

## Park Electrochemical Nelco® N4000-6 FC Multifunctional Epoxy Laminate and Prepreg

Category : Polymer , Thermoset , Epoxy

### Material Notes:

The Nelco® N4000-6 FC is a high-Tg epoxy laminate and prepreg system that provides a wide range of performance versatility and ease of processing for demanding high-layer count applications. Key Features and Benefits: A Proven High-Tg Substrate Robust Thermal Properties Superior electrical properties Enhanced Standard FR-4 processing Applications/Qualifications: Fine-Line Multilayers Backplanes Surface-Mount Multilayers BGA Multilayers CSP Attachment Automotive Underhood Automotive Wireless Communications Infrastructure Network Storage High-End Servers RoHS Compliant Meets IPC-4101/24 and /26 Specifications Information provided by Park Electrochemical Corp.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Park-Electrochemical-Nelco-N4000-6-FC-Multifunctional-Epoxy-Laminate-and-Prepreg.php](http://www.lookpolymers.com/polymer_Park-Electrochemical-Nelco-N4000-6-FC-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	25.5 GPa	3700 ksi	Y; ASTM D3039
	30.3 GPa	4400 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 - 15.0 $\mu\text{m}/\text{m}^{\circ}\text{C}$	6.67 - 8.33 $\mu\text{in}/\text{in}^{\circ}\text{F}$	X/Y; IPC-TM-650.2.4.41
	@Temperature -40.0 - 125 $^{\circ}\text{C}$	@Temperature -40.0 - 257 $^{\circ}\text{F}$	
	70.0 $\mu\text{m}/\text{m}^{\circ}\text{C}$	38.9 $\mu\text{in}/\text{in}^{\circ}\text{F}$	Z-Axis Alpha 1; IPC-TM-650.2.4.41
	@Temperature 50.0 - 175 $^{\circ}\text{C}$	@Temperature 122 - 347 $^{\circ}\text{F}$	
	320 $\mu\text{m}/\text{m}^{\circ}\text{C}$	178 $\mu\text{in}/\text{in}^{\circ}\text{F}$	

Thermal Properties	Metric @ Temperature 175 - 260 °C	English @ Temperature 347 - 500 °F	7-Axis Alpha 2; IPC-TM-650.2.4.41 Comments
Specific Heat Capacity	1.21 - 1.38 J/g-°C	0.290 - 0.330 BTU/lb-°F	ASTM E1461-92
Thermal Conductivity	0.300 - 0.401 W/m-K	2.08 - 2.78 BTU-in/hr- ft <sup>2</sup> -°F	ASTM E1461-92
Glass Transition Temp, Tg	170 °C	338 °F	TMA; Nominal; IPC-TM-650.2.4.24c
	175 °C	347 °F	DSC; Nominal; IPC-TM-650.2.4.25c
Decomposition Temperature	325 °C	617 °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+13 ohm	1.00e+13 ohm	C - 96/35/90; IPC-TM-650.2.5.17.1
	1.00e+13 ohm	1.00e+13 ohm	E - 24/125; IPC-TM-650.2.5.17.1
Dielectric Constant	4.0	4.0	Stripline; IPC-TM-650.2.5.5.5
	@Frequency 2.50e+9 Hz	@Frequency 2.50e+9 Hz	
	4.1	4.1	RF Impedance; IPC-TM-650.2.5.5.9
	@Frequency 1.00e+9 Hz	@Frequency 1.00e+9 Hz	
	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 Strength	51.2 kV/mm	1300 kV/in	IPC-TM-650.2.5.6.2
Dielectric Breakdown	>= 50000 V	>= 50000 V	IPC-TM-650.2.5.6
Dissipation Factor	0.022	0.022	Stripline; IPC-TM-650.2.5.5.5
	@Frequency 2.50e+9 Hz	@Frequency 2.50e+9 Hz	
	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	70 sec	70 sec	IPC-TM-650.2.5.1

Electrical Properties	Metric	English	Comments
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)	4-8	IPC-TM-650.2.4.24.1	
Z Axis Expansion (%)	4.1	50°C to 260°C; IPC-TM-650.2.4.41	

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