SOLUTIONS FOR ENERGY SAVINGS
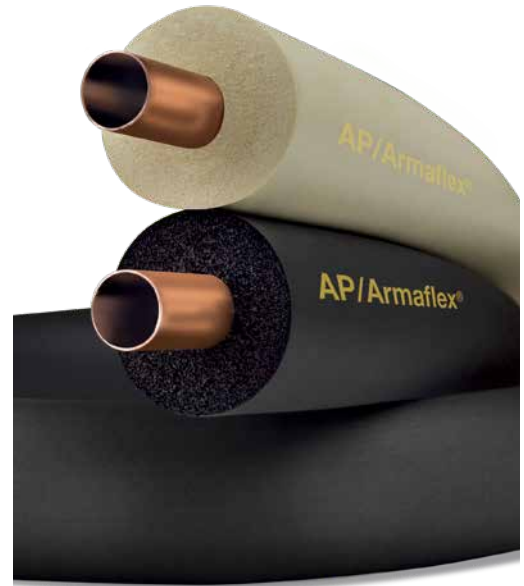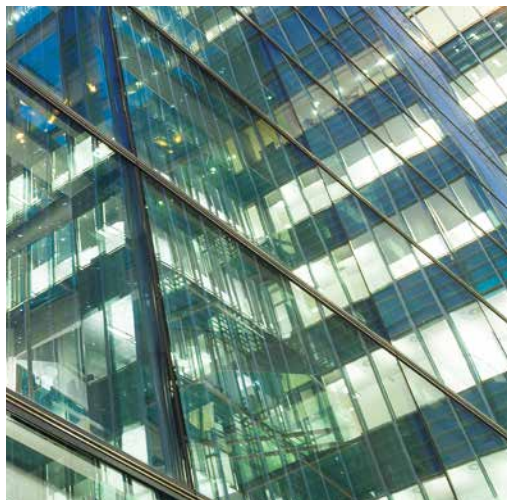
AP ArmaFlex®

Black and White Tube Insulation

The original, fiber-free, flexible elastomeric pipe insulation for reliable protection against condensation and energy loss.

// Fiber-free, formaldehyde-free, low VOC and non-particulating formulation protects indoor air quality
// Closed-cell structure provides excellent condensation control
// Built-in vapor barrier eliminates need for additional vapor retarder

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AP ArmaFlex®

TECHNICAL DATA – AP ArmaFlex® BLACK AND WHITE TUBE INSULATION

Description

Black or off-white flexible closed-cell elastomeric thermal insulation in a tubular form

Applications

Insulation for piping associated with HVAC, VRV and VRF systems, chillers, hot and cold water, refrigeration

Specification Compliance

ASTM C 534, Type I – Grade 1	ASTM G21/C1338	MEA 107-89M	UL 181
ASTM D 1056, 2C1	ASTM G22	MIL-P-15280J, FORM T ②	UL 94 5V-A, V-0, File E55798
ASTM E 84, NFPA 255, UL723	CAN/ULC S102 ①	NFPA 90A, 90B	City of LA – RR 7642

Approvals, Certifications, Compliances

- 3rd party certified by FM Approvals through 1-1/2" wall thickness
- GREENGUARD® Children & Schools Indoor Air Quality certified.
- Manufactured without CFCs, HFCs, HCFCs, PBDEs, or Formaldehyde.

- Made with EPA registered Microban® antimicrobial product protection.
- All Armacell facilities in North America are ISO 9001:2008 certified.
- Plenum Rated

Typical Properties

Specifications	Values		Test Method
	3/8" through 1" Walls	1-1/2" and 2" Walls	
Thermal Conductivity: Btu • in/h • ft2 • °F (W/mK)			
75°F Mean Temperature (24°C)	0.245 (0.0353)	0.28 (0.040)	ASTM C 177 or C 518
90°F Mean Temperature (32°C)	0.254 (0.0366)	0.286 (0.041)	
Water Vapor Permeability: Perm-in. [Kg/(s • m • Pa)]	0.05 (0.725 x 10⁻¹³)	0.08 (1.16 x 10⁻¹³)	ASTM E 96, Procedure A
Flame Spread and Smoke Developed Index:	25/50 rated	25/50 rated	ASTM E 84 CAN/ULC S102 ①
Water Absorption, % by Volume:	0.2 %	0.2 %	ASTM C 209 or ASTM C1763
Mold Growth: Fungi Resistance: Bacterial Resistance:	Passed	Passed	UL181 ASTM G21/C1338 ASTM G22
Upper Use Limit:	220°F (105°C) ③	300°F (149°C) ④	ASTM C534
Lower Use Limit: ⑤	-297°F (-183°C) ⑥	-297°F (-183°C) ⑥	ASTM C534

