

Advanced Materials**Kerimid[®] 701 A N-70 and Kerimid[®] 701-1 B**

GENERAL	Kerimid [®] 701 A N-70 and Kerimid [®] 701-1 B are suitable for use in the manufacture of high performance multi-layer printed circuit boards.	
CHEMICAL DESCRIPTION	Kerimid [®] 701 is 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 [®] 701-1 B component which are mixed together to make Kerimid [®] 701.	
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[®] 701-1 B	
	Visual Appearance	clear, yellow liquid
	Solids %	43.5 - 45.5
	Viscosity @ 25°C (77°F), mPa s (cPs)	20 - 80

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

HAZARDOUS DECOMPOSITION PRODUCTS Kerimid[®] 701 A N-70 and Kerimid[®] 701-1 B - 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 Kerimid[®] 701 A N-70 component is stored under refrigerated conditions @ 40°F. The material should be warmed to 70°F - 80°F to facilitate easier discharge from the drum. We also recommend that both Kerimid[®] 701 A N-70 and Kerimid[®] 701-1 B be kept in closed containers when in storage, and / or, when not in use. This will prevent excess solvent loss during the manufacturing operations.

Kerimid[®] 701 components should be formulated at 3 parts by weight Kerimid[®] 701 A N-70 to 1 part by weight Kerimid[®] 701-1 B to make the Kerimid[®] 701 product. The Kerimid[®] 701 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 Butyl 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

TYPICAL LAMINATE PROPERTIES

All properties measured on 8 plies 7628 glass fabric laminate as per IPC TM13949.

<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 → Tg	TMA	40 - 60
Decomposition, °C	TGA	350 - 360
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	Instron	
Initial		7 - 8
After solder shock		7 - 8
@ 177°C		7 - 8
Storage Modulus, Kpsi DMA		
@ 30°C		3,807
@ 250°C		3,200
Tg, °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	4.50
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 [®] 701-1 B can be stored @ room temperature. For health and safety considerations see Material Safety Data Sheets.
HANDLING/SAFETY PRECAUTIONS	<p>Warning ! Flammable liquid. Can cause irritation and dermatitis. Can cause central nervous system depression.</p> <p>Keep away from heat, sparks and flames. Ground metal containers during transfer of liquid to avoid static sparks. Avoid breathing vapor, mist or spray. Avoid contact with eyes, skin, and clothing. Use only with good ventilation. Promptly remove contaminated clothing and wash before reuse.</p> <p>Before Using Read Material Safety Data Sheet. For Industrial Use Only.</p>
FIRST AID	<p>In case of contact :</p> <p>Eyes : Rinse immediately with water for at least 15 minutes. In the case of irritation, get medical attention.</p> <p>Skin : Wash with mild soap and water. Do not use organic solvents.</p> <p>Inhalation : Move affected person to fresh air. Give oxygen if breathing is difficult.</p> <p>Ingestion : If conscious, give water. Do not induce vomiting. Get immediate medical attention.</p>

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Main Offices :

Huntsman Corporation
10003 Woodloch Forest Dr.
The Woodlands
Texas 77380
(281) 719-6000

**Huntsman Advanced Technology
Center**
8600 Gosling Rd.
The Woodlands
Texas 77381
(281) 719-7400