

SELECTION & SPECIFICATION DATA

Generic Type	Reinforced inorganic polymer (inert multi-polymeric matrix)
Description	<p>This is an extreme performance coating for hot, cryogenic and cycling exposures. Thermaline Heat Shield contains a unique blend of plate-like reinforcing pigments fortified with an inert polymeric matrix. The resulting film provides an outstanding barrier against corrosives and harsh exposures typically seen in elevated temperature environments. This versatile coating is ideal for all piping, vessels and equipment operating from cryogenic conditions up to 1200°F. It is particularly well suited to prevent corrosion under insulated equipment/piping for both carbon steel substrates and stainless steels. This fortified coating has superior shop handling properties over standard silicone coatings (see Curing). It is recommended for CS-6 and SS-5 systems of NACE SP0198 Standard Practice for coatings to control corrosion under insulation (CUI).</p>
Features	<ul style="list-style-type: none"> • Unique reinforced but flexible polymer film • Versatile use from cryogenic to 1200°F (650°C) exposures • Dries to handle without heat cure (See curing schedule) • Outstanding barrier properties • Protects steel from thermal wet cyclic conditions • Suitable for both shop and field application • Provides corrosion protection even with ambient temperature cure • Meets ISO 12944-6 C5-M Medium • Self priming or apply over Carbozinc 11 primers when uninsulated • Protects stainless steels from chlorides and stress corrosion cracking • Very fast recoat times
Color	0700 (Metallic Aluminum Grey) and J700 (Metallic Grey) only
Finish	Eggshell
Primer	Self-priming. May be used over Carbozinc 11 primers for uninsulated applications.
Dry Film Thickness	<p>3.5 - 5 mils (89 - 127 microns) per coat</p> <p>Two coats are recommended for optimal performance. For best results keep maximum dry film thickness below 12 mils (300 microns).</p>
Solids Content	By Volume 51% +/- 2%
Theoretical Coverage Rate	<p>818 ft²/gal at 1.0 mils (20.1 m²/l at 25 microns) 234 ft²/gal at 3.5 mils (5.7 m²/l at 88 microns) 164 ft²/gal at 5.0 mils (4.0 m²/l at 125 microns) Allow for loss in mixing and application.</p>
VOC Values	<p>As Supplied : 3.5 lbs/gal (420 g/l) Thinner 235 : 3.72 lbs/gal (446 g/l) Thinner 10 : 3.72 lbs/gal (446 g/l)</p>
Maximum Service Temperature	This product will handle thermal cycling from cryogenic of -321°F (-196°C) to high heat of 1200°F (649°C).
Topcoats	<ul style="list-style-type: none"> • Thermaline 4900 and 4900 VOC colors may be used, except for Thermaline 4900 Aluminum and 4900 VOC Aluminum. • Only topcoat for atmospheric service.

Thermaline[®] Heat Shield

PRODUCT DATA SHEET



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 along with the recommended surface preparation as referenced below.
Stainless Steel	See SSPC-SP16 for reference. 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, embedded iron or chlorides. Follow SSPC-SP11 for repairs.
Ferrous Metal	For optimum performance, abrasive blast to SSPC-SP10 (NACE No.2) to obtain a 1-3 mil (25-75 micron) blast profile. Where blasting is impractical or not permitted use hand power tools to prepare surface to SSPC-SP11 or SSPC-SP15 to obtain a 1-2 mil profile (25-50 microns). A better cleaning method will improve performance and service life.

MIXING & THINNING

Mixing	Power mix base component and then add Thermaline Heat Shield Part B (Fortifier HT) to base and mix to uniformity. For field applications only to in situ equipment and structures, please note that the addition of Thermaline Heat Shield Part B (Fortifier HT) to the base component may be considered optional.
Thinning	Thinning not normally required for spray application. For applications over hot surfaces (up to 500°F/260°C) conventional spray is the preferred method of application. For small areas or touch-up use a brush and thin up to 6% by volume with Thinner #10 or Thinner 236 E for normal temperatures or up to 6% with Thinner 230 for hot surface applications. 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	(Optional) Add Fortifier HT at a ratio of 25:1 or 5.12oz/gallon, yielding 133.12 oz/kit If not using Fortifier HT, follow heat curing instructions found on the Thermaline Heat Shield Application Guide before handling the coated items.
Pot Life	8 hours at 75°F (24°). Less at higher temperatures.

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.

Conventional Spray	Pressure pot equipped with dual regulators, 3/8" ID minimum material hose, 0.070" fluid tip with appropriate air cap. Adjust air pressure to provide uniform spray pattern.
Airless Spray	Pump Ratio: 32:1 (min)* Volume Output: 2.5 gpm (11.5 lpm)(min) Material Hose: 1/2" ID (12.5 mm)(min) Tip Size: 0.017-0.021" (0.043-0.053 mm) Output PSI: 1500-2000 (105-140 kg/cm2) *PTFE packings are recommended and available from the pump manufacturer.
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. Appearance will vary using brush or roller application methods due to the orientation of the aluminum flake.

APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	55°F (13°C)	50°F (10°C)	45°F (7°C)	0%
Maximum	90°F (32°C)	500°F (260°C)	100°F (38°C)	95%

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 Touch	Dry to Recoat	Dry to Handle
50°F (10°C)	1 Hour	6 Hours	6 Hours
60°F (16°C)	1 Hour	3 Hours	5.5 Hours
75°F (24°C)	45 Minutes	1 Hour	5 Hours
90°F (32°C)	30 Minutes	1 Hour	2 Hours

Curing Details

These times are based on the recommended dry film thicknesses, 3.5 to 5 mils. Excessive film thickness or inadequate ventilating conditions after application require longer dry times and will cause premature failure in extreme cases. Lower humidity may lengthen dry time.

Force Cure Parameters: Raise substrate temperature slowly until it reaches 500°F (260°C). The maximum rate of heat increase is 30°F every thirty minutes, but Carboline recommends a gentle heat rise of 30°F every sixty minutes (approximately 7-14 hours from 25°C to 260°C).

Once the substrate has reached 500°F (260°C), hold for two hours to achieve maximum film durability.

Note: Avoid rapid temperature excursion for the first heat cycle; particularly early in the cure.

For recoat time via brush or roller, follow the dry to handle time (thumb twist test).

This product has superior handling properties over standard silicones (harder film), but has some thumbnail softness until it has undergone a heat excursion. In these cases use padded slings and dunnage. Typical dry-to-ship time is 24 hours.

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 | 12 months at 75°F(24°C)

Storage Temperature & Humidity | 40°-120°F(4°-49°C)
0-95% Relative Humidity

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PACKAGING, HANDLING & STORAGE

Storage | Store indoors

Shipping Weight | 1.04 Gallon - 14 lbs (6.35 kg)
(Approximate) | 5.2 Gallon - 70 lbs (31.75 kg)

Flash Point (Setaflash) | Part A (base component): 80°F(27°C)
Thermaline Heat Shield Part B (Fortifier HT): 108°F (42°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 Company to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. We guarantee our products to conform to Carboline quality control. We assume no responsibility for coverage, performance, injuries or damages resulting from use. Carbolines sole obligation, if any, is to replace or refund the purchase price of the Carboline product(s) proven to be defective, at Carbolines option. Carboline shall not be liable for any loss or damage. 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.