



306

General Purpose, High Viscosity, Two-Part, Epoxy Adhesive

Description

Lord® 306 is a general purpose, high viscosity, two-part epoxy adhesive used for applications that require gap filling or non-slumping characteristics on a vertical surface. The cured adhesive offers strong, durable, chemically and environmentally resistant bonds. Lord 306 adhesive conforms to MIL-A-24456(SHIPS), the military specification for bonding plastic vibration damping tiles.

Features and Benefits

Contains No Solvent - provides 100% solids content, nonflammable, and virtually odorless.

High Strength - provides load bearing properties equal to or greater than the materials being bonded in many cases.

Environmental Resistance - resists dilute acids, alkalis, solvents, fuels, greases, oils, moisture, sunlight, and weathering. Temperature resistant for Military Specification – Certifications to Mil-A-24456(SHIPS) are available if requested at the time of ordering.

Variable Cure - cures completely at room temperature or much more quickly at elevated temperatures. See graph on page 2.

Excellent Engineering Properties - provides low shrinkage, good creep properties, and low water absorption. For these and other engineering properties, see Table 3 on page 4.

Table 1: Typical Properties* of Uncured Lord 306 Adhesive

	Lord 306-1	Lord 306-2	Mixed
Appearance	Gray Paste	Off-White Paste	Gray Paste
Viscosity, cP @ 25°C (77°F) Brookfield HBF with Helipath at 1 rpm T-bar E	1.5 x10 x 10 ⁶ T-Bar Spindle E	5 - 20 x10 ⁵ T-Bar Spindle C	N/A
Density kg/m ³ lb/gal	1431 ± 3% 11.9 ± 3%	1054 ± 3% 8.8 ± 3%	N/A N/A
Flash Point (closed cup)	85°C (185°F)	>93°C (>200°F)	>93°C (>200°F)
Total Reactive Solids Content	100%	100%	100%
Working Time {54g mass @ 24°C (77°F)}	N/A	N/A	1 - 2 Hours
Handle Bonds	Temperature Dependent, See Graph on Page 2		
Mix Ratio per MIL-A-24456 (SHIPS)	5 Parts, by Wt.	3 Parts, by Wt.	N/A
General Purpose Mix Ratio	1 Part, by Wt.	1 Part, by Wt.	N/A
Shelf Life from Date of Shipment at 4°C - 32°C (40°F - 90°F), unopened container	2 Years	2 Years	N/A

*Note to be used for specification purposes

Surface Preparation

Remove soil, grease, oil, fingerprints, dust, mold release agents, rust, and other contaminants from substrate surfaces.

Vapor degrease or wipe the surfaces with a clean cloth soaked in an uncontaminated ketone or chlorinated solvent and allow to dry thoroughly. If a solvent cannot be used, substitute a detergent solution or, for metals only, a suitable alkaline degreasing agent following the manufacturer's instructions for use. Wear chemical resistant gloves.

Next, use an abrasive material to roughen the surfaces or remove tarnish if necessary. Abrasion should always be followed by a second degreasing which will ensure removal of loose particles.

Glass and ceramic surfaces that have been primed with Lord AP134 primer exhibit superior environmental resistance. Cured rubber should first be primed with Lord 7701 surface treatment. Prime metal surfaces with Lord 7714 primer.

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

Mixing

Nonautomated

Measure the resin and hardener components to meet the service temperature needs and joint design (see Table 2). Thoroughly mix the components until uniform in color and consistency. Be careful not to whip excessive air into the adhesive as it will weaken the cured film.

Heat buildup due to an exothermic reaction between the two components will shorten the potlife of the adhesive. Mixing smaller quantities or spreading the mixing operation over a large surface area will minimize heat buildup. Do not attempt to use any adhesive that has exhausted its potlife and has begun to set.

Automated

Lord 306 adhesive can be dispensed using conventional meter/mix/dispense equipment if the particular adhesive usage justifies the investment. Gear pumps are not recommended due to the high viscosity of this product.

