

Nelco N7000-2 HT Laminate Nelco N7000-3 Prepreg

Toughened Polyimide Laminate & Prepreg



The Nelco N7000-2 HT laminate and N7000-3 prepreg are a series of toughened polyimide materials for use in high-reliability multilayers. This combined resin system provides excellent thermal performance, improved processing characteristics and is exceptional for use in a wide variety of applications that include fine geometry multilayer constructions and extreme reliability requirements.

Key Features

Polyimide resin chemistry

- Robust thermal stability and reliability
- Toughened resin system
- High temperature tolerance and chemical resistance

Lead-free assembly compatibility

- Withstands multiple thermal excursions
- T_g 260°C by DSC
- T₂₆₀ >12 minutes
- Low Z-Axis CTE
- Designed for use in severe conditions

Supports current and previous military and industrial standards

- N7000-2 HT and N7000-3 meet IPC-4101/40, /41 and /42 specifications
- Complies with the old GIJ and GIL military specifications

Reliable plated-through holes

- Low Z-Axis CTE and toughened polyimide chemistry providing good dimensional stability

Reliable processing

- Improved fracture resistance compared with traditional polyimide systems
- Reduced cure time compared to other traditional polyimide systems

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
- Direct Chip Attach
- Underhood Automotive
- Burn-in Boards

Global Availability

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Nelco N7000-2 HT / N7000-3

Toughened 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	1.31	N/mm	IPC-TM-650.2.4.8
At Elevated Temperature	7.0	lb/inch	1.22	N/mm	IPC-TM-650.2.4.8.2a
After Exposure to Process Solutions	7.0	lb/inch	1.22	N/mm	IPC-TM-650.2.4.8
X/Y CTE [-40°C to +125°C]	9 - 12	ppm/°C	9 - 12	ppm/°C	IPC-TM-650.2.4.41
Z Axis Expansion [50°C to 260°C]	<2.5	%	<2.5	%	IPC-TM-650.2.4.41
Young's Modulus (X/Y)	3.1/3.3	psi x 10 ⁶	21.1/22.2	GN/m ²	ASTM D3039
Poisson's Ratios (X/Y)	0.146/0.153		0.146/0.153		ASTM D3039
Thermal Conductivity	0.45	W/mK	0.45	W/mK	ASTM E1461
Specific Heat	1.06	J/gK	1.06	J/gK	ASTM E1461
Electrical Properties					
Dielectric Constant (50% resin content)					
@ 1 GHz (RF Impedance)	3.8		3.8		IPC-TM-650.2.5.5.9
@ 2.5 GHz (Stripline)	3.5		3.5		IPC-TM-650.2.5.5.5
@ 10 GHz (Stripline)	3.5		3.5		IPC-TM-650.2.5.5.5
@ 10 GHz (Split Post Cavity)	3.5		3.5		
Dissipation Factor (50% resin content)					
@ 2.5 GHz (Stripline)	0.015		0.015		IPC-TM-650.2.5.5.5
@ 10 GHz (Stripline)	0.015		0.015		IPC-TM-650.2.5.5.5
@ 10 GHz (Split Post Cavity)	0.009		0.009		
Volume Resistivity					
C - 96/35/90	10 ⁷	MΩ - cm	10 ⁷	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	1200	V/mil	4.7x10 ⁴	V/mm	IPC-TM-650.2.5.6.2
Dielectric Breakdown	>50	kV	>50	kV	IPC-TM-650.2.5.6
Arc Resistance	100	seconds	100	seconds	IPC-TM-650.2.5.1
Thermal Properties					
Glass Transition Temperature (T _g)					
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)	376	°C	376	°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	12+	minutes	12+	minutes	IPC-TM-650.2.4.24.1
Chemical/Physical Properties					
Moisture Absorption	0.35	wt. %	0.35	wt. %	IPC-TM-650.2.6.2.1
Methylene Chloride Resistance	<0.50	% wt. chg.	<0.50	% wt. chg.	IPC-TM-650.2.3.4.3
Density [50% resin content]	1.70	g/cm ³	1.70	g/cm ³	Internal Method

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