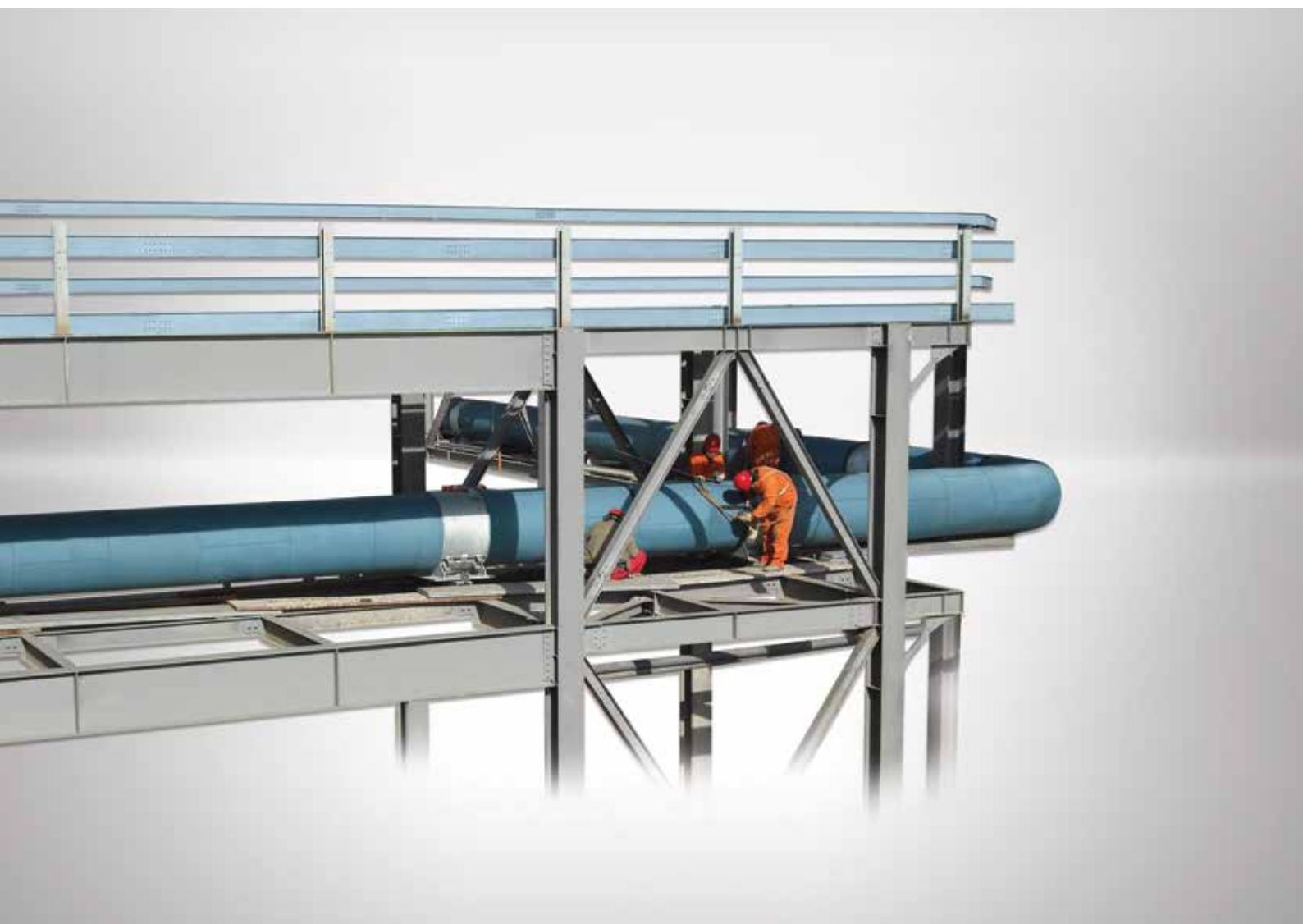


Armaflex[®] LTD

FEF INSULATION FOR CRYOGENIC AND
LOW TEMPERATURE APPLICATIONS



- Improved flexibility at low temperatures over traditional insulation materials
- Mitigates the risk of corrosion under insulation (CUI)
- Protects against mechanical impact and shock

- Low thermal conductivity
- Low glass transition temperature
- Easy installation even to complex shapes
- Less wastage compared to rigid / pre-fabricated pieces

