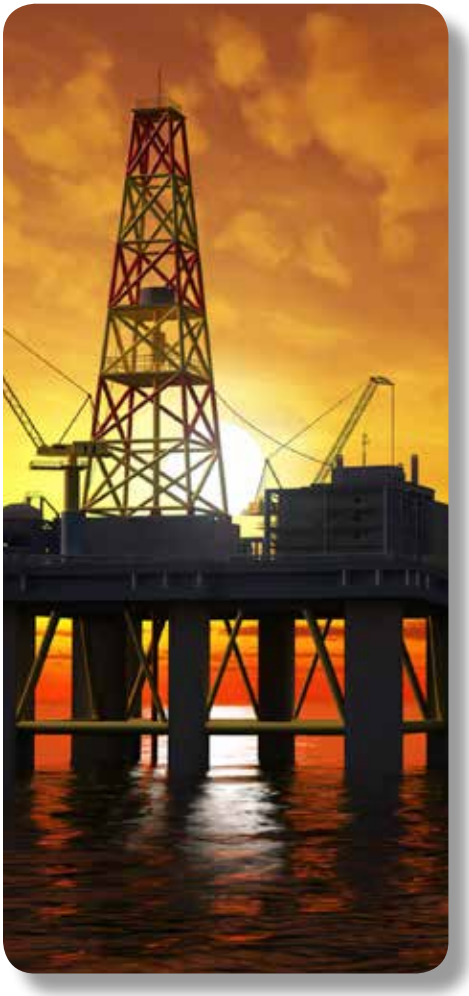
35N

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
- UL recognized as UL-94 V-1
- Low Z-axis of 1.1% between 50-260°C (vs. 2.5-4.0% for typical high-performance epoxies).
- Low Z-axis 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) offer outstanding long-term high-temperature performance
- Electrical and mechanical properties meeting the requirements of IPC-4101/40 and /41
- Toughened, chemistry resists resin fracturing
- Ideal for lead-free processing
- RoHS/WEEE compliant

Typical Applications:

- PCBs that are subjected to high temperatures during processing, such as lead-free soldering, HASL, IR Reflow
- 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

35N

Typical Properties:

Property	Units	Value	Test Method
1. Electrical Properties			
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	1.5×10^8	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	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	15.8	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 (1.1)	IPC TM-650 2.4.8
Young's Modulus	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	kpsi (MPa)	69 (476 / 36.3 (250)	IPC TM-650 2.4.18.3
Poisson's Ratio	-	0.15 / 0.15	ASTM D-3039
4. Physical Properties			
Water Absorption (0.062")	%	0.26	IPC TM-650 2.6.2.1
Specific Gravity	g/cm^3	1.6	ASTM D792 Method A
Thermal Conductivity	W/mk	0.2	ASTM E1461
Flammability	class	V-0	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 ΔH (mils)
35N0672	106	72	1.7 ± 0.3	0.55 ± 0.20
35N8063	1080	63	2.4 ± 0.3	0.55 ± 0.20
35N2355	2313	55	3.4 ± 0.3	0.55 ± 0.20
35N2650	2116	50	4.1 ± 0.3	0.55 ± 0.20
35N2840	7628	40	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 107°C - 121°C (225°F - 250°F) immediately prior to lay-up. Store prepreg at 16°C - 21°C (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°C - 6°C (8°F - 12°F) per minute between 65°C and 121°C (150°F and 250°F). 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/cm^2	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) Set cure temperature at 213°C (415°F). Start cure timer when product temperature reaches 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.

5) 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 121°C (250°F) prior to solder reflow or HASL

TECHNOLOGY ENABLING INNOVATION

Arlon Electronic Substrates... Challenge Us

For samples, technical assistance, customer service or for more information, please contact Arlon Materials for Electronics Division at the following locations:

NORTH AMERICA:

Arlon LLC
Electronic Substrates
9433 Hyssop Drive
Rancho Cucamonga, CA 91730
Tel: (909) 987-9533
Fax: (909) 987-8541

Arlon LLC
Microwave Materials
1100 Governor Lea Road
Bear, DE 19701
Tel: (800) 635-9333
Outside U.S. & Canada: (302) 834-2100
Fax: (302) 834-2574

NORTHERN EUROPE:

Arlon LLC
44 Wilby Avenue
Little Lever
Bolton, Lancashire BL31QE
United Kingdom
Tel: (44) 120-457-6068
Fax: (44) 120-479-6463

SOUTHERN CHINA:

Arlon LLC
Room 601, Unit 1, Bldg 6
Liyuan, Xincun Shahe
Shenzhen, China 518053
Tel: (86) 755-269-066-12
Fax: (86) 755-26910475

NORTHERN CHINA:

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

SOUTHERN EUROPE:

Arlon LLC
6 cours des Juilliottes
94700 Maisons-Alfort France
Phone : (33) 1 84 23 41 51
Fax: (33) 9 55 62 43 26

www.arlon-med.com