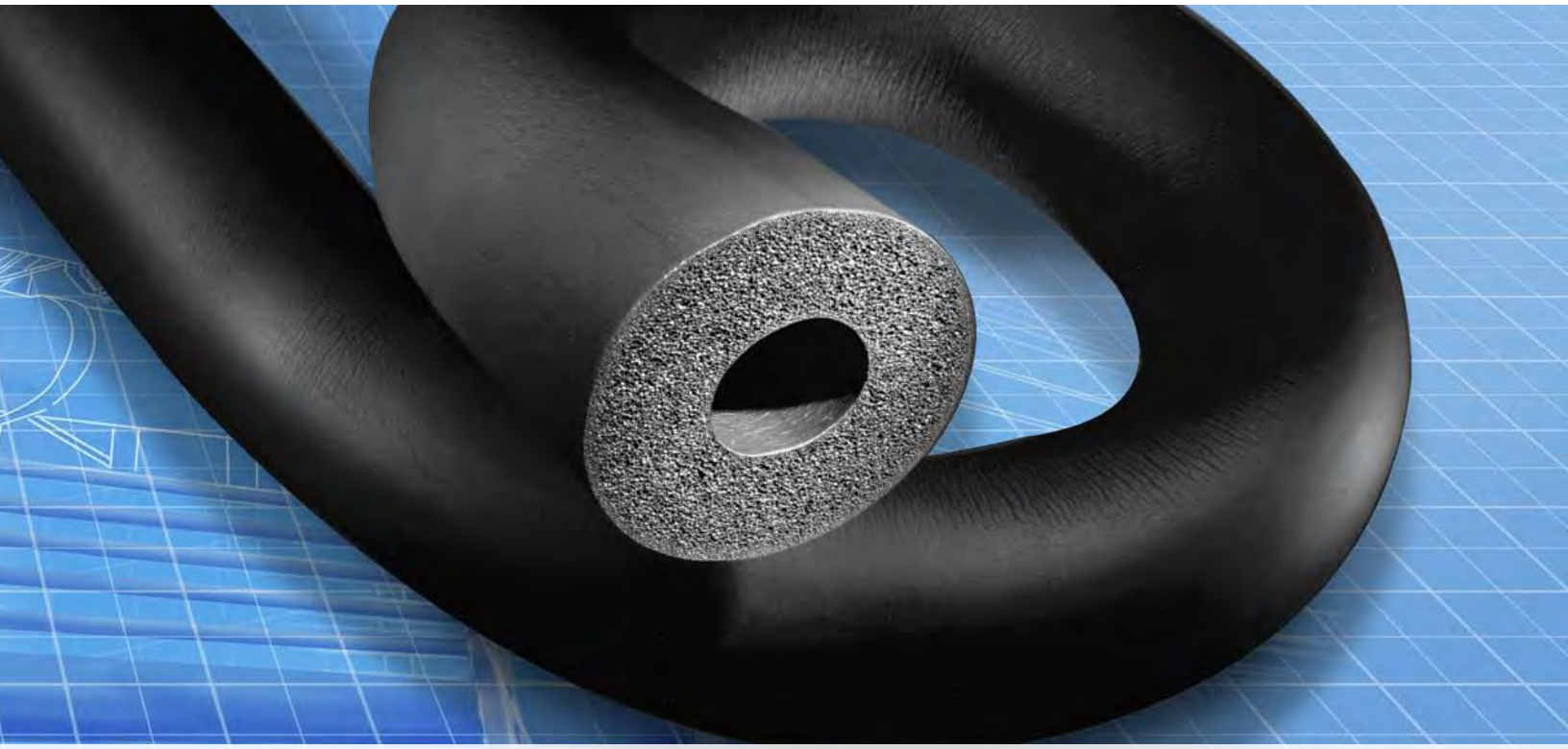
armacell engineered foams

THE MAKERS OF Armaflex®



AP/Armaflex®

Tube Insulation

Super Moisture Control, Mold-Resistant

- Closed-cell, nonwicking
- Microban® antimicrobial product protection
- The IAQ Insulation™
- Fiber-free

THE GLOBAL COMPACT
WE SUPPORT

FOR GREENER BUILDINGS

FM APPROVED

Microban® antimicrobial product protection

AP Armaflex Pipe (Tube) Insulation

AP Armaflex Pipe (Tube) Insulation is the original closed cell, fiber-free elastomeric foam and the world's most recognized brand in flexible mechanical insulation.

- **Proven:** World's first choice for insulating chilled water and refrigeration lines
- **Mold resistant:** Made with Microban antimicrobial product protection
- **Indoor Air Quality-friendly:** Fiber-free, formaldehyde-free, low VOCs, nonparticulating
- **Durable:** No fragile vapor retarder

Description

AP Armafex Pipe (Tube) Insulation is a black flexible elastomeric thermal insulation. The expanded closed-cell structure makes it an efficient insulation. It is manufactured without the use of CFC's, HFC's or HCFC's. All AP Armaflex products are made with Microban® antimicrobial product protection for added defense against mold on the insulation.

