

## Polyimide Laminate and Prepreg

---



**35N is a pure polyimide laminate and prepreg system for applications requiring high temperature performance. High Tg (250°C) results in low Z-direction expansion for resistance to PTH failure during PWB processing, and minimizes risk of latent PTH defects in-service. Reduced temperature and time to cure offers improved throughput compared to traditional polyimide cycles.**

### Features:

- Meets IPC4101/40 and /41 description and specification
- UL recognized as UL-94 V-1
- Best-in-Class thermal properties
  - Tg=> 250°C
  - Decomposition temperature >407°C
- Low Z-axis expansion
  - 1.2% between 50-260°C (vs. 2.5-4.0% for typical high-performance epoxies)
  - Minimizes the risk of latent PTH defects caused during solder reflow and device attachment.
- Decomposition temperature of 407°C, compared with 300-360°C for typical high-performance epoxies, offering outstanding long-term high-temperature performance
- Toughened chemistry resists resin fracturing
- Compatible with lead-free processing
- RoHS/WEEE compliant

### Typical Applications:

- PCB's that are subjected to high temperatures during processing, such as lead-free soldering, HASL, IR Reflow
  - Applications with long term exposure to high temperatures such as aircraft engine instrumentation, down hole drilling, under-hood automotive controls, burn-in boards, or industrial sensors
-

## Typical Properties:

Property	Units	Value	Test Method
<b>Electrical Properties</b>			
Dielectric Constant @ 1 MHz	Multilayer ~ 50% RC	4.2	IPC TM-650 2.5.5.3
@ 1 GHz	Multilayer ~ 50% RC	4.0	IPC TM-650 2.5.5.9
Dissipation Factor @ 1 MHz		0.01	IPC TM-650 2.5.5.3
@ 1 GHz		N/A	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	1.2 x 10 <sup>8</sup>	IPC TM-650 2.5.17.1
Surface Resistivity			
C96/35/90	MΩ	5.0 x 10 <sup>8</sup>	IPC TM-650 2.5.17.1
E24/125	MΩ	3.7 x 10 <sup>8</sup>	IPC TM-650 2.5.17.1
Electrical Strength	Volts/mil (kV/mm)	1400 (55.9)	IPC TM-650 2.5.6.2
Dielectric Breakdown	kV	>40	IPC TM-650 2.5.6
Arc Resistance	sec	165	IPC TM-650 2.5.1
<b>Thermal Properties</b>			
Glass Transition Temperature (Tg)			
TMA	°C	=>250	IPC TM-650 2.4.24C
Decomposition Temperature			
Initial	°C	363	IPC TM-650 2.4.24.6
5% weight loss	°C	407	IPC TM-650 2.4.24.6
T260	min	>60	IPC TM-650 2.4.24.1
T288	min	>60	IPC TM-650 2.4.24.1
T300	min	11	IPC TM-650 2.4.24.1
CTE (X,Y)	ppm/°C	16	IPC TM-650 2.4.41
CTE (Z)			
< Tg	ppm/°C	51	IPC TM-650 2.4.24C
> Tg	ppm/°C	158	IPC TM-650 2.4.24C
z-axis Expansion (50-260°C)	%	1.2	IPC TM-650 2.4.24C
<b>Mechanical Properties</b>			
Peel Strength to Copper (1 oz/35 micron)			
After Thermal Stress	lb./in (N/mm)	6.3 (1.1)	IPC TM-650 2.4.8C
At Elevated Temperatures	lb./in (N/mm)	6.3 (1.1)	IPC TM-650 2.4.8.2A
After Process Solutions	lb./in (N/mm)	6.0 (1.1)	IPC TM-650 2.4.8C
Young's Modulus CD/MD	Mpsi (GPa)	3.5/4.2 (24.1/28.9)	ASTM E111
Tensile Strength CD/MD	kpsi (MPa)	48/65 (330/445)	ASTM D3039
Poisson's Ratio	-	0.17	ASTM E13204
<b>Physical Properties</b>			
Water Absorption (0.062")	%	0.26	IPC TM-650 2.6.2.1A
Density	g/cm <sup>3</sup>	1.6	ASTM D792 Method A
Thermal Conductivity	W/mK	0.2	ASTM E1461
Flammability	class	V1	UL-94

Results listed above are typical properties, provided without warranty, expressed or implied, and without liability. Properties may vary, depending on design and application. Arlon reserves the right to change or update these values.

