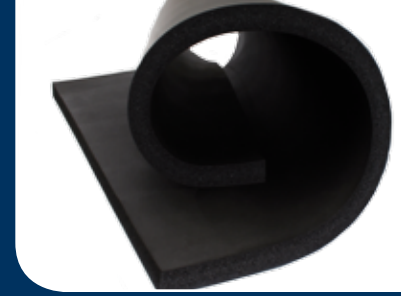


INSUL-SHEET®

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") or rolls (48" wide) in standard thicknesses of 1/8" thru 2". It is supplied skin two sides in 1/4" and above. 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.

OUTDOOR APPLICATIONS

INSUL-SHEET® is made from a UV-resistant elastomeric blend. For severe UV exposure or for optimum performance, K-FLEX® 374 Protective Coating, approved jacketing, or K-FLEX Clad® is required.

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

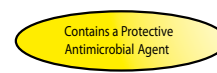
INSUL-SHEET® in thicknesses of 2" (50 mm) and below has a flame spread rating of 25 or less and a smoke development rating of 50 or less as tested by ASTM E 84, "Surface Burning Characteristics of Building Materials".

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 1056-00-2B1
- 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
- FMVSS302
- 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® | TEST METHODS |
|---|-----------------------|-----------------------------------|--------------------------|
| THERMAL CONDUCTIVITY (K) | 90°F (32°C) MEAN TEMP | 0.258 (0.0372) | ASTM C 177/ ASTM C 518 |
| BTU - IN/HR - FT² - °F (W/MK) | 75°F (24°C) MEAN TEMP | 0.245 (0.0353) | |
| DENSITY | | 3-6 PCF | ASTM D 1622/ ASTM D 3575 |
| OPERATING TEMPERATURE RANGE (FLEXIBLE TO -40°F) | | -297°F (-182°C) TO +220°F (104°C) | |
| WATER VAPOR PERMEABILITY DRY CUP. PERM-IN | | 0.03 | ASTM E 96 |
| WATER ABSORPTION % (VOLUME CHANGE) | | 0 | ASTM C 209 |
| FLAME SPREAD / SMOKE DEVELOPED (UP TO 2" WALL) | | <25/50 | ASTM E 84 |
| OZONE RESISTANCE | | GOOD | ASTM D 1171 |
| CHEMICAL/SOLVENT/OIL & GREASE RESISTANCE | | GOOD | |
| MILDEW RESISTANCE/AIR EROSION | | PASS | UL 181 |
| RESISTANCE TO U.V. & WEATHER ¹ | | PASS | QUV CHAMBER TEST |
| ODOR | | NOT OBJECTIONABLE | ASTM C 1304 |
| FLEXIBILITY | | EXCELLENT | |

¹ OUTDOOR APPLICATIONS SHOULD BE PROTECTED WITH AN APPROVED K-FLEX® COATING OR CLADDING.

| SOUND ABSORPTION CO-EFFICIENTS AT FREQUENCY | | | | | | | |
|--|--------|--------|--------|---------|---------|---------|------|
| ASTM C-423/E-795 TYPE A MOUNTING/SABINS/SQ. FT | | | | | | | |
| THICKNESS | 125 HZ | 250 HZ | 500 HZ | 1000 HZ | 2000 HZ | 4000 HZ | 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 |
| 2" (50mm) | 0.22 | 0.65 | 0.48 | 0.54 | 0.47 | 0.45 | 0.55 |

Sound Transmission Class at 1" = 17 per ASTM E 90

| THICKNESS RECOMMENDATIONS - TO CONTROL CONDENSATION | | | | |
|---|---------------------|--------------|--------------|----------------|
| OUTSIDE TEMPERATURE | 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" (3 mm) | 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) | 2" (50 mm) | 2" (50 mm) |

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 rarely 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 high humidity, additional thickness of insulation may be required. NOTE: Thickness recommendations calculated using 0.2575 K-factor (0.245 plus 5% test error allowance)

| "R" VALUES | | | | | |
|------------------------|-------|-------|-----|---------|-----|
| 3/8"* | 1/2"* | 3/4"* | 1"* | 1-1/2"* | 2"* |
| 1.5 | 2 | 3 | 4 | 6 | 8 |
| *All sizes are nominal | | | | | |

NOTE: "R" FACTORS WERE CALCULATED USING A K FACTOR OF 0.2575 (0.245 PLUS 5% 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.

