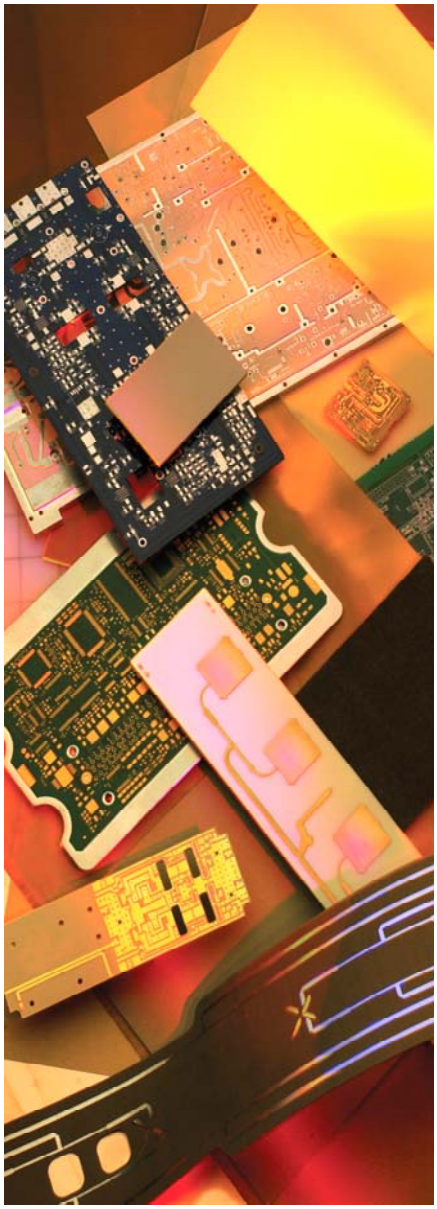
35N

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:

- Tg greater than 250°C
- Certified to the flammability requirements of UL-94 V-1
- Low z-expansion of 1.1% between 50-260°C (vs. 2.5-4.0% for typical high-performance epoxies).
- Low Z-expansion minimizes the risk of latent PTH defects caused during solder reflow and device attachment
- Decomposition temperature of 407°C (vs. 300-360°C for typical high-performance epoxies) offering outstanding long-term high-temperature performance
- Up to 50% or more reduction in cure time compared with traditional polyimide cycles
- Electrical and mechanical properties meeting the requirements of IPC-4101/40 and /41
- Toughened, non-MDA chemistry resists drill cracking
- 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, under-hood automotive controls, burn-in boards, or industrial sensors

ARLON
TECHNOLOGY ENABLING INNOVATION

Typical Properties:

35N

Property	Units	Value	Test Method
1. Electrical Properties			
Dielectric Constant *(may vary with Resin %)*			
@ 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	1.6×10^8	IPC TM-650 2.5.17.1
E24/125	MΩ-cm	1.2×10^8	IPC TM-650 2.5.17.1
Surface Resistivity			
C96/35/90	MΩ	5.0×10^8	IPC TM-650 2.5.17.1
E24/125	MΩ	3.7×10^8	IPC TM-650 2.5.17.1
Electrical Strength (typical)	Volts/mil (kV/mm)	1400 (55.9)	IPC TM-650 2.5.6.2
Dielectric Breakdown	kV		IPC TM-650 2.5.6
Arc Resistance	sec	165	IPC TM-650 2.5.1
2. Thermal Properties			
Glass Transition Temperature (Tg)			
TMA	°C	>250	IPC TM-650 2.4.24
DSC	°C		IPC TM-650 2.4.25
Decomposition Temperature (Td)			
Initial	°C	363	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	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 2.4.24
> Tg	ppm/°C	158	IPC TM-650 2.4.24
z-axis Expansion (50-260°C)	%	1.2	IPC TM-650 2.4.24
3. Mechanical Properties			
Peel Strength to Copper (1 oz/35 micron)			
After Thermal Stress	lb/in (N/mm)	6.3 (1.1)	IPC TM-650 2.4.8
At Elevated Temperatures	lb/in (N/mm)	6.3 (1.1)	IPC TM-650 2.4.8.2
After Process Solutions	lb/in (N/mm)	6.0 (1.0)	IPC TM-650 2.4.8
Young's Modulus (x, y)	Mpsi (GPa)	4.3 (29.6) / 3.8 (26.2)	IPC TM-650 2.4.18.3
Flexural Strength	kpsi (MPa)		IPC TM-650 2.4.4
Tensile Strength (x, y)	kpsi (MPa)	69 (476) / 36.3 (250)	IPC TM-650 2.4.18.3
Compressive Modulus	kpsi (MPa)		ASTM D-695
Poisson's Ratio (x, y)	-	0.16/0.15	ASTM D-3039
4. Physical Properties			
Water Absorption	%	0.26	IPC TM-650 2.6.2.1
Specific Gravity	g/cm³	1.6	ASTM D792 Method A
Thermal Conductivity	W/mK	0.2	ASTM E1461
Flammability	class	V-1	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.

