

# Leepoxy Plastics, Inc.

3706 W. Ferguson Rd., Fort Wayne, IN 46809  
Phone (260) 747-7411 Fax: (260) 747-7413

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## TECHNICAL BULLETIN LEEBOND E30025-1 LOUD SPEAKER ADHESIVE

### Description

Since 1965, top-quality loudspeaker components have been assembled using Leepoxy's high-temperature-resistant structural adhesives. These epoxy adhesives are a proven method for rapid on-line assembly of speaker cone, spider, dome, and dust cap-to-voice coil at room or modestly elevated temperature. Concurrently, they provide excellent tonal quality and reliability the world over under the high temperature and high stress imposed by today's highest-powered loudspeakers.

LEEBOND loudspeaker adhesives bond tenaciously to the most commonly used materials for cones, spiders, domes, dust caps, voice coil, and other speaker components and maintain that bond integrity up to 400°F. Furthermore, they combine rigidity for accurate sound reproduction with enough flexibility to prevent tearing of the cone during use. In sum, these adhesives combine excellent mechanical properties with rapid cure allowing very efficient assembly-line production and immediate packaging of speakers once assembled.

LEEBOND E30025-1 is the thixotropic high-performance black epoxy resin component of the two-component epoxy system. Its thixotropy is specifically formulated not to sag or slump on the

vertical in a bead as thick as ¼ inch thick, even during heat cure as high as 350°F. When combined with any one of three highly reactive LEECURE B BF<sub>3</sub> curing agents, it forms a strong impact-resistant bond with exceptional heat resistance. The choice of three LEECURE B BF<sub>3</sub> catalysts allows fine-tuning the adhesive to a specific work life/cure time requirement to accommodate any practical assembly line speed (See Typical Handling Properties Table.)

LEEBOND E30025-1 resin is pigmented black for fast response to infrared heating.

### TYPICAL PROPERTIES LEEBOND E30025-1

Appearance	Black viscous liquid
Thixotropy @ 25°C, cps	350,000
Viscosity @ 25°C, cps	55,000
Density, pounds/gallon	9.0
Shelf life, months	12

### Handling and Mixing

For a good strong bond, the surfaces of the speaker components to be bonded must be clean and free of mold release agents, moisture, dust, and other foreign materials.

Once LEEBOND E30025-1 resin is thoroughly blended with the LEECURE BF<sub>3</sub> catalyst of choice, the adhesive should be applied at once to one of the substrates being bonded. For high throughput bonding operations cured with any of the three LEECURE B catalysts, automatic meter-mix equipment with static mixers is a practical necessity.

<b>TYPICAL HANDLING PROPERTIES</b>			
	B-612	B-614	B-1310
Mix Ratio <sup>1</sup> , phr	10	10	10
Gel Time @ 25°C, 11 g, min	1.2	12	25
Static Mixer Life @ 25°C, minutes	4	20	50
Cure Time @ 25°C, 1/8 inch bead, sec.	180	---	---
Cure Time @ 66°C, seconds	20	60	90
Hardness, Shore D	>85	>85	>85

<sup>1</sup> Use level of LEECURE BF<sub>3</sub> hardener with LEEBOND E30025-1 resin

### **Cure**

Once the adhesive is applied, the parts should be joined under pressure to assure intimate surface contact and sufficient wet-out throughout the bondline, and then cured immediately. If the uncured adhesive is exposed to humidity for extended periods, the BF<sub>3</sub> catalyst may become partially deactivated. In such cases, the reactivity, performance properties, and cured cosmetics of the epoxy system will be irreversibly jeopardized.

In automated or semi-automated high throughput, on-line assembly operations,

the fixtured speaker component assembly is placed on a conveyor for consistently timed passage under a heat source such as a quartz lamp, radiant heater or infrared lamp. Under proper processing conditions, when the bonded part emerges, the adhesive should be fully cured so that the speaker assembly can be further processed or power-tested without delay.

Cure time can vary from 15 seconds up to three minutes and will be determined by what line speed is desired or needed. Judicious selection of LEECURE B hardener, type and length of heat source, heat source temperature, and distance of bondline from the heat source should produce timely cure with respect to any viable assembly line speed.

See Typical Handling Properties table for minimum bondline temperatures necessary to achieve cure. It is possible to cure LEECURE B-612-cured systems at 77°F bondline temperature. However, LEECURE B-614 and B-1310-cured systems require at least a 150°F bondline temperature for 60 and 90 seconds respectively for consistent full cure. Higher temperatures will produce faster cures, but they should not be so high as to preclude sufficient surface wet-out of the mated components or to cause out-gassing in the ungelled epoxy bead. Ramp curing may be an attractive option to expedite both gel and cure where achieving fastest assembly line speeds is critical.

See the “Epoxy Adhesives for Small Part On-Line Assembly” Technical Bulletin on Leepoxy’s Website for further information regarding adhesives, on-line processing, and enhanced performance properties through post-curing.

The Information contained herein is correct to the best of our knowledge. The recommendations or suggestions contained in this bulletin are made without guarantee or representation as to results. We suggest that you evaluate these recommendations and suggestions in your own laboratory prior to use. Our responsibility for claims arising from breach of warranty, negligence or otherwise is limited to the purchase price of the material. Freedom to use any patent owned by Leepoxy Plastics, Inc. or others is not to be inferred from any statement contained herein.  
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