

INSUL-SHEET®

S2S
SKIN2SIDES



Flexible Closed Cell Sheet Insulation Designed for the HVAC/R Industry

DESCRIPTION

INSUL-SHEET® is an environmentally friendly, CFC-free, flexible elastomeric thermal insulation. It is black in color and supplied as flat sheets (36" x 48") in standard thicknesses of 1/8" thru 2". It is supplied skin two sides in 1/4" and above. INSUL-SHEET® is also available in rolls, with a standard roll width of 48". INSUL-SHEET® key physical properties are approved through supervision by *Factory Mutual Research Corporation*.

INSUL-SHEET® is non-porous, fiber-free and resists mold growth. An EPA-registered antimicrobial agent is incorporated into the product providing additional protection against mold, fungal and bacterial growth. INSUL-SHEET® is GREENGUARD® certified as a low VOC material, meeting the requirements of the "Children and Schools" and "Indoor Air Quality" classifications.

APPLICATIONS

INSUL-SHEET® is used to retard heat gain and prevent condensation or frost formation on cold equipment, tanks, vessels, ducts, or large O.D. pipes. It also effectively retards heat loss when used on hot equipment, ducts, or large pipes. INSUL-SHEET® is recommended for applications ranging from -297°F to 220°F (-182°C to 104°C) when used as pipe insulation where only the longitudinal seams and butt joints are glued. On full adhesion applications, the upper limit is 200°F (93°C).

INSUL-SHEET® has a tough skin that withstands tearing, rough handling, and severe environmental conditions, yet is flexible for easy installation. INSUL-SHEET® has superior cold weather flexibility.

INSUL-SHEET® thickness has been calculated to control condensation on cold surfaces. Refer to the table on the reverse side for specific recommendations.

INSTALLATION

When INSUL-SHEET® is applied to duct work and equipment, use 100% coverage of an approved contact adhesive. With a contact adhesive, both surfaces to be joined should be coated and then joined after the adhesive is dry to the touch. Compression joints with adhesive applied should be used on all butt edges. INSUL-SHEET® is also available with pre-applied pressure sensitive adhesive (PSA) with an easy-to-use release liner. ASTM C1710, *Installation Guide for Flexible Closed Cell Foams*, should be used as an installation guide.

RESISTANCE TO MOISTURE VAPOR FLOW

The closed cell structure and unique formulation of INSUL-SHEET® effectively retards the flow of moisture vapor, and is considered a low transmittance vapor retarder. For most applications, INSUL-SHEET® needs no additional protection. Additional vapor barrier protection may be necessary for INSUL-SHEET® when installed on low temperature surfaces that are exposed to continuous high humidity.

FLAME AND SMOKE RATING

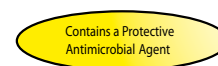
INSUL-SHEET® in thicknesses of 2" (50 mm) and below has a flame spread rating of 25 or less and a smoke development rating of 50 or less as tested by ASTM E 84, "Surface Burning Characteristics of Building Materials".

INSUL-SHEET® is acceptable for use in duct/plenum applications meeting the requirements of NFPA 90A/B.

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 when compared to a known standard.

SPECIFICATION COMPLIANCE

- ASTM C 534 Type 2 (Sheet), Grade 1
- ASTM D 1056-00-2C1
- New York City MEA 186-86-M Vol. IV
- USDA Compliant
- RoHS Compliant
- STC = 17 at 1" per ASTM E 90
- NRC = .35 at 1" per ASTM C423
- UL 94-5V Flammability Classification (Recognition No. E300774)
- ASTM E 84 2" 25/50-tested according to UL 723 and NFPA 255
- Complies with requirements of CAN/ULC S102-03 NFPA No. 101 Class A Rating
- Meets requirements of NFPA 90A/B Sect. 2.3.3 for Supplementary Materials for Air Distribution Systems
- Meets requirements of UL 181 sections 11.0 and 16.0 (Mold Growth/Air Erosion)
- Meets requirements of ASTM C 411 (Test Method for Hot Surface Performance of High Temperature Thermal Insulation)
- MIL-P-15280, Form S (Sheet)
- R8 Sheet meets R-value requirements of the International Energy Conservation Code for Outdoor Ductwork
- GREENGUARD certified under the "Children & Schools" and "Indoor Air Quality" classifications
- Meets energy code requirements of ASHRAE 90.1 and 189.1