- Nominal wall thicknesses of 3/8″, 1/2″, 3/4″, 1″ and 1-1/2″ (10, 13, 19, 25 and 38mm)
- Popular sizes up to 6″ IPS

Factory Mutual (FM) Approvals

AP Armaflex is approved through continuing supervision by Factory Mutual Approvals to consistently provide actual values on these key performance criteria for mechanical system insulation:

- **Thermal Conductivity:** 0.25 BTU-in/hr. ft^2 °F
- **Water Vapor Transmission:** 0.05 perm-inch
- **Fire Rating:** will not contribute significantly to fire (simulated end-use testing)

As tested by ASTM E 84 "Method of Test for Surface Burning Characteristics for Building Materials" and CAN/ULC S-102, AP Armaflex Pipe Insulation in wall thicknesses through 1-1/2″ (38mm) has a flame-spread index of less than 25 and a smoke-developed index of less than 50.

Note: Numerical flammability ratings alone may not define the performance of products under actual fire conditions. They are provided only for use in the selection of products to meet limits specified.

Uses

- Retards heat gain and controls condensation drip from chilled-water and refrigeration systems. Efficiently reduces heat flow for hot-water plumbing, liquid-heating and dual-temperature piping
- Acceptable in wall thicknesses through 1-1/2″ (38mm) for use in air plenums and conforms to NFPA 90A and NFPA 90B requirements

The recommended temperature usage range for AP Armaflex Pipe Insulation is -297°F to +220°F (-183°C to +105°C). For use on cold pipes, thicknesses have been calculated to control condensation on the insulation outer surface, as shown in the table of thickness recommendations. AP Armaflex meets the energy code requirements of ASHRAE 90.1, ASHRAE 90.2 International Energy Conservation Code (IECC) and other building codes.

Application

AP Armaflex Pipe Insulation in unslit tubular form can be slipped onto piping before it is connected, or it can be slit lengthwise and snapped over piping already connected. Fitting covers are fabricated from miter-cut tubular form. In all cases, butt joints and seams are to be sealed with one of our Armaflex adhesives: Armaflex 520, 520 Black or, where a low V.O.C. adhesive is required, 520 BLV. 520 Adhesives are contact adhesives; therefore, in all cases, both surfaces to be joined are coated with adhesive.

For pipes greater than 6″ IPS, use AP/Armaflex Sheet/Roll insulation. For thicknesses greater than 1″, sleeve the insulation. See technical bulletin #030 for additional information. AP/Armaflex pipe insulation is available in 1-1/2″ wall thicknesses with 25/50 rating for ID size range from 7/8″ to 4″ IPS.

AP Armaflex normally requires no supplemental vapor-retarder protection but additional vapor-retarder protection may be necessary when installed on very-low-temperature piping or exposure to continually high humidity conditions.

AP Armaflex is designed for installation above ground. Outdoors, a weather-resistant protective finish is to be applied and Armaflex WB Finish is recommended.

Armaflex insulation products must be installed according to "Installation of Armaflex Insulations" brochure. Proper installation is required to assure Armaflex insulation performance.

Specification Compliance

AP Armaflex Pipe Insulation developed to meet:

ASTM C 534, Type I — Tubular Grade 1
ASTM E 84, NFPA 255, UL 723
CAN/ULC S102
UL 94 5V-5A, V-O, File E 55798
NFPA 90A, 90B
UL 181
ASTM G-21/C1338,
ASTM G-22
ASTM D 1056, 2B1
MIL-P-15280J, FORM T
MIL-C-3133C (MIL STD 670B), Grade SBE 3
MEA 96-85-M
City of LA – RR 7642

ALL ARMACELL FACILITIES IN NORTH AMERICA ARE ISO 9001:2000 CERTIFIED.

Physical Properties

Specifications	Values	Test Method
Thermal Conductivity, Btu • in./h • ft² • °F (W/mK) 75°F Mean Temperature (24°C) 90°F Mean Temperature (32°C)	 0.25 (0.036) 0.256 (0.037)	 ASTM C 177 or C 518
Water Vapor Permeability, Perm-in. [Kg/(s•m•Pa)]	0.05 (0.725 x 10^{-13})	ASTM E 96, Procedure A
Flame Spread and Smoke Developed Index through 1-1/2″ (38mm)	 25/50	 ASTM E 84 CAN/ULC S102
Mold Growth **Fungi Resistance** **Bacterial Resistance**	UL181 ASTM G21/C1338 ASTM G22	Meets requirements Meets requirements Meets requirements
Water Absorption, % by Volume	0.2%	ASTM C 209
Upper Use Limit①	220°F (105°C)	—
Lower Use Limit②	-297°F (-183°C)*	—
Ozone Resistance	GOOD	—
Sizes		
Wall Thickness, (nominal) Form	3/8″, 1/2″, 3/4″, 1″, 1-1/2″ (10, 13, 19, 25 and 38mm)	
Inside Diameter, Tubular Form	3/8″ ID to 6″ IPS (10mm ID to 168mm) [1-1/2″ wall: 7/8″ to 4″ IPS (22mm to 114mm)]	—
Length of Sections, Feet, Tubular Form	6 (1.8m) [1-1/2″ wall: 3 (0.9m)]	
Density, Typical Range③	3.0 - 6.0 lbs./ft.³	ASTM D 1622 or D 1667

Notes

① On the heating cycle, AP Armaflex Pipe Insulation will withstand temperatures as high as 220°F (105°C). 520, 520 Black or 520 BLV Adhesive may be used with pipe insulation applications up to 220°F (105°C).

