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Advanced Materials

Araldite® LZ 8001 A-80

BROMINATED EPOXY RESIN SOLUTION

GENERAL

Araldite® LZ 8001 A-80 is a brominated epoxy resin solution that has been specially designed to meet the stringent requirements of the printed wiring board industry. It is suitable for use in the manufacture of rigid laminates, thin laminates and prepegs for multilayer printed wiring boards.

CHEMICAL DESCRIPTION

A brominated epoxy resin solution, which is 80% by weight solids in acetone

APPLICATIONS

Electrical grade laminates to meet the requirements of:

MIL-P-13949 Type GF
NEMA FR-4

ADVANTAGES

Tailored molecular weight distribution designed for enhanced wetting of glass cloth, controllable press flow and superior physical and thermal properties.
Superior humidity resistance as demonstrated by pressure cooker performance.
High copper peel strength.
Low hydrolyzable chlorine content for higher varnish reactivity.
New process to achieve consistent molecular weight distribution and hydrolyzable chlorine content.

TYPICAL PROPERTIES*

Visual Appearance	Clear, no contamination
Color, Gardner, max	2
Epoxy Value, eq./kg (solids)	2.17 - 2.44
Epoxy Equivalent, g/eq. (solids)	410 - 460
Viscosity @ 25°C (77°F), mPa s (cPs)	1200 - 2500
Solids content, %	79 - 81
Bromine content, % (solids)	18 - 21
Hydrolyzable chlorine, %	.02 - .05
Flash Point, Closed Cup, °C (°F)	<13 (<55)

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

FORMULATIONS

Araldite® LZ 8001 A-80 can be B-staged with conventional hardeners, e.g., dicyandiamide (DICY) to produce prepegs for use in manufacture of electrical laminates. Both benzyl dimethylamine (BDMA) and 2-methyl imidazole (2-MI) are suitable as accelerators for Araldite® LZ 8001 A-80/DICY system.

Formulation No.	**1**	**2**
	Parts by weight	
Araldite® LZ 8001 A-80	125	125
DICY	3	3
Ethylene glycol monomethyl ether	43	43
2-MI	0.1	-
BDMA	-	0.25

2-MI-based varnish systems generally provide a slightly higher Tg than BDMA-based systems. A multifunctional resin can be incorporated in these formulations to further enhance thermal and chemical resistance properties of resulting laminates. Several multifunctional resins, e.g., epoxy cresol novolacs, epoxy phenol novolacs and tetrafunctional resins are available from Vantico Inc. Please contact Vantico Inc. representative for any assistance on selection of such resins.

Ethylene glycol monomethyl ether used in dissolving DICY can be fully or partially replaced by other solvents, e.g., dimethyl formamide and propylene glycol monomethyl ether.

Laminate Properties	**Formulation 1**
Laminate thickness, in.	0.059
Laminate construction	8 plies 7628 style fabric
Laminate resin content, wt. %	40.0
Flexural strength @ 23°C, psi	
lengthwise	80,000
crosswise	66,000
Flexural modulus @ 23°C, psi	
lengthwise	2.93×10^6
crosswise	2.49×10^6
Peel strength, 1 oz. copper, lbs/in.	
before thermal stress	9 - 11
after thermal stress	9 - 11
Tg by DSC, °C	130
Flammability, UL-94	V - 0
Water absorption, after 24 hours, %	0.084
Methylene chloride absorption,	
after 10 minutes, %	0.8
Pressure cooker performance, 15 psi steam followed by 20 sec solder dip @ 550°F	passed 75 minutes

FORMULATIONS (CONTINUED)

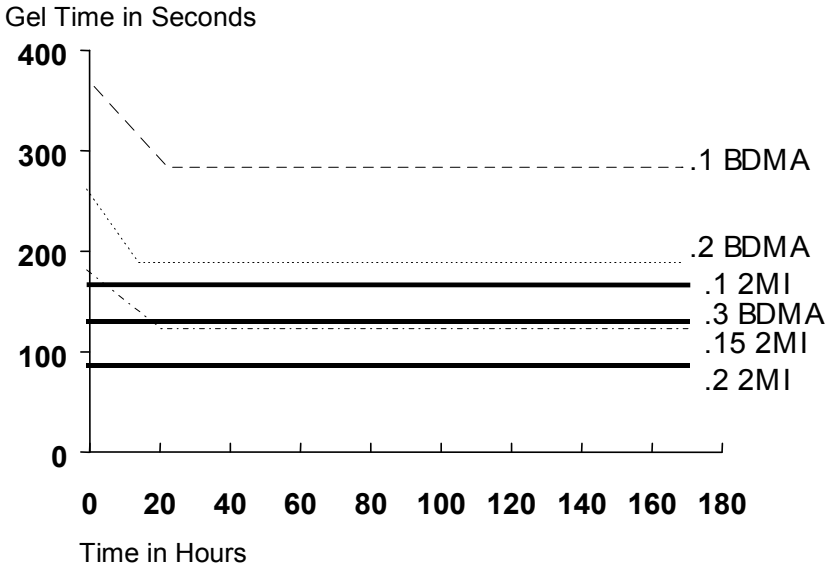
Electrical Properties	Formulation 1
Dielectric constant C-24 / 23 / 50 @ 1 megacycle	4.6
Dissipation factor C-24 / 23 / 50 @ 1 megacycle	0.02
Dielectric breakdown, KV, D-48 / 50	
500 V / sec.	61
stepped	66

Processing Data

The following figure illustrates the effect of accelerator type and concentration on gel time of varnish as measured by stroke cure. It can be seen that gel time of 2-MI-based varnishes does not significantly change with varnish age. BDMA-based varnishes, however, show an initial decline in gel time, which then levels off. In order to produce prepegs with predictable gel time, it is essential that BDMA-based varnish be aged until stable varnish gel time values are obtained.

Various treater parameters, e.g., oven temperatures, air-flow and web speed can be adjusted to yield prepegs with desired resin flow and gel time properties.

Araldite LZ 8001 A-80 SP Varnish Reactivity vs. Time



STORAGE

Araldite® LZ 8001 A-80 resin is supplied in 475 pound steel drums. This product should be stored in a dry place, in the sealed original container, away from heat and humidity, at temperatures between +5°C and +25°C (+41°F and +77°F). Under these storage conditions, the shelf life is 5 years. The product should not be exposed to direct sunlight.

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First Aid!
Refer to MSDS as mentioned above.

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