SUBMITTAL

# AEROCEL® TUBE & SHEET

## Closed Cell Elastomeric Thermal Insulation for HVAC & R

### General

AEROCEL® Tube and Sheet Insulation is a highly flexible, closed-cell and lightweight EPDM-rubber based elastomeric product. Aerocel® Tube and Sheet Insulation is designed for insulating warm or cold piping, duct, or equipment. Aerocel® EPDM Elastomeric Tube and Sheet Insulation is supplied in 1/4", 3/8", 1/2", 3/4", 1", 1-1/4",1-1/2" 2", 2-1/2" and 3" thicknesses, in popular I.D. sizes up to 8" IPS, and as flat sheets and rolls. Please check for specific size combinations. The tightly formed, closed-cell structure of Aerocel® Pipe and Sheet Insulation makes it an efficient insulation, providing superior insulating capacity to many materials, including other elastomeric insulations. Aerocel is manufactured to consistently provide actual values on these key performance criteria for mechanical system insulation:

**Thermal Conductivity:** 0.245
**Water Vapor Transmission, Perms:** 0.03
**Fire Rating:** Will not contribute significantly to fire (simulated end-use testing).

Aerocel® Pipe and Sheet Insulation, in 1/4" through 2" thickness, has a flame spread rating of 25 or less and a smoke developed rating of 50 or less as tested by ASTM E 84 "Surface Burning Characteristics of Building Materials." Aerocel EPDM Pipe and Sheet Insulation is acceptable for use in air distribution systems including ducts, plenums, air handling equipment and air terminal devices.

### Uses

AEROCEL® Pipe Insulation is used to retard heat gain or loss, and to control condensation formation on cold-water plumbing, chilled water, and refrigeration lines. The material also efficiently reduces heat flow on hot water plumbing, liquid heating and dual-temperature piping systems. Aerocel® sheet is used to insulate large OD pipes, chillers, vessels and tanks, and can be used as a duct liner or duct wrap. The recommended service temperature range for Aerocel Insulation is -297°F to +300°F. ***Aerocel® is designed for installation above and below ground, indoors and outdoors. No protective finish is required.***

Aerocel® Pipe Insulation is uniquely suited, over many other cellular or fibrous insulation materials, to dual-temperature HVAC piping systems. This unique fit results from Aerocel's proprietary combination of very low moisture vapor flow for times of cooling-mode operation, higher temperature usage properties during times of heating-mode operation, and superior insulating capacity in either operating mode.

Aerocel® Pipe Insulation is uniquely suited to Solar piping systems because of its proprietary combination of UV Resistance, greater thermal efficiency, non-corrosiveness to copper or stainless steel, and availability as single layer product in greater thicknesses.

### Resistance to Moisture Vapor Flow

The unique cell structure of Aerocel® EPDM Insulation effectively retards the flow of moisture vapor. Aerocel is considered a low transmittance vapor retarder. In normal service conditions, Aerocel requires no supplemental vapor retarder protection. When used in extremely low-temperature or extremely high-humidity conditions, an additional vapor barrier maybe required.

### Key Features

- UV Resistant – Added Weather Protection Not Required, Saves on First Cost and Maintenance
- Lower Thermal Conductivity – Saves Additional Energy Costs
- 300° Upper Use Limit – Greater Application Range – Cryogenic to Medium Pressure Steam
- E 84 25/50 to 2" Thickness – Lowers Installation Costs with Fewer Layers
- Versatile for Heating, AC, Refrigeration, Solar, Plumbing – Single Product for All Systems
- Easy to install – Lowers Installation Costs, Keeps Job Cost as Estimated


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# Application

AEROCEL® 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 that has already been installed. Butt joints and other seams are to be sealed with contact adhesive. Fittings can be fabricated from straight tubing or sheet. Larger diameter, curved, or flat surfaces can be insulated by adhering properly fabricated sheet sections to them. Consult the Aeroflex Installation Handbook for more complete installation details and instructions.

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In addition to the specifications listed below, Aerocel also is approved by or conforms to the requirements of the following: ASTM C 534 Type I and II, NY City MEA #171-04-M, City of LA RR-8413, UL 181 Section 13 Mold Growth/Humidity, ASTM G 21 Fungal Resistance Test, UL181 Section 18 Air Erosion, NFPA 90A & 90B, MIL15280J, CAN/ULC-S102-07.

