

## SOLUTIONS FOR ENERGY SAVINGS

## AP/ArmaFlex + AP/ArmaFlex FS

The original flexible elastomeric pipe insulation for reliable protection against condensation and energy loss.

// Fiber-free, formaldehyde-free, and low VOC
// Closed-cell structure controls condensation
// Ideal for below-ambient piping and equipment









ArmaCell<sup>®</sup>
ArmaFlex<sup>®</sup>

## TECHNICAL DATA - AP/ARMAFLEX + AP/ARMAFLEX FS

Brief description	AP/ArmaFlex are flexible insulation products that reliably protects against water vapor ingress due to its closed-cell structure. No additional water vapor retarder is required, for most applications. AP/ArmaFlex is manufactured using nitrile rubber and polyvinyl chloride (NBR/PVC) formulations for insulation thickness up to and including one-inch wall thickness. AP/ArmaFlex FS and insulation thickness greater than one-inch wall thickness are manufactured using Ethylene Propylene Diene Monomer (EPDM) formulations. Available in Tube/Sheet/Roll.					
Approvals and compliance Specification compliance	<ul> <li>GREENGUARD Gold Certified</li> <li>Made with EPA registered All Armacell facilities in North America are ISO 9001 certified</li> <li>ASTM C534, Type I – Tube Grade 1</li> <li>Conforms to ASHRAE 90.1 energy standards</li> <li>MIL-P-15280J, FORM S</li> <li>MIL-P-15280J, FORM S</li></ul>					

Property	Value / Assessment	Standard / Test method				
Temperature range						
Service temperature <sup>1,2,3,4,5</sup>	Range / Item group	Min. °C	Min. °F	Max. °C	Max. °F	ASTM C534
	3/8" through 1" Walls (NBR/PVC-based)	-183	-297	105	220	
	1-1/2" and 2" walls (NBR/PVC based)	-183	-297	105	220	
	1-1/2" and 2" Walls (EPDM-based)	-183	-297	149	300	
	Remarks	82 °C (180 °F) — F Contact Armacell				
Thermal conductivity						
1 - Declared thermal conductivity W/(m·K)	θm	50 ° F (10 ° C)	75 ° F (24 ° C)	100 ° F (38 ° C)	125 ° F (52 ° C)	ASTM C177, ASTM C518
	λd ≼ [W/(m⋅K)]	0.034	0.0353	0.037	0.039	
	k ≼ [Btu∙in/(h∙ft².°F)]	0.235	0.245	0.257	0.268	
	1 - Range	3/8" through 2" w				
2 - Declared thermal conductivity W/[m.K]	θm	50 °F (10 °C)	75 °F (24 °C)	100 °F (38 °C)	125 °F (52 °C)	ASTM C177, ASTM C518
	λd ≼ [W/(m⋅K)]	0.040	0.040	0.041	0.043	
	k ≼ [Btu∙in/(h∙ft².°F)]	0.278	0.28	0.289	0.300	
	2 - Range	1 1/2" and 2" Wall	s (EPDM based)			

Property	Value / Assess	sment						Standard / Test metho
R-Value for tubes <sup>6,7</sup>	ID / Wall thickness	3/8" (10mm)	1/2" (13mm)	3/4" (19mm)	1" (25mm)	1-1/2" (38mm)	2" (50mm)	
	1/4" (6 mm)	2.8	3.8	6.4	8.3			_
	3/8" (10 mm)	2.8	3.3	5.9	7.3	13.7	19.7	_
	1/2" (13 mm)	2.6	3.3	5.5	7.2	12.7	18.2	_
	5/8" (16 mm)	2.6	3.4	5.6	7.2	12.0	17.2	_
	3/4" (19 mm)	2.4	3.3	5.5	7.0	11.3	16.2	_
	7/8" (22 mm)	2.4	3.3	5.4	7.0	10.8	15.5	_
	1-1/8" (29 mm)	2.3	3.3	5.4	7.2	10.1	14.5	_
	1-3/8" (35 mm)	2.2	3.2	5.3	7.2	9.6	13.7	_
	1-5/8" (41 mm)	2.5	3.2	5.1	7.2	9.2	13.1	_
	1-1/2" IPS (48 mm)	2.4	3.1	4.9	6.9	8.7	12.4	_
	2-1/8" (54 mm)	2.4	3.2	4.8	6.8	8.6	12.2	_
	2" IPS (60 mm)	2.4	3.2	5.2	7.1	8.8	12.3	_
	2-5/8" (67 mm)	2.4	3.2	4.7	6.5	8.2	11.6	_
	2-1/2" IPS (73 mm)	2.4	3.2	5.0	6.8	8.4	11.7	_
	3-1/8" (79 mm)	2.4	3.2	4.6	6.3	7.9	11.1	_
	3" IPS (89 mm)	2.3	3.1	4.9	6.6	8.1	11.2	_
	3-5/8" (92 mm)		3.1	4.5	6.2	7.7	10.7	_
	4-1/8" (105 mm)		3.1	4.5	6.1	7.5	10.5	_
	4" IPS (114 mm)		3.0	4.8	6.4	7.8	10.7	_
	5" IPS (141 mm)		3.0	4.7	6.2	7.5	10.2	
	6" IPS (168 mm)		3.0	4.6	6.1	7.3	9.9	
	8" IPS (219 mm)		2.9	4.5	5.9	7.0	9.5	_
	10" IPS (273 mm)				5.8	6.8	9.2	
R-Value for sheets and rolls <sup>6,7</sup>	Wall thickness							
	1/4" (6mm)							
	3/8" (10mm)							
	1/2" (13mm)		2.1		_			
	3/4" (19mm)		3.1		_			
	1" (25mm)		4.2		_			
	1-1/2" (38mm)			6			_	
	2" (50mm) 8							_
Fire Performance and Approvals								
Surface burning characteristics	Flame Spread Ir AP/ArmaFlex tu AP/ArmaFlex FS AP/ArmaFlex sh thickness NOT 2	ndex less than 2 be insulation a 5 sheet and roll neet and roll ins 25/50 RATED	25: Smoke Devel Il thicknesses insulation throu sulation through	oped Index less Igh 2" thickness 1" thickness (AF	than 50. ?/ArmaFlex she	et and roll insulation	on 1 1/2" and 2'	ASTM E84 and UL 723, CAN ULC S102 <sup>8</sup>

