product data carboline®

Carboguard® 690

Selection & Specification Data

Generic Type	Phenalkamine epoxy
Description	High performance, surface tolerant epoxy that has excellent resistance to water and wastewater exposures. This coating exhibits outstanding moisture tolerance during application, low temperature cure capability, and very fast cure response for quick return to service. Can be used on structural steel, piping, tankage, and equipment exposed to industrial or marine environments. It can also be used in immersion service for salt water, process water (non-potable) and waste water treatment projects; and is ideal for coatings under insulation on pipes up to 300°F(150°C).
Features	• High solids, low VOC • High build (16 mils) • Low temperature cure (20°F) • Excellent moisture tolerance during application • Fast cure response • Suitable for use in USDA inspected facilities
Color	Refer to Carboline Color Chart
Finish	Semi-Gloss
Primer	Self-Priming, Zinc-rich, or epoxies
Dry Film Thickness	5.0 - 8.0 mils (127 - 203 microns) per coat
Solids Content	By Volume 80% +/- 2%
Theoretical Coverage Rate	1283 ft^2 at 1.0 mils (31.5 m^2/l at 25 microns) 257 ft^2 at 5.0 mils (6.3 m^2/l at 125 microns) 160 ft^2 at 8.0 mils (3.9 m^2/l at 200 microns) Allow for loss in mixing and application.
Severe Exposures	Under insulation temperature resistance: Continuous: 300°F (149°C) Non-Continuous: 350°F (176°C) Discoloration occurs above 200 F (93 C) but does not affect performance. Discoloration occurs above 200°F(93°C) but does not affect performance.
VOC Values	Thinner 2 16* oz/gal 2.06 lbs/gal 248 g/l As Supplied 1.42 lbs/gal 170 g/l mixed These are nominal values and may vary with color.
Limitations	• Epoxies lose gloss, discolor and eventually chalk in sunlight exposure. Discoloration is more pronounced with this product. • For immersion projects use only factory made material in special colors. • This product has the ability to be applied over damp or even wet substrates. Remove excess water by blowing down the surface and apply in multiple coats to achieve desired film thickness. • Brush or roller, and multiple coats are preferred over wet substrates.

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Temperature Resistance (Immersion)	Immersion temperature resistance depends upon exposure (120°F maximum). Consult Carboline Technical Service for specific information. Linings exposed to cargos warmer than the outside steel temperature are subject to a "cold-wall' effect. The smaller the temperature differential, the less negative influence on performance.
Topcoats	May be coated with Acrylics, Epoxies, Alkyds, or Polyurethanes 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.
Steel	**Immersion:** SSPC-SP10; Surface Profile: 1.5-3.0 mils (38-75 microns) (See Limitations) **Non-Immersion:** SSPC-SP6; Surface Profile: 1.5-3.0 mils (38-75 microns) In certain situations hand tool or power tool cleaning (SSPC-SP2 or 3) is acceptable for thicknesses up to 8 mils (200 microns)
Concrete or CMU	Clean and dry. Remove all loose, unsound concrete. Do not apply coating unless 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.

Mixing & Thinning

Mixing	Mix separately, then combine and mix in the following proportions (4:1 ratio): **1 Gal. Kit** Part A: .8 gallon Part B: .2 gallon **5 Gal. Kit** Part A: 4 gallon Part B: 1 gallon Thin up to 12.5% by volume with Carboline Thinner #2 for non-immersion applications and Thinner #10 for immersion projects.
Pot Life	1.5 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

Pump Ratio: 45:1 (min.)
Volume Output: 11.5 l/min min. (2.5gpm min.)
Material Hose: 12.5mm min. (½" I.D. recommended)
Tip Size: 0.43-0.53mm (0.017-0.021")
Output: 140-175kg/cm²
Pressure: (2000-2500 psi)
*PTFE packings are recommended and available from pump manufacturer.

Brush & Roller (General)

Not recommended for tank lining applications except when striping welds. For non-immersion 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). Thin up to 12.5% by volume per gallon with Carboline #2. 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)	90%

Industry standards are for substrate temperatures to be above the dew point. For immersion conditions it is recommended to follow this procedure. For non-immersion conditions this product 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 Touch	Maximum Recoat Time	Minimum Recoat Time	Minimum cure for immersion service
20 °F (-7 °C)	10 Hours	60 Days	72 Hours	45 Days
35 °F (2 °C)	6 Hours	45 Days	17 Hours	30 Days
60 °F (16 °C)	5 Hours	30 Days	6 Hours	14 Days
75 °F (24 °C)	4 Hours	15 Days	2 Hours	7 Days
90 °F (32 °C)	2 Hours	7 Days	2 Hours	6 Days

These times are based on a 5.0-8.0 mil (125-200 micron) dry film thickness per coat. Higher film thickness, insufficient ventilation or cooler temperatures will require longer cure times and could result in solvent entrapment and premature failure. Excessive humidity or condensation on the surface during curing can interfere with the cure, can cause discoloration and may 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.

Surface Temp.*	Dry to Handle	Dry to Recoat
35 °F (2 °C)	48 Hours	2 Days
60 °F (16 °C)	24 Hours	40 Hours
75 °F (24 °C)	8 Hours	24 Hours
90 °F (32 °C)	6 Hours	24 Hours

The above times are based on 16 mils (400 microns) DFT of Carboguard 690 applied in a single coat. Honor the other precautions outlined above.

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, 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: 12 months at 76°F (24°C)

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

Shipping Weight (Approximate)

1 Gal. Kit
15 lbs.
5 Gal. Kit
75 lbs.

Storage Temperature & Humidity

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

Flash Point (Setaflash)

Part A: 91°F (33°C)
Part B: 80 °F (27°C)
Thinner 2: 23°F (-5°C)

Storage

Store Indoors. KEEP DRY

carboline®
Coatings - Linings - Fireproofing

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