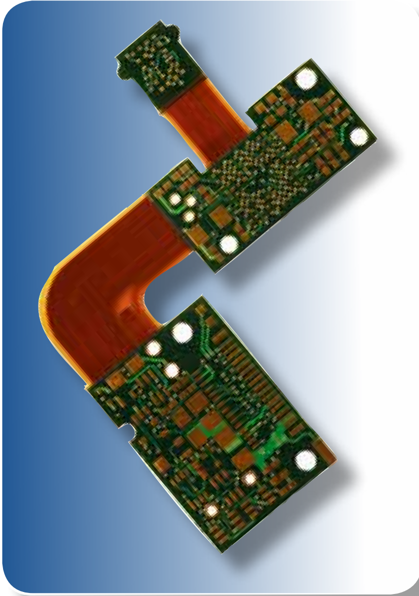
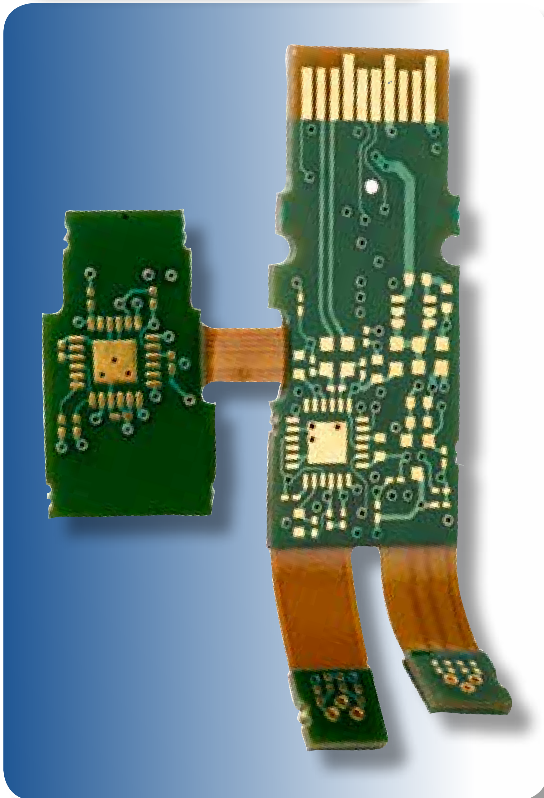
38N

Polyimide Low-Flow Prepreg



38N is an improved polyimide low-flow prepreg suitable for bonding multilayer polyimide rigid-flex, attaching heat sinks to polyimide MLBs, or other applications where minimal and uniform resin flow is required.



Features:

- Novel chemistry ensuring faster and more uniform resin cure for minimal and consistent resin flow, preventing excessive flow into clearance/relief areas
- Improved bond strength to Kapton® polyimide of up to 50% compared with conventional polyimide low-flow or no-flow products
- Tg = 200°C and expansion characteristics typical of polyimide greatly improves PTH reliability
- Curable at temperatures as low as 350°F (177°C)
- Excellent thermal stability
- Improved bond strength to copper and other metals for excellent performance in heat sink bonding applications
- Electrical and mechanical properties meeting the requirements of IPC-4101/42
- Compatible with lead-free processing
- RoHS/WEEE compliant

Typical Applications:

- Bonding multilayer rigid-flex boards
- Finished PCB assemblies requiring excellent thermal stability
- Dielectric insulators
- Other applications where minimal and uniform resin flow is required

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Kapton® is a tradename of E.I. Dupont de Nemours, Wilminton, DE.

Typical Properties:

