

LORD® 305 Epoxy Adhesive

Description

LORD® 305 adhesive is a general purpose, medium viscosity, two-component epoxy adhesive system used for applications that require strong, durable, chemically and environmentally resistant bonds. This adhesive system provides excellent adhesion to prepared metals, fiberglass reinforced plastics (FRP), phenolic, wood, prepared rubber and other materials. It is also used to bond cured rubber to itself and rubber to metal, including gaskets, bushings, shock-absorbing devices and rubber rolls. LORD 305 adhesive can be either room temperature cured or heat cured for faster processing.

Features and Benefits

Durable – provides load bearing properties equal to or greater than the materials being bonded.

Environmentally Friendly – contains no solvent, nonflammable and virtually odorless.

Environmentally Resistant – resists moisture, sunlight and weathering.

Temperature Resistant – performs at temperatures from -30 to +250°F (-34 to +121°C)

Chemically Resistant – resists dilute acids, alkalis, solvents, greases and oils.

Excellent Engineering Properties – provides low shrinkage, good creep properties and low water absorption.

Application

Surface Preparation – Remove soil, grease, oil, fingerprints, dust, mold release agents, rust and other contaminants from the surfaces to be bonded by solvent degreasing or alkaline cleaning.

On metal surfaces which are free of oxidation, use an isopropyl alcohol wipe. If necessary, use an abrasive material to remove tarnish. Always follow abrasion by a second cleaning to ensure removal of loose particles.

When bonding cured rubber, allow LORD 7701 adhesion enhancer/surface modifier to flash off before applying LORD 305 adhesive. Prime glass and ceramic surfaces with LORD AP-134 adhesion enhancer/surface modifier to promote adhesion.

Handle prepared surfaces carefully to avoid contamination. Assemble as soon as possible.

Typical Properties*

	305-1 Resin	305-2 Hardener
Appearance	Clear Amber Liquid	Blue Heavy Liquid
Viscosity, cP @ 77°F (25°C) Brookfield HBF Spindle 2, 10 rpm	10,000-18,000	20,000-45,000
Density		
lb/gal	9.4-10.0	7.75-8.35
(kg/m ³)	(1126-1198)	(928-1001)
Flash Point (Closed Cup), °F (°C)	>200 (>93)	>200 (>93)

*Data is typical and not to be used for specification purposes.

LORD TECHNICAL DATA

Mixing – Thoroughly mix the proper amount of resin and hardener until uniform in color and consistency. Be careful not to whip excessive air into the adhesive system. Handheld cartridges will automatically dispense the correct volumetric ratio of each component.

Heat buildup due to an exothermic reaction between the two components will shorten the working time of the adhesive. Mixing smaller quantities will minimize heat buildup. Do not use any adhesive that has begun to cure.

Applying – Apply the mixed adhesive to bond surfaces using automatic meter/mix/dispense equipment, handheld cartridges or any convenient tool such as a stiff brush, spatula or trowel. For general use, a film thickness of approximately 0.02 inch (0.51 mm) is recommended. To control bondline thickness, a small amount of solid glass beads can be added into the mixed adhesive.

Join the parts in such a way as to avoid entrapped air. Apply only enough pressure to ensure good wetting of the adhesive on both surfaces. Squeezing a little adhesive out at the edges is usually a sign of proper assembly. It is not necessary to clamp the assembly unless movement during adhesive cure is likely.

Maximum adhesion will occur only with parts which mate well without the need for excessive clamping pressure during cure. Excessive clamping may squeeze too much adhesive from the bond area which can result in a poor bond.

Curing – LORD 305 adhesive will cure to full strength in 24-48 hours, provided that the adhesive, substrates and ambient temperature are 65°F (18°C) or higher.

Higher temperatures will provide faster cure times; however, the bondline temperature should not exceed 325°F (162°C). Elevated temperature cure produces the highest bond strengths and impact resistance. Firm recommendations of cure times and temperatures depend on material composition and heating methods.

Once the adhesive has cured, it can be filed, sanded, machined or otherwise handled in the same way as a light metal. Paint, lacquers, enamels and other coatings can be applied to cured adhesive.

