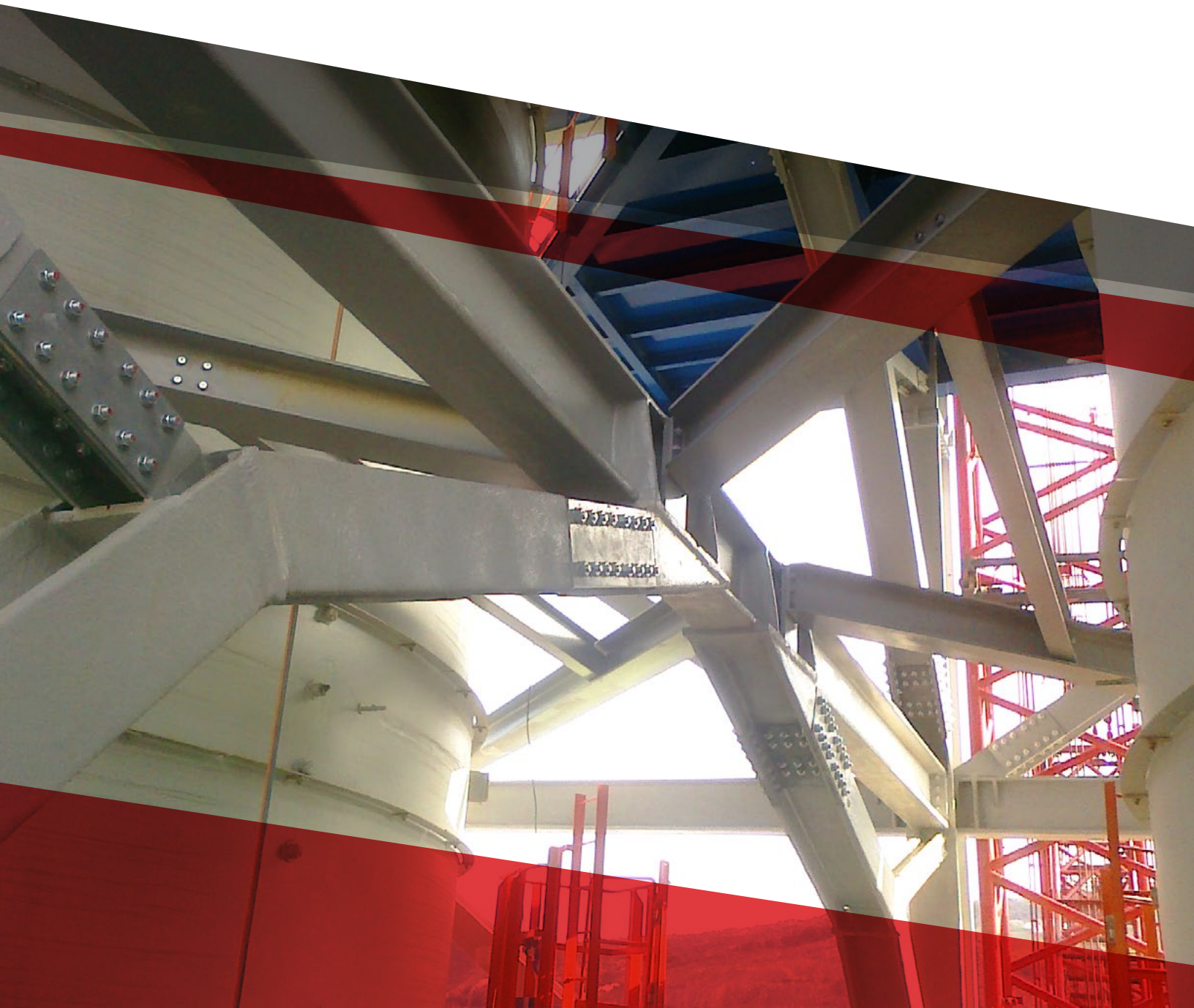


Thermo-Lag[®] 3000

Advanced, flexible epoxy intumescent fireproofing



Thermo-Lag 3000: A proven flexible epoxy intumescent

Thermo-Lag 3000 is the lightest, most efficient epoxy intumescent passive fire protection (PFP) material based on independent UL and offshore certification. No- and low-VOC, thin-film formulas provide one- to four-hour hydrocarbon fire protection for structural steel.



