condition A; ASTM D695
	@Strain 3.30 %, Temperature 100 °C	@Strain 3.30 %, Temperature 212 °F	
	30.0 MPa	4350 psi	X direction, Condition A; ASTM D695
	@Strain 4.00 %, Temperature 23.0 °C	@Strain 4.00 %, Temperature 73.4 °F	
	37.0 MPa	5370 psi	Y direction, Condition A; ASTM D695
	@Strain 3.30 %, Temperature 23.0 °C	@Strain 3.30 %, Temperature 73.4 °F	
	37.0 MPa	5370 psi	Z direction, Condition A; ASTM D695
	@Strain 8.50 %, Temperature 100 °C	@Strain 8.50 %, Temperature 212 °F	
	54.0 MPa	7830 psi	Z direction, Condition A; ASTM D695
	@Strain 8.70 %, Temperature 23.0 °C	@Strain 8.70 %, Temperature 73.4 °F	
Compressive Modulus	0.520 GPa	75.4 ksi	Z direction, Condition A; ASTM D695
	@Temperature 100 °C	@Temperature 212 °F	

Mechanical Properties	0.680 GPa Metric	98.6 ksi English	Comments
	@Temperature 100 °C	@Temperature 212 °F	Z direction, Condition A; ASTM D695
	0.803 GPa	116 ksi	Z direction, Condition A; ASTM D695
	@Temperature 23.0 °C	@Temperature 73.4 °F	
	0.860 GPa	125 ksi	Y direction, Condition A; ASTM D695
	@Temperature 100 °C	@Temperature 212 °F	
	1.21 GPa	175 ksi	X direction, Condition A; ASTM D695
	@Temperature 23.0 °C	@Temperature 73.4 °F	
	1.36 GPa	197 ksi	Y direction, Condition A; ASTM D695
	@Temperature 23.0 °C	@Temperature 73.4 °F	
Peel Strength	4.77 kN/m	27.2 pli	1 oz EDC foil; after solder float; IPC-TM-650 2.4.8

Thermal Properties	Metric	English	Comments
CTE, linear	22.0 µm/m-°C	12.2 µin/in-°F	X-Direction; IPC-TM-650 2.4.41
	@Temperature 0.000 - 100 °C	@Temperature 32.0 - 212 °F	
	28.0 µm/m-°C	15.6 µin/in-°F	Y-Direction; IPC-TM-650 2.4.41
	@Temperature 0.000 - 100 °C	@Temperature 32.0 - 212 °F	
	173 µm/m-°C	96.1 µin/in-°F	Z-Direction; IPC-TM-650 2.4.41
	@Temperature 0.000 - 100 °C	@Temperature 32.0 - 212 °F	
Specific Heat Capacity	0.960 J/g-°C	0.229 BTU/lb-°F	calculated
Thermal Conductivity	0.220 W/m-K	1.53 BTU-in/hr-ft ² -°F	Z direction; ASTM C518
	@Temperature 80.0 °C	@Temperature 176 °F	
Deflection Temperature at 1.8 MPa (264 psi)	>= 260 °C	>= 500 °F	X, Y direction; ASTM D648
Decomposition Temperature	500 °C	932 °F	TGA; ASTM D3850
Flammability, UL94	V-0	V-0	

Electrical Properties	Metric	English	Comments
Volume Resistivity	2.00e+13 ohm-cm	2.00e+13 ohm-cm	Z direction; C96/35/90; ASTM D257
Surface Resistance	2.00e+13 ohm	2.00e+13 ohm	Z direction; C96/35/90; ASTM D257

Electrical Properties	2.31 - 2.35 Metric	2.31 - 2.35 English	Comments
Dielectric Constant	@Frequency 1.00e+10 Hz	@Frequency 1.00e+10 Hz	Z direction; C24/23/50; IPC-TM-650 2.5.5.5
	2.33	2.33	Design; Z direction; C24/23/50; IPC-TM-650 2.5.5.5
	@Frequency 8.00e+9 - 4.00e+10 Hz	@Frequency 8.00e+9 - 4.00e+10 Hz	
Dissipation Factor	0.00050	0.00050	Z direction; C24/23/50; IPC-TM-650 2.5.5.3
	@Frequency 1.00e+6 Hz	@Frequency 1.00e+6 Hz	
	0.0012	0.0012	Z direction; C24/23/50; IPC-TM-650 2.5.5.5
	@Frequency 1.00e+10 Hz	@Frequency 1.00e+10 Hz	

Descriptive Properties	Value	Comments
Thermal Coefficient of Dielectric Constant	-115 ppm/°C	IPC-TM-650 2.5.5.5; -50°C to 150°C

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