

AP/Armaflex® TUBES



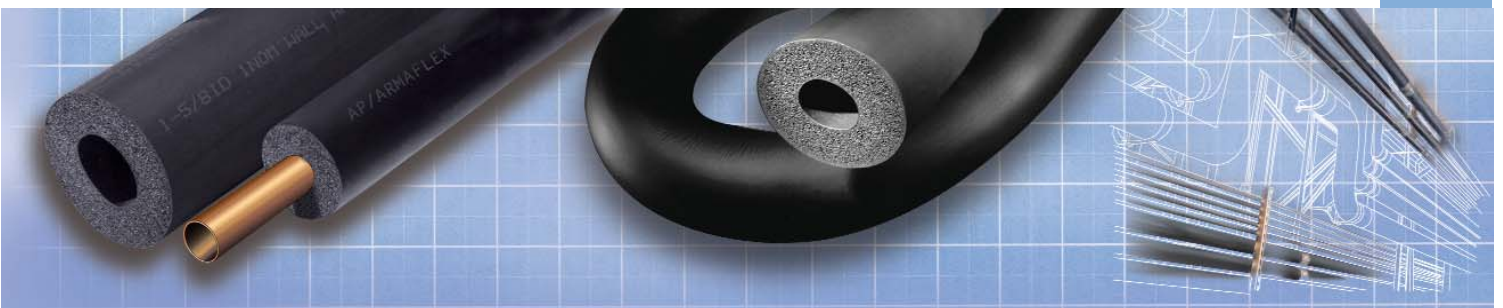
PROVEN PERFORMANCE LEADER

Superior
condensation
control

Excellent
for retarding
heat gain

Trusted
brand
world-wide

Dust-Free,
fiber-free
closed cell



AP/Armaflex® TUBES

Description

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", and 1" (10, 13, 19, and 25mm)
- 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.

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: 0.27 BTU-in/hr. ft² °F

Water Vapor Transmission: 0.08 perm-inch

Fire Rating: will not contribute significantly to fire (simulated end-use testing).

AP Armaflex Pipe Insulation, in thicknesses through 1" (25mm) 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."

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 -70°F to +220°F (-57°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" (25mm) for use in air plenums. Conforms to NFPA 90A and NFPA 90B requirements.

Resistance To Moisture Vapor Flow

The closed-cell structure of AP Armaflex 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 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 is designed for installation above ground. Outdoors, a weather-resistant protective finish is to be applied. WB Armaflex 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

Physical Data

Physical Properties

Test Method

Thermal conductivity, Btu • in./h • ft ² • °F (W/mK) 75°F mean temp (24°C) 90°F mean temp (32°C)	0.27 (0.039) 0.276 (0.040)	ASTM C 177 or C 518
Water vapor permeability, perm-in. [Kg/(s•m•Pa)]	0.08 (1.16 x 10 ⁻¹³)	ASTM E 96 Procedure A
Flame spread and smoke developed index through 1" (25mm)	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 ②	-70°F (-57°C)*	—
Ozone resistance	GOOD	—
Sizes Wall thickness, (nominal)	3/8", 1/2", 3/4", 1" (10, 13, 19, 25mm)	—
Inside diameter, tubular form	3/8" ID to 6" IPS (10mm ID to 168mm)	—
Length of sections, feet, tubular form	6 (1.8m)	—
Density, typical range ③	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 or 520 BLV Adhesive may be used with pipe insulation applications up to 220°F (105°C).

② At -20°F (-29°C), flexible AP Armaflex Insulation becomes hard and, as temperatures drop below -20°F (-29°C), will be increasingly brittle; however, this hardening characteristic does not affect thermal efficiency or water vapor permeability.

* For applications of -40°F to -70°F (-40°C to -57°C), contact Armacell.

③ Reference only.

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)

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) Over 1-1/8" ID through 2-1/8" ID (28mm–54mm) Over 2-1/8" ID through 2-5/8" ID (54mm–65mm) Over 2-5/8" ID through 6" IPS (65mm–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)
BASED ON MILD DESIGN CONDITIONS** 3/8" ID through 2-5/8" ID (10mm–65mm) Over 2-5/8" ID through 6" IPS (65mm–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)
BASED ON SEVERE DESIGN CONDITIONS*** 3/8" ID through 1-5/8" ID (10mm–40mm) Over 1-5/8" ID through 3-5/8" ID (40mm–90mm) Over 3-5/8" ID through 6" IPS (90mm–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)

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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