Typical Properties* of Resin Mixed with Hardener

Mix Ratio, Resin to Hardener

General Purpose, -30 to 250°F (-34 to 121°C)

Mixed Stress Joint Design

by Volume 1:1
by Weight 1.2:1

High Temperature, 50-250°F (10-121°C)

Shear Stress Joint Design

by Volume 2:1
by Weight 2.4:1

Low Temperature, -40 to 100°F (-40 to 38°C)

Peel Stress Joint Design

by Volume 1:2
by Weight 1:1.7

Solids Content, %

100

Working Time, hr @ 75°F (24°C)

1-2

54 g mass

Time to Handling Strength, hr

8-16

Mixed Appearance

Blue Liquid

Cured Appearance

Translucent Blue

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LORD TECHNICAL DATA

Typical Cured Properties

Tensile Strength at Break, psi (MPa) ASTM D882-83A, modified	2490 (17.2)
Elongation, % ASTM D882-83A, modified	31
Young's Modulus, psi (MPa) ASTM D882-83A, modified	108,500 (748)
Glass Transition Temperature, °F (°C) ASTM E1640-99, by DMA	141 (61)

Bond Performance

Substrates	Cold Rolled Steel to Cold Rolled Steel Lap Shear psi (MPa)	Aluminum to Aluminum Lap Shear psi (MPa)	SMC to SMC Lap Shear psi (MPa)	Natural Rubber to Cold Rolled Steel 45° Peel pli (N/mm)	SBR to SBR T-Peel pli (N/mm)
Test @ Room Temperature Failure Mode	2240 (15.4) A	1890 (13.0) 36C/A	820 (5.6) FT	37 (6.5) 58R/A	84 (14.7) R
Test @ Hot Strength, 180°F (82°C) Failure Mode	1100 (7.6) A	1040 (7.2) A	490 (3.4) 13FT/A	24 (4.2) 44R/A	—
Test after 7 days in H ₂ O @ 130°F (54°C) Test after 24 hours Failure Mode	2630 (18.1) A	1840 (12.7) A	600 (4.1) FT	33 (5.8) 13R/A	83 (14.5) SB
Test after 14 days Salt Spray Exposure Test Immediately Failure Mode	2500 (17.2) A	1790 (12.3) A	610 (4.2) 100FT	—	110 (19.3) 83R/SB
Test after 14 days @ 100°F (38°C), 100% RH Test Immediately Failure Mode	2740 (18.9) A	2010 (13.8) A	660 (4.5) FT	41 (7.2) 50R/A	94 (16.5) 83R/SB
Test @ -30°F (-34°C) Failure Mode	2490 (17.1) A	1600 (11.0) A	720 (5.0) FT	60 (10.5) 85R/A	78 (13.6) R

Substrate

Cold Rolled Steel and Aluminum
Sheet Molding Compound (SMC)
Styrene Butadiene Rubber (SBR)
Natural Rubber

Surface Treatment

MEK Wipe, Grit Blast, MEK Wipe
320-grit Sandpaper, Dry Rag Wipe
Primed with LORD 7701 Surface Treatment
Primed with LORD 7701 Surface Treatment

Bonded Parameters

Bonded Parameters	Bond Area	Film Thickness	Cure	Mix Ratio
Metal Lap Shears	1.0"x0.5"	0.010"	72 hr @ RT	1:1 by Weight
SMC Lap Shears	1.0"x1.0"	0.030"	72 hr @ RT	1:1 by Weight
T-Peels	1.0"x3.0"	0.020"	72 hr @ RT	1:1 by Weight
45° Peels	1.0"x1.0"	0.020"	72 hr @ RT	1:1 by Weight

Failure Mode Definition

Failure Mode Definition	Abbreviation
Adhesive Failure	A
Cohesive Failure	C
Fiber Tear	FT
Rubber Failure	R
Stock Break	SB

LORD TECHNICAL DATA

Cleanup – Clean excess adhesive on the bonded assembly, as well as the equipment, prior to the adhesive cure with hot water and detergent or an organic solvent such as ketones. Once adhesive has cured, heat the adhesive to 400°F (204°C) or above to soften the cured adhesive. This allows the parts to be separated and the adhesive to be more easily removed. Some success may be achieved with commercial epoxy strippers.

Shelf Life/Storage

Shelf life is two years from date of manufacture when stored at 40-80°F (4-27°C) in original, unopened container.

Cautionary Information

Before using this or any LORD product, refer to the Material Safety Data Sheet (MSDS) and label for safe use and handling instructions.

For industrial/commercial use only. Must be applied by trained personnel only. Not to be used in household applications. Not for consumer use.

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