



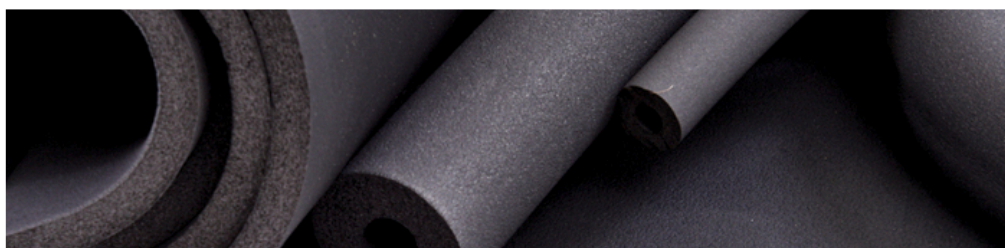
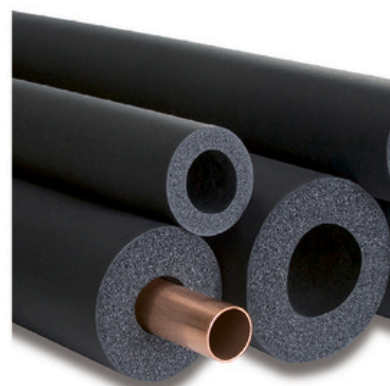
## SOLUTIONS FOR ENERGY SAVINGS

# 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

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 **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 vapour ingress due to its closed-cell structure. No additional water vapour 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 insulation and pipe insulation in 1 1/2 and 2" wall thicknesses are manufactured using Ethylene Propylene Diene Monomer (EPDM) formulations.  
 Available in Tube/Sheet/Roll.

### Approvals and compliance

|                          |   |  |   |  |
|--------------------------|---|--|---|--|
| Specification compliance | <ul style="list-style-type: none"> <li>GREENGUARD® Children &amp; Schools Indoor Air Quality Standard</li> <li>Manufactured without CFCs, HFCs, HCFCs, PBDEs, or Formaldehyde.</li> <li>ASTM D1056, 2C1</li> <li>NFPA 90A, 90B</li> <li>ASTM G21/C1338</li> </ul> | <ul style="list-style-type: none"> <li>Made with EPA registered MICROBAN antimicrobial product protection.</li> <li>All Armacell facilities in North America are ISO 9001 certified.</li> <li>ASTM E84, UL723</li> <li>MIL-P-15280J, FORM T</li> <li>Conforms to ASHRAE 90.1 energy standards</li> </ul> | <ul style="list-style-type: none"> <li>3rd party certified by FM Approvals through 1 1/2" wall thickness for pipe insulation, 1" thickness for sheet and roll insulation</li> <li>ASTM C534, Type I – Tube Grade 1</li> <li>CAN/ULC S102</li> <li>MIL-P-15280J, FORM S</li> </ul> | <ul style="list-style-type: none"> <li>Conforms to building codes: International Mechanical Code (IMC), International Energy Conservation Code (IECC), International Residential Code (IRC), Title 24: California Building Energy Efficiency Standards</li> <li>ASTM C534, Type II - Sheet Grade 1</li> <li>UL 94 5V-A, V-0, File E55798</li> <li>MEA 107-89M</li> </ul> |
|--------------------------|---|--|---|--|

| Property                               | Value / Assessment                             |  |               |                |                | Standard / Test method |
|--|--|--|---------------|----------------|----------------|------------------------|
| <b>Temperature range</b>               |  |  |               |                |                |                        |
| Service temperature <sup>1,2,3,4</sup> | Range  | 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) — Full bonding sheet insulation |  |               |                |                |                        |
| <b>Thermal conductivity</b>            |  |  |               |                |                |                        |
| Declared thermal conductivity          | 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          |                        |
|  | Range  | 3/8" through 2" walls (NBR/PVC products) |               |                |                |                        |
| Declared thermal conductivity          | θm   | 50 °F (10 °C)                            | 75 °F (24 °F) | 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          |                        |
|  | Range  | 1 1/2" and 2" Walls (EPDM based)         |               |                |                |                        |

| Property                                    | Value / Assessment   |             |             |             |           |               |                     | Standard / Test method |
|---|--|-------------|-------------|-------------|-----------|---------------|---------------------|------------------------|
| R-Value for tubes <sup>5,6</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>5,6</sup> | Wall thickness   |             |             |             |           |               | R-value             |                        |
|   | 1/4" (6mm)   |             |             |             |           |               | 1.0                 |                        |
|   | 3/8" (10mm)  |             |             |             |           |               | 1.5                 |                        |
|   | 1/2" (13mm)  |             |             |             |           |               | 2.1                 |                        |
|   | 3/4" (19mm)  |             |             |             |           |               | 3.1                 |                        |
|   | 1" (25mm)  |             |             |             |           |               | 4.2                 |                        |
|   | 1-1/2" (38mm)  |             |             |             |           |               | 6                   |                        |
|   | 2" (50mm)  |             |             |             |           |               | 8                   |                        |
| <b>Fire Performance and Approvals</b>       |  |             |             |             |           |               |                     |                        |
| Surface burning characteristics             | Flame Spread Index less than 25: Smoke Developed Index less than 50<br>NBR/PVC formulation up to one-inch thickness: EPDM for 1 1/2" and 2" thickness<br>NBR/PVC formulations in 1 1/2" and 2" thickness are not 25/50 rated |             |             |             |           |               | ASTM E84 and UL 723 |                        |

