

Advanced Materials**Kerimid[®] 701 A N-70 and Kerimid[®] 701 C**

GENERAL	Kerimid [®] 701 A N-70 and Kerimid [®] 701 C are suitable for use in the manufacture of high performance multilayer printed circuit boards.	
CHEMICAL DESCRIPTION	Kerimid [®] 701 A N-70 and Kerimid [®] 701 C are a two component modified bismaleimide resin system based on non-MDA chemistry. The product consists of Kerimid [®] 701 A N-70 component and the Kerimid [®] 701 C component which are mixed together to make a polyimide resin system with V-1 flammability.	
APPLICATIONS	High performance UL 94 V-0 electrical laminates	
ADVANTAGES	High copper peel strength Superior performance reliability Excellent thermostability Field repairability Excellent resistance to chlorinated solvents Low coefficient of thermal expansion (CTE, z-axis)	
TYPICAL PROPERTIES*	Kerimid[®] 701 A N-70	
	Visual Appearance	Clear, dark, amber liquid
	Gel Time @ 171°C, seconds	150 - 450
	Solids %	69 - 71
	Viscosity @ 25°C (77°F), mPa s (cPs)	1,000 - 4,500
	Kerimid[®] 701 C	
	Visual Appearance	Amber / brown liquid
	Solvent	Gamma Butyro Lactone (GBL)
	Solids %	35 - 37
	Viscosity @ 25°C (77°F), mPa s (cPs)	Less than 60

* Typical properties are based on Huntsman's test methods. Copies are available upon request.

HAZARDOUS DECOMPOSITION PRODUCTS Kerimid[®] 701 A N-70 and Kerimid[®] 701 C - carbon monoxide, carbon dioxide, aldehydes; Kerimid[®] 701 A N-70 - trace amounts of acrolein may be emitted on heating to about 80°C or higher.

DISPOSAL Dispose in accordance with federal, state and local regulations.

VARNISH PREPARATION The components should be formulated at 3 parts by weight Kerimid[®] 701 A N-70 to 1 part by weight Kerimid[®] 701 C to make the polyimide product. The product can be further diluted with one or more of the following solvents to the appropriate viscosity for the coating of the particular glass fabric style. The recommended solvents are:

1. Methyl Ethyl Ketone. (i.e.: MEK)
2. Propylene Glycol Methyl Ethyl Ether Acetate. (i.e.: PMA)
3. Gamma Butyro Lactone (GBL)

The varnish should be stirred until a homogenous solution has been achieved. Recommended dilution's are:

<u>Glass Style</u>	<u>Viscosity, cps</u>	<u>Zahn Cup # 2, seconds</u>	<u>Solids %</u>
Heavy Weight Glass (i.e.: 7628, 2116)	200 - 300	55 - 65	55 - 65
Light Weight Glass (i.e.: 1080, 106)	100 - 150	30 - 40	45 - 50

Note: The use of nitrogen solvents (i.e.: DMF & NMP) is not recommended.

PREPREGGING For optimum bonding between resin and glass, it is recommended that a glass fabric treated with a silane-sizing agent suitable for polyimide resins be used. Typical temperatures and residence times for impregnation are:

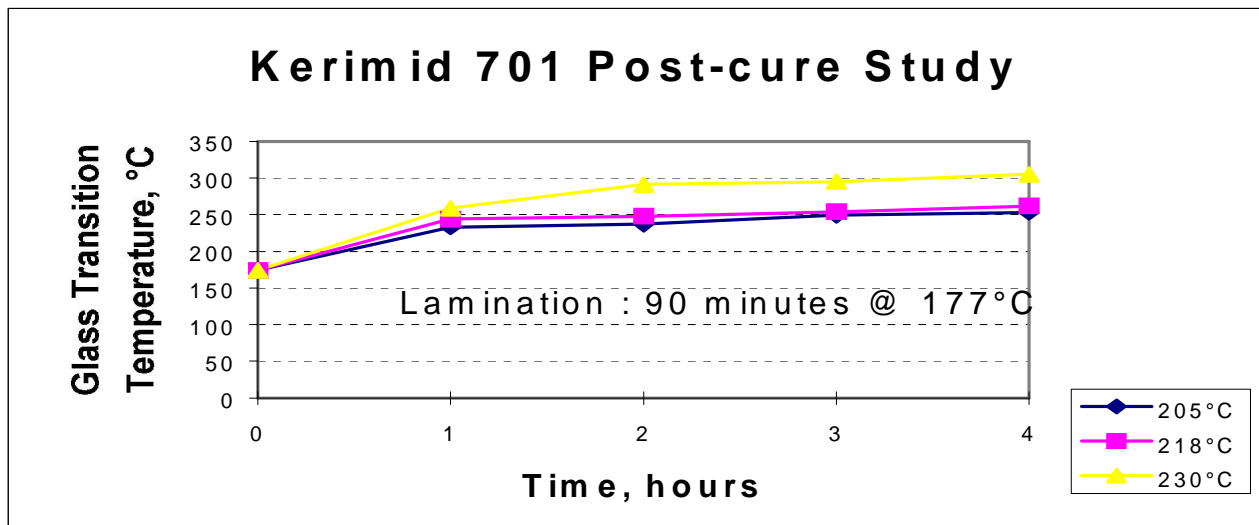
<u>Target Dust Gel @ 171°C, secs</u>	<u>Oven Temperature, °C</u>	<u>Residence Time, min</u>
60 - 70	160 - 180	2½ - 4½
90 - 110	160 - 180	1½ - 3½
130 - 150	160 - 180	1 - 2½

