product data

carboline®

Thermaline®4700 & 4700 Aluminum

Selection & Specification Data

Generic Type
Single package silicone finish

Description
High-performance finish for areas exposed to extreme temperatures. Suitable for service from 400°F-1000°F (204°C-538°C) Color stability at maximum temperature will depend on color selected. Requires heat curing.

Features
- Resistant to severe thermal shock
- Provides outstanding long-term performance when applied over Carbozinc inorganic zinc primers
- Air-dries to touch (full film formation properties occurs after heat curing)

Color & Dry Temperature Resistance *
Available in the following stock colors:

Black (C900) 1000°F (538°C) Continuous
Aluminum (C901) 1000°F (538°C) Continuous
Black and Aluminum allow surges to 1200°F (649°C)
Gray (C705) 750°F (399°C)

All other colors are made to order and have temperature resistance in the 650-750°F (343°C-399°C) range.

Finish
Gloss - initial (Flat after heat curing)

Primers
Inorganic zincs. None needed for stainless steel or aluminum.

Topcoats
Normally none

Dry Film Thickness
2 mils (50 microns), 4 wet mils (100 microns)
Do not exceed 2.0 mils in a single coat.

4700 Aluminum: 1.5 mils (40 microns)
Two coats are recommended over stainless steel and one or two coats over inorganic zincs.

Solids Content
By Volume: 48% ± 2
4700 Aluminum by volume: 30% ± 2

Theoretical Coverage Rate
770 mil/ft^2/gal. (19 m^2/ l at 25 microns)
4700 Aluminum: 481 mil/ft^2/gal.
(12 m^2/ l at 25 microns).

VOC Values
As Supplied: 3.8 lbs./gal (456 g/l)
(sprayed un-thinned except in hot application)
Thinned:
12.8 oz/gal w/#235 (10%) 4.1 lbs./gal (492 g/l)

4700 Aluminum supplied: 5.04 lbs./gal (604 g/l)
Thinned:
8 oz/gal w/#10 (6%) 5.16 lbs./gal (618 g/l)
16 oz/gal w/#10 (12%) 5.27 lbs./gal (632 g/l)

Limitations
- Do not use for immersion service.
- Do not exceed thickness recommendation. Excessive film thickness may result in blistering and delamination when the temperature is increased.

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
SSPC-SP 10 with a 0.5-1.0 mils (12-25 micron) surface profile. Prime with specific Carboline primers as recommended by your Carboline sales representative.

Stainless Steel
Sweep blast cleaning (SSPC-SP7) is recommended.

Aluminum
Sweep blast cleaning (SSPC-SP7) is recommended.

* The alignment of aluminum flakes in aluminum-filled finishes is very dependent on application conditions and techniques. Care must be taken to keep conditions as constant as possible to reduce variations in final appearance. It is also advisable to work from a single batch of material since variations can occur from batch to batch. For more information consult Carboline Technical Service Department.

Thermaline® 4700 & 4700 Aluminum

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 for application of this material. Conventional spray application is preferred.

Conventional Spray Use DeVilbiss P-MBC, E-needle and tip, and a 704 air cap or equal. Use adequate air volume for proper equipment operation. Hold gun 10-12" from the surface and at right angles. Overlap each pass 50%. Apply 4.0 wet mils to obtain desired dry film.

Brush & Roller (General) Recommended for touch up of small areas or where spray application is not permitted. Avoid excessive re-brushing or re-rolling will create a non-uniform appearance.

Brush Use a medium bristle brush.

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

Note Different application procedures or methods will result in streaky or non-uniform appearance with aluminum containing products.

Mixing & Thinning

Mixing Power mix until uniform in consistency. Avoid excessive air entrapment.

Thinning Normally not required. May be thinned up to 12.8 oz./gal. (10%) by volume with Thinner #235 for "hot" applications exceeding 150°F (66°C). 4700 Aluminum may be thinned up to 16oz./gal. 12% by volume with Thinner #10. Use of thinners other than those supplied or recommended by Carboline may adversely affect product performance and void product warranty, whether expressed or implied.

Cleanup & Safety

Cleanup Use Thinner #2. 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 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 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.

Application Conditions

Condition	Material	Surface	Ambient	Humidity
Normal	77°F(25°C)	125°F(52°C)	80°F(27°C)	50%
Minimum	55°F(13°C)	40°F (4°C)	40°F (4°C)	0%
Maximum	95°F (35°C)	300°F (148°C)	120°F (49°C)	90%

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

Substrate Temperature	Dry to Touch	Dry to Topcoat with Itself	Dry to Handle*	Final Cure
77°F (25°C)	1 Hour	4 Hours	8 Hours	**2 Hours at** 400°F

These times are based on a 2.0 mil (50 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. During high humidity conditions, it is recommended that the application be done while temperatures are increasing. If the final cure time is exceeded, the surface must be abraded prior to the application of additional coats.

* Dry to handle (thumb-twist test). Final hardness and ultimate film properties are not reached until heat curing has been achieved. Final cure: To obtain optimal properties, must be cured at 400°F. After a 2 hour flash-off at 75°F, allow temperature to increase slowly to 400°F. Hold at 350°F to 450°F for 2 hours. The coating may then be placed in service.

Packaging, Handling & Storage

Shipping Weight (Approximate)		1 Gallon Kit 12 lbs. (5.5 kg)	5 Gallon Kit 60 lbs. (27 kg)
Flash Point (Setaflash)		Thermaline 4700 83°F (28°C) Thermaline 4700 Aluminum 68°F (20°C)	
Storage (General)		Store indoors	
Storage Temperature & Humidity		Between 40°F-100°F(4°C-38°C) 0-90% Humidity	
Shelf Life:	**4700** **4700 Alum**	24 months at 77°F (25°C) 12 months at 77°F (25°C)	

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

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An RPM Company

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