Technical Data - Armaflex LTD

Brief description	Armaflex® LTD is a flexible, high density and mechanically robust, closed cell cryogenic thermal insulation material based on extruded elastomeric foam. The product has been specially developed for use on the import/export pipelines and process areas of LNG facilities.
Material type	Synthetic Diene Terpolymer rubber based foam. Factory made flexible elastomeric foam (FEF) according to EN 14304.
Colour	Blue
Special features	A high-performance thermal insulation material designed to meet the demands of cryogenic-temperature environments. Armaflex® LTD is part of Armaflex® Cryogenic Systems, providing low temperature flexibility to the system.
Material special information	Armaflex® LTD is suitable for a range of operating conditions down to -180°C including liquefied natural gas (LNG) installations. However, it is not recommended for application to process pipelines and equipment carrying liquid oxygen, or to gaseous oxygen lines and equipment running above 1.5 MPa (218 psi) pressure or running above +60°C (+140°F) operating temperature. For detailed information or advice please refer to our Customer Service Centre.
Product range	Tubes, 25 mm thickness, for pipe outer diameters ranging from 18 to 89 mm (¾" to 3" NB). Sheets in rolls, 25 mm thickness.
Applications	Cryogenic thermal insulation / protection of pipes, vessels and equipment (incl. elbows, fittings, flanges etc.) in production plants for petrochemicals, industrial gases, LNG, agricultural chemicals and other process equipment facilities.
Installation	For industrial applications it is recommended to consult the relevant Armacell installation instructions and application manuals. Please consult our Customer Service Centre.
Regulation / approval compliance	EN 14304 (harmonized construction product standard for FEF) Lloyds approval

Property	Value / Assessment			Standard / Test method
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Temperature range*1				
Service temperature	Max. service temperature	+110 °C	+230 °F	Tested according to EN 14706, EN 14707 and EN 14304
	Min. service temperature	-180 °C	-292 °F	

Thermal conductivity

Declared thermal conductivity (metric units)	$\lambda_d \leq 0.040 \text{ W/(m}\cdot\text{K)}$ at 0 °C								Declared according to EN ISO 13787 Tested according to EN 12667 and EN ISO 8497 (Equivalent methods ASTM C177 and C518)	
	θ_m	-180	-100	-50	0	+50	+100	+110		[°C]
	$\lambda_d \leq$	0.031	0.039	0.040	0.040	0.044	0.053	0.056		[W/(m·K)]
Equation of declared thermal conductivity as a function of temperature: $\lambda_d(\theta_m) = 0.04 + 3 \times 10^{-5} \times \theta_m + 6 \times 10^{-7} \times \theta_m^2 + 4 \times 10^{-9} \times \theta_m^3 \text{ W/(m}\cdot\text{K)}$, where θ_m is mean temperature in °C										
Declared thermal conductivity (imperial units)	$\lambda_d \leq 0.277 \text{ Btu}\cdot\text{in/(h}\cdot\text{ft}^2\cdot\text{°F)}$ at 32 °F									
	θ_m	-292	-148	-58	+32	+122	+212	+230		[°F]
	$\lambda_d \leq$	0.213	0.270	0.274	0.277	0.302	0.367	0.387		[Btu·in/(h·ft ² ·°F)]

Water vapour diffusion (transmission) resistance

Water vapour diffusion resistance factor	For details on system performance please contact our Customer Service Centre.
Water vapour permeability	

Fire performance & approvals

International standards	Class A, < 25 Flame Spread Index	Tested according to ASTM E84
	Class 1	Approved by Lloyds Tested according to BS 476 part 7
General fire performance	Self-extinguishing, does not drip, does not spread flames.	

Density

Density	65 to 80 kg/m ³	4.1 to 5.0 lb/ft ³	Tested according to ISO 845, ASTM D1622
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Mechanical properties

Compression deflection	≥ 10 kPa	≥ 1.5 psi	at 25% deflection	Tested according to ISO 6916-1 (equivalent method ASTM D1056)
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Corrosion mitigation

Leachable (water-soluble) chlorides*2	≤ 80 ppm (mg/kg or µg/g)	Tested according to EN 13468 and ASTM C871
pH-value	7 to 9	Tested according to ISO 10523

