Thermo-Lag® 3000-SA

PRODUCT DATA SHEET

SELECTION & SPECIFICATION DATA

Generic Type	A two component, 95% solids epoxy based intumescent coating for the fire protection of structural steel.
Designation	**This is a Carboline Specialty Product** Minimum order quantities and special pricing will apply in North America. Contact your Carboline Sales Representative for more details.
Description	Thermo-Lag 3000-SA is an architectural grade, 95% solids epoxy based intumescent designed to fireproof steelwork for up to a 4 hour fire rating, depending on the design. The recommended use for this product is fireproofing of steel beams, columns, tubes, pipes, vessel skirts, bulkheads, underdecks and electrical raceways.
Features	• UL listed - designs for many types of steel sections up to 4 hour fire ratings for both interior and exterior environments. • Durable finish - provides a hard, durable finish resistant to normal wear. • Thin film coating - offers an economical solution to alternative fireproofing. • VOC compliant • Easy repair - if damaged it can be repaired easily using material as putty.
Color	Part A: Light Grey Part B: Black Mixed: Grey
Finish	Textured *Aesthetics can be improved by trowel and back rolling.
Primer	Thermo-Lag 3000-SA must be applied over a compatible primer. If the steel has already been coated with an existing primer, refer to Carboline Technical Service for advice before applying Thermo-Lag 3000-SA. Contact Carboline Technical Service for a complete list of approved primers. *The thickness range for primers used under Thermo-Lag 3000 must be 3-5 mils (75-125 microns) DFT per SSPC-PA2.
Film Build	60-120 mils (1.5-3 mm)
Solids Content	By Weight 95
VOC Values	**As Supplied** : 0.53 lb/gal (64 g/L)
Mesh	Use FP-Fiberglass Mesh or High Temp Mesh depending on design. *Contact Carboline Technical Service for specific design details.
Limitations	Not recommended for steelwork subject to long-term surface temperatures over 175°F (79°C) in normal use.
Topcoats	For interior conditioned space, topcoats are optional. For interior general purpose and exterior use, Carboline approved topcoats are required. Thermo-Lag 3000-SA must be applied to the specified DFT prior to applying a topcoat. The choice of topcoat will depend on project requirements. Contact Carboline Technical Service for a complete list of approved topcoats.

SUBSTRATES & SURFACE PREPARATION

General	Remove all oil or grease from the surface to be coated using Thinner 2 or Carboline Surface Cleaner 3.
Steel	The general requirement for steel preparation before the application of an approved primer should meet SSPC-SP6, with a 1.5-2.0 mil (37-50 micron) angular profile. Contact Carboline Technical Service for recommendations and specific primer requirements. *Recommended thickness range for primers used under Thermo-Lag 3000 is 3-5 mils (75-125 microns) DFT per SSPC-PA2, level 3.
Galvanized Steel	Steel preparation before priming should meet SSPC-SP7. 1.5-2.0 mil (37-50 micron) angular profile required. Prime with Carboguard 893 SG @ 3-5 mils (75-125 microns) DFT per SSPC-PA2.
Non-Ferrous Metals	Contact Carboline Technical Service for advice.
Painted/Primed Structural Steel	Existing coatings must attain a minimum 3A rating in accordance with ASTM D3359 Method A, X cut adhesion test. If acceptable, clean and lightly abrade in accordance with SSPC-SP2 or SP3 to roughen and de-gloss the surface. If not acceptable, the coating must be removed and areas re-primed with a compatible primer. If primer coating has acceptable adhesion, but is not compatible or compatibility is unknown, a tie-coat primer can be applied as a bonding or barrier coating. Contact Carboline Technical Service for a list of approved tie-coat primers and specific primer requirements. Primer recoat intervals may vary from the published product datasheet when using under intumescent fireproofing products. Consult Carboline Technical Service for recommended cure times before applying Carboline intumescent products.

PERFORMANCE DATA

All test data was generated under laboratory conditions. Field testing results may vary.

Test Method	Results
ASTM D2240 Hardness	Shore D - 50 (fully cured)
ASTM D2794 Impact Resistance	288 inch-lb (3.31 kg-m)
ASTM D4541 Bond Strength	950 psi (6.55 MPa)
ASTM D4541 Bond Strength	Typical Field Value 300 psi (2.07 MPa)
ASTM D638 Tensile Strength	37,600 psi (259.3 MPa) modulus
ASTM D695 Compressive Strength	2,190 psi (15.1 MPa)
ASTM D790 Flexural Strength	2,253 psi (15.5 MPa)
ASTM E84 Surface Burning	Class A
Target Density	78 - 81 pcf (1,249 - 1,297 kg/m³)

All values derived under controlled laboratory conditions unless otherwise noted.