Application

The mixed adhesive may be applied by spreading it on one or both of the surfaces to be bonded using any convenient tool such as a spatula, or notched trowel. As a general rule, a film thickness of approximately 20 one-thousandths of an inch (~0.020" or ~0.5 mm) is suggested. The addition of a small amount of solid glass beads to the mixed adhesive is a convenient way to control the thickness of the bondline.

Parts Assembly

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 set-up is likely. Excessive clamping pressure will create a poor bond.

Curing

The graph below shows suggested times versus temperatures for accelerating the cure of Lord 306 adhesive. Elevated temperature cures produce the highest bond strengths and impact resistance. Firm recommendations of cure times and temperatures are difficult because heat transmission varies considerably depending upon material composition and heating methods.

The adhesive will cure fully in 24 - 48 hours with handling strength in 8 - 16 hours, provided that the adhesive, substrates, and ambient temperature are 18°C (65°F) or higher.

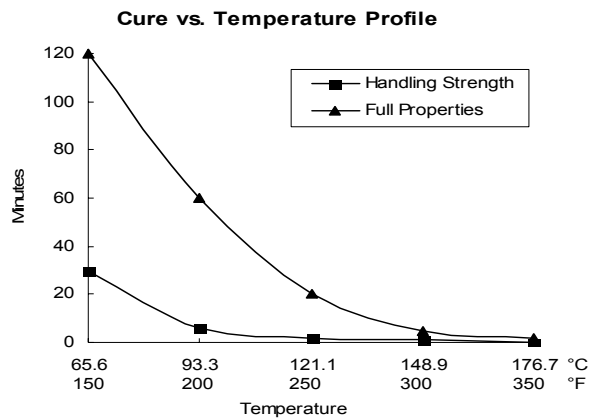


Table 2: Mix Ratios for Lord 306-1 Resin: Lord 306-2 Hardener

Service Temperature	High Temperature 10°C-121°C (50°F-250°F)	General Purpose -34°C-121°C (-30°F-250°F)	Low Temperature -40°C-38°C (-40°F-100°F)
Mix Ratio			
by Weight	2:1	1:1	1:2
by Volume	1.5:1	1:1.3	1:2.6
Joint Design	Shear Stress	Mixed Stress	Peel Stress

Table 3: Typical Properties of Cured Lord 306 Adhesive Mixed 1:1 by Weight, RT Cure*

	Values	Units	Test Method
Hardness	79	Shore D	Lord TM 23B
Tensile Strength at Break	4360	psi	ASTM D882-83A (mod)
Elongation at Break	10	%	ASTM D882-83A (mod)
Young's Modulus	146.070	psi	ASTM D882-83A (mod)
Water Absorption	0.43	%	ASTM D570-81 (24 hour immersion)
Glass Transition Temperature (T _g)	56 (133)	°C (°F)	ASTM E1640-99 (by DMA)
Coefficient of Thermal Expansion above T _g	268 x 10 ⁻⁶	mm/mm°C	Lord Internal Method (by DMA)

Table 4: Bond Performance Data

Substrates	Cold Rolled Steel to Cold Rolled Steel Lap Shear	Aluminum to Aluminum Lap Shear	SMC to SMC Lap Shear	Natural Rubber to Cold Rolled Steel 45° Peel	SBR to SBR T-Peel
Room Temperature	2790 psi A	2190 psi A	590 psi FT	50 lbs/in 65R/8C/A	113 lbs.in 34R/SB
Hot Strength at 85°C (180°F)	370 psi A	295 psi A	230 psi A	N/A	N/A
24 Hour Recovery After 7 Days in H ₂ O	3000 psi A	2900psi A	770 psi FT	28 lbs/in A	113 lbs./in R
14 Days Salt Spray Exposure, Test Immediately	2620 psi A	1950 psi A	885 psi 92FT/A	18 lbs./in. A	113 lbs/in 17R/SB
14 Days at 38°C (100°F), 100% Relative Humidity, Test Immediately	2070 psi A	1620 psi A	610 psi FT	30 lbs/in 50R/A	58 lbs/in 30R/SB/A
Test at -34°C (-30°F)	1550 psi A	920 psi A	580 psi FT	69 lbs 70R/10C/A	107 lbs 50R/C

