

HT/ArmaFlex[®] Industrial



HIGH DENSITY INDUSTRIAL GRADE FEF INSULATION FOR ELEVATED TEMPERATURES

- High density and mechanically robust for superior stability and multi-layer applications
- Suitable for operating temperatures to +125°C
- Built-in vapour barrier reduces risk of corrosion under insulation (CUI)
- Retains physical characteristics throughout service life
- Low maintenance and repair costs
- Low leachable chloride content (< 30 ppm) to minimise stress corrosion cracking (SCC)
- Low thermal conductivity to minimise energy losses



RANGE

TUBE

Tubes



SHEET

Continuous sheet (rolls)



TAPE



RECOMMENDED PRODUCTS

For a complete installation



ArmaFlex HT625 adhesive



ArmaFlex Cleaner

TECHNICAL DATA

HT/ArmaFlex Industrial is a flexible, high density and mechanically robust, closed cell thermal insulation material based on extruded elastomeric foam. The product has been specially developed to provide enhanced thermal resistance for industrial applications.

Material type	Synthetic EPDM rubber based foam. Factory made flexible elastomeric foam (FEF) according to EN 14304.
Colour	Black
Special features	HT/ArmaFlex Industrial is resistant to elevated operating temperatures. The product is suitable for use in multi-layer applications including ArmaSound Industrial Systems.
Product range	Tubes, 13, 19 and 25mm thickness, for pipes outer diameters ranging from 18 to 89mm (¾" to 3" NB). Sheets in rolls, 10, 13, 19 and 25mm thickness.
Applications	Thermal insulation / protection of pipes, vessels and ducts (incl. elbows, fittings, flanges etc.) in offshore, industrial (typically oil & gas) and process equipment facilities. HT/ArmaFlex Industrial is also used as a component of ArmaSound Industrial Systems to provide acoustic insulation on industrial pipework and vessels ensuring reduction of sound transmission.
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 (harmonised construction product standard for FEF) IMO 2010 FTP (Fire Test Procedure) Code part 5 (surface flammability)

Property	Value/Assessment	Standards & Remarks							
Temperature Range*¹									
Service temperature	Max service temperature +125 °C +257 °F Min service temperature -50 °C -58 °F	Tested acc. to EN 14706, EN 14707 & EN 14304							
Thermal Conductivity									
Declared thermal conductivity (metric units)	$\lambda_d \leq 0.041$ W/(m·K) at 0 °C	Declared acc. to EN ISO 13787 Tested according to EN 12667 and EN ISO 8497 (Equivalent methods ASTM C177 and C518)							
	<table border="1"> <tr> <td>θ_m</td> <td>-50</td> <td>0</td> <td>+50</td> <td>+100</td> <td>+125</td> <td>[°C]</td> </tr> </table>		θ_m	-50	0	+50	+100	+125	[°C]
	θ_m		-50	0	+50	+100	+125	[°C]	
$\lambda_d \leq$	0.039	0.041	0.047	0.057	0.063	[W/(m·K)]			
Equation of declared thermal conductivity as a function of temperature: $\lambda_d (\theta_m) = 0.04028 + 1.25 \times 10^{-4} \times \theta_m + 8 \times 10^{-7} \times (\theta_m - 30)^2$ W/(m·K), where θ_m is mean temperature in °C									
Declared thermal conductivity (imperial units)	$\lambda_d \leq 0.284$ Btu·in/(h·ft ² ·°F) at 32 °F								
	<table border="1"> <tr> <td>θ_m</td> <td>-58</td> <td>+32</td> <td>+122</td> <td>+212</td> <td>+257</td> <td>[°F]</td> </tr> </table>		θ_m	-58	+32	+122	+212	+257	[°F]
	θ_m		-58	+32	+122	+212	+257	[°F]	
$\lambda_d \leq$	0.271	0.284	0.325	0.393	0.438	[Btu·in/(h·ft ² ·°F)]			
Water Vapour Diffusion (transmission) Resistance*²									
Water vapour diffusion resistance factor	$\mu \geq 3,000$ (sheets)	Tested acc. to EN 12086 & EN 13469 (equivalent method ASTM E96)							
Sheet	sheets: $\leq 6.51 \times 10^{-7}$ g/(m·s·Pa) ≤ 0.045 Perm inch								
Fire Performance & approvals									
International standards	Class A, < 25 Flame Spread Index* ³	Tested acc. to ASTM E84							
	Class 1	Tested acc. to BS 476 part 7							
Reaction to fire (Euroclass)	D-s3, d0 / DL-s3, d0	Classified acc. to EN 13501-1 Tested acc. to EN 13823 (SBI) and EN ISO 11925-2							
General fire performance	Self-extinguishing, does not drip, does not spread flames								
Density									
Density	sheets: 70 to 85 kg/m ³ 4.4 to 5.3 lb/ft ³ tubes: 60 to 75 kg/m ³ 3.7 to 4.7 lb/ft ³	Tested acc. to ISO 845, ASTM D1622							