| Property   | Value / Assessment   |      |      |      | Standard / Test method |
|--|--|------|------|------|------------------------|
| FM approved  | Up to 1-1/2" insulation thickness for tubes and up to 1" insulation thickness for sheets   |      |      |      | FM 4924                |
| <b>UL standards</b>  |  |      |      |      |                        |
| UL 94 5VA <sup>7</sup>   | Pass at 6 mm (1/4") and thicker.   |      |      |      |                        |
| UL 94 V-0 <sup>7</sup>   | Pass at 6 mm (1/4") and thicker.   |      |      |      |                        |
| <b>Resistance to water vapour</b>  |  |      |      |      |                        |
| Water vapour permeability  | 0.05 perm-inch [0.725 x 10 <sup>-13</sup> kg/(s m Pa)] for NBR/PVC products<br>0.08 perm-inch [1.16 x 10 <sup>-13</sup> kg/(s m Pa)] for EPDM products |      |      |      | ASTM E96, procedure A  |
| <b>Resistance to water</b>   |  |      |      |      |                        |
| Water absorption   | ≤ 0.2% by volume   |      |      |      | ASTM C209, ASTM C1763  |
| <b>Physical attributes</b>   |  |      |      |      |                        |
| Density  | 3 to 6 pounds per cubic feet (48 to 96 kilograms per cubic feet)   |      |      |      | ASTM D1667             |
| <b>Acoustic performance</b>  |  |      |      |      |                        |
| Sound absorption average   | Thickness (mm)   | 25   | 38   | 50   | ASTM C423 <sup>8</sup> |
|  | Thickness (inches)   | 1    | 1.5  | 2    |                        |
|  | SAA  | 0.38 | 0.49 | 0.51 |                        |
| <b>Health and environment</b>  |  |      |      |      |                        |
| Mould growth   | Passed   |      |      |      | UL 181                 |
| Fungal growth  | Passed   |      |      |      | ASTM C1338, ASTM G21   |
| <sup>1</sup> At temperatures below -20°F (-29°C), elastomeric insulation starts to become less flexible. However, this does not affect the performance of AP/ArmaFlex in terms of thermal efficiency and resistance to water vapour permeability.<br><sup>2</sup> For temperatures below -40 °F(-40 °C), please contact our Customer Service Centre.<br><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.<br><sup>4</sup> 1 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.<br><sup>5</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.<br><sup>6</sup> Please see technical bulletin #1 for more details.<br><sup>7</sup> UL File No. E55798.<br><sup>8</sup> Type A Mounting |  |      |      |      |                        |

**Adhesives and Cleaners**

| Item            | Description  |
|-----------------|--|
| IPAAD520002     | 48 tins of 1/2 pint brush-top ArmaFlex 520 adhesive in a carton.     |
| IPAAD520003     | 24 tins of 1 pint ArmaFlex 520 adhesive in a carton                  |
| IPAAD520004     | 24 tins of 1 pint ArmaFlex 520 adhesive with a brush-top in a carton |
| IPSPRAYGUNSG200 |  |
| IPSPRAYHOSE     |  |

Standard Pipe Table

| Pipe Ø [mm] | Copper pipe (ASTM B280) [inch] |
|-------------|--------------------------------|
| 3           | -                              |
| 6           | 0.25                           |
| 8           | -                              |
| 10          | 0.375                          |
| 12          | 0.5                            |
| 13          | -                              |
| 14          | -                              |
| 15          | 0.625                          |
| 16          | -                              |
| 17          | -                              |
| 18          | 0.75                           |
| 19          | -                              |
| 20          | 0.875                          |
| 22          | -                              |
| 25          | -                              |
| 28          | 1.125                          |
| 30          | -                              |
| 32          | -                              |
| 35          | 1.375                          |
| 38          | -                              |
| 40          | -                              |
| 42          | 1.625                          |
| 45          | -                              |
| 48          | -                              |
| 50          | -                              |
| 54          | 2.125                          |
| 57          | -                              |
| 60          | -                              |
| 63          | -                              |
| 64          | -                              |
| 65          | -                              |
| 67          | 2.625                          |
| 70          | -                              |
| 73          | -                              |
| 75          | -                              |
| 76          | -                              |
| 80          | 3.125                          |
| 89          | -                              |
| 90          | 3.625                          |
| 100         | -                              |
| 102         | 4.125                          |
| 105         | -                              |

Standard Pipe Table

| Pipe Ø [mm] | Copper pipe (ASTM B280) [inch] |
|-------------|--------------------------------|
| 108         |                                |
| 110         |                                |
| 114         |                                |
| 125         |                                |
| 128         |                                |
| 131         |                                |
| 133         |                                |
| 140         |                                |
| 150         |                                |
| 152         |                                |
| 154         |                                |
| 156         |                                |
| 159         |                                |
| 160         |                                |
| 165         |                                |
| 168         |                                |
| 175         |                                |
| 180         |                                |
| 197         |                                |
| 200         |                                |
| 204         |                                |
| 207         |                                |
| 219         |                                |
| 225         |                                |
| 242         |                                |
| 250         |                                |
| 254         |                                |
| 267         |                                |
| 273         |                                |
| 306         |                                |
| 324         |                                |
| 356         |                                |
| 406         |                                |
| 457         |                                |
| 508         |                                |
| 610         |                                |

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## ABOUT ARMACELL

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As the inventor of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal 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 more than 3,300 employees and 25 production plants in 19 countries, the company 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.

For more information, please visit:  
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