TYPICAL PREPREG PROPERTIES

Glass Cloth	7628
Finish	1642 (supplier: BGF)
Resin Content, %	35 - 42
Mil Flow, %	15 - 25
Volatiles, %	0.5 - 1.0

PREPREG RESIN RHEOLOGY	Lamination Sheet :	500 - 2000 poise minimum melt viscosity @ 140°C - 160°C
	Bond Sheet :	200 - 1000 poise minimum melt viscosity @ 140°C - 160°C

SUGGESTED LABORATORY PRESS CYCLE	Initial Press Temperature :	room temperature
	Heating Rate, °C (°F) / min :	3 - 5 (5 - 8)
	Pressure, psi :	50 - 100
	Final Press Temperature :	177°C (350°F)
	Time @ 177°C :	60 minutes
	Cool to :	< 30°C (100°F)
	Post-cure :	cure laminate to 250°C Tg



**TYPICAL LAMINATE
PROPERTIES**

All properties measured on 8 plies 7628 glass fabric laminate as per IPC TM13949, except for Flammability and Dielectric analysis.

<u>Thermal Properties</u>	<u>Test Instrument/Method</u>	<u>Value</u>
Glass Transition Temperature, °C	TMA	240 - 260
CTE / z axis, ppm 100°C → T _g	TMA	40 - 60
Decomposition, °C	TGA	380 - 390
Flammability	UL 94	V-0
<u>Chemical Properties</u>	<u>Test Instrument/Method</u>	<u>Value</u>
Water Absorption	24 hours	0.30 %
Methylene Chloride Absorption	1 hour	0.06 %
<u>Mechanical Properties</u>	<u>Test Instrument/Method</u>	<u>Value</u>
Copper Peel Strength, lbs./in Initial	Instron	7 - 8
After solder shock		7 - 8
@ 177°C		7 - 8
Storage Modulus, Kpsi DMA @ 30°C		3,807
@ 250°C		3,200
T _g , °C (inflection)		325
Flex Strength, Kpsi	Instron	63.3
Flex Modulus, Kpsi	Instron	3,100
<u>Electrical Properties</u>	<u>Test Instrument/Method</u>	<u>Value</u>
Dielectric Constant @ 1 MHz	Digibridge/CGTM	4.51
Dissipation Factor @ 1 MHz	Digibridge/CGTM	0.012

PACKAGING & STORAGE	This product is supplied in 450 pound drums. Limited storage stability data is available. The recommended storage condition for the Kerimid [®] 701 A N-70 material is 40°F in a closed container. Ambient temperature storage @ 70°F - 80°F is satisfactory for a short-term exposure of the material. Kerimid [®] 701 C can be stored @ room temperature.
HANDLING/SAFETY PRECAUTIONS	Kerimid[®] 701 A N-70: WARNING! FLAMMABLE LIQUID. Keep away from heat, sparks, or open flame. Can cause central nervous system depression. Kerimid[®] 701 A N-70 and Kerimid[®] 701 C: Can cause skin and eye irritation and dermatitis. Can cause allergic reactions. Avoid contact with eyes, skin and clothing. Avoid breathing vapor, mist or spray. Use only with good ventilation. Wash after handling. Keep away from heat, sparks and flames. Before Using Read Material Safety Data Sheet. For Industrial Use Only
FIRST AID	In case of contact: Eyes: Rinse immediately with water for at least 15 minutes. In the case of irritation, get medical attention. Skin: Wash with mild soap and water. Inhalation: Move affected person to fresh air. Give oxygen if breathing is difficult. Ingestion: If conscious, give water, but do not induce vomiting. Get immediate medical attention.

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