Arlon 33N

Electronic Substrates

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

- Tg Greater than 250º C
- Non-MDA chemistry
- Meets flammability requirements of UL94V-O
- Meets IPC-4101 (type GIL)
- Up to 50% reduction in cure time
- Excellent yield on complicated multilayers
- Low Z direction expansion

Description:

Arlon's 33N is the next generation of polyimide materials incorporating the high performance and reliability characteristics of 31N, the toughness and ease of cure of our 76N, and flame retardant properties meeting the stringent requirements of UL94V-0. The base resin system is a pure polyimide that provides low Z-axis expansion through the most severe processes and thermal excursions, resulting in plated through hole integrity second to none. 33N is 50% tougher than conventional polyimides and is less prone to fracture during small hole drilling and profiling. 33N contains no MDA or other known potentially carcinogenic materials.

Applications:

The 33N materials are an excellent choice for many different applications. The low Z-axis expansion improves plated through hole reliability on high layer count multilayer boards, or where very thick (>0.093") finished boards are needed for mechanical purposes. High copper peel strength retention allows for multiple soldering or rework cycles, and is ideal where field repairs are required. The pure polyimide chemistry provides the ultimate in thermal resistance for long term high temperature burn-in applications or in down-hole environments. The low Z-axis CTE significantly improves via reliability in thermal cycling environments.

Typical Properties: 33N Polyimide Laminate

Property	Test Method	Result
Peel strength lb/in elev. temp. (Kg/m) -14 MIL LAM	IPC-TM-650 2.4.8	10.7 (190)
Peel after process solutions lbs./in. (Kg/m) -14 MIL LAM	IPC-TM-650 2.4.8	9.0 (160)
Tg (degrees C)	IPC-TM-650 2.4.24 (TMA)	>250
CTE - Z axis (ppm/°C)	IPC-TM-650 2.4.24 (TMA)	55
CTE - X,Y axis (ppm/°C)	IPC-TM-650 2.4.24 (TMA)	16 - 17
Permitivity (1 MHz) - 8 MIL LAM	IPC-TM-650 2.5.5.3	4.25
Loss Tangent (1 MHz) - 8 MIL LAM	IPC-TM-650 2.5.5.3	0.009
Flammability	UL94	V-0
Volume Resistivity (megohm-cm) Elev. Temp. / Temp. + Humidity	IPC-TM-650 2.5.17.1	7.3×10^8 / 7.2×10^9
Surface Resistivity (megohms) Elev. Temp. / Temp. + Humidity	IPC-TM-650 2.5.17.1	1.5×10^8 / 7.9×10^9
Flexural Strength Elev. Temp. psi (Kg/m) 31 MIL LAM	IPC-TM-650 2.4.4	77.668 (5.4×10^7)
Electrical Strength -8 MIL LAM v/mil (V/mm)	IPC-TM-650 2.5.6.2	1460 (5.1×10^4)
Water Absorption % -31 MIL LAM	IPC-TM-650 2.6.2.1	0.32%

Data is believed to be accurate but values are average and not guaranteed. All sales of these products are governed by the terms and conditions under which they are sold. Determination of the suitability of any of these materials for a particular application is the sole responsibility of the user.

Typical Properties: 33N Polyimide Prepreg

Glass Cloth Style	Arlon Designation	IPC-4101 Classification	Resin Content (weight %)	SCALED FLOW Hf(mils)	SCALED FLOW ΔH(mils)
106	33N0672	P41 E0106 RC SC 00	72 ± 3	1.9 ± 0.3	0.55 ± 0.20
1080	33N8063	P41 E1080 RC SC 00	63 ± 3	2.6 ± 0.3	0.55 ± 0.20
2313	33N2355	P41 E2313 RC SC 00	55 ± 3	3.6 ± 0.3	0.55 ± 0.20
2116	33N2650	P41 E2116 RC SC 00	50 ± 3	4.3 ± 0.3	0.55 ± 0.20
7628	33N2840	P41 E7628 RC SC 00	40 ± 3	6.8 ± 0.3	0.55 ± 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/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 = 1.5 - 2.0 hours
Cool down under pressure at ≤ 12°F(6°C)/min.
Drill at 350 SFM. Undercut bits are recommended for vias 0.018" 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 33N.
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.

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.

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