Features of Thermo-Lag 3000

- › Inherent flexibility and elongation based on advanced polysulfide technology
- › Crack-resistant during construction and in service
- › High flexural and tensile strength
- › Lowest thickness and applied weight per fire rating of any exterior-rated epoxy intumescent
- › Best application characteristics of any epoxy intumescent: 1:1 mix ratio and easy batch-mix for single-component and trowel application
- › UL 1709-certified
- › Offshore certification by Lloyd's Register (LR) & Det Norske Veritas (DNV)
- › Resistant to torch / hose stream impingement per NFPA 58, Annex H
- › Explosion-resistant

Applications

- › Refineries
- › Petrochemical plants
- › Gas plants
- › LNG facilities
- › Power plants
- › Commercial buildings

Thermo-Lag 3000 material and weight savings

PROPERTIES	THERMO-LAG 3000	COMPETITOR 1	COMPETITOR 2	COMPETITOR 3
Design	XR618	XR625	XR647	XR612
Fire rating	2 hour	2 hour	2 hour	2 hour
Thickness	310 mils	416 mils	424 mils	480 mils
Applied weight	2.02 lb/ft²	2.48 lb/ft²	2.53 lb/ft²	2.87 lb/ft²
*Weight savings	Most weight saved	+18% heavier	+20% heavier	+29% heavier

Comparisons are based on a W10X49 column size. Plural-component application only.

*Thermo-Lag 3000 based on 1.25 g/cm³ density
*Competitive products based on 1.15 g/cm³ (typical applied density).

NOTE: All competitive epoxy intumescent products that are applied by single-component application have similar spray-applied densities of approximately 1.25 g/cm³.



SHOP APPLICATION OF THERMO-LAG 3000. INSTALLATION OF FIBERGLASS MESH REINFORCEMENT



THERMO-LAG 3000 SYSTEM INSTALLED, READY FOR TRANSPORT TO SITE



FIELD CONNECTIONS (BLOCK-OUTS) INSTALLED ON-SITE

Off-site speed and durability

- › Fast application and shop throughput
- › Hard, durable, highly flexible material resistant to damage
- › High-quality finish in less time
- › Connections and block-outs are easily fireproofed on-site



PERFORMANCE TESTING

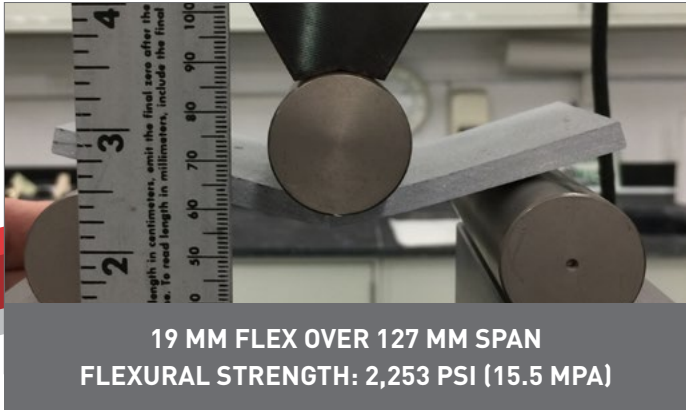
Advanced flexible polysulfide technology

Thermo-Lag 300 is based on advanced polysulfide technology that imparts excellent flexibility, high tensile strength, and very strong adhesion.

Rigid epoxy intumescent are prone to embrittlement and cracking under certain weather, transport, or service conditions. Thermo-Lag 3000 boasts a 25-year history as a proven flexible alternative that withstands:

- > Climatic extremes including severe, frequent temperature swings
- > Vibration and impact damage during transport from shop to field
- > Explosive shock and steel deformation in the event of a fire

Specifiers often weigh field vs. shop application of intumescent fireproofing. Our view is neutral: each has its place. And Thermo-Lag 3000 is ideal for either one. It applies well in the field but also resists the stress of transit when applied in the shop.



