

## Selection & Specification Data

<b>Generic Type</b>	Amine-cured, modified epoxy-phenolic
<b>Description</b>	Highly cross-linked coating with exceptional chemical resistance. Widely used as a tank lining system in the petrochemical industry as well as in other aggressive immersion conditions like jet fuel, municipal and industrial wastewater. Can also be used in wet-dry cycling conditions for hot steel substrates under insulation.
<b>Features</b>	<ul style="list-style-type: none"> <li>▪ Excellent overall chemical resistance</li> <li>▪ Very good abrasion resistance and flexibility</li> <li>▪ VOC compliant to current AIM regulations</li> <li>▪ Resistance to 400°F (under insulation)</li> <li>▪ May be used over stainless steels</li> <li>▪ Meets all performance requirements of:                             <ul style="list-style-type: none"> <li>•DOD-P-23236 Type 1, Class 1</li> <li>•Complies with FDA 21CFR 175.300 criteria for food contact</li> </ul> </li> </ul>
<b>Color</b>	Primer: Red (0500) Finish: Gray (C703); White (1898)
<b>Finish</b>	Flat
<b>Dry Film Thickness</b>	4.0-6.0 mils (100-150 microns) for 187 Primer 4.0-6.0 mils (100-150 microns) for 187 Finish A second coat of 187 Finish may be used to meet specifications or increase service life.
<b>Solids Content</b>	By Volume: 65% ± 2% Primer 63% ± 2% Finish
<b>Theoretical Coverage Rate</b>	1043 mil ft <sup>2</sup> (26.0 m <sup>2</sup> /l at 25 microns) Primer 1011 mil ft <sup>2</sup> (25.0 m <sup>2</sup> /l at 25 microns) Finish Allow for loss in mixing and application
<b>VOC Values</b>	As supplied: 2.50 lbs/gal (300 g/l) Primer 2.60 lbs/gal (312 g/l) Finish  Thinned: 32 oz/gal w/ #2: 3.42 lbs/gal (410 g/l) Primer 16 oz/gal w/ #33: 3.50 lbs/gal (420 g/l) Finish These are nominal values and may vary slightly with color.
<b>Wet/Dry Temp. Resistance</b> <small>(under insulation)</small>	Continuous: 400°F (204°C) Non-Continuous: 450°F (232°C) Discoloration and loss of gloss is observed above 200°F (93°C).
<b>Immersion Temperature Resistance</b>	Immersion temperature resistance depends upon exposure. Consult Carboline Technical Service for specific information.
<b>Limitations</b>	<ul style="list-style-type: none"> <li>▪ Do not use in water immersion over 130°F (54°C).</li> <li>▪ Epoxies lose gloss, discolor and eventually chalk in sunlight exposure.</li> <li>▪ 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.</li> </ul>

## Substrates & Surface Preparation

<b>General</b>	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.	
<b>Steel</b>	Immersion: <small>(includes under insulation use)</small>	SSPC-SP10
	Non-Immersion:	SSPC-SP6
	Surface Profile	2.0-3.0 mils (50-75 micron)
<b>Concrete</b>	<u>Immersion:</u>	
	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.	
<b>Stainless Steel</b>	Surface profile should be a dense angular 2.0-3.0 mils and is best achieved through abrasive blasting. Remove all surface contaminants that would interfere with the performance of stainless steel for the intended service such as, but not limited to, imbedded iron or chlorides.	

## Performance Data

Test Method	System	Results
ASTM D4541 Adhesion (Elcometer)	Blasted Steel 1 ct 187 Primer 1 ct 187 Finish	840 psi
ASTM D4060 Abrasion	Blasted Steel 1 ct 187 Primer 1 ct 187 Finish	163.3 mg loss CS 17 Wheel 1000 gm load 1000 cycles
ASTM D2794 Gardner Impact	Blasted Steel 1 ct 187 Primer 1 ct 187 Finish 180 inch lbs	Direct Impact: 5/16 inch diameter Reverse Impact: 1/16 inch diameter
ASTM D522 Mandrel Bend test for Flexibility	Blasted Steel 1 ct 187 Primer 1 ct 187 Finish	7 3/8" – Average length of first continuous crack. 26.4% – Actual average maximum elongation.
ASTM D1653 Permeability Method B Condition C	Blasted Steel 1 ct 187 Primer 1 ct 187 Finish	Permeability .0076; WVP: 0.29 metric perms, 0.44 perms; MVT 5.72
ASTM B117 Salt Spray	Blasted Steel 1 ct 187 Primer 1 ct 187 Finish	No blistering, rusting, cracking, or delamination; less than 1/16" rust creepage at the scribe at 1000 hrs.

Test reports and additional data are available upon written request.

# Phenoline<sup>®</sup> 187 Primer & Finish

## 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** Primer may be thinned up to 32 oz/gal (25%) with Thinner #2. Finish may be thinned up to 16 oz/gal with Thinner #33. 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** 4 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
Min-Max	55-90°F (13-32°C)	50-110°F (10-43°C)	50-100°F (10-38°C)	00-85%

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)	4 Days	30 Days	N/R*
60°F (16°C)	2 Days	30 Days	30 Days
75°F (24°C)	24 Hours	15 Days	15 Days
90°F (32°C)	12 Hours	7 Days	7 Days

These times are based on a 4.0-6.0 mil (100-150 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 bluish 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.

**Force Curing:** Force curing is recommended for all tank linings, especially for storage of food grade products. 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 and safety information.

## Packaging, Handling & Storage

**Shipping Weight (Approximate)**

1 Gallon Kit 13 lbs (6 kg)	5 Gallon Kit 63 lbs (29 kg)
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**Flash Point (Setaflash)**

Part A:	67°F (19°C)
Part B:	68°F (20°C)
Mixed:	67°F (19°C)

**Storage (General)** Store Indoors.

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

**Shelf Life** Part A (color 1898): 6 months @75°F(24°C)  
Part A (other colors) and Part B: 36 months @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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