Value / Assessment	Standard / Test method			
Up to 1-1/2" insulation t	hickness for tubes an	d up to 1" insulation thickne	ss for sheets	FM 4924 <sup>9</sup>
Pass at 6 mm (1/4") and				
Pass at 6 mm (1/4") and				
Self-extinguishing, does	UL 94			
0.05 perm-inch (0.725 x 0.08 perm-inch (1.16 x 1	ASTM E96, procedure A			
0.2% by volume	ASTM C209, ASTM C1763			
3 to 6 pounds per cubic	ASTM D1667			
Thickness (mm)	25	38	50	ASTM C42311
Thickness (inches)	1	1.5	2	
SAA	0.38	0.49	0.51	
Passed				UL 181
Passed	ASTM C1338, ASTM G21			
	Value / Assessment Up to 1-1/2" insulation to Pass at 6 mm (1/4") and Pass at 6 mm (1/4") and Pass at 6 mm (1/4") and Self-extinguishing, does 0.05 perm-inch (0.725 x 0.08 perm-inch (0.725 x 0.08 perm-inch (1.16 x 1 0.2% by volume 0.2% by volume 3 to 6 pounds per cubic Thickness (mm) Thickness (inches) SAA Passed Passed	Value / Assessment         Up to 1-1/2" insulation thickness for tubes an         Pass at 6 mm (1/4") and thicker.         Pass at 6 mm (1/4") and thicker.         Self-extinguishing, does not drip, does not sp         0.05 perm-inch (0.725 x 10 <sup>-13</sup> )Kg/(s m Pa) for 0.08 perm-inch (1.16 x 10 <sup>-13</sup> )Kg/(s m Pa) for E         0.2% by volume         3 to 6 pounds per cubic feet [48 to 96 kilogram         Thickness (inches)       1         SAA       0.38         Passed         Passed	Value / Assessment         Up to 1-1/2" insulation thickness for tubes and up to 1" insulation thickness         Pass at 6 mm (1/4") and thicker.         Pass at 6 mm (1/4") and thicker.         Self-extinguishing, does not drip, does not spread flames.         0.05 perm-inch (0.725 x 10 <sup>-13</sup> )Kg/(s m Pa) for NBR/PVC products         0.05 perm-inch (1.16 x 10 <sup>-13</sup> )Kg/(s m Pa) for SPDM products         0.2% by volume         3 to 6 pounds per cubic feet (48 to 96 kilograms per cubic meter)         Thickness (mm)       25         3 to 6 pounds per cubic feet (48 to 96 kilograms per cubic meter)         Passed	Value / Assessment         Up to 1-1/2" insulation thickness for tubes and up to 1" insulation thickness for sheets         Pass at 6 mm (1/4") and thicker.         Pass at 6 mm (1/4") and thicker.         Self-extinguishing, does not drip, does not spread flames.         0.05 perm-inch (0.725 x 10 <sup>-13</sup> )Kg/(s m Pa) for NBR/PVC products         0.08 perm-inch (1.16 x 10 <sup>-13</sup> )Kg/(s m Pa) for EPDM products         0.2% by volume         1         1         1         25         3 to 6 pounds per cubic feet [48 to 96 kilograms per cubic meter]         Thickness (mm)         25         38         50         2         5AA         0.38         0.49         0.51

water vapour permeability. <sup>2</sup> For temperatures below -40 °F(-40 °C), please contact our Customer Service Center.

<sup>3</sup>AP/ArmaFlex insulation can withstand temperatures as high as 250 °F (121 °C) when tested according to ASTM C411 - Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.

41 1/2" and 2" AP/ArmaFlex tubes are formulated with EPDM rubber giving them a higher upper temperature than AP/ArmaFlex tubes less than 1 1/2" wall thickness.

<sup>5</sup> Recommended exposure limit to 30 minute period at 350 °F (175 °C) over a 24 hours operation for EPDM based products.

<sup>6</sup>These specifications are based on the measurements 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.

<sup>7</sup> Please see technical bulletin #1 for more details.

<sup>8</sup>CAN/ULC S102 up to 1" thickness.

 $^{\circ}\text{AP}$  ArmaFlex Pipe Insulation is FM Approved for ID sizes up to and including 4 IPS

<sup>10</sup>UL file number E535094

<sup>11</sup>Type A Mounting

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## ABOUT ARMACELL

As the inventor of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal and mechanical insulation solutions that create sustainable value for its customers. Armacell's products significantly contribute to driving energy efficiency worldwide. With more than 3,300 employees and 25 production plants in 20 countries, Armacell operates two main businesses, Advanced Insulation and Engineered Foams. Armacell focuses on insulation materials for technical equipment, high-performance foams for acoustic and lightweight applications, recycled PET products, next-generation aerogel technology and passive fire protection systems.



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