***Aerocel Sheet and Tube insulations meet the energy code requirements of International Energy Conservation Code(IECC) and ASHRAE for R-4 for Refrigeration Piping at 1" wall thickness.***

| PHYSICAL PROPERTIES | | RESULT | | | | TEST METHOD |
|---|---|---|---|---|---|---|
| Cell Structure | | Closed Cell | | | | |
| Thermal Conductivity | Mean temp. | -4˚F (-20˚C) | 32˚F (0˚C) | 75˚F (24˚C) | 90˚F (32˚C) | ASTM C 518 / C 177<br>104˚F (40˚C) |
| BTU.in/ft.²hr. ˚F | K-value | 0.22 | 0.23 | 0.245 | 0.25 | 0.265 |
| Service Temperature, CONTINUOUS | | -297°F to +300°F<br>-57°C to +149°C | | | | ASTM C 411<br>AEROCEL loses flexibility at -70°F. This does not affect the insulating properties of the material. |
| U.V. Resistance | | PASS | | | | ASTM G 7 / G 90 |
| Ozone Resistance | | No cracking | | | | ASTM D 1171 |
| Water Vapor Permeability | | .03 perm (4.38 x $10^{-11}$) | | | | ASTM E 96 |
| Water Absorption (weight %) | | .2% | | | | ASTM C 209 |
| Fire Safety Characteristics Through 2" thickness | | UL-94 5 V-A, V-O | | | | File E228536 |
| | | 25/50 | | | | ASTM E84 |
| | | Self extinquishing | | | | ASTM D 635 |
| Corrosion of Stainless Steel | | Non corrosive | | | | ASTM C 692, DIN 1988 |
| Nitrosamine Content | | None detected | | | | U.S. FDA CPG No. 7117.11<br>BSEN 12868 |
| Flexibility | | PASS | | | | ASTM C 534 |

**ASHRAE 90.1-2007 ENERGY EFFICIENCY INSULATION THICKNESS**

| | Pipe Sizes | | | | |
|---|---|---|---|---|---|
| | <1" ID | 1" ID to <1-1/2" ID | 1-1/2" ID to < 4" ID | 4" ID to < 8" ID | ≥ 8" ID |
| **Operating Temperature** | **Space Heating (*Insulation Thickness, Inches*)** | | | | |
| 201 Deg. F - 250 Deg. F | 1-1/2" | 1-1/2" | 2" | 2" | 2" |
| 141 Deg. F - 200 Deg. F | 1" | 1" | 1" | 1-1/2" | 1-1/2" |
| 105 Deg. F - 140 Deg. F | 1/2" | 1/2" | 1" | 1" | 1" |
| **Operating Temperature** | **Service Water Heating (*Insulation Thickness, Inches*)** | | | | |
| 105 Deg. F+ | 1/2" | 1/2" | 1" | 1" | 1" |
| **Operating Temperature** | **Cooling Systems (*Insulation Thickness, Inches*)** | | | | |
| 40 Deg. F - 60 Deg. F | 1/2" | 1/2" | 1" | 1" | 1" |
| ≤40 Deg. F | 1/2" | 1" | 1" | 1" | 1-1/2" |

**MINIMUM THICKNESS OF AEROCEL REQUIRED TO PREVENT CONDENSATION**

| Design Conditions — 85 Deg. F, 70% RH, Low Air Movement | | | | |
|---|---|---|---|---|
| | Pipe Operating Temperature | | | |
| | 50 Deg. | 38 Deg. F | 0 Deg. F | -20 Deg. F |
| **Insulation Thickness** | **Pipe Outside Diameters** | | | |
| 1/4" | 3/8" - 1" | - | - | - |
| 3/8" | 3/4" - 6" | 3/8" - 3/4" | - | - |
| 1/2" | - | 7/8" - 6" | - | - |
| 3/4" | - | - | 3/8" - 1-1/2" | 3/8" - 1/2" |
| 1" | - | - | 1-5/8" - 6" | 3/4" - 2-1/2" |
| 1-1/4" | - | - | - | 2-5/8" - 6" |
| **Design Conditions — 80 Deg. F, 50% RH, Low Air Movement** | | | | |
| 1/4" | 3/8" - 6" | 3/8" - 6" | - | - |
| 3/8" | - | - | 3/8" - 3/4" | - |
| 1/2" | - | - | 7/8" - 6" | 3/8" - 1" |
| 3/4" | - | - | - | 1-1/8" - 6" |
| **Design Conditions — 90 Deg. F, 80% RH, Low Air Movement** | | | | |
| 1/2" | 3/8" - 7" | - | - | - |
| 3/4" | 1" - 6" | 3/8" - 2" | - | - |
| 1" | - | 2-1/8" - 6" | 3/8" - 1/2" | - |
| 1-1/4" | - | - | 3/4" - 2" | 3/8" - 7/8" |
| 1-1/2" | - | - | 2-1/8" - 6" | 1" - 2-1/8" |
| 2" | - | - | - | 2-1/4" - 6" |

AEROFLEX USA, INC.
282 INDUSTRIAL PARK ROAD • SWEETWATER, TN 37874
TEL: (423) 337-2493 • FAX: (423) 337-7675 • TOLL FREE: (866) AEROCEL
WEBSITE: www.aeroflexusa.com