Technical Data - Armaflex LTD

Other technical features

Dimensional tolerances	According to EN 14304, for detailed values please refer to product range tables.		Tested according to EN 822, EN 823 and EN 13467
Weather resistance	In all industrial applications the outer layer of the material must be protected with an adequate covering like Arma-Chek R, metal jacketing or preformed UV-cured GRP (Glass-Reinforced Plastic) cladding. For further information please consult our Customer Service Centre.		
Health aspects	Neutral, MSDS available on request.		
Water absorption* ³	≤ 0.1% by volume (total submersion for 2 hours)		Tested according to ASTM C209
Closed cell content	≥ 90 %	declared on the basis of the water absorption test	
Glass transition temperature* ³	Below -70 °C	Below -94 °F	
Application conditions* ⁴	Ambient temperature: Max. relative humidity:	+5 °C to +35 °C 80%	+41 °F to +95 °F
Sealing and adhesion	Armaflex Adhesive 520 or Adhesive HT625 shall be used for reliable adhesion of joints and seams.		
Storage	Material shall be stored indoors, in clean and dry conditions, away from direct sunlight.		
Shelf (storage) life* ⁵	Max. 3 years		

1. For temperatures below or above those published please contact our Customer Service Centre to request for the corresponding technical information.
2. Specimen preparation in accordance with EN 13486: neither cut nor blended. Test temperature +100°C, leaching time 0.5 hours as specified in the standard for product maximum service temperature.
3. Based on single test results which are not monitored in regular frequency. Can be used for information / reference only.
4. For environmental conditions outside the given range please contact our Customer Service Centre.
5. Shelf life (maximum storage time) is limited in order to make sure that only currently manufactured products are applied on projects. This limitation is restricted solely to storage of the product and does not affect the lifetime of product after it has been installed.

All data and technical information are based on results achieved under typical application conditions. Recipients of this information should, in their own interest and responsibility, clarify with us in due time whether or not the data and information apply to the intended application area. Armacell takes every precaution to ensure the accuracy of the data provided in this document and all statements, technical information and recommendations contained within are believed to be correct. However, Armacell cannot guarantee that the data are 100 % accurate. Furthermore, minor deviations in colour, quality and dimensions are unavoidable and in most cases do not influence the performance of the product. Armacell expressly disclaims any and all liability in relation to any results obtained or arising from any use of the product or reliance on such information. No warranty of fitness for any particular purpose, warranty of merchantability or any other warranty, expressed or implied, is made concerning the goods described or the information provided herein. Please consult our Customer Service Centre before insulating stainless steels. Installation instructions are available in our Armaflex installation manual. All the statements and technical information within this document should be read in conjunction with the customer's own specification. It is the responsibility of the recipient to inform all involved parties about the content of these documents. The described and recommended methods should be strictly followed. If there is a requirement to deviate from our recommendations, please contact us in advance to discuss possible suitable alternatives. Armacell will not be liable for any claim resulting from a failure to observe our specification or any other agreed solutions and from non-observance of the customer's specification.

Product Range - Armacell LTD

Sheets

Item	Nominal Thickness [mm]	Nominal Roll Length [m]	m ² /carton
LTD-25-99/E	25	4	4
Tolerances for sheets According to EN 14304			
Thickness tolerances		25 mm nominal thickness	± 2 mm
Width tolerances			± 2 %
Length tolerances			± 1.5 %

Tubes

Steel pipes *			Pipe max. Outside Diameter	Inside Diameter ID of Insulation Tube min/max	Nominal Insulation Thickness:	
Nominal Pipe Size NPS	Nominal Diameter DN	Outside Diameter OD*			25 mm	
[inch]		[mm]	[mm]	[mm]	Item	m/carton
¾	10	17.2	18	19.5 - 21.0	LTD-25X018	36
½	15	21.3	22	23.5 - 25.0	LTD-25X022	32
¾	20	26.9	28	29.5 - 31.5	LTD-25X028	24
1	25	33.7	35	36.5 - 38.5	LTD-25X035	24
1¼	32	42.4	42.4	44.0 - 46.0	LTD-25X042	20
1½	40	48.3	48.3	50.0 - 52.0	LTD-25X048	18
2	50	60.3	60.3	62.0 - 64.0	LTD-25X060	12
2½	65	76.1	76.1	78.0 - 80.0	LTD-25X076	10
3	80	88.9	89	91.0 - 94.0	LTD-25X089	8
Tolerances for tubes According to EN 14304				Thickness tolerances	25 mm nominal thickness	± 2.5 mm
				Internal Diameter tolerances		see ID min/max in the table above
				Length tolerances		± 1.5 %
Notes				* In accordance with European standards for steel pipes. For further dimensions please contact our Customer Service Centre.		

Accessories

Item	Article description	Units / carton	
ADH520/2,5E	2.5 Litre TIN	20	Litre
ADH520/1,0E	1 Litre TIN	12	Litre
ADH-HT625/1,0	1 Litre TIN	12	Litre

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