

# AP Armaflex® & AP Armaflex W Tube Insulation

**Superior Moisture Control, Mold-Resistant, Available Black or White**



- Closed-cell, nonwicking
- GREENGUARD Indoor Air Quality Certified®
- Microban® antimicrobial product protection
- The IAQ Insulation™
- Fiber-free
- 25/50 through 1" wall



# AP Armaflex (and AP Armaflex W) 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. GREENGUARD Indoor Air Quality Certified®
- **Durable:** No fragile vapor retarder

## Description

**AP Armaflex Pipe (Tube) Insulation** is a black or white 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" and 1" (10, 13, 19 and 25mm)
- Popular sizes up to 8" 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<sup>2</sup> °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" AP Armaflex Pipe Insulation has a flame-spread index of less than 25 and a smoke-developed index of less than 50.

AP Armaflex Black meets CAN/UL S102.

*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.*

\* Black Only

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

AP Armaflex Tube Insulation

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For the latest document, please refer to our website.

## 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 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, 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 8" IPS\*, use AP/Armaflex Sheet/Roll insulation (black only). For thicknesses greater than 1", sleeve the insulation. See technical bulletin #030 for additional information.

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 or below ground. For below ground applications, contact Armacell or see our Technical Bulletin No. 7 on our website, [www.armacell.com](http://www.armacell.com). 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.

AP/Armaflex FS pipe insulation is available in 1-1/2" and 2" wall thicknesses with 25/50 rating for ID size range from 3/8" to 8" IPS\*. See AP Armaflex FS submittal.

## Specification Compliance

**AP Armaflex Pipe Insulation developed to meet:**

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

## Physical Properties

Specifications	Values	Test Method
<b>Thermal Conductivity, Btu • in./h • ft<sup>2</sup> • °F (W/mK)</b> 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
<b>Water Vapor Permeability, Perm-in. [Kg/(s•m•Pa)]</b>	0.05 (0.725 x 10 <sup>-13</sup> )	ASTM E 96, Procedure A
<b>Flame Spread and Smoke Developed Index</b>	25/50*	ASTM E 84 CAN/ULC S102 (Black)
<b>Mold Growth</b> <b>Fungi Resistance</b> <b>Bacterial Resistance</b>	UL181 ASTM G21/C1338 ASTM G22	Meets requirements Meets requirements Meets requirements
<b>Water Absorption, % by Volume</b>	0.2%	ASTM C 209
<b>Upper Use Limit</b> <sup>①</sup>	220°F (105°C)	—
<b>Lower Use Limit</b> <sup>②</sup>	-297°F (-183°C)**	—
<b>Ozone Resistance</b>	GOOD	—
<b>Sizes</b>		
<b>Wall Thickness, (nominal) Form</b>	3/8", 1/2", 3/4", 1", (10, 13, 19 and 25mm)	—
<b>Inside Diameter, Tubular Form</b>	3/8" ID to 8" ID* (10mm ID to 203mm)	—
<b>Length of Sections, Feet, Tubular Form</b>	6 (1.8m) *Black Only	—
<b>Density, Typical Range</b> <sup>③</sup>	3.0 - 6.0 lbs./ft. <sup>3</sup>	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 25/50 above 1" (25mm) Please see our AP Armaflex FS submittal.

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

## 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)
<b>BASED ON NORMAL DESIGN CONDITIONS*</b>				
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)
<b>BASED ON MILD DESIGN CONDITIONS**</b>				
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)
<b>BASED ON SEVERE DESIGN CONDITIONS*</b>				
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 <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			

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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## Insulation Products for Mechanical Systems

### Armaflex® Adhesives

**Armaflex® 520 and Armaflex 520 Black Adhesives** are air-drying contact adhesives that are excellent for joining seams and butt joints of AP and NH Armaflex Pipe and Sheet Insulation and Tubolit Pipe Insulation. Where a low V.O.C. adhesive is required, use **Armaflex 520 BLV Adhesive**.

520 Adhesives meet MIL-A-24179A and Amend-2 as Type II, Class 1. 520 Adhesives when dried to a film meet codes and specifications of less than 25 for flame spread and less than 50 for smoke (ASTM E 84).



**Armaflex Low VOC Spray Contact Adhesive**, green in color, is supplied in 27 pound aerosolized canisters. The product contains no chlorinated solvents such as methylene chloride and does not contain ozone depleting compounds. Complies with SCAQMD rule 1168 for volatile organic compound content less than 80 g/l. Dried film meets the fire building codes of flame spread index of less than 25 and smoke developed index of less than 50. Excellent for bonding Armaflex sheet and roll insulations to vessels, tanks, ducts and mechanical equipment operating at temperatures below 180°F (82°C).



### Armaflex® WB Finish

**Armaflex WB Finish** is a white water-based latex enamel for use over all forms of Armaflex insulations. It provides a protective semi-gloss finish for both indoor and outdoor applications. Armaflex WB Finish brushes or rolls on easily. Its water base formulation makes it fast-drying without solvent fumes. Cleans up with soap and warm water. Armaflex WB Finish is supplied in gallon and quart containers.

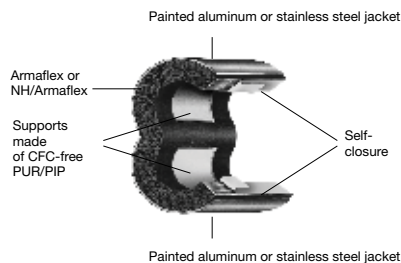


Impervious to moisture. Outdoors, is exceptionally durable and weather resistant to ultraviolet (UV) and ozone. Outdoor surfaces should be recoated every 2-4 years.

### Armafix IPH, NPH Pipe Hangers

#### Uses

Armafix is used to support Armaflex and Armaflex NH (nonhaogen)insulated pipes with pre-insulated hangers that retard heat gain and control condensation drip from chilled-water and refrigeration systems. See Armafix Submittal Sheet for details.



### Armacell Fabricated Fittings

**Armacell Fabricated Fittings** are made-to-order and prefabricated using the world's highest quality, closed cell insulation. Available in wall thicknesses up to 2", these fittings are labor saving, easy to work with and apply, and provide total Armaflex system integrity.



Options include 90-degree elbows (2-piece and 3-piece), T's, 45-degree elbows, grooved fittings (AP Armaflex black) and grooved couplings

### Insulation Tape

**AP Armaflex® Insulation Tape** is made of high-quality AP Armaflex insulation. Available in tape dispenser form, the expanded closed-cell structure makes it an efficient insulation. Made with Microban® antimicrobial product protection, our tape is also formaldehyde free, low VOCs, fiber free, dust free and resists mold and mildew.

Provides a fast, easy method for insulating pipes and fittings. Reduces heat loss when applied to hot-water lines that operate up to 180°F (82°C). AP Armaflex Tape may be used with AP Armaflex Pipe and Sheet Insulation.



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