Thermo-Lag 3000-SP

PRODUCT DATA SHEET

SELECTION & SPECIFICATION DATA

Generic Type	A two component, 95% solids epoxy based intumescent coating for the fire protection of structural steel.
Description	Thermo-Lag® 3000-SP is a petrochemical 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. • Approved & certified by Lloyds Register and DNV • 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.
Colour	Part A: Light Grey Part B: Black Mixed: Grey
Finish	Textured *Aesthetics can be improved by trowel and back rolling.
Primer	Thermo-Lag® 3000-SP 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-SP. Contact Carboline Technical Service for a complete list of approved primers. *The thickness range for primers used under Thermo-Lag® 3000 must be 75-125 microns DFT per SSPC-PA2.
Film Build	2-4 mm
Solids Content	By Volume 95%
Theoretical Coverage Rates	9.5 m²/litre at 100 microns 0.95 m²/litre at 1 mm (1000 microns)
VOC Values	**As Supplied** : 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 steel-work subject to long-term surface temperatures over 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-SP 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 Altex P40 Cleaner.
Steel	Steel preparation before the application of an approved primer should meet AS 1627.4 Class 2 (onshore), AS 1627.4 Class 2½ (offshore) with a 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 75-125 microns DFT per SSPC-PA2, level 3.
Galvanized Steel	Steel preparation before priming should meet the relevant AS 1627.4 Class rating with a 37-50 micron angular profile. Prime with Carboguard® 635 @ 75-125 microns DFT.
Non-Ferrous Metals	Contact Carboline Technical Service for advice.

PERFORMANCE DATA

Test Method	System	Results
ASTM D2240 Hardness	Thermo-Lag 3000 SP	Shore D - 50 (fully cured)
ASTM D2794 Impact Resistance	Thermo-Lag 3000 SP	288 inch-lb (3.31 kg-m)
ASTM D4541 Bond Strength	Thermo-Lag 3000 SP	300 psi (2.0 MPa) minimum
ASTM D638 Tensile Strength	Thermo-Lag 3000 SP	37,600 psi (259.3 MPa) modulus
ASTM D695 Compressive Strength	Thermo-Lag 3000 SP	2,190 psi (15.1 MPa)
ASTM D790 Flexural Strength	Thermo-Lag 3000 SP	2,253 psi (15.5 MPa)
ASTM E84 Surface Burning	Thermo-Lag 3000 SP	Class A
Density	Thermo-Lag 3000 SP	81 pcf (1,297 kg/m³)

*All values derived under controlled laboratory conditions.

MIXING & THINNING

Mixer	Use 1/2" (12.7 mm) electric or air driven drill with a slotted paddle mixer or large 'spiral' type (300 rpm under load).
Mixing	**Plural Component Application:** Australasian customers should refer to Carboline Technical Services for plural component application procedures. **Single Component Application:** For single component applications, the product is supplied in 4.5 gallon (17.0 litre) kits, one 1/2 full pail of part A and one 1/2 full pail of part B. Add up to 1 litre of pure toluene or Thinner #2 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 slotted paddle mixing blade for approximately 2 minutes or until completely blended and consistent colour 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 litre) kits, one 1/2 full pail of part A and one 1/2 full pail of part B. Add up to 1 litre of pure toluene or Thinner #2 or Carboline approved equivalent to part B and mix until fully incorporated. Thinning is not normally 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.

