Carboguard® 635 VOC

PRODUCT DATA SHEET

SELECTION & SPECIFICATION DATA

Generic Type	Cross-linked epoxy polymeric amine
Description	An all-purpose immersion-grade 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. It has low VOC and low HAP's content for use in areas with restricted volatile emissions. Can be used direct to metal as a corrosion resistant primer or as an intermediate coating over other primers. Suitable for both maintenance and new construction projects due to its excellent surface wetting characteristics and quick cure for handling. May also be used for immersion in potable water, fresh or salt water (marine) exposures.
Features	• 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) • Low VOC and low HAPs content • Certified by UL to meet the drinking water criteria of NSF/ANSI/CAN 600 • Meets IMO Performance Standard for Protective Coatings MSC.215(82): 2006 for sea water ballast tanks
Color	Black (0900), Grey (C705), Red (0500). Other limited colors available on request. For Potable water use: See Potable Water Certifications in Testing/Certification/Listing.
Gloss	Satin
Primer	Self-Priming
Dry Film Thickness	4 - 6 mils (102 - 152 microns) per coat DFT in excess of 8.0 mils per coat is not recommended.
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 Value(s)	Per EPA Method 24: 2.05 lbs/gal (246 g/l) Thinner 236 E (12 oz/gal): 2.05 lbs/gal (246 g/l) Thinner 242 E (12 oz/gal): 2.05 lbs/gal (246 g/l) Thinner 76 (12 oz/gal): 2.50 lbs/gal (300 g/l) These are nominal values and may vary slightly with color. Product contains VOC-exempt t-butyl acetate. Check local regulations regarding product usage.
Dry Temp. Resistance	Continuous: 180°F (82°C) Non-Continuous: 220°F (104°C)

SELECTION & SPECIFICATION DATA

Limitations	Epoxies may lose gloss, discolor and chalk when exposed to sunlight. Do not apply over latex coatings. For immersion projects use only factory made material in special colors. Consult Technical Service for specifics.

SUBSTRATES & SURFACE PREPARATION

General	Remove any oil or grease from surface to be coated with clean rags soaked in Carboline Thinner #2 or toluol.
Steel	Atmospheric Exposure: For optimal performance: Hand Tool or Power Tool clean in accordance with SSPC-SP 2, SSPC-SP 3, or SSPC-SP11 to produce a rust-scale free surface. For maximum performance: SSPC-SP 6 (or greater) with a 1½-3 mil (40-75 micron) blast profile. Immersion Service: Minimum near white metal cleanliness in accordance with SSPC-SP10.
Concrete or CMU	Remove all loose, unsound concrete. Remove all oils or other non-compatible sealers or treatments. Do not apply coating unless the concrete has cured at least 28 days @ 70 F (21 C) and 50% relative humidity or equivalent. Consult Carboline Technical Service for more specific recommendations.
Non-Ferrous Metals	Surface profile should be a dense angular 1.5 - 3 mils and is best achieved through abrasive blasting in accordance with SSPC-SP16 for atmospheric exposure, or SSPC-SP17 for immersion environments.

MIXING & THINNING

Mixing	Mix components separately, then combine and mix until homogenous.
Thinning	**Preferred Thinner Uses and Application:** For atmospheric applications thin up to 10% by volume with Carboline Thinner 242E, 236E, or 76. Use up to 10% with Thinner 33 for brush and roller. If thinning is desired for potable water applications, Thinner 76 must be used. **Alternate Compatible Thinners for Atmospheric Service:** Carboline Thinner 2, 10, 15, 76, 225E, 229, 236E, 243E, 248 and Plasite Thinner #19 or #20 Use of thinners other than those supplied or recommended by Carboline may adversely affect product performance and void product warranty, whether expressed or implied.
Ratio	4:1 (Part A: Part B)
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)	This is a high solids coating and may require adjustments in spray techniques. Wet film thickness is easily and quickly achieved. The following spray equipment has been found suitable and is available from manufacturers. Hold gun 12-14 inches from the surface and at a right angle to the surface.

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Conventional Spray	Pressure pot equipped with dual regulators, 3/8” I.D. minimum material hose, 0.070” I.D. fluid tip and appropriate air cap.
Airless Spray	Pump Ratio: 30:1 (min.) Volume Output: 2.5 gal/min (9.5 l/min) Material Hose: 3/8" I.D. min (905 mm) Tip Size: 0.017-0.021" (0.43-0.53 mm) Fluid Pressure: 2000-2500 psi (13.8-17.2 MPa) *PTFE packings are recommended and available from pump manufacturer.
Brush & Roller (General)	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.

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 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	Dry to Touch
20°F (-7°C)	36 Hours	24 Hours	180 Days	4 Hours
35°F (2°C)	18 Hours	2 Hours	180 Days	2 Hours
50°F (10°C)	11 Hours	1 Hour	180 Days	1 Hour
75°F (24°C)	3 Hours	45 Minutes	180 Days	30 Minutes
90°F (32°C)	1.5 Hours	30 Minutes	180 Days	15 Minutes

These times are to be used as a guideline for non-immersion applications. 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 Representative for assistance/guidance.
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. 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.

CURING SCHEDULE

Surface Temp.	Dry to Topcoat Minimum	Dry to Topcoat with Antifoulant Maximum	Dry to Topcoat with Itself
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.
The optimum time to topcoat with an antifoulant is when the film is "touch-tacky." If the touch-tacky time has been exceeded, or if the film is "glossy," you can generally re-prime/refresh the first coat with a fresh coat of itself. High temps and/or sunlight exposure may shorten this recoat schedule.
Marine Use: Undocking time of 24 hours @75°F

TESTING / CERTIFICATION / LISTING

Potable Water Certifications

Potable Water Use Limitations @ 75°F (24°C):
Meets drinking water criteria of NSF/ANSI/CAN 600
Max DFT: 16 mils (406.4 microns)
Coats: 1 to 2
Tank Rating: >40,000 gal (151416.47 Liters)
Pipe Rating: Not Rated
Valve Rating: 4" or larger (10.16 cm)
Thinning: Thinner 76 at 10% by volume
7 Day Cure Required before service
Approved Colors: 0700 (Grey), 0800 (White).
Special Order Colors: 0100 (Blue), 0200 (Tan), 0500 (Red)

CLEANUP & SAFETY

Cleanup
Use Thinner 2 or MEK. 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. 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)

PACKAGING, HANDLING & STORAGE

	*Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.
Storage Temperature & Humidity	40 -100°F (4°C-38°C) 0-95% Relative Humidity
Storage	Store Indoors. KEEP DRY
Shipping Weight (Approximate)	1 Gal Kit - 14 lbs (6.4 kg) 5 Gal Kit - 65 lbs (29.5 kg)
Flash Point (Setaflash)	Part A: 66°F (19°C) Part B: 80 °F (27°C) Mixed: 77°F (25°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 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, injuries or damages resulting from use. Carbolines sole obligation, if any, is to replace or refund the purchase price of the Carboline product(s) proven to be defective, at Carbolines option. Carboline shall not be liable for any loss or damage. 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.