

SELECTION & SPECIFICATION DATA

Generic Type	Epoxy Phenalkamine
Designation	This is a product that Carboline is intending to drop from the product line. Please reach out to your Carboline Sales Representative for a product alternative.
Description	A highly abrasion resistant, all-purpose epoxy with a variety of attributes including low-temperature cure, surface tolerance, fast re-coat 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 particularly where abrasion resistance is needed. 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.
Features	<ul style="list-style-type: none"> • High abrasion resistance • Low temperature cure (20°F) • Excellent corrosion protection • Excellent application characteristics • Fast recoat times • Moisture tolerance during application • Continues to cure underwater • Extended recoat window for atmospheric exposures (6 months for most topcoats) • Meets VOC restrictions
Color	Black (C900), Red (0500)
Gloss	Satin
Primer	Self-Priming
Dry Film Thickness	4 - 6 mils (102 - 152 microns) per coat
Solids Content	By Volume 65% +/- 2%
Theoretical Coverage Rate	1043 ft²/gal at 1.0 mils (25.6 m²/l at 25 microns) 261 ft²/gal at 4.0 mils (6.4 m²/l at 100 microns) 174 ft²/gal at 6.0 mils (4.3 m²/l at 150 microns) Allow for loss in mixing and application.
VOC Values	Thinner 76 : (8%) 10.5oz/gal=2.79 lbs/gal (337 g/l) Thinner 248 : (8%) 10.5oz/gal=2.79 lbs/gal (337 g/l) As Supplied : 2.47 lbs/gal (296 g/l) mixed These are nominal values and may vary with color.
Dry Temp. Resistance	Continuous: 180°F (82°C) Non-Continuous: 220°F (104°C)
Limitations	Epoxies may lose gloss, discolor and chalk when exposed to sunlight.
Abrasion Resistance	55-65 mg loss (Tabor Abrasion Test using 1 kg weight, CS17 wheel and 1000 cycles)
Topcoats	May be coated with Acrylics, Epoxies, Alkyds, Polyurethanes or Polysiloxanes depending on exposure and need.

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.
Steel	Atmospheric exposures: For optimal performance, hand tool or power tool clean in accordance with SSPC-SP 2, SSPC-SP 3, SSPC-SP 15 or SSPC-SP 11 to produce a rust-scale free surface. For maximum performance clean to a minimum of SSPC-SP 6 with a 1 1/2 to 3 mil (40-75 micron) blast profile. Immersion service: Minimum of SSPC-SP 10 with 1 1/2 to 3 mil (40-75 micron) blast profile.
Concrete or CMU	Remove all loose, unsound concrete. Remove all oils or other non-compatible sealers or treatments. Consult Carboline Technical Service for more specific recommendations.

MIXING & THINNING

Mixing	Mix separately, then combine and mix in the following proportions (4:1 ratio): Part A: 1 Gal Kit: .8 gallon Part B: 1 Gal Kit: .2 gallon Part A: 5 Gal Kit: 4 gallon Part B: 5 Gal Kit: 1 gallon
Thinning	For atmospheric applications thin up to 8% by volume with Carboline Thinner 76 or Thinner 10, or 8% by volume with Thinner 33 for brush and roller. For immersion, use Thinner #38 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.

APPLICATION EQUIPMENT GUIDELINES

Listed below are 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 (General)	Hold gun 12-14 inches from the surface and at a right angle to the surface.
Conventional Spray	Pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, .070" I.D. fluid tip and appropriate air cap.

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Airless Spray	<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/cm² Pressure: (2000-2500 psi) 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> <p>Mfg. & Gun Use either model: Graco 207-300, Binks Model 520 Pump : Huskie, (DeVilbiss), Bulldog 45:1, Jupiter 8D *Teflon packings are recommended and available from pump manufacturer.</p>
Brush & Roller (General)	<p>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.</p>

APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	45°F (7°C)	20°F (-7°C)	20°F (-7°C)	0%
Maximum	90°F (32°C)	120°F (49°C)	100°F (38°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

Surface Temp.	Dry to Handle	Dry to Topcoat Minimum	Dry to Topcoat Maximum
20°F (-7°C)	36 Hours	24 Hours	180 Days
35°F (2°C)	16 Hours	2 Hours	180 Days
50°F (10°C)	10 Hours	1 Hour	180 Days
75°F (24°C)	3 Hours	45 Minutes	180 Days
90°F (32°C)	1.5 Hours	30 Minutes	180 Days

***These times are to be used as a guideline. The optimum time to topcoat with an antifoulant is when the 635 HAR is "tough-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.**

CURING SCHEDULE

Surface Temp.	Dry to Topcoat Minimum	Dry to Topcoat with Antifoulant Maximum	Dry to Topcoat Maximum
20°F (-7°C)	24 Hours	36 Hours	30 Days
35°F (2°C)	2 Hours	16 Hours	30 Days
50°F (10°C)	1 Hour	8 Hours	30 Days
75°F (24°C)	45 Minutes	4 Hours	30 Days
90°F (32°C)	30 Minutes	3 Hours	30 Days

The curing schedule above references curing times for immersion service when an antifoulant topcoat is used.

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.

*Do not apply to substrates with ice or ice crystal formation. Dehumidify or raise the temperature to eliminate ice on the substrate. This product will tolerate drops in temperature to 0°F (-17°C) during its cure and will continue to cure when the temperature rises. Follow "Cure for Service" guideline listed above to determine when the product is fully cured.

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 SDS 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, workers should be required to use non-ferrous tools and wear conductive and non-sparking shoes.

PACKAGING, HANDLING & STORAGE

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.
Storage Temperature & Humidity	Store Indoors. KEEP DRY 40 -100°F (4°C-38°C) 0-95% Relative Humidity

PACKAGING, HANDLING & STORAGE

Shipping Weight (Approximate)	5 Gal Kit - 65 lbs. (30 kg)
Flash Point (Setaflash)	Part A: 45°F (7°C) Part B: 80°F (27°C) Mixed: 88°F (31°C) Carboline Thinner 76: 23°F (-5°C)

WARRANTY

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 to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. Carboline warrants our products to be free of manufacturing defects in accord with applicable Carboline quality control procedures. THIS WARRANTY IS NOT VALID WHEN THE PRODUCT IS NOT: (1) APPLIED IN ACCORDANCE WITH CARBOLINE'S SPECIFICATIONS, AND/OR (2) PROPERLY STORED, CURED, AND USED UNDER NORMAL OPERATING CONDITIONS. Carboline assumes no responsibility for coverage, performance, injuries, or damages resulting from use of the product. If this product is found not to perform as specified upon inspection by a Carboline representative during the warranty period, Carboline's sole obligation, if any, is to replace the Carboline product(s) proven to be defective or refund the purchase price thereof, at Carboline's sole option. Carboline shall not be liable for any other losses or damages. This warranty excludes (1) labor and costs of labor for the application or removal of any product, and (2) any incidental or consequential damages, whether based on breach of express or implied warranty, negligence, strict liability or any other legal theory. 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. All of the trademarks referenced above are the property of Carboline International Corporation unless otherwise indicated. The whole text of this Product Data Sheet, as well as the documents derived from it, have been written in English, and for legal purposes the English version shall prevail.