Arlon 85N

Electronic Substrates

High Performance Polyimide / E-Glass
Exceptional Thermal Performance
Superior Reliability

- Tg Greater than 250° C
- Non-MDA polyimide
- No bromination that might reduce service temperatures, service life, or repairability
- Not blended - 85N is a pure polyimide
- Low Z direction expansion
- Toughened for improved interlaminar bond, better drilling and routing characteristics
- Melt rheology close to FR-4 even at lower heatup rates
- Excellent yield on complicated multilayers

Polyimides have been increasingly selected for military and high end commercial PWB programs requiring high reliability, serviceability under extremes of temperature, and the ability to be repaired in the field under adverse conditions. Polyimide's high glass transition temperature (Tg) results in a product which has a low Z-direction coefficient of thermal expansion (CTE) and which permits higher aspect ratio holes to be plated and processed through more thermally abusive conditions on thicker boards than any other commercially available material.

Arlon's 85N Series of Pure Polyimide laminates and prepregs produce multilayer PWB's with this outstanding thermal stability, low Z-direction expansion during solder reflow and the excellent field repairability expected of Arlon polyimides. Modified to be tougher than conventional polyimides, 85N Series products are less sensitive to drilling and routing variations.

Manufactured under demanding SPC and Quality Control, Arlon's 85N Polyimides are fully qualified to IPC-4101/41. Arlon's 85N Polyimides contain no MDA or other potentially carcinogenic diamines.

ARLON

MATERIALS FOR ELECTRONICS

Typical Properties: 85N Polyimide Laminate

Properties	Test Method	Value
Peel strength lb/in elev. temp. lbs./in. (Kg/m)	IPC-TM-650 2.4.8	9.0 (160)
Peel strength after process solutions lbs./in. (Kg/m)	IPC-TM-650 2.4.8	6.8 (120)
Tg (degrees C)	IPC-TM-650 2.4.24 (TMA)	260
CTE - Z axis (ppm/°C) X,Y axis (ppm/°C)	IPC-TM-650 2.4.24 (TMA) IPC-TM-650 2.4.24 (TMA)	50 16
Permitivity (1 MHz) -16 MIL LAM	IPC-TM-650 2.5.5.3	4.39
Loss Tangent (1 MHz) -16 MIL LAM	IPC-TM-650 2.5.5.3	0.008
Flammability	UL94	HB
Volume Resistivity (megohm-cm) Elev. Temp. Temp. + Humidity	IPC-TM-650 2.5.17.1	3.0×10^8 1.3×10^9
Surface Resistivity (megohms) Elev. Temp. Temp. + Humidity	IPC-TM-650 2.5.17.1	1.4×10^9 6.9×10^7
Flexural Strength psi (Kg/m^2) psi @ 250°C (Kg/m^2)	IPC-TM-650 2.4.4 IPC-TM-650 2.4.4.1	70,000 (4.9×10^7) 71,000 (5.0×10^7)
Tensile Modulus psi x 10^6 (Kg/m^2)	ASTM D-638	3.2
Thermal Conductivity (W/mK)	ASTM E-1225	0.3
Specific Gravity (g/cm^3)	ASTM D-792 Method A	1.7
Poission's Ratio	—	0.2
Electrical Strength -10 MIL LAM v/mil (V/mm)	IPC-TM-650 2.5.6.2	1230 (4.8×10^4)
Water Absorption % -59 MIL LAM	IPC-TM-650 2.6.2.1	0.20%

Data provided herein is provided for reference purposes only and are not intended to be sales specifications. Determination of the suitability of any of these materials for a particular application is the sole responsibility of the user. Furthermore, no suggestion for use, or material supplied shall be construed as a recommendation or inducement to violate any law or infringe any patent.

Glass Cloth Style	Arlon Designation	IPC-4101 Classification	Resin Content (weight %)	SCALED FLOW Hf(mils)	SCALED FLOW ΔH(mils)
106	85N0672	P41 E0106 RC SC 00	72 ± 3	1.7 ± 0.3	0.75 ± 0.20
1080	85N8063	P41 E1080 RC SC 00	63 ± 3	2.4 ± 0.3	0.75 ± 0.20
2313	85N2355	P41 E2313 RC SC 00	55 ± 3	3.4 ± 0.3	0.75 ± 0.20
2116	85N2650	P41 E2116 RC SC 00	50 ± 3	4.1 ± 0.3	0.75 ± 0.20
7628	85N2840	P41 E7628 RC SC 00	40 ± 3	6.6 ± 0.3	0.70 ± 0.20

Processing:

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°-250°F(107°-121°C) immediately prior to lay-up.
Vacuum desiccate the prepreg for 8 - 12 hours prior to lamination.
Lamination: Pre-Vaccuum for 30 - 45 minutes
Product heat rise = 8 - 12°F(4-7°C)/min. measured between 150°F and 250°F(65°C and 121°C).
Full pressure: 12 x 18 = 275 PSI (30cm x 45cm, 20 kg/cm²)
16 x 18 = 350 PSI (40cm x 45cm, 25.5 kg/cm²)
18 x 24 = 400 PSI (45cm x 61cm, 28 kg/cm²)
Note: reduce pressure by 35 - 40% with vaccum assist lamination
Product temperature at start of cure = 425°F (218°C)
Cure time at temperature = 2.0 hours minimum (depending on stack height and amount of copper.)
Cool down under pressure at < 12°F(6°C)/min.
Drill at 400-500 SFM. Undercut bits are recommended for vias 0.018"(0.045cm) and smaller.
De-smear using plasma 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 prior to solder reflow or HASL.

85N Polyimide Prepregs are offered on fiberglass fabric styles from 106 through 7628. The above table lists the standard styles. Others may be available by special order.

The information and data contained herein are believed reliable, but all recommendations or suggestions are made without guarantee. You should thoroughly and independently test materials for any planned applications and determine satisfactory performance before commercialization. Furthermore, no suggestion for use, or material supplied shall be construed as a recommendation or inducement to violate any law or infringe any patent.

ARLON
MATERIALS FOR ELECTRONICS
1100 Governor Lea Road, Bear, DE 19701 • Telephone: (302) 834-2100, (800) 635-9333 • Fax: (302) 834-2574
9433 Hyssop Drive, Rancho Cucamonga, CA 91730 • Telephone: (909) 987-9533 • Fax: (909) 987-8541
37 Rue Collange, 92300 LeVallois, Perret, France • Telephone: (33) 1-427-02642 • Fax: (33) 1-427-02798
44 Wilby Avenue, Little Lever, Bolton, Lancashire, BL31QE, U.K. • Telephone: (44) 120-457-6068 • Fax: (44) 120-479-6463
Website: www.arlonmed.com • E-mail: substrates@arlon-med.com

Arlon is an ISO 9002 Registered Company