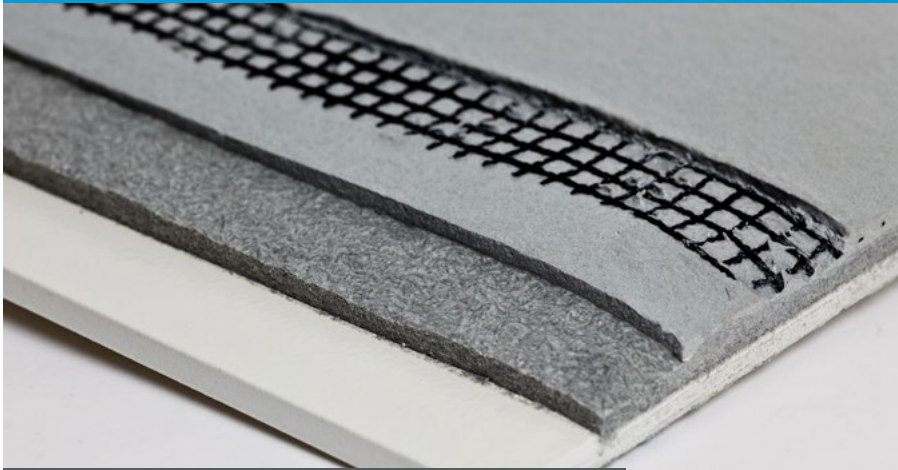


Carbotherm[®] 730/ Thermo-Lag[®] 3000



CRYOGENIC AND FIRE PROTECTION SYSTEM

This dual system is designed to provide cryogenic insulation and hydrocarbon fire protection for structural steel, vessels, piping and ductwork. It is suitable for use in high risk environments where there is a combined requirement for cryogenic protection and a 1-4 hour hydrocarbon fire rating.

SYSTEM DETAILS The Carbotherm 730 / Thermo-Lag 3000 System consists of an epoxy syntactic insulative underlayment (Carbotherm 730) overcoated with an epoxy intumescent fireproofing (Thermo-Lag 3000).

This dual system has been tested in accordance to "Specification for Cryogenic Protection and Passive Fire Protection of Structural Members", dated March 2006 from South Hook LNG Terminal Company Ltd.

This system was developed to provide combined protection against the embrittlement of steel during a cryogenic spill followed by a hydrocarbon fire event.

Carbotherm 730 was designed to be used as an underlayment for Thermo-Lag 3000 to provide cryogenic insulation for structural steel, vessels, piping and ductwork with operating temperatures between -40°F (-40°C) and 175°F (79°C).

Thermo-Lag 3000 provides industry leading hydrocarbon ratings and offers 1-4 hour fire protection.

APPLICATIONS

LNG TERMINALS
LPG STORAGE FACILITIES
PETROCHEMICAL PLANTS
REFINERIES

FEATURES

- › Up to 20 minute cryogenic protection
- › 1-4 hour hydrocarbon fire protection
- › Resistant to moisture and chemical exposure
- › Excellent application properties
- › Applied by plural component airless, trowel, casting
- › Low heat required for plural application
- › High film build
- › Fast recoat intervals
- › 1:1 mix ratio by volume

Carbotherm[®] 730/Thermo-Lag[®] 3000

Quality Product Backed by Quality Service

- › Carboline Company has been solving tough corrosion and fireproofing problems since 1947
- › Industrial service centers and sales offices located around the world
- › Over 20 worldwide manufacturing locations with a global network of sales and technical support
- › Industry leading field service and technical engineering support team
- › Certified to ISO 9001

Reasons To Use Carbotherm 730/Thermo-Lag 3000

PERFORMANCE FEATURE	ADVANTAGE	BENEFIT
Excellent cryogenic and thermal performance	Less thickness required when compared to competitive systems	Material and labor savings
1:1 mix ratio	Easy to maintain proper mix ratio, visual ratio check	Avoid off ratio application, time and labor savings
High durability and toughness	High impact resistance	Longer service life, damage resistant

Physical Properties of Carbotherm 730/Thermo-Lag 3000

PRODUCT	CARBOTHERM 730	THERMO-LAG 3000
Spray Density ¹	40-44.5 pcf (0.64-0.71 g/cm ³)	81 pcf (1.29 g/cm ³)
Weight Per Gallon	6.0 lbs (2.7 kg)	11 lbs (4.9 kg)
Solids by Volume	100%	100% / 95%
VOC (EPA Method 24)	0.02 lbs/gal (3 g/l)	0.11 (13 g/l)
Thermal Conductivity (ASTM C177)	0.108 BTU/hr-ft-°F (0.187 W/m-°K) @ 248°F (120°C) 0.103 BTU/hr-ft-°F (0.178 W/m-°K) @ 90°F (32°C)	N/A
R Value	0.139 hr-ft ² -°F/BTU @ 1.0" (25.4 mm)	N/A
Specific Heat (ASTM E1269-11)	1,088 J/(kg-K) @ 73°F (23°C)	N/A
Compressive Strength (ASTM D695)	1,064 psi (7.3 MPa)	2,190 psi (15.1 MPa)
Tensile Strength (ASTM D638)	1,044 psi (7.2 MPa) (2.8% elongation)	36,700 psi (253 MPa) (modulus)
Flexural Strength (ASTM D790)	1,112 psi (7.6 MPa)	2,253 psi (15.5 MPa)
Bond Strength (ASTM D4541)	500 psi (3.4 MPa) (cohesive break)	300 psi (2.1 MPa) (minimum)
Hardness (ASTM D2240)	Shore D 37	Shore D 50
Mix Ratio	1:1	1:1
Film Build	160-250 mils (4-6 mm) per coat	160-200 mils (4-5 mm) per coat
Recoat Time / Topcoat Time	2 hours / 24 hours	1 hour / 10 hours
Cryogenic and Thermal Protection ²	10 minutes: 630 mils (16 mm) 15 minutes: 710 mils (18 mm) 20 minutes: 750 mils (19 mm)	1 hour: 120 mils (3.0 mm) 2 hour: 310 mils (7.9 mm) 3 hour: 500 mils (12.6 mm) 4 hour: 690 mils (17.5 mm)

¹ Spray density will vary dependent upon application method

² Cryogenic thicknesses based on testing witnessed by Underwriter's Laboratories, thermal protection based on UL 1709 certification (XR 618)

*All values derived under laboratory conditions



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