Sizes

Wall Thickness (nominal)	3/8", 1/2", 3/4", 1", 1-1/2", 2" (10, 13, 19, 25, 38, 50 mm)
Inside Diameter, Tubular	3/8" ID to 10"ID (10 mm ID to 250 mm ID)
Length of Sections, Feet, Tubular	6' (1.8 m) (Some larger sizes may be shipped in two 3' sections)

Outdoor Use	Painting with WB Finish or other protective jacketing is required to prevent damage to the insulation in exterior applications and to comply with the insulation protection sections of the International Energy Conservation Code (IECC) and ASHRAE 90.1.

① AP ArmaFlex meets CAN/ULC S102 through 1" wall. AP ArmaFlex Black tested. AP ArmaFlex White determined to be comparable through 1" wall.
② AP ArmaFlex meets MIL-P-15280J through 1" wall.
③ AP ArmaFlex Pipe Insulation can withstand temperatures as high as 250°F for 96 hour time periods when tested according to ASTM C411 - Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
④ 1-1/2" and 2" AP ArmaFlex tubes are formulated with EPDM rubber giving them a higher upper use temperature than AP ArmaFlex tubes less than 1-1/2" wall thickness.
⑤ 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.
⑥ For applications of -40°F to -297°F (-40°C to -183°C), contact Armacell.

AP ArmaFlex BLACK TUBES - R VALUES

3/8" WALLS

IPAPT01438	3/16" Copper	2.8
IPAPT03838	1/4" Copper	2.8
IPPT01238	3/8" Copper	2.6
IPAPT05838	1/2" Copper	2.6
IPAPT03438	5/8" Copper	2.4
IPAPT07838	3/4" Copper	2.4
IPAPT11838	1" Copper	2.3
IPAPT13838	1-1/4" Copper	2.2
IPAPT15838	1-1/2" Copper	2.5
IPAPT11038	1-1/2" IPS	2.4
IPAPT21838	2" Copper	2.4
IPAPT20038	2" IPS	2.4
IPAPT25838	2-1/2" Copper	2.4
IPAPT21038	2-1/2" IPS	2.4
IPAPT31838	3" Copper	2.4
IPAPT30038	3" IPS	2.3

1/2" Walls

IPAPT01412	3/16" Copper	3.8
IPAPT03812	1/4" Copper	3.3
IPAPT01212	3/8" Copper	3.3
IPAPT05812	1/2" Copper	3.4
IPAPT03412	5/8" Copper	3.3
IPAPT07812	3/4" Copper	3.3
IPAPT11812	1" Copper	3.3
IPAPT13812	1-1/4" Copper	3.2
IPAPT15812	1-1/2" Copper	3.2
IPAPT11012	1-1/2" IPS	3.1
IPAPT21812	2" Copper	3.2
IPAPT20012	2" IPS	3.2
IPAPT25812	2-1/2" Copper	3.2
IPAPT21012	2-1/2" IPS	3.2
IPAPT31812	3" Copper	3.2
IPAPT30012	3" IPS	3.1
IPAPT35812	3-1/2" Copper	3.1
IPAPT41812R	4" Copper	3.1
IPAPT40012R	4" IPS	3.0
IPAPT50012R	5" IPS	3.0
IPAPT60012R	6" IPS	3.0
IPAPT80012R	8" IPS	2.9

3/4" WALLS

IPAPT01434	3/16" Copper	6.4
IPAPT03834	1/4" Copper	5.9
IPAPT01234	3/8" Copper	5.5
IPAPT05834	1/2" Copper	5.6
IPAPT03434	5/8" Copper	5.5
IPAPT07834	3/4" Copper	5.4
IPAPT11834	1" Copper	5.4
IPAPT13834	1-1/4" Copper	5.3
IPAPT15834	1-1/2" Copper	5.1
IPAPT11034	1-1/2" IPS	4.9
IPAPT21834	2" Copper	4.8
IPAPT20034	2" IPS	5.2
IPAPT25834	2-1/2" Copper	4.7
IPAPT21034	2-1/2" IPS	5.0
IPAPT31834	3" Copper	4.6
IPAPT30034	3" IPS	4.9