	Substrate	Surface Treatment
Surface Preparations	Cold Rolled Steel and Aluminum Sheet Molded Compound (SMC) Styrene Butadiene Rubber (SBR) Natural Rubber	MEK Wipe, Grit Blast, MEK Wipe 320 Grit Sandpaper, Dry Rag Wipe Primed with Lord 7701 Primer Primed with Lord 7701 Primer

Bond Parameters	Bond Area	Film Thickness	Cure	Mix Ratio	
Metal Lap Shears	1.0"x0.5"	0.010"	72 hr. @ RT	1:1 by Weight	All values represent an average of 5 test samples.
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 Key

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

*All data is typical and not to be used for specification purposes. Physical properties may vary depending on mix ratio, degree of crosslink, and cure method as well as other parameters.

Table 5: Coverage Information

Square Coverage by Wet Film thickness					Linear Coverage by Bead Diameter					
Wet Film Thickness		Per Gallon		~ Gals. Required Per 1000 Sq. Ft. (93 Sq. M)	Bead Diameter		Per Gallon		Per Lord Pak CX	
mils	mm	Sq.Ft.	Sq. M		In.	mm	Ft.	M	Ft.	M
5	0.13	320	29.7	3.1	1/16	1.59	6100	1800	630	192
10	0.25	160	14.9	6.5	1/8	3.18	1500	457	160	48.7
20	0.51	80	7.4	12.5	3/16	4.76	690	210	68	20.7
30	0.76	52	4.8	20	1/4	6.35	375	114	38.5	11.7
31.25*	0.79	50	4.6	20	3/8	9.52	165	50	16	4.8
40	1.02	40	3.7	25	1/2	12.7	95	29	8.5	2.6
60	1.52	26	2.4	40	3/4	19.0	35	11	3.5	1.0
62.5**	1.59	25	2.3	40	7/8	22.2	30	9	2.5	0.7
125***	3.18	12	1.1	80	1	25.4	22	7	1	0.3

*1/32 in. **1/16 in. ***1/8 in. 1 mil = 0.001 inch All values are approximate; not for specification purposes.

Clean Up

Uncured Adhesive

It is important to clean up excess adhesive on the bonded assembly, as well as mixing and application equipment, before the adhesive sets up. Use hot water and detergent, or an organic solvent; ketones have been shown to work best.

Cured Adhesive

Removing cured Lord 306 adhesive is difficult because of its resistance to chemicals, solvents, and cleaning agents. Heating to 204°C (400°F) or greater will soften the adhesive, allowing the parts to be separated and the adhesive to be more easily removed. Some success may be achieved with commercial epoxy strippers.

Values stated in this bulletin represent typical values as not all tests are run on each lot of material produced. For formalized product specifications for specific product end uses, contact the Customer Service Department.

Information provided herein is based upon tests believed to be reliable. Inasmuch as Lord Corporation has no control over the manner in which others may use this information, it does not guarantee the results to be obtained. In addition, Lord Corporation does not guarantee the performance of the product or the results obtained from the use of the product or this information where the product has been repackaged by any third party including but not limited to any product end user. Nor does the company make any express or implied warranty of merchantability, or fitness for a particular purpose concerning the effects or results of such use.

Lord is a registered trademark of Lord Techmark, Inc., a subsidiary of Lord Corporation.
©Lord Corporation Printed in USA DS3372 (Rev. 2 4/04)

Subsequent Processing

After the adhesive has been cured, it may be filed, sanded, machined or otherwise handled in the same way as a light metal. Paints, lacquers, enamels, and other coatings may be applied without danger of solvent attack.

Values stated in this bulletin represent typical values as not all tests are run on each lot of material produced. For formalized product specifications for specific product end users, contact the Customer Service Department.

Packaging

- 1/2 Pint Container (0.24 Liter)
- 1 Gallon Container (3.8 Liter)
- 5 Gallon Pail (19 Liter)
- 55 Gallon Drum (208 Liter)

Storage

Ship and store Lord 306 adhesive in the original container between 4°C - 32°C (40°F - 90°F).

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.

For information, contact Bergdahl Associates, Inc.
2990 Sutro Street
Reno, Nevada 89512-1616
775-323-7542 fax 775-323-7595