Prepreg Availability:

Arlon Part Number	Glass Style	Resin %	Scaled Flow Hf (mils)	Scaled Flow ΔH (mils)
35N0672	106	72 ± 3	1.7 ± 0.3	0.55 ± 0.20
35N8063	1080	63 ± 3	2.4 ± 0.3	0.55 ± 0.20
35N2355	2313	55 ± 3	3.4 ± 0.3	0.55 ± 0.20
35N2650	2116	50 ± 3	4.1 ± 0.3	0.55 ± 0.20
35N2840	7628	40 ± 3	6.6 ± 0.3	0.55 ± 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. 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 8°F - 12°F (4°C - 6°C) per minute between 150°F and 250°F (65°C and 121°C). Vacuum lamination is preferred. Start point vacuum lamination pressures are shown in the table below:

Panel Size		Pressure		Pressure / 29" Vacuum	
in	cm	psi	kg/sq cm	psi	kg/cm^2
12 x 18	40 x 46	275	19	200	14.0
16 x 18	30 x 46	350	25	250	17.5
18 x 24	46 x 61	400	28	300	21.0

3) Product temperature at start of cure = 410°F (210°C).

4) Cure time at temperature = 1.5 - 2.0 hours

5) Cool down under pressure at ≤ 12°F/min (6°C/min)

Drill at 350 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 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 reflow or HASL

35N

North America:
9433 Hyssop Drive, Rancho Cucamonga, California 91730
Tel: (909) 987-9533 • Fax: (909) 987-8541

1100 Governor Lea Road, Bear, Delaware, 19701
Tel: (302) 834-2100, (800) 635-9333
Fax: (302) 834-2574

Northern Europe:
44 Wilby Avenue, Little Lever, Bolton, Lancaster, BL31QE, UK
Tel/Fax: (44) 120-457-6068

Southern Europe:
1 Bis Rue de la Remarde, 91530 Saint Cheron, France
Tel: (33) 871-096-082 • Fax: (33) 164-566-489

Arlon Material Technologies
No. 20 Datong Road, Export Processing Zone, Suzhou New & High District, Jiangsu, China
Tel (86) 512-6269-6966
Fax: (86) 512-6269-6038

Arlon Electronic Materials (Suzhou) Co., Ltd.
Building 7, Da Xing Industrial Park of Suzhou New & High District
Jinangsu, China 21500
Tel: (86) 512-6672-1698
Fax: (86) 512-6672-1697

Eastern China:
Room 11/401, No. 8, Hong Gu Road, Shanghai, China, 200336
Tel/Fax: (86) 21-6209-0202

Southern China:
Room 601, Unit 1, Building 6, Liyuanxincun, Road Holiday,
Hua qiaocheng, Nanshan District, Shenzhen City, China
Tel: (86) 755-26906612 • Fax: (86) 755-26921357