

Selection & Specification Data

Generic Type	Cross-linked epoxy polymeric amine
Description	An all-purpose epoxy that has a variety of attributes including low-temperature cure, surface tolerance, fast recoat times, moisture tolerance during application and cure, and excellent corrosion protection. Carboguard 635 HAR can be used direct to metal as a corrosion resistant primer or as an intermediate coating over other primers. It is suitable for both maintenance and new construction projects due to its excellent surface wetting characteristics and quick cure for handling. It may also be used for immersion in fresh or salt water (marine) exposures. See also <i>marine-version data sheet</i> .
Features	<ul style="list-style-type: none"> ▪ Low temperature cure (20°F) ▪ Excellent corrosion protection ▪ Excellent application characteristics ▪ Fast recoat times ▪ Moisture tolerance during application ▪ Extended recoat window for atmospheric exposures (6 months for most topcoats) ▪ Meets VOC restrictions
Gloss	Satin
Color	Beige, Gray, Red, Black, and White
Primers	Self-Priming
Topcoats	Acrylics, Alkyds, Epoxies, Polyurethanes, Polysiloxanes
Dry Film Thickness	For most applications: 4.0-6.0 mils (100-150 microns) per coat. <i>Note: Thicknesses above this range may result in higher gloss appearance which can interfere with topcoat adhesion. Follow "Curing Schedule" notes to mitigate possible adhesion issues.</i>
Solids Content	Theoretical solids (mixed) by volume: SBV: 65 +/- 2%
Theoretical Coverage Rates	1042 mil ft ² (25 m ² /l at 25 microns) 260 sq. ft. at 4 mils (6.4 sq. m/l @ 100 microns) NOTE: Material losses during mixing and applications will vary and must be taken into consideration when estimating job requirements.
Dry Temp. Resistance	Continuous: 180°F (82°C) Non-Continuous: 220°F (104°C)
VOC Values (calculated)	As supplied: 2.47 lbs/gal (296 g/l) mixed Thinned: 10.5 oz/gal w/ #76: 2.79 lbs/gal (334 g/l) These are nominal values and may vary with color.
Limitations	Epoxies lose gloss, discolor and eventually chalk in sunlight exposure.

Substrates & Surface Preparation

General	Remove any oil or grease from surface to be coated with clean rags soaked in Carboline Thinner #2, or toluol. Concrete Do not apply coating unless concrete has cured at least 28 days @ 70°F (21°C) and 50% RH or equivalent.
Substrates	<p>Steel: For optimal performance: Hand Tool or Power Tool clean in accordance with SSPC-SP 2, SSPC-SP 3, or SSPC-SP 11 to produce a rust-scale free surface.</p> <p>For maximum performance: SSPC-SP 6 (or greater) with a 1½-2 mil (40-75 micron) blast profile.</p> <p>Concrete: Remove all loose, unsound concrete. Remove all oils or other non-compatible sealers or treatments. Consult Carboline Technical Service for more specific recommendations.</p>

Ordering Information

Prices may be obtained from Carboline Sales Representative or Main Office. Terms – Net 30 days.

Shipping Weight (approx)	1 Gal. Kit	5 Gal. Kit
	14 lbs.	65 lbs. (30 kg)