Property	Value/Assessment	Standards & Remarks
Acoustic performance		
Acoustic insertion loss* ⁴	When used as part of a system: HT/ArmaFlex Industrial complies to ISO 15665 Classes A to C and Shell DEP 31.46.00.31-Gen Class D Minimum acoustic service temperature (interface temperature to pipework or underlying thermal insulation layers) is -40°C (-40 °F)	Tested according to ISO 3741 (equivalent method ASTM E1222) Classified according to ISO 15665
Mechanical properties		
Compression deflection	≥ 15 kPa ≥2.2 psi at 25% deflection	Tested acc. to ISO 6916-1 (equivalent method ASTM D1056)
Tear strength	≥ 0.4 kN/m ≥2.3 lbf/in	Tested acc. to ISO 34-1* ⁵
Corrosion mitigation		
Leachable (water soluble) chlorides	≤ 30 ppm (mg/kg or µg/g)	Tested* ⁶ acc. to EN 13468 and ASTM C871
pH-value* ³	7 to 9	Tested acc. to ISO 10523
Stress corrosion cracking	No cracks under magnifying glass on test coupons after evening, cleaning and rebending. * ^{7 & 3}	Tested acc. to ASTM C692
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 acc. to ASTM C209
Closed cell content	≥90% declared on the basis of the water absorption test	
Vacuum water absorption	≤ 4% by mass total submersion for 2 x 180 seconds, vacuum pressure 17.2 kPa [2.5 psi]	Tested acc. to ASTM D1056
Application conditions* ⁸	Ambient temperature: +5 °C to +35 °C, +41 F to +95 °F. Max. relative humidity: 80%	
Sealing and adhesion* ⁹	ArmaFlex adhesive HT625 shall be used for reliable adhesion of joints and seams.	
Tape* ¹⁰	HT/ArmaFlex tape can be used for application	
Storage	Material shall be stored indoors, in clean and dry conditions, away from direct sunlight	
Shelf (storage) life* ¹¹	Max 3 years	

1. For temperatures below or above those published please contact our Customer Service Centre to request the corresponding technical information.
2. For further information on water vapour transmission resistance of HT/ArmaFlex Industrial tubes please contact our Customer Service Centre.
3. Based on single test results which are not monitored in regular frequency. Can be used for information / reference only.
4. For further details on acoustic classes according to ISO 15665 please consult our leaflet on ArmaSound Industrial Systems.
5. Minimum value in Machine Direction (MD) and in Cross Direction (CD). Angle test piece with a nick.
6. 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.
7. The coupons from type 304 stainless steel sheet, 1.5 mm thick. 28 days drip test using deionized or distilled water at around +100 °C.
8. For environmental conditions outside the given range please contact our Customer Service Centre.
9. During storage of the product, blooming on the surfaces may occur, especially at wall thickness below 19 mm. This blooming does not affect the technical properties of the material, but can affect the adhesion properties. Therefore, the surface needs to be cleaned before adhesives can be applied.
10. For further information and application instructions please contact our Customer Service Centre.
11. 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 is 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.

