

# Leepoxy Plastics, Inc.

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## TECHNICAL BULLETIN LEECURE B-950

### Description

LEECURE B-950 is a proprietary Leepoxy Lewis acid epoxy curing agent based on boron trifluoride. It is the most reactive in a series of latent BF<sub>3</sub> catalysts that have been offered by Leepoxy since 1965. Its distinctive attribute is a long pot life, yet short cure in thin film or small mass at a relatively low cure temperature. At room temperature, Bisphenol A systems cured with B-950 have a work life of 6 hours before doubling in viscosity. However, Leecure B-950 activation temperature is a modest 80°C. Therefore, it can cure epoxy systems at a lower temperature in less time than more latent catalysts resulting in lower energy costs and higher product throughput.

LEECURE 950 is liquid at room temperature and is compatible with Bisphenol A, Bisphenol F, flexible, novolac and other multifunctional epoxy resins. Epoxy novolac resins are more reactive than Bisphenol A resins, while most flexibilized resins are less reactive. Cured systems offer exceptional water, chemical, and heat resistance, tensile strength, and electrical properties.

The excellent physical properties of LEECURE B-950 cured systems can be enhanced through the judicious choice of appropriate dry non-alkaline fillers. In unfilled systems, fracture, impact, and thermal shock resistance can be significantly

improved through the incorporation of flexibilized resins or toughening agents. For a longer pot life system without sacrificing any physical, chemical or electrical properties, either Leepoxy's LEECURE B-550 or LEECURE B-1550 should be considered.

LEECURE B-950 has found wide spread commercial applications. These include electrical-grade potting, windings, and reinforced composites for castings. Other advanced composite users include printed circuit board blanks; discreet components for aerospace, automotive, and sporting goods industries; corrosion resistant pipes and pipefittings; and high-pressure vessels.

When blended with Leepoxy's more latent LEECURE B-550, LEECURE B-950 is the vital catalyst in one-component liquid epoxies with lengthy work lives but short cure times. These one-part systems are often used as the liquid binder in reinforced sheet molding compounds, which can be B-staged, stored for weeks, then heat cured for the same applications listed above.

TYPICAL PROPERTIES	
Appearance	Brown liquid
Viscosity @ 25°C, cps.	22,000
Density, lbs/gal	10.0
Shelf Life, months	12

## **Handling and Mixing**

Keep LEECURE B-950 containers tightly sealed at all times. Use of dry nitrogen is recommended to protect partial containers from moisture/humidity contamination. The epoxy resin, fillers, and any other ingredients to be mixed should be moisture-free as well. Avoid alkaline fillers such as calcium carbonate. Fillers such as silica, barytes, glass, graphite, clays, and others that have a pH of 7 or lower are recommended. Mix very thoroughly in a dry mix vessel. No special equipment is necessary, but entrapment of excessive air bubbles should be avoided. Exposure to humidity in the air should be minimized from the time of mix until the product is ultimately heat cured because prolonged exposure to humidity may harm the reactivity, physical properties, and surface appearance of the LEECURE B-950 cured system.

<b>TYPICAL HANDLING PROPERTIES</b>	
Mix Ratio <sup>1</sup> , by weight, phr	5
Pot Life @ 25°C, 100 g, hours	6
Gel Time @ 80°C, 10 g, min.	11
Cure Time @ 135°C, thin film, min.	6
@ 150°C	2
@ 180°C	1

1 Mix ratio with Bisphenol A Resin (EEW=189)

## **Curing Conditions**

Epoxy compounds containing LEECURE B-950 should be cured so as to control the effects of the exothermic reaction. The optimum time and temperature will depend on the particular formulation and the mass of compound. Longer cure schedules may be needed when curing thin sections or where the epoxy is adjacent to a mass of material that will act as a heat sink. The

recommended minimum bondline cure temperature is 100°C. Generally, the higher the cure temperature, the better the heat resistance and physical properties of the cured systems.

Additives, modifiers, and diluents used in formulating epoxy compounds incorporating LEECURE B-950 may have a marked effect not only on the cure rate but also the final properties of the cured system. Diluents, fillers, and flexibilizers will generally increase pot life, gel time, and cure time.

<b>TYPICAL PERFORMANCE</b>	
Glass Transition Temperature, °C	132
Tensile Strength, psi	9,000
Modulus, psi	4.8 x 10 <sup>5</sup>
Tensile Elongation, %	4.1
Hardness, Shore D	90
Dielectric Constant, 1 MHz @ 25°C	3.8
Dissipation Factor, 1 MHz @ 25°C	0.014
Volume Resistivity, ohm-cm @ 25°C	1 x 10 <sup>14</sup>
@ 130°C	1 x 10 <sup>9</sup>
Dielectric Strength, v/mil	790

[100 parts Bisphenol A epoxy resin (EEW=189) and 5 parts LEECURE B-950]

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