② At temperatures below -20°F (-29°C), elastomeric insulation starts to become less flexible. However, this characteristic does not affect thermal efficiency and resistance to water vapor permeability of Armaflex insulation.

③ Reference only.

* For applications of -40°F to -297°F (-40°C to -183°C), contact Armacell.

Performance approved through continuing supervision by Factory Mutual Approvals.

Armaflex Pipe Insulation Thickness Recommendations

For Controlling Outer Insulation Surface Condensation

(Based upon available manufactured thicknesses and not intended to supercede any state or local building codes.)

Pipe Size	Line Temperatures			
	50°F (10°C)	**35°F (2°C)**	**0°F (–18°C)**	**–20°F (–29°C)**
BASED ON **NORMAL** DESIGN CONDITIONS*				
3/8″ ID through 1-1/8″ ID (10mm–28mm)	Nom 3/8″ (10mm)	Nom 1/2″ (13mm)	Nom 3/4″ (19mm)	Nom 1″ (25mm)
Over 1-1/8″ ID through 2-1/8″ ID (28mm–54mm)	Nom 3/8″ (10mm)	Nom 1/2″ (13mm)	Nom 1″ (25mm)	Nom 1″ (25mm)
Over 2-1/8″ ID through 2-5/8″ ID (54mm–67mm)	Nom 3/8″ (10mm)	Nom 1/2″ (13mm)	Nom 1″ (25mm)	Nom 1-1/4″ (32mm)
Over 2-5/8″ ID through 6″ IPS (67mm–168mm)	Nom 1/2″ (13mm)	Nom 3/4″ (19mm)	Nom 1″ (25mm)	Nom 1-1/4″ (32mm)
BASED ON **MILD** DESIGN CONDITIONS**				
3/8″ ID through 2-5/8″ ID (10mm–67mm)	Nom 3/8″ (10mm)	Nom 3/8″ (10mm)	Nom 1/2″ (13mm)	Nom 3/4″ (19mm)
Over 2-5/8″ ID through 6″ IPS (67mm–168mm)	Nom 1/2″ (13mm)	Nom 1/2″ (13mm)	Nom 1/2″ (13mm)	Nom 3/4″ (19mm)
BASED ON **SEVERE** DESIGN CONDITIONS*				
3/8″ ID through 1-5/8″ ID (10mm–42mm)	Nom 3/4″ (19mm)	Nom 1″ (25mm)	Nom 1-1/2″ (38mm)	Nom 1-1/2″ (38mm)
Over 1-5/8″ ID through 3-5/8″ ID (42mm–92mm)	Nom 3/4″ (19mm)	Nom 1″ (25mm)	Nom 1-1/2″ (38mm)	Nom 1-3/4″ (44mm)
Over 3-5/8″ ID through 6″ IPS (92mm–168mm)	Nom 3/4″ (19mm)	Nom 1″ (25mm)	Nom 1-1/2″ (38mm)	Nom 2″ (50mm)
For **VERY SEVERE** DESIGN CONDITIONS which Armacell would consider temperatures above **90°F(32°C)** and/or above **80% RH**	Consult Armacell for recommended insulation thickness			

NOTE: Thicknesses greater than 1″ (25mm) are multiple-layer applications, see technical bulletin #30.

*BASED ON **NORMAL** DESIGN CONDITIONS AP Armaflex in the thicknesses noted and within the specified temperature ranges will control outer insulation surface condensation indoors under **normal** design conditions, a maximum severity of **85°F (29°C) and 70% RH**. Armacell research and field experience indicate that indoor conditions anywhere in the United States seldom exceed this degree of severity.

BASED ON **MILD DESIGN CONDITIONS AP Armaflex in the thicknesses noted and within the specified temperature ranges will control outer insulation surface condensation indoors under **mild** design conditions, a maximum severity of **80°F (27°C) and 50% RH**. Typical of these conditions are most air-conditioned spaces and arid climates.

***BASED ON **SEVERE** DESIGN CONDITIONS AP Armaflex in the thicknesses noted and within the specified temperature ranges will control outer insulation surface condensation indoors under **severe** design conditions, a maximum severity of **90°F (32°C) and 80% RH**. Typical of these conditions are indoor areas in which excessive moisture is introduced or in poorly ventilated confined areas where the temperature may be depressed below ambient.

Air-drying contact adhesives that are excellent for joining seams.

Armaflex 520, 520 Black & 520 BLV Adhesive

ARMACELL LLC
TEL: 1 800 866-5638
FAX: 919 304-3847
info.us@armacell.com
www.armacell.com/us
7600 Oakwood Street Extension • Mebane, NC 27302

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