MIXING & THINNING

Mixer	Use 1/2" (12.7 mm) electric or air driven drill with a rectangular paddle mixer (300 rpm under load).
Mixing	**Plural Component Application:** For plural component applications, the product is supplied in full 9 gallon (34.0 liter) kits. The part A and part B components must be pre-mixed separately before introduction into the plural equipment. **Single Component Application:** For single component applications, the product is supplied in 4.5 gallon (17.0 liter) kits, one 1/2 full pail of part A and one 1/2 full pail of part B. Add up to 1 quart (1 liter) of Plasite Thinner 19, Thinner

MIXING & THINNING

	242E or Carboline approved equivalent to part B and mix until fully incorporated. Stage material by adding part B on top of part A. Material can be left staged for entire days' production (8 hours), but not overnight. Mix staged material with rectangular paddle mixing blade until completely blended and consistent color is achieved. Once mixed, material should be immediately introduced into single component equipment and spraying should commence. **Trowel Application:** For trowel applications, the product is supplied in 4.5 gallon (17.0 liter) kits, one 1/2 full pail of part A and one 1/2 full pail of part B. Add up to 1 quart (1 liter) of Plasite Thinner 19, Thinner 242E or Carboline approved equivalent to part B and mix until fully incorporated. Thinning is not required for this application and material should only be thinned as necessary to achieve the desired working time and consistency. Stage material by adding part B on top of part A. Material can be left staged for entire days' production (8 hours), but not overnight. Mix staged material with rectangular paddle mixing blade until completely blended and consistent color is achieved. Once mixed, material should be immediately poured out of mass onto a clean table or flat working surface to extend the pot life. Mixed material left in the pail will begin to exotherm and diminish pot life. Trowel application should commence immediately after mixing.
Thinning	**Plural Component Application:** Do not thin **Single Component Application:** Thin with Plasite Thinner 19, Thinner 242E or Carboline approved equivalent – Maximum 1 quart (1 liter) per 4.5 gallon (17.0 liter) kit **Trowel Application:** Only thin as required with Plasite Thinner 19, Thinner 242E or Carboline approved equivalent – Maximum 1 quart (1 liter) per 4.5 gallon (17.0 liter) kit. Always use clean solvent for thinning.
Ratio	1:1 (by volume)
Working Time	30-45 minutes @ 75°F (24°C) 15-20 minutes @ 100°F (38°C)

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.

General	Thermo-Lag 3000 SA may be applied by either single component or plural component application. Use only single component or plural component equipment specifically designed for epoxy based PFP. Consult the manufacturers for specific information: **AirTech Spray Systems** (Houston, TX) **Spray Quip** (Houston, TX) **Graco** (Minneapolis, MN) **WIWA** (Alger, OH/Lahnau, Germany)
Airless Spray	Use 45:1 airless (minimum) with Dura Flow lower cylinder (3/4" outlet) / 3.3 gal. per minute to provide an operating pressure of 3,000 p.s.i. (211 kg/cm2). *Remove filters and surge tanks. Set bottom ball to greatest travel. Hopper feed required. Teflon packings are recommended.

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Pump	**Single Component:** Graco® Xtreme XL Heavy Fluid Package (with stainless steel hopper feed) WIWA® Herkules 75:1 (with stainless steel hopper feed) or Carboline approved equivalent **Plural Component:** Graco® XM PFP WIWA® Duomix 333 or Carboline approved equivalent Contact the equipment manufacturers for specific models. Contact Carboline Fireproofing Technical Service for details.
Spray Gun	WIWA® 500 PFP, Binks 1M Mastic or equivalent Must be non-wetted spring assembly.
Gun Swivel	5,000 psi (34.4 MPa) 1/2-3/8" (12.7-9.5 mm)
Spray Tips	0.035-0.045" (Use Graco heavy duty RAC non diffuser tips and housing)
Fan Size	6-10" (152-254 mm) depending on section being sprayed
Static Mixer	Standard Static 12 turn 3/4" (19 mm) I.D.
Material Hose	**Single Component:** Use 50' (15.2 m) of high pressure spray line with a minimum I.D. of 3/4" (19 mm) **Plural Component:** 100' (30.4 m) heated hose bundle with 3/4" (19 mm) I.D. minimum and 3/4" (19 mm) mixer manifold
Whip Hose	20' (6.1 m) of 1/2" (12.7 mm) I.D. minimum
Compressor	Be certain that the air supply is a minimum of 185 cfm @ 100 psi (690 kPa). Air volume and pressure required will depend on equipment used.

