Thermo-Lag® E100 S

PRODUCT DATA SHEET

SELECTION & SPECIFICATION DATA

Generic Type	A two component, 95% solids epoxy intumescent fireproofing.
Description	An epoxy intumescent fireproofing for commercial and light industrial applications. It was specifically designed with an advanced formulation to provide 1-3 hour cellulosic fire protection for structural steel beams, I-section columns, tubular columns and pipes without the need for reinforcing mesh. It provides a fast curing, aesthetically pleasing fire protection solution and is rated for both exterior and interior applications.
Features	• Certified to UL 263 / ASTM E119 / UL1709 / UL2431 I-A • Exterior and interior rated • High quality aesthetic finish • Does not require reinforcing mesh • Low thickness requirements • High build, fast recoat • Saves application time, lowering installation cost • Rugged durable material suitable for onsite or offsite applications • LEED compliant, low VOC • Extensive outgas testing for controlled cleanroom and sterile environments
Color	Grey
Finish	Orange Peel
Primer	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. Contact Carboline Technical Service for a complete list of approved primers. Carboline approved primers must be sufficiently cured prior to application of Thermo-Lag E100 S. The general requirement for epoxy primers is a 24 hour cure. Material must be applied after 24 hours and not to exceed the approved primer's maximum recoat window.
Film Build	60-120 mils (1.5-3.0 mm)
Solids Content	By Volume 95%
Theoretical Coverage Rates	1523 ft²/gallon at 1 mil (38 m²/liter at 25 microns)
VOC Values	**As Supplied** : 0.53 lb/gal (64 g/L)
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. Product 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.

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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.
Galvanized Steel	The general requirement for steel preparation before priming should meet SSPC-SP7. 1.5-2.0 mil (37-50 micron) angular profile required. Prime with Carboline approved primer. Contact Carboline Technical Service for recommendations.
Non-Ferrous Metals	Contact Carboline Technical Service for recommendations.
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	> 40 Shore D
ASTM D256 Impact Resistance	0.75 ft*lbs/in
ASTM D4541 Bond Strength	600-1200 psi (4.14-8.27 MPa)
ASTM D4541 Bond Strength	Typical Field Value 300 psi (2.07 MPa)
ASTM D695 Compressive Strength	> 2,330 psi (> 16.0 MPa)
ASTM D790 Flexural Strength	> 1,220 psi (> 8.4 MPa)
ASTM E84 Surface Burning	Class A

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. Must be 300 rpm under load (minimum).
Mixing	**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 242E or Carboline approved equivalent to part B and mix until fully incorporated. Stage material by adding part B on top of part A. 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

MIXING & THINNING

	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. 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. For small areas, equal volumes of part A and part B can be mixed as needed. Trowel application should commence immediately after mixing.
Thinning	**Single Component Application:** Thin with Plasite Thinner 19, Thinner 242E or Carboline approved equivalent – Recommended 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 – Thinning typically not necessary for trowel application Thinning more than 1 quart (1 liter) per 4.5 gallon (17.0 liter) kit will result in longer cure times and reduced film build
Ratio	1:1 (by volume)
Working Time	30-45 minutes @ 75°F (25°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 E100 S is applied by single component application. Use only single component equipment specifically designed for epoxy based PFP. Consult the manufacturers for specific information and models: **AirTech Spray Systems** **Spray Quip** **Graco** **WIWA**
Pump	**Single Component:** Graco® Xtreme XL Heavy Fluid Package (with stainless steel hopper feed) Graco® Mark V (with stainless steel hopper feed) WIWA® Herkules 75:1 (with stainless steel hopper feed) or Carboline approved equivalent Contact the equipment manufacturers for specific models. Graco® Mark V is recommended for small areas only. Contact Carboline Fireproofing Technical Service for specific mixing and thinning details when using Graco® Mark V equipment.
Spray Gun	WIWA® 500F PFP 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	0.027-0.035" (Use heavy duty RAC non diffuser tips and housing)
Fan Size	6-10" (152-254 mm) depending on section being sprayed

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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) For Graco Mark V option, use 50' (15.2 m) of high pressure spray line (maximum) with a minimum I.D. of 3/8" (9.5 mm) I.D.
Whip Hose	20' (6.1 m) of 1/2" (12.7 mm) I.D. minimum (Not recommended for application with Graco Mark V equipment)
Compressor	185 cfm @ 100 psi (6.9 KPa) minimum

APPLICATION PROCEDURES

General	**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 at 60-120 mils (1.5-3 mm). Allow material to gel for 20-30 minutes before backrolling (only if required). If backrolling, use 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. **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 backrolling (only if required). If backrolling, use 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. **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.
Wet Film Thickness	Frequent thickness measurements with a wet film gauge are recommended during the application process to ensure uniform thickness.
Dry Film Thickness	For recommended methods 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) or SSPC-PA 2 (The Society for Protective Coatings Paint Application Standard No. 2).

APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	70°F (21°C)	41°F (5°C)	41°F (5°C)	0%
Maximum	130°F (54°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%. Material must be protected from direct rain until it has reached sufficient cure.

CURING SCHEDULE

Surface Temp.	Touch	Handle	Minimum Recoat Time	Maximum Recoat Time	Minimum Topcoat Time	Maximum Topcoat Time
50°F (10°C)	5 Hours	48 Hours	5 Hours	7 Days	48 Hours	7 Days
70°F (21°C)	4 Hours	48 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. Lower temperatures will slow down the curing process and increase recoat intervals, higher temperatures will speed up the curing process and shorten the recoat intervals. The material can be heated to achieve a quicker recoating and curing schedule. For optimum curing, it is recommended to apply coats at 60-120 mils (1.5-3 mm) wet per coat. 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

Underwriters Laboratories, Inc. | This product has been tested in accordance with the UL Environmental Test Program and is listed and classified by UL for both exterior and interior use.

Intertek | This product has been tested in accordance with ASTM E-119 at Intertek Laboratories and is listed in the following designs:
Wide Flange Columns: CC/IF 180-02
HSS Columns: CC/IF 180-03
Restrained / Unrestrained Beams: CC/IF 180-01

City of Los Angeles | Report: RR 25484

CLEANUP & SAFETY

Cleanup | Pump, mixer, hose, and gun should be cleaned with 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.

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.

CLEANUP & SAFETY

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	For patches and repairs, the material can be applied by spray or trowel. Repair areas must be abraded back to a firm edge by sanding or scraping. Remove product from areas in need of repair back to solidly adhered material. Ensure that the primer system is still is tact as well. If not, the primer system shall be reinstated to its original specification. All edges can be left as butt joints at a 90 degree angle or beveled at a 45 degree angle. The topcoat should be abraded back by 1" (25.4 mm) from the repair area. All edges must be solvent cleaned and allowed to dry before commencing application. It is important that the patch area blends into the existing material to achieve a uniform appearance. The product shall then be troweled or spray applied to the appropriate thickness based on the project specification and fire test certification. Once the material has been allowed to sufficiently cure, the specified topcoat system shall be applied, based on the original specification, in strict accordance with Carboline's written instructions.

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 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)	12 lb. per gallon (1.4 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 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.