

Park Advanced Circuitry Materials



Nelco® N4000-6NF

High-Tg Multifunctional Epoxy No Flow Prepreg

Part number N4205-6

N4000-6NF ("no flow") is based on Park's proven N4000-6 resin system. It is a high-Tg epoxy prepreg system that provides performance versatility and ease of processing. N4000-6NF is designed for bonding flex circuitry and bonding heat sinks to rigid circuit boards. N6000-6NF adheres well to most substrates. It's minimal, and consistent, flow is controlled through precise rheological and prepreg process control.

Key Features

A Proven High-Tg Substrate

- Years of field use with consistent results
- Tg of 175°C
- Consistent flow characteristics with enhance bonding.
- Global availability

Standard FR-4 processing

- 60 min press at 182°C and 200-300 psi.
- Key processing parameters of drilling, desmear and lamination use standard FR-4 methods
- Meets UL 94V-0 and IPC-4101/24 and /26 specifications
- All Nelco® materials are RoHS compliant

Typical Flow specification

- Tested per IPC TM-650 2.3.17.2
- Flow migration 50 -120 mils
- Available glass styles 106 and 1080

Applications

- Bonding multilayer epoxy rigid-flex
- Bonding adhesiveless epoxy rigid-flex
- Attaching heat sinks.
- All applications where minimal and uniform resin flow is required

Global Availability

Neltec, Inc. (Arizona) - Americas

+1.480.967.5600

Nelco Products Pte. Ltd. - Asia Pacific

+65.6861.7117

Neltec, S.A. - Europe

+33.562.98.52.90

www.parkelectro.com

info@parkelectro.com

Park's UL file number: E36295



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Nelco® N4000-6NF

High-Tg Multifunctional Epoxy No Flow 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-650.2.4.24
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 (65% resin content)					
@ 1 MHz (TFC / LCR Meter)	3.9		3.9		IPC-TM-650.2.5.5.3
@ 1 GHz (RF Impedance)	3.7		3.7		IPC-TM-650.2.5.5.9
@ 2.5 GHz (Stripline)	3.7		3.7		IPC-TM-650.2.5.5.5
Dissipation Factor (65% resin content)					
@ 2.5 GHz (Stripline)	0.015		0.015		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, 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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