product data

carboline®

Phenoline® 357

Selection & Specification Data

Generic Type Modified Novolac Epoxy

Description Phenoline 357 is a highly cross-linked epoxy lining with extraordinary overall chemical resistance and versatility. It has a unique blend of resins that make it highly resistant to a variety of aggressive cargos like ethanol, gasolines, gasoline blends, biodiesel, fuel oils, and others. It can be used is both acidic and high temperature caustic exposures. Markets served are terminals, refineries, petrochemical, wastewater, railcar linings, and many others.

Features

- Outstanding overall chemical resistance
  Dense, highly cross-linked film with excellent abrasion resistance and toughness
- VOC compliant to current AIM regulations
- Well-suited for hydrocarbon exposures
- Can be applied in a single-coat

Color Red-brown (0500), Gray (0700), White (0800)

Finish Gloss

Dry Film Thickness
Two-Coat Applications :
5-8 mils (125-175 microns) per coat

Solids Content By Volume: 75% ± 2%

Theoretical Coverage Rate
1203 mil ft^2 (29.6 m^2/l at 25 microns)
120 ft^2 @10 mils (250 microns)
Allow for loss in mixing and application

VOC Values
As supplied: 1.72 lbs/gal (206 g/l)
Thinned:
8 oz/gal w/ #:2 2.04 lbs/gal (244 g/l)
These are nominal values and may vary slightly with color.

Dry Temp. Resistance
Continuous: 250°F (121°C)
Non-Continuous: 300°F (149°C)
Discoloration and loss of gloss is observed above 200°F (93°C).

Wet Temp. Resistance Immersion temperature resistance depends upon exposure. Consult Carboline Technical Service for specific exposures.

Limitations Linings exposed to cargos warmer than the outside steel temperature are subject to a "cold-wall" effect. Therefore, tanks with service above 140°F should have insulation.

Epoxies lose gloss, discolor and eventually chalk in sunlight exposure.

Substrates & Surface Preparation

General Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating.

Steel
Immersion: SSPC-SP10
Non-Immersion: SSPC-SP6
Surface Profile: 1.5-3.2 mils (38-80 microns)

Concrete
Immersion:
Concrete must be cured 28 days at 75°F (24°C) and 50% relative humidity or equivalent. Prepare surfaces in accordance with ASTM D4258-92 Surface Cleaning of Concrete and ASTM D4259 Abrading Concrete. Voids in concrete may require surfacing.

Immersion Service

(Temperature of service is 100°F unless noted)
R = Recommended for immersion service

Caustic (NaOH) up to 150°F, 10%, 50%, 73%	R
Potassium Hydroxide (KOH) up to 150°F	R
Crude Oil	R
Biodiesel	R
Diesel Oil	R
Fuel Oils	R
Lubricating Oils	R
Gasolines	R
Gasoline with Ethanol	R
Ethanol	R
Methanol	R
MTBE, ETBE, TAME	R
Jet Fuels	R
Aviation Gas	R
Aromatic Solvents	R
Ethylene Glycol up to 150°F	R
Tri- Ethylene Glycol	R
Urea-formaldehyde	R
Acetate Solvents	R
Glycol Ethers Solvents	R
Sodium Sulfide Solutions (≤50%)	R
Tetraethyl Lead	R
Toluol (Toluene)	R
TSP - Tribasic sodium phosphate	R
Phthalates	R
Citric Acid	R

Contact Technical Service for recommendations
1-800-848-4645

Phenoline® 357

Application Equipment

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.
General guidelines:

Spray Application (General) The following spray equipment has been found suitable and is available from manufacturers such as Binks, DeVilbiss and Graco.

Conventional Spray Pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, .055-.070" I.D. fluid tip and appropriate air cap.

Airless Spray

Pump Ratio:	30:1 (min.)*
GPM Output:	3.0 (min.)
Material Hose:	3/8" I.D. (min.)
Tip Size:	.015-.019"
Output PSI:	2100-2300
Filter Size:	60 mesh

*Teflon packings are recommended and available from the pump manufacturer.

Brush & Roller (General) Not recommended for tank lining applications except when striping welds and touching up.

Brush Use a medium bristle brush.

Roller Use a short-nap synthetic roller cover with phenolic core.

Mixing & Thinning

Mixing Power mix separately, then combine and power mix. DO NOT MIX PARTIAL KITS.

Ratio 4:1 Ratio (A to B)

Thinning May be thinned up to 8 oz/gal with Thinner #2. Use of thinners other than those supplied or recommended by Carboline may adversely affect product performance and void product warranty, whether expressed or implied.

Pot Life 2 Hours at 75°F (24°C)
Pot life ends when coating loses body and begins to sag. Pot life times will be less at higher temperatures.

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. In addition to ensuring proper ventilation, appropriate respirators must be used by all application personnel.

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

Condition	Material	Surface	Ambient	Humidity
Normal	65°-85°F (18°-29°C)	65°-85°F (18°-29°C)	65°-85°F (18°-29°C)	30-60%
Minimum	55°F (13°C)	50°F (10°C)	50°F (10°C)	0%
Maximum	90°F (32°C)	110°F (43°C)	100°F (38°C)	85%

This product simply requires the substrate temperature to be above the dew point. Condensation due to substrate temperatures below the dew point can cause flash rusting on prepared steel and interfere with proper adhesion to the substrate. Special application techniques may be required above or below normal application conditions.

Curing Schedule

Surface Temp. & 50% Relative Humidity	Minimum Recoat Time	Maximum Recoat Time	Final Cure for Immersion
50°F (10°C)	18 hrs	6 days	15 days
60°F (16°C)	12 hrs	5 days	10 days
75°F (24°C)	8 hrs	3 days	7 days
90°F (32°C)	6 hrs	2 days	5 days

These times are based on a 5-7 mil (125-175 micron) dry film thickness. 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 time **is** exceeded, the surface must be abraded by sweep blasting prior to the application of additional coats. ***Note**: Final cure temperatures below 60°F (16°C) are not recommended for tank linings in aggressive service.

Force Curing: The following schedule may be used to force cure the coating system after the final coat is applied. Elevate temperature no more than 30°F (-1°C) every 30 minutes.

Surface Temp. & 50% Relative Humidity	Final Cure for Immersion
75°F (24°C)	4 Hours, followed by
150°F (66°C)	8 Hours

Final cure requirement varies depending upon exposure. Contact Carboline Technical Service for additional force curing.

Packaging, Handling & Storage

Shipping Weight (Approximate) 1 Gallon Kit: 15 lbs (7 kg); 5 Gallon Kit: 75 lbs (32 kg)

Flash Point (Setaflash) Part A: 81°F (27°C); Part B: 55°F (13°C)

Storage (General) Store Indoors.

Storage Temperature & Humidity 40° - 110°F (4°-43°C); 0-90% Relative Humidity

Shelf Life Part A & B: Min. 24 months at 75°F (24°C)

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

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