

## **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 highperformance 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

# 35N

### Typical Properties:

Property	Units	Value	Test Method
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	Í	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
Arc Resistance	sec	165	IPC TM-650 2.5.1
Thermal Properties			
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
Mechanical Properties			
Peel Strength to Copper (1 oz/35 micron)			
After Thermal Stress	lb./in (N/mm)	6.3 (1.1)	IPC TM-650 2.4.8C
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
Physical Properties			
Water Absorption (0.062")	%	0.26	IPC TM-650 2.6.2.1A
Density	g/cm3	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.

Arion reserves the right to change or update these values.



#### Availability:

Arlon Part Number	Glass Style	Resin (%)	Scaled Flow Hf (mils)	Scaled Flow ∆ H (mils)
35N0672	106	72	1.7 ± 0.3	0.75 ± 0.20
35N8063	1080	63	$2.4 \pm 0.3$	0.75 ± 0.20
35N2355	2313	55	$3.4 \pm 0.3$	0.75 ± 0.20
35N2650	2116	50	4.1 ± 0.3	0.75 ± 0.20
35N2840	7628	40	$6.6 \pm 0.3$	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 shownin the table below:

Panel Size		Pressure		
in.	mm	psi	kg/cm2	
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 0.0 18" (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



# ... Challenge Us!

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

#### **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

H5=K 5B. Oåçæ) cæÁ V^&@ [ || \*^ÁQ & ÀÇEV ODÁ9Ø Þ [ ÈÁ 493 Wen-zhong ÁÜ å ÉVæ§ ^ æ) Á Ôounty ÁHHO ÉVæ§ æ) ÁÇÜ ÈÜ ÈÒ ÈÒ Ú@ } ^ KÁÇÌÎÎ DÁHËHOÎ €€ Ï ÁØæ¢ KÁ ÇÌÎ DÁHËHOÎ €€ÎH

#### **SINGAPORE:**

C.T.S. Industries Pte Ltd 47 Kaki Bukit Place Singapore 416225

Phone: (65) 6276 3328 Fax: (65) 6276 3336

#### **JAPAN:**

Nakao Corp. 12-8 Nihonbashi Hisamatsu-Cho Tokyo 103-0005 Japan

Phone: (81) 336623201 Fax: (81) 336617118

#### **KOREA:**

UniMicrotek Co. Ltd. 478 Baekbeom-Ro, Bupyeong-Gu Incheon, Korea

Phone: (82) 32-424-1776 Fax: (82) 505-720-1785

#### CHINA:

Zack Peng Room 6A, Unit 2, Bldg 2 Jin Cheng Shi Dai, Tian Road Shenzhen, China 518103

Phone: (86) 75528236491 Fax: (86) 75528236463

#### INDIA:

Synertec 301 Raheja Chambers,12 Museum Rd Bangalore, India 560001

Phone: (91) 80-25585432 Fax: (91) 80-25588565