19 MM FLEX OVER 127 MM SPAN
FLEXURAL STRENGTH: 2,253 PSI (15.5 MPA)

PROVEN SINCE 1999
NO COLD WEATHER CRACKING OR
DISBONDMENT IN PRODUCT HISTORY

Performance testing

Thermo-Lag 3000 has been extensively tested and meets the following rigorous third-party criteria:



HOSE STREAM ENDURANCE (NFPA 58, ANNEX H)



EXPLOSION RESISTANCE

SEVERE COLD THERMAL CYCLIC TESTING

Severe temperature resistance

Thermo-Lag 3000 passes NACE TM0304 Section 9, the most rigorous thermal cyclic testing program in the industry.

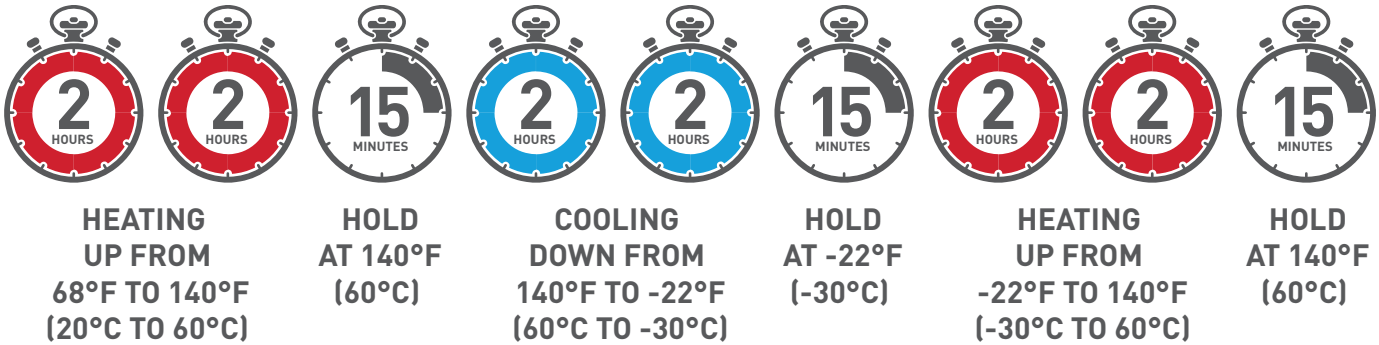
This program establishes extreme temperature performance of epoxy PFP materials:

- > Testing performed with T-bar panel configuration (modified) NACE TM0304 - worst case
- > Severe thermal shock per cycle (162°F/90°C temperature swing)



(Modified) NACE TM0304 Section 9 test procedure

225 cycles. Cycle duration: seven hours. Test duration: three weeks.



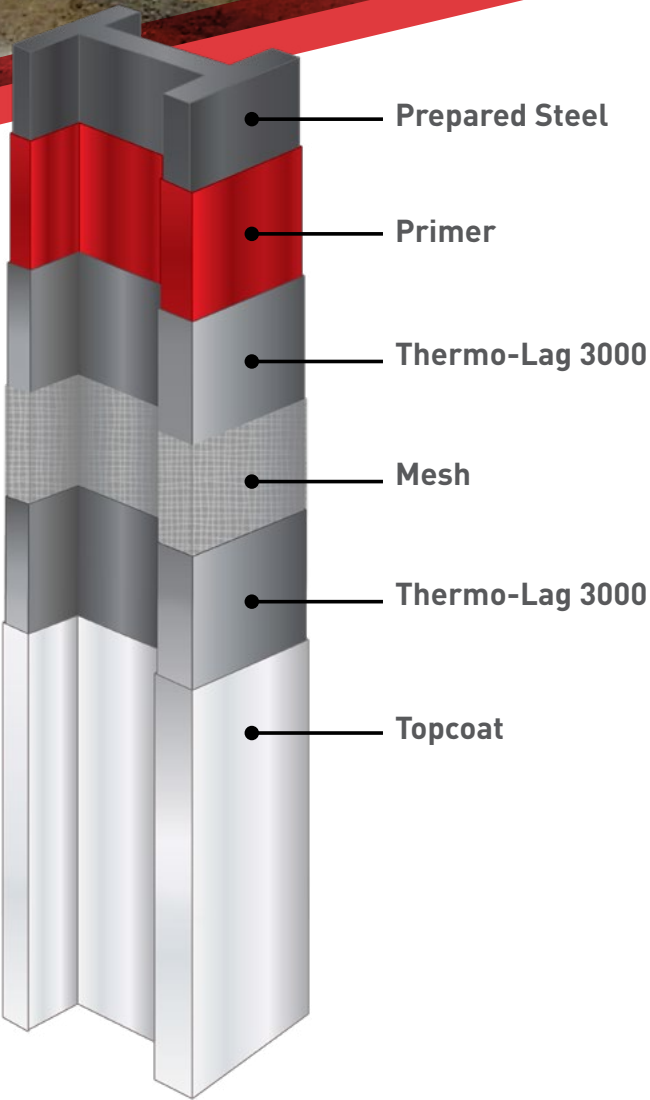
- ✓ Modified to include T-bar test sample to evaluate worst case configuration
- ✓ All products were tested with both mesh and mesh-free samples
- ✓ Evaluation included Thermo-Lag 3000 and rigid epoxy PFP systems

