

**Description**

Mold resistant AP Armaflex Pipe (Tube) Insulation is a flexible elastomeric thermal insulation, black in color, supplied as unslit tubing, in:

- 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.

The expanded closed-cell structure of AP Armaflex Pipe Insulation makes it an efficient insulation. It is manufactured without the use of CFC's, HFC's or HCFC's. It is also formaldehyde free, low VOCs, fiber free, dust free and resists mold and mildew. All AP Armaflex products are made with Microban® antimicrobial product protection for added defense against mold on the insulation.

**Factory Mutual Approvals System**

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<sup>2</sup> °F
- Water Vapor Transmission: 0.05 perm-inch
- Fire Rating: will not contribute significantly to fire (simulated end-use testing).

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

**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**

AP Armaflex Pipe Insulation is used to retard heat gain and control condensation drip from chilled-water and refrigeration systems. It also efficiently reduces heat flow for hot-water plumbing and liquid-heating and dual-temperature piping. 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, AP Armaflex Pipe Insulation thicknesses have been calculated to control condensation on the insulation outer surface, as shown in the table of thickness recommendations.

AP Armaflex Insulation is acceptable in wall thicknesses through 1-1/2" for use in air plenums. Conforms to NFPA 90A and NFPA 90B requirements.

AP/Armaflex meets the energy code requirements of ASHRAE 90.1, ASHRAE 90.2, International Energy Conservation Code (IECC) and other building codes.

**Resistance To Moisture Vapor Flow**

The closed-cell structure of AP Armaflex Insulation prevents moisture from wicking and makes it an efficient insulation. AP Armaflex normally requires no supplemental vapor-retarder protection. Additional vapor-retarder protection may be necessary for AP Armaflex when installed on very-low-temperature piping or where exposed to continually high humidity conditions.



**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 Armaflex 520, 520 Black Adhesive or, where a low V.O.C. adhesive is required, Armaflex 520 BLV Adhesive. 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 thickness with 25/50 rating for ID size range from 7/8" to 4" IPS

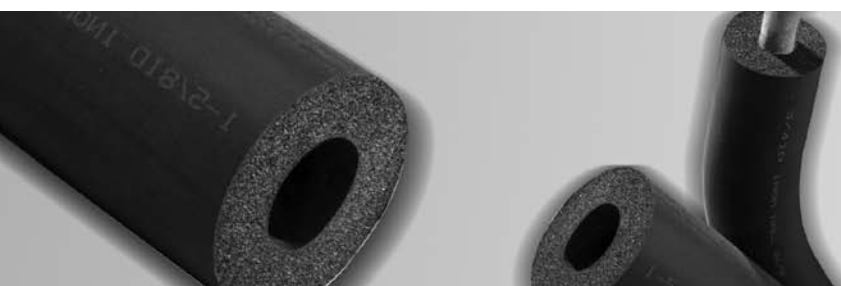
AP Armaflex is designed for installation above ground. Outdoors, a weather-resistant protective finish is to be applied. Armaflex WB Finish is recommended.

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-A, 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

**AP/Armaflex® TUBES**



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

## Physical Data

### Physical Properties

### Test Method

Thermal conductivity, Btu • in./h • ft <sup>2</sup> • °F (W/mK) 75°F mean temp (24°C) 90°F mean temp (32°C)	0.25 (0.036) 0.256 (0.037)	ASTM C 177 or C 518	<b>Notes</b> 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. * For applications of -40°F to -297°F (-40°C to -183°C), contact Armacell. ③ Reference only. <hr/> Performance approved through continuing supervision by Factory Mutual Approvals.
Water vapor permeability, perm-in. [Kg/(s•m•Pa)]	0.05 (0.725 x 10 <sup>-13</sup> )	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 limit ①	220°F (105°C)	—	
Lower use limit, °F ②	-297°F (-183°C)*	—	
Ozone resistance	GOOD	—	
Sizes Wall thickness, (nominal)	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 range ③	3.0 - 6.0 lbs./ft. <sup>3</sup>	ASTM D 1622 or D 1667	

## Armaflex Pipe Insulation Thickness Recommendations

### For Controlling Outer Insulation Surface Condensation

(Based upon available manufactured thicknesses and not intended to supersede 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)
<b>BASED ON NORMAL DESIGN CONDITIONS*</b> 3/8" ID through 1-1/8" ID (10mm–28mm) Over 1-1/8" ID through 2-1/8" ID (28mm–54mm) Over 2-1/8" ID through 2-5/8" ID (54mm–67mm) Over 2-5/8" ID through 6" IPS (67mm–168mm)	Nom 3/8" (10mm) Nom 3/8" (10mm) Nom 3/8" (10mm) Nom 1/2" (13mm)	Nom 1/2" (13mm) Nom 1/2" (13mm) Nom 1/2" (13mm) Nom 3/4" (19mm)	Nom 3/4" (19mm) Nom 1" (25mm) Nom 1" (25mm) Nom 1" (25mm)	Nom 1" (25mm) Nom 1" (25mm) Nom 1-1/4" (32mm) Nom 1-1/4" (32mm)
<b>BASED ON MILD DESIGN CONDITIONS**</b> 3/8" ID through 2-5/8" ID (10mm–67mm) Over 2-5/8" ID through 6" IPS (67mm–168mm)	Nom 3/8" (10mm) Nom 1/2" (13mm)	Nom 3/8" (10mm) Nom 1/2" (13mm)	Nom 1/2" (13mm) Nom 1/2" (13mm)	Nom 3/4" (19mm) Nom 3/4" (19mm)
<b>BASED ON SEVERE DESIGN CONDITIONS***</b> 3/8" ID through 1-5/8" ID (10mm–42mm) Over 1-5/8" ID through 3-5/8" ID (42mm–92mm) Over 3-5/8" ID through 6" IPS (92mm–168mm)	Nom 3/4" (19mm) Nom 3/4" (19mm) Nom 3/4" (19mm)	Nom 1" (25mm) Nom 1" (25mm) Nom 1" (25mm)	Nom 1-1/2" (38mm) Nom 1-1/2" (38mm) Nom 1-1/2" (38mm)	Nom 1-1/2" (38mm) Nom 1-3/4" (44mm) Nom 2" (50mm)
For <b>VERY SEVERE</b> DESIGN CONDITIONS which Armacell would consider temperatures above <b>90°F(32°C)</b> and/or above <b>80% RH</b>	Consult Armacell for recommended insulation thickness	Consult Armacell for recommended insulation thickness	Consult Armacell for recommended insulation thickness	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.

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