

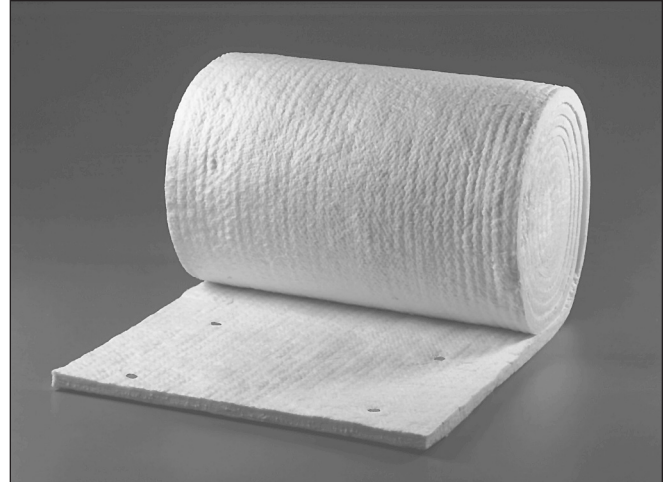
FyreWrap® Marine Blanket

Introduction

FyreWrap® Marine Blanket from Unifrax is a totally inorganic, flexible, high-temperature insulation blanket specifically designed to provide passive fire protection for marine applications. The calcia, magnesia, silica chemistry is designed to enhance biosolubility. Unifrax's proprietary fiber spinning technology combined with mechanical needling of the fibers eliminates the need for binders in the product. This results in a material with high tensile strength and superior thermal and acoustical properties. FyreWrap Marine Blanket is chemically stable and its thermal properties are unaffected after exposure to water immersion or high humidity.

FyreWrap Marine Blanket provides fire protection insulation for a variety of rated assemblies on marine structures and vessels. Thin, lightweight systems combined with a flexible product form result in lower installation costs and significant weight savings. This offers builders and owners reduced structure weight, which may yield increased vessel speed, fuel savings and available payloads. FyreWrap Marine Blanket provides the following product features:

- U.S. Coast Guard approved for steel and aluminum structures
- Complies with SOLAS Safety Objectives and IMO FTP Code fire test requirements; Res.A.754(18)
- Fire Resisting Division for High Speed Craft (HSC); Res. MSC.45(65)
- ABS (American Bureau of Shipping) approved for steel and aluminum structures
- Fire protection structural insulation for bulkheads and decks
- Significant weight savings versus mineral wool systems
- Flexible blanket is easy to cut and install
- Contour wrap around multiple stiffeners and beams
- Up to 50% weight savings over mineral wool and significant installed cost savings



Applications

FyreWrap Marine Blanket is utilized to insulate bulkheads and decks on passenger and vehicle fast ferries, cruise ships, commercial and military vessels, and offshore oil platforms. Tested systems are in compliance with U.S. Coast Guard regulations, now defined under IMO Res.A.754(18).

Typical applications include:

- Steel bulkheads and decks
- Aluminum bulkheads and decks, including extruded thin plate designs (min. 2mm thick)
- Vehicle loading areas, engine rooms, storage areas, etc.
- Various H-Rated offshore structures
- Non-combustible insulation
- Exhaust ducts and pipes

Typical Product Properties

Melting Point	2300°F (1260°C)
Temperature Grade	2012°F (1100°C)
Loss On Ignition (LOI)	0%
Surface Burning Characteristics (per ASTM E84)	Flame Spread Rating = 0 Smoke Developed Rating = 0
Marine Certifications	USCG, Lloyd's, Intertek

Refer to the product Safety Data Sheet (SDS) for recommended work practices and other product safety information.

Typical Product Parameters

Thickness	0.5", 1.0", 1.5", 2.0" and 2.5" (13mm, 25mm, 38mm and 55mm)
Density	6, 8 and 9 lb./cu.ft. (96, 128 and 144 kg/m ³) available upon request
Width	Standard: 24" (600mm) Non-standard: 48" (120mm)
Facings	Aluminum Foil .0015" (0.038mm)

Data are average results of tests conducted under standard procedures and are subject to variation. Results should not be used for specification purposes.

For availability of nonstandard sizes and thicknesses, contact our Customer Service Department at 716-768-6500.