## Availability:

Arlon Part Number	Glass Style	Resin (%)	Scaled Flow Hf (mils)	Scaled Flow Δ H (mils)
35N0672	106	72	1.7 ± 0.3	0.75 ± 0.20
35N8063	1080	63	2.4 ± 0.3	0.75 ± 0.20
35N2355	2313	55	3.4 ± 0.3	0.75 ± 0.20
35N2650	2116	50	4.1 ± 0.3	0.75 ± 0.20
35N2840	7628	40	6.6 ± 0.3	0.75 ± 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 107°C - 121°C (225°F - 250°F) immediately prior to lay-up. Store prepreg at 60-70°F at or below 30% RH. 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 4.5°C - 6.5°C (8°F - 12°F) per minute between 100°C and 150°C (210°F and 300°F). Vacuum lamination is preferred. Start point vacuum lamination pressures are shown in the table below:

Panel Size		Pressure	
in.	mm	psi	kg/cm <sup>2</sup>
12 x 18	305 x 457	275	19
16 x 18	406 x 457	350	25
18 x 24	457 x 610	400	28

- 3) Set cure temperature at 213°C (415°F). Start cure time when product temperature > 210°C (410°F)
- 4) Cure time at temperature = 90 minutes  
NOTE: For sequential lamination use 60 minutes for the first lamination and 90 minutes for the final.

Drill at 350 SFM. Undercut bits are recommended for vias 0.018" (0.45mm) 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 35N

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

**For samples, technical assistance and customer service, please contact Arlon Electronic Materials at the following locations:**

**NORTH AMERICA:**

Arlon EMD, 9433 Hyssop Drive, Rancho Cucamonga, CA  
Tel: (909) 987-9533 • Fax: (909) 987-8541

**FRANCE:**

CCI Eurolam  
9, rue Marcelin Bertholet  
92160 Antony, France  
Phone: (33) 146744747  
Fax: (33) 146666313  
www.ccieurolam.com

**GERMANY:**

CCI Eurolam  
Otto-Hahn-Str. 46 63303  
Dreiech Germany  
Phone: (49) 610339920  
Fax: (49) 6103399229

**UK & SCANDINAVIA:**

CCI Eurolam – UK  
Ulness Walton Lane  
Leyland, PR26 8NB, UK  
Phone: (44) 1772452236  
Fax: (44) 1772456859

**ITALY:**

CCI Eurolam  
9, rue Marcelin Bertholet  
92160 Antony, France  
Phone: (33) 146744755  
Fax: (33) 146666313

**ISRAEL:**

Tech Knowledge, Ltd. 159 Yigal  
Alon Street,  
Tel Aviv 6744367, Israel  
Phone: (972) 36958117  
Fax: (972) 36917117  
www.tech-knowledge.co.il

**SINGAPORE:**

C.T.S. Industries Pte Ltd  
47 Kaki Bukit Place  
Singapore 416225  
Phone: (65) 6276 3328  
Fax: (65) 6276 3336  
www.ctsind.com.sg

**INDIA:**

Synertec  
301 Raheja Chambers, 12  
Museum Rd Bangalore, India  
560001  
Phone: (91) 80-25585432  
Fax: (91) 80-25588565

**JAPAN:**

Nakao Corp.  
12-8 Nihonbashi Hisamatsu-Cho Tokyo  
103-0005 Japan  
Phone: (81) 336623201  
Fax: (81) 336617118

**KOREA**

Landmark International Corp.  
306 Sihwa Venture-ro, Siheung-si  
Gyeonggi-do, Korea  
Phone: (82) 31-434-0606  
Fax: (82) 31-434-0868  
www.landmarkcorp.net

**CHINA:**

Zack Peng  
Room 6A, Unit 2, Bldg 2  
Jin Cheng Shi Dai, Tian Road  
Shenzhen, China 518103  
Phone: (86) 75528236491  
Fax: (86) 75528236463