Property	Units	Value	Test Method
1. Electrical Properties			
Dielectric Constant			
@ 1 MHz	-	4.25	IPC TM-650 2.5.5.3
@ 1 GHz	-		IPC TM-650 2.5.5.9
Dissipation Factor			
@ 1 MHz	-	0.010	IPC TM-650 2.5.5.3
@ 1 GHz	-		IPC TM-650 2.5.5.9
Volume Resistivity			
C96/35/90	MΩ-cm	8.2×10^7	IPC TM-650 2.5.17.1
E24/125	MΩ-cm	4.7×10^9	IPC TM-650 2.5.17.1
Surface Resistivity			
C96/35/90	MΩ	4.4×10^6	IPC TM-650 2.5.17.1
E24/125	MΩ	1.2×10^9	IPC TM-650 2.5.17.1
Electrical Strength	Volts/mil (kV/mm)	1600 (63.0)	IPC TM-650 2.5.6.2
Dielectric Breakdown	kV		IPC TM-650 2.5.6
Arc Resistance	sec	125	IPC TM-650 2.5.1
2. Thermal Properties			
Glass Transition Temperature (Tg)			
TMA	°C	200	IPC TM-650 2.4.24
DSC	°C		IPC TM-650 2.4.25
Decomposition Temperature (Td)			
Initial	°C	311	IPC TM-650 2.3.41
5%	°C	330	IPC TM-650 2.3.41
T260	min	50	IPC TM-650 2.4.24.1
T288	min	5	IPC TM-650 2.4.24.1
T300	min	3	IPC TM-650 2.4.24.1
CTE (X,Y)	ppm/°C	17	IPC TM-650 2.4.41
CTE (Z)			
< Tg	ppm/°C	54	IPC TM-650 2.4.24
> Tg	ppm/°C	157	IPC TM-650 2.4.24
z-axis Expansion (50-260°C)	%	1.5	IPC TM-650 2.4.24
3. Mechanical Properties			
Peel Strength to Copper (1 oz/35 micron)			
After Thermal Stress	lb/in (N/mm)	8.5 (1.5)	IPC TM-650 2.4.8
At Elevated Temperatures	lb/in (N/mm)		IPC TM-650 2.4.8.2
After Process Solutions	lb/in (N/mm)		IPC TM-650 2.4.8
Peel Strength to Kapton			
As Received	lb/in (N/mm)	5.9 (1.0)	
After Solder	lb/in (N/mm)	5.2 (0.9)	
Young's Modulus	Mpsi (GPa)	2.1 (14.5)	IPC TM-650 2.4.18.3
Flexural Strength	kpsi (MPa)	60 (414)	IPC TM-650 2.4.4
Tensile Strength	kpsi (MPa)	32 (221)	IPC TM-650 2.4.18.3
Poisson's Ratio	-	0.18	ASTM D-3039
4. Physical Properties			
Water Absorption (0.062")	%	<1.0	IPC TM-650 2.6.2.1
Specific Gravity	g/cm3	1.6	ASTM D792 Method A
Thermal Conductivity	W/mK	0.3	ASTM E1461
Flammability	class	Meets V-O	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 %	Pressed Thickness	Flow Range
38N0666	106	66	1.9 mils	70 - 120 mils
38N8060	1080	60	2.9 mils	70 - 120 mils

Recommended Process Conditions:

Because of varying storage conditions, it is recommended that 38N prepreg be dried at 29" (736mm) Hg for 12 to 24 hours.

38N Low-Flow prepreg is very process tolerant. It laminates well with either a cold platen press start or with a hot start. Vacuum or vacuum assist lamination is recommended for the removal of moisture and air. Low-Flow products do not displace air voids as well as standard prepregs, and vacuum will help assure a void-free final product.

Lamination Cycle:

1) Vacuum draw down the package for 30 minutes at <29" (736mmHg) prior to applying pressure in the press. Maintain the vacuum beyond the set point of the resin, i.e., above 320°F (160°C)
2) Use a platen temperature in the range of 360°F - 380°F (182°C - 193°C). Tg at epoxy cure temperature will be 200°C.
3) Control the heat rise to about 8°F - 12°F per minute (4°C – 6°C) between 200°F and 300°F (93°C and 149°C)
4) Use a pressure of 180 to 350 psi (12.6 to 24 kg/sq.cm), depending on panel size and complexity. Following are recommended pressures relative to panel size to use as starting points:

Panel Size		Pressure	
in	cm	psi	kg/cm^2
9 x 12	22 x 30	180	13
12 x 12	30 x 30	200	14
12 x 18	30 x 46	250	18
16 x 18	40 x 46	290	20
18 x 24	46 x 61	330	23
24 x 24	61 x 61	350	25

Cure time is 90 minutes at temperature.

The subsequent processing should be the same as those normally used for rigid-flex PCBs.

Optimal processing requirements may vary depending on specific equipment and operating conditions. These recommendations are offered only as a starting point.

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