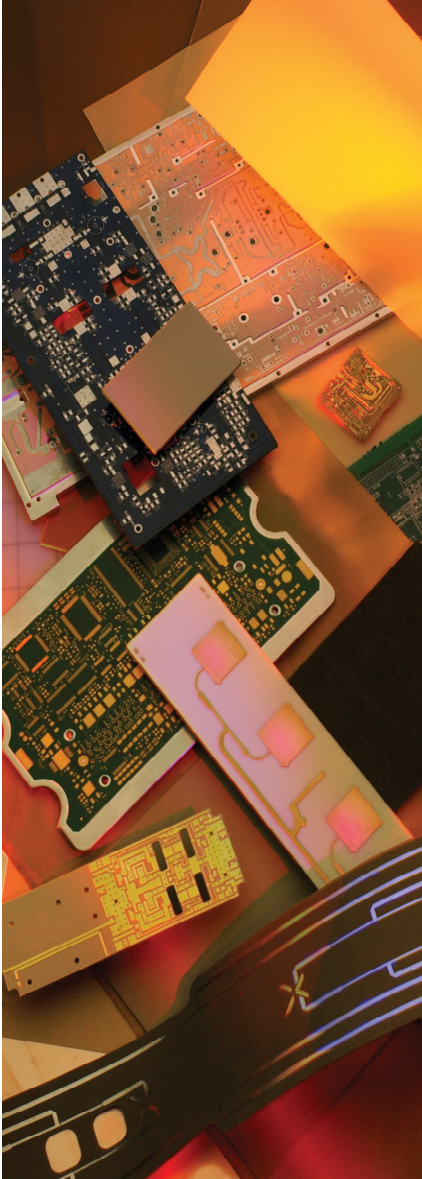


# 85N

## POLYIMIDE Laminate and Prepreg



**85N** is a pure polyimide laminate and prepreg system, offering the ultimate high-reliability solution, with significantly less PTH failure, delamination, or board degradation compared with FR-4, high-performance epoxies, or other high-performance materials.

### Features:

- Low in-plane (x,y) expansion of 6-9 ppm/°C allows attachment of SMT devices with minimal risk of solder joint failure due to CTE mismatch.
- Random fiber organic reinforcement guarantees outstanding dimensional stability and reduced misregistration for improved multi-layer yields
- Decomposition temperature of 407°C, compared with 300-360°C for typical high-performance epoxies, offering outstanding high-temperature lifetime performance
- Up to 50% or more reduction in cure time compared with competitive products
- Electrical and mechanical properties meeting the requirements of IPC-4101/40 and /41
- Toughened, Non-MDA chemistry is more resistant to cracking during drilling
- Non-halogenated chemistry
- Compatible with lead-free processing
- RoHS/WEEE compliant

### Typical Applications:

- PCBs that are subjected to high temperatures during processing, such as lead-free soldering
- Applications with significant lifetimes at high temperatures, such as aircraft engine instrumentation, down hole drilling, on-engine applications, burn-in boards, or industrial sensors.

