

CHEMLOK® 320/310-B BLACK EPOXY ADHESIVE

Technical Data Sheet

Chemlok® 320/310-B Black adhesive is a two-component epoxy adhesive system used to bond cured rubber treated with Chemlok 7701 surface treatment. This adhesive system also bonds metals and plastics, both thermosets and thermoplastics.

Features and Benefits

Fast Cure: rapidly cures when heated at 93-162°C (200-325°F).

Durable: provides good impact resistance down to -40°C (-40°F).

Environmentally Recommended: contains no solvent, nonflammable and virtually odorless.

Environmentally Resistant: resists humidity, salt spray and temperature extremes.

High Temperature Resistant: resists postbakes up to 204°C (400°F).

Chemically Resistant: solvent resistant when cured; anti-corrosion processes including phosphatizing and ELPO (e-coat) coatings do not affect the adhesive or its bond strength.

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 Chemlok 7701 surface treatment to flash off before applying Chemlok 320/310-B Black adhesive. Prime glass and ceramic surfaces with Chemlok AP-134 primer to promote adhesion.

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

Mixing: Mix Chemlok 320 resin with Chemlok 310-B Black hardener at a ratio of 1:1, by volume. Adhesive properties such as hardness and flexibility can be varied by changing the mix ratio.

Typical Properties*

	320 Resin	310-B Black Hardener
Appearance	Off-white Paste	Black Paste
Viscosity, cps @ 25°C (77°F) Brookfield HBF Helipath, 5 rpm	300,000 - 1,000,000	200,000 - 700,000
Density kg/m ³ (lb/gal)	1498 - 1546 (12.5 - 12.9)	1234 - 1318 (10.3 - 11.0)
Solids Content by Weight, %	100	100
Flash Point (Seta), °C (°F)	>93 (>200)	>93 (>200)

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

Thoroughly mix the components 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 in bead form. Use automatic meter/mix/dispense equipment for large applications. For small applications, use handheld cartridges or a disposable paper cone to apply the adhesive in a continuous bead. For general use, a film thickness of approximately 0.51-0.76 mm (0.02-0.03 inch) 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: Handling strength is achieved after curing for 6-8 hours at room temperature. Chemlok 320/310-B Black adhesive will cure to full strength in approximately 24 hours at room temperature.

Higher temperatures will provide faster cure times; however, the bondline temperature should not exceed 162°C (325°F). When heated at 66°C (150°F), full cure strength can be obtained in 2.5 hours; when heated at 93°C (200°F), full cure strength can be obtained in 25 minutes; when heated to 121°C (250°F), full cure strength can be obtained in 15 minutes. 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.

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.

Typical Properties* of Resin Mixed with Hardener

Mix Ratio, Resin to Hardener	
by Volume	1:1
by Weight	1:2.1
Solids Content, %	100
Working Time, hours	0.5-1
Time to Handling Strength, hours	6-8
Mixed Appearance	Black Paste
Cured Appearance	Black

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Bond Performance*

Substrates	CRS to CRS	AL to AL	SMC to SMC	NR to CRS	SBR to SBR
	Lap Shear, psi (MPa)	Lap Shear, psi (MPa)	Lap Shear, psi (MPa)	45° Peel, pli (N/mm)	T-Peel, pli (N/mm)
Test @ Room Temperature	3017 (20.8)	2258 (15.6)	583 (4.0)	45 (7.8)	28 (4.9)
Failure Mode	C	C	FT	C	A
Test @ Hot Strength, 82°C (180°F)	2252 (15.5)	2213 (15.3)	612 (4.2)	63 (11.1)	40 (7.0)
Failure Mode	C	C	FT	SF	SF/C
Test after 7 days in H ₂ O @ 54°C (130°F) Test after 24 hours	2759 (19.0)	2811 (19.4)	567 (3.9)	92 (16.2)	26 (4.5)
Failure Mode	C	C	FT	SF	A
Test after 14 days Salt Spray Exposure Test immediately	2574 (17.7)	2452 (16.9)	555 (3.8)	39 (6.8)	31 (5.4)
Failure Mode	C	C	FT	SF	SF/A
Test after 14 days @ 38°C (100°F), 100% RH Test immediately	3084 (21.3)	2594 (17.9)	542 (3.7)	42 (7.3)	30 (5.2)
Failure Mode	C	C	FT	SF	SF/A
Test @ -34°C (-30°F)	3225 (22.2)	2093 (14.4)	657 (4.5)	36 (6.3)	27 (4.7)
Failure Mode	C	C	FT	SF	A

Substrate

Surface Treatment

Cold Rolled Steel (CRS) and Aluminum (AL)	MEK Wipe, Grit Blast, MEK Wipe
Sheet Molded Compound (SMC)	320-grit Sandpaper, Dry Rag Wipe
Styrene Butadiene Rubber (SBR)	Primed with Chemlok 7701 Surface Treatment
Natural Rubber (NR)	Primed with Chemlok 7701 Surface Treatment

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

Failure Mode Definition

Abbreviation

Adhesive Failure	A
Cohesive Failure	C
Fiber Tear	FT
Sub Failure	SF

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Shelf Life/Storage

Shelf life is one year from date of shipment when stored by the recipient at 16-27°C (60-80°F) in original, unopened container.

Cautionary Information

Before using this or any Parker Lord product, refer to the Safety Data Sheet (SDS) 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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