Thermo-Lag 3000 results vs. rigid epoxy intumescent

Thermo-Lag 3000 was tested against a competing rigid epoxy intumescent according to a modified NACE TM0304 Section 9 method. No cracking or disbondment of the Thermo-Lag 3000 (including both meshed and un-meshed samples) was observed after 225 test cycles. The competing rigid epoxy intumescent exhibited cracking after the first few test cycles, cracked at the leading edge, disbonded from the primer at the leading edge, and cracked at the web/flange radius (both meshed and un-meshed samples).

Thermo-Lag 3000 saves lives and assets

When exposed to a fire, Thermo-Lag 3000 swells to produce a heat-blocking char that insulates steel and slows its rise in temperature.



APPLICATION PROPERTIES		
	THERMO-LAG 3000 P	THERMO-LAG 3000 P (THINNED 5%)
Construction phase	Off-site	On-site
Recoat time	30 minutes	4 hours
Volume solids	100%	95%
Film build (per coat)	160-200 mils (4-5 mm)	80-160 mils (2-4 mm)
Application method	Plural component / trowel	Single component / trowel

PERFORMANCE DATA		
Hardness	ASTM D2240	Shore D 50
Impact resistance	ASTM D2794	288 inch-lb (3.31 kg-m)
Bond strength	ASTM D4541	950 psi (6.55 MPa)
Compressive strength	ASTM D695	2,190 psi (15.1 MPa)
Flexural strength	ASTM D790	2,253 psi (15.5 MPa)
Surface burning	ASTM E84	Class A

Fire resistance certifications

Thermo-Lag 3000 has undergone extensive third-party fire performance testing and is certified to:

Underwriter’s Laboratories (UL)

UL 1709

Intertek

ASTM E119 / UL 263 / CAN/ULC S101-07

Lloyds Register (LR) / Det Norske Veritas (DNV)

IMO FTP Code Part 3 / IMO Res.A.754(18) hydrocarbon curve according to ISO 834-3



UL 1709 environmental testing

Thermo-Lag 3000 is in full compliance with the acceptance criteria for the UL Environmental Test Program which is the basis for exterior fireproofing product evaluation. Thermo-Lag 3000 is rated by UL and Intertek for both exterior and interior use.



INDUSTRIAL ATMOSPHERE	HIGH HUMIDITY	WET/FREEZING/THAW CYCLING	UV EXPOSURE	SALT SPRAY
› Sulfur dioxide & carbon dioxide exposure for 30 days	› Subjected to high humidity exposure for 180 days	› Wet, freeze, thaw cycling › 12 cycles: › 72 hours rain › 24 hours at -40°F (-40°C) › 72 hours dry at 140°F (60°C)	› Subjected to accelerated UV aging for 270 days at 158°F (70°C)	› Subjected to salt spray for 90 days

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