



# Scotch-Weld™

## Flexible Epoxy Adhesive LSB90

Preliminary Technical Data Sheet

February 2012

### Product Description

3M™ Scotch-Weld™ Epoxy Adhesive LSB90 is a high performance, two-part, flexible epoxy adhesive offering high shear and peel adhesion and very high levels of durability. It has a 90 minute worklife, and is a 1:1 mix ratio product. Ideal for bulk application through meter mix dispensing equipment.

### Features

- Flexible
- High peel and shear
- 10 hour handling strength
- Easy Mixing
- 90 minute work life
- 1:1 mix ratio

**NOTE: This material is currently under development and is subject to change or cancellation. The following data is taken from tests conducted on limited production runs. 3M will continue to test samples from additional product runs and will issue a new data page if the test results change.**

### Typical Uncured Physical Properties

**Note: the following technical information and data should be considered representative or typical only and should not be used for specification purposes.**

Product		Scotch-Weld™ Epoxy Adhesive LSB90
Color	Base Accelerator	Off-white Off-white
Net Weight (lbs./gallon)	Base Accelerator	10.4 10.2
Viscosity <sup>1</sup> @ 73°F (23°C)	Base Accelerator	22,000 7000
Base Resin		Epoxy/Amine
Mix Ratio (B:A)	By volume By weight	1:1 1:1
Work Life <sup>2</sup> @ 73°F (23°C)	Nozzle mixed	90 minutes
Time to Handling Strength <sup>3</sup>		10 hours

1. Brookfield RVF Viscometer, #7 spindle at 20 rpm at 80°F

2. Approximate time during which material can remain in a mixer nozzle and still be expelled without undue force on the applicator.

3. Time to achieve approximate 50 psi of Overlap Shear Strength (OLS) when cured at 73°F (23°C).

**Note:** The data in this sheet were generated using the 3M™ EPX™ Applicator System equipped with an EPX static mixer, according to manufacturer's directions. Thorough hand-mixing will afford comparable results

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## Typical Cured Properties

**Note: the following technical information and data should be considered representative or typical only and should not be used for specification purposes.**

Product	Scotch-Weld™ Epoxy Adhesive LSB90
Color	Off-white
Full Cure Time	7 days @ 73°F (23°C)
Shore D Hardness	35-40

## Typical Adhesive Performance Characteristics

**Note: the following technical information and data should be considered representative or typical only and should not be used for specification purposes.**

### Overlap Shear, (OLS) to Various Substrates (PSI) (ASTM D1002)

Substrate	Scotch-Weld™ Epoxy Adhesive LSB90
Aluminum - Anodized	2700 CF
Aluminum – MEK/abrade/MEK	1700 AF/CF
CRS – MEK/abrade/MEK	1500 AF/CF
PVC (IPA/abrade/IPA)	1200 CF/SF
FRP (red) (IPA/abrade/IPA)	1300 SF
HIPS (IPA/abrade/IPA)	270 AF
Wood (Fir) (dry wipe)	1600 SF

AF: adhesive failure CF: cohesive failure SF: substrate failure

### Bell Peel Adhesion (PIW) at 75°F (ASTM D3167)

	Scotch-Weld™ Epoxy Adhesive LSB90
Aluminum – etched	60 CF

AF: adhesive failure CF: cohesive failure SF: substrate failure

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## Typical Adhesive Performance Characteristics (continued)

### Aluminum, etched, Overlap Shear Retention (PSI) (ASTM D1002)

Environmental Condition (30 day dwell in condition)	Scotch-Weld™ Toughened Epoxy Adhesive LSB90
73°F (23°C)	2800 CF
Water soak at 73°F (23°C)	2220 CF
150°F (65°C)/80% Relative Humidity	1840 CF
Bleach Solution (10% household Bleach in water)	1830 CF
Gasoline soak at 73°F (23°C)	160 AF

AF: adhesive failure CF: cohesive failure SF: substrate failure

### Aluminum, Overlap Shear, at Temperature (PSI) (ASTM D1002)

Temperature	Scotch-Weld™ Epoxy Adhesive LSB90
-67°F (-55°C)	3700 CF
73°F (23°C)	2700 CF
180°F (82°C) (4 hr) <sup>1</sup>	430 AF

AF: adhesive failure CF: cohesive failure SF: substrate failure

<sup>1</sup> Represents time in test chamber oven before test.

## Substrates And Testing

### Overlap Shear (ASTM D1002)

Overlap Shear (ASTM D-1002, 3M Test Method C-236) strength was measured on 1" wide X ½" overlap specimen. These bonds were made individually using 1" X 4" pieces of substrates except for Aluminum. Two panels 0.063 in. thick, 4 in. x 7y in of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The thickness of the adhesive bond line was approximately 0.005". All strengths were measured at 73°F (23°C) except when noted,

The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125in.; plastics, 0.125 in.

and samples were allowed to cure at 75°F and approximately 50% RH for 1 week before tested. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.

