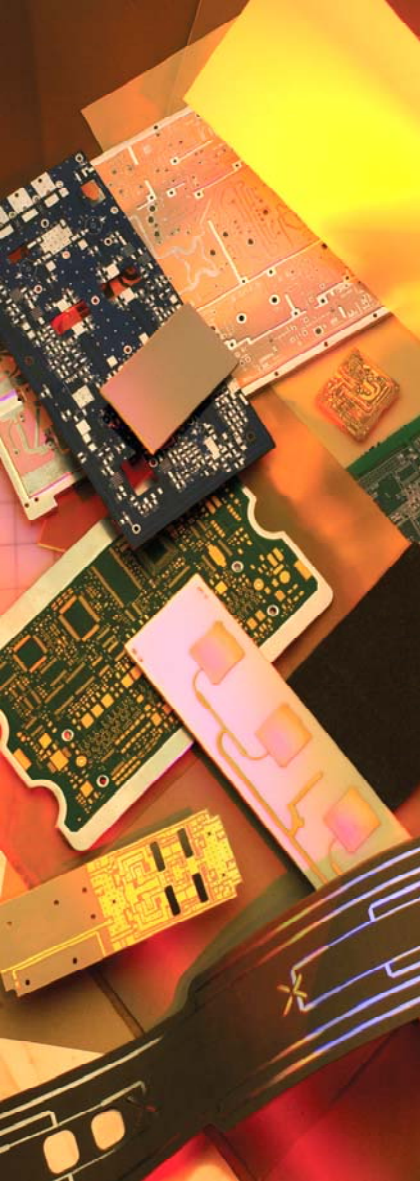


# 38N

## 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
- $T_g = 200^\circ\text{C}$  and expansion characteristics typical of polyimide greatly improves PTH reliability
- Curable at temperatures as low as  $350^\circ\text{F}$  ( $177^\circ\text{C}$ )
- 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 polyimide rigid-flex
- Attaching heat sinks to polyimide MLBs
- Other applications where minimal and uniform resin flow is required

# Typical Properties:



Property	Units	Value	Test Method
<b>1. Electrical Properties</b>			
Dielectric Constant <i>(may vary with Resin %)</i>			
@ 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 x 10 <sup>7</sup>	IPC TM-650 2.5.17.1
E24/125	MΩ-cm	4.7 x 10 <sup>9</sup>	IPC TM-650 2.5.17.1
Surface Resistivity			
C96/35/90	MΩ	4.4 x 10 <sup>6</sup>	IPC TM-650 2.5.17.1
E24/125	MΩ	1.2 x 10 <sup>9</sup>	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
<b>2. Thermal Properties</b>			
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
<b>3. Mechanical Properties</b>			
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
Compressive Modulus	kpsi (MPa)		ASTM D-695
Poisson's Ratio (x, y)	-	0.18	ASTM D-3039
<b>4. Physical Properties</b>			
Water Absorption	%	<1.0	IPC TM-650 2.6.2.1
Specific Gravity	g/cm <sup>3</sup>		ASTM D792 Method A
Thermal Conductivity	W/mK	0.3	ASTM E1461
Flammability	class	Meets V-O	UL-94

## Availability:

Arlon Part Number	Glass Style	Resin %	Flow Range	Pressed Thickness
38N0666	106	66%	70 - 120 mils	1.9 mils
38N8060	1080	60%	70 - 120 mils	2.9 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" (736mm) Hg 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/sq cm
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.

# 38N

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