Application Equipment

Listed below are the general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Spray Application	Hold gun 12-14 inches from the surface and at a right angle to the surface.																										
Airless Spray	<table border="0"> <tr> <td>Pump Ratio:</td> <td>30:1 (min.)</td> </tr> <tr> <td>Volume:</td> <td>9.5 l/min min.</td> </tr> <tr> <td>Output:</td> <td>(2.5gpm min.)</td> </tr> <tr> <td>Material:</td> <td>905 mm min.</td> </tr> <tr> <td>Hose:</td> <td>(3/8" I.D. min.)</td> </tr> <tr> <td>Tip Size:</td> <td>0.43-0.53mm (0.017-0.021")</td> </tr> <tr> <td>Output:</td> <td>140-175kg/cm²</td> </tr> <tr> <td>Pressure:</td> <td>(2000-2500 psi)</td> </tr> </table> <p>Use a 3/8" minimum I.D. material hose The following spray equipment has been found suitable and is available from manufacturers such as Binks, DeVilbiss and Graco.</p> <table border="0"> <tr> <td>Mfr. & Gun</td> <td>Pump*</td> </tr> <tr> <td>Use either model below:</td> <td>Huskie</td> </tr> <tr> <td>Graco 207-300</td> <td>(DeVilbiss)</td> </tr> <tr> <td>Binks Model 520</td> <td>Bulldog 45:1</td> </tr> <tr> <td></td> <td>Jupiter 8D</td> </tr> </table> <p>*Teflon packings are recommended and available from pump manufacturer.</p>	Pump Ratio:	30:1 (min.)	Volume:	9.5 l/min min.	Output:	(2.5gpm min.)	Material:	905 mm min.	Hose:	(3/8" I.D. min.)	Tip Size:	0.43-0.53mm (0.017-0.021")	Output:	140-175kg/cm ²	Pressure:	(2000-2500 psi)	Mfr. & Gun	Pump*	Use either model below:	Huskie	Graco 207-300	(DeVilbiss)	Binks Model 520	Bulldog 45:1		Jupiter 8D
Pump Ratio:	30:1 (min.)																										
Volume:	9.5 l/min min.																										
Output:	(2.5gpm min.)																										
Material:	905 mm min.																										
Hose:	(3/8" I.D. min.)																										
Tip Size:	0.43-0.53mm (0.017-0.021")																										
Output:	140-175kg/cm ²																										
Pressure:	(2000-2500 psi)																										
Mfr. & Gun	Pump*																										
Use either model below:	Huskie																										
Graco 207-300	(DeVilbiss)																										
Binks Model 520	Bulldog 45:1																										
	Jupiter 8D																										

Carboguard 635 HAR

Conventional Spray Pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, .070" I.D. fluid tip and appropriate air cap.

Brush or Roller For applications over damp surfaces, brush and roller is the preferred method. Multiple coats may be required to obtain desired appearance, recommended dry film thickness, and adequate hiding. Avoid excessive re-brushing or re-rolling. For best results, tie-in within 10 minutes at 75°F (24°C). Use a short-nap synthetic roller cover with phenolic core.

Mixing & Thinning

Mixing Mix separately, then combine and mix in the following proportions (4:1 ratio):

	1 Gal. Kit	5 Gal. Kit
Part A	.8 gallon	4 gallon
Part B	.2 gallon	1 gallon

Thinning For atmospheric applications thin up to 8% by volume with Carboline Thinner #76 or 8% by volume per with Thinner #33 for brush and roller. For immersion, use Thinner #38E up to 8%.

Pot Life 3 hours at 75°F (24°C) and less at higher temperatures. Pot life ends when coating becomes too viscous to use.

Cleanup & Safety

Cleanup Use Thinner #2 or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.

Safety Read and follow all caution statements on this product data sheet and on the MSDS for this product. Employ normal workmanlike safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.

Ventilation When used as a tank lining or in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor levels, use MSHA/NIOSH approved supplied air respirator.

Caution This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be made and grounded in accordance with the National Electric Code. In areas where explosion hazards exist, workmen should be required to use non-ferrous tools and wear conductive and non-sparking shoes.

Application Conditions

<u>Condition</u>	<u>Material</u>	<u>Substrate</u>	<u>Ambient</u>	<u>RH</u>
Optimum	60°F– 75°F (16°C–24°C)	60°F-75°F (16°C-24°C)	60°F-75°F (16°C-24°C)	30-70%
Minimum	45°F (7°C)	20°F (-7°C)	20°F (-7°C)	0%
Maximum	90°F (32°C)	120°F (50°C)	100°F (35°C)	95%

Industry standards are for substrate temperatures to be above the dew point. Carboguard 635 HAR is unique in that it can tolerate damp substrates. See Brush or Roller above. Special thinning and application techniques may be required above or below normal conditions.