APPLICATION PROCEDURES

General	Pre-cut all mesh before beginning application. Contact Carboline Technical Service for design details. All mesh must be kept clean and dry. **Single Component Application:** Prior to spraying using single component airless equipment, the material must be preheated to a minimum of 70°F (21°C) to achieve a consistent fan pattern. Apply first coat to point of mesh placement at 60-120 mils (1.5-3 mm). Lighter coats will achieve a smoother finish. Allow material to gel for 20-30 minutes before installing mesh and backrolling. Apply pre-cut mesh into wet coating using solvent resistant mohair rollers. Use Carboline Plasite Thinner 19, Thinner 242E or approved equal as rolling solvent to mist down rollers to prevent them from sticking to the material. Allow material to cure for 4 hours between coats. Continue building material at 60-120 mils (1.5-3 mm) per coat to specified thickness. Use solvent moistened rollers to back roll material after each subsequent coat to improve finish and level surface. **Plural Component Application:** Prior to introduction into the plural component equipment, the product must be preheated to 70-100°F (21-38°C). Perform at least two ratio checks per day and also after any equipment maintenance. Apply first coat at 60-120 mils (1.5-3 mm). Lighter coats will achieve a smoother

APPLICATION PROCEDURES

finish. Allow material to gel for 15 minutes before installing mesh and backrolling. Apply pre-cut mesh into wet coating using solvent resistant mohair rollers. Use Carboline Plasite Thinner 19, Thinner 242E or approved equal as rolling solvent to mist down rollers to prevent them from sticking to the material. Allow material to cure for approximately 30 minutes (depending upon temperature) between coats. Continue building material at 60-120 mils (1.5-3 mm) per coat to specified thickness.

Trowel Application:

Prior to trowel application, the material must be preheated to a minimum of 70°F (21°C) to achieve a workable consistency. Once material is mixed, it must be poured out of mass onto a clean table or flat working surface to extend the pot life. The material can then be divided into workable amounts. Trowel apply first coat at 60-120 mils (1.5-3 mm). Allow material to gel for 20-30 minutes before installing mesh and backrolling. Apply pre-cut mesh into wet coating using solvent resistant mohair rollers. Use Carboline Plasite Thinner 19, Thinner 242E or approved equal as rolling solvent to mist down rollers to prevent them from sticking to the material. Allow material to cure for 4 hours between coats. Continue building material at 60-120 mils (1.5-3 mm) per coat to specified thickness.

Always use clean solvent for backrolling. Avoid using excessive solvent when backrolling as this can lead to solvent entrapment and lengthen the cure time of the material. Use solvent moistened rollers to back roll material after each subsequent coat to improve finish and level surface if required. Lighter coats will achieve a smoother finish. Contact Carboline Technical Service or refer to the product application manual for more detailed information.

Application Rates

At an ambient temperature of 70°F (21°C), the following application rates are applicable:
60-120 mils (1.5-3 mm) per coat (wet)
4 hour recoat time between coats
2 coats per day

Wet Film Thickness

Frequent thickness measurements with a wet film gauge are recommended during the application process to ensure uniform thickness.

Dry Film Thickness

Final thickness must be measured using an electronic dry film thickness gauge. For method of thickness determination and tolerances refer to: AWCI Technical Manual 12-B (Standard Practice for the Testing and Inspection of Field Applied Thin Film Intumescent Fire Resistive Materials).

APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	70°F (21°C)	41°F (5°C)	41°F (5°C)	0%
Maximum	105°F (41°C)	125°F (52°C)	110°F (43°C)	85%

*Air and substrate temperature must be at least 41°F (5°C) and rising. Steel surface temperature should be a minimum of 5°F (3°C) above the dew point. The maximum humidity is 85%. Area must be protected from rain or running water during application until material is cured and topcoated.

