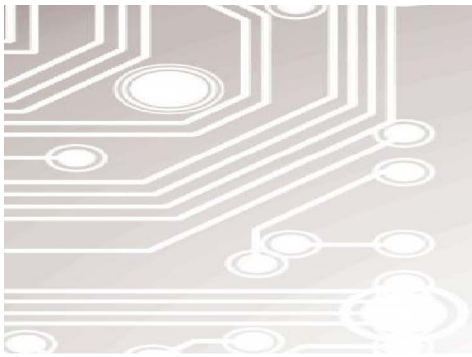
49N

ARLON ELECTRONIC MATERIALS

Multifunctional Epoxy Low-Flow Prepreg



49N is a low-flow epoxy prepreg engineered for bonding multilayer epoxy rigid-flex or attaching heat- sinks to multilayer epoxy PCBs. With a high Tg, the prepreg can be used in high-performance or high- temperature applications compared to a standard difunctional epoxy low-flow.

Features:

- Multifunctional epoxy resin system with a Tg of 170°C offers improved high-temperature and PTH reliability
- Engineered with discrete low ranges and various fiberglass styles to optimize flexibility
- Electrical and mechanical properties meeting the requirements of IPC-4101/26, modified to be “Low-Flow”
- RoHS/WEEE compliant

Typical Applications:

- Bonding multilayer epoxy rigid-flex
- Bonding adhesiveless epoxy rigid-flex
- Attaching heat sinks to polyimide MLBs

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Typical Properties:

Property	Units	Value	Test Method
Electrical Properties			
Dielectric Constant @ 1 MHz	-	4.3	IPC TM-650 2.5.5.3
Dissipation Factor @ 1 MHz		0.022	IPC TM-650 2.5.5.3
Volume Resistivity			
C96/35/90	MΩ-cm	5.1×10^7	IPC TM-650 2.5.17.1
E24/125	MΩ-cm	7.4×10^7	IPC TM-650 2.5.17.1
Surface Resistivity			
C96/35/90	MΩ	8.8×10^6	IPC TM-650 2.5.17.1
E24/125	MΩ	1.5×10^6	IPC TM-650 2.5.17.1
Electrical Strength	Volts/mil (kV/mm)	1000 (39.4)	IPC TM-650 2.5.6.2
Thermal Properties			
Glass Transition Temperature (Tg)			
DSC	°C	170	IPC TM-650 2.4.25D
Decomposition Temperature			
Initial	°C	296	IPC TM-650 2.4.24.6
5% weight loss	°C	325	IPC TM-650 2.4.24.6
T260	min	18	IPC TM-650 2.4.24.1
CTE (X,Y)	ppm/°C	16	IPC TM-650 2.4.41
CTE (Z)			
< Tg	ppm/°C	85	IPC TM-650 2.4.24C
Mechanical Properties			
Peel Strength to Copper (1 oz/35 micron)			
After Thermal Stress	lb./in (N/mm)	9.0 (1.6)	IPC TM-650 2.4.8C
Young's Modulus CD/MD	Mpsi (GPa)	2.6 (17.9)	ASTM E111
Tensile Strength CD/MD	kpsi (MPa)	6.5 (45)	ASTM D3039
Poisson's Ratio	-	0.17	ASTM E13204
Physical Properties			
Water Absorption (0.062")	%	0.1	IPC TM-650 2.6.2.1A
Density	g/cm^3	1.65	ASTM D792 Method A
Thermal Conductivity	W/mK	0.25	ASTM E1461
Flammability	class	V0	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.

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Availability:

Arlon Part Number	Glass Style	Resin (%)	Thickness	Flow
49N067201	106	72	0.0023"	0.030" - 0.090"
49N806501	1080	65	0.0034"	0.030" - 0.090"
49N067202	106	72	0.0023"	0.060" - 0.120"
49N806502	1080	65	0.0034"	0.060" - 0.120"
49N067204	106	72	0.0023"	0.130" - 0.190"
49N806504	1080	65	0.0034"	0.130" - 0.190"

Recommended Process Conditions:

Process inner-layers through develop, etch, and strip using standard industry practices. Bake inner layers in a rack for 60 minutes at 225°F - 250°F (107°C - 121°C) immediately prior to lay-up. 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 about 8°F - 12°F per minute (4.5°C - 6.5°C) between 210°F and 300°F (100°C and 150°C)
3) Lamination Pressure: 150-300 PSI (11-21 Kg/cm2) depending on complexity
4) Product temperature at start of cure = 360°F (182°C).
5) Cure time at temperature = 90 minutes
6) Cool down under pressure at ≤ 10°F/min (6°C/min)

Drill at 350-400 SFM. Undercut bits are recommended for vias 0.023” (0.9cm) and smaller

De-smear using alkaline permanganate or plasma with settings appropriate for epoxy; plasma is preferred for positive etchback

Conventional plating processes are compatible with 49N

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

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