Curing Schedule

Non-Immersion Schedule

<u>Surface Temperature @ 50% RH</u>	<u>Dry to Handle</u>	<u>Dry to Topcoat Minimum</u>	<u>Dry to Topcoat Maximum</u>
20°F (-7°C)	36 hrs	24 hrs	180 Days
35°F (2°C)	16 hrs	2 hrs	180 Days
50°F (10°C)	10 hrs	1 hr	180 Days
75°F (24°C)	3 hrs	45 min	180 Days
90°F (32°C)	1.5 hrs	30 min	180 Days

Immersion Schedule – 635 HAR or Antifoulant Topcoat

<u>Surface Temperature @ 50% RH</u>	<u>Dry to Topcoat Minimum</u>	<u>Dry to Topcoat with Antifoulant Maximum*</u>	<u>Dry to Topcoat with 635 HAR* Maximum</u>
20°F (-7°C)	24 hrs	36 hrs	Up to 30 days; high temps and/or sunlight exposure may shorten this recoat schedule
35°F (2°C)	2 hrs	16 hrs	
50°F (10°C)	1 hr	8 hrs	
75°F (24°C)	45 min	4 hrs	
90°F (32°C)	30 min	3 hrs	

*These times are to be used as a guideline. The optimum time to topcoat with an antifoulant is when the 635 HAR is "touch-tacky". If the touch-tacky time has been exceeded, or if the film is "glossy", you can generally reprime/refresh the first coat of 635 HAR with a fresh coat of itself. The longer the first coat has to cure, particularly in sunlight exposure or elevated temps, the higher risk of inadequate adhesion. If those maximum recoat times have been exceeded, the surface must be abraded by sweep blasting or sanding prior to the application of additional coats. Contact your local Carboline Marine Representative for assistance/guidance.

Marine Use: Undocking time of 24 hours @75°F

The listed times in the chart above are based on a 4-6 mil (100-150 micron) dry film thickness per coat. Deviation from those thicknesses may compromise the performance and adhesive properties of the film. Higher film thickness, insufficient ventilation or cooler temperatures could result in solvent entrapment and premature failure. Excessive humidity or condensation on the surface during curing will not affect performance but may cause discoloration and result in a surface haze. Any haze or blush must be removed by water washing before recoating. If the maximum recoat times have been exceeded, the surface must be abraded by sweep blasting or sanding prior to the application of additional coats. For force curing, contact Carboline Technical Service for specific requirements. For application and cure conditions below 35°F, dehumidify before, during, and after application to prevent ice formation on the surface.

*Do not apply to substrates with ice or ice crystal formation. Dehumidify or raise the temperature to eliminate ice on the substrate.

Packaging, Handling & Storage

Flash Point (Setaflash)	Part A:	45°F (7°C)
	Part B:	80°F (15°C)
	Mixed:	88°F (31°C)
	Carboline Thinner 76	23°F (-5°C)

Storage (General) Store Indoors. **KEEP DRY**

40 -100°F (4°C-38°C)
0-95% Relative Humidity

Shelf Life	Part A	24 months at 76°F (24°C)
	Part B	24 months at 76°F (24°C)

*Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.



2150 Schuetz Rd., St. Louis, MO 63146
PH: 314-644-1000 Toll-Free: 800-848-4645
www.carboline.com

An **RPM** Company

June 2010 replaces January 2008 N

To the best of our knowledge the Technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. User must contact Carboline Company to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. We guarantee our products to conform to Carboline quality control. We assume no responsibility for coverage, performance or injuries resulting from use. Liability, if any, is limited to replacement of products. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY CARBOLINE, EXPRESS OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Carboline® and Carboxane® are registered trademarks of Carboline Company.