Installation

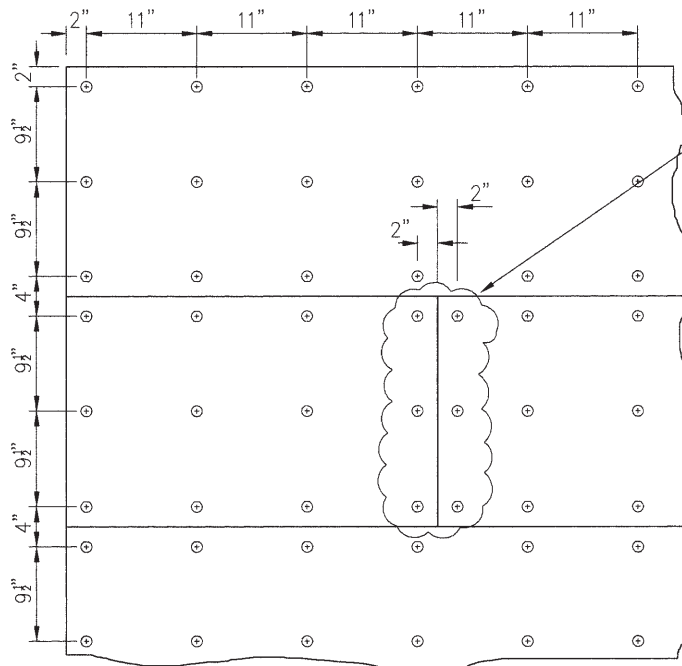
FyreWrap Marine Blanket is available in a variety of thicknesses and densities. The material parameters chosen depend upon the specific application and the Fire Rating Class required. Refer to page 3 for a list of current Certifications and details on tested systems and material components. The blanket's flexibility enables it to be easily contoured around beams and fit into tight spaces. No special tools or pre-cutting is required.

For steel bulkheads and decks, mild steel, .118 inch (3mm) CD insulation pins are utilized to permanently attach the blanket to the surface. The pin length should be equal to the total insulation thickness plus 1.0 (25mm) inch. The pins are welded to the steel surface with a standard capacitor discharge welding system. Pin spacing is typically maximum 11 inches (279mm) on center with additional pins located within 2.0 inches (50.8mm) of any material joints or termination points. See Figure 1 for details.

FyreWrap Marine Blanket is impaled over the insulation pins and can be easily cut to the necessary length and width using a straightedge and sharp knife. All blanket butt joints are compressed a minimum 1.18 inches (30mm) during the installation process – e.g., 24 inches (610mm) wide blanket compressed to 22.8 inches (580mm) as shown in Figure 2. In multiple-layer systems, the joint in each layer must be offset by approximately 12 inches (305mm), thus maximizing the thermal integrity of the insulation system. A corresponding round or square speed clip or washer is installed over the pins to permanently attach the blanket in place. Bend over excess pin length to eliminate hazards.

For aluminum bulkheads and decks, a similar pin and washer system is used, except the mild steel pin is supplied with an aluminum base, which is welded to the aluminum surface.

