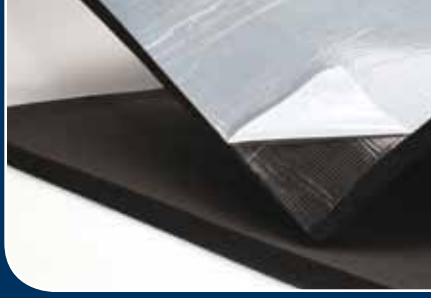
INSUL-SHEET® WITH PSA

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



DESCRIPTION

INSUL-SHEET® with Pressure Sensitive Adhesive (PSA) 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 1-1/2". It is supplied skin one side with a specially formulated scrim reinforced adhesive and tear- and moisture-resistant release liner on the opposite side. INSUL-SHEET® with PSA key physical properties are approved through supervision by *Factory Mutual Research Corporation*.

INSUL-SHEET® with PSA 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® with PSA is GREENGUARD® certified as a low VOC material, meeting the requirements of the *"Children and Schools"* and *"Indoor Air Quality"* classifications.

APPLICATIONS

INSUL-SHEET® with PSA is used to retard heat gain and prevent condensation or frost formation on cold equipment, tanks, vessels or ducts (for covering only). It also effectively retards heat loss when used on hot or cold equipment or ducts (for covering only). INSUL-SHEET® with PSA is recommended for applications ranging from -70°F to 200°F (-57°C to 93°C).

INSUL-SHEET® with PSA speeds up installation time and reduces the amount of solvent-based contact adhesives required, making it ideal for retrofit and OEM applications. The scrim reinforcement reduces the tendency to stretch the sheet insulation during installation and improves the peel strength of the material. INSUL-SHEET® with PSA thickness has been calculated to control condensation on cold surfaces. Refer to the table on the reverse side for specific recommendations.

INSTALLATION

ASTM C1710, *Installation Guide for Flexible Closed Cell Foams*, should be used as an installation guide. INSUL-SHEET® with PSA is applied to clean, dry ductwork (for covering only) and equipment by simply peeling the easy release liner away and applying uniform pressure to the sheet. Compression joints with adhesive applied should be used on all butt edges. See technical bulletin for installation instructions in cold temperatures. Contact K-FLEX USA for specific installation instructions.

INSUL-SHEET® is acceptable for use in duct covering applications. K-FLEX Duct® Liner Gray should be used for duct lining applications.

OUTDOOR APPLICATIONS

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

FLAME AND SMOKE RATING

INSUL-SHEET® with PSA 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® with PSA is acceptable for use in duct/plenum cover 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
- UL 94-5V Flammability Classification (Recognition No. E300774)
- Foam Core: ASTM E84 25/50-tested according to UL 723 and NFPA 255; PSA: 0/10
- Meets requirements of CAN/ULC S102-M88
- STC=17 at 1" per ASTM E 90
- NRC = 0.35 at 1" per ASTM C423
- Meets requirements of NFPA 90A Sect. 4.3.3 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)
- 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® WITH PSA	TEST METHODS
THERMAL CONDUCTIVITY (K) BTU - IN/HR - FT^2 - °F (W/MK)	90°F (32°C) MEAN TEMP 75°F (24°C) MEAN TEMP	0.258 (0.0372) 0.245 (0.0353)	ASTM C 177/ ASTM C 518
DENSITY		3-6 PCF	ASTM D 1622/ ASTM D 3575
OPERATING TEMPERATURE RANGE (FLEXIBLE TO -40°F)		-70°F (-57°C) TO +200°F (93°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

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

THICKNESS RECOMMENDATIONS - TO CONTROL CONDENSATION

	SURFACE TEMPERATURE			
OUTSIDE 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® with PSA 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. Thickness recommendations above 1-1/2" can be layered to achieve thickness. 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

1/8"*	1/4"*	3/8"*	1/2"*	3/4"*	1"*	1-1/2"*
0.5	1.0	1.5	2	3	4	6

*All sizes are nominal

NOTE:"R" FACTORS WERE CALCULATED USING A K FACTOR OF 0.2575 (0.245 PLUS 5% TEST ERROR ALLOWANCE AT 75º F, 24ºC MEAN TEMP.) AND NOMINAL WALL THICKNESS IS EACH CASE. LOWER OPERATING TEMPERATURES WILL RESULT IN IMPROVED R VALUES. CONTACT TECHNICAL SERVICES FOR SPECIFIC RECOMMENDATIONS.

PRESSURE SENSITIVE ADHESIVE PROPERTIES (PSA)

Description	Double-sided, solvent-free, modified acrylic adhesive with a high initial tack, high adhesive strength (min 18N/25mm after 1 hour contact time according to AFERA 5001), and resistance to humidity and ageing.
Construction	Adhesive: 70 g/m^2 weight; 0.08 mm thickness Support: PES/PVA scrim Liner: PE release liner, moisture and tear resistant, easy release

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