

## Nelco® N7000-1

### Polyimide Laminate & Prepreg

The Nelco N7000-1 series of polyimide laminate and prepreg has a low Z-axis expansion and high-Tg offering PCB manufacturers consistent board performance and reliability. N7000-1 is a good choice for applications requiring the superior thermal stability and chemical resistance provided by a polyimide.

#### Key Features

##### Polyimide resin chemistry

- Robust thermal stability and reliability
- High temperature tolerances and chemical resistance

##### Lead-free assembly compatibility

- Withstands multiple thermal excursions
- Tg 260°C by DSC
- Low Z-Axis CTE
- Designed for use in severe conditions

##### Supports current and previous military and industrial standards

- Meets UL 94 HB
- Meets IPC-4101/40 and /41 specifications and the laminate and prepreg properties of IPC-4101/42
- Complies with the old GIJ and GIL military specifications

##### Reliable plated-through holes

- Low Z-Axis CTE providing good dimensional stability
- Specially-treated copper for enhanced peel strength and bond integrity

##### Proven processing and performance

- Proven performer with well-known processing characteristics
- Wide processing window

##### And Much More

- Vacuum laminated
- Available in a wide variety of constructions, copper weights and glass styles
- All Nelco materials are RoHS compliant



#### Applications

- Fine-Line Multilayers
- Backplanes
- Surface-Mount Multilayers
- BGA Multilayers
- MCM-Ls
- Direct Chip Attach
- High Speed Computing
- Burn-in Boards

#### Global Availability

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**Park's UL file number: E36295**

МЕХНОЛОГИЧЕСКИЙ ЦЕНТР



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# Nelco® N7000-1

## Polyimide Laminate & Prepreg

Mechanical Properties	U.S. Units		Metric Units		Test Method
Peel Strength - 1 oz. (35 micron) Cu					
After Solder Float	7.5	lb / inch	1.001	N / mm	IPC-TM-650.2.4.8
At Elevated Temperature	6.0	lb / inch	0.91	N / mm	IPC-TM-650.2.4.8.2a
After Exposure to Process Solutions	7.0	lb / inch	0.98	N / mm	IPC-TM-650.2.4.8
X / Y CTE [-40°C to +125°C]	12 - 15	ppm / °C	12 - 15	ppm / °C	IPC-TM-650.2.4.41
Z Axis Expansion [50°C to 260°C]	1.8	%	1.7	%	IPC-TM-650.2.4.24
Young's Modulus (X / Y)	3.9 / 3.9	psi x 10 <sup>6</sup>	30.6 / 25.9	GN / m <sup>2</sup>	ASTM D3039
Poisson's Ratios (X / Y)	0.12 / 0.12		0.183 / 0.160		ASTM D3039
Thermal Conductivity	TBD	W / mK	TBD	W / mK	ASTM E1461
Specific Heat	TBD	J / gK	TBD	J / gK	ASTM E1461
<b>Electrical Properties</b>					
Dielectric Constant (50% resin content)					
@ 1 GHz (RF Impedance)	3.9		3.9		IPC-TM-650.2.5.5.9
@ 2.5 GHz (Stripline)	3.9		3.9		IPC-TM-650.2.5.5.5
@ 10 GHz (Stripline)	3.9		3.8		IPC-TM-650.2.5.5.5
@ 10 GHz (Split Post Cavity)	3.9		3.9		
Dissipation Factor (50% resin content)					
@ 2.5 GHz (Stripline)	0.015		0.015		IPC-TM-650.2.5.5.5
@ 10 GHz (Stripline)	0.016		0.016		IPC-TM-650.2.5.5.5
@ 10 GHz (Split Post Cavity)	0.0095		0.0095		
Volume Resistivity					
C - 96 / 35 / 90	10 <sup>7</sup>	MΩ - cm	10 <sup>7</sup>	MΩ - cm	IPC-TM-650.2.5.17.1
E - 24 / 125	10 <sup>7</sup>	MΩ - cm	10 <sup>7</sup>	MΩ - cm	IPC-TM-650.2.5.17.1
Surface Resistivity					
C - 96 / 35 / 90	10 <sup>7</sup>	MΩ	10 <sup>7</sup>	MΩ	IPC-TM-650.2.5.17.1
E - 24 / 125	10 <sup>7</sup>	MΩ	10 <sup>7</sup>	MΩ	IPC-TM-650.2.5.17.1
Electric Strength	1350	V / mil	5.3x10 <sup>4</sup>	V / mm	IPC-TM-650.2.5.6.2
Dielectric Breakdown	>50	kV	>50	kV	IPC-TM-650.2.5.6
Arc Resistance	136	seconds	136	seconds	IPC-TM-650.2.5.1
<b>Thermal Properties</b>					
Glass Transition Temperature (T <sub>g</sub> )					
DSC (°C)	260	°C	260	°C	IPC-TM-650.2.4.25c
TMA (°C)	250	°C	250	°C	IPC-TM-650.2.4.24c
Degradation Temp (TGA) (5% wt. loss)	389	°C	389	°C	IPC-TM-650.2.4.24.6
Pressure Cooker-60 min then solder dip					IPC-TM-650.2.6.16
@ 288°C until failure (max 10 min.)	Pass		Pass		(modified)
T <sub>260</sub>	12+	minutes	12+	minutes	IPC-TM-650.2.4.24.1
<b>Chemical / Physical Properties</b>					
Moisture Absorption	0.35	wt. %	0.35	wt. %	IPC-TM-650.2.6.2.1
Methylene Chloride Resistance	0.42	% wt. chg.	0.42	% wt. chg.	IPC-TM-650.2.3.4.3
Density [50% resin content]	1.68	g / cm <sup>3</sup>	1.68	g / cm <sup>3</sup>	Internal Method

Park Electrochemical Corp. is a global advanced materials company which develops and manufactures high-technology digital and RF/microwave printed circuit materials and advanced composite materials, parts and assemblies. The company operates under the Nelco®, Nelcote® and Nova™ names.

All test data provided are typical values and not intended to be specification values. For review of critical specification tolerances, please contact a Nelco representative directly. Nelco reserves the right to change these typical values as a natural process of refining our testing equipment and techniques.

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