

## Park Electrochemical Nelco® N4000-2 Multifunctional Epoxy Laminate and Prepreg

Category : Polymer , Thermoset , Epoxy

### Material Notes:

The Nelco® N4000-2 is the most established material of Nelco's product line. This multifunctional epoxy laminate and prepreg system has a long history of use and one of the broadest operating and processing windows. Applications/Qualifications: Fine-Line Multilayers Surface-Mount Multilayers MCM-Ls PCMCIA Cards Wireless Communications Bluetooth Modules Automotive RoHS Compliant Meets IPC-4101/21 Specifications Information provided by Park Electrochemical Corp.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Park-Electrochemical-Nelco-N4000-2-Multifunctional-Epoxy-Laminate-and-Prepreg.php](http://www.lookpolymers.com/polymer_Park-Electrochemical-Nelco-N4000-2-Multifunctional-Epoxy-Laminate-and-Prepreg.php)

Physical Properties	Metric	English	Comments
Density	1.92 g/cc	0.0694 lb/in <sup>3</sup>	50% Resin Content; Internal Method
Water Absorption	0.10 %	0.10 %	IPC-TM-650.2.6.2.1

Mechanical Properties	Metric	English	Comments
Modulus of Elasticity	24.1 GPa	3500 ksi	Y; ASTM D3039
	28.3 GPa	4100 ksi	X; ASTM D3039
Poissons Ratio	0.14	0.14	Y; ASTM D3039
	0.16	0.16	X; ASTM D3039
Peel Strength	1.23 kN/m	7.00 pli	at elevated temperature; IPC-TM-650.2.4.8.2a
	1.58 kN/m	9.00 pli	after exposure to process solutions; IPC-TM-650.2.4.8
	1.58 kN/m	9.00 pli	after solder float; IPC-TM-650.2.4.8

Thermal Properties	Metric	English	Comments
CTE, linear	12.0 - 16.0 $\mu\text{m}/\text{m}\cdot\text{C}$	6.67 - 8.90 $\mu\text{in}/\text{in}\cdot\text{F}$	X/Y; IPC-TM-650.2.4.41
	@Temperature -40.0 - 125 $^{\circ}\text{C}$	@Temperature -40.0 - 257 $^{\circ}\text{F}$	
Specific Heat Capacity	1.21 - 1.38 $\text{J}/\text{g}\cdot\text{C}$	0.290 - 0.330 $\text{BTU}/\text{lb}\cdot\text{F}$	ASTM E1461-92
Thermal Conductivity	0.300 - 0.401 $\text{W}/\text{m}\cdot\text{K}$	2.08 - 2.78 $\text{BTU}/\text{in}/\text{hr}\cdot\text{ft}^2\cdot\text{F}$	ASTM E1461-92
Glass Transition Temp, Tg	130 $^{\circ}\text{C}$	266 $^{\circ}\text{F}$	TMA; IPC-TM-650.2.4.24c
			DSC; IPC-TM-650.2.4.25c

Thermal Properties	140 °C Metric	284 °F English	Comments
Decomposition Temperature	300 °C	572 °F	5% weight loss; TGA; IPC-TM-650.2.4.24.6
Flammability, UL94	V-0	V-0	

Electrical Properties	Metric	English	Comments
Volume Resistivity	1.00e+13 ohm-cm	1.00e+13 ohm-cm	E - 24/125; IPC-TM-650.2.5.17.1
	1.00e+14 ohm-cm	1.00e+14 ohm-cm	C - 96/35/90; IPC-TM-650.2.5.17.1
Surface Resistance	1.00e+12 ohm	1.00e+12 ohm	E - 24/125; IPC-TM-650.2.5.17.1
	1.00e+13 ohm	1.00e+13 ohm	C - 96/35/90; IPC-TM-650.2.5.17.1
Dielectric Constant	4.1	4.1	RF Impedance; IPC-TM-650.2.5.5.9
	@Frequency 1.00e+9 Hz	@Frequency 1.00e+9 Hz	
Dielectric Strength	4.3	4.3	TFC/LCR Meter; IPC-TM-650.2.5.5.3
	@Frequency 1.00e+6 Hz	@Frequency 1.00e+6 Hz	
Dielectric Breakdown	49.2 kV/mm	1250 kV/in	IPC-TM-650.2.5.6.2
Dielectric Breakdown	>= 50000 V	>= 50000 V	IPC-TM-650.2.5.6
Dissipation Factor	0.023	0.023	TFC/LCR Meter; IPC-TM-650.2.5.5.3
	@Frequency 1.00e+6 Hz	@Frequency 1.00e+6 Hz	
Arc Resistance	65 sec	65 sec	IPC-TM-650.2.5.1

Descriptive Properties	Value	Comments
Methylene Chloride Resistance (% Weight Change)	0.7	IPC-TM-650.2.3.4.3
Pressure Cooker	Pass	60 min then solder dip @288°C until failure (max 10 min.); IPC-TM-650.2.6.16 (modified)
T260 (minutes)	8-12	IPC-TM-650.2.4.24.1
Z Axis Expansion (%)	4.5	50°C to 260°C; IPC-TM-650.2.4.41

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