product data

carboline®

Phenoline®385

Selection & Specification Data

Generic Type
High solids polyamine-epoxy

Description
High performance, high solids, epoxy lining that is recommended for a variety of petroleum storage products including 180° crude oil, demineralized water 150°F, crude/water mixtures, gasohol, ethanol, fuel oil, jet fuel, biodiesel, and gasoline. It is also a good choice for wastewater and water exposures. Product is self-priming and is normally applied in two coats. It is also suitable for food-grade (aqueous) cargos and meets the FDA requirements for 21CFR 175.300 for direct food contact.

Features
- High solids; Low VOC formula
- VOC compliant to current AIM regulations
- Excellent for crude-oil storage
- Excellent resistance to petroleum products
- Excellent abrasion resistance
- Excellent thermal shock resistance

Colors
Light Grey (0700), White (0800), and Light Blue (0100) Colors are unmatched, designed for immersion service.

Finish
Semi-gloss

Primers
Self-priming

Dry Film Thickness
4.0-6.0 mils (100-150 microns) per coat.
8-12 mils total thickness is typical.
Some service may require 12-14 mils DFT.

Solids Content
By Volume: 85% ± 2%

Theoretical Coverage Rate
1373 mil ft^2 (33.2 m^2/l at 25 microns)
For estimating purposes, 122 sq. ft. /gal. will produce a 9 mil/225 microns film (20% loss included).
Allow for loss in mixing and application

VOC Values
As supplied: 1.00 lbs/gal (119 g/l)
Thinned:
25 oz/gal w/ #2: 1.96 lbs/gal (235 g/l)
25 oz/gal w/ #76: 1.96 lbs/gal (235 g/l)
These are nominal values and may vary slightly with color.

Dry Temp. Resistance
Continuous: 230°F (110°C)
Non-Continuous: 250°F (121°C)
Discoloration and loss of gloss is observed above 200°F (93°).

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

Limitations
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**
Surface Profile: **2-3½ mils** (50-88 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 Surface Cleaning of Concrete and ASTM D4259 Abrading Concrete. Voids in concrete may require surfacing.

Performance Data

Test	Method	Results
Abrasion	ASTM D4060 (CS17 Wheel, 1000 cycles, 1000 g load)	94 mg loss
Thermal Shock	5 cycles (-70° to 200°F)	Unaffected

Packaging, Handling & Storage

Shipping Weight (Approximate)
1 Gallon Kit: 15 lbs (6.8 kg)
5 Gallon Kit: 75 lbs (34 kg)

Flash Point (Setaflash)
Part A: 24°F (-4.5°C)
Part B; 41°F (5°C)

Storage (General)
Store Indoors.

Storage Temperature & Humidity
40° - 110°F (4°- 43°C)
0-100% Relative Humidity

Shelf Life
Part A: Min. 12 months at 75°F (24°C)
Part B: Min. 6 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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Application Equipment

Conventional Spray

Pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, .070" I.D. fluid tip and appropriate air cap. Adjust air pressure to approximately 50 psi at the gun and provide 10-20 lbs. of pot pressure.

Airless Spray

Pump Ratio:	30:1 (min.)
GPM Output:	2.5 (min.)
Material Hose:	3/8" I.D. (min.)
Tip Size:	.017"-.021"
Output PSI:	1500-2300
Filter Size:	60 mesh

Teflon packings are recommended

Apply a "mist" bonding pass.
Allow to dry approximately one minute but not long enough to allow film to completely dry. Apply crisscross multi-passes, moving gun at fairly rapid rate, maintaining a wet appearing film. Fast multi-passes may be applied until you have a film thickness of approximately 4-6 mil/100-150 microns (approximately 5-7 wet mil/125-175 microns). Repeat this procedure for the second coat to obtain an 8-12 mil/200-300 microns DFT. Call Tech. Service for Q&A

Brush (General)

Recommended for small areas and repairs only. Use a high quality brush, and apply a very light crisscross brush coat. Allow to dry for approximately 5 minutes. Then apply a heavy coat using a crisscross brush pattern. "Flow" the coating on rather than try to "brush out." Allow to dry tack-free. Repeat until sufficient film thickness is obtained. Normally, a film thickness of 2.5-3 mils (62-75 microns) can be obtained per coat by this method.

Brush

Use a medium bristle brush.

Roller

Not recommended

Mixing & Thinning

Mixing

Power mix separately, then combine and power mix. DO NOT MIX PARTIAL KITS. Requires short 15 min sweat-in time.

Ratio

2:1 Ratio (A to B)

Thinning

Thinning will be required to properly atomize the mixed material. Thin up to 20% (25 oz/gal) with Thinner #2 or Thinner #76 (cooler conditions). Use of thinners other than those supplied by Carboline may adversely affect product performance and void product warranty, whether expressed or implied.

Pot Life

1¼ Hours at 75°F (24°C), 2 Hours at 60°F (15.5°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. 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.

Cleanup & Safety Cont.

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	60°-85°F (16°-29°C)	60°-85°F (16°-29°C)	60°-90°F (16°-32°C)	0-80%
Minimum	50°F (10°C)	50°F (10°C)	50°F (10°C)	0%
Maximum	90°F (32°C)	125°F (52°C)	110°F (43°C)	80%

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.

Note: Prior to spray application, stripe brush all weld attachments and surface irregularities using Phenoline 385 thinned a minimum of 50% by volume with Thinner #2.

Curing Schedule

Surface Temp. & 50% Relative Humidity	Dry to Recoat	Final Cure for Immersion Service	Maximum Recoat Time
50°F (10°C)	36 Hours	14 Days	30 days
60°F (16°C)	20 Hours	10 Days	21 days
75°F (24°C)	10 Hours	7 Days	14 days
90°F (32°C)	5 Hours	5 Days	7 days

These times are based on a 4.0-6.0 mil (150-175 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 times have been exceeded, the surface must be abraded by sweep blasting or sanding prior to the application of additional coats.
Food-grade exposures require force curing at 225°F for four hours. Raise temperature 30°F for every 30 minutes until temperature is reached. (Other curing temperatures in table below)

METAL TEMPERATURE	CURING TIME
150°F/66°C	12 Hrs
175°F/79°C	10 Hrs
200°F/93°C	6 Hrs
225°F/107°C	4 Hrs

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