TUBE

Length - 2m, Colour - Black



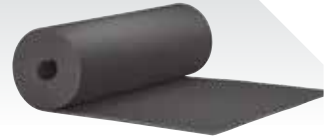
Steel pipes					13mm INSULATION THICKNESS		
Nominal Pipe size (")	Nominal Ø	Outside Ø (mm)	Pipe max. Outside Ø (mm)	Inner Ø min/ max (mm)	Code	m/carton	
3/8	10	17.2	18	19.5 - 21	HTI-13X018 •	98	
1/2	15	21.3	22	23.5 - 25	HTI-13X022 •	84	
3/4	20	26.9	28	29.5 - 31.5	HTI-13X028 •	64	
1	25	33.7	35	36.5 - 38.5	HTI-13X035 •	50	
1 1/4	32	42.4	42.4	44 - 46	HTI-13X042 •	40	
1 1/2	40	48.3	48.3	50 - 52	HTI-13X048 •	32	
		54	54	56 - 58	HTI-13X054 •	32	
2	50	60.3	60.3	62 - 64	HTI-13X060 •	28	
2 1/2	65	76.1	76.1	78 - 80	HTI-13X076 •	24	
3	80	88.9	89	91 - 94	HTI-13X089 •	18	

Steel pipes					19mm INSULATION THICKNESS		
Nominal Pipe size (")	Nominal Ø	Outside Ø (mm)	Pipe max. Outside Ø (mm)	Inner Ø min/ max (mm)	Code	m/carton	
3/8	10	17.2	18	19.5 - 21	HTI-19X018 •	98	
1/2	15	21.3	22	23.5 - 25	HTI-19X022 •	84	
3/4	20	26.9	28	29.5 - 31.5	HTI-19X028 •	64	
1	25	33.7	35	36.5 - 38.5	HTI-19X035 •	50	
1 1/4	32	42.4	42.4	44 - 46	HTI-19X042 •	40	
1 1/2	40	48.3	48.3	50 - 52	HTI-19X048 •	32	
		54	54	56 - 58	HTI-19X054 •	32	
2	50	60.3	60.3	62 - 64	HTI-19X060 •	28	
2 1/2	65	76.1	76.1	78 - 80	HTI-19X076 •	24	
3	80	88.9	89	91 - 94	HTI-19X089 •	18	

Steel pipes					25mm INSULATION THICKNESS		
Nominal Pipe size (")	Nominal Ø	Outside Ø (mm)	Pipe max. Outside Ø (mm)	Inner Ø min/ max (mm)	Code	m/carton	
3/8	10	17.2	18	19.5 - 21	HTI-25X018 •	98	
1/2	15	21.3	22	23.5 - 25	HTI-25X022 •	84	
3/4	20	26.9	28	29.5 - 31.5	HTI-25X028 •	64	
1	25	33.7	35	36.5 - 38.5	HTI-25X035 •	50	
1 1/4	32	42.4	42.4	44 - 46	HTI-25X042 •	40	
1 1/2	40	48.3	48.3	50 - 52	HTI-25X048 •	32	
		54	54	56 - 58	HTI-25X054 •	32	
2	50	60.3	60.3	62 - 64	HTI-25X060 •	28	
2 1/2	65	76.1	76.1	78 - 80	HTI-25X076 •	24	
3	80	88.9	89	91 - 94	HTI-25X089 •	18	

CONTINUOUS SHEET (ROLLS)

Width - 1m, Colour - Black



Item	Nominal Thickness (mm)	Nominal Roll Length (m)	m ² /carton	
HTI-10-99/E •	10	10	10	
HTI-13-99/E •	13	8	8	
HTI-19-99/E •	19	6	6	
HTI-25-99/3.5 •	25	3.5	3.5	

Other information and remarks		
Thickness tolerance for tubes	13 - 19mm	± 1.5mm
	25mm	± 2.5mm
Thickness tolerance for sheets	10 - 19mm	± 1.5mm
	25mm	± 2mmw
Length tolerance for tubes & sheets	± 1.5mm	
• Not a stock item		
* In accordance with European standards for steel pipes with the exception of Outside Diameter 54 for copper pipe. For further dimensions please contact our Customer Service Centre.		

TAPE

Colour - black



Code	Description	Units / carton		
HT-TAPE	Tape 3mm thick x 50mm wide (15m long roll)	12	rolls	