MIXING & THINNING

	Mix staged material with slotted paddle mixing blade for approximately 2 minutes or until completely blended and consistent colour 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 pure toluene or Thinner #2 or Carboline approved equivalent – Maximum 1 litre per 4.5 gallon (17.0 litre) kit **Trowel Application:** Only thin as required with pure toluene or Thinner #2 or Carboline approved equivalent – Maximum litre per 4.5 gallon (17.0 litre kit. Always use clean solvent for thinning.
Ratio	1:1
Working Time	30 - 45 minutes @ 25°C 15 - 20 minutes @ 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 SP 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.
Airless Spray	Use 45:1 airless (minimum) with Dura Flow lower cylinder (3/4" outlet) / 12.5 litres (3.3 US gal.) per minute to provide an operating pressure of 3,000 p.s.i. (320 kg/cm²). *Remove filters and surge tanks. Set bottom ball to greatest travel. Hopper feed required. Teflon packings are recommended.
Pump	**Single Component:** Graco® Xtreme XL Heavy Fluid Package (with stainless steel hopper feed) or Carboline approved equivalent **Plural Component:** Refer to Carboline Technical Service. Contact the equipment manufacturers for specific models.
Spray Gun	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 mm - 9.5 mm)
Spray Tips	0.035" - 0.045" (Use Graco heavy duty RAC non diffuser tips and housing)
Fan Size	6" - 10" (152 mm - 254 mm) depending on section being sprayed

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.

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:** Refer to Carboline Technical Service.
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 (6.9 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 21°C to achieve a consistent fan pattern. Apply first coat to point of mesh placement, typically at 2-4 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 pure toluene or Thinner #2 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 2-4 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:** Refer to Carboline Technical Service. **Trowel Application:** Prior to trowel application, the material must be preheated to a minimum of 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 2-4 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 pure toluene or Carboline Thinner #2 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 2-4 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 21°C, the following application rates are applicable: 2-4 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.

APPLICATION PROCEDURES

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	21°C (70°F)	5°C (41°F)	5°C (41°F)	0%
Maximum	41°C (105°F)	52°C (125°F)	43°C (110°F)	85%

*Air and substrate temperature must be at least 5°C and rising. Steel surface temperature should be a minimum of 3°C above the dew point. The maximum allowable 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
10°C (50°F)	4 Hours	48 Hours	4 Hours	7 Days	48 Hours	7 Days
21°C (70°F)	4 Hours	48 Hours	4 Hours	7 Days	48 Hours	7 Days
35°C (95°F)	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 2-4 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.

CLEANUP & SAFETY

Cleanup

Pump, mixer, hose, and gun should be cleaned with toluene or Thinner #76 at least once every 4 hours at 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.

Safety

Follow all safety precautions on the Thermo-Lag® 3000-SP Material Safety Data Sheet. It is recommended that personal protective equipment be worn, including spray suits, gloves, eye protection and respirators when applying Thermo-Lag® 3000-SP.

Overspray

All adjacent and finished surfaces shall be protected from damage and overspray.

Ventilation

In enclosed areas, ventilation shall not be less than 4 complete air exchanges per hour until the material is cured.

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 25-30 mm from the damaged area and mesh reinforcement replaced where necessary. The surface must be clean and dry before re-applying Thermo-Lag® 3000-SP. 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.

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-SP has been tested in accordance with UL 1709 and ASTM E-119 (UL 263) at Underwriter's Laboratories, Inc. Thermo-Lag® 3000-SP 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.
Lloyd's Register	Certified tests / loadings for: • Bulkhead H0, H60, H120 • Deck H0, H60, H120 • Hollow & H sections; various Hp/A and Limiting Temperatures; H60 to H180

PACKAGING, HANDLING & STORAGE

Shelf Life	12 Months *Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.
Shipping Weight (Approximate)	1.3 kg per litre
Flash Point (Setaflash)	Part A: 35°C Part B: 34°C
Storage	Store indoors in a dry environment between 0°C - 49°C. Can be stored down to -7°C for no longer than 30 days. 0-100% Relative Humidity

PACKAGING, HANDLING & STORAGE

Packaging	**Standard 'Single Leg' Half kits:** 4.5 gallons (17.0 litres) Part A: 2.25 gallons (8.5 litres) Part B: 2.25 gallons (8.5 litres) ***Full kits:** 9.0 gallons (34.0 liters) Part A: 4.5 gallons (17.0 liters) Part B: 4.5 gallons (17.0 liters) *Full kits only available for plural component application

WARRANTY

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