| Physical Properties | | INSUL-SHEET® Insulation | Test Methods |
|---|-----------------------|----------------------------|--------------------|
| Thermal Conductivity (K) | 90°F (32°C) Mean Temp | 0.27 (.039) | ASTM C 177/C 518 |
| BTU -in/hr - Ft² - °F (W/mK) | 75°F (24°C) Mean Temp | 0.25 (.036) | ASTM C 177/C 518 |
| Density | | 3 - 6 PCF | ASTM D1622 / D3575 |
| Operating Temperature Range | Upper | 220°F (104°C) | |
| Flexible to -40°F (-40°C) | Lower | -297°F (-182°C) | |
| Water Vapor Permeability Dry Cup, Perm-In | | <0.06 | ASTM E 96 |
| Water Absorption % | | <0.20 by volume | ASTM C 209 |
| Flame Spread (up to 2" thickness) | | Not greater than 25 | ASTM E 84 |
| Smoke Developed (up to 2" thickness) | | Not greater than 50 | ASTM E 84 |
| Ozone Resistance | | Pass | ASTM D 1171 |
| Chemical/ Solvent Resistance | | Good | |
| Mildew Resistance/Air Erosion | | Pass | UL 181 |

| Sound Absorption Co-efficients at Frequency | | | | | | | |
|---|-------|-------|-------|--------|--------|--------|------|
| ASTM C-423/E-795 Type A Mounting/Sabins/Sq. Ft. | | | | | | | |
| Thickness | 125Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | NRC |
| 1/4" (6mm) | 0.00 | 0.03 | 0.05 | 0.10 | 0.25 | 0.45 | 0.10 |
| 1/2" (12mm) | 0.03 | 0.04 | 0.08 | 0.15 | 0.40 | 0.25 | 0.20 |
| 1" (25mm) | 0.10 | 0.15 | 0.45 | 0.30 | 0.40 | 0.33 | 0.35 |

SOUND TRANSMISSION CLASS AT 1" = 17 PER ASTM E 90

| Thickness Recommendations* - To Control Condensation | | | | | | | |
|--|---|-------|------|-------|--------|---------|----------------|
| Sheet Size | Ducts - Tanks - Vessels - Equipment - Metal - Surface Temperature | | | | | | |
| | 50°F | 10°C | 35°F | 2°C | 0°F | -18°C | -20°F -29°C |
| Normal Conditions (Max 85°F, 29°C - 70% R.H.) | 1/2" | 13 mm | 3/4" | 19 mm | 1" | 25 mm | 1-1/2" 38 mm** |
| Mild Conditions (Max 80°F, 26°C - 50% R.H.) | 1/8" | 3mm | 1/4" | 6 mm | 1/2" | 13 mm | 3/4" 19 mm |
| Severe Conditions (Max 90°F, 32°C -80% RH) | 3/4" | 19 mm | 1" | 25 mm | 1-3/4" | 44 mm** | 2" 50 mm** |

**Subject to code compliance.

*INSUL-SHEET® in thickness noted within the specified temperature ranges will prevent condensation on indoor piping under design conditions defined below.

Normal: Maximum severity of indoor conditions seldom exceed 85°F (29°C) and 70% R.H. in United States.

Mild: Typical conditions are most air-conditioned spaces and arid climates.

Severe: Generally found in areas where excessive moisture is introduced or in poorly ventilated areas where the temperature may be depressed below the ambient. Under conditions of higher humidity, additional thickness of insulation may be required.

NOTE: Thickness recommendations calculated using 0.2575 K-factor (0.25 plus 3% test error allowance)

| INSUL-SHEET® "R" Values (based on nominal thickness) | | | | | |
|--|-------------------------------|-------------------------------|-----------------------------|---------------------------------|-----------------------------|
| R Value 3/8" ^{NA} | R Value 1/2" ^{NA} | R Value 3/4" ^{NA} | R Value 1" ^{NA} | R Value 1 1/2" ^{NA} | R Value 2" ^{NA} |
| 1.5 | 2 | 3 | 4 | 6 | 8 |

*All sizes are nominal.

Note: "R" factors were calculated using a K factor of 0.2575 (0.25 plus 3% test error allowance at 75°F, 24°C mean temp.) and nominal wall thickness is each case. Lower operating temperatures will result in improved R values. Contact Technical Services for specific recommendations.



to meet International Energy Conservation Code requirements for Outdoor Ductwork



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