



Nelco N4000-6

High-Tg Multifunctional Epoxy Laminate & Prepreg

The Nelco N4000-6 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

A Proven High-Tg Substrate

- Years of field use with consistent results
- Consistent dielectric thickness
- Global availability

Robust Thermal Properties

- Tg of 175°C
- Passed the stringent Q1000 thermal cycling requirement
- Suitable for high-layer count, sophisticated PWB designs

Superior electrical properties

- Excellent electrical properties for a standard loss material
- Supporting advanced technology PWB designs

Enhanced Standard FR-4 processing

- Key processing parameters of drilling, desmear and lamination use standard low Tg FR-4 methods
- Excellent drilling characteristics, especially in high layer-count designs
- 90 min press at 182°C and 200-300 psi.

And Much More

- Vacuum laminated
- Available in a wide variety of constructions, copper weights and glass styles including standard copper, double treat and RTFOIL® laminate
- Meets UL 94V-0 and IPC-4101/24 and /26 specifications
- All Nelco materials are RoHS compliant

Applications

- Fine-Line Multilayers
- Backplanes
- Surface-Mount Multilayers
- BGA Multilayers
- CSP Attachment
- Automotive
- Underhood Automotive
- Wireless Communications
- Infrastructure
- Network Storage
- High-End Servers

Global Availability

Contact us worldwide:

Nelco, California	+1.714.879.4293
Nelco, New York	+1.845.567.6200
Neltec, Arizona	+1.480.967.5600
Nelco, Asia Pacific	+65.6861.7117
Neltec Europe SAS	+33.380.10.10.00
Neltec, SA	+33.562.98.52.90
www.parkelectro.com	info@parkelectro.com

Park's UL file number: E36295

Nelco N4000-6

High-Tg Multifunctional Epoxy Laminate & Prepreg

Property / Condition	Value (U.S. Units)		Value (Metric Units)		Test Method
Mechanical Properties					
Peel Strength - 1 oz. (35 micron) Cu					
After Solder Float	9.0	lb/inch	1.58	N/mm	IPC-TM-650.2.4.8
At Elevated Temperature	7.0	lb/inch	1.23	N/mm	IPC-TM-650.2.4.8.2a
After Exposure to Process Solutions	9.0	lb/inch	1.58	N/mm	IPC-TM-650.2.4.8
X/Y CTE [-40°C to +125°C]	12 - 15	ppm/°C	12 - 16	ppm/°C	IPC-TM-650.2.4.41
Z Axis Expansion [50°C to 260°C]	3.7	%	3.7	%	IPC-TM-650.2.4.41
Young's Modulus (X/Y)	4.4/3.7	psi x 10 ⁶	29.9/25.1	GN/m ²	ASTM D3039
Poisson's Ratios (X/Y)	0.16/0.14		0.16/0.14		ASTM D3039
Thermal Conductivity	0.3 - 0.4	W/mK	0.3 - 0.4	W/mK	ASTM E1461-92
Specific Heat	1.20 - 1.40	J/gK	1.20 - 1.40	J/gK	ASTM E1461-92
Electrical Properties					
Dielectric Constant (50% resin content)					
@ 1 MHz (TFC/LCR Meter)	4.3		4.3		IPC-TM-650.2.5.5.3
@ 1 GHz (RF Impedance)	4.1		4.1		IPC-TM-650.2.5.5.9
@ 2.5 GHz (Stripline)	4.0		4.0		IPC-TM-650.2.5.5.5
Dissipation Factor (50% resin content)					
@ 1 MHz (TFC/LCR Meter)	0.023		0.023		IPC-TM-650.2.5.5.3
@ 2.5 GHz (Stripline)	0.022		0.022		IPC-TM-650.2.5.5.5
Volume Resistivity					
C - 96/35/90	10 ⁸	MΩ - cm	10 ⁸	MΩ - cm	IPC-TM-650.2.5.17.1
E - 24/125	10 ⁷	MΩ - cm	10 ⁷	MΩ - cm	IPC-TM-650.2.5.17.1
Surface Resistivity					
C - 96/35/90	10 ⁷	MΩ	10 ⁷	MΩ	IPC-TM-650.2.5.17.1
E - 24/125	10 ⁷	MΩ	10 ⁷	MΩ	IPC-TM-650.2.5.17.1
Electric Strength	1300	V/mil	5.1x10 ⁴	V/mm	IPC-TM-650.2.5.6.2
Dielectric Breakdown	>50	kV	>50	kV	IPC-TM-650.2.5.6
Arc Resistance	65	seconds	65	seconds	IPC-TM-650.2.5.1
Thermal Properties					
Glass Transition Temperature (T _g)					
DSC (°C)	175 *	°C	175 *	°C	IPC-TM-650.2.4.25c
TMA (°C)	170 *	°C	170 *	°C	IPC-TM-650.2.4.24c
Degradation Temp (TGA) (5% wt. loss)	325	°C	325	°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 ₂₆₀	4 - 8	minutes	4 - 8	minutes	IPC-TM-650.2.4.24.1
Chemical / Physical Properties					
Moisture Absorption	0.1	wt. %	0.1	wt. %	IPC-TM-650.2.6.2.1
Methylene Chloride Resistance	0.7	% wt. chg.	0.7	% wt. chg.	IPC-TM-650.2.3.4.3
Density [50% resin content]	1.92	g/cm ³	1.92	g/cm ³	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. The company operates under the Nelco® and Nelcote™ 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.

Nelco®, Neltec®, Nelcote™, RTFoil®, SI®, LD® and EF® are trademarks of Park Electrochemical Corp.

BC®, ZBC-2000® and Buried Capacitance™ are Trademarks of the Sanmina-SCI Corporation.

*Tg nominal on laminates. Finished board value may be lower due to printed circuit processes.

Nelco reserves the right to make changes without further notice to any products herein to improve reliability, function or design. Nelco does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights nor the rights of others. This disclaimer of warranty is in lieu of all warranties whether expressed, implied or statutory, including implied warranties of merchantability or fitness for a particular purpose. Park is an Equal Opportunity Employer.