CURING SCHEDULE

Surface Temp.	Touch	Handle	Minimum Recoat Time	Maximum Recoat Time	Minimum Topcoat Time	Maximum Topcoat Time
50°F (10°C)	4 Hours	48 Hours	4 Hours	7 Days	48 Hours	7 Days
70°F (21°C)	4 Hours	4 Hours	4 Hours	7 Days	48 Hours	7 Days
95°F (35°C)	3 Hours	48 Hours	3 Hours	7 Days	48 Hours	7 Days

Above cure times are based on 50% relative humidity. Curing times are dependent upon temperature, air movement and humidity. For optimum curing, it is recommended to apply coats at 60-120 mils (1.5-3 mm) wet per coat. Material can be heated to achieve a quicker recoating and curing schedule. If maximum recoat or topcoat times are exceeded, the surface must be mechanically abraded and solvent wiped prior to applying additional coats. Consult Carboline Technical Service for specific details.

TESTING / CERTIFICATION / LISTING

General	Underwriter's Laboratories, Inc. (UL) Intertek Laboratories, Inc. Lloyd's Register of Shipping (LRS) Det Norske Veritas (DNV) American Bureau of Shipping (ABS) Southwest Research Institute (SWRI)
Underwriters Laboratories, Inc.	Thermo-Lag 3000-SA has been tested in accordance with ASTM E-119 (UL 263) and UL 1709 at Underwriter's Laboratories, Inc. Thermo-Lag 3000-SA is listed by UL for the following designs: **Columns:** XR618 **Columns:** XR620 **Columns:** XR621 **Columns:** XR649 **Beams:** N608 *The product should be applied in accordance with the appropriate design.
Intertek	Thermo-Lag 3000-SA has been tested in accordance with ASTM E-119 at Intertek Laboratories. Thermo-Lag 3000-SA is listed by Intertek for the following designs: **Wide Flange Columns:** CC/CA 180-02 **HSS Columns:** CC/CA 180-03 **Restrained and Unrestrained Beams:** CC/BA 180-01 *The product should be applied in accordance with the appropriate design.
City of New York	Thermo-Lag 3000-SA has been found acceptable for use in Class I and Class II buildings in accordance with report number: MEA 64-01-M Vol.II
City of Los Angeles	Report: RR25484

CLEANUP & SAFETY

Cleanup	Pump, mixer, hose, and gun should be cleaned with Carboline Plasite Thinner 19, Thinner 76 or Thinner 242E at least once every 4 hours at 70°F (21°C), and more often at higher temperatures. After each use or any shut down, the pump, mixer, hopper and gun must be completely flushed with solvent. After flushing pump, remove hopper and bottom foot of pump to clean lower ball check valve. Also remove and hand clean gun, tips and tip housing. The hopper and mixing paddle must be kept clean continuously during application to prevent cured material from falling into the foot of the pump.

CLEANUP & SAFETY

Safety	Read and follow all caution statements on this product data sheet and on the SDS for this product. Employ normal workmanlike safety precautions. Use adequate ventilation. Keep container closed when not in use.
Overspray	All adjacent and finished surfaces shall be protected from damage and overspray.
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.

MAINTENANCE

General	If coating becomes damaged, rebuild required thickness by spray or trowel. When dry, smooth and finish with approved topcoat to match. Damaged areas must be abraded back to a firm edge by sanding or scraping. The topcoat should be abraded back by 1" (25.4 mm) from the damaged area. The surface must be clean and dry before re-applying Thermo-Lag 3000-SA. The coating shall then be built back to the original thickness. If the mesh is damaged, it must be cut out and replaced as well. Allow to cure and then overcoat with the specified topcoat or system.

PACKAGING, HANDLING & STORAGE

Packaging	**Half kits:** 4.5 gallons (17.0 liters) Part A: 2.25 gallons (8.5 liters) Part B: 2.25 gallons (8.5 liters) **Full kits:** 9.0 gallons (34.0 liters) Part A: 4.5 gallons (17.0 liters) Part B: 4.5 gallons (17.0 liters)
Shelf Life	12 Months *Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.
Storage	Store indoors in a dry environment between 32-120°F (0-49°C). Can be stored down to 20°F (-7°C) for no longer than 30 days. 0-100% Relative Humidity
Shipping Weight (Approximate)	11 lb. per gallon (1.3 kg per liter)
Flash Point (Setaflash)	Part A: 95°F (35°C) Part B: 93°F (34°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.