

INSUL-SHEET®

S2S
SKIN2SIDES

R-8
sheet

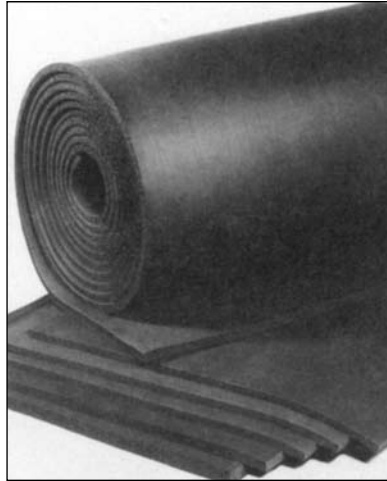
to meet International Energy
Conservation Code requirements
for Outdoor Ductwork

Sheet Insulation Flexible Closed Cell Insulation

Made in USA
Designed for the HVAC/R Industry

UL 94
(Recognition No. E147665)
UV resistant Refer to K-Flex USA L.L.C.
Technical Bulletin
(Outdoor Applications) for More Information

Protected by the
Bio-Guard™ System



DESCRIPTION

INSUL-SHEET® insulation 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® is non-porous, non-fibrous and resists mold growth. The Bio-Guard™ antimicrobial system provides added protection against mold, fungal and bacterial growth. The active ingredient in Bio-Guard™ is registered with the EPA.

K-Flex USA elastomeric insulation products are GREENGUARD **certified** as low VOC materials, meeting the requirements of the "Children and Schools" classification, the most stringent requirements. Additionally, all K-Flex USA elastomeric insulation products are GREENGUARD **listed** for mold resistance and meet the "mold resistant" criteria.

APPLICATIONS

INSUL-SHEET® insulation 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®

can be used as duct covering. 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 seams and butt joints are glued. On full adhesion applications, the upper limit is 200°F (93°C).

INSUL-SHEET® has a very tough skin which withstands tearing, rough handling, and severe environmental conditions, and yet is quite 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® insulation is applied to ductwork 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 easy to use release liner. *Contact K-Flex USA for specific installation instructions.*

OUTDOOR APPLICATIONS

For optimum performance, outdoor applications require 374 UV Protective Coating or other recommended protective coating, cladding or jacketing. *For more detailed information refer to the Application 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® insulation in thicknesses of 1 1/2" (38 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 Method of Testing entitled: "Surface Burning Characteristics of Building Materials."

INSUL-SHEET® insulation 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 Requirements
STC = 17 per ASTM E 90
UL 94-5V Flammability Classification
(Recognition No. E300774)
ASTM E 84 1 1/2" 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.

PRODUCT DATA

Physical Properties		INSUL-SHEET® Insulation	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	.27 (.039) .25 (.036)	ASTM C 177/C 518 ASTM C 177/C 518
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 1-1/2" thickness)		Not greater than 25	ASTM E 84
Smoke Developed (up to 1-1/2" 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

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**	
									**Multiple Layers

*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"	R Value 1/2"	R Value 3/4"	R Value 1"	R Value 1 1/2"	R Value 2"	
1.5	2	3	4	6	8	
*All sizes are nominal.						
Note: "R" factors were calculated using a K factor of 0.2575 (0.25 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.						