3/4" WALLS (continued)

IPAPT35834	3-1/2" Copper	4.5
IPAPT41834R	4" Copper	4.5
IPAPT40034R	4" IPS	4.8
IPAPT50034R	5" IPS	4.7
IPAPT60034R	6" IPS	4.6
IPAPT80034R	8" IPS	4.5

1" WALLS

IPAPT01410	3/16" Copper	2.8
IPAPT03810	1/4" Copper	7.3
IPAPT01210	3/8" Copper	7.2
IPAPT05810	1/2" Copper	7.2
IPAPT03410	5/8" Copper	7.0
IPAPT07810	3/4" Copper	7.0
IPAPT11810	1" Copper	7.2
IPAPT13810	1-1/4" Copper	7.2
IPAPT15810	1-1/2" Copper	7.2
IPAPT11010	1-1/2" IPS	6.9
IPAPT21810	2" Copper	6.8
IPAPT20010	2" IPS	7.1
IPAPT25810	2-1/2" Copper	6.5
IPAPT21010	2-1/2" IPS	6.8
IPAPT31810	3" Copper	6.3
IPAPT30010	3" IPS	6.6
IPAPT35810	3-1/2" Copper	6.2
IPAPT41810R	4" Copper	6.1
IPAPT40010R	4" IPS	6.4
IPAPT50010R	5" IPS	6.2
IPAPT60010R	6" IPS	6.1
IPAPT80010R	8" IPS	5.9
IPAPT10010R	10" IPS	5.8

1-1/2" WALLS

IPAPT03815	1/4" Copper	13.7
IPAPT01215	3/8" Copper	12.7
IPAPT05815	1/2" Copper	12.0
IPAPT03415	5/8" Copper	11.3
IPAPT07815	3/4" Copper	10.8
IPAPT11815	1" Copper	10.1
IPAPT13815	1-1/4" Copper	9.6
IPAPT15815	1-1/2" Copper	9.2
IPAPT11015	1-1/2" IPS	8.7
IPAPT21815	2" Copper	8.6
IPAPT20015	2" IPS	8.8
IPAPT25815	2-1/2" Copper	8.2
IPAPT21015	2-1/2" IPS	8.4
IPAPT31815	3" Copper	7.9
IPAPT30015	3" IPS	8.1
IPAPT35815	3-1/2" Copper	7.7
IPAPT41815R	4" Copper	7.5
IPAPT40015R	4" IPS	7.8
IPAPT50015R	5" IPS	7.5
IPAPT61815R	6" Copper	7.4
IPAPT60015R	6" IPS	7.3
IPAPT80015R	8" IPS	7.0
IPAPT10015R	10" IPS	6.8

2" WALLS

IPAPT03820	1/4" Copper	19.7
IPAPT01220	3/8" Copper	18.2
IPAPT05820	1/2" Copper	17.2
IPAPT03420	5/8" Copper	16.2
IPAPT07820	3/4" Copper	15.5
IPAPT11820	1" Copper	14.5
IPAPT13820	1-1/4" Copper	13.7
IPAPT15820	1-1/2" Copper	13.1
IPAPT11020	1-1/2" IPS	12.4
IPAPT21820	2" Copper	12.2
IPAPT20020	2" IPS	12.3
IPAPT25820	2-1/2" Copper	11.6
IPAPT21020	2-1/2" IPS	11.7
IPAPT31820	3" Copper	11.1
IPAPT30020	3" IPS	11.2
IPAPT35820	3-1/2" Copper	10.7
IPAPT41820R	4" Copper	10.5
IPAPT40020R	4" IPS	10.7
IPAPT50020R	5" IPS	10.2
IPAPT60020R	6" IPS	9.9
IPAPT80020R	8" IPS	9.5
IPAPT10020R	10" IPS	9.2

*These specifications are based on the measurement methods employed by Armacell. Other methods may not result in the same values and cannot be used to determine if the product is within the given tolerance.