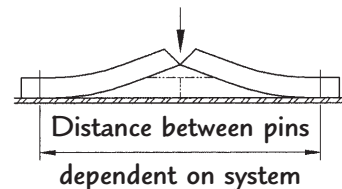
Figure 1.
Pin Layout



See compression joint detail

Figure 2.
Compression Joint Detail

Compress during installation



FyreWrap® Marine Blanket Certificates of Approval – Reference List

Construction	Rating Class	Configuration	Min. Plate Thickness	Insulation Thickness	Insulation Density	No. of Layers	USCG Certification No.	Expiration Date	ABS Certificate No.
Structural Insulation Per IMO FTP Code Res.A.754(18) and Annex 2									
Noncombustible	N/A	Unfaced, alum. foil faced	N/A	N/A	6pcf, 8pcf	N/A	164.109/23/0	May 20, 2018	N/A
Steel	A-60	Deck	N/A	1.5" (38mm)	6pcf	1	164.107/10/0	Mar. 17, 2018	14-HS1222667A-PDA
Steel	A-30	Deck	N/A	1.0" (25mm)	6pcf	1	164.107/10/0	Mar. 17, 2018	14-HS1222667B-PDA
Steel	A-60	Bulkhead (unrestricted)	N/A	2.5" (1" + 1.5") (25mm + 38mm)	8pcf	2	164.107/10/0	Mar. 17, 2018	14-HS1222667C-PDA
Steel	A-30	Bulkhead (unrestricted)	N/A	2.0" (50mm)	6pcf	1	164.107/10/0	Mar. 17, 2018	14-HS1222667D-PDA
Steel	A-60	Bulkhead (restricted)	N/A	1.5" (38mm)	6pcf	1	164.107/11/0	Mar. 17, 2018	14-HS1222667E-PDA
Steel	A-30	Bulkhead (restricted)	N/A	1.0" (25mm)	6pcf	1	164.107/11/0	Mar. 17, 2018	14-HS1222667F-PDA
Steel	H60	Deck	N/A	2.0" (50mm)	9pcf	1	Lloyds SAS F120390	Dec. 20, 2017	N/A
Steel	H60	Bulkhead (restricted)	N/A	2.0" (50mm)	9pcf	1	Lloyds SAS F120391	Dec. 20, 2017	N/A
Steel	H120	Deck	N/A	3.5" (88mm)	6pcf	2	Lloyds SAS F110290	Jul. 25, 2016	N/A
Steel	H120	Bulkhead (restricted)	N/A	4.0" (100mm)	6pcf	2	Lloyds SAS F120387	Dec. 20, 2017	N/A
Steel	H120	Bulkhead (unrestricted)	N/A	6.0" (150mm)	8pcf	3	Lloyds SAS F110291	Jul. 25, 2016	N/A
Steel	J60	Pipe	N/A	1.0" (25mm) + 1.5" T4 Foamglas	8pcf	1	Lloyds SAS F110292	Jul. 25, 2016	N/A
Aluminum	A-60	Deck	6mm	2.0" (50mm)	6pcf	1	164.107/12/0	May 20, 2018	14-HS1222667H-PDA
Aluminum	A-60	Deck	2mm	2.0" (55mm)	6pcf	1	164.107/12/0	May 20, 2018	14-HS1222667L-PDA
Aluminum	A-30	Deck	6mm	1.5" (38mm)	6pcf	1	164.107/12/0	May 20, 2018	14-HS1222667I-PDA
Aluminum	A-30	Deck	2mm	2.0" (50mm)	6pcf	1	164.107/12/0	May 20, 2018	14-HS1222667J-PDA
Aluminum	A-60	Bulkhead (unrestricted)	4mm	2.0" (50mm) on both sides	6pcf	1 on each side	164.107/12/0	May 20, 2018	14-HS1222667G-PDA (6mm)
Aluminum	A-60	Bulkhead (restricted)	4.5mm	2.0" (50.8mm)	6pcf	1	164.107/13/0	May 20, 2018	14-HS1222667M-PDA (6mm)
Aluminum	A-60	Bulkhead (restricted)	2mm	2.0" (55mm)	6pcf	1	164.107/13/0	May 20, 2018	N/A
Aluminum	A-60	Bulkhead (restricted)	3mm	1" + 1.5" (25mm + 38mm)	6pcf	2	164.107/13/0	May 20, 2018	14-HS1222667K-PDA
Aluminum	A-30	Bulkhead (restricted)	6mm	1.5" (38mm)	6pcf	1	164.107/13/0	May 20, 2018	14-HS1222667N-PDA
Aluminum	A-30	Bulkhead (restricted)	2mm	2.0" (50mm)	6pcf	1	164.107/13/0	May 20, 2018	N/A
Fire Resisting Divisions Per IMO High Speed Craft (HSC) MSC.45(65)									
Aluminum	A-60	Deck	6mm	2.0" (50mm)	6pcf	1	164.207/2/0	May 20, 2018	14-HS1222667H-PDA
Aluminum	A-60	Deck	2mm	2.0" (55mm)	6pcf	1	164.207/2/0	May 20, 2018	14-HS1222667L-PDA
Aluminum	A-30	Deck	6mm	1.5" (38mm)	6pcf	1	164.207/2/0	May 20, 2018	14-HS1222667I-PDA
Aluminum	A-30	Deck	2mm	2.0" (50mm)	6pcf	1	164.207/2/0	May 20, 2018	14-HS1222667J-PDA
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Aluminum	A-60	Bulkhead (restricted)	4.5mm	2.0" (50.8mm)	6pcf	1	164.207/2/0	May 20, 2018	14-HS1222667M-PDA (6mm)
Aluminum	A-60	Bulkhead (restricted)	2mm	2.0" (55mm)	6pcf	1	164.207/2/0	May 20, 2018	N/A
Aluminum	A-60	Bulkhead (restricted)	3mm	1" + 1.5" (25mm + 38mm)	6pcf	2	164.207/2/0	May 20, 2018	14-HS1222667K-PDA
Aluminum	A-30	Bulkhead (restricted)	6mm	1.5" (38mm)	6pcf	1	164.207/2/0	May 20, 2018	14-HS1222667N-PDA
Aluminum	A-30	Bulkhead (restricted)	2mm	2.0" (50mm)	6pcf	1	164.207/2/0	May 20, 2018	14-HS1222667PDA (3mm)

Updated October 7, 2014



Other Fire Protection Products and Applications

Unifrax offers many UL listed Fiberfrax® and FyreWrap® product forms and FyreWrap fire protection materials for passive fire protection applications, such as:

Product	UL File Number
FyreWrap® Duct Insulation	R14514
Insulfrax® S Blanket	R14514
FyreWrap® – Expanding Paper XFP®	R15435
Fiberfrax® Durablanket® Ceramic Fiber Blanket	R14514
Fiberfrax® Duraboard® Ceramic Fiber Board LD	E75289
Fiberfrax® Ceramic Fiber Papers (110/440)	E75289
Fiberfrax® Ceramic Fiber Papers (970)	MH7030
Fiberfrax® Lo-Con™ Felt	MH7030
Fiberfrax® Moist Pak-D®	E75289

These products offer solutions in applications such as:

- Cable Trays, Conduits
- Control System Covers
- Above Ground Storage Tanks
- Marine Bulkheads, Decks
- Structural Steel
- Construction Joints
- Curtain Walls/Safing
- Circuit Protection
- Grease, HVAC Ducts
- Railroad Tank Cars
- Transit Cars
- Ships
- Expansion Joints
- Fire Door Seals
- Chimney Liners
- Ceiling Air Diffusers
- Hazardous Material Storage Containers



Refer to the product Safety Data Sheet (SDS) for recommended work practices and other product safety information.

Unifrax has a wide range of FyreWrap fire protection materials available to provide passive fire protection solutions in a variety of applications in the commercial building, industrial facility and transportation industries.

For additional information about product performance or to identify the recommended product for your fire protection application, please contact the Unifrax Fire Protection Application Engineering Group at 716-768-6500.