# Typical Properties:

**85N**

Property	Units	Value	Test Method
<b>1. Electrical Properties</b>			
Dielectric Constant <i>(may vary with Resin %)</i>			
@ 1 MHz	-	4.2	IPC TM-650 2.5.5.3
@ 1 GHz	-		IPC TM-650 2.5.5.9
Dissipation Factor			
@ 1 MHz	-	0.01	IPC TM-650 2.5.5.3
@ 1 GHz	-		IPC TM-650 2.5.5.9
Volume Resistivity			
C96/35/90	MΩ-cm	1.5 x 10 <sup>8</sup>	IPC TM-650 2.5.17.1
E24/125	MΩ-cm	3.0 x 10 <sup>8</sup>	IPC TM-650 2.5.17.1
Surface Resistivity			
C96/35/90	MΩ	1.6 x 10 <sup>9</sup>	IPC TM-650 2.5.17.1
E24/125	MΩ	1.6 x 10 <sup>9</sup>	IPC TM-650 2.5.17.1
Electrical Strength	Volts/mil (kV/mm)	1450 (57.1)	IPC TM-650 2.5.6.2
Dielectric Breakdown	kV		IPC TM-650 2.5.6
Arc Resistance	sec	143	IPC TM-650 2.5.1
<b>2. Thermal Properties</b>			
Glass Transition Temperature (Tg)			
TMA	°C	260	IPC TM-650 2.4.24
DSC	°C		IPC TM-650 2.4.25
Decomposition Temperature (Td)			
Initial	°C	387	IPC TM-650 2.3.41
5%	°C	407	IPC TM-650 2.3.41
T260	min	>60	IPC TM-650 2.4.24.1
T288	min	>60	IPC TM-650 2.4.24.1
T300	min	>60	IPC TM-650 2.4.24.1
CTE (x,y)	ppm/°C	16	IPC TM-650 2.4.41
CTE (z)			
< Tg	ppm/°C	55	IPC TM-650 2.4.24
> Tg	ppm/°C	149	IPC TM-650 2.4.24
z-axis Expansion (50-260°C)	%	1.2	IPC TM-650 2.4.24
<b>3. Mechanical Properties</b>			
Peel Strength to Copper (1 oz/35 micron)			
After Thermal Stress	lb/in (N/mm)	7.1 (1.2)	IPC TM-650 2.4.8
At Elevated Temperatures	lb/in (N/mm)	7.1 (1.2)	IPC TM-650 2.4.8.2
After Process Solutions	lb/in (N/mm)	7.1 (1.2)	IPC TM-650 2.4.8
Young's Modulus	Mpsi (GPa)		IPC TM-650 2.4.18.3
Flexural Strength	kpsi (MPa)		IPC TM-650 2.4.4
Tensile Strength	kpsi (MPa)		IPC TM-650 2.4.18.3
Compressive Modulus	kpsi (MPa)		ASTM D-695
Poisson's Ratio (x, y)	-		ASTM D-3039
<b>4. Physical Properties</b>			
Water Absorption	%	0.27	IPC TM-650 2.6.2.1
Specific Gravity	g/cm <sup>3</sup>	1.6	ASTM D792 Method A
Thermal Conductivity	W/mK	0.2	ASTM E1461
Flammability	class	HB	UL-94

## Availability:

Arlon Part Number	Glass Style	Resin %	Scaled Flow Hf (mils)	Scaled Flow $\Delta H$ (mils)
85N0672	106	72 $\pm$ 3	1.7 $\pm$ 0.3	0.75 $\pm$ 0.20
85N8063	1080	63 $\pm$ 3	2.4 $\pm$ 0.3	0.75 $\pm$ 0.20
85N2355	2313	55 $\pm$ 3	3.4 $\pm$ 0.3	0.75 $\pm$ 0.20
85N2650	2116	50 $\pm$ 3	4.1 $\pm$ 0.3	0.75 $\pm$ 0.20
85N2840	7628	40 $\pm$ 3	6.6 $\pm$ 0.3	0.70 $\pm$ 0.20

## Recommended Process Conditions:

Process inner-layers through develop, etch, and strip using standard industry practices. Use brown oxide on inner layers. Adjust dwell time in the oxide bath to ensure uniform coating. Bake inner layers in a rack for 60 minutes at 225°F - 250°F (107°C - 121°C) immediately prior to lay-up. Vacuum desiccate the prepreg for 8 - 12 hours prior to lamination.

### Lamination Cycle:

- 1) Pre-vacuum for 30 - 45 minutes
- 2) Control the heat rise to 8°F - 12°F (4°C - 6°C) per minute between 150°F and 250°F (65°C and 121°C)

Panel Size		Pressure	
in	cm	psi	kg/sq cm
12 x 18	40 x 46	275	19
16 x 18	30 x 46	350	25
18 x 24	46 x 61	400	28

- 3) Product temperature at start of cure = 425°F (218°C).
- 4) Cure time at temperature = 2.0 hours
- 5) Cool down under pressure at  $\leq$  12°F/min (6°C/min)

Drill at 400-500 SFM. Undercut bits are recommended for vias 0.018" (0.045cm) and smaller

De-smear using alkaline permanganate or plasma with settings appropriate for polyimide; plasma is preferred for positive etchback

Conventional plating processes are compatible with 85N

Standard profiling parameters may be used; chip breaker style router bits are not recommended

Bake for 1 - 2 hours at 250°F (121°C) prior to solder to reflow of HASL

# 85N

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