

SELECTION & SPECIFICATION DATA

Generic Type	Epoxy Phenolic-Novolac Blend
Description	A high performance immersion-grade coating system which has excellent resistance to wet/dry cycling conditions at elevated temperatures. It is typically used on hot steel substrates under insulation operating continuously up to 400°F, 204°C. It has excellent chemical resistance properties to handle the corrosive effects of wet insulation under thermal cycling conditions. This coating is recommended for NACE SP0198 Standard Practice for coatings to control corrosion under insulation (CUI) system numbers CS-1, CS-3, CS-4, SS-1, SS-2, and SS-3.
Features	<ul style="list-style-type: none"> • Versatile use from cryogenic to 400°F (204°C) exposures • Very good flexibility • Excellent overall chemical resistance • Very good abrasion resistance • Easily applied by spray • Acceptable for use over stainless steels • High solids, low VOC formula
Color	Grey (0700), Red (0500) For non-insulated service, Thermaline 440 offers a wider range of colors.
Finish	Semi-Gloss
Dry Film Thickness	4 - 8 mils (102 - 203 microns) per coat Two coats are recommended for optimum performance. Do not exceed 20 mils total DFT
Solids Content	By Volume 84% +/- 2%
Theoretical Coverage Rate	1347 ft ² /gal at 1.0 mils (33.1 m ² /l at 25 microns) 337 ft ² /gal at 4.0 mils (8.3 m ² /l at 100 microns) 168 ft ² /gal at 8.0 mils (4.1 m ² /l at 200 microns) Allow for loss in mixing and application.
VOC Values	As Supplied : 1.00 lbs/gal (119 g/l) Thinner 2 : 24 oz/gal: 2.00 lbs/gal (240 g/l)
Under Insulation Resistance	Continuous: 400°F (204°C) Non-Continuous: 450°F (232°C)
Topcoats	May be top-coated with polyurethane or modified silicone to provide added UV resistance if needed. Contact Carboline for specific product recommendations.

SUBSTRATES & SURFACE PREPARATION

General	All surfaces must be thoroughly cleaned to remove dirt, grease, mill scale, loose rust and any other contaminants that can reduce adhesion via SSPC-SP1 solvent cleaning with recommended surface preparation.
Stainless Steel	Surface profile should be a dense angular 1-3 mils and is best achieved through abrasive blasting. Remove all contaminants that would interfere with the performance of stainless steel for the intended service such as, but not limited to, imbedded iron or chlorides.

Thermaline[®] 450 EP

PRODUCT DATA SHEET



SUBSTRATES & SURFACE PREPARATION

Ferrous Metal | SSPC-SP10 (NACE No.2) to obtain a 1.5-3 mil mil (37-75 micron) blast profile. Weld slag must be removed. Striping of properly prepared welds with primer by brush or spray is recommended.

MIXING & THINNING

Mixing | Power mix components separately, then combine and mix to homogeneity. DO NOT MIX PARTIAL KITS. Requires short 15 minute sweat-in time.

Thinning | May be thinned up to 20% (24 oz/gal) with Thinner #2. Use of thinners other than those supplied or approved by Carboline may adversely affect product performance and will void product warranty whether express or implied.

Ratio | 2:1 by volume (Part A to Part B)

Pot Life | 1 hours @75°F and less at higher temperature. Pot life ends when coating loses body and begins to sag.

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) | The following spray equipment has been found suitable and is available from WIWA[®] or other equipment manufacturers.

Conventional Spray | Pressure pot equipped with dual regulators, 3/8" ID minimum material hose, 0.055-0.070" fluid tip with appropriate air cap. Adjust air pressure to approximately 50 psi at the gun and provide 10-20 psi of pot pressure.

Airless Spray | Pump Ratio: 30:1 (min)*
GPM Output: 2.5 (min)
Material Hose: 3/8" ID (min)
Tip Size: 0.017-0.021"
Output PSI: 1500-2300
Filter Size: 60 mesh

*PTFE packings are recommended and available from the pump manufacturer. Apply a "mist" bonding pass. Allow to flash dry about 1 min and then apply criss-cross multi-passes maintaining a wet film. Repeat fast passes until the wet film thickness desired is achieved.

Brush & Roller (General) | Use a natural bristle brush applying in full strokes. Avoid rebrushing. If rolled, use a short nap roller with solvent resistant core. Avoid rerolling.

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APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	50°F (10°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.	Dry to Recoat	Final Cure General	Maximum Recoat
50°F (10°C)	36 Hours	14 Days	30 Days
60°F (16°C)	24 Hours	10 Days	21 Days
75°F (24°C)	12 Hours	7 Days	14 Days
90°F (32°C)	6 Hours	5 Days	7 Days

These times are based on the recommended dry film thicknesses. Excessive film thickness or inadequate ventilating conditions after application require longer dry times and will cause premature failure in extreme cases. Excessive humidity or condensation on the surface during curing may result in surface haze or blush; any haze or blush should be removed by washing with water before recoating. After a 24 hour dry time at 75°F; force curing the material may be done during start-up provided the temperature does not exceed 1 degree/minute.

CLEANUP & SAFETY

Cleanup | Use Thinner #2 or Acetone.

Ventilation | When used 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, workmen should be required to use non-ferrous tools and wear conductive and non-sparking shoes.

PACKAGING, HANDLING & STORAGE

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

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

Storage | Store indoors

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

Flash Point (Setflash) | Part A: 24°F(-4.5°C)
Part B: 41°F(5°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 to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. Carboline warrants our products to be free of manufacturing defects in accord with applicable Carboline quality control procedures. THIS WARRANTY IS NOT VALID WHEN THE PRODUCT IS NOT: (1) APPLIED IN ACCORDANCE WITH CARBOLINE'S SPECIFICATIONS, AND/OR (2) PROPERLY STORED, CURED, AND USED UNDER NORMAL OPERATING CONDITIONS. Carboline assumes no responsibility for coverage, performance, injuries, or damages resulting from use of the product. If this product is found not to perform as specified upon inspection by a Carboline representative during the warranty period, Carboline's sole obligation, if any, is to replace the Carboline product(s) proven to be defective or refund the purchase price thereof, at Carboline's sole option. Carboline shall not be liable for any other losses or damages. This warranty excludes (1) labor and costs of labor for the application or removal of any product, and (2) any incidental or consequential damages, whether based on breach of express or implied warranty, negligence, strict liability or any other legal theory. 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. The whole text of this Product Data Sheet, as well as the documents derived from it, have been written in English, and for legal purposes the English version shall prevail.