AP ArmaFlex WHITE TUBES - R VALUES

1/2" Walls

IPWTT03812	1/4" Copper	3.3
IPWTT01212	3/8" Copper	3.3
IPWTT05812	1/2" Copper	3.4
IPWTT03412	5/8" Copper	3.3
IPWTT07812	3/4" Copper	3.3
IPWTT11812	1" Copper	3.3
IPWTT13812	1-1/4" Copper	3.2
IPWTT15812	1-1/2" Copper	3.2
IPWTT11012	1-1/2" IPS	3.1
IPWTT21812	2" Copper	3.2
IPWTT20012	2" IPS	3.5
IPWTT25812	2-1/2" Copper	3.4
IPWTT21012	2-1/2" IPS	3.4
IPWTT31812	3" Copper	3.3

3/4" WALLS

IPWTT03834	1/4" Copper	5.9
IPWTT01234	3/8" Copper	5.5
IPWTT05834	1/2" Copper	5.7
IPWTT03434	5/8" Copper	5.5
IPWTT07834	3/4" Copper	5.5
IPWTT11834	1" Copper	5.5
IPWTT13834	1-1/4" Copper	5.4
IPWTT15834	1-1/2" Copper	5.2
IPWTT11034	1-1/2" IPS	5.0
IPWTT21834	2" Copper	4.9
IPWTT20034	2" IPS	4.9
IPWTT25834	2-1/2" Copper	4.8
IPWTT21034	2-1/2" IPS	4.8
IPWTT31834	3" Copper	4.7
IPWTT30034	3" IPS	4.6
IPWTT35834	3-1/2" Copper	4.6
IPWTT41834R	4" Copper	4.5

1" WALLS

IPWTT03810	1/4" Copper	10.2
IPWTT01210	3/8" Copper	9.5
IPWTT05810	1/2" Copper	9.1
IPWTT03410	5/8" Copper	8.6
IPWTT07810	3/4" Copper	8.3
IPWTT11810	1" Copper	7.7
IPWTT13810	1-1/4" Copper	7.4
IPWTT15810	1-1/2" Copper	7.3
IPWTT11010	1-1/2" IPS	7.0
IPWTT21810	2" Copper	6.9
IPWTT25810	2-1/2" Copper	6.6
IPWTT31810	3" Copper	6.4
IPWTT35810	3-1/2" Copper	6.3

1-1/2" WALLS

IPWTT03815	1/4" Copper	13.7
IPWTT01215	3/8" Copper	12.7
IPWTT05815	1/2" Copper	12.0
IPWTT03415	5/8" Copper	11.4
IPWTT07815	3/4" Copper	10.9
IPWTT11815	1" Copper	10.2
IPWTT13815	1-1/4" Copper	9.7
IPWTT15815	1-1/2" Copper	9.3
IPWTT11015	11/2" IPS	8.9
IPWTT21815	2" Copper	8.7
IPWTT20015	2" IPS	8.5
IPWTT25815	2-1/2" Copper	8.3
IPWTT21015	2-1/2" IPS	8.1
IPWTT31815	3" Copper	8.0
IPWTT30015	3" IPS	7.8
IPWTT35815	3-1/2" Copper	7.8
IPWTT41815R	4" Copper	7.6
IPWTT40015R	4" IPS	7.4
IPWTT50015R	5" IPS	7.2
IPWTT60015R	6" IPS	7.0

2" WALLS

IPWTT03820	1/4" Copper	19.7
IPWTT01220	3/8" Copper	18.2
IPWTT05820	1/2" Copper	17.3
IPWTT03420	5/8" Copper	16.3
IPWTT07820	3/4" Copper	15.7
IPWTT11820	1" Copper	14.6
IPWTT13820	1-1/4" Copper	13.8
IPWTT15820	1-1/2" Copper	13.2
IPWTT21820	2" Copper	12.3
IPWTT20020	2" IPS	12.0
IPWTT25820	2-1/2" Copper	11.7
IPWTT31820	3" Copper	11.2
IPWTT30020	3" IPS	10.9
IPWTT35820	3-1/2" Copper	10.8
IPWTT41820R	4" Copper	10.5
IPWTT40020R	4" IPS	10.3
IPWTT50020R	5" IPS	9.9
IPWTT60020R	6" IPS	9.6

*These specifications are based on the measurement methods employed by Armacell. Other methods may not result in the same values and cannot be used to determine if the product is within the given tolerance.

ABOUT ARMACELL

As the inventors of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal, acoustic and mechanical solutions that create sustainable value for its customers. Armacell's products significantly contribute to global energy efficiency making a difference around the world every day. With 3,000 employees and 26 production plants in 17 countries, the company operates two main businesses, Advanced Insulation and Engineered Foams. Armacell focuses on insulation materials for technical equipment, high-performance foams for high-tech and lightweight applications and next generation aerogel blanket technology.

For more information, please visit:
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