product data carboline®

Thermo-Lag® E100

fireproofing systems

Selection & Specification Data

Generic Type
A two component, 100% 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 / NFPA 251
- 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
- Low outgassing properties for clean room environments

Color
Grey

Finish
Slightly Textured

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. 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
60-200 mils (1.5-5 mm)

Solids Content
By Volume 100%

Theoretical Coverage Rates
1604 ft² at 1 mil (149 m² at 25 microns)

VOC Values
As Supplied 0.11 lbs/gal (13 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.

Substrates & Surface Preparation

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.

Performance Data

Test Method	Results
ASTM D2240 Hardness	> 40 Shore D
ASTM D256 Impact Resistance	0.75 ft*lbs/in
ASTM D4541 Bond Strength	> 1,200 psi (> 8.2 MPa)[1]
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.

[1] Typical value. Recommended field minimum value is > 300 psi (> 2.0 MPa)

Mixing & Thinning

Mixer
Use 1/2" electric or air driven drill with a slotted paddle mixer. Must be 300 rpm under load (minimum).

Mixing
Plural Component Application:
For plural component applications, the part A and part B components must be pre-mixed separately before introduction into the plural equipment.
Trowel Application:
Recommended for small areas only. The product is supplied in 9 gallon (34.0 liter) kits. The product must be mixed in equal volumes of part A and part B. It is recommended to split each kit in half and mix 2.25 gallons (8.5 liters) of part A and 2.25 gallons (8.5 liters) of part B to achieve a maximum mixing volume of 4.5 gallons (17.0 liters). Add up to 1 quart (1 liter) of Carboline 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 slotted paddle mixing blade for approximately 2 minutes or 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.

Thermo-Lag® E100

Mixing & Thinning

Thinning

Plural Component Application:
Do not thin
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.

Ratio 1:1

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 is applied by plural component application. Use only 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)

Pump
Plural Component:
Graco® XM PFP
WIWA® Duomix 333
or Carboline approved equivalent
Contact the equipment manufacturers for specific models.

Spray Gun WIWA 500 PFP, Binks 1M Mastic or equivalent
Must have non-wetted spring assembly.

Gun Swivel 5,000 psi (34.4 MPa) 1/2" - 3/8" (12.7 mm - 9.5 mm)

Spray Tips 0.027" - 0.035" (Use heavy duty RAC non diffuser tips and housing)

Fan Size 6" - 10" (152 mm - 254 mm) depending on section being sprayed

Static Mixer Standard Static 12 turn 3/4" (19 mm) I.D.

Material Hose
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 185 cfm @ 100 psi (6.9 kPa) minimum

Application Procedures

General

Plural Component Application:
Prior to introduction into the plural component equipment, the product must be preheated to 70°F - 100°F (21°C - 38°C). Perform at least two ratio checks per day and also after any equipment maintenance. Apply first coat at 60-200 mils (1.5-5 mm). Lighter coats will achieve a smoother finish for higher quality aesthetics. Allow material to gel for 15 minutes before backrolling (only if required). If backrolling, use 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 60-200 mils (1.5-5 mm) per coat to specified thickness.

Application Procedures

Trowel Application:
Recommended for small areas only. 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 60-200 mils (1.5-5 mm). Allow material to gel for 15 minutes before backrolling (only if required). If backrolling, 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 set up sufficiently to support the next trowel applied coat. This will range between 1-4 hours between coats. Continue building material at 60-200 mils (1.5-5 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).

Application Conditions

Condition	Material	Surface	Ambient	Humidity
Minimum	70 °F (21 °C)	41 °F (5 °C)	41 °F (5 °C)	0%
Maximum	140 °F (60 °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)	1 Hours	24 Hours	1 Hours	7 Days	24 Hours	7 Days
70 °F (21 °C)	30.0 Minutes	24 Hours	30.0 Minutes	7 Days	10 Hours	7 Days
95 °F (35 °C)	30.0 Minutes	24 Hours	30.0 Minutes	7 Days	10 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 60-200 mils (1.5-5 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.

Thermo-Lag® E100

Cleanup & Safety

Cleanup Flush static mixer, whip hose, gun and tips with hot water or Carboline approved thinner immediately after each use (depending on pump set up). Use Carboline Plasite Thinner #19, Thinner #242E or approved equal for cleaning solvent. Break down static mixer, gun and tip assembly and hand clean.

Safety Follow all safety precautions on the product Material Safety Data Sheet.

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 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.

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

Packaging, Handling & Storage

Shelf Life 12 Months

Shelf life when kept at recommended storage conditions and in original unopened containers.

Shipping Weight (Approximate) 11 lbs. per gallon (1.3 kg per liter)

Flash Point (Setaflash) Part A: 185°F (85°C)
Part B: >200°F (>93°C)

Storage Store indoors in a dry environment between 32°F - 100°F (0°C - 38°C).

Packaging, Handling & Storage

Packaging **Full Kits:** 9.0 gallons (34.0 liters)
Part A: 4.5 gallons (17.0 liters)
Part B: 4.5 gallons (17.0 liters)

carboline®
Coatings - Linings - Fireproofing

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NC26