#### A. Bell Peel

Bell peel strengths were measured on 1 in. wide bonds at the temperatures noted. The testing jaw separation rate was 6 in. per minute. The bonds were made with 0.065 in. bonded to 0.020 in. thick adherends.

#### B. Cure Cycle

With the exception of Rate of Strength Build-Up Tests, all bonds were cured 7 days at 73°F (23°C) at 50% RH before testing or subjected to further conditioning or environmental aging.

## Directions For Use

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- For highest strength structural bonds, paint, oxide films, oils, dust, mold release agents and all other surface contaminants must be completely removed. The amount of surface preparation depends on the required bond strength, environmental aging resistance desired by user. For suggested surface preparations on common substrates, see the section on surface preparation.
- Mixing

#### For Duo-Pak Cartridges

3M™ Scotch-Weld™ Flexible Epoxy Adhesive LSB90 is supplied in a dual syringe, plastic duo-pak cartridge as part of the 3M™ EPX™ Applicator System. To use, simply insert the duo-pak cartridge into the EPX applicator and start the plunger into the cylinders using light pressure on the trigger. Next, remove the duo-pak cartridge cap and expel a small amount of adhesive to be sure both sides of the duo-pak cartridge are flowing evenly and freely. If automatic mixing of Part A and part B is

## Flexible Epoxy Adhesive LSB90

### Directions For Use (continued)

desired, attach the EPX mixing nozzle to the duo-pak cartridge and begin dispensing the adhesive. For hand mixing, expel the desired amount of adhesive and mix thoroughly. Mix approximately 15 seconds after a uniform color is obtained.

#### For Bulk Containers

Mix thoroughly by weight or volume in the proportions specified on the product label or in the typical uncured properties section. Mix approximately 15 seconds after a uniform color is obtained.

3. For maximum bond strength, apply adhesive evenly to both surfaces to be joined.
4. Application to the substrates should be made within 60-90 minutes. Larger quantities and/or higher temperatures will reduce this working time.
5. Join the adhesive coated surfaces and allow to cure at 60°F (16°C) or above until completely firm. Heat up to 120°F - 150°F (49°C - 66°C) will speed curing.
6. Keep parts from moving during cure. Apply contact pressure if necessary. Maximum shear strength is obtained with a 3-5 mil bond line.
7. Excess uncured adhesive can be cleaned up with ketone type solvents\*.

**\*Note:** when using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer's precautions and directions for use.

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### Surface Preparation

3M™ Scotch-Weld™ Flexible Epoxy Adhesive LSB90 is designed to be used on metal, wood and some plastic surfaces. For high strength structural bonds, paint, oxide films, oils, dust, mold release agents and all other surface contaminants must be completely removed. The amount of surface preparation depends on the required bond strength, environmental aging resistance desired by the user. The following cleaning methods are suggested for common surfaces:

#### Steel:

1. Wipe free of dust with oil-free solvent such as acetone or isopropyl alcohol solvents\*.
2. Sandblast or abrade using clean fine grit abrasives.
3. Wipe again with solvent to remove loose particles\*.
4. If a primer is used, it should be applied within 4 hours after surface preparation.

#### Aluminum:

1. Wipe free of dust with oil-free solvent such as acetone or isopropyl alcohol solvents\*.
2. Sandblast or abrade using clean fine grit abrasives
3. Wipe again with oil-free solvent such as acetone or isopropyl alcohol solvents\*

#### Plastics/Rubber:

1. Wipe with isopropyl alcohol\*.
2. Abrade using fine grit abrasives.
3. Wipe with isopropyl alcohol\*

#### Glass:

1. Solvent wipe surface using acetone or MEK\*.
2. Apply a thin coating (0.0001 in. or less) of 3M™ Scotch-Weld™ Metal Primer EC3901 to the glass surfaces to be bonded and allow the primer to dry before bonding.

**\*Note:** When using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer's precautions and directions for use.

# 3M Scotch-Weld™

## Flexible Epoxy Adhesive LSB90

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**Storage** Store products at 60-80°F (15-27°C) or refrigerate for maximum shelf life.

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**Shelf Life** 3M™ Scotch-Weld™ Flexible Epoxy Adhesive LSB90 has a shelf life of 24 months in unopened original containers kept at recommended storage conditions.

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**Precautionary Information** Refer to Product Label and Material Safety Data Sheet for health and safety information before using this product. For additional health and safety information, call 1-800-364-3577 or 651-737-6501.

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**For Additional Information** To request additional product information or to arrange for sales assistance, call toll free 1-800-362-3550 or visit [www.3M.com/adhesives](http://www.3M.com/adhesives). Address correspondence to 3M Industrial Adhesives and Tapes Division, Building 21-1W-10, 900 Bush Avenue, St. Paul, MN 55144-1000. Our fax number is 651-778-4244. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-787-750-3000. In Mexico, phone: 52-70-04-00